AC/AC Slim Drive

SIEIDrive

AVRy

..... Instruction Manual

GEFRAN

Information about this manual

Current revision
This manual is updated according to :
- drive software version 3.6XX
- regen software version 1.0XX

The identification number of the software version can be read on the drive nameplate, on the label on the FLASH memories mounted on the regulation card or can be checked with the **Software version** parameter, on **MONITOR / ID status** menu.

Variation of the number replacing "X" have no influence on the functionality of the device.

General information

Note !

In industry, the terms "Inverter", "Regulator" and "Drive" are sometimes interchanged. In this document, the term "Drive" will be used.

Before using the product, read the safety instruction section carefully. Keep the manual in a safe place and available to engineering and installation personnel during the product functioning period.
Gefran S.p.A has the right to modify products, data and dimensions without notice. The data can only be used for the product description and they can not be understood as legally stated properties.

Thank you for choosing this Gefran product.
We will be glad to receive any possible information which could help us improving this manual.
The e-mail address is the following: techdoc@gefran.com.

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0 - Safety Precautions

0.1 Symbols used in the manual

Warning

Indicates a procedure, condition, or statement that, if not strictly observed, could result in personal injury or death.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont passtrictement respectées, il y a des risques de blessures corporelles ou de mort.

Caution

Indicates a procedure, condition, or statement that, if not strictly observed, could result in damage to or destruction of equipment.

Indique et le mode d'utilisation, la procédure et la condition d'exploitation. Si ces consignes ne sont pas strictement respectées, il y a des risques de détérioration ou de destruction des appareils.

Indicates that the presence of electrostatic discharge could damage the appliance. When handling the boards, always wear a grounded bracelet.

Indique que la présence de décharges électrostatiques est susceptible d'endommager l'appareil. Toujours porter un bracelet de mise à la terre lors de la manipulation des cartes.

Attention

Indicates a procedure, condition, or statement that should be strictly followed in order to optimize these applications.

Indique le mode d'utilisation, la procédure et la condition d'exploitation. Ces consignes doivent êtrerigoureusement respectées pour optimiser ces applications.

Note !

Indicates an essential or important procedure, condition, or statement.

Indique un mode d'utilisation, de procédure et de condition d'exploitation essentiels ou importants

Qualified personnel

For the purpose of this Instruction Manual , a "Qualified person" is someone who is skilled to the installation, mounting, start-up and operation of the equipment and the hazards involved. This operator must have the following qualifications:

- trained in rendering first aid.
- trained in the proper care and use of protective equipment in accordance with established safety procedures.
- trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety procedures.

Personne qualifiée

Aux fins de ce manuel d'instructions, le terme « personne qualifiée » désigne toute personne compétente en matière d'installation, de montage, de mise en service et de fonctionnement de l'appareil et au fait des dangers qui s'y rattachent. L'opérateur en question doit posséder les qualifications suivantes :

- formation lui permettant de dispenser les premiers soins

- formation liée à l'entretien et à l'utilisation des équipements de protection selon les consigne de sécurité en vigueur

- formation et habilitation aux manoeuvres suivantes : branchement, débranchement,

vérification des isolations, mise à la terre et étiquetage des circuits et des appareils selon les consignes de sécurité en vigueur

Use for intended purpose only

The power drive system (electrical drive + application plant) may be used only for the application stated in the manual and only together with devices and components recommended and authorized by Gefran.

Utiliser uniquement dans les conditions prévues

Le système d'actionnement électrique (drive électrique + installation) ne peut être utilisé que dans les conditions d'exploitation et les lieux prévus dans le manuel et uniquement avec les dispositifs et les composants recommandés et autorisés par Gefran.

0.2 General hints

Note!

If the Drives have been stored for longer than two years, the operation of the DC link capacitors may be impaired and must be "reformed".
Before commissioning devices that have been stored for long periods, connect them to a power supply for two hours with no load connected in order to regenerate the capacitors, (the input voltage has to be applied without enabling the drive).

En cas de stockage des variateurs pendant plus de deux ans, il est conseillé de contrôler l'état des condensateurs CC avant d'en effectuer le branchement. Avant la mise en service des appareils, ayant été stockés pendant longtemps, il faut alimenter variateurs à vide pendant deux heures, pour régénérer les condensateurs: appliquer une tension d'alimentation sans actionner le variateur .

Note!

The terms "Inverter", "Controller" and "Drive" are sometimes used interchangably throughout the industry. We will use the term "Drive" in this document.

Les mots "Inverter", "Controller" et "Drive" sont interchangeables dans le domaine industriel. Nous utiliserons dans ce manuel seulement le mot "Drive".

Caution

Do not perform a megger test between the Drive terminals or on the control circuit terminals.

Ne pas exécuter un test megger entre les bornes du drive ou entre les bornes du circuit de contrôle.

Caution

No dielectric tests should be carried out on parts of the drive. A suitable measuring instrument (internal resistance of at least 10 kΩ/V) should be used for measuring the signal voltages.

Il ne faut pas éxécuter de tests de rigidité diélectrique sur des parties du convertisseurs. Pour mesurer les tensions, des signaux, il faut utiliser des instruments de mesure appropriés (résistance interne minimale 10 kΩ/V).

0.3 When the unit is working

Warning

According to the EEC standards the AVRy and accessories must be used only after checking that the machine has been produced using those safety devices required by the 89/392/EEC set of rules, as far as the machine industry is concerned. These standards do not apply in the Americas, but may need to be considered in equipment being shipped to Europe.
Drive systems cause mechanical motion. It is the responsibility of the user to insure that any such motion does not result in an unsafe condition. Factory provided interlocks

and operating limits should not be bypassed or modified.

Selon les normes EEC, les drives AVRy et leurs accessoires doivent être employés seulement après avoir verifié que la machine ait été produit avec les même dispositifs de sécurité demandés par la réglementation 89/392/EEC concernant le secteur de l'industrie.

Les systèmes provoquent des mouvements mécaniques. L'utilisateur est responsable de la sécurité concernant les mouvements mécaniques. Les dispositifs de sécurité prévues par l'usine et les limitations operationelles ne doivent être dépassés ou modifiés.

Electrical Shock and Burn Hazard:
When using instruments such as oscilloscopes to work on live equipment, the oscilloscope's chassis should be grounded and a differential probe input should be used. Care should be used in the selection of probes and leads and in the adjustment of the oscilloscope so that accurate readings may be made. See instrument manufacturer's instruction book for proper operation and adjustments to the instrument.

Décharge Èlectrique et Risque de Brúlure : Lors de l'utilisation d'instruments (par example oscilloscope) sur des systémes en marche, le chassis de l'oscilloscope doit être relié à la terre et une sonde différentiel devrait être utilisé en entrée. Les sondes et conducteurs doivent être choissis avec soin pour effectuer les meilleures mesures à l'aide d'un oscilloscope. Voir le manuel d'instruction pour une utilisation correcte des instruments.

Never open the device or covers while the AC Input power supply is switched on. Minimum time to wait before working on the terminals or inside the device is listed in section 4.8 on Instruction manual .

Ne jamais ouvrir l'appareil lorsqu'il est suns tension. Le temps minimum d'attente avant de pouvoir travailler sur les bornes ou bien à l'intérieur de l'appareil est indiqué dans la section 4.8.

0.3 Safety in case of installation and maintenance

Fire and Explosion Hazard:
Fires or explosions might result from mounting Drives in hazardous areas such as locations where flammable or combustible vapors or dusts are present. Drives should be installed away from hazardous areas, even if used with motors suitable for use in these locations.

Risque d'incendies et d'explosions: L'utilisation des drives dans des zônes à risques (présence de vapeurs ou de poussières inflammables), peut provoquer des incendies ou des explosions. Les drives doivent être installés loin des zônes dangeureuses, et équipés de moteurs appropriés.

Drives and motors must be ground connected according to the NEC.

Tous les moteurs et les drives doivent être mis à la terre selon le Code Electrique National ou équivalent.

Do not connect power supply voltage that exceeds the standard specification voltage fluctuation permissible. If excessive voltage is applied to the Drive, damage to the internal components will result.

Ne pas raccorder de tension d'alimentation dépassant la fluctuation de tension permise par les normes. Dans le cas d' une alimentation en tension excessive, des composants internes peuvent être endommagés.

Warning

Power supply and grounding

1. The regen converters series has been designed to be connected to standard three phase supply lines that are electrically symmetrical with respect to ground (TN or TT Network).
2. In case of IT supply line or TT supply line with grounded phase conductor, an isolating transformer is mandatory.

Please refer to the following connection sample.

Attention! Alimentation puissance et mise à la terre

1. *La série de convertisseurs de REGEN a été conçue pour être reliée aux canalisations d'alimentation triphasées standard qui sont électriquement symétriques en ce qui concerne la terre (réseau de TN ou de TT).*
2. *En cas de canalisation d'alimentation de IT ou canalisation d'alimentation de TT avec le conducteur fondé de phase, un transformateur d'isolement est obligatoire.*

Vous pouvez trouver ci-après des exemples de câblage.

Figure 0.3.1: Supply line types

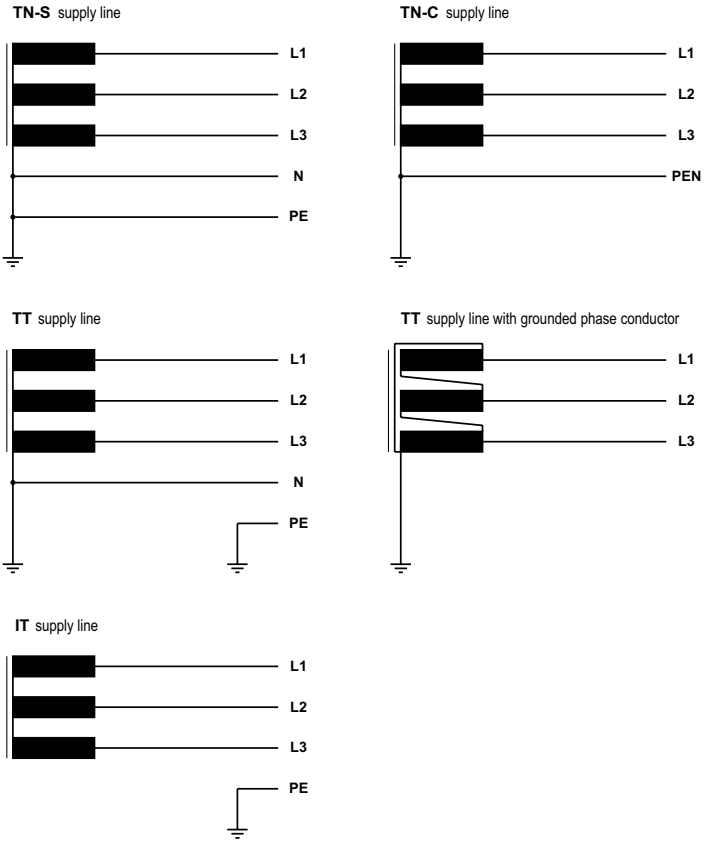
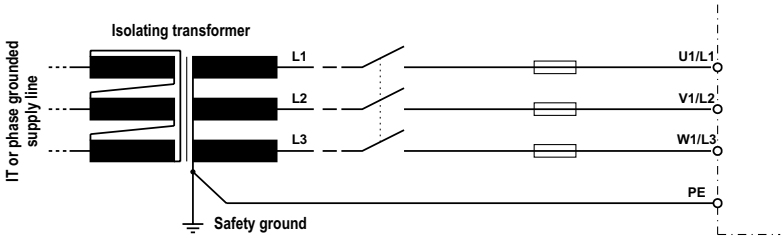


Figure 0.3.2: Insertion of isolating transformer

Figure 0.3.2: Insertion of isolating transformer



Caution

Do not operate the Drive without the ground wire connected. The motor chassis should be grounded to earth through a ground lead separate from all other equipment ground leads to prevent noise coupling.

Ne pas faire fonctionner le drive sans prise de terre. Le chassis du moteur doit être mis à la terre à l'aide d'un connecteur de terre separé des autres pour éviter le couplage des perturbations. Le connecteur de terre devrait être dimensionné selon la norme NEC ou le Canadian Electrical code.

If the Drive's Fault Alarm is activated, consult the TROUBLESHOOTING section of this instruction book, and after correcting the problem, resume operation. Do not reset the alarm automatically by external sequence, etc.

Si la Fault Alarm du drive est activée, consulter la section du manuel concernant les défauts et après avoir corrigé l'erreur, reprendre l'opération. Ne pas réiniliatiser l'alarme automatiquement par une séquence externe, etc

0.4 Avoiding of unwanted restart

Warning

The drive may cause accidental motion in the event of a failure, even if it is disabled, unless it has been disconnected from the AC input feeder.

En cas de panne, le variateur peut causer une mise en marche accidentelle, même s'il est désactivé, sauf s'il a été débranché de l'alimentateur à courant alterné.

0.5 EMC

According to EN12015 (Conducted emission) and EN12016 (Immunity).

0.6 Cooling

Caution

Because the ambient temperature greatly affects Drive life and reliability, do not install the Drive in any location that exceeds the allowable temperature.

Étant donné que la température ambiante influe sur la vie et la fiabilité du drive, on ne devrait pas installer le drive dans des places ou la temperature permise est dépassée.

0.7 Installing the unit

Strain Hazard:
Improper lifting practices can cause serious or fatal injury. Lift only with adequate equipment and trained personnel.

Attention à l'Élévation:

Une élévation inappropriée peut causer des dommages sérieux ou fatals. Il doit être élevé seulement avec des moyens appropriés et par du personnel qualifié.

Replace all covers before applying power to the Drive. Failure to do so may result in death or serious injury.

Remettre tous les capots avant de mettre sous tension le drive. Des erreurs peuvent provoquer de sérieux accidents ou même la mort.

Adjustable frequency drives are electrical apparatus for use in industrial installations. Parts of the Drives are energized during operation. The electrical installation and the opening of the device should therefore only be carried out by qualified personnel. Improper installation of motors or Drives may therefore cause the failure of the device as well as serious injury to persons or material damage.
Drive is not equipped with motor overspeed protection logic other than that controlled by software.Follow the instructions given in this manual and observe the local and national safety regulations applicable.

Les drives à fréquence variable sont des dispositifs électriques utilisés dans des installations industriels. Une partie des drives sont sous tension pendant l'operation. L'installation électrique et l'ouverture des drives devrait être executé uniquement par du personel qualifié. De mauvaises installations de moteurs ou de drives peuvent provoquer des dommages materiels ou blesser des personnes.On doit suivir les instructions donneés dans ce manuel et observer les régles nationales de sécurité.

Always connect the Drive to the protective ground (PE) via the marked connection terminals (PE2) and the housing (PE1). AC Input filters have ground discharge currents greater than 3.5 mA. EN 50178 specifies that with discharge currents greater than 3.5 mA the protective conductor ground connection (PE1) must be fixed type and doubled for redundancy.

Il faut toujours connecter le variateur à la terre (PE) par les des bornes (PE2) et le châssis (PE1). Le courant de dispersion vers la terre est supérieur à 3,5 mA sur les filtres à courant alterné (CA). Les normes EN 50178 spécifient qu'en cas de courant de dispersion vers la terre, supérieur à 3,5 ma, la mise à la terre (PE1) doit avoir une double connexion pour la redondance.

The grounding connector shall be sized in accordance with the NEC or Canadian Electrical Code. The connection shall be made by a UL listed or CSA certified closed-loop terminal connector sized for the wire gauge involved. The connector is to be fixed using the crimp tool specified by the connector manufacturer.

Le raccordement devrait être fait par un connecteur certifié et mentionné à boucle fermé par les normes CSA et UL et dimensionné pour l'épaisseur du cable correspondant. Le connecteur doit être fixé a l'aide d'un instrument de serrage specifié par le producteur du connecteur.

Be sure to remove the desicant dryer packet(s) when unpacking the Drive. (If not removed these packets may become lodged in the fan or air passages and cause the Drive to overheat).

Lors du déballage du drive, retirer le sachet déshydraté. (Si celui-ci n'est pas retiré, il empêche la ventilation et provoque une surchauffe du drive).

The Drive must be mounted on a wall that is constructed of heat resistant material. While the Drive is operating, the temperature of the Drive's cooling fins can rise to a temperature of 194° F (90°C).

Le drive doit être monté sur un mur construit avec des matériaux résistants à la chaleur. Pendant le fonctionnement du drive, la température des ailettes du dissipateur thermique peut arriver à 194°F (90°).

Do not touch or damage any components when handling the device. The changing of the isolation gaps or the removing of the isolation and covers is not permissible.

Manipuler l'appareil de façon à ne pas toucher ou endommager des parties. Il n'est pas permis de changer les distances d'isolement ou bien d'enlever des matériaux isolants ou des capots.

Protect the device from impermissible environmental conditions (temperature, humidity, shock etc.)

Protéger l'appareil contre des effets extérieurs non permis (température, humidité, chocs etc.).

No voltage should be connected to the output of the drive (terminals U2, V2 W2). The parallel connection of several drives via the outputs and the direct connection of the inputs and outputs (bypass) are not permissible.

Aucune tension ne doit être appliquée sur la sortie du convertisseur (bornes U2, V2 et W2). Il n'est pas permis de raccorder la sortie de plusieurs convertisseurs en parallèle, ni d'effectuer une connexion directe de l'entrée avec la sortie du convertisseur (Bypass).

A capacitative load (e.g. Var compensation capacitors) should not be connected to the output of the drive (terminals U2, V2, W2).

Aucune charge capacitive ne doit être connectée à la sortie du convertisseur (bornes U2, V2 et W2) (par exemple des condensateurs de mise en phase).

The electrical commissioning should only be carried out by qualified personnel, who are also responsible for the provision of a suitable ground connection and a protected power supply feeder in accordance with the local and national regulations. The motor must be protected against overloads.

La mise en service électrique doit être effectuée par un personnel qualifié. Ce dernier est responsable de l'existence d'une connexion de terre adéquate et d'une protection des câbles d'alimentation selon les prescriptions locales et nationales. Le moteur doit être protégé contre la surcharge.

1 - Features and general functions

1.1 General description

AVRy is a new family of SIEIDrive IGBT AC/AC Lift drive for synchronous PM motors.

GEFRAN integrated regenerative drive can achieve up to 40% energy reduction over standard non-regenerative geared installations. The amount of energy saving due to regeneration depends on various system parameters such as traffic pattern, duty load and speed of the lift. This saving translates into lower operating costs for building owners.

Thanks to a powerful DSP (Digital Signal Processor) coupled with a proven IGBT power section, the input current of AVRy unit is controlled in phase with input voltage with minimum distortion allowing for positive and negative power flow. Output section integrated is that of well known AVy-L drive with dedicated control interface for lift application. With many protection functions mostly programmable, AVRy unit guarantees robust operation.

The main advantages of AVRy are:

- energy saving
- unity power factor operation
- low input current harmonic distortion < 5%
- high dynamic performance handling motoring and regenerative power transients.
- no need of braking resistor

1.2 Dedicated features

➲ Lift sequence

Typical sequence of input / output signals used in elevator application, brake, output contactor & door control.

➲ Parameters in linear units

It is possible to select different engineering units for principal parameters determining the movement, rpm for speed and rpm/s, rmp/s^2 for acceleration referred to motor or mm/s for speed, mm/s^2, mm/s^3 for acceleration referred to car.

➲ Lift mechanical parameters

Parameters of mechanical system like Pulley diameter and Gearbox ratio for transformation between unit systems and System weights to calculate inertia and tune speed regulator for desired response.

➲ Ramp generation

Two independent S ramps selectable through digital input with 4 independent jerk settings. Dedicated deceleration ramp corresponding to stop command.

➲ Multi speed

8 preset speed reference values. At start, possibility to overwrite with additional value to achieve smooth start.

➲ Pre-torque

Initialisation of speed regulator from weight sensor to avoid saging or lifting at start.

➲ Landing control

Precision control of car position in floor zone through internal position regulator.

➲ Higher overload

Overload capability corresponding to typical load cycle used in elevator application.

➲ Fan control logic function

Fan control logic function allows to run internal inverter fans only when the drive is enabled.

➲ Easy of use menu

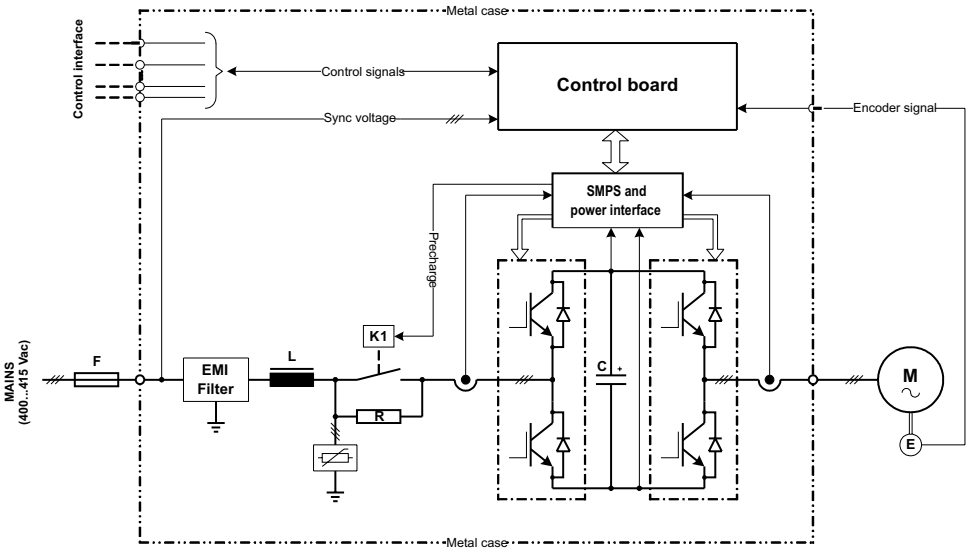
Menus with elevator terminology separated for MONITORing, motor STARTUP and TRAVEL settings.

1.3 Product features

- Input supply rating: from 3ph 380Vac to 3ph 460Vac, 50/60Hz
- Power capability at unity power factor: 11kW, 20kW and 27kW with high voltage motors
- Overload capability: 183% * 10”
- Drive includes input line choke and EMI filter
- Inverter & Regen, programmable PWM frequency ≤ 16kHz (size dependent)
- Integrated pre-charge (circuit)
- 2 relay digital outputs
- 8 Digital inputs
- 2 Analog outputs
- 2 Analog input
- RS485 serial interface, available with SLINK4 and Modbus protocol
- External 24V input for control power backup
- Possibility to supply 230V single phase for emergency operation
- Programming keypad with alphanumeric display
- IP20 protection degree

1.4 Principle of operation

Figure 1.4.1: Power circuit block diagram



AC input supply voltage
See section 2.3.6.

Fuse
See section 4.7.1.

Precharging circuit
DC-link precharging is made by a resistor connected at the mains input side. When precharging is complete, the resistor is bypassed with a power relay driven by the control board. The power relay is opened again in case of “undervoltage” trip to allow a new cycle when mains voltage values returns to rated value.

EMI Filter
The EMI Filter, inside the converter, drive emission according to of EN 12015.

AC mains choke
An AC choke against the presence of high frequency harmonics superposed to the fundamental line frequency current is integrated in the drive.

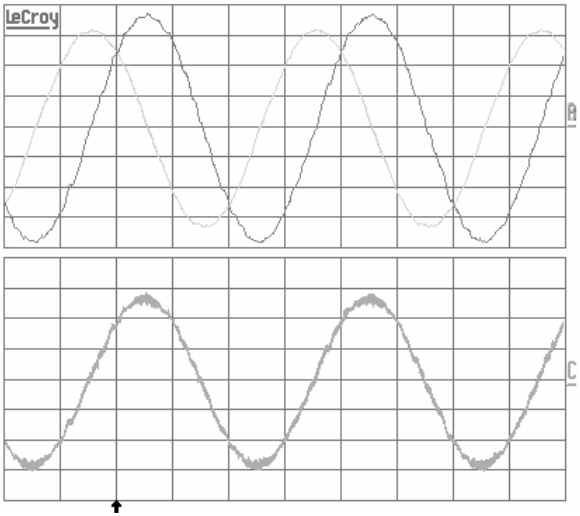
IGBT bridge (ac/dc converter)
Converts a variable three-phase alternating voltage with variable frequency to a direct voltage .

Control section
Modules for open-loop and closed-loop control of the power section. This is used for processing control commands, reference values and actual values.

IGBT bridge (inverter)
Converts direct voltage to a variable three-phase alternating voltage with variable

frequency.

Figure 1.4.2: Example of input current and voltage of AVRy drive



This figure show the sinusoidal wave of voltage (orange) and current (blue) that it's possible measure at the input side of AVRy drive.

2 - Specifications

2.1 Permissible ambient conditions

Ambient temperature:	0 … +40°C; 0 …+50°C with derating.
Installation location:	Pollution degree 2 or better (free from direct sunlight, vibration, dust, corrosive or inflammable gases, fog, vapour oil and dripped water, avoid saline environment).
Installation altitude:	Up to 1000 m above sea level; for higher altitudes an output current reduction of 1.2% every 100 m of additional height applies. Max. installation altitude is 2000m.

Temperature:

operation	0…+40°C
operation	0…+50°C with derating
storage	-25…+55°C, class 1K4 according to EN 50178
storage	-20…+55°C, for devices with keypad (not this case)
transport	-25…+70°C, class 2K3 according to EN 50178
transport	-20…+60°C, for devices with keypad (not this case)

Air humidity:

operation	5% to 85%, 1g/m^3 to 25g/m^3 without moisture condensation or icing, class 3K3 according to EN 50178
storage	5% to 95 %, 1 g/m^3 to 29 g/m^3, class 1K3 according to EN 50178
transport	95%, 60g/m^3
	A light condensation of moisture may occur for a short time occasionally if the device is not in operation. Class 2K3 according to EN 50178

Air pressure:

operation	86 to 106kPa, class 3K3 according to EN 50178
storage	86 to 106kPa, class 1K4 according to EN 50178
transport	70 to 106kPa, class 2K3 according to EN 50178

1) Parameter Ambient temp = 40°C (104°)
Ambient temp = 0 ... 40°C (32°...104°F)
Over 40°C: current reduction of 2% of rated output current per °C

2) Parameter Ambient temp = 50°C (122°F)
Ambient temp = 0 ... 50°C (32°...122°F)
Current derated to 0.8 rated output current
Over 40°C (104°): removal of the top cover (better than class 3K3 as per EN50178)

2.2 Standards

Climatic conditions	IEC 68- 2 Part 2 and 3
Clearance and creepage:	EN 50178, UL508C, UL840 degree of pollution 2
Vibration:	IEC 68- 2 Part 6
Approvals	CE
EMC compatibility	According to EN12015 (Conducted emission) and EN12016 (Immunity).

Table 2.2.1: AC Input

Drive type		AVRy 1 1425	AVRy 1 2545	AVRy 2 3360
Supply line type		TT or TN		
Nominal mains input voltages	VAC	3 x 400 -15% - 3 x 460 +15%, 45...65Hz		
cosφL1		≅ +1 (motor), ≅ -1 (generator) anyhow better than |±0.95|		
Rated input power (see motor side output load cycle)	KVA	13	22	29
Rated input current ILN (@ ULN = 400VAC)	AAC	18	32	42
Rated DC-link voltage UdN (@ ULN = 400VAC)	VDC	740		
DC-link overvoltage threshold	VDC	820		
DC-link undervoltage threshold (@ ULN = 400 ... 480VAC)	VDC	400		
THD of ILN (ref. to IL1 and @ ISC = 100)	%	≤4		
Efficiency	%	≤ 94 ...96		
Modulation type		Space vector PWM		
fsw switching frequency (Default)	kHz	16	8	
Derating factor fsw switching frequency (Higher)	kf	1*I2	0,7*I2	

Table 2.2.2: Output

Drive type		AVRy 1 1425	AVRy 1 2545	AVRy 2 3360
Output voltage range U2	VAC	0 ... 520		
Output frequency range f2	Hz	0 ... 300		
Modulation type		Space vector PWM		
fsw switching frequency (Default)	kHz	8		
Derating factor fsw switching frequency (Higher)	kf	0,7 * I2		
Max. output dV / dt	kV / μs	5		
Rated output current I2 (duty 80%)	ARMS	14	25	33
Rated output overload current I2OVL	ARMS	25 (*)	45 (*)	60' (*)

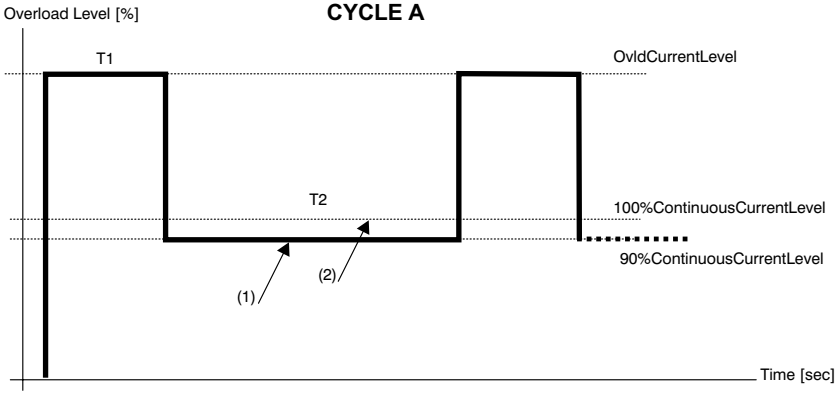
(*) See specific overload cycle and current table)

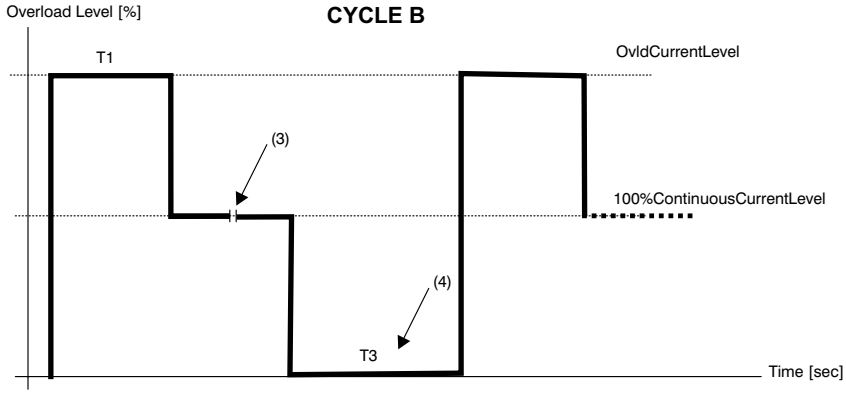
Table 2.2.3:Overload capability table

Drive type	I2	Overall overload factor	Overload time T1	I2OVL	Pause time T2 @ 90% I2OVL	Pause time T3 @ 0% I2OVL	Overload factor kLOW @ f2 < 3Hz	Overload time T1LOW @ f2 < 3Hz
	ARMS	KOVL	sec	ARMS	sec	sec		sec
AVRy 1 1425	14	1.83	10	25.6	124	24	1.5	2
AVRy 1 2545	25	1.83	10	45.7	124	24	1.5	2
AVRy 2 3360	33	1.83	10	60	124	24	1.5	2

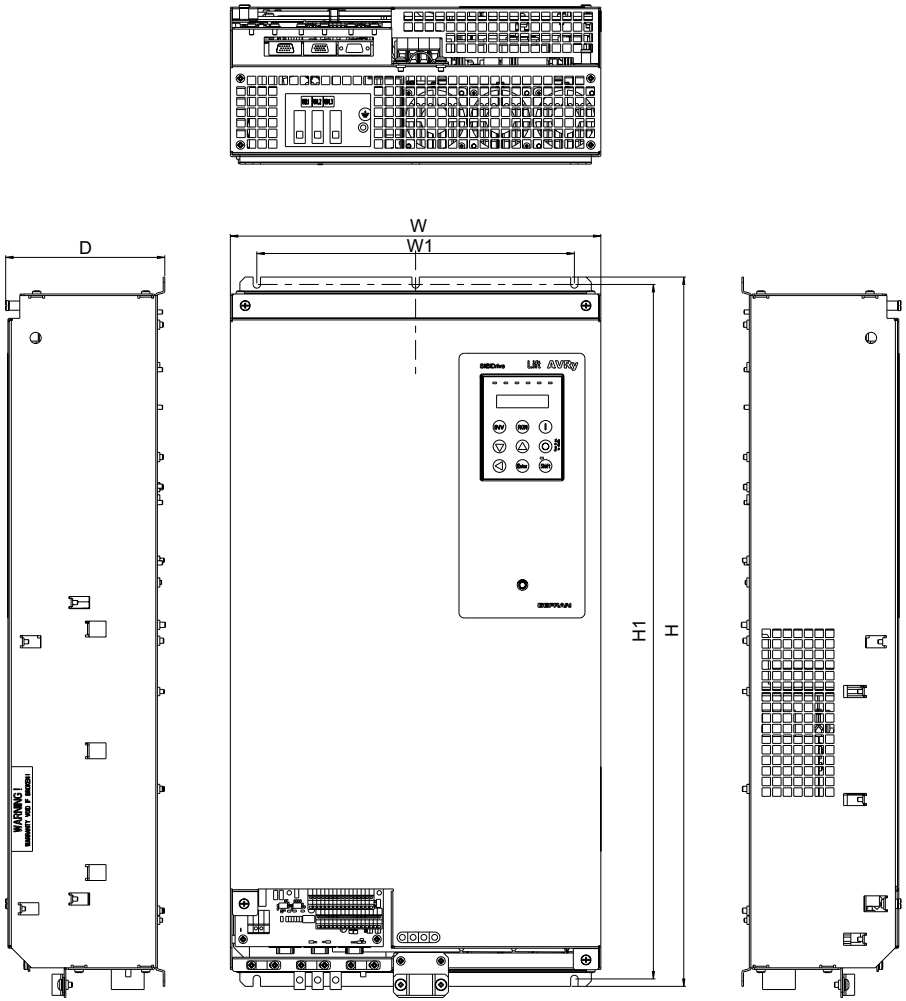
Figure 2.2.1:Overload cycles “A” and “B”

(1) Load current must be reduced to 90% level to allow next overload cycle.
(2) Drive current is limited to 100% level when drive overload alarm is selected as Ignore or Warning
(3) No limit on duration of this time interval @100% Cont current
(4) Next overload cycle is allowed after T3





2.3 Dimensions and weights



Drive type	H mm (inches)	H1 mm (inches)	W mm (inches)	W1 mm (inches)	D mm (inches)	Weight kg (lbs)
AVRy 1 1425	670 (26.38)	656 (25.83)	350 (13.78)	300 (11.81)	150.3 (5.92)	28.7 (63.27)
AVRy 1 2545						32.0 (70.55)
AVRy 2 3360	788 (31.02)	753 (29.65)	420 (16.53)	400 (15.75)	180 (7.09)	55.0 (121.25)

2.4 Watt loss and cooling

The heat dissipation of the Drives depends on the operating state of the connected motor. The table below shows values that refer to operation at default switching frequency (see table 2.3.1, “AC Input/Output”), Tamb ≤ 40°C, typ. motor power factor and nominal continuous current.

Table 2.4.1: Heat Dissipation and Required Air Flow

Drive type	Heat Dissipation [W]	Airflow of fan [m^3/h]	
	@U_{LN}=400V_{AC}	Internal choke fan	Heatsink fans
AVRy 1 1425	480	140	3 x 50
AVRy 1 2545	620	250	3 x 50
AVRy 2 3360	800	250	3 x 80

Table 2.4.2: Minimum Cabinet Opening Suggested for the Cooling

Drive type	Minimum cooling opening [cm^2] (sq.inch)
	Internal choke and heatsink
AVRy 1 1425	408
AVRy 1 2545	408
AVRy 2 3360	630

3 - Installation

3.1 Disposal of the device

The AVRy Drive can be disposed as electronic scrap in accordance with the currently valid national regulations for the disposal of electronic parts.

3.2 Upon delivery inspection procedures

A high degree of care is taken in packing the AVRy drives and preparing them for delivery. They should only be transported with suitable transport equipment (see weight data). Observe the instructions printed on the packaging. This also applies when the device is unpacked and installed in the control cabinet.

Upon delivery, check the following:
- the packaging for any external damage
- whether the delivery note matches your order.

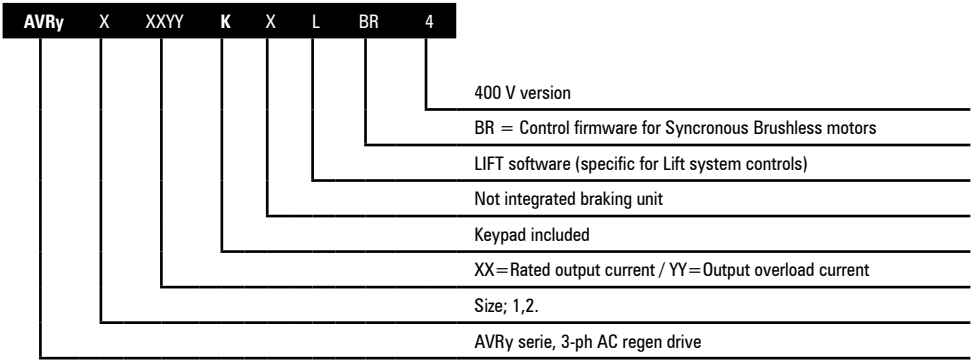
Open the packaging with suitable tools. Check whether:
- any parts were damaged during transport
- the device type corresponds to your order.

In the event of any damage or of an incomplete or incorrect delivery please notify the responsible sales offices immediately.
The devices should only be stored in dry rooms within the specified temperature ranges.

Note !

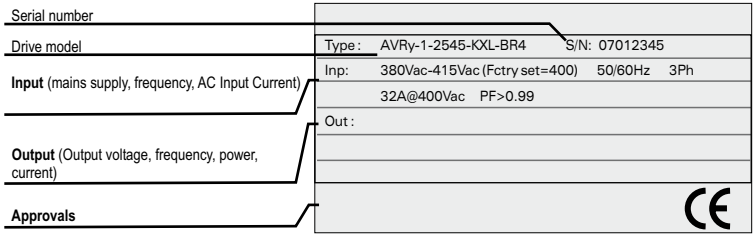
A certain degree of moisture condensation is permissible if this arises from changes in temperature (see section 3.1, “Permissible Environmental Conditions”). This does not, however, apply when the devices are in operation. Always ensure that there is no moisture condensation in devices that are connected to the power supply!

3.3 Type designation

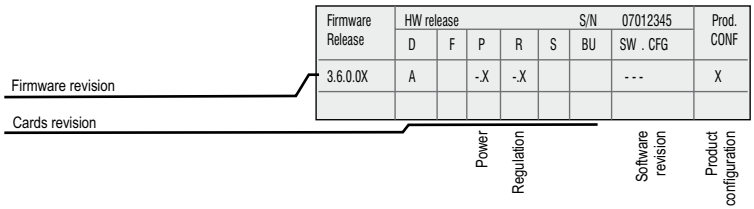


3.4 Name plate

Identification Nameplate



Firmware & cards revision level nameplate



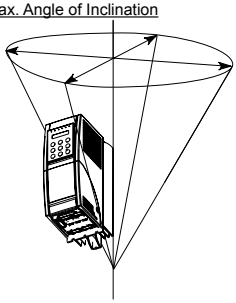
3.5 Installing the device

3.5.1 Installation mounting clearance

Note!

The dimensions and weights specifed in this manual should be taken into consideration when the device is mounted. The technical equipment required (carriage or crane for large weights) should be used. Improper handling and the use of unsuitable tools may cause damage.

Figure 3.5.1: Max. Angle of Inclination



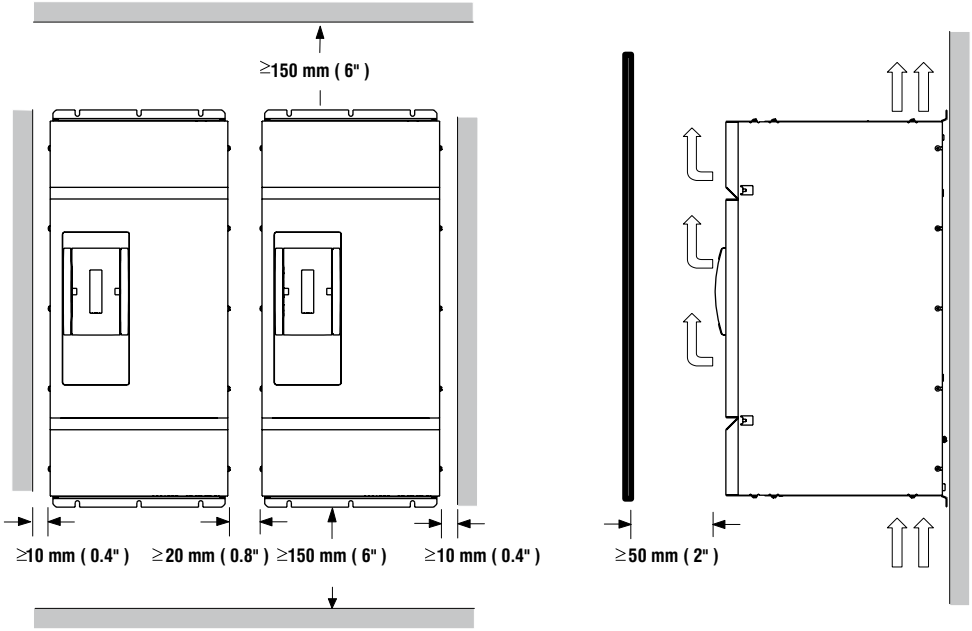
The maximum angle of inclination is 30°

Note!

The drives must be mounted in such a way that the free flow of air is ensured.
The clearance to the device must be at least 150 mm (6 inches).
A space of at least 50 mm (2 inches) must be ensured at the front.

Devices that generate a large amount of heat must not be mounted in the direct vicinity of the drive.

Figure 3.5.2: Mounting Clearance



Note! Fastening screws should be re-tightened after a few days of operation.

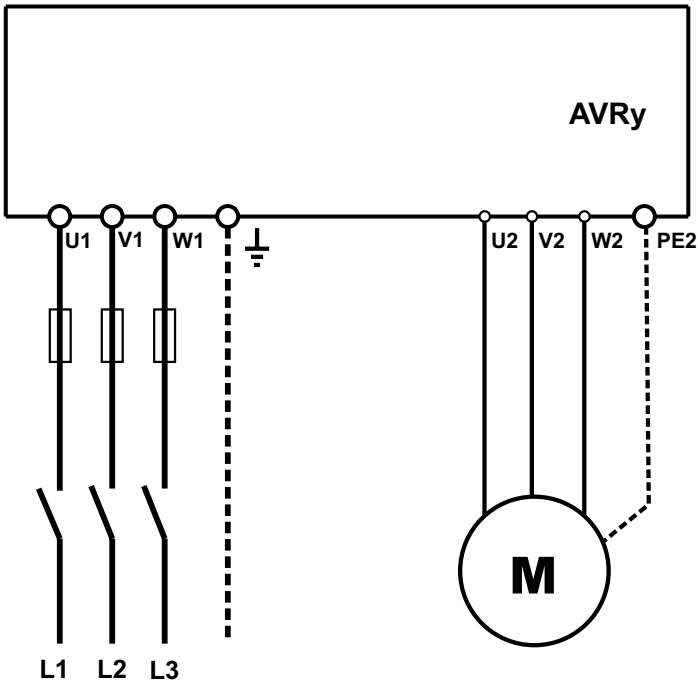
4.1 Accessing to electrical connection

The terminals are accessible without remove any cover or protection.

4.2 Power section wiring schematic

4.2.1 Standard connection diagram of power section

Figure 4.2.1: Connection example



4.2.2 Floating network

The AVRy-.. series of drive has been designed to be connected to standard three phase supply lines that are electrically symmetrical with respect to ground (TN or TT Network). Please refer to the connection sample: figure 0.3.1 Supply line types, chapter 0 3 .

4.2.3 Earthed network

In case of IT supply line or TT supply line with grounded phase conductor, an isolating transformer is mandatory. Please refer to the connection sample: figure 0.3.2: Insertion of isolating transformer, chapter 0.3 .

4.2.4 Terminals

Table 4.2.1: Connection cables max. cross sections (in conformity to UL 508C)

Drive type		Terminal cross section							
		U1	V1	W1	PE1 (M5 terminal)	U2	V2	W2	PE2
AVRy 1 1425	mm^2	10				10			
	AWG	6				6			
	sq.in.	0.016				0.016			
	Tightening torque Nm (lbf.in)	1.5 to 1.8 (13.3 to 15.9)				1.2 to 1.5 (10.6 to 13.3)			

Drive type		U1	V1	W1	PE1 (M6 terminal)	U2	V2	W2	PE2
AVRy 1 2545 AVRy 2 3360	mm^2	16				10			
	AWG	4				6			
	sq.in.	0.025				0.016			
	Tightening torque Nm (lbf.in)	2.0 to 2.3 (17.7 to 20.4)				1.2 to 1.5 (10.6 to 13.3)			

4.3 Regulation and control section

Table 4.3.1: Terminal Assignments on Regulation Section ("R-AVRUy" board)

	Strip X1	Function	max
1 2	Analog input 1	Programmable/configurable analog differential input. Signal: terminal 1. Reference point: terminal 2.	±10V 0.25mA (20mA when current loop input)
3 4	Analog input 2	Programmable/configurable analog differential input. Signal: terminal 3. Reference point: terminal 4.	
5 6	Not used		
7	+10V	Reference voltage +10V; Reference point: terminal 9	+10V/10mA
8	-10V	Reference voltage - 10V; Reference point: terminal 9	- 10V/10mA
9	0V	Internal 0V and reference point for±10V	-
12	Inverter Enable / Digital input 0	Inverter ENABLE, active=high. Concurrently, it can be used as a programmable input. (Default none)	+30V 3.2mA @ 15V 5mA @ 24V 6.4mA @ 30V
13	Digital input 1	Programmable input, Default setting: START FWD	
14	Digital input 2	Programmable input, Default setting: START REW	
15	Digital input 3	Programmable input, Default setting: NULL	
16	COM D I/O	Reference point for digital inputs and outputs, term.12...15, 36...39, 41...42	-
18	0 V 24	Reference point for + 24V OUT supply, terminal 19	-
19	+24V OUT	+24V supply output. Reference point: terminal 18 or 27 or 28	+22…28V 120mA @ 24V
	Strip X2	**Function**	**max**
21	Analog output 1	Programmable analog output; Default setting: NULL	±10V/5mA
22	0V	Internal 0V and reference point for terminals 21 and 23	-
23	Analog output 2	Programmable analog output; Default setting: NULL	+15 ... 30V
112	Regen Enable / Digital input	Regen ENABLE, active=high.	+15 ... 30V
141	Digital output	Regen OK	+ 30V/40mA
28	Reserved		
29	Reserved		
36	Digital input 4	Programmable input: Default setting: MLT SPD S0	+30V 3.2mA @ 15V 5mA @ 24V 6.4mA @ 30V
37	Digital input 5	Programmable input: Default setting: MLT SPD S1	
38	Digital input 6	Programmable input: Default setting: MLT SPD S2. Configurable as 2nd encoder index qualifier (setting via S30 jumper, "Digital input 6" parameter must be set as not used)	
39	Digital input 7	Programmable input: Default setting: FAULT RESET. Configurable as 1st encoder index qualifier "Digital input 7" parameter must be set as not used)	
41	Digital output 2	Programmable output; Default setting: DRIVE READY	+30V/40mA
42	Digital output 3	Programmable output; Default setting: SPEED IS 0	
46	Supply D O	Supply input for digital outputs on terminals 41/42. Ref. point: term.16.	+30V/80mA
78 79	Motor PTC	Motor PTC sensing for overtemperature (cutoff R1k if used)	1.5 mA
	Strip X2	**Function**	**max**
80 82	Digital output 0 Relay	Potential- free relay contact, programmable output, Default=DRIVE OK	250V AC 1A
83 85	Digital output 1 Relay	Potential- free relay contact, programmable output, Default=BRAKE CONT MON	250V AC 1A

Table 4.3.2: LEDs & Test points on Regulation card

Designation	Color	Function
PWR	green	LED lit when the voltage +5V is present and at correct level
RST	red	LED lit during the Hardware Reset
PWM_I	green	LED lit during inverter IGBT modulation
RUN_I	green	LED is flashing when inverter regulation is running (not in STARTUP menu)
PWM_R	green	LED lit during regen IGBT modulation
RUN_R	green	LED is flashing when regen regulation is running (not in STARTUP menu)
RS485	green	LED lit when RS485 interface is supplied
+5VE	green	LED lit when encoder power supply +5V (XE-9)
+8VE	red	LED lit when encoder power supply +8V (XE-2)
XY4	(test point)	Phase current signal (U)
XY5	(test point)	Reference point

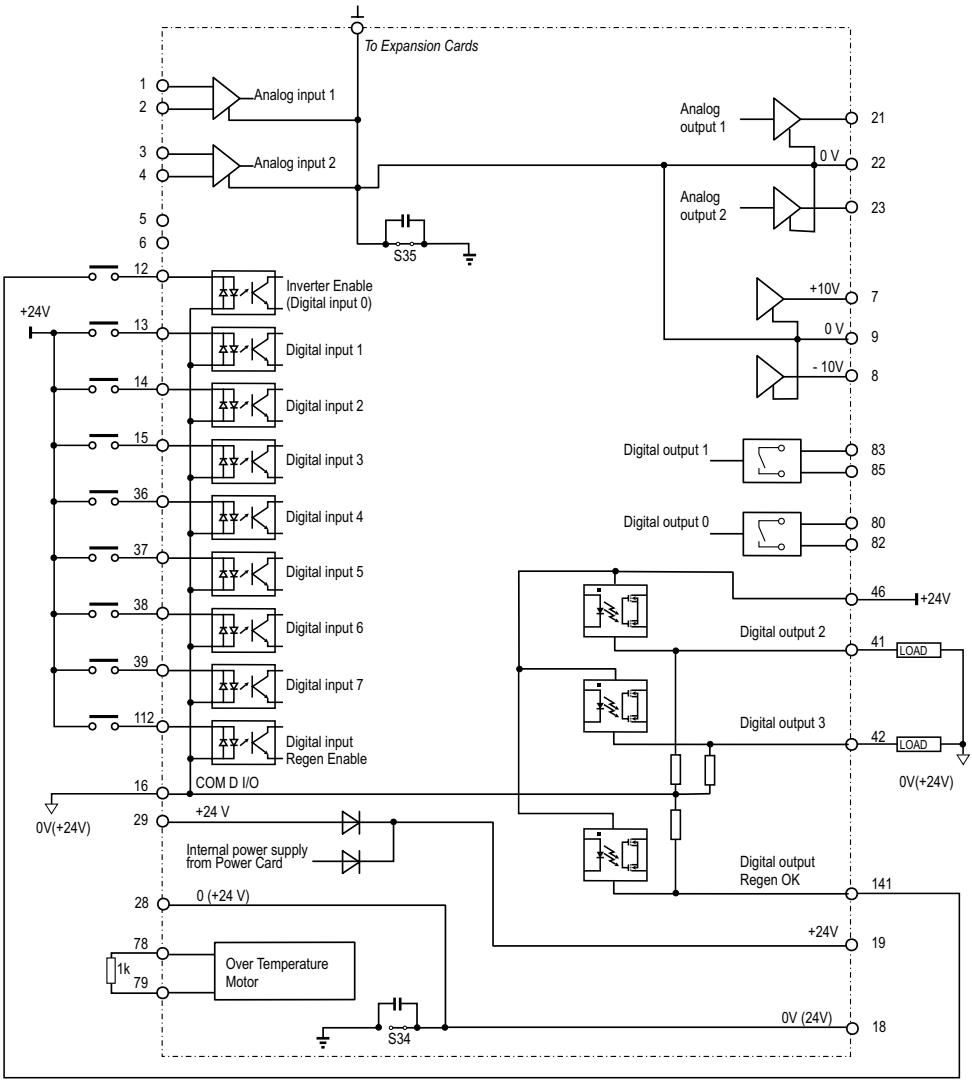
Table 4.3.3: Jumpers

Designation	Function	Factory setting
S3	Factory use, the setting must not be changed	-
S5 - S6	Terminating resistor for the serial interface RS485 ON= Termination resistor IN OFF= No termination resistor	ON (*)
S8	Adaptation to the input signal of analog input 1 (terminals 1 and 2) ON=0...20 mA / 4...20 mA OFF=0...10 V / -10...+10 V	OFF
S9	Adaptation to the input signal of analog input 2 (terminals 3 and 4) ON=0...20 mA / 4...20 mA OFF=0...10 V / -10...+10 V	OFF
S11 - S12 - S13 S14 - S15 - S16 (**)	Encoder setting (jumpers on kit EAM_1618 supplied with the drive) ON=Sinusoidal SE or SESC encoder OFF=Digital DE or DEHS encoder	OFF
S17	Monitoring of the C-channel of the digital encoder ON=C-Channel monitored OFF=C-Channel not monitored (required for single-ended channels)	OFF
S18 - S19 S20 - S21 (**)	Encoder setting Pos. B=digital DEHS encoder Pos. A= sinusoidal SESC encoder	A
S22 - S23 (**)	Analog input 3 enabling (alternative with SESC encoder) Pos. A= if SESC encoder is used Pos. B=analog input 3 enabled Pos. OFF= resolver	A
S26 - S27	Reserved	ON
S29	Internal use	A
S30	Second encoder qualifier input A=from EXP-… board B=from digital input 6 on RV33-4	B

Designation	Function	Factory setting
S34	Jumper to disconnect 0V (+24V power supply) from ground ON = 0V connected to ground OFF = 0V disconnected from ground	ON (hard-wire)
S35	Jumper to disconnect 0V (regulation board) from ground ON = 0V connected to ground OFF = 0V disconnected from ground	ON (hard-wire)
S40-S41 (***)	Power supply for the serial interface RS485 ON = Internal power supply (from pins XS.5 / XS.9) OFF = External power supply (to pins XS.5 / XS.9)	OFF

(*) on multidrop connection the jumper must be ON only for the last drop of a serial line
(**) see table 4.5.2 for more details on encoder jumper setting
(***) see chapter 4.4.

Figure 4.3.1: Potentials of the control section, Digital I/O NPN connection



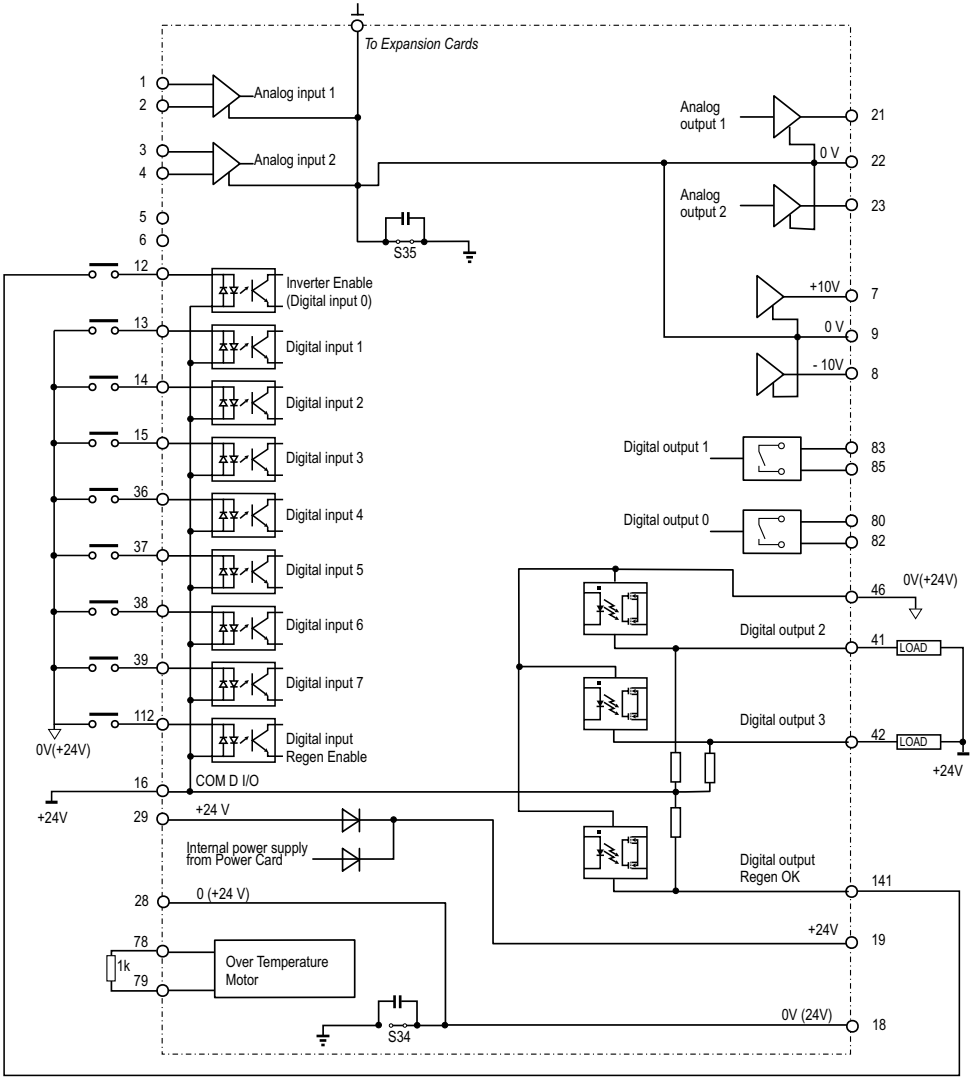
Note! Combination NPN inputs / PNP outputs and viceversa is not permitted.

The potentials of the regulation section are isolated and can be disconnected via jumpers from ground.

The connections between each potential are shown in Figure 4.3.1 .
The analog inputs are designed as differential amplifiers.
The digital inputs are optocoupled with the control circuit.

The digital inputs have terminal 16 as reference point.
The analog outputs are not designed as differential amplifiers and have a common reference point (terminal 22). The analog outputs and the ±10V reference point have same potential (terminal 9 and 22).
The digital outputs are optocoupled with the control circuit. The digital outputs (terminal 41 and 42) have same potential (terminal 16) and terminal 46 as common supply.

Figure 4.3.2: Potentials of the control section, Digital I/O PNP connection



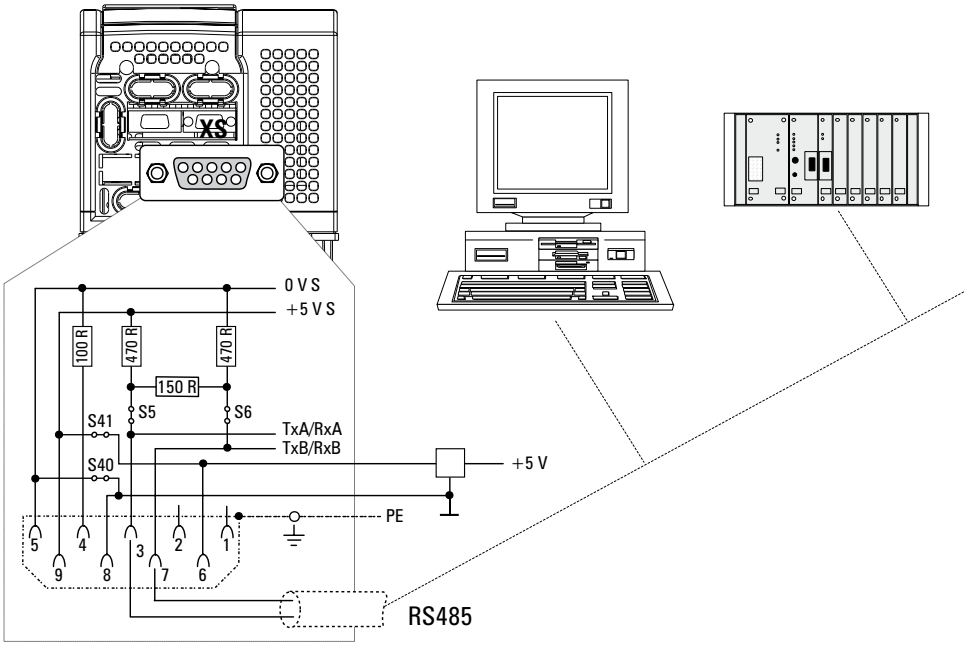
Note!

Combination NPN inputs / PNP outputs and viceversa is not permitted.

4.4 RS-485 serial interface

The RS 485 serial interface enables data transfer via a loop made of two symmetrical, twisted conductors with a common shield. The maximum transmission distance is 1200 m (3936 feet) with a transfer rate of up to 9,600 KBaud.
The transmission is carried out via a differential signal. RS 485 interfaces are bus-compatible in half-duplex mode, i.e. sending and receiving take place in sequence. Only single drive connection is allowed. Address setting is carried out via the Slave address parameter. Further information concerning the parameters to be transfered, their type and value range is given in paragraph 9.2, COMMUNICATION \ RS 485.

Figure 4.3.4 : RS485 Serial Interface



The RS 485 on the AVRy series devices is located on the Regulation card in the form of a 9-pole SUB-D socket connector (XS).The communication may be with or without galvanic isolation: when using galvanic isolation an external power supply is necessary (+5V). Communication without galvanic isolation is suggested only in case of temporary connections for setup with one drive connected. The differential signal is transferred via PIN 3 (TxA/RxA) and PIN 7 (TxB/RxB). Bus terminating resistors must be connected at the physical beginning and end of an RS 485 bus in order to prevent signal reflection. The bus terminating resistors on ARTDriveL drives are connected via jumpers S5 and S6. This enables a direct point-to-point connection with a PLC or PC.

Note!

A connection point to point can be done using “PCI-COM” option interface (S40 and S41 mounted).
Pins 6 and 8 are reserved for use with the “PCI-COM” interface card.

When connecting the serial interface ensure that:
- only shielded cables are used
- power cables and control cables for contactors/relays are routed separately

The communication protocol can be chosen between Slink4 through “Protocol type” parameter (COMMUNICATION / RS 485 / Protocol type).

4.4.1 RS 485 Serial Interface Connector Description

Table 4.4.1 : Assignment of the Plug XS Connector for the RS 485 Serial Interface

Designation	Function	I/O	Elec. Interface
PIN 1	Internal use	–	–
PIN 2	Internal use	–	–
PIN 3	RxA/TxA	I/O	RS485
PIN 4	Internal use	–	–
PIN 5	0V (Ground for 5 V)	–	Power supply
PIN 6	Internal use	–	–
PIN 7	RxB/TxB	I/O	RS 485
PIN 8	Internal use	–	–
PIN 9	+5 V	–	Power supply

I = Input , O = Output

4.5 Encoders

Several types of encoders may be connected to the XE connector (high density 15-pole socket, fitted on device), see the table 4.5.2 for the jumper settings.

- **SEHS**: sinusoidal incremental encoder with A+/A-,B+/B-,C+/C- traces and three digital “Hall sensor” absolute position traces for initial synchronization (factory setting).
- **SESC**: sinusoidal incremental encoder with A+/A-,B+/B-,C+/C- traces and two analog Sin Cos absolute position traces for initial synchronization.
- **SC**: sinusoidal encoder with two analog SinCos absolute position traces

Encoders are used to feed back a speed signal to the drive. The encoder should be coupled to the motor shaft with a backlash free connection.
Optimal regulation results are ensured when using sinusoidal encoders. Digital encoders may also be used but regulation properties get worse at low speeds.
The encoder cable must made of twisted pairs with a global shield should be connected to the ground on the Drive side. Typically shield should not be connected to ground on the motor side. In some installation with high electromagnetical noise connecting the shield also on motor side helps to suppress pickup of false encoder pulses and reduces amount of disturbanes in the measured speed.

In case of brushless motor or where the cable length is more than 100 meters (328 feet), a cable with a shield on each conductor pair must be used. The shield must be connected to the common point (0V). The global shield must always be grounded.
Some types of sinusoidal encoders may require installation with galvanic isolation from the motor frame and shaft.

Table 4.5.1: Recommended Cable Section and Length for the Connection of Encoders

Cable section	mm^2	0.22	0.5	0.75	1	1.5
Max Length	(m) [feet]	27 [88]	62 [203]	93 [305]	125 [410]	150 [492]

Table 4.5.2: Encoders Setting via S11...S23 Jumpers

Encoder / Jumpers setting	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S26	S27
SEHS	ON	ON	ON	ON	ON	ON	(*)	B	B	B	B	-	-	-	-
SESC	ON	ON	ON	ON	ON	ON	(*)	A	A	A	A	A	A	ON	ON
SC	-	-	-	-	-	-	(*)	A	A	A	A	A	A	ON	ON

(*) If the encoder is not provided of the zero channel : S17=OFF

The jumper S17 selects the inhibition or the enabling of the channel C pulses reading. It has to be correctly selected in order to detect appropriately the encoder loss alarm.

S17 ON : channel C (index) reading=ON
S17 OFF: channel C (index) reading=OFF

Table 4.5.3: Encoders Connections

Encoder type	Shielded cable	XE CONNECTOR PIN														
		1 B-	2 +8V	3 C+	4 C-	5 A+	6 A-	7 0V	8 B+	9 +5V	10 E+	11 E-	12 F+	13 F-	14 G+	15 G-
Internal +5V Encoder Power Supply																
SESC	12 pole	•		•	•	•	•	•	•	•	•	•	•	•		
SEHS	14 pole	•		•	•	•	•	•	•	•	•	•	•	•	•	•
Internal +8V Encoder Power Supply																
SESC	12 pole	•	•	•	•	•	•	•	•		•	•	•	•		
SEHS	14 pole	•	•	•	•	•	•	•	•		•	•	•	•	•	•

Requirements:

Sinusoidal encoders (XE connector on Regulation card)

Max. frequency _____ 80 kHz (select the appropriate number of pulses depending on required max. speed)
Number of pulses per revolution _ min 512, max 9999 (see table below)
Channels _____ two-channel, differential
Input Voltage _____ 1 V pp
Power supply _____ + 5 V / +8V (Internal supply) *
Load capacity _____ > 8.3 mA pp per channel (input resistance = 124 Ohms).
Cable max. _____ 500 feet (150 m), screened, 4 twisted pairs.

Configure drive software for the signal amplitude range of the encoder in use (STARTUP / Startup config / Encoders config / Std sin enc Vp)

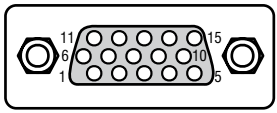
Speed D reference resolution (rpm)	Recommended min number of encoder pulses (ppr)						Max number of encoder pulses (ppr)
0.003125	4096	4096	4096	4096	4096	4096	
0.125	1024	1024	1024	1024	1024	1024	
0.25	512	512	512	1024	1024	1024	80kHz* 60/FSS
0.5	512	512	512	1024	1024	1024	
1	512	512	512	1024	1024	1024	
Mot. pole pairs (rpm@50Hz)	1(3000)	2(1500)	3(1000	4(750)	5(600)	6(500)	
Mot.pole pairs (rpm@60Hz)	1(3600)	2(1800)	3(1200)	4(900)	5(720)	6(600)	(FSS=Full scale speed)

* Via keypad (STARTUP / Startup config / Encoder config) it is possible to select 4 different values of internal encoder supply voltage to compensate the voltage reduction due to encoder cable length and load current encoder.
Selection available, according to S28 jumper, are: 5.41V, 5.68V, 5.91V, 6.18V and 8.16V, 8.62V, 9.00V, 9.46V via Std enc supply parameter.

Speed D reference resolution (rpm)	Recommended min number of encoder pulses (ppr)						Max number of encoder pulses (ppr)
0.003125	512	512	512	1024	1024	1024	
0.125	256	512	512	1024	1024	1024	
0.25	256	512	512	1024	1024	1024	150kHz* 60/FSS
0.5	256	512	512	1024	1024	1024	
1	256	512	512	1024	1024	1024	
Mot. pole pairs (rpm@50Hz)	1(3000)	2(1500)	3(1000	4(750)	5(600)	6(500)	
Mot.pole pairs (rpm@60Hz)	1(3600)	2(1800)	3(1200)	4(900)	5(720)	6(600)	(FSS=Full scale speed)

Encoder power supply test (if the internal supply +5V is used)
During the start up of the drive:
- verify the encoder power supply to the encoders terminals with all the encoders channels connected
- via Std enc supply parameter set the appropriate voltage if the encoder supply characteristic (example: +5V ± 5%) is out of range.

Terminals for external encoder connections



Male terminals type: 15 poles high density (VGA type)
Connector cover: Standard 9 poles low profile (Example manufacturer code: AMP 0-748676-1, 3M 3357-6509)

The connection with the drive is through a 15 poles high density sub-D connector (VGA type). Please note that it is mandatory to use a shielded cable with al least 80 % coverage. The shield should be connected to ground on both sides.

Note!

For synchronous brushless firmware it is possible to use only encoder having pulses per revolution equal to number that is power of 2.
Example: 512 ppr, 1024 ppr, 2048 ppr, etc.

Table 4.5.4: Assignment of the High Density XE Connector for a Sinusoidal or a Digital Encoder

Designation		Function	I/O	Max. voltage	Max. current
PIN 1	ENC B-	Channel B- Incremental encoder signal B negative	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 2		+8V Encoder supply voltage (see table 4.5.3)	O	+8 V	200 mA
PIN 3	ENC C+	Channel C+ Incremental encoder signal Index positive	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 4	ENC C-	Channel C- Incremental encoder signal Index negative	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 5	ENC A+	Channel A+ Incremental encoder signal A positive	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 6	ENC A-	Channel A- Incremental encoder signal A negative	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 7	GND	Reference point for +5V encoder supply voltage	O	–	–
PIN 8	ENC B+	Channel B+ Incremental encoder signal B positive	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 9	AUX+	+5V encoder supply voltage (see table 4.5.3)	O	+5 V	200 mA

PIN 10	HALL 1+/SIN+	Channel HALL1 + / SIN+ Hall 1 positive / Analog encoder Sin positive	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 11	HALL 1-/SIN-	Channel HALL 1- / SIN- Hall 1 negative / Analog encoder Sin negative	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 12	HALL 2+/COS+	Channel HALL 2+ / COS+ Hall 2 positive / Analog encoder Cos positive	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 13	HALL 2-/COS-	Channel HALL 2- / COS- Hall 2 negative / Analog encoder Cos negative	I	5 V digital or 1 V pp analog	10 mA digital or 8.3 mA analog
PIN 14	HALL 3+	Channel HALL 3 + Hall 3 positive	I	5 V digital or 1 V pp analog	10 mA digital
PIN 15	HALL 3-	Channel HALL 3 - Hall 3 negative	I	5 V digital or 1 V pp analog	10 mA digital

4.5.1 Encoder repeat

The encoder output interface is used to repeat the encoder signals withTTL levels via a male 15-pin high-density connector XER (VGA type).

Interface type _____ differential incremental digital encoder data (not opto-isolated)

Standard outputs _____ A+, A-, B+, B-

Output levels _____ tandard TTL

TTL output voltage limits in high state (on pins) (UHigh TTL): ___ $\geq$ 2.5V

TTL output voltage limits in low state (on pins) (ULow TTL): ____ $\leq$ 0.5V

TTL output loading _____ 20mA max cad.

Standard inputs connected in parallel to TTL outputs: _____ 3 outputs

Delay between encoder to be repeated and repeated encoder: __ 3μs or A and B for Encoder 1.

_____ 1.3μs for A and B for Encoder 2

Max. frequency _____ 150kHz

Encoder repeat power supply _____ 5 V internal

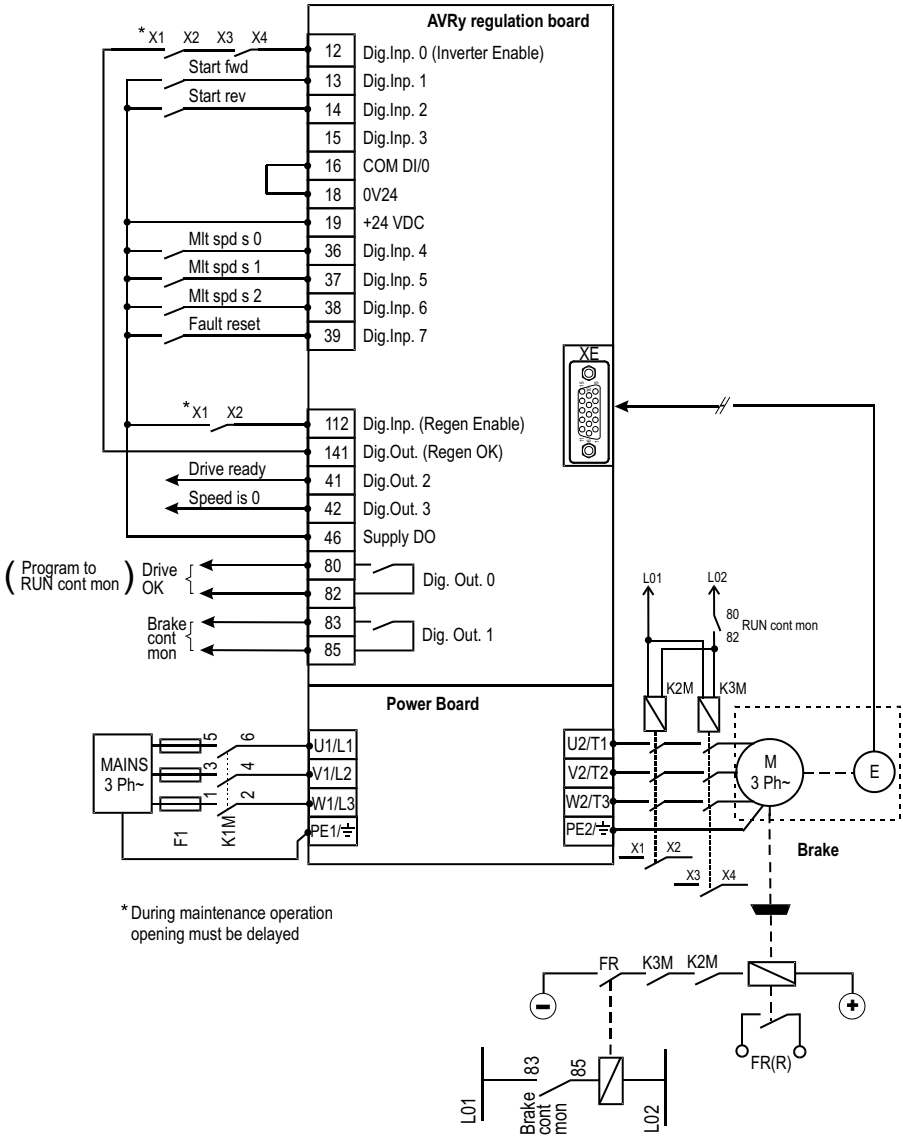
Table 4.5.1: Encoder repeat

Encoder repetition (XER Connector)															
PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Signal	B- (TTL)				A+ (TTL	A - (TTL		B + (TTL							

The TTL drivers are protected against short-circuits for 1 second. The drivers may be damaged if the short-circuit persists beyond this period.

4.6 Connection Diagrams

Figure 4.6.1: Standard Connection Diagram

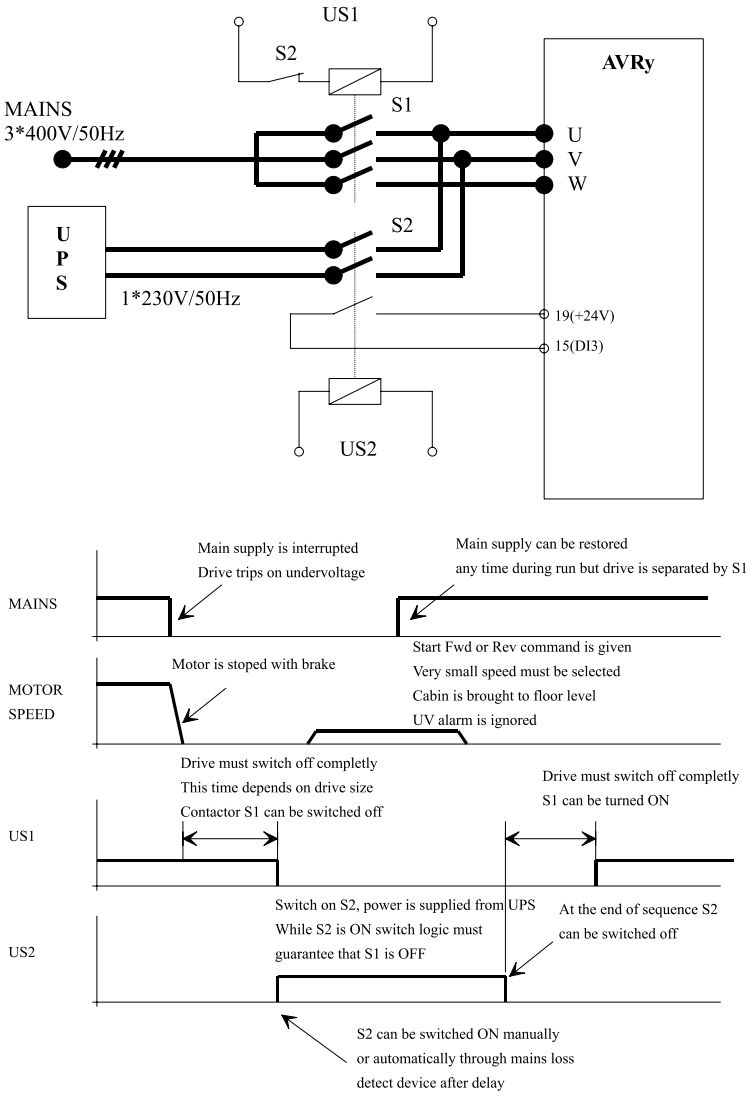


4.6.1 Emergency Connection Diagrams

In case of mains failure it's possible to use the following connection diagram to allow the emergency movement of the motor with a single phase 230Vac supply. When this configuration is used must be setting the following parameters:

UV select src = DI 3 monitor
Fault reset src = DI 3 monitor

Figure 4.6.2: Emergency Connection Diagram



4.7 Circuit Protection

4.7.1 External Fuses for the Power Section (F1)

The inverter must be fused on the AC Input side. Use fast fuses only.

Size	DC link capacitors life time [h]	Europe		America	
		Line fuses	code	Line fuses	code
AVRy 1 1425	25000	GRD3/35 or Z22GR40	F4D20	A70P35 or FWP35	S7G86
AVRy 1 2545	25000	GRD3/50 or Z22GR40	F4D21	A70P40 or FWP40	S7G52
AVRy 2 3360	25000	GRD3/63 or Z22GR63	F4M17	A70P60 or FWP60	S7G88

Fuse manufacturers: S00 ..., M.. Jean Müller, Eltville
A70P... Gould Shawmut
FWP... Bussmann

Note! The technical data of the fuses, e.g. dimensions, weights, heat dissipation, auxiliary contactors, are reported in the corresponding data sheets.

4.8 Discharge Time of the DC-Link

Table 4.8.1: DC Link Discharge Time

Size	Time (seconds)
AVRy 1 1425	300
AVRy 1 2545	300
AVRy 2 3360	300

This is the minimum time that must be elapsed when an AVRy Drive is disconnected from the AC Input before an operator may service parts inside the drive to avoid electric shock hazard.

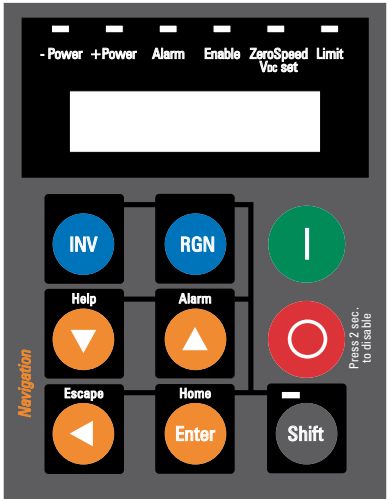
Condition The value consider the time to turn-off for a drive supplied at 400Vac +10%, without any options (the charge for the switching supply is the regulation card, the keypad and the 24Vdc fans “if mounted”).
The drive is disabled. This represents the worst case condition.

5 - Converter Operation

The keypad is made of a LCD display with two 16-digit lines, seven LEDs and nine function keys. It is used:

- to start and stop the drive (this function can be disabled)
- to display the speed, voltage, diagnostics etc. during the operation
- to set parameters and enter commands

Note! A replacement keypad cable longer than 20 cm must be shielded.



5.1 Diagnostic LEDs & keys

The LEDs present on the keypad are used to quickly diagnose the operating state of the drive.

Designation	-Torque	+Torque	ALARM	ENABLE	Zero speed	Limit	Shift
Color	yellow	yellow	red	green	yellow	yellow	yellow
Inverter function press "-" key	the LED is lit when the drive operates with a negative power	the LED is lit when the drive operates with a positive power	the LED is lit when the drive signals a trip	the LED is lit when the drive is enabled	the LED is lit when motor speed is zero	the LED is lit when the drive operates at a current limit	the LED is lit when the keypad second functions are enabled
Regen function press "+" key	the LED is lit when output power is positive (motor)	the LED is lit when output power is negative (regen)			the LED is lit when output DC voltage is regulated		

Control keys	Text reference	Function
	[START]	START key commands the drive to Enable and Start. (Command select = I O key)
	[STOP]	STOP key commands to Stop and disable (Command select = I O key) Stop key also resets the sequencer after an alarm event
	[RGN]	To activate Regen menu
	[INV]	To activate Inverter menu
	[Down arrow] / [Help]	Used to scroll down menu items in menu navigation, picklists in selectors, or digit values in numeric editing. After pressing shift key, an item-specific information menu is entered when applicable. Help menu can be browsed with up/down arrows. Left arrow returns to normal mode.
	[Up arrow] / [Alarm]	Used to scroll up menu items in menu navigation, picklists in selectors, or digit values in numeric editing. After pressing Shift key, the Alarm list display mode is entered. Active alarms and Alarms pending for acknowledge can be browsed with up/downs arrows. Alarms can be acknowledged whit the Enter key. Left arrow returns to normal mode.
	[Left arrow] / [Escape]	Used to go up one level in menu navigation; to scroll digits in numeric edit mode, to return to normal mode from alarm list or help modes. After pressing shift key, it is used to Escape out of numeric edit or selection with no change.
	[Enter] / [Home]	Used to go down one level in menu navigation; to enter Selections or numeric values after editing, to issue commands, to acknowledge alarms in the Alarm list mode. Home second function, return to Monitor menu from any main menu level.
	[Shift]	Shift button enables the keypad second functions (Help, Alarm, Escape, Home)

5.1.1 Select Inverter or Regen menu

At switching on the keypad displays the inverter menu:

```
R:          S:
MONITOR
```

R = Drive speed reference (Speed ref)
S = Speed of the motor (Norm speed)

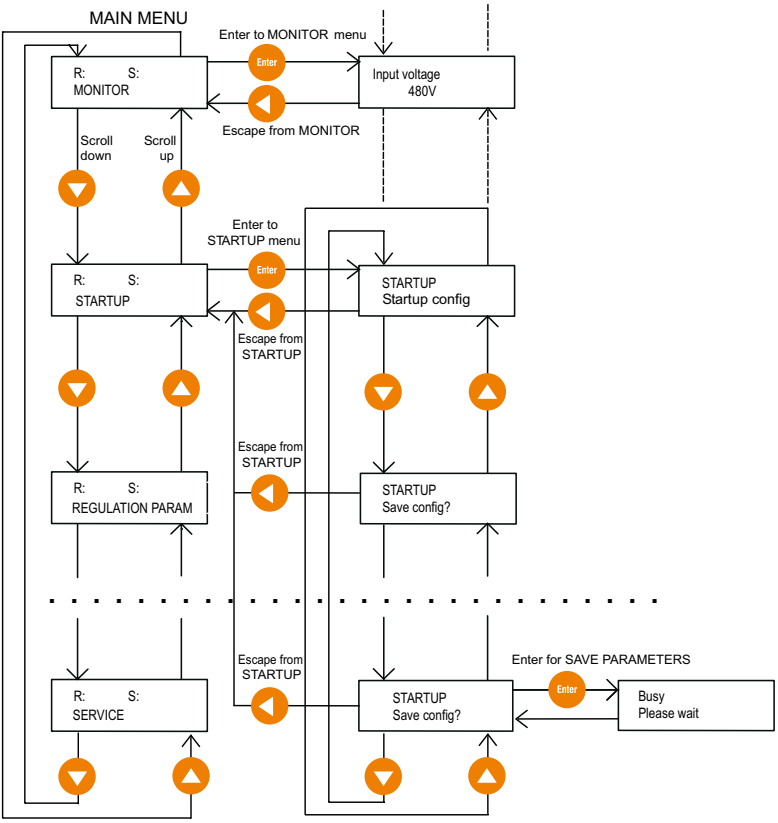
Press “+” key to display the **Regen** menu:

*:	#:
MONITOR	

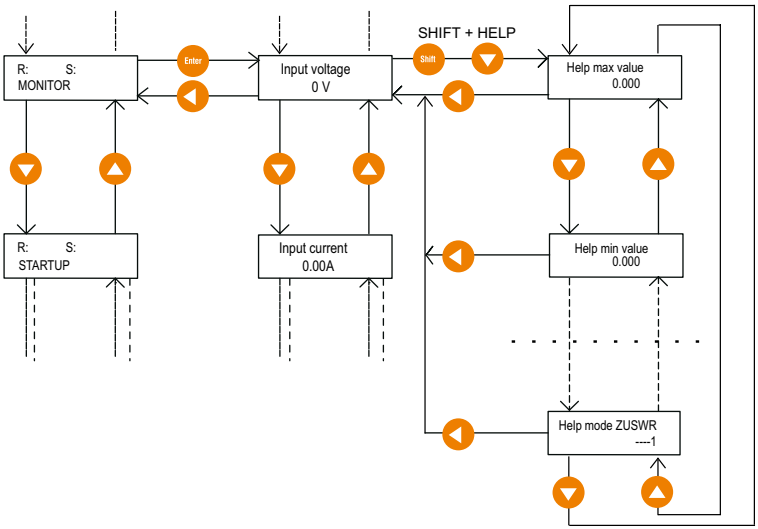
* = Drive DC link voltage (DC link voltage)
# = Speed of the motor (Input current)

To display again the **Inverter** menu press “-”.

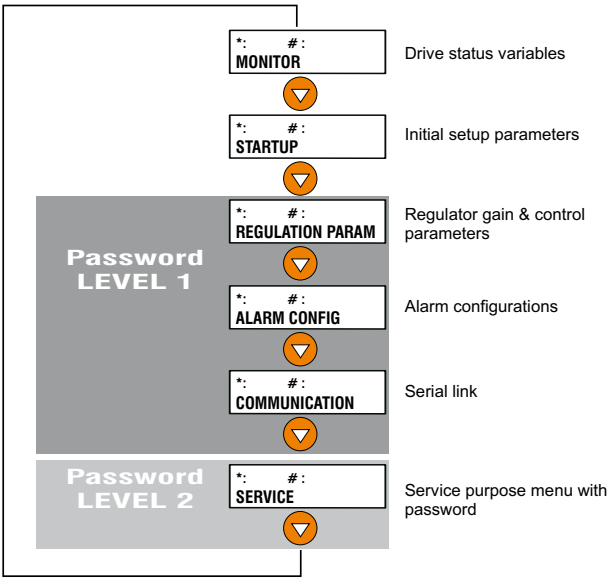
5.1.2 Moving inside a menu



5.1.3 Using keypad help



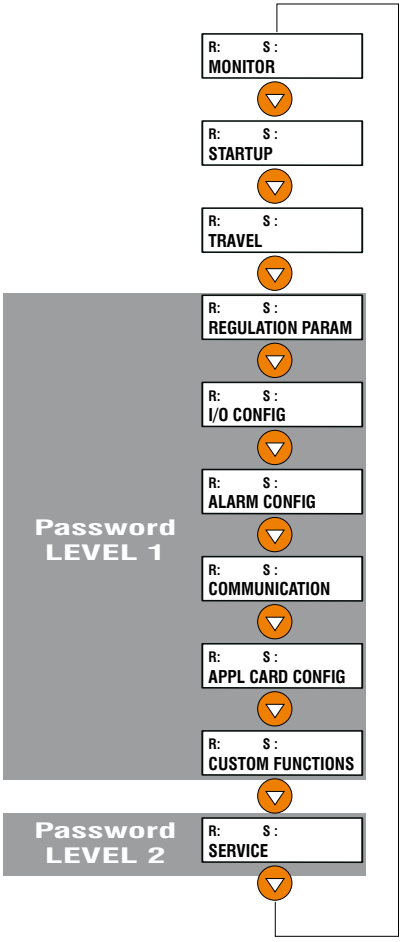
5.1.4 Regen main menu structure



* SERVICE menu allows the setting of the password to enable Level 1 drive menus: 12345. To have the access of Level 1 drive menus, edit 12345 password into "Insert Password" parameter and confirm it using "Enter" button.

Note! Level 1 password must be set every recycle drive supply

5.1.5 Inverter main menu structure



* SERVICE menu allows the setting of the password to enable Level 1 drive menus: 12345.
To have the access of Level 1 drive menus, edit 12345 password into “Insert Password” parameter and confirm it using “Enter” button.

Note! Level 1 password must be set every recycle drive supply

6. Commissioning

Commissioning Set-up Procedure (Regen)

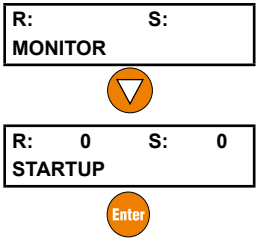
No parameter set-up is required.

Commissioning Set-up Procedure (Inverter)

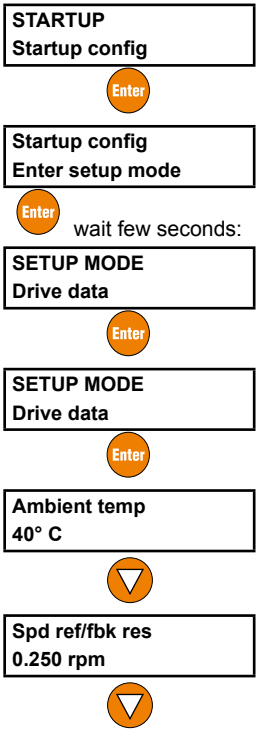
1	Set Drive data	Drive Data parameters: Mains voltage, Ambient temp, Switching freq, Speed reference resolution
2	Set Motor data	Motor Data parameters: Rated voltage, Rated current, Rated speed, Pole pairs, Torque constant, EMF constant, Stator resistance and LsS inductance.
3	Run current Regulator Autotune	Autotune procedure measures a real motor parameters: - "Curr Reg autotune" can be used when motor is coupled to gearbox and lift car is installed. It could cause limited shaft rotation.
4	Escape setup mode	During this operation a "Load setup" is required to load all datas changes into SETUP MODE.
5	Set all system mechanical data	System mechanical data: Gearbox ratio, Pulley diameter, Full scale speed.
6	Set all system weight data	System weights data: Cabin weight, Counter weight, Load weight, Rope weight, Motor inertia, Gearbox inertia
7	Encoder configuration	Feedback source type selection: Sinusoidal Hall, Sinusoidal SinCos, Sinusoidal Extern, Digital Hall, DigitalExtern and SinCos.
8	Save configuration made in startup menu	Use "Save Config ?" to save all the changes made in the Startup menu.
9	Set speed profile	A binary combination of three digital input allows to select up to 8 different speed setpoints
10	Set ramp profile	Accelerations jerk and decelerations jerk can be set in the ramp profile
11	Encoder phasing	Two options are available: - motor rotating - still.
12	Save all the parameters	

Note! Drive Startup procedure below take as example an AVyL 4220 BR4 drive (software revision 3.300).

Power up the drive, after few seconds the drive will display the main menu:



Note! Upon opening the STARTUP menu, the drive enters in the parametrization mode.



Press or to select a speed resolution value based on max motor speed.

E.g.: if rated speed is 144 rpm, set 0.03125 rpm (see table)

Speed resolution (Spd ref/fbk res)	Max speed Value
0.125 rpm	2048 rpm
0.25 rpm	4096 rpm
0.5 rpm	8192 rpm
1 rpm	16384rpm
0.03125 rpm	512 rpm

Spd ref/fbk res
0.250 rpm

Enter

Press Enter to confirm the selection.

Press ◁, the drive will show:

Busy
Please wait ...

then

SETUP MODE
Drive data

▽

Set **Motor nameplate** parameters in Motor data menu (values accepted depend on drive size):

Rated voltage
330.00 V

then

SETUP MODE
Drive data

▽

Press Enter to edit rated motor voltage.

Press again Enter to confirm the new value.

▽

Rated current
35 A

Press Enter to edit rated motor current. Press again Enter to confirm.

▽

Rated speed
2000.00 rpm

Press Enter to edit rated synchronous motor speed. Press again Enter to confirm the value.

Pole pairs
4

Press Enter to edit motor pole pairs. Press again Enter to confirm the value.

Torque Constant
2.480 Nm/A

Press Enter to edit motor torque value. Press again Enter to confirm the value.

Note!

If Torque Constant is not available, it should be calculated with the following:

$$K_{T1} = \frac{P_n}{\left(\frac{2\pi S_n}{60}\right) I_n}$$

Where:
P_n = Rated power [W]
I_n = Rated current [A]
S_n = Rated speed [rpm]

$$K_{T1} = \frac{T_n}{I_n}$$

Where:
T_n = Rated torque [Nm]
I_n = Rated current [A]

EMF constant
1.430 V*s

Press Enter to edit motor back EMF constant from motor type plate (*). Press Enter to confirm.

Stator resist
0.135 ohm

Press Enter to edit motor stator resistance value (*). Press Enter to confirm.

LsS inductance
0.00237 H

Press Enter to edit motor stator value (*). Press Enter to confirm.

(*) Note! If “EMF costant”, “Stator resistance” and “LsSinductance” values are unknowed, set them to zero before running current self-tuning procedure.

Press  to exit from **Motor data**; for few seconds the drive will show:

Busy
Please wait ...

then

SETUP MODE
Motor data

Note! If any changes have been made to **Motor data** menu parameters, with this operation internal drive values will be calculated and autotune results will be initialized.

If the operation generates any error messages or alarm led comes on, please check consistency of motor parameters and try again or see specific directions in section 10, Troubleshooting.

Scroll  to perform Current Regulator Autotune procedure.

This operation may cause limited shaft rotation.

SETUP MODE
Autotune

CurrReg
Start?

Connect terminal 12 (Enable) to terminal 19 (+24VDC) through relays or local switch, then switch on the output contactors. It is suggested to open the brake (the rope must be removed), if not possible leave the brake closed.

CurrReg
Press I Key

Press  to start the Autotune procedure.

Note! Autotune procedure can take different minutes to be completed.

Autotune can be aborted at any time by pressing  .

The drive will display from:

CurrReg **0 %**

to

CurrReg **100 %**

after

End **Autotune**

blinking to show the end of procedure.

Press  2 times to exit from the procedure:

SETUP MODE **Autotune**

Switch off the output contactors and disconnect terminal 12 (Enable).

Press  and wait few seconds

Load setup? **Yes->Ent No->Esc**

Busy **Please wait ...**

then

Load setup? **Yes->Ent No->Esc**

Press  to exit from menu:

Startup config **Load setup**

Scroll  till:

Startup config **Mechanical data**

Press 

to set “Gearbox ratio”, “Pulley diameter” and “Full scale speed” of the system:

Travel unit sel **Revolution**

“Travel unit sel” parameter determines all Speed and Ramp profile parameters units:

- Revolution = rpm, rpm/s and rpm/s^2
- Millimeters = mm/s, mm/s^2 and mm/s^3.

Press Enter and ▽ or △ to select the units, press Enter to confirm.

▽

Gearbox ratio
35.00

Press Enter to set gearbox ratio of the system, press Enter to confirm.

▽

Pulley diameter
500 mm

Press Enter and edit the pulley diameter of the system, press Enter to confirm.

Pulley diameter
+0000500 mm

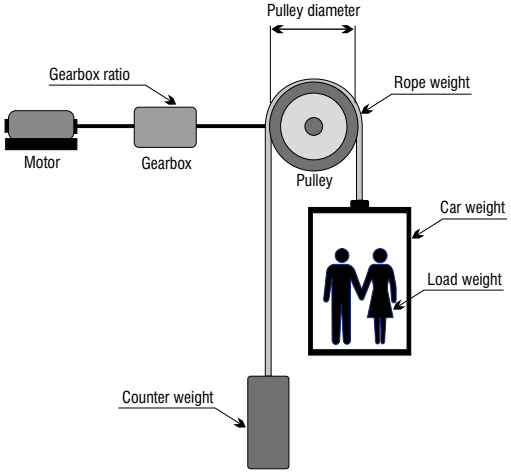
▽ to **Full scale speed** parameter

Full scale speed
2000 rpm

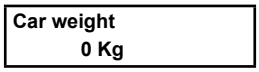
Press Enter and edit the value of max speed (in lift application set this parameter to rated motor speed), press Enter to confirm. Press ◁ to exit from **Mechanical data** menu.

Scroll ▽ to Weights menu:

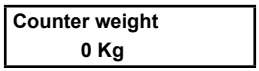
Startup config
Weights



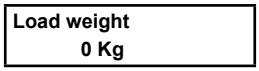
Press Enter to set Car weight (weight of the lift car), Counter weight, Load weight, Rope weight, Motor and Gearbox inertia parameter:



Press Enter and edit the value of Car weight, press Enter to confirm.

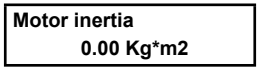


Press Enter and the value of Counter weight (car weight to achive balance system) parameter, press Enter to confirm.

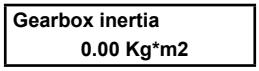


Press Enter and edit the value of Load weight (maximum weight of lift load) parameter, press Enter to confirm.

Press Enter and edit the value of Rope weight (total inertia of cabin rope) parameter, press Enter to confirm.



Press Enter and edit the value of Motor inertia (if it is not available, leave to default), press Enter to confirm.



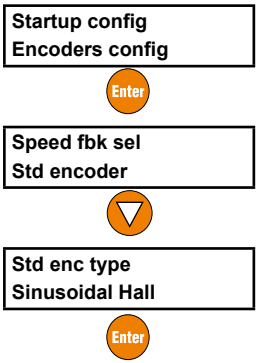
Press Enter and edit the value of Gearbox inertia (if it is not available, leave to default), press Enter to confirm.

Note!

"Gearbox inertia" is intended as inertia of all rotating masses on slow rotating side of gearbox, e.g. pulley inertia, etc...

Press  to exit from **Weight menu**.

Press 2 times.

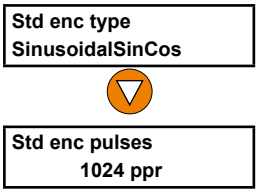


Press to select the parameter (see following list) according to the encoder type, press Enter to confirm.

Parameter	*Description*
SinusoidalHall	is a sinusoidal incremental encoder with A+/A-,B+/B-,C+/C- traces and three digital “Hall sensor” absolute position traces for initial synchronization (**XE** connector)
SinusoidalSinCos	is a sinusoidal incremental encoderwith A+/A-,B+/B-,C+/C- traces and two analog Sin Cos absolute position traces for initial synchronization (**XE** connector).
SinCos	is a sinusoidal absolute encoder with SinCos traces.

Caution

For each encoder feedback, set the correct jumpers configuration on the regulation card RV33.



Press Enter to edit the number according to encoder data, press Enter to confirm.

Note!

It is possible to use only encoder having pulses per revolution equal to a multiple of 2.

Example: 512 ppr, 1024 ppr, 2048 ppr, etc.

Press  to exit from Startup Config menu.

STARTUP
Save config?

The prompt displays “Save config ?” (Recommended).
For this operation the drive will take around 5 seconds.

Press  to execute the procedure:

Busy
Please wait ...

to

STARTUP
Save config?

Press  to exit from STARTUP menu:

R:	**0**	**S:**	**0**
STARTUP			

AVRy drive allows to set a Speed profile through 8 different speed point:
“Multi speed 0” ... “Multi speed 7”

R:	**S:**
STARTUP	

R:	**S:**
TRAVEL	

TRAVEL
Speed profile

Smooth start spd
0 rpm

Multi speed 0
0 rpm

Press  to set “Multi speed 0” set point:

Multi speed 0
+00000000 rpm

Edit the value requested by the system and press  to confirm.

Scroll  to set “Multi speed 1” set point:

Multi speed 1
0 rpm

Press Enter and repeat the procedure as for “Multi speed 0”. Scroll ▽ to set all the others Multi speed required by the system.

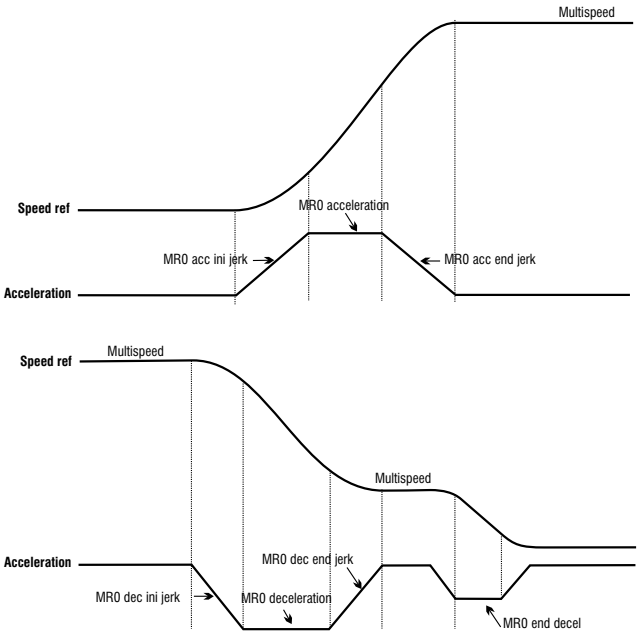
Attention

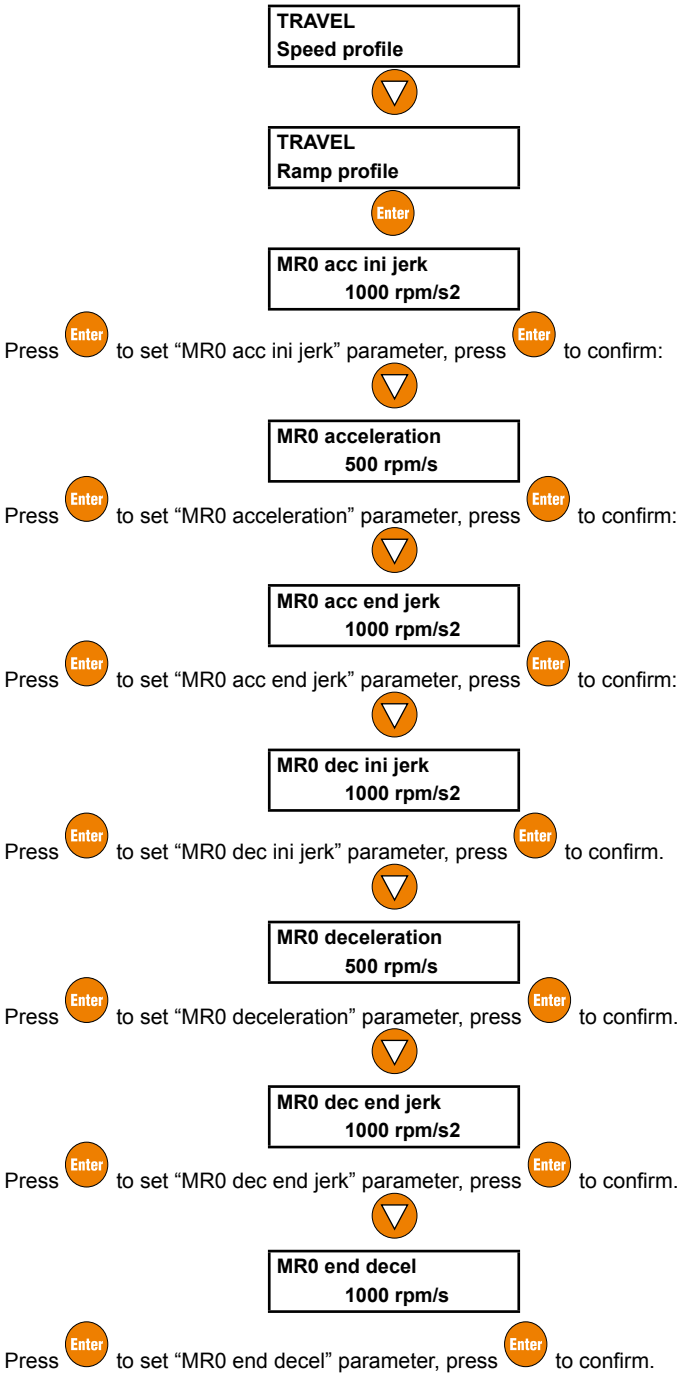
Through the combination of “Mlt spd s0 src” (equal Digital input 4), “Mlt spd s1 src” (equal Digital input 5) and “Mlt spd s2 src” (equal Digital input 6), is possible to select Multi speed desired, according to next table:

Mtl spd sel 2 src	Mtl spd sel 1 src	Mtl spd sel 0 src	ACTIVE SPEED
0	0	0	Multi speed 0
0	0	1	Multi speed 1
0	1	0	Multi speed 2
0	1	1	Multi speed 3
1	0	0	Multi speed 4
1	0	1	Multi speed 5
1	1	0	Multi speed 6
1	1	1	Multi speed 7

Press ◁ to exit from Speed profile menu.

AVRy drive allows to set a Ramp profile as the picture shows below:




TRAVEL
Speed profile
TRAVEL
Ramp profile
Enter
MR0 acc ini jerk
1000 rpm/s2
Press Enter to set “MR0 acc ini jerk” parameter, press Enter to confirm:
MR0 acceleration
500 rpm/s
Press Enter to set “MR0 acceleration” parameter, press Enter to confirm:
MR0 acc end jerk
1000 rpm/s2
Press Enter to set “MR0 acc end jerk” parameter, press Enter to confirm:
MR0 dec ini jerk
1000 rpm/s2
Press Enter to set “MR0 dec ini jerk” parameter, press Enter to confirm.
MR0 deceleration
500 rpm/s
Press Enter to set “MR0 deceleration” parameter, press Enter to confirm.
MR0 dec end jerk
1000 rpm/s2
Press Enter to set “MR0 dec end jerk” parameter, press Enter to confirm.
MR0 end decel
1000 rpm/s
Press Enter to set “MR0 end decel” parameter, press Enter to confirm.

TRAVEL
Ramp profile

Press  9 times to open the saving procedure

TRAVEL
SAVE PARAMETERS

Press  to execute the procedure:

Busy
Please wait ...

to

TRAVEL
Save parameters

Press  +  .

R:	**0**	**S:**	**0**
MONITOR			

Now the drive is set with commands for standard sequence.

R:	**0**	**S:**	**0**
SERVICE			

 .

SERVICE
Insert password

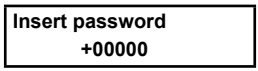
Press  twice.

Insert password
+00000

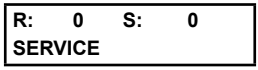
the last digit will blinking

Insert password
+12345

Insert the “**12345**” password and press 



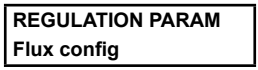
Press twice



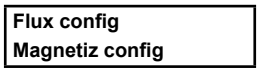
Press four times.

Enter

Press four times.

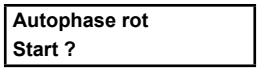


Enter

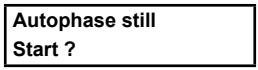


Enter

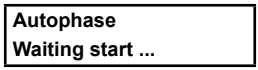
Now it is possible to select two different modes of phasing procedure: rotation (brake opened) or still (brake closed)



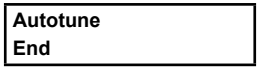
or



Switch on the output contactors and press Enter.

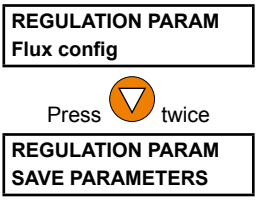


When the drive will display “Waiting start ...”, give Enable and Start commands, then wait until the end of phasing procedure.



When the drive will display “Autotune End”, close the brake, remove the Enable and Start commands, switch off the output contactors.

Press three times.



Press 

to save the changes.

External contactor control

It is possible to delegate output contactor control to external devices like PLC etc. In this case it must be ensured that contactor is closed prior drive enable and is open only after drive disable signal has been issued. Contactor mechanical opening and closing times must be taken into consideration.

External brake control

Also brake control can be accomplished by an external means. In this case, brake can be opened only when Drive ready signal is asserted. Brake must be closed after Start fwd/rev command is removed and Ref is zero or Ref is zero dly signal programmed on digital output becomes active. In FOC and BRS modes it is possible to refer to Ref is zero dly signal and adjust with parameter **Spd 0 ref delay** time for signal activation when motor has come to a complete stop, such that stopping shock is avoided. In case of SLS and VF control since it is not possible to guarantee required torque at low frequencies it is better to refer to signal Ref is zero. Threshold for signal activation can be set by parameter **Spd 0 ref thr.** Brake opening time and closing time must also be considered.

When output contactor or brake are not controlled by the drive it is possible to set corresponding delay times to zero and implement required delay intervals in external control.

Contactor & Brake drive control

Standard command sequence diagram shows most complete sequence in which output contactor and brake are controlled by the drive.

Start of contactor control sequence in case that contactor is controlled by the drive depends on parameter **Seq start mode**. In case that it is set as Start fwd/rev contactor is closed when asserting the Start fwd or Start rev command. Enable command is not required for closing contactors! It is required only to start sequence of motor magnetization and therefore it can be provided for example using auxiliary contact of output contactor. Drive will wait until Enable command is given. In case that selection Enable is made contactors sequence starts when Enable command is asserted.
Start fwd/rew commands are not required and one of them must be connected to 24V or more easily set corresponding source to ONE. Since Start command is not used, zero speed in this configuration must be obtained through multi speed selection. Change of direction must be accomplished by multi speed selection where some parameters are set to negative values or through **Ramp ref inv src** parameter pointing to an digital input controlling direction.
In case that selection **Seq start mode** = Mlt spd out!=0 is made, sequence is started by selecting any multispeed value different from zero. When output of multispeed selection is zero, it is equivalent to a stop command.
Start fwd/rev commands are not required and for their management is valid what is written for selection Enable .
In general, direction is controlled by Start fwd/rew commands, but if preferred only one of these commands can be used and delegate direction control to a simple multispeed selection. Another possibility is to use digital input controlling parameter **Ramp ref inv src**.

Figure 7.1: Standard Commands Sequence

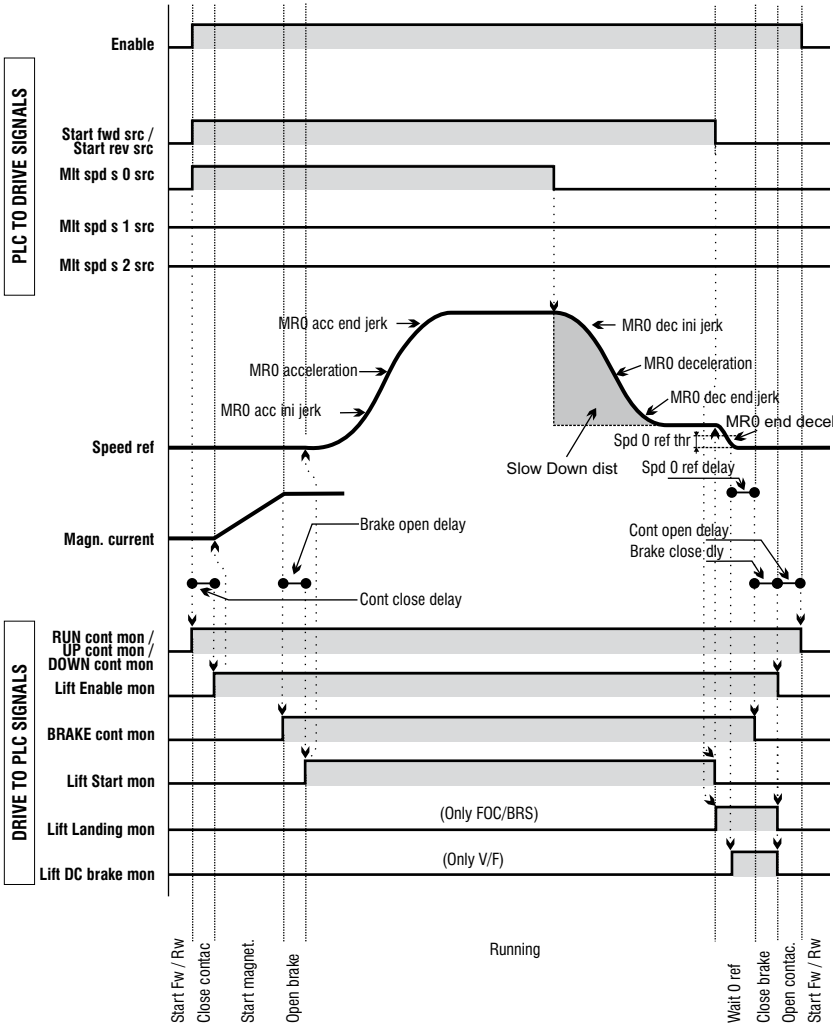


Figure 7.2: Detail Starting

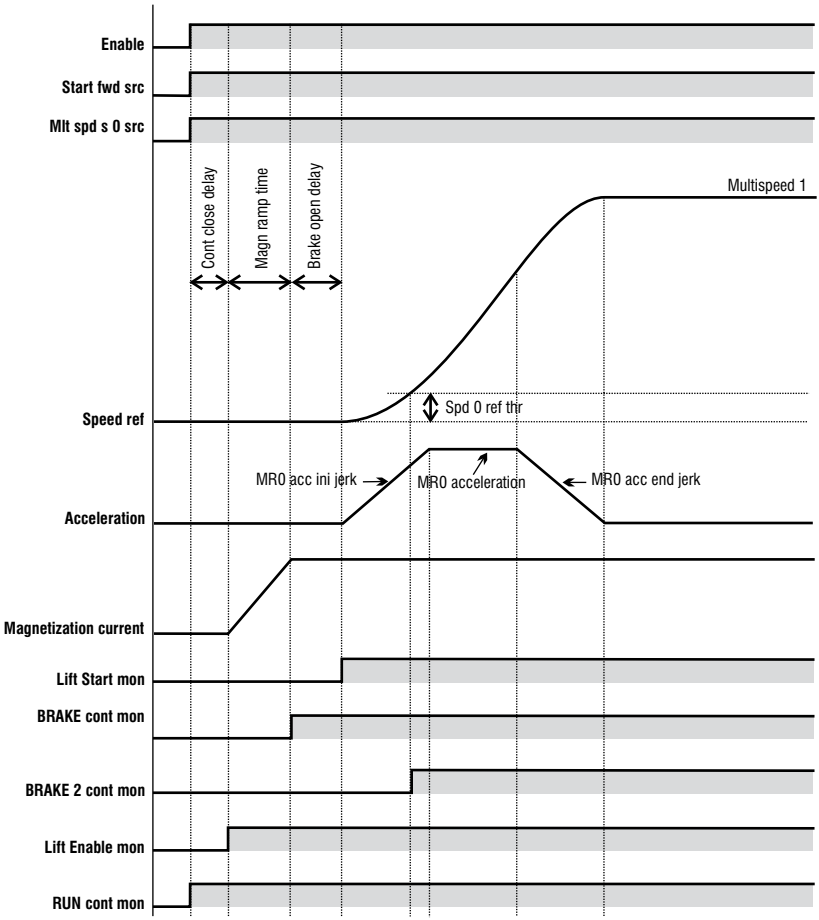


Figure 7.3: Detail Stopping

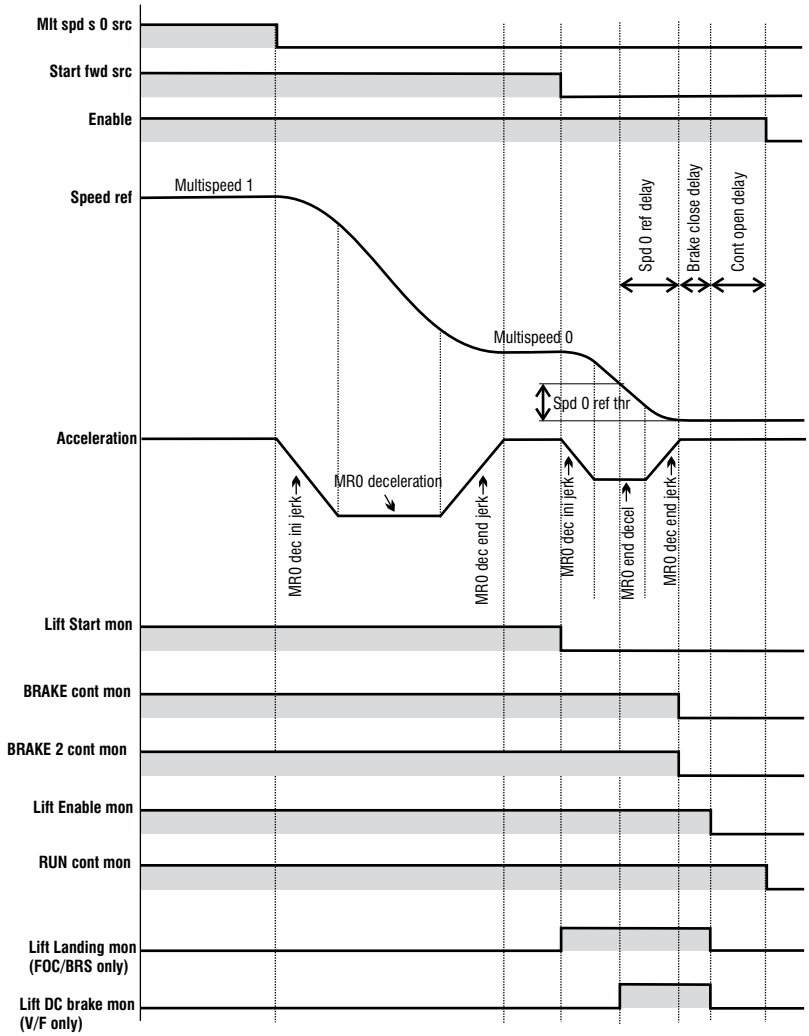
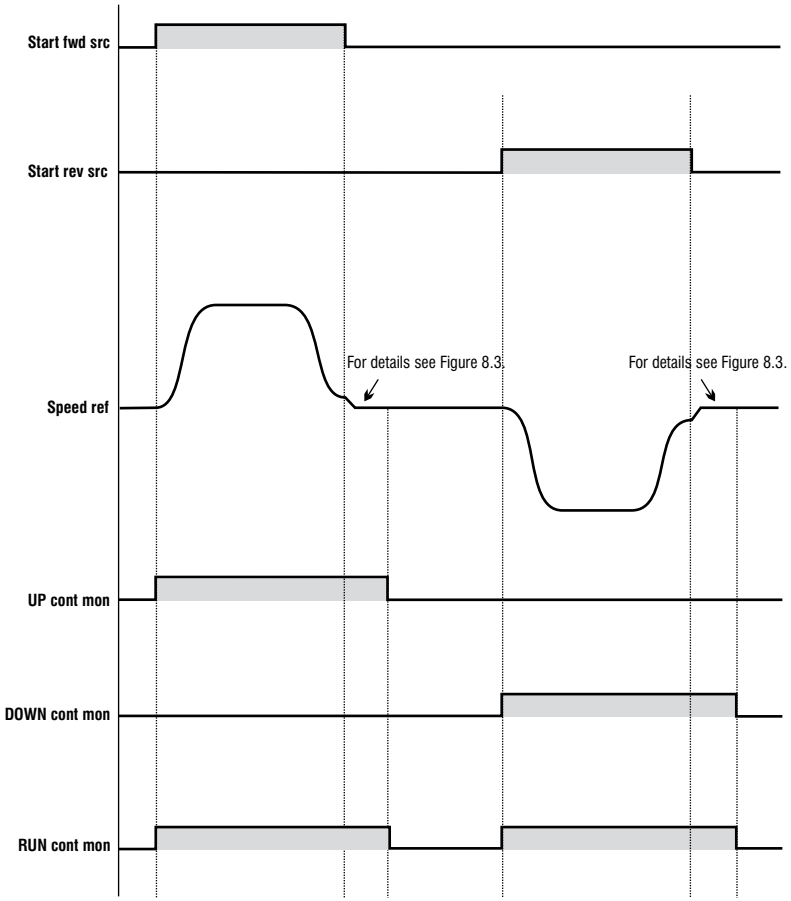


Figure 7.4: Relation between Direction Commands and Contactor Control Signals



Note!

To invert the sign of Speed ref corresponding to Start fwd and Start rev commands set parameter in TRAVEL \ Ramp rev inv src = UP cont mon.

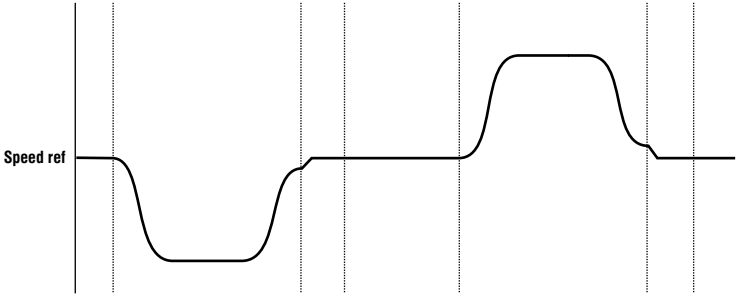
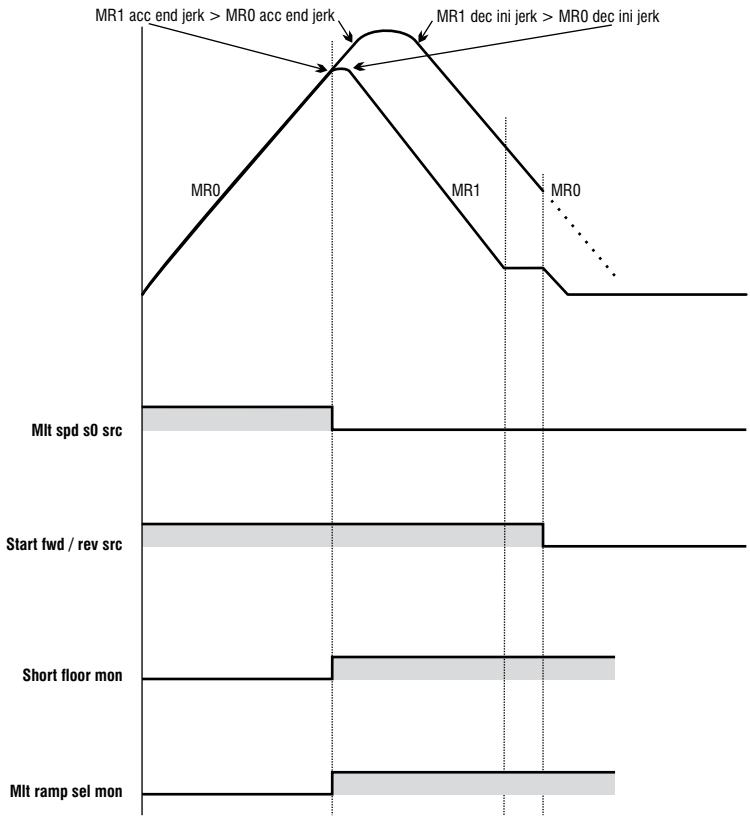


Figure 7.5:Short floor function



8 - Parameter description

8.1 Parameter legend

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
❶	❷	❸	❹	❺	❻	❼	❽	❾

STARTUP *(Level 1 menu)*

STARTUP / Startup config / Enter setup mode

Enter setup mode command allows the access to SETUP MODE to set drive basic parameters and motor plate data. Drive will reboot and few seconds are required. All changes and operations done in the SETUP MODE will be automatically saved, every time the user executes exits setup mode.

SETUP MODE / Drive data *(Level 2 menu)*

380 Mains voltage [V] RW 2 0 5 DK B

Drive power supply voltage. Select supply voltage parameter accurately, according to actual drive supply voltage. After changing this parameter, selftune data are initialized to default, self-tuning must be repeated !

0 230 V
1 380 V
2 400 V
3 415 V
4 440 V
5 460 V

9419 Landing init src N/A RWSZ IPA 7124 List 3 PIN B

IPA 7124 Lift Landing mon = Default
It allows to select the signal to initialize the close loop position control in the Landing Zone (leave to default if landing should be managed by internal lift control sequence; refer to signals List 3 of Pick List, see chapter 11)

❿

❶	Parameter number
❷	Parameter name
❸	Unit of measure
❹	Accessibility : R read only W write type S saved in flash Z accessible with drive disabled
❺	Default value
❻	Minimum value
❼	Maximum value D.Size value determined by drive size Calc value calculated in function of other parameter DrvVer value dependent on drive fw version Motr value dependent on motor List X signal list

❽	Point type AB A can to be > F float type > P float type > D digital type (Integer with 16 bits) B can to be > P parameter > V variable > K constant PIN The parameter type is enumerative. It has, therefore, a list of possible values (for example it is a source)
❾	Validity DB The reading keys are: B Brushles
❿	The Pick List manual is available (pdf format) on the supplied "CONF 99" cd-rom.

8.2 Inverter Parameter list

MONITOR

This menu displays a series of variables useful to check the Drive state. The variable function is clearly explained by the variable name.

Monitor

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
3060	**Output voltage** Voltage on the drive output terminals	**[V]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
3070	**Output current** Current on the drive output terminals	**[A]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
3080	**Output frequency** Drive output frequency	**[Hz]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
3090	**Output power** Drive output power.	**[kVA]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
9406	**Torque ref** Drive torque reference	**[Nm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
9405	**Norm Speed** Speed of the motor	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
3210	**Speed ref** Drive speed reference	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
3200	**Ramp ref** Drive ramp reference	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
162	**Enable SM mon** It shows the drive Enable state	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
163	**Start SM mon** It shows the drive Start state 0 OFF 1 ON	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
164	**FastStop SM mon** It shows the drive FastStop state 0 OFF 1 ON	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**

MONITOR / I/O status

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4028	**DI 7654321E** Standard digital inputs status, from 0 to 7; E (Enable) = Digital Input 0	**N/A**	**R**	**0**	**0**	**1**	**DP**	**B**
4064	**DO 3210** Standard digital outputs status, from 0 to 3	**N/A**	**R**	**0**	**0**	**1**	**DP**	**B**
4057	**DIX BA9876543210** Expanded digital inputs status, from 0 to 11; A = Digital InputX 10, B = Digital InputX 11 (X suffix means expanded)	**N/A**	**R**	**0**	**0**	**1**	**DP**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4078	**DOX 76543210**	**N/A**	**R**	**0**	**0**	**1**	**DP**	**B**
	Expanded digital outputs status, from 0 to 7 (X suffix means expanded)							
MONITOR / Advanced Status								
3100	**DC link voltage**	**[V]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive DC link voltage							
3110	**Magnetizing curr**	**[A]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive magnetizing current							
3120	**Torque curr**	**[A]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive torque current							
3130	**Magn curr ref**	**[A]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive magnetizing current reference							
3140	**Torque curr ref**	**[A]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive torque current reference							
3180	**Flux ref**	**[Wb]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive flux reference							
3190	**Flux**	**[Wb]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive flux							
1670	**Mot OL accum %**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Motor I2t overload accumulator. When 100% is reached Mot overload alarm is generated and output inverter current is reduced to motor continuous current							
1781	**BU OL accum %**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Braking Unit I2t overload accumulator. When 100% is reached BU overload alarm is generated.							
1540	**Drv OL accum %**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive Unit I2t overload accumulator. When 100% is reached Drv overload alarm is generated and output inverter current is reduced to drive continuous current. .							
3222	**Norm Std enc spd**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Encoder speed of standard feedback (connector "XE"on RV33 regulation board)							
3223	**Norm Exp enc spd**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Encoder speed of expanded feedback (encoder connector on expansion optional boards)							
9553	**Std enc position**	**[cnt]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Raw accumulated encoder pulses of the standard encoder, measured in ppr x 4							
9554	**Exp enc position**	**[cnt]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Raw accumulated encoder pulses of the expanded encoder, measured in ppr x 4							
9204	**Std sin enc mod**	**[cnt]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Module of "A" and "B" trace of sinusoidal encoder on std port. Encoder peak voltage is constantly monitored and the alarm Speed feedback loss is generated if it is outside the range: min=IPA 1902/5, max=IPA 1902 * 2.							
9072	**HT sensor temp**	**[°C]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive Heatsink temperature							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9073	**RG sensor temp**	**[°C]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Temperature on the regulation card RV33							
9095	**IA sensor temp**	**[°C]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Temperature of the heatsink incoming air temperature							
9090	**Sequencer status**	**N/A**	**R**	**0.00**	**0.00**	**- - -**	**DV**	**B**
	Sequencer status of drive State Machine. It controls the drive running and starting, accounting for protection & alarming, command sequence, and reset status. State Sequencer status 1 Magnetization running 2 Magnetization completed, Stop 3 Start 4 Fast stop, Stop 5 Fast stop, Start 9 No alarm, drive is ready to accept all commands 10 Magnetization running and Start command already present 12 Alarm active 16 Alarm not active, waiting for reset							
3230	**CPU1 runtime**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Time needed by the CPU1 (microprocessor)							
3240	**CPU2 runtime**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**
	Time needed by the CPU2 (microprocessor)							

MONITOR - Drive ID Status

1460	**Drive cont curr**	**[A]**	**RW**	**CALC**	**0.00**	**0.00**	**FK**	**B**
	Drive maximum continuos current rating; its default value depends by the drive size and applicable derating factors.							
114	**Drive size**	**N/A**	**R**	**D.Size**	**0**	**20**	**DK**	**B**
	Drive size rating in kW (U_{LN} = 400VAC, IEC 146 Class 1) or Hp (U_{LN} = 460VAC, IEC 146 Class 2): 7 ACAC Inv-14A 8 ACAC Inv-25A 9 ACAC Inv-33A							
300	**Drive type**	**N/A**	**R**	**288**	**0**	**0**	**DK**	**B**
	41 400V default settings for AVRy							
115	**Drive name**	**N/A**	**RWS**	**0.00**	**0.00**	**0.00**	**FK**	**B**
	ACDRVM : brushless firmware							
810	**Actual setup**	**N/A**	**R**	**0**	**0**	**0**	**DK**	**B**
	Setup motor file in use (reserved)							
107	**Software version**							
	Drive software version (factory installed), example: V 3. 6. 0							
110	**Software type**	**N/A**	**R**	**DrvVer**	**0**	**0**	**DV**	**B**
	Software type factory use							
111	**Software status**	**N/A**	**R**	**DrvVer**	**0**	**0**	**DV**	**B**
	Software state factory use							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
99	**Life time**	**[hrs]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Drive life time accumulated with power on							
98	**Sys time-ddmmyy**	**[h/m/s]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Time and date setting from PC configurator or serial communications. Clock is active only when the Drive is powered on Note! On a new regulation card the variable takes value: 00:00:00 (time) 011299 (date)							

MONITOR / Alarm log

This function provides a list of last 30 drive trips or various system error messages. Together with cause indications also time and data infornations is provided. Alarm log message is referred to “Sys time - dd mm yy” variable.

Example: 01:02:36 01 02 00
Undervoltage

01:02:36	time of alarm
02 02 00	date of alarm
Undervoltage	alarm description

MONITOR / Alarm log clear?

It deletes all the alarms listed in the Alarm log.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

STARTUP

STARTUP / Startup config / Enter setup mode

Enter setup mode command allows the access to SETUP MODE to set drive basic parameters and motor plate data. Drive will reboot and few seconds are required. All changes and operations done in the SETUP MODE will be automatically saved, every time the user executes exits setup mode.

SETUP MODE / Drive data

380 **Mains voltage** **[V]** **RW** **2** **0** **5** **DK** **B**

Drive power supply voltage. Select supply voltage parameter accurately, according to actual drive supply voltage. After changing this parameter, selftune data are initialized to default, self-tuning must be repeated !

0 230 V
1 380 V
2 400 V
3 415 V
4 440 V
5 460 V

Selections from 0 to 4 are disabled – default 460

1350 **Ambient temp** **[°C]** **RW** **0** **0** **1** **DK** **B**

Drive ambient temperature. Selecting 50°C will result in drive derating, see chapter 2.1. After changing this parameter selftune data are initialized to default, self-tuning must be repeated !

0 40°C
1 50°C

170 **Switching freq** **[kHz]** **RW** **D.Size** **0** **3** **DK** **B**

Drive PWM switching frequency. Selecting higher switching frequency then default, results in drive derating, see table 2.3.4.1. Selecting lower value results in higher continuous output current.
After changing this parameter, selftune data are initialized to default, self-tuning must be repeated !

0 2 kHz
1 4 kHz
2 8 kHz
3 16 kHz
4 12 kHz

Selections 0, 1 and 4 are disabled

1880 **Spd ref/fbk res** **[rpm]** **RW** **1** **0** **5** **DK** **B**

Resolution of the speed references referred to the maximum process speed (1885. "Full scale speed" parameter). After changing this parameter, selftune data are initialized to default, self-tuning must be repeated !

0 0.125 rpm -> 2048 rpm maximum process speed
1 0.250 rpm -> 4096 rpm maximum process speed
2 0.500 rpm -> 8192 rpm maximum process speed
3 1.000 rpm -> 16384 rpm maximum process speed
4 0.03125 rpm -> 512 rpm maximum process speed

SETUP MODE / Motor data

670 **Rated voltage** **[V]** **RW** **D.Size** **Calc** **Calc** **FK** **B**

Motor rated voltage

690 **Rated current** **[A]** **RW** **D.Size** **Calc** **Calc** **FK** **B**

Motor rated current

Note! The value should be not less then approx 0.3 times the drive rated current (output current Class 1 @ 400V on the drive nameplate).

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
700	**Rated speed**	**[rpm]**	**RW**	**D.Size**	**Calc**	**Calc**	**FK**	**B**
	Motor synchronous speed.							
930	**Pole pairs**	**N/A**	**RW**	**4.0**	**0.0**	**0.0**	**FK**	**B**
	Must be integer number.							
990	**Torque constant**	**[Nm/A]**	**RW**	**D.Size**	**0.0**	**0.0**	**FK**	**B**
	Motor torque costant. This parameter is usually stated by the motor manufacturer. If not, it can be calculated from motor rated power, speed and current as: $\text{Torque Constant} = \frac{P\,[W]}{2\pi \cdot \frac{S\,[rpm]}{60} \cdot I\,[A]}$ Current in torque constant unit [Nm/A is RMS current.							
775	**EMF constant**	**[V.s]**	**RW**	**D.Size**	**0.0**	**0.0**	**FK**	**B**
	If the number is unknown, set the parameter to zero: the drive will automatically calculate an approximate value.							
970	**Stator resistance**	**[ohm]**	**RW**	**D.Size**	**0.0**	**0.0**	**FK**	**B**
	Motor stator resistance value.							
980	**LsS inductance**	**[H]**	**RW**	**D.Size**	**0.0**	**0.0**	**FK**	**B**
	Motor stator inductance value							

Note! If “EMF costant”, “Stator resistance” and “LsSinductance” values are unknown, set them to zero before running the current self-tuning procedure.

SETUP MODE / Motor data / Load default mot

Load default mot

It selects and loads the motor standard parameters:

0 Set 0

1 Set 1

Note! By this selection, the motor standard parameters with “Set 1” (or “Set 2”) are loaded making reference to the used Drive size. Through this process, motor data is overwritten.

SETUP MODE / Autotune

CurrReg

Self-tuning of current loop only with stopped motor

“Start ?” enable data detection command (12 drive terminal must be cycle to +24Vdc)

SETUP MODE / Autotune / Results

2780	**Measured Rs**	**[ohm]**	**RW**	**Calc**	**Calc**	**Calc**	**FK**	**B**
	Value of the phase resistance detected on the stator of the motor							
2790	**Measured DTL**	**[V]**	**RW**	**Calc**	**0**	**Calc**	**FK**	**B**
	IGBT dead time limit.							
2800	**Measured DTS**	**[ohm]**	**RW**	**Calc**	**0**	**Calc**	**FK**	**B**
	IGBT dead time slope.							
2810	**Measured LsSigma**	**[H]**	**RW**	**Calc**	**Calc**	**Calc**	**FK**	**B**
	Value of inductance detected on the stator of the motor.							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

STARTUP / Startup config / Load setup

Load setup

Load setup command is required to load all SETUP MODE settings into the regulation mode selected.
Entering this parameter, on the display will appear:

Load setup?
Yes -> Ent No -> Esc

- Press Enter to load the SETUP MODE settings.
- Press Escape if you do not want to load the SETUP MODE settings

If any changes / settings in Motor data and Drive data are detected, Load setup command is presented automatically to the user, respond Yes to load data.

STARTUP / Startup config / Mechanical data

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1015	**Travel units sel**	**N/A**	**RWZ**	**0**	**0**	**1**	**DK**	**B**

0 Revolutions
1 Millimeters
It determines the units of "TRAVEL / Speed profile" and "TRAVEL / Ramp profile" menu parameters:
Revolutions = rpm, rpm/s and rpm/s^2 - Millimeters = mm/s, mm/s^2 and mm/s^3

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1002	**Gearbox ratio**	**N/A**	**RWZ**	**35**	**1**	**100**	**FK**	**B**

Ratio between motor shaft speed and pulley speed. Eventual roping ratio must also be included.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1003	**Pulley diameter**	**[mm]**	**RWZ**	**500**	**100**	**2000**	**FK**	**B**

Diameter of the pulley

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1885	**Full scale speed**	**[rpm]**	**RW**	**1500**	**Calc**	**Calc**	**PV**	**B**

It defines the 100% of the application speed referenced. The absolute speed handling range is ± 200% Full scale speed.
For lift application set this parameter to maximum allowed motor speed, typically rated speed of the motor. This parameter will also set the limit on all multispeed values IPA 7060 - 7067.

STARTUP / Startup config / Weights

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1004	**Car weight**	**[kg]**	**RWZ**	**0.00**	**0.00**	**0.00**	**FK**	**B**

Weight of the Lift car

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1005	**Counter weight**	**[kg]**	**RWZ**	**0.00**	**0.00**	**0.00**	**FK**	**B**

Weight of the counter mass to achieve balanced system

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1006	**Load weight**	**[kg]**	**RWZ**	**0.00**	**0.00**	**0.00**	**FK**	**B**

Maximum weight of Lift load (total persons weight)

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1007	**Rope weight**	**[kg]**	**RWZ**	**0.00**	**0.00**	**0.00**	**FK**	**B**

Total weight of Rope

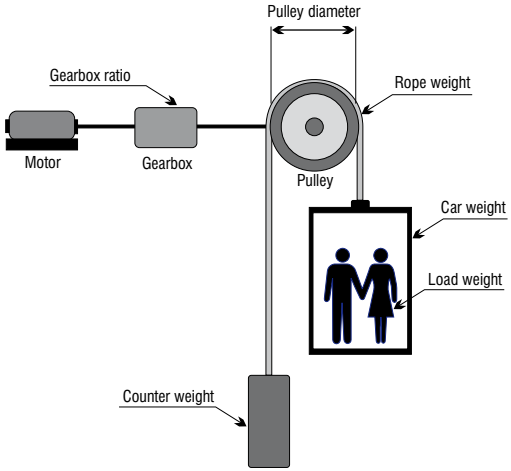
IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1011	**Motor inertia**	**[kgm2]**	**RWZ**	**0.000**	**0.000**	**0.000**	**FK**	**B**

Inertia of the motor, refer to motor manufacturer (if it is not available, leave to default)

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1012	**Gearbox inertia**	**[kgm2]**	**RWZ**	**0.000**	**0.000**	**0.000**	**FK**	**B**

Inertia of the gearbox, refer to manufacturer (if it is not available, leave to default). Can be set here the inertia of all mechanical parts at slow side of gearbox (ex. pulley, etc...)

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode



STARTUP / Startup config / Landing zone

9411 **Landing control** **N/A** **RWZ** **0** **0** **1** **DP** **B**

0 Disabled
1 Enabled
Enable/Disable of accurate position control in landing zone

9419 **Landing init src** **N/A** **RWSZ** **IPA 7124** **List 3_I** **PIN** **B**

IPA 7124 Lift Landing mon = Default
It allows to select the signal to initialize the close loop position control in the Landing Zone (leave to default if landing should be managed by internal lift control sequence; refer to signals List 3_I of Pick List, see chapter 11)

9412 **Landing distance** **[mm]** **RWZ** **100** **10** **1000** **PP** **B**

Total distance between landing zone signal and floor position. Higher value allows faster positioning.

9420 **Landing ratio** **[%]** **RWZ** **50** **0** **90** **PP** **B**

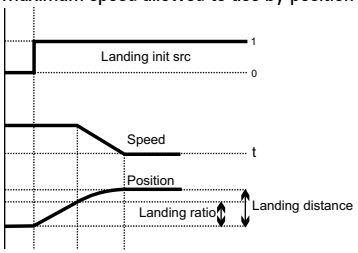
Percentage of landing distance during which car runs at constant speed

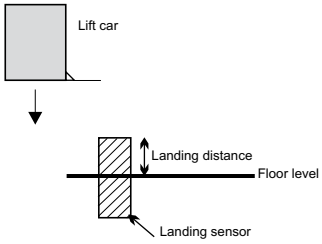
9417 **Pos P gain** **[%]** **RWZ** **1** **0** **100** **PP** **B**

Proportional gain of position regulator

9410 **Pos speed limit** **[rpm]** **RWZ** **200** **0** **Calc** **PP** **B**

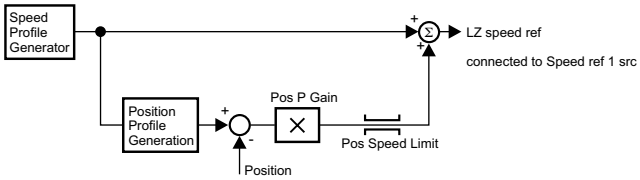
Maximum speed allowed to use by position controller





Landing sensor output can be interfaced to the drive through digital input which can become command to initialize landing control.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode



STARTUP / Startup config / Encoders config

1940 Speed fbk sel — N/A — RW — 0 — 0 — 1 — DV — B

0 Std encoder
1 Exp encoder

It allows to switch the feedback between the encoder standard port "XE" (on RV33 regulation card) and the encoder expanded (from encoder optional cards: EXP-F2E and EXP-D14A4F)

Note! Expansion encoder cannot be used for speed feedback in Brushless mode.
It can be used only for setting speed reference.

1925 Std enc type — N/A — RWZ — 4 — 3 — 8 — DK — B

Encoder type connected to the standard input.

3	Sinusoidal Hall	sinusoidal incremental encoder with A+ / A-, B+ / B-, C+ /C traces and three digital "Hall sensor" absolute position traces for initial synchronisation (factory setting)
4	Sinusoidal SinCos	sinusoidal incremental encoder with A+ / A-, B+ / B-, C+ /C- traces and two Sin/Cos absolute position traces for initial synchronisation
8	SinCos	Sin / Cos absolute position traces for initial synchronisation, incremental information is not used.

1890 Std enc pulses — [ppr] — RWZ — 1024 — Calc — Calc — FK — B

Encoder pulses per revolution (ppr) value of the standard input.
For brushless motors it is possible to use only the following values: 512, 1024, 2048, 4096, 8192.

1931 Std dig enc mode — N/A — RWZ — 0 — 0 — 1 — DP — B

0	FP	mode frequency and period measuring
1	F	mode frequency measuring

Measuring method of the digital encoder speed connected to the standard input

1927 Std enc supply — N/A — RWZ — 0 — 0 — 3 — DP — B

0 5.41 / 8.16 V
1 5.68 / 8.62 V
2 5.91 / 9.00 V
3 6.16 / 9.46 V

Selection between 5V / 8V range is done through dip-switch S28.
Power supply voltage of the standard Encoder input. Increse this value in case of long encoder cable.

1902 Std sin enc Vp — [V] — RW — 0.5 — 0 — 1.5 — FK — B

Peak voltage value of the sinusoidal encoder connected to the standard input

1300 Std enc cnt dir — N/A — RWSZ — 0 — 0 — 1 — DP — B

0 Not inverted
1 Inverted

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

Selection of standard encoder counting direction. It allows to change sign of measured speed, it is equivalent of swaping encoder channels AA- <-> BB-.

1926 Exp enc type — **N/A** — **RW** — **1** — **1** — **2** — **DK** — **B**

Encoder type connected to the expanded input

1	Digital	digital encoder
2	Frequency input	digital single channel frequency input: channel A. Signal +5V must be connected between A and power supply common.

Note! For brushless motors expanded encoder cannot be used for speed feddback.It can be used only for setting speed reference.

1900 Exp enc pulses — **[ppr]** — **RWZ** — **1024** — **Calc** — **Calc** — **FK** — **B**

Encoder pulses per revolution (ppr) value of the expanded input.

1301 Exp enc cnt dir — **N/A** — **RWSZ** — **0** — **0** — **1** — **DP** — **B**

0 Not inverted
1 Inverted

Selection of expansion encoder counting direction. It allows to change sign of measured speed, it is equivalent of swaping encoder channels AA- <-> BB-.

STARTUP / Startup config / Encoders config / Rep/Sim encoder

1962 Rep/Sim enc sel — **N/A** — **RWZ** — **0** — **0** — **1** — **DK** — **V-F**

Selection of the encoder to be repeated using .

0	Repeat standard encoder
1	Repeat expanded encoder
2	Simulate digital incremental encoder in case of SinCos

1952 Sim enc pulses — **N/A** — **RWZ** — **1024** — **1** — **Calc** — **FK** — **B**

Simulated encoder pulses per revolution (ppr) value (factory setting = 1024 ppr)

STARTUP / Startup config / Encoders config / Index storing

9550 Index storing en — **N/A** — **RWSZ** — **0** — **0** — **3** — **DV** — **B**

Index storing function.
The encoder counts can be latched allowing the user to determine the position of the encoder relative to an absolute position.

0	Off	
1	Storing enabled	enables the capturing of the encoder count as described by the setting of the control word. The control word is the value of “Int IS ctrl” or the word selected by “IS ctrl src”
2	Control std enc	it constantly reads all the generated pulses on the std encoder
3	Control exp enc	it constantly reads all the generated pulses on the exp encoder

9551 Int IS ctrl — **N/A** — **RWS** — **0** — **0** — **0X0000** — **DV** — **B**

Fixed programming at Index Storing Function according to following table.

9557 IS ctrl src — **N/A** — **RWSZ** — **IPA 9551** — **List 39_IPIN** — **B**

IPA 9551 Int IS ctrl = Default
It allows to select the origin of the signal for “Index storing function” command.
For example a SBI word or DGFC word (refer to signals List 39_I of Pick List, see chapter 11)

Note! Digital inputs 6 and 7 (terminals 38 and 39) are dedicated to the use of the “Index Qualifier” (home

position switch) when Index storing is enabled.

In the next table are showed the values of IS ctrl src from SBI word, DGFC word or Int IS ctrl if:
IS ctrl src = Int IS ctrl

No. bit	Name	Description	Access (Read/Write)	Default
0-1	**-**	Not used	-	-
2	**POLNLT**	It indicates the encoder index edge polarity: 0= rising edge 1= falling edge	R/W	0
3	**-**	Not used	-	-
4-5	**ENNQUAL**	It sets the qualifier input state to activate the encoder index reading: =0, switched off when dig.input 7 = 0 =1, switched off when dig.input 7 = 1 =2, through signal = 0 =3, through signal = 1	W	0
6	**Target Enc Num**	It points out for which encoder the values of this parameter are reported: =0, operations requested on the Std Encoder input =1, operations requested on the Exp Encoder input	R/W	0
7	**-**	Not used	-	-
8-9	**ENNLT**	Control function of the encoder index reading =0, switched off, function disabled =1, once, enables the reading of the first index signal edge only. =2, continuous, enables the reading of the index signal	R/W	0

For the Index storing function, the status Registers are not available via keypad and are to be used for the configuration and the data reading. These are:

L index register	IPA9556
H index register	IPA9555

In the next table are showed the registers values:

Ipa	No. bit	Name	Description	Access (Read/ Write)	Default
9556	**0**	Source Enc Num	It indicates which encoder is used for index storing: =0, register data are referred to the Std Encoder input =1, register data are referred to the Exp Encoder input	R	0
	1	MP_IN	Actual Qualifier input value (digital input 7): =0, qualifier input level is low =1, qualifier input level is high	R	0
	2-3	STATNLT	Status of the acquisition function; as: 0=OFF 1=Once, storing is not executed yet 2=Once, storing is already executed 3=Continuous	R	0
9555	**0-15**	CNTNLT	Position counter value corresponding to the index. Value is only valid when STANLT is equal to 2 or 3	R	0

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1936	**Motor pp/sens pp**	**N/A**	**RW**	**Calc**	**Calc**	**32**	**PP**	**B**

Ratio between motor pole pairs and feedback sensor pole pairs, typically used for resolver.

STARTUP / Startup config / SpdReg gain calc

2048	**Calc method**	**N/A**	**RWZ**	**0**	**0**	**1**	**DK**	**B**

With “Calc method” two gain calculation methods can be selected:

0	Variable bandw	speed regulation bandwidth is internally selected according to the principle that bandwidth is decreased as inertia is increased
1	Fixed bandw	speed regulation bandwidth is specified by parameter “Bandwidth”

It allows to perform the speed regulator gain calculation. Inertia must be entered throught the “Calc Inertia” parameter or specifying parameters in Weights menu.

2610	**Calc Inertia**	**[kgm2]**	**RWZ**	**D.Size**	**0**	**0**	**FK**	**B**

Inertia of the load. When parameters in Weights menu have been set, the result of system inertia referred to the motor shaft is set in this parameter.

2049	**Bandwidth**	**[rad/s]**	**RWZ**	**50**	**1**	**400**	**FK**	**B**

Speed regulator bandwidth. Higher bandwidth value makes motor respond faster and overall result is more stiff control.

STARTUP / Startup config / Motor protection

I2t function is similar to the protection of the motor by the thermal relay. It states the I2t typical behavior.
The integrator state is given by Mot OL accum %, it gives the percentage state of the Rms current integration, 100 % = I2t alarm level. Mot OL trip signal is available in the pick-list selections.
It states that the trip condition of I2t has been reached and overload is not allowed.
The intervention time depends on the value of the motor current as follows:

$$\text{Overload time} = \frac{(\text{Motor Rated current} * \text{Service factor} * \text{Motor OL factor})^{\wedge} 2 * \text{Motor OL time}}{(\text{Motor current})^{\wedge} 2}$$

It is possible to generate an alarm condition or reduce eventual overload current to nominal current of the motor. For various options of alarm configuration see menu ALARM CONFIG / Motor overload.

1612	**Motor OL control**	**N/A**	**RW**	**0**	**0**	**1**	**DK**	**B**

0 Disabled
1 Enabled
Enable / disable motor current limit control and overload I2t protection function

1611	**Service factor**	**N/A**	**RW**	**1**	**0.5**	**1.5**	**FK**	**B**

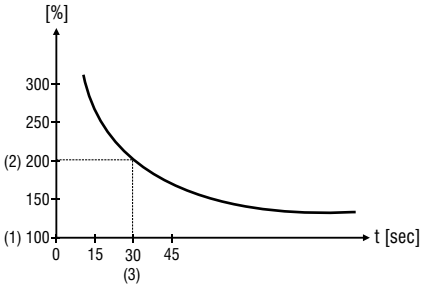
Service factor. Some motors have a motor continuous current (Ic) higher than the rated current (In).
The service factor makes reference to the Ic/In ratio.

1610	**Motor OL factor**	**N/A**	**RW**	**2**	**1.2**	**Calc**	**FK**	**B**

Allowed motor overload factor referring to the Motor rated current * Service factor

1650	**Motor OL time**	**[sec]**	**RW**	**30**	**10**	**Calc**	**FK**	**B**

Allowed overload time with overload level equal to Motor OL factor.



(1) Rated current • Service factor = 100%
(2) Motor OL factor
(3) Motor OL time

STARTUP / Startup config / BU protection

Note! This menu are not applicable in this product (AVRy).

STARTUP / Startup config / Load default ?

Load default ?

Drive reset with default parameter values in the selected regulation mode only.
Each regulation mode has its own "Load default ?" command.

Note! "Load default ?" command does not reset SETUP MODE with default parameter values; Drive, Motor data and Autotune values are mantained.

Use Save config command to save default parameter values such that are preserved for next power up.

STARTUP / Startup config / Load saved ?

Load saved ?

Reload of the last saved database selected.

STARTUP / Regulation mode

100 Regulation mode | **N/A** | **R** | **4** | **4** | **5** | **DK** | **B**

It allows to select the desired regulation mode. When the Regulation mode parameter is selected, the active regulation mode is displayed; in order to change it to a new mode press "Enter"; Select new mode will be displayed, then scroll the list:

4 Brushless
5 Setup mode (brushless motors)

STARTUP / Import recipe

In recipe user can store its configuration of parameters for a given application. By re-calling appropriate recipe file all the necessary application parameters are set by a single command. Recipe files must be filled with parameters in the factory (please contact drive manufacturer). Available are 7 recipe files that are empty in default configuration. Only parameters outside STARTUP menu can be put to recipe files.

Select recipe:

1 User 1
2 User 2
3 User 3
4 User 4
5 User 5

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
6	User 6							
7	User 7							

STARTUP / Save config ?

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected. It is recommended every time the user made any changes into STARTUP menu.
“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.
When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

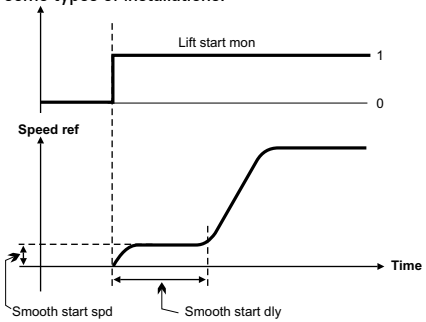
TRAVEL

TRAVEL / Speed profile

The parameters unit is defined by IPA 1015 in “STARTUP / Startup config / Mechanical data” menu, changing the IPA 1015 setting from [0] Revolutions (default) to [1] Millimeters, the units in this menu change as follows: [rpm] becomes [mm/s], [rpm/s] becomes [mm/s2], [rpm/s2] becomes [mm/s3].

7110	**Smooth start spd**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**

Smooth start speed is selected automatically after start command independently from multispeed value. Duration of this special speed depends on Smooth start dly parameter. If this parameter is zero, Smooth start spd is not selected and multispeed values prevails. Smooth start speed can be used to optimise feeling at starting in some types of installations.

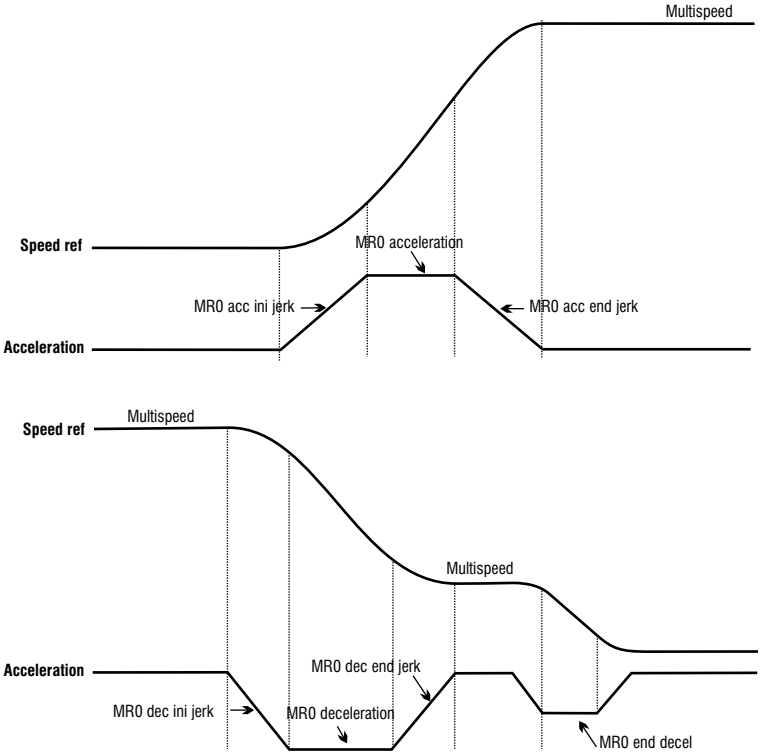


Note! “Smooth start dly” can be set in TRAVEL / Lift sequence menu.

7060	**Multi speed 0**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**
	Speed 0 value							
7061	**Multi speed 1**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 1 value							
7062	**Multi speed 2**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 2 value							
7063	**Multi speed 3**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 3 value							
7064	**Multi speed 4**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 4 value							
7065	**Multi speed 5**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 5 value							
7066	**Multi speed 6**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 6 value							
7067	**Multi speed 7**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PP**	**B**
	Speed 7 value							
7134	**Max linear speed**	**[mm/s]**	**R**	**Calc**	**0**	**0**	**FK**	**B**

TRAVEL / Ramp profile

The parameters unit is defined by IPA 1015 in “STARTUP / Startup config / Mechanical data” menu, changing the IPA 1015 setting from [0] Revolutions (default) to [1] Millimeters, the units in this menu change as follows: [rpm] becomes [mm/s], [rpm/s] becomes [mm/s2], [rpm/s2] becomes [mm/s3].
Two different sets of ramp profiles (MR0 ... and MR1 ...) are available; the selection is done by parameter Mlt ramp sel src (IPA 8090) into “TRAVEL / Lift sequence” menu. Default is MR0 ... .



8046	**MR0 acc ini jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*100**	**PP**	**B**
	Acceleration initial jerk, set 0							
8040	**MR0 acceleration**	**[rpm/s]**	**RWS**	**500**	**1**	**1.5*106**	**PP**	**B**
	Acceleration ramp, set 0							
8041	**MR0 acc end jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Acceleration end jerk, set 0							
8047	**MR0 dec ini jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Deceleration initial jerk, set 0							
8042	**MR0 deceleration**	**[rpm/s]**	**RWS**	**500**	**1**	**1.5*106**	**PP**	**B**
	Deceleration ramp, set 0							
8043	**MR0 dec end jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Deceleration end jerk, set 0							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
8044	**MR0 end decel**	**[rpm/s]**	**RWS**	**1000**	**1**	**1.5*106**	**PP**	**B**
	Final deceleration slope corresponding to removal of Start command.							
8056	**MR1 acc ini jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Acceleration initial jerk, set 1							
8050	**MR1 acceleration**	**[rpm/s]**	**RWS**	**500**	**1**	**1.5*106**	**PP**	**B**
	Acceleration ramp, set 1							
8051	**MR1 acc end jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Acceleration end jerk, set 1							
8057	**MR1 dec ini jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Deceleration initial jerk, set 1							
8052	**MR1 deceleration**	**[rpm/s]**	**RWS**	**500**	**1**	**1.5*106**	**PP**	**B**
	Deceleration ramp, set 1							
8053	**MR1 dec end jerk**	**[rpm/s2]**	**RWS**	**1000**	**0.349**	**750*106**	**PP**	**B**
	Deceleration end jerk, set 1							
8054	**MR1 end decel**	**[rpm/s]**	**RWS**	**1000**	**1**	**1.5*106**	**PP**	**B**
	Final deceleration slope corresponding to removal of Start command.							
9421	**SlowDown dist**	**[mm]**	**RW**	**0.00**	**0.00**	**0.00**	**FK**	**B**
	It allows to calculate the distance from running speed to approach speed if for running speed and approach speed Multispeed 1 and Multispeed 0 are used respectively.							

TRAVEL / Ramp profile / SlowDown dist Calculate?

SlowDown dist Calculate ?

Executing “Calculate ?” using Enter key, will be calculate the distance from running speed to approach speed.

Note! It is available only if IPA 1015 Travel units sel parameter is set to Millimeters.

TRAVEL / Lift sequence

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7100	**Cont close delay**	**[ms]**	**RWS**	**200**	**0.00**	**65535**	**PP**	**B**
	Output contactor close delay. See Chapter 7 - Lift Sequencies							
7101	**Brake open delay**	**[ms]**	**RWS**	**0.00**	**0.00**	**65535**	**PP**	**B**
	See chapter 7 - Lift Sequencies							
7102	**Smooth start dly**	**[ms]**	**RWS**	**0.00**	**0.00**	**65535**	**PP**	**B**
	See IPA 7110 into “TRAVEL / Speed profile” menu.							
7103	**Brake close dly**	**[ms]**	**RWS**	**200**	**0.00**	**65535**	**PP**	**B**
	See chapter 7 - Lift Sequencies							
7104	**Cont open delay**	**[ms]**	**RWS**	**200**	**0.00**	**65535**	**PP**	**B**
	Output contactors open delay. See chapter 7 - Lift Sequencies							
7105	**Seq start mode**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**
	0 Start fwd/rev 1 Enable 2 Mlt spd out !=0 It changes the way how contactor sequence starts:							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

"Start fwd/rev" selection allows to start contactor sequence without Enable command (Enable is required only to run the motor). Enable signal can be given by an auxilary contact of output contactors "Enable" selection allows to start contactor sequences only with Enable command.
"Mlt spd out !=0" selection allows to start contactor sequencies with multispeed selection.
Non zero multi speed value will cause sequence start. Start command must be also asserted.

7106 Seq start sel — N/A | RWS | 0 | 0 | 1 | DP | B

0 Standard inp — Using Start fwd / rev src input
1 Alternative inp — Using Start alt src input

7115 Start fwd src — N/A | RWS | IPA 4021 | List 3_I | PIN | B

IPA 4021 DI 1 monitor = Default (refer to signals List 3_I of Pick List, see chapter 11)

7116 Start rev src — N/A | RWS | IPA 4022 | List 3_I | PIN | B

IPA 4022 DI 2 monitor = Default (refer to signals List 3_I of Pick List, see chapter 11)

7117 Start alt src — N/A | RWS | IPA 4000 | List 3_I | PIN | B

IPA 4000 NULL = Default

7072 Mlt spd s 0 src — N/A | RWS | IPA 4024 | List 3_I | PIN | B

DI 4 monitor = Default
It allows to select the origin of the signals stating the input combination of multispeed function.
(Mlt spd s 0 - 1 - 2 sources; refer to signals List 3_I of Pick List, see chapter 11)

7073 Mlt spd s 1 src — N/A | RWS | IPA 4025 | List 3_I | PIN | B

DI 5 monitor = Default
It allows to select the origin of the signals stating the input combination of multispeed function.
(Mlt spd s 0 - 1 - 2 sources; refer to signals List 3_I of Pick List, see chapter 11)

7074 Mlt spd s 2 src — N/A | RWS | IPA 4025 | List 3_I | PIN | B

DI 6 monitor = Default
It allows to select the origin of the signals stating the input combination of multispeed function.
(Mlt spd s 0 - 1 - 2 sources; refer to signals List 3_I of Pick List, see chapter 11)

Mtl spd sel 2 src	Mtl spd sel 1 src	Mtl spd sel 0 src	ACTIVE RAMP REF
0	0	0	Multi speed 0
0	0	1	Multi speed 1
0	1	0	Multi speed 2
0	1	1	Multi speed 3
1	0	0	Multi speed 4
1	0	1	Multi speed 5
1	1	0	Multi speed 6
1	1	1	Multi speed 7

7069 Mlt spd sel mon — N/A | R | 0 | 0 | 7 | DP | B

Active selection displaying (Multispeed 0, Multispeed 1, etc.)

7070 Mlt spd out mon — [rpm] | R | 0.00 | 0.00 | 0.00 | PV | B

It displays multispeed block output signal

8090 Mlt ramp sel src — N/A | RWS | IPA 7149 | List 3_I | PIN | B

IPA 7149 Short floor mon = Default
It allows to select the origin of the signals stating Multi ramp input combination (Mlt ramp s0-1 src; refer to

signals List 3_I of Pick List, see chapter 11)

Multi Ramp sel src	Active set
0	MR0
1	MR1

8078 Mlt ramp sel mon **N/A** **R** **0** **0** **3** **DP** **B**

Displaying of the selected ramp set

7147 Short floor spd1 **N/A** **RWS** **8** **0** **8** **PP** **B**

Selection of multispeed for which short floor function should be active. See Chapter 7, figure 7.5.

7148 Short floor spd2 **N/A** **RWS** **8** **0** **8** **PP** **B**

Selection of multispeed for which short floor function should be active. See Chapter 7, figure 7.5.

7143 Door open src **N/A** **RWS** **IPA 4000** **List 3_I** **PIN** **B**

IPA 4000 NULL = Default (refer to signals List 3_I of Pick List, see chapter 11)
Source to Enable the function through the digital input.

7138 Door open speed **[rpm]** **RWS** **0.00** **0.00** **Calc** **PP** **B**

Door open speed threshold.

Door open control function
This function allows anticipated door open control before the car arrival at the floor level. Door open signal can be given on digital output when speed drops below settable threshold. The function must be enabled by the digital input. Status of the speed checking command execution to open the door can be checked by providing the feedback from door open mechanism to drive digital input.
Alarm can be generated if command and feedback don't match.

7118 Brake open src **N/A** **RWS** **IPA 4001** **List 3** **PIN** **B**

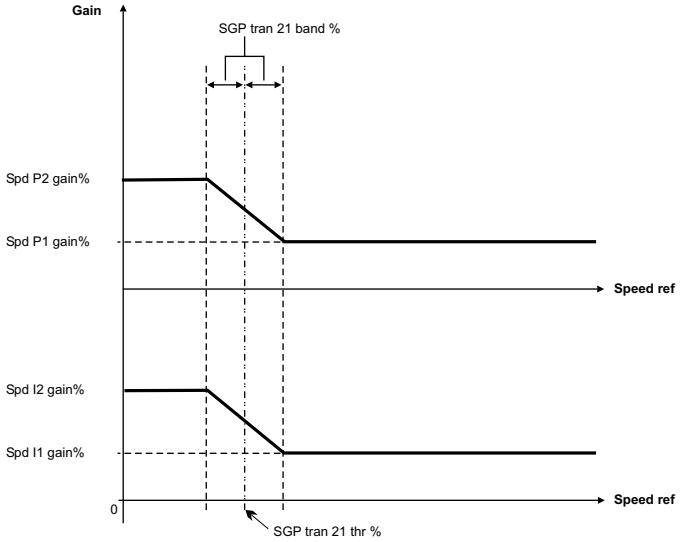
Source to enable brake release through the digital input. In standard sequence brake release is controlled by the drive and therefore this parameter is set to ONE. In case that brake release should be conditioned by some external control (e.g. PLC), set this parameter to digital input controlled by PLC.
Internal sequence for brake release will wait until this input is asserted.
During run brake will be closed whenever this input becomes not asserted.

TRAVEL / Speed reg gains

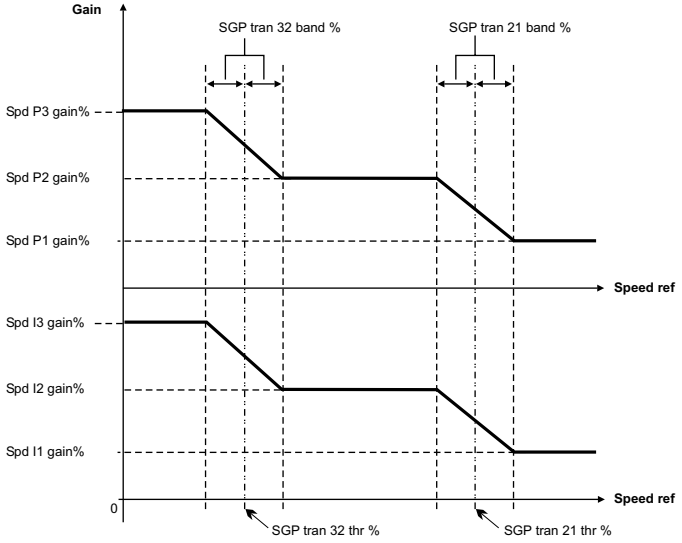
Allows to change speed regulation gain according to speed reference. Typically at low speed high gains are required to have good starting behavior. At high speed lower gains are preferred to suppress eventual vibrations due to mechanical imperfections. In case that values above 100% are required to achieve desired speed response increase gains base values in menu "REGULATION PARAM / Spd regulator / Base values", IPA 2075 and 2077.
When base values are increased percentage values are reduced such that resulting gain used by regulator preserves original value. At this point percentage values can be increased.

Note! "Bands %" and "Thr%" can be set in TRAVEL/Speed threshold menu.

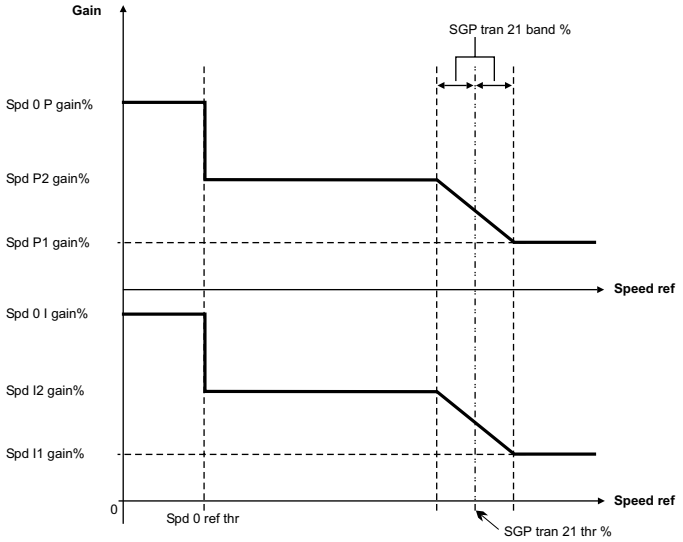
Default configuration (Spd 0 enable = Disable, only parameters 21 are set):
Gains #1 are used for middle (accel / decel) and high speed
Gains #2 are used at low speed (starting and approach speed)



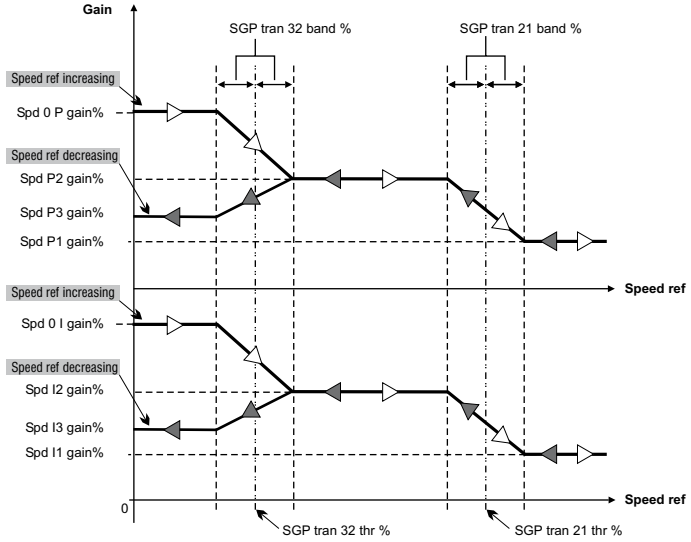
Possible configuration (Spd 0 enable = Disable, also parameters 32 are set):
Gains #1 are used for high speed (running)
Gains #2 are used for middle (accel / decel) speed
Gains #3 are used for low speed (starting / stopping)



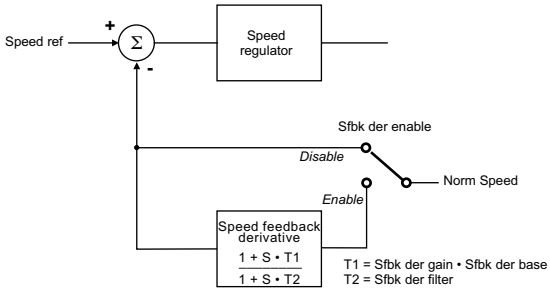
Possible configuration (Spd 0 enable =Enable as spd 0, only parameters 21 are set):
Gains #1 are used for high speed (running)
Gains #2 are used for middle (accel / decel) speed
Gains #0 are used for low speed (starting / stopping)



Possible configuration (Spd 0 enable =Enable as start, also parameters 32 are set):
Gains #1 are used for high speed (running)
Gains #2 are used for middle (accel / decel) speed
Gains #3 are used for stopping
Gains #0 are used for starting



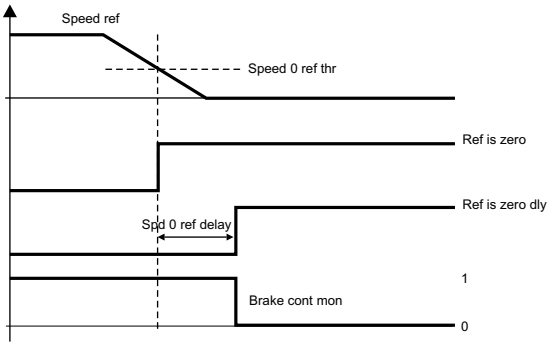
IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
3700	**SpdP1 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Proportional speed 1 regulator gain at high speed							
3701	**SpdI1 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Integral speed 1 regulator gain at high speed							
3702	**SpdP2 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Proportional speed 2 regulator gain at medium speed							
3703	**SpdI2 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Integral speed 2 regulator gain at medium speed							
3704	**SpdP3 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Proportional speed 3 regulator gain at low speed							
3705	**SpdI3 gain %**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	Integral speed 3 regulator gain at low speed							
3720	**Spd 0 enable**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	Apart from gain adaptive function, it is possible to have another set of gains when speed reference is below Speed 0 reference threshold parameter. Function must be enabled by this parameter. 0 Disable 1 Enable as spd 0 2 Enable as start							
3722	**Spd 0 P gain %**	**[%]**	**RWS**	**Calc**	**0**	**100**	**PP**	**B**
	Proportional speed 0 regulator gain at zero speed							
3723	**Spd 0 I gain %**	**[%]**	**RWS**	**Calc**	**0**	**100**	**PP**	**B**
	Integral speed 0 regulator gain at zero speed							
2530	**Sfbk der enable**	**N/A**	**RWSZ**	**0**	**0**	**1**	**DV**	**B**
	Speed feedback derivative function enable / disable. 0 Disable 1 Enable							
2540	**Sfbk der gain**	**[%]**	**RWS**	**0**	**-100**	**100**	**PV**	**B**
	Speed feedback derivative gain.							
2550	**Sfbk der base**	**[ms]**	**RWS**	**10000**	**0**	**10000**	**FK**	**B**
	Base feedback derivative gain.							



IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
2560	**Sfbk der filter**	**[ms]**	**RWS**	**5**	**0**	**1000**	**PP**	**B**
	Speed feeedback derivative filter							
2380	**Prop filter**	**[ms]**	**RWS**	**1.5**	**0.15**	**1000**	**PP**	**B**
	Filter on the proportional part of torque reference. Can be used to suppress the noise.							

TRAVEL / Speed threshold

3726	**Spd 0 ref thr**	**[rpm]**	**RWS**	**30**	**0**	**0**	**PP**	**B**
	Speed 0 reference threshold							
3727	**Spd 0 ref delay**	**[ms]**	**RWS**	**500**	**0**	**30000**	**PP**	**B**
	Speed 0 reference delay							



Note! "Ref is zero" and "Ref is zero dly" signals are available in the pick-lists of the digital outputs. "Brake cont mon" signal is available a digital relay output (83-85 terminals).

3724	**Spd 0 speed thr**	**[rpm]**	**RWS**	**30**	**0**	**0**	**PP**	**B**
	Speed 0 speed threshold.							
3725	**Spd 0 spd delay**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Speed 0 speed delay							

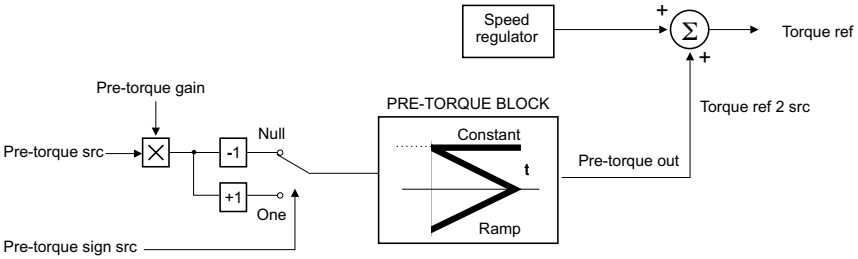
Note! "Spd is zero" and "Spd is zero dly" signals are available in the pick-lists of the digital and analog outputs.

3706	**SGP tran21 h thr**	**[%]**	**RWS**	**15**	**0**	**100**	**PP**	**B**
	See "Possible/Default configuration" figures on "TRAVEL / Speed reg gains" menu.							
3707	**SGP tran32 l thr**	**[%]**	**RWS**	**0**	**0**	**100**	**PP**	**B**
	See "Possible/Default configuration" figures on "TRAVEL / Speed reg gains" menu.							
3708	**SGP tran21 band**	**[%]**	**RWS**	**10**	**0**	**100**	**PP**	**B**
	See "Possible/Default configuration" figures on "TRAVEL / Speed reg gains" menu.							
3709	**SGP tran32 band**	**[%]**	**RWS**	**0**	**0**	**100**	**PP**	**B**
	See "Possible/Default configuration" figures on "TRAVEL / Speed reg gains" menu.							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

TRAVEL / Pre-torque

Pre torque function helps to ensure smooth starting without initial jerk. This is achieved by setting the torque prior to open the brake to a value that corresponds to the load. Pre torque value applied to the motor as well as direction of applied torque can be provided by mounting load cell on the lift car. Load cell signal is acquired through analog input and scaled appropriately, if pre-torque function is used.
If load cell is not available it is possible to work with fixed value of torque and provide only torque direction. In this case fixed value is optimized only for one load condition.



9431	**Int Pre-torque**	**[%]**	**RWS**	**0**	**0**	**100**	**PV**	**B**

Internal (fixed) motor pre-torque value

9432	**Pre-torque time**	**[sec]**	**RWS**	**1.0**	**0.01**	**5**	**PP**	**B**

Pre-torque duration in case that IPA 9439 is selected as ramp.

9438	**Pre-torque gain**	**[%]**	**RWS**	**1.0**	**0**	**4.0**	**PP**	**B**

Gain factor of the Pre-torque function to scale value from load sensor.
Pre-torque gain value is automatically calculated after mechanical and weights data have been entered.

9439	**Pre-torque type**	**N/A**	**WSZ**	**0**	**0**	**1**	**DV**	**B**

0	Ramp	Initial torque will be removed in ramp
1	Costant	Initial torque remains constant

Pre-torque type control

9434	**Pre-torque src**	**N/A**	**RWSZ**	**IPA 9431**		**List 2_I**	**PIN**	**B**

IPA 9431 Int Pre-torque = Default
It allows to select an analog input to provide motor pre-torque value
(refer to signals List 2_I of Pick List, see chapter 11)

9435	**Pre-trq sign src**	**N/A**	**RWSZ**	**IPA 4000**		**List 3_I**	**PIN**	**B**

IPA 4000 NULL = Default
It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1 (refer to signals List 3_I of Pick List, see chapter 11).

TRAVEL / Inertia comp

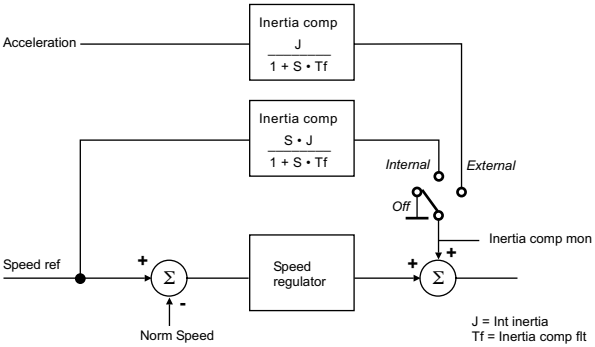
Inertia compensation function can be used to compensate the inertia caused by the load of the motor during acceleration / deceleration phase. It avoids also speed overshoot at the end of ramp.

2580	**Inertia comp en**	**N/A**	**RWS**	**1**	**0**	**1**	**DV**	**B**

0	OFF	Inertia compensation function is switched off
1	Internal	Inertia compensation function is using speed reference to calculate acceleration
2	External	Inertia compensation function is using speed acceleration provided by external control through SBI card.

It enables inertia compensation function

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
2054	**Int Inertia**	**[kgm2]**	**RWS**	**0**	**0**	**Calc**	**PV**	**B**
	Internal value of the moment of Inertia. Inertia value is automatically calculated after mechanical and weights data have been entered.							
2590	**Inertia comp flt**	**[ms]**	**RWS**	**30**	**0**	**1000**	**PP**	**B**
	Filter on the compensation							
2625	**Inertia comp mon**	**[Nm]**	**R**	**0.00**	**0.00**	**0.00**	**DV**	**B**
	It displays Inertia compensation torque contribution.							



Note! "Inertia comp mon" signals is available in the pick-lists of the analog outputs.

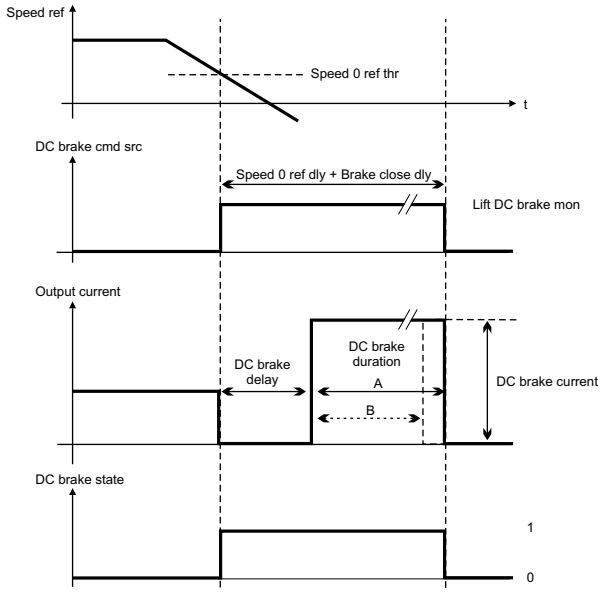
TRAVEL / DC braking

DC current injection can help to stop the motor and ensure that lift car arrives exactly at floor level.

1836	**DCbrake cmd src**	**N/A**	**RWS**	**IPA 7125**		**List 3_I**	**PIN**	**B**
	IPA 7125 Lift DC Brake mon = Default It allows to select the origin of the signal to command DC braking function, normally if is controled by lift sequence. (refer to signals List 3_I of Pick List, see chapter 11)							
1833	**DCbrake delay**	**[sec]**	**RWS**	**0.1**	**0.01**	**30**	**PP**	**B**
	Delay between the injection command and the injection of the current itself							
1834	**DCbrake duration**	**[sec]**	**RWS**	**1**	**0.01**	**30**	**PP**	**B**
	Duration of the current injection							
1835	**DCbrake current**	**[%]**	**RWS**	**100**	**0**	**100**	**PP**	**B**
	Braking current as a percentage of Drive continuos current							
1837	**DCBrake state**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	0 non-active 1 active State of DC Brake functon.							

Note! Sequence available only when IPA 7105 set as Start fwd/rev.

Lift DC brake mon signal that controls DC current braking is not available.



A = DC brake delay + DC brake duration > Spd 0 ref dly + Brake close dly
B = DC brake delay + DC brake duration < Spd 0 ref dly + Brake close dly

TRAVEL / Ramp function

8031 **Ramp out enable** **N/A** **WSZ** **1** **0** **1** **DP** **B**

0 Disabled
1 Enabled
Ramp function enabling

8021 **Ramp shape** **N/A** **RWS** **1** **0** **1** **DV** **B**

0 Linear
1 S-Shaped
Ramp selection. Linear or S-shaped ramp

TRAVEL / Ramp setpoint

The Function of this block is to generate the Set point for the ramp. Set reference by algebraically adding its inputs. All parameters in this menu have default values set for lift application.

TRAVEL / Ramp setpoint / Ramp ref src

7035 **Ramp ref 1 src** **N/A** **RWS** **IPA 7130** **List 7_I** **PIN** **B**

IPA 7130 Lift out spd mon = Default
It select the origin of the signal of Ramp ref 1 (refer to signals List 7_I of Pick List, see chapter 11)

7036 **Ramp ref 2 src** **N/A** **RWS** **IPA 7031** **List 8_I** **PIN** **B**

IPA 7031 Int ramp ref 2 = Default
It select the origin of the signal of Ramp ref 2 (refer to signals List 8_I of Pick List, see chapter 11)

7029 **Ramp ref 3 src** **N/A** **RWS** **IPA 7038** **List 45_I** **PIN** **B**

IPA 7038 Int ramp ref 3 = Default It select the origin of the signal of Ramp ref 3

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7037	**Ramp ref inv src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**

IPA 7121 DOWN Count mon = Default
It connects the selected signal to the selector of the multiplier input:if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Ramp reference signal (refer to signals List 3_I of Pick List, see chapter 11). By using DOWN cont mon / Up cont mon it is possible to invert lift movement direction that corresponds to commands Start fwd src (IPA 7115), Start rev src (IPA 7116).

TRAVEL / Ramp setpoint / Ramp ref cfg

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7030	**Int ramp ref 1**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**

Value of the Int ramp ref 1 variable

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7031	**Int ramp ref 2**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**

Value of the Int ramp ref 2 variable

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7038	**Int ramp ref 3**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**

Value of the Int ramp ref 3 variable

TRAVEL / Ramp setpoint / Ramp ref mon

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7032	**Ramp ref 1 mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**

Displaying of the Ramp ref 1 signal

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7033	**Ramp ref 2 mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**

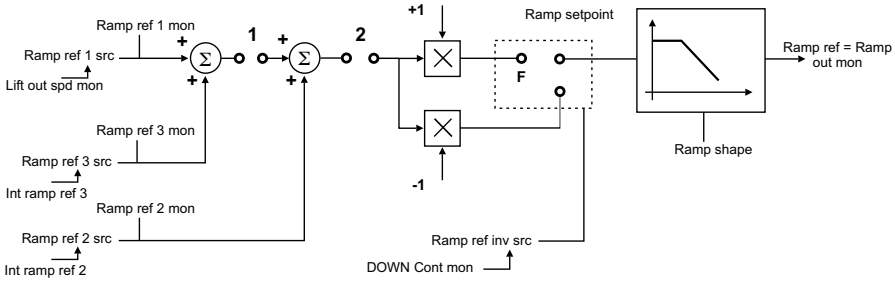
Displaying of the Ramp ref 2 signal

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7039	**Ramp ref 3 mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**

Displaying of the Ramp ref 3 signal

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7034	**Ramp setpoint**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**

Displaying of the Ramp setpoint output signal



1. Switch is closed if Ramp out enable = Enabled & Start. Switch is opened if Ramp out enable = Enabled & Stop
2. Switch is closed if Ramp out enable = Enabled & (!Fast stop). Switch is opened if Ramp out enable = Enabled & Fast stop
Both switches are closed if Ramp out enable = Disabled

TRAVEL / Speed setpoint

The function of the block is to generate the set point for the speed regulator by algebraically adding its inputs, see ramp set point. All parameters in this menu have default values set for lift application.

TRAVEL / Speed setpoint / Speed ref src

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7050	**Speed ref 1 src**	**N/A**	**RWS**	**IPA 7040**		**List 9_I**	**PIN**	**B**

IPA 7040 Int speed ref 1 = Default
It select the origin of the signal of Speed ref 1 (refer to signals List 9_I of Pick List, see chapter 11)

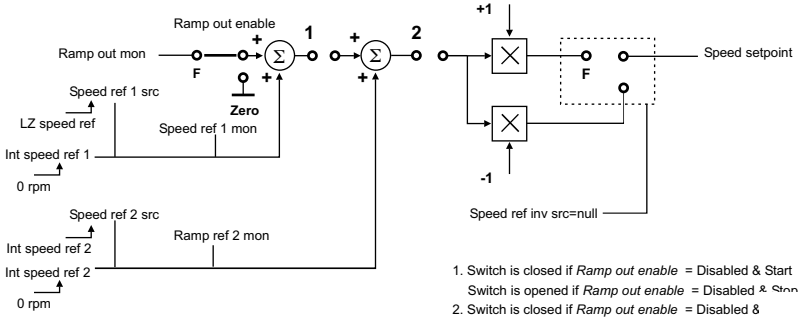
IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
7051	**Speed ref 2 src**	**N/A**	**RWS**	**IPA 7041**		**List 10_I**	**PIN**	**B**
	IPA 7041 Int speed ref 2 = Default It select the origin of the signal of Speed ref 2. (Refer to signals List 10_I of Pick List, see chapter 11).							
7053	**Speedref inv src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Speed reference signal (refer to signals List 3_I of Pick List, see chapter 11)							

TRAVEL / Speed setpoint / Speed ref cfg

7040	**Int speed ref 1**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**
	Value of the Int speed ref 1 variable							
7041	**Int speed ref 2**	**[rpm]**	**RWS**	**0**	**Calc**	**Calc**	**PV**	**B**
	Value of the Int speed ref 2 variable							

TRAVEL / Speed setpoint / Speed ref mon

8022	**Ramp out mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Displaying of Ramp output signal							
7045	**Speed ref 1 mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**
	Displaying of the Speed ref 1 signal							
7046	**Speed ref 2 mon**	**[rpm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**
	Displaying of the Speed ref 2 signal							



1. Switch is closed if *Ramp out enable* = Disabled & Start
   Switch is opened if *Ramp out enable* = Disabled & Stop
2. Switch is closed if *Ramp out enable* = Disabled &
   Switch is opened if *Ramp out enable* = Disabled & Fast stop

Both switches are closed if *Ramp out enable* = Enabled

SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

REGULATION PARAM

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

Most of the parameters in this menu are initialized by autotune procedure. The access to Regulation Param menu is allowed by Level 1 password: 12345. It must to be set in the SERVICE menu.

REGULATION PARAM / Spd regulator

REGULATION PARAM / Spd regulator / Percent values

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
3700	**SpdP1 gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**00**	**PP**	**B**
	Proportional speed 1 gain regulator at high speed							
3701	**SpdI1 gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**00**	**PP**	**B**
	Integral speed 1 gain regulator at high speed							

REGULATION PARAM / Spd regulator / Base values

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
2075	**SpdP base value**	**[A/rpm]**	**RWS**	**Calc**	**0.00**	**0.00**	**FK**	**B**
	Basic value of the speed Proportional gain							
2077	**SpdI base value**	**[A/rpm]**	**RWS**	**Calc**	**0.00**	**Calc**	**FK**	**B**
	Basic value of the speed Integral gain							

REGULATION PARAM / Spd regulator / In use values

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
2063	**InUse SpdP gain%**	**[%]**	**R**	**10**	**0**	**100**	**PV**	**B**
	In use value of the speed Proportional gain							
2065	**InUse SpdI gain%**	**[%]**	**R**	**10**	**0**	**100**	**PV**	**B**
	In use value of the speed Integral gain							

REGULATION PARAM / Curr regulator

REGULATION PARAM / Curr regulator / Percent values

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
1999	**CurrP gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**100**	**PP**	**B**
	Proportional gain of current loop							
2000	**CurrI gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**100**	**PP**	**B**
	Integral gain of current loop							

REGULATION PARAM / Curr regulator / Base values

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
2005	**CurrP base value**	**[V/A]**	**RWS**	**Calc**	**0.00**	**Calc**	**FK**	**B**
	Basic value of the proportional gain of current loop							
2007	**CurrI base value**	**[V/A/s]**	**RWS**	**Calc**	**0.00**	**Calc**	**FK**	**B**
	Basic value of the integral gain of current loop							

REGULATION PARAM / Curr regulator / Dead time comp

The function allows for compensation of the output voltage distortion due to IGBT voltage drop and its switching characteristics.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
530	**Dead time limit**	**[V]**	**RWS**	**Calc**	**0.00**	**50**	**PP**	**B**
	Value of the voltage compensation							
540	**Dead time slope**	**[V/A]**	**RWS**	**Calc**	**0.00**	**100**	**PP**	**B**
	Compensation Gradient							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

REGULATION PARAM / Vlt regulator

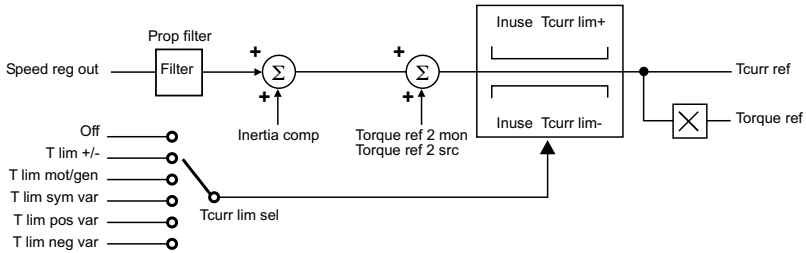
REGULATION PARAM / Vlt regulator / Percent values

2031	**VltP gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**100**	**PP**	**B**
	Proportional gain of voltage loop							
2033	**VltI gain %**	**[%]**	**RWS**	**Calc**	**0.00**	**100**	**PP**	**B**
	Integral gain of voltage loop							

REGULATION PARAM / Vlt regulator / Base values

2039	**VltP base value**	**[A/V]**	**RWS**	**Calc**	**0.00**	**0.00**	**FK**	**B**
	Basic value of the proportional gain of voltage loop							
2041	**VltI base value**	**[A/V/s]**	**RWS**	**Calc**	**0.00**	**0.00**	**FK**	**B**
	Basic value of the integral gain of voltage loop							

REGULATION PARAM / Torque config



REGULATION PARAM / Torque config / Torque setpoint / T setpoint src

2441	**Torque ref 2 src**	**N/A**	**RWS**	**IPA 9433**		**List15_I**	**PIN**	**B**
	IPA 9433 Pre-torque out = Default It allows to select the origin of the signal for torque reference (refer to signals List 15_I of Pick List, see chapter 11)							

REGULATION PARAM / Torque config / Torque setpoint / T setpoint cfg

2440	**Int torque ref 2**	**[Nm]**	**RWS**	**0.00**	**Calc**	**Calc**	**PV**	**B**
	It allows to set an alternative reference to connect to Torque ref 2 src							

REGULATION PARAM / Torque config / Torque setpoint / T setpoint mon

2442	**Torque ref 2 mon**	**[Nm]**	**R**	**0.00**	**0.00**	**0.00**	**PP**	**B**
	Torque ref 2 variable displaying							
2450	**Torque ref**	**[Nm]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**
	Overall Torque ref variable displaying							

REGULATION PARAM / Torque config / Torque curr lim / Trq curr lim src

1195	**Trq curr lim src**	**N/A**	**RWS**	**IPA 4000**		**List15_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to select the origin of the signal for torque current limit (refer to signals List 15_I of Pick List, see chapter 11)							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

REGULATION PARAM / Torque config / Torque curr lim / Trq curr lim cfg

1190 Tcurr lim sel — N/A — RWS — 0 — 0 — 4 — DV — B

0	Off	None	Limits depend on drive rating.
1	T lim +/-	Positive or negative limit	Limits depend on IPA 1210, IPA1220
2	T lim mot/gen	Motor or Generator limit	Limits depend on IPA 1210, IPA1220
3	T lim sym var	Limits are controlled by IPA 1195.	
4	T lim pos var	Limits are controlled by IPA 1195.	
5	T lim neg var	Limits are controlled by IPA 1195.	

Selection of the torque Current limit type

1210 Tcurr lim + — [A] — RWS — Calc — 0.00 — Calc — PV — B

Positive current limit or Motor (Positive power) limit.

1220 Tcurr lim - — [A] — RWS — Calc — 0.00 — Calc — PV — B

Negative current limit or Generator (Negative power) limit.

REGULATION PARAM / Torque config / Torque curr lim / Trq curr lim mon

1250 Inuse Tcurr lim+ — [A] — R — 0.00 — 0.00 — 0.00 — PV — B

Monitor of the positive current limit in use

1260 Inuse Tcurr lim- — [A] — R — 0.00 — 0.00 — 0.00 — PV — B

Monitor for the negative current limit in use

2445 Tcurr lim state — N/A — R — 0 — 0 — 1 — DV — B

Current limit state

0	Not-reached
1	Reached

REGULATION PARAM / Flux config

REGULATION PARAM / Flux config / Magnetiz config

Autophase rot / Start ?

Autophasing command to phase brushless motors. After pressing Start, give the Enable and Start command to drive. Motor must be free of any load, brake must be released.
Motor will first align and then rotate slightly at very low speed.

Autophase still / Start ?

Autophasing command to phase brushless motors. After pressing Start, give the Enable and Start command to drive. Drive will perform phasing procedure without rotation. Brake can be locked

1815 Lock flux pos — N/A — RWSZ — 0 — 0 — 1 — DP — B

0	Off	No locking of flux position
1	At magnetization	Flux position is locked during magnetization
2	At Spd = 0	Flux positon is locked when stop command has been issued and signal “Speed is zero delayed” becomes TRUE
3	At Magn & Spd = 0	Flux positon is locked during magnetization or when stop command has been issued and signal “Speed is zero delayed” becomes TRUE
4	At magn & Ref=0	Flux positon is locked during magnetization or when both signals “Speed reference is zero delayed” and “Speed is zero delayed” become TRUE

The function is useful for undesidered motor shaft rotation. It allows to lock the Flux position.

REGULATION PARAM / Flux config / Flux max limit / Flux max lim src

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

This Function allows the user to control the maximum value of the Flux current.
It is linked to the control of the voltage loop. In a condition where the Flux is = 100%, the voltage regulator prevails by controlling the motor. It means that it is only possible to further limit the requirement of the voltage loop. In case the Drive is active in the constant torque area, it is possible to set an overflux up to 115% of the rated flux. Such control is possible, obviously, only if the motor/drive combination is in a position to supply a sufficient magnetizing current.

1121	**Flux level src**	**N/A**	**RWS**	**IPA 1120**		**List 24_I**	**PIN**	**B**

IPA 1120 Int flx maxlim = Default
It allows to select the origin of the signal to control the function (refer to signals List 24_I of Pick List, see chapter 11)

REGULATION PARAM / Flux config / Flux max limit / Flux max lim cfg

1120	**Int flx maxlim**	**[%]**	**RWS**	**0.00**	**0.00**	**0.00**	**PV**	**B**

It allows to set an alternative signal to connect to Flux level src

REGULATION PARAM / Flux config / Flux max limit / Flux max lim mon

1150	**Inuse flx maxlim**	**[%]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**

Monitor of flux limit value in use

REGULATION PARAM / Flux config / Output vlt ref

The Function allows the regulation of the flux in the constant power area where a voltage margin must be available for the regulation. This value is usually equal to 2% of the maximum output voltage.
A higher value allows a faster response of the voltage regulator but with a lower amount of available voltage on the output. A lower value allows a higher output voltage with a decrease of the dynamic performances

REGULATION PARAM / Flux config / Output vlt ref / Out vlt ref src

1141	**Outvlt lim src**	**N/A**	**RWS**	**IPA 1140**		**List 42**	**PIN**	**B**

IPA 1140 Int Outvlt lim = Default
It allows to select the origin of the signal to control the function (refer to signals List 42 of Pick List, see chapter 11)

REGULATION PARAM / Flux config / Output vlt ref / Out vlt ref cfg

1140	**Int Outvlt lim**	**[V]**	**RWS**	**Calc**	**Calc**	**Calc**	**PV**	**B**

Internal output voltage limit. initialized from motor rated voltage. This parameter determines the start of flux weakening. Connected to Outvlt lim src

1130	**Dyn vlt margin**	**[%]**	**RWS**	**2**	**1**	**10**	**PV**	**B**

Voltage margin for the flux regulation

REGULATION PARAM / Flux config / Output vlt ref / Out vlt ref mon

1170	**Available Outvlt**	**[V]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**

Monitor for the maximum available output voltage. It is calculated directly starting from the DC link voltage

1180	**Inuse Outvlt ref**	**[V]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**

Limit in use on the output voltage

2044	**Magn curr lim**	**[A]**	**RWS**	**0.00**	**0.00**	**Calc**	**PP**	**B**

Limit for magnetizing current reference.
Set to value different from zero to enable operation above rated speed for brushless motors “field weakening”.

REGULATION PARAM / Test generator

The tuning of the regulators can be done using an internal test signal generator in order to evaluate the

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

regulator response. This operation requires the use of a digital oscilloscope. The “Test generator” generates signal shaped as a rectangular wave with a programmable frequency and amplitude.
Using the Test generator function it is possible to carry out the manual tunings of Current regulator, Flux regulator Voltage regulator and Speed regulator.

REGULATION PARAM / Test generator / Test gen mode

2756	**Test gen mode**	**N/A**	**RWS**	**0**	**0**	**6**	**DK**	**B**

0	Off	
1	Ramp ref 1	Ramp reference 1
2	Speed ref 1	Speed reference 1
3	Torque ref 2	Torque reference 2
4	Magn curr ref	Magnetizing current reference
5	Flux ref	Flux reference
6	Outvlt lim	Voltage reference

This parameter defines where the test signal is connected in the control scheme.

REGULATION PARAM / Test generator / Test gen cfg

2745	**Gen Hi ref**	**[cnt]**	**RWS**	**0**	**32767**	**-32767**	**PV**	**B**

Value in count of the higher amplitude signal value

2750	**Gen Low ref**	**[cnt]**	**RWS**	**0**	**32767**	**-32767**	**PV**	**B**

Value in count of the lower amplitude signal value

2755	**Gen Period**	**[sec]**	**RWS**	**10**	**0**	**10000**	**PV**	**B**

Period of the square wave

REGULATION PARAM / Test generator / Test gen mon

2760	**Gen output**	**[cnt]**	**R**	**0.00**	**0.00**	**0.00**	**PV**	**B**

Monitorig the test generator output signal.

SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:
- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.
It is recommended every time the user made any changes into STARTUP menu.
“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.
When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

I/O CONFIG

The access to I/O CONFIG menu is allowed by Level 1 password: 12345. It must all be set in the SERVICE menu.

I/O CONFIG / Commands

Configuration of Enable, Start commands. All parameters in this menu have default values set for lift application.

I/O CONFIG / Commands / Commands src

153 Term StrStp src — N/A — RWS — IPA 4001 — List 16_I — PIN — B

IPA 4001 ONE = Default
It allows to select the signal to generate the Start (1) command and of the terminal strip Stop (0) command (refer to signals List 16_I of Pick List, see chapter 11)

9210 Term Start src — N/A — RWS — IPA 4000 — List 16_I — PIN — B

IPA 4000 NULL = Default
It allows to select the signal to generate the terminal strip Start command (refer to signals List 16_I of Pick List, see chapter 11)

9211 Term Stop src — N/A — RWS — IPA 4000 — List 16_I — PIN — B

IPA 4000 NULL = Default
It allows to select the signal to generate the terminal strip Stop command (refer to signals List 16_I of Pick List, see chapter 11)

156 Dig Enable src — N/A — RWS — IPA 7128 — List 17_I — PIN — B

IPA 7128 Lift Enable mon= Default
It allows to select the signal to generate a digital Enable command (refer to signals List 17_I of Pick List, see chapter 11)

157 Dig StrStp src — N/A — RWS — IPA 7129 — List 17_I — PIN — B

IPA 7129 Lift Start mon = Default
It allows to select the signal to generate the a digital Start (1) command and a digital Stop (0) command (refer to signals List 17_I of Pick List, see chapter 11)

154 FastStop src — N/A — RWS — IPA 4000 — List 18_I — PIN — B

IPA 4000 NULL = Default
It allows to select the signal to generate the FastStop command (refer to signals List 18_I of Pick List, see chapter 11)

I/O CONFIG / Commands / Commands cfg

"Commands select" parameter determines the logic for the Start/Stop Edge sensitive signal or Level sensitive signal or I O keys keypad commands control

4002 Commands select — N/A — RWS — 2 — 0 — 4 — DV — B

0	Terminals Level	The drive is controlled via terminal strip using a Level sensitive signals
1	Terminals Edge	The drive is controlled via terminal strip using a Edge sensitive signals
2	Digital Level	The drive is controlled from a communication or application card using a Level sensitive signals
3	Digital Edge	The drive is controlled from a communication or application card using a Edge sensitive signals
4	I O keys	The drive is controlled from the keyboard using the I O keys; terminal 12 to and terminal 13 to 24Vdc are required

Setting of this parameter is not allowed while terminal enable is active.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4004	**En/Disable mode**	**N/A**	**RWS**	**0**	**0**	**3**	**DP**	**B**

0 Off
1 Stop/FS & Spd=0
2 Stop & Spd=0
3 FS & Spd=0

It controls the action time of the stop condition.
Setting of this parameter is not allowed while terminal enable is active.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4006	**Spd 0 dis dly**	**[ms]**	**RWS**	**1000**	**16**	**10000**	**PP**	**B**

Delay time between the zero speed and the disabling procedure

I/O CONFIG / Commands / Commands mon

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
150	**Enable cmd mon**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**

It displays the Enable command state

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
151	**Start cmd mon**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**

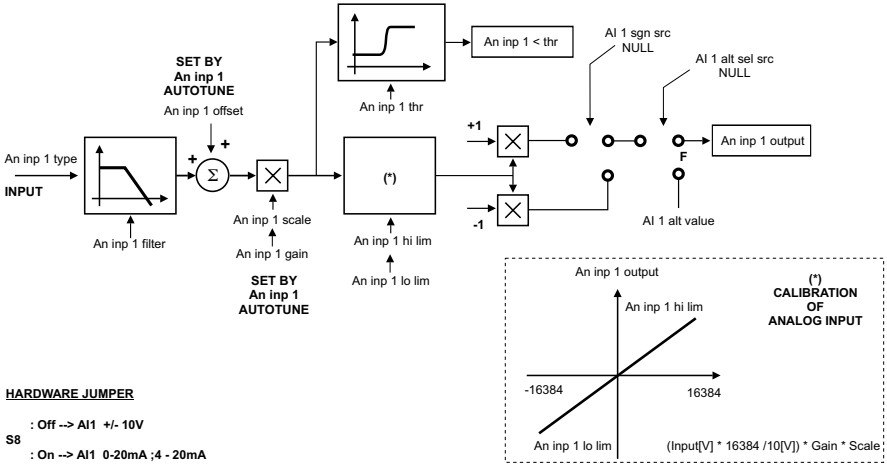
It displays the Start command state

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
152	**FastStop cmd mon**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**

It displays the FastStop command state

I/O CONFIG / Analog inputs

Drive has 3 standard and 2 expanded analog inputs. Each AI block has the following structure.
Analog inputs can also be used as non isolated digital inputs by using An inp X<thr as output and setting appropriately parameter Anp inp X thr.



Analog inputs / Std analog inps / Analog input 1 / An inp 1 src

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
5011	**AI 1 sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**

IPA 4000 NULL = Default
It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Analog Input 1 signal (refer to signals List 3_I of Pick List, see chapter 11)

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
5012	**AI 1 alt sel src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

IPA 4000 NULL = Default
It connects the selected signal to the selector of the alternative reference for An. Inp. 1 block (refer to signals List 3_I of Pick List, see chapter 11)

Analog inputs / Std analog inps / Analog input 1 / An inp 1 cfg

5000	**An inp 1 type**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**

0	-10V...+10V	Input connects a signal with a maximum voltage of +/-10V. (The change in the motor rotation direction is obtained according to the signal polarity). Input voltage > 10V or >-10V cause saturation of the count value.
1	0..20mA,0..10V	On the input it's possible to connect a max voltage of +10V or a 0…20mA current signal. The signal must always have a positive sign, through which, if used as a reference, it is possible to change the motor rotation direction via "AI 1 sgn src"
2	4..20mA	On the input it is possible to connect a 4… 20mA current signal. The signal must always have a positive sign through which, if used as a reference, it is possible to change the motor rotation direction via "AI 1 sgn src". Through the An inp X <thr output it is possible to state if the current signal is lower than the one of the set threshold. If the current is <= 4mA , the output supplies a signal (error signal). This, for example, can be combined with a digital output

Note! "An inp 1 type" selection requires a correct jumpers configuration of RV33 regulation card:

-10V...+10V & 0..10V	S8=OFF – S9=OFF – S10=OFF
0..20mA & 4..20mA	S8=ON – S9= ON – S10= ON

5002	**AI 1 alt value**	**[cnt]**	**RWS**	**0**	**32767**	**-32767**	**PV**	**B**

Alternative reference value in count for Analog input 1

5003	**An inp 1 thr**	**[cnt]**	**RWS**	**3277**	**-16384**	**16383**	**PP**	**B**

Analog Input 1 threshold value in count

5004	**An inp 1 scale**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**

Analog Input 1 scale factor

5006	**An inp 1 filter**	**[sec]**	**RWS**	**0.0064**	**0.00**	**4.096**	**PP**	**B**

Time constant of the Analog Input 1 filter

5007	**An inp 1 low lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**32767**	**PP**	**B**

Lower limit of the Analog Input 1 block output in count (see figure below)

5008	**An inp 1 hi lim**	**[cnt]**	**RWS**	**16383**	**-32768**	**32767**	**PP**	**B**

Upper limit of the Analog Input 1 block output in count (see figure below)

AI 1 offs tune / Start?

Autotune command for the Analog Input 1 offset. Input automatic fine-tuning.
To run the autotune, put the input signal to its minimum value and execute "Start ?" command

AI 1 gain tune / Start?

Autotune command for the Analog Input 1 gain. Conditions containing an offset can be compensated.
To run the autotune, put the input signal to its maximum value and execute "Start ?" command

Analog inputs / Std analog inps / Analog input 1 / An inp 1 mon

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
5009	**An inp 1 output**	**[cnt]**	**R**	**0.00**	**-32768**	**32767**	**PV**	**B**
	Analog Input 1 output count displaying							
5010	**An inp 1 < thr**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Display of threshold compensator state of Analog Input 1 (1 = the condition is true)							
5001	**An inp 1 offset**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 1 offset count value displaying							
5005	**An inp 1 gain**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 1 gain count value displaying							

Analog inputs / Std analog inps / Analog input 2 / An inp 2 src

5031	**AI 2 sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Analog Input 2 signal (refer to signals List 3_I of Pick List, see chapter 11)							
5032	**AI 2 alt sel src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the alternative reference for An. Inp. 2 block (refer to signals List 3_I of Pick List, see chapter 11)							

Analog inputs / Std analog inps / Analog input 2 / An inp 2 cfg

5020	**An inp 2 type**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**
	0 -10V ... +10V 1 0..20mA,0..10V 3 4..20mA For “An inp 2 type” description refer to “An inp 1 type” description above							
5022	**AI 2 alt value**	**[cnt]**	**RWS**	**0**	**32767**	**-32767**	**PV**	**B**
	Alternative reference value in count for Analog input 2							
5023	**An inp 2 thr**	**[cnt]**	**RWS**	**3277**	**-16384**	**16383**	**PP**	**B**
	Analog Input 2 threshold value in count							
5024	**An inp 2 scale**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 2 scale factor							
5026	**An inp 2 filter**	**[sec]**	**RWS**	**0.0064**	**0.00**	**4.096**	**PP**	**B**
	Time constant of the Analog Input 2 filter							
5027	**An inp 2 lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**32767**	**PP**	**B**
	Lower limit of the Analog Input 2 block output in count (see figure of Analog Input 1 above)							
5028	**An inp 2 hi lim**	**[cnt]**	**RWS**	**16383**	**-32768**	**32767**	**PP**	**B**
	Upper limit of the Analog Input 2 block output in count (see figure of Analog Input 1 above)							

AI 2 offs tune / Start?

Refer to “AI 1 offs tune” description above

AI 2 gain tune / Start?

Refer to “AI 1 gain tune” description above

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
Analog inputs / Std analog inps / Analog input 2 / An inp 2 mon								
5029	**An inp 2 output**	**[cnt]**	**R**	**0.00**	**-32768**	**32767**	**PV**	**B**
	Analog Input 2 output count displaying							
5030	**An inp 2 < thr**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Display of threshold compensator state of Analog Input 2 (1 = the condition is true)							
5021	**An inp 2 offset**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 2 offset count value displaying							
5025	**An inp 2 gain**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 2 gain count value displaying							
Analog inputs / Std analog inps / Analog input 3 / An inp 3 src								
5051	**AI 3 sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Analog Input 3 signal (refer to signals List 3_I of Pick List, see chapter 11)							
5052	**AI 3 alt sel src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the alternative reference for An. Inp. 3 block (refer to signals List 3_I of Pick List, see chapter 11)							
Analog inputs / Std analog inps / Analog input 3 / An inp 3 cfg								
5040	**An inp 3 type**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**
	0 -10V ... +10V 1 0..20mA,0..10V 2 4..20mA For “An inp 3 type” description refer to “An inp 1 type” description above							
5042	**AI 3 alt value**	**[cnt]**	**RWS**	**0**	**32767**	**-32767**	**PV**	**B**
	Alternative reference value in count for Analog input 3							
5043	**An inp 3 thr**	**[cnt]**	**RWS**	**3277**	**-16384**	**16383**	**PP**	**B**
	Analog Input 3 threshold value in count							
5044	**An inp 3 scale**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 3 scale factor							
5046	**An inp 3 filter**	**[sec]**	**RWS**	**0.0064**	**0.00**	**4.096**	**PP**	**B**
	Time constant of the Analog Input 3 filter							
5047	**An inp 3 lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**32767**	**PP**	**B**
	Lower limit of the Analog Input 3 block output in count (see figure of Analog Input 1 above)							
5048	**An inp 3 hi lim**	**[cnt]**	**RWS**	**16383**	**-32768**	**32767**	**PP**	**B**
	Upper limit of the Analog Input 3 block output in count (see figure of Analog Input 1 above)							
AI 3 offs tune								
	Refer to “AI 1 offs tune” description above							
AI 3 gain tune								

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Refer to “AI 1 gain tune” description above							

Analog inputs / Std analog inps / Analog input 3 / An inp 3 mon

5049	**An inp 3 output**	**[cnt]**	**R**	**0.00**	**-32768**	**32767**	**PV**	**B**
	Analog Input 3 output count displaying							
5050	**An inp 3 < thr**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Display of threshold compensator state of Analog Input 3 (1 = the condition is true)							
5041	**An inp 3 offset**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 3 offset count value displaying							
5045	**An inp 3 gain**	**-**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 3 gain count value displaying							

Analog inputs / Exp analog inps / Analog input 1X / An inp 1X src

5069	**AI 1X sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Analog Input 1X signal. (refer to signals List 3_I of Pick List, see chapter 11)							

Analog inputs / Exp analog inps / Analog input 1X / An inp 1X cfg

5060	**An inp 1X type**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**
	0 -10V ... +10V 1 0..20mA,0..10V 3 4..20mA For “An inp 1X type” description refer to “An inp 1 type” description above							
5062	**An inp 1X thr**	**[cnt]**	**RWS**	**3277**	**-16384**	**16383**	**PP**	**B**
	Analog Input 1X threshold value in count							
5063	**An inp 1X scale**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 1X scale factor							
5065	**An inp 1X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**32767**	**PP**	**B**
	Lower limit of the Analog Input 1X block output in count (see figure of Analog Input 1 above)							
5066	**An inp 1X hi lim**	**[cnt]**	**RWS**	**16383**	**-32768**	**32767**	**PP**	**B**
	Upper limit of the Analog Input 1X block output in count (see figure of Analog Input 1 above)							
AI 1X offs tune								
	Refer to “AI 1 offs tune” description above							
AI 1X gain tune								
	Refer to “AI 1 offs gain” description above							

Analog inputs / Exp analog inps / Analog input 1X / An inp 1X mon

5067	**An inp 1X output**	**[cnt]**	**R**	**0.00**	**-32768**	**32767**	**PV**	**B**
	Analog Input 1X output count displaying							
5068	**An inp 1X < thr**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Display of threshold compensator state of Analog Input 1X (1 = the condition is true)							
5061	**An inp 1X offset**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Analog Input 1X offset count value displaying							
5064	**An inp 1X gain**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 1X gain count value displaying							

Analog inputs / Exp analog inps / Analog input 2X / An inp 2X src

5089	**AI 2X sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It connects the selected signal to the selector of the multiplier input: if the signal is 0, multiply by +1, or if the signal is 1, multiply by –1. The multiplier allows to invert Analog Input 2X signal. (refer to signals List 3_I of Pick List, see chapter 11)							

Analog inputs / Exp analog inps / Analog input 2X / An inp 2X cfg

5080	**An inp 2X type**	**N/A**	**RWS**	**0**	**0**	**2**	**DP**	**B**
	0 -10V ... +10V 1 0..20mA,0..10V 2 4..20mA For “An inp 2X type” description refer to “An inp 1 type” description above							
5082	**An inp 2X thr**	**[cnt]**	**RWS**	**3277**	**-16384**	**16383**	**PP**	**B**
	Analog Input 2X threshold value in count							
5083	**An inp 2X scale**	**N/A**	**RWS**	**1**	**-16**	**16**	**PP**	**B**
	Analog Input 2X scale factor							
5085	**An inp 2X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**32767**	**PP**	**B**
	Lower limit of the Analog Input 2X block output in count (see figure of Analog Input 1 above)							
5086	**An inp 2X hi lim**	**[cnt]**	**RWS**	**16383**	**-32768**	**32767**	**PP**	**B**
	Upper limit of the Analog Input 2X block output in count (see figure of Analog Input 1 above)							
AI 2X offs tune								
	Refer to “AI 1 offs tune” description above							
AI 2X gain tune								
	Refer to “AI 1 offs gain” description above							

Analog inputs / Exp analog inps / Analog input 2X / An inp 2X mon

5087	**An inp 2X output**	**[cnt]**	**R**	**0.00**	**-32768**	**32767**	**PV**	**B**
	Analog Input 2X output count displaying							
5088	**An inp 2X < thr**	**N/A**	**R**	**0.00**	**0.00**	**0.00**	**DV**	**B**
	Display of threshold compensator state of Analog Input 2X (1 = the condition is true)							
5081	**An inp 2X offset**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 2X offset count value displaying							
5084	**An inp 2X gain**	**[cnt]**	**RWS**	**0**	**-16384**	**16383**	**PP**	**B**
	Analog Input 2X gain count value displaying							

Analog inputs / Exp analog inps / Exp ana inp en

3900	**Exp ana inp en**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	0 Disabled 2 Enabled							

It enables Expanded Analog Inputs

Analog inputs / Destinations

This read-only menu allows the user to see where the Analog inputs are connected. If more then one source is connected to an Analog Input, only one is shown. If no sources are connected the message “Not used” is displayed.

4500 An inp 1 dst

It displays the Analog Input 1 destination

4501 An inp 2 dst

It displays the Analog Input 2 destination

4502 An inp 3 dst

It displays the Analog Input 3 destination

4503 An inp 1X dst

It displays the Analog Input 1X destination

4504 An inp 2X dst

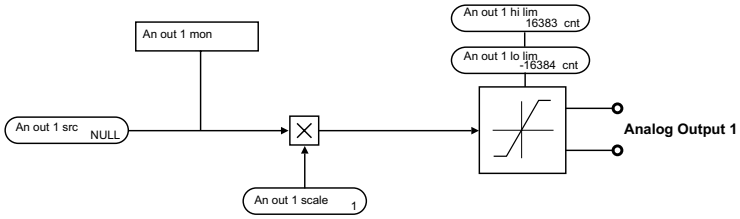
It displays the Analog Input 2X destination

I/O CONFIG / Analog outputs

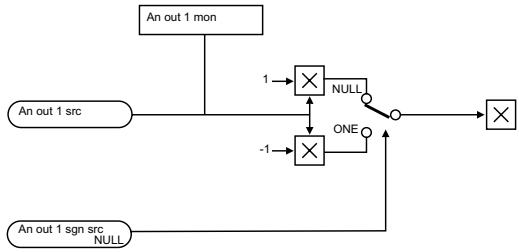
CALIBRATION TO +/-10 V OUTPUT

An out 1 mon (in counts) * An out 1 scale = An out 1 hi lim (in counts) = 10 V
An out 1 mon (in counts) * An out 1 scale = An out 1 lo lim (in counts) = -10 V

Software version 3.200



Software version 3.300



Drive has 2 standard (voltage outputs) and 4 expanded analog outputs (1x and 2x = volatge outputs, 3x and 4x=current outputs). Each Analog output block has the following structure.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
Analog outputs / Std analog outs / Analog output 1 / An out 1 src								
3570	**An out 1 src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 1(refer to signals List 2_I of Pick List, see chapter 11)							
3575	**An out 1 sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	It allows to select the sign of the signal connected on analog output.							
Analog outputs / Std analog outs / Analog output 1 / An out 1 cfg								
6012	**An out 1 scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 1							
6010	**An out 1 hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 1 count value aimed at obtaining +10V. Value must be higher than zero							
6011	**An out 1 lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 1 count value aimed at obtaining -10V. Value must be higher than zero							
Analog outputs / Std analog outs / Analog output 1 / An out 1 mon								
6013	**An out 1 mon**	**[cnt]**	**R**	**0**	**-32768**	**32767**	**PP**	**B**
	Analog output 1 count value displaying							
Analog outputs / Std analog outs / Analog output 2 / An out 2 src								
3580	**An out 2 src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 2 (refer to signals List 2_I of Pick List, see chapter 11)							
3576	**An out 2 sgn src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	It allows to select the sign of the signal connected on analog output.							
Analog outputs / Std analog outs / Analog output 2 / An out 2 cfg								
6017	**An out 2 scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 2							
6015	**An out 2 hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 2 count value aimed at obtaining +10V. Value must be higher than zero							
6016	**An out 2 lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 2 count value aimed at obtaining -10V. Value must be higher than zero							
Analog outputs / Std analog outs / Analog output 2 / An out 2 mon								
6018	**An out 2 mon**	**[cnt]**	**R**	**0.00**	**-32768**	**32676**	**PP**	**B**
	Analog output 2 count value displaying							
Analog outputs / Exp analog outs / Analog output 1X / An out 1X src								
4090	**An out 1X src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 1X (refer to signals List 2_I of Pick List, see chapter 11)							
Analog outputs / Exp analog outs / Analog output 1X / An out 1X cfg								

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
6022	**An out 1X scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 1X							
6020	**An out 1X hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 1X count value aimed at obtaining +10V. Value must be higher than zero							
6021	**An out 1X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 1X count value aimed at obtaining -10V. Value must be higher than zero							

Analog outputs / Exp analog outs / Analog output 1X / An out 1X mon

6023	**An out 1X mon**	**[cnt]**	**R**	**0.00**	**-32768**	**32676**	**PP**	**B**
	Analog output 1X count value displaying							

Analog outputs / Exp analog outs / Analog output 2X / An out 2X src

4091	**An out 2X src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 2X (refer to signals List 2_I of Pick List, see chapter 11)							

Analog outputs / Exp analog outs / Analog output 2X / An out 2X cfg

6027	**An out 2X scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 2X							
6025	**An out 2X hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 2X count value aimed at obtaining +10V. Value must be higher than zero							
6026	**An out 2X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 2X count value aimed at obtaining -10V. Value must be higher than zero							

Analog outputs / Exp analog outs / Analog output 2X / An out 2X mon

6028	**An out 2X mon**	**[cnt]**	**R**	**0.00**	**-32768**	**32676**	**PP**	**B**
	Analog output 2X count value displaying							

Analog outputs / Exp analog outs / Analog output 3X / An out 3X src

4092	**An out 3X src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 3X (refer to signals List 2_I of Pick List, see chapter 11)							

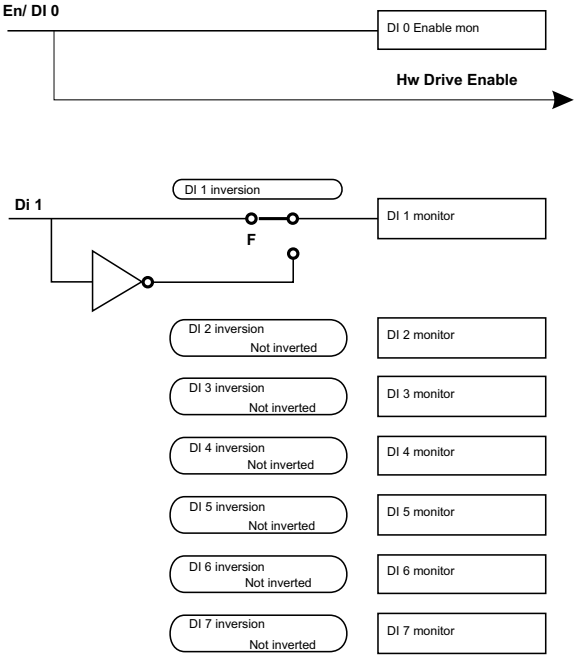
Analog outputs / Exp analog outs / Analog output 3X / An out 3X cfg

6034	**An out 3X type**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 0..20 mA 1 4..20 mA It allows to select the Analog output 3X type (EXP-D20A6 optional card is required)							
6032	**An out 3X scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 3X							
6030	**An out 3X hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 3X count value aimed at obtaining +10V. Value must be higher than zero							
6031	**An out 3X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 3X count value aimed at obtaining -10V. Value must be higher than zero							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
Analog outputs / Exp analog outs / Analog output 3X / An out 3X mon								
6033	**An out 3X mon**	**[cnt]**	**R**	**0.00**	**-32768**	**32676**	**PP**	**B**
	Analog output 3X count value displaying							
Analog outputs / Exp analog outs / Analog output 4X / An out 4X src								
4093	**An out 4X src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**		**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Analog output 4X (refer to signals List 2_I of Pick List, see chapter 11)							
Analog outputs / Exp analog outs / Analog output 4X / An out 4X cfg								
6039	**An out 4x type**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 0..20 mA 1 4..20 mA It allows to select the Analog output 4X type (EXP-D20A6 optional card is required)							
6037	**An out 4X scale**	**N/A**	**RWS**	**1**	**-10**	**10**	**PP**	**B**
	Scale or multiplicative factor of Analog output 4X							
6035	**An out 4X hi lim**	**[cnt]**	**RWS**	**16383**	**0**	**32767**	**PP**	**B**
	Analog output 4X count value aimed at obtaining +10V. Value must be higher than zero							
6036	**An out 4X lo lim**	**[cnt]**	**RWS**	**-16384**	**-32768**	**0**	**PP**	**B**
	Analog output 4X count value aimed at obtaining -10V. Value must be higher than zero							
Analog outputs / Exp analog outs / Analog output 4X / An out 4X mon								
6038	**An out 4X mon**	**[cnt]**	**R**	**0.00**	**-32768**	**32676**	**PP**	**B**
	Analog output 4X count value displaying							
Analog outputs / Exp analog outs / Exp ana out en								
3901	**Exp ana out en**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	0 Disabled 1 Enabled It enables the expanded analog outputs							

I/O CONFIG / Digital inputs

Digital Input Block function allows to invert the signal on the terminal strip.
For example, if the potential available on the terminal strip is +24V, and the inversion is disabled (not inverted) the input state is 1 (ONE), standard configuration; if the inversion is enabled (inversion) the input state is 0 (NULL). The Drive ENABLE is set on the “Digital input 0”; such condition can not be changed as it is performed via the hardware. Its function, anyway, can be combined with a command signal in the sources of the other Blocks. “DI 0 Enable mon” signal (Digital input 0 signal) is available in the “List 3”.



I/O CONFIG / Digital inputs / Std digital inps / Std dig inp cfg

4011	**DI 1 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4012	**DI 2 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4013	**DI 3 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4014	**DI 4 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4015	**DI 5 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4016	**DI 6 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4017	**DI 7 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
I/O CONFIG / Digital inputs / Std digital inps / Std dig inp mon								
4020	**DI 0 Enable mon**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Enable terminal displaying							
4021	**DI 1 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 1 terminal displaying							
4022	**DI 2 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 2 terminal displaying							
4023	**DI 3 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 3 terminal displaying							
4024	**DI 4 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 4 terminal displaying							
4025	**DI 5 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 5 terminal displaying							
4026	**DI 6 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 6 terminal displaying							
4027	**DI 7 monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 7 terminal displaying							
4028	**DI 7654321E**	**N/A**	**R**	**0**	**0**	**-**	**DP**	**B**
	Standard digital inputs displaying. Under each number the logical state of each single input is displayed.							
I/O CONFIG / Digital inputs / Exp digital inps / Exp dig inp cfg								
4030	**DI 0X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4031	**DI 1X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4032	**DI 2X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4033	**DI 3X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4034	**DI 4X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4035	**DI 5X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4036	**DI 6X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	1 Inverted							
4037	**DI 7X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4038	**DI 8X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4039	**DI 9X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4040	**DI 10X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4041	**DI 11X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
I/O CONFIG / Digital inputs / Exp digital inps / Exp dig inp mon								
4045	**DI 0X monitor** Digital Input 0X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4046	**DI 1X monitor** Digital Input 1X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4047	**DI 2X monitor** Digital Input 2X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4048	**DI 3X monitor** Digital Input 3X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4049	**DI 4X monitor** Digital Input 4X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4050	**DI 5X monitor** Digital Input 5X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4051	**DI 6X monitor** Digital Input 6X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4052	**DI 7X monitor** Digital Input 7X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4053	**DI 8X monitor** Digital Input 8X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4054	**DI 9X monitor** Digital Input 9X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
4055	**DI 10X monitor** Digital Input 10X terminal displaying	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4056	**DI 11X monitor**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Digital Input 11X terminal displaying							
4057	**DIX BA9876543210**	**N/A**	**R**	**0**	**0**	**-**	**DV**	**B**
	Expanded digital inputs displaying. Under each number the logical state of each single input is displayed.							

I/O CONFIG / Digital inputs / Exp dig inp en

3902	**Exp dig inp en**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**

0 Disabled
1 Enabled
It enables the expanded digital inputs

I/O CONFIG / Digital inputs / Destinations

This read-only menu allows the user to see where the Digital inputs are connected. If more then one source is connected to the Digital Input, only first one is shown. If no sources are connected the message “Not used” is displayed.

4505 **DI 0 Enable dst**

It displays the Digital Input 0 (Enable) destination

4506 **DI 1 dst**

It displays the Digital Input 1 destination

4507 **DI 2 dst**

It displays the Digital Input 2 destination

4508 **DI 3 dst**

It displays the Digital Input 3 destination

4509 **DI 4 dst**

It displays the Digital Input 4 destination

4510 **DI 5 dst**

It displays the Digital Input 5 destination

4511 **DI 6 dst**

It displays the Digital Input 6 destination

4512 **DI 7 dst**

It displays the Digital Input 7 destination

4513 **DI 0X dst**

It displays the Digital Input 0X destination

4514 **DI 1X dst**

It displays the Digital Input 1X destination

4515 **DI 2X dst**

It displays the Digital Input 2X destination

4516 **DI 3X dst**

It displays the Digital Input 3X destination

4517 **DI 4X dst**

It displays the Digital Input 4X destination

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

4518 DI 5X dst

It displays the Digital Input 5X destination

4519 DI 6X dst

It displays the Digital Input 6X destination

4520 DI 7X dst

It displays the Digital Input 7X destination

4521 DI 8X dst

It displays the Digital Input 8X destination

4522 DI 9X dst

It displays the Digital Input 9X destination

4523 DI 10X dst

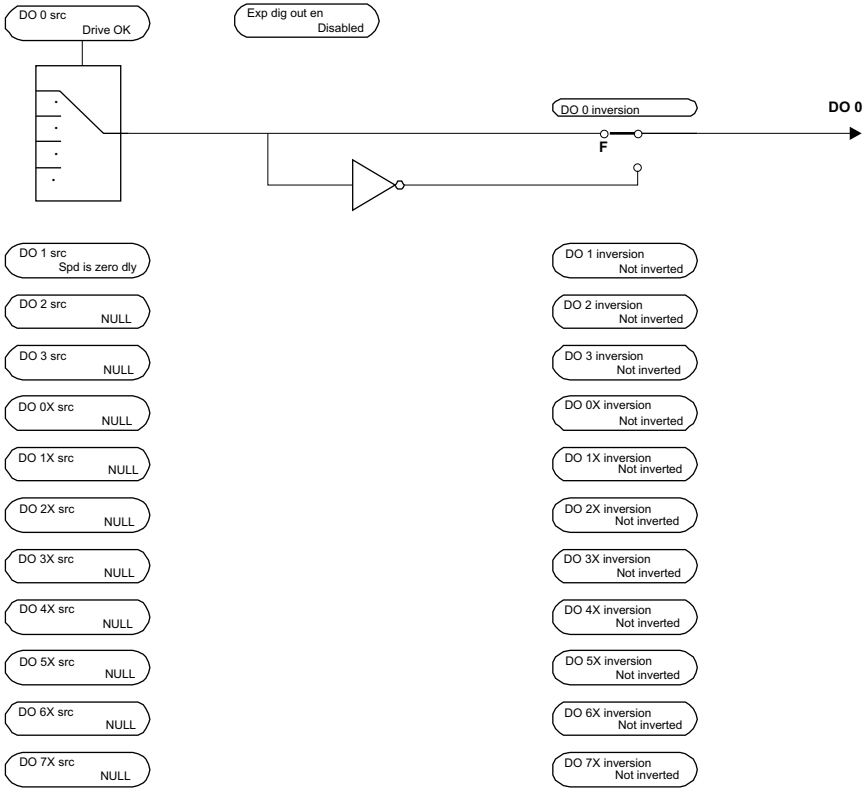
It displays the Digital Input 10X destination

4524 DI 11X dst

It displays the Digital Input 11X destination

I/O CONFIG / Digital outputs

The blocks of the digital outputs allow to turn an internal signal into a signal available on the terminal strip.



IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

I/O CONFIG / Digital outputs / Std digital outs / Std dig out src

4065 DO 0 src — N/A — RWS — IPA 9097 — List 1_I — PIN — B

IPA 9097 Drive OK = Default

It allows to connect the selected signal to the Digital output 0 and it can also defines the conditions that the relay contacts will close. For example:

Drive OK — The contact closes when the drive is powered up with no failure alarms.

Drive Ready — The contact closes when the following conditions are fulfilled:
- The drive is powered up
- There are no failure alarms present
- The drive is enabled. The enable operation is defined by parameters [En/disable mode] & [Commands sel]
- The magnetizing procedure has been completed (Drive is ready to deliver torque)

NOTE! The contact opens immediately on a drive failure, or when the drive is disabled. (refer to signals List 1_I of Pick List, see chapter 11)

4066 DO 1 src — N/A — RWS — IPA 7123 — List 1_I — PIN — B

IPA 7123 BRAKE cont mon = Default

It allows to connect the selected signal to the Digital output 2 (refer to signals List 1_I of Pick List, see chapter 11)

4067 DO 2 src — N/A — RWS — IPA 161 — List 1_I — PIN — B

IPA 161 Drive ready = Default

It allows to connect the selected signal to the Digital output 3 (refer to signals List 1_I of Pick List, see chapter 11)

4068 DO 3 src — N/A — RWS — IPA 3728 — List 1_I — PIN — B

IPA 3728 Speed is zero = Default

It allows to connect the selected signal to the Digital output 2 (refer to signals List 1_I of Pick List, see chapter 11)

I/O CONFIG / Digital outputs / Std digital outs / Std dig out cfg

4060 DO 0 inversion — N/A — RWS — 0 — 0 — 1 — DP — B

0 Not inverted
1 Inverted

4061 DO 1 inversion — N/A — RWS — 0 — 0 — 1 — DP — B

0 Not inverted
1 Inverted

4062 DO 2 inversion — N/A — RWS — 0 — 0 — 1 — DP — B

0 Not inverted
1 Inverted

4063 DO 3 inversion — N/A — RWS — 0 — 0 — 1 — DP — B

0 Not inverted
1 Inverted

I/O CONFIG / Digital outputs / Std digital outs / Std dig out mon

4064 DO 3210 — N/A — RWS — 0 — 0 — - — DP — B

The digital output logical state is displayed under each number

I/O CONFIG / Digital outputs / Exp digital outs / Exp dig out src

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
4080	**DO 0X src**	**N/A**	**RWS**	**IPA 7122**		**List 1_I**	**PIN**	**B**
	IPA 7122 RUN cont mon = Default It allows to connect the selected signal to the Digital output 0X (refer to signals List 1_I of Pick List, see chapter 11)							
4081	**DO 1X src**	**N/A**	**RWS**	**IPA 7120**		**List 1_I**	**PIN**	**B**
	IPA 7120 UP cont mon = Default It allows to connect the selected signal to the Digital output 1X (refer to signals List 1_I of Pick List, see chapter 11)							
4082	**DO 2X src**	**N/A**	**RWS**	**IPA 7121**		**List 1_I**	**PIN**	**B**
	IPA 7121 DOWN cont mon = Default It allows to connect the selected signal to the Digital output 2X (refer to signals List 1_I of Pick List, see chapter 11)							
4083	**DO 3X src**	**N/A**	**RWS**	**IPA 7139**		**List 1_I**	**PIN**	**B**
	IPA 7139 Door open mon = Default It allows to connect the selected signal to the Digital output 2X (refer to signals List 1_I of Pick List, see chapter 11)							
4084	**DO 4X src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Digital output 4X (refer to signals List 1_I of Pick List, see chapter 11)							
4085	**DO 5X src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Digital output 5X (refer to signals List 1_I of Pick List, see chapter 11)							
4086	**DO 6X src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Digital output 6X(refer to signals List 1_I of Pick List, see chapter 11)							
4087	**DO 7X src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the selected signal to the Digital output 7X (refer to signals List 1_I of Pick List, see chapter 11)							
I/O CONFIG / Digital outputs / Exp digital outs / Exp dig out cfg								
4070	**DO 0X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4071	**DO 1X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4072	**DO 2X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted							
4073	**DO 3X inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	1 Inverted							
4074	**DO 4X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4075	**DO 5X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4076	**DO 6X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
4077	**DO 7X inversion** 0 Not inverted 1 Inverted	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**

I/O CONFIG / Digital outputs / Exp digital outs / Exp dig out mon

4078	**DOX 76543210**	**N/A**	**R**	**0**	**0**	**-**	**DP**	**B**

The digital output logical state (of expansion board) is displayed under each number.

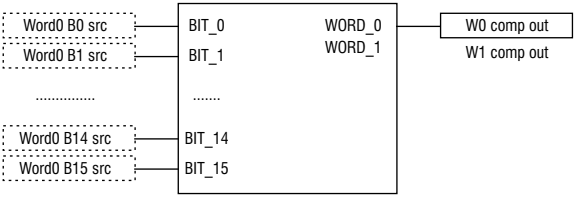
I/O CONFIG / Digital outputs / Exp dig out en

3903	**Exp dig out en**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**

0 Disabled
1 Enabled
It enables the expanded digital outputs

I/O CONFIG / Bits->Word

The Word Composing Block, “Bits->Word”, is useful to communicate, for example, between Drive and APC card: it is possible to compose a word made of Drive ready, Drive ok, Ref is zero, Speed is zero, by communicating on a single word.
The Bits->Wordn Block has 16 inputs, where each of them can be connected to a signal; the output of the Word compn Block contains the packed input bits.
Two “Bits->Word” blocks are available.



I/O CONFIG / Bits->Word / Bits->Word0 src

2100	**Word0 B0 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**

IPA 4000 NULL = Default
It allows to connect the Bit 0 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)

2101	**Word0 B1 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**

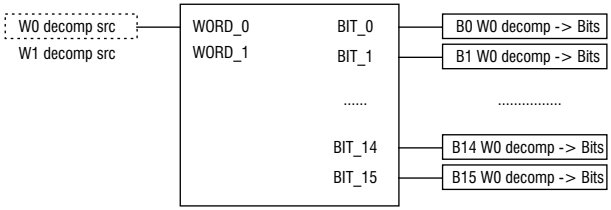
IPA 4000 NULL = Default

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	It allows to connect the Bit 1 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2102	**Word0 B2 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 2 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2103	**Word0 B3 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 3 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2104	**Word0 B4 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 4 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2105	**Word0 B5 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 5 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2106	**Word0 B6 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 6 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2107	**Word0 B7 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 7 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2108	**Word0 B8 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 8 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2109	**Word0 B9 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 9 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2110	**Word0 B10 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 10 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2111	**Word0 B11 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 11 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2112	**Word0 B12 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	It allows to connect the Bit 12 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2113	**Word0 B13 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 13 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2114	**Word0 B14 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 14 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
2115	**Word0 B15 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 15 signal selected to the Word 0 (refer to signals List 1_I of Pick List, see chapter 11)							
I/O CONFIG / Bits->Word / Bits->Word0 mon								
2116	**W0 comp out**	**N/A**	**R**	**0**	**0**	**-**	**DV**	**B**
	Monitor for the hexadecimal output value of “Word 0”							
I/O CONFIG / Bits->Word / Bits->Word1 src								
9340	**Word1 B0 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 0 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9341	**Word1 B1 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 1 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9342	**Word1 B2 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 2 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9343	**Word1 B3 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 3 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9344	**Word1 B4 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 4 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9345	**Word1 B5 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 5 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9346	**Word1 B6 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	It allows to connect the Bit 5 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9347	**Word1 B7 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 7 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9348	**Word1 B8 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 8 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9349	**Word1 B9 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 9 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9350	**Word1 B10 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 10 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9351	**Word1 B11 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 11 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9352	**Word1 B12 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 12 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9353	**Word1 B13 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 13 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9354	**Word1 B14 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 14 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
9355	**Word1 B15 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the Bit 15 signal selected to the Word 1 (refer to signals List 1_I of Pick List, see chapter 11)							
I/O CONFIG / Bits->Word / Bits->Word1 mon								
9356	**W1 comp out**	**N/A**	**R**	**0**	**0**	**-**	**DV**	**B**
	Monitor for the hexadecimal output value of "Word 1"							
I/O CONFIG / Word->Bits								
	The Word Decomposing Block, "Word->Bits", allows to set some signals on a digital word; each signal composing the word, on the Block input, can be combined with an output channel.							

It is useful to communicate, for example, between APC card and Drive.
The “Wordn->Bits” block has an input word and 16 Bx Wn decomp output bits.
Two “Word->Bits” blocks are available.



I/O CONFIG / Word->Bits / Word0->Bits src

2120 W0 decomp src | **N/A** | **RWS** | **IPA 2121** | **List 26_I** | **PIN** | **B**

IPA 2121 W0 decomp inp = Default
It allows to connect the word that will be input to decomposing block (refer to signals List 26_I of Pick List, see chapter 11)

I/O CONFIG / Word->Bits / Word0->Bits cfg

2121 W0 decomp inp | **N/A** | **RWS** | **0X0000** | **-** | **-** | **DV** | **B**

It allows to set the “W0 decomp inp” value

I/O CONFIG / Word->Bits / Word0->Bits mon

2122 W0 decomp mon | **N/A** | **R** | **0** | **0** | **-** | **DP** | **B**

Monitor of the hexadecimal input value of the Word 0 decomposed

2123 B0 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 0 of Word 0 decomposed displaying

2124 B1 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 1 of Word 0 decomposed displaying

2125 B2 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 2 of Word 0 decomposed displaying

2126 B3 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 3 of Word 0 decomposed displaying

2127 B4 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 4 of Word 0 decomposed displaying

2128 B5 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 5 of Word 0 decomposed displaying

2129 B6 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 6 of Word 0 decomposed displaying

2130 B7 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 7 of Word 0 decomposed displaying

2131 B8 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

Bit 8 of Word 0 decomposed displaying

2132 B9 W0 decomp | **N/A** | **R** | **0** | **0** | **1** | **DV** | **B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Bit 9 of Word 0 decomposed displaying							
2133	**B10 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 10 of Word 0 decomposed displaying							
2134	**B11 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 11 of Word 0 decomposed displaying							
2135	**B12 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 12 of Word 0 decomposed displaying							
2136	**B13 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 13 of Word 0 decomposed displaying							
2137	**B14 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 14 of Word 0 decomposed displaying							
2138	**B15 W0 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 15 of Word 0 decomposed displaying							
I/O CONFIG / Word->Bits / Word1->Bits src								
9361	**W1 decomp src**	**N/A**	**RWS**	**IPA 9360**		**List 27_I**	**PIN**	**B**
	IPA 9360 W1 decomp inp = Default It allows to connect the word that will be input to decomposing block (refer to signals List 27_I of Pick List, see chapter 11)							
I/O CONFIG / Word->Bits / Word1->Bits cfg								
9360	**W1 decomp inp**	**N/A**	**RWS**	**0X0000**	**-**	**-**	**DV**	**B**
	It allows to set the “W1 decomp inp” value							
I/O CONFIG / Word->Bits / Word1->Bits mon								
9362	**W1 decomp mon**	**N/A**	**R**	**0**	**0**	**-**	**DP**	**B**
	Monitor of the hexadecimal input value of the Word 1 decomposed							
9363	**B0 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 0 of Word 1 decomposed displaying							
9364	**B1 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 1 of Word 1 decomposed displaying							
9365	**B2 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 2 of Word 1 decomposed displaying							
9366	**B3 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 3 of Word 1 decomposed displaying							
9367	**B4 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 4 of Word 1 decomposed displaying							
9368	**B5 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 5 of Word 1 decomposed displaying							
9369	**B6 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 6 of Word 1 decomposed displaying							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9370	**B7 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 7 of Word 1 decomposed displaying							
9371	**B8 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 8 of Word 1 decomposed displaying							
9372	**B9 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 9 of Word 1 decomposed displaying							
9373	**B10 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 10 of Word 1 decomposed displaying							
9374	**B11 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 11 of Word 1 decomposed displaying							
9375	**B12 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 12 of Word 1 decomposed displaying							
9376	**B13 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 13 of Word 1 decomposed displaying							
9377	**B14 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 14 of Word 1 decomposed displaying							
9378	**B15 W1 decomp**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	Bit 15 of Word 1 decomposed displaying							

SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

ALARM CONFIG

The access to ALARM CONFIG menu is allowed by Level 1 password: 12345. It must to be set in the SERVICE menu.

In the ALARM CONFIG menu it is possible to configure Drive alarms behavior through the following functions:

- Activity — It allows to set the action to be performed after the alarm intervention as:
  - 0 Only msg alarmq — Actions: Message
  - 1 Ignore — Actions: none
  - 2 Warning — Actions: Message – Status
  - 3 Disable drive — Actions: Message – Commands for SM – Status
  - 4 Stop — Actions: Message – Commands for SM – Status
  - 5 Fast stop — Actions: Message – Commands for SM – Status
  - 6 Curr limstop — Actions: Message – Commands for SM – Status

  Actions meaning:
  - Message — It means that the message has been sent to the "Alarm List"and to the "Alarm log list".
  - Commands for SM — - State Machine commands : A change in the drive state has been forced (alarm intervention).
    - Status: The active alarm signal is immediately set; it is reset when the alarm is not more present and the state machine is not in an alarm condition.
- Restart — It allows to enable the automatic start after the alarm cause has been removed.
  - 0 — Off
  - 1 — On
- Restart Time — It allows to set a period of time, within which the alarm state has to be removed, in order to perform an automatic start.
- Hold Off Time — It allows to set a period of time, in which a specific alarm condition has to remain active (it has to persist) in order to be considered an alarm situation.
  It is possible to set a millisecond period of time, in which the Drive does not recognize the alarm state. Therefore, the alarm is recognized only if it persists for a period longer than the set "Hold off time"

ALARM CONFIG / Fault reset

9076	**Fault reset src**	**N/A**	**RWS**	**IPA 4027**		**List 3_I**	**PIN**	**B**

IPA 4027 DI 7 monitor = Default

By using the "Fault reset src" source, it is possible to select the origin of the "reset" command signal, for example a command via the terminal strip through a digital Input (refer to signals List 3_I of Pick List, see chapter 11)

ALARM CONFIG / Undervoltage

It trips when the voltage on the drive DC link is lower than the minimum threshold according to the Mains voltage setting

9050	**UV restart**	**N/A**	**RWS**	**1**	**0**	**1**	**DP**	**B**

0 off
1 on
Undervoltage restart

9051	**UV restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**

Undervoltage restart time

396	**UV select src**	**N/A**	**RWSZ**	**IPA 4001**		**List 3_I**	**PIN**	**B**

Source to disable Undervoltage alarm through digital input.
To be used exclusivelly with Emergency Module Supply. Main power supply must be off !

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
ALARM CONFIG / Overvoltage								
	It trips when the voltage on the drive DC link is higher than the maximum threshold according to the Mains voltage setting							
9052	**OV restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on Overvoltage restart							
9053	**OV restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Overvoltage restart time							
ALARM CONFIG / IGBT desaturat								
	It trips when the IGBT instantaneous overcurrent is detected by gate desaturation sensing circuit							
9046	**DS restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on IGBT desaturation restart							
9047	**DS restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	IGBT desaturation restart time							
ALARM CONFIG / Inst overcurrent								
	It trips when the IGBT instantaneous overcurrent is detected by output current sensor							
9063	**IOC restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on Instantaneous overcurrent restart							
9064	**IOC restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Instantaneous overcurrent restart time							
ALARM CONFIG / Ground fault								
	It trips when the output phase discharge to ground							
9640	**GF activity**	**N/A**	**RWS**	**2**	**1**	**6**	**DP**	**B**
	1 Ignore 2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp Ground fault activity							
9641	**GF threshold**	**[A]**	**RWS**	**D.Size**	**Calc**	**D.Size**	**PP**	**B**
	Ground fault threshold							
ALARM CONFIG / External fault								
	It trips when the External fault input is active							
9075	**EF src**	**N/A**	**RWS**	**IPA 4023**		**List 3_I**	**PIN**	**B**
	IPA 4000 NULL = Default It allows to connect the External fault input terminal strip (refer to signals List 3_I of Pick List, see chapter 11)							
9060	**EF activity**	**N/A**	**RWS**	**3**	**2**	**6**	**DP**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	1 Ignore 2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp External fault activity							
9061	**EF restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on External fault restart							
9062	**EF restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	External fault restart time							
9600	**EF hold off**	**[ms]**	**RWS**	**0**	**0**	**30000**	**PP**	**B**
	External fault hold off							
ALARM CONFIG / Motor OT								
	Motor Over-Temperature indicated via thermal contact or PTC thermistor on 78-79 drive regulation board terminals							
9065	**MOT activity**	**N/A**	**RWS**	**2**	**2**	**6**	**DP**	**B**
	2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp Motor Over-Temperature activity							
9066	**MOT restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on Motor Over-Temperature restart							
9067	**MOT restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Motor Over-Temperature restart time							
9603	**MOT hold off**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Motor Over-Temperature hold off							
ALARM CONFIG / Heatsink S OT								
	Heatsink Sensor Over-Temperature (detected by a sensor)							
9054	**HTS activity**	**N/A**	**RWS**	**3**	**2**	**6**	**DP**	**B**
	2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp Heatsink Sensor Over-Temperature activity							
9055	**HTS restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Heatsink Sensor Over-Temperature restart							
9056	**HTS restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Heatsink Sensor Over-Temperature restart time							
9604	**HTS hold off**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Heatsink Sensor Over-Temperature hold off							

ALARM CONFIG / Regulation S OT

Regulation card Sensor Over-Temperature

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9057	**RGS activity**	**N/A**	**RWS**	**3**	**2**	**6**	**DP**	**B**
	2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp							
	Regulation card Sensor Over-Temperature activity							
9058	**RGS restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on							
	Regulation card Sensor Over-Temperature restart							
9059	**RGS restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Regulation card Sensor Over-Temperature restart time							
9605	**RGS hold off**	**[ms]**	**RWS**	**10000**	**0**	**30000**	**PP**	**B**
	Regulation card Sensor Over-Temperature hold off							

ALARM CONFIG / Intake air S OT

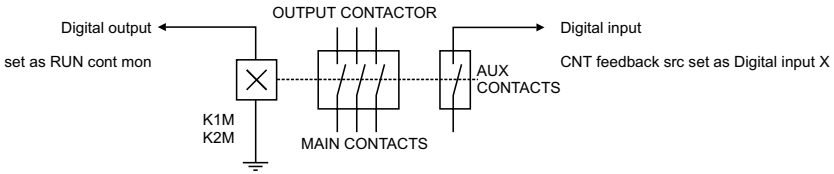
Intake air Sensor Over-Temperature

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9087	**IAS activity**	**N/A**	**RWS**	**3**	**2**	**6**	**DP**	**B**
	2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp							
	Intake air Sensor Over-Temperature activity							
9088	**IAS restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on							
	Intake air Sensor Over-Temperature restart							
9089	**IAS restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Intake air Sensor Over-Temperature restart time							
9606	**IAS hold off**	**[ms]**	**RWS**	**10000**	**0**	**30000**	**PP**	**B**
	Intake air Sensor Over-Temperature hold off							

ALARM CONFIG / Contact feedback

It trips when the contact feedback signal is not detected .
Can be used to monitor the status of output contactor and give alarm if command and feedback don't match.

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode



7141	**CNT feedback src**	**N/A**	**RWS**	**IPA 7122**		**List 3_I**	**PIN**	**B**

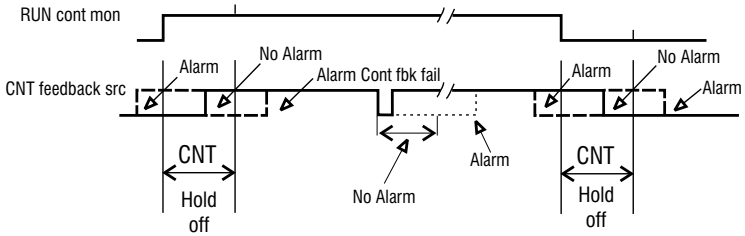
IPA 7122 RUN cont mon = Default
It allows to select the origin of Contact feedback signal (refer to signals List 3_I of Pick List, see chapter 11)

9068	**CNT activity**	**N/A**	**RWS**	**3**	**1**	**6**	**DP**	**B**

1 Ignore
2 Warning
3 Disable drive
4 Stop
5 Fast stop
6 Curr limstp
Contact feedback alarm activity

7135	**CNT hold off**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**

Contact feedback hold off



ALARM CONFIG / Brake feedback

It trips when the brake feedback signal is not detected

7142	**BRK feedback src**	**N/A**	**RWS**	**IPA 7123**		**List 3_I**	**PIN**	**B**

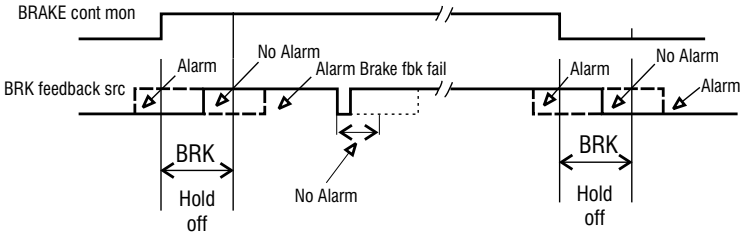
IPA 7123 BRAKE cont mon = Default
It allows to select the origin of Brake feedback signal (refer to signals List 3_I of Pick List, see chapter 11)

9086	**BRK activity**	**N/A**	**RWS**	**3**	**1**	**6**	**DP**	**B**

1 Ignore
2 Warning
3 Disable drive
4 Stop
5 Fast stop
6 Curr limstp
Brake feedback alarm activity

7136	**BRK hold off**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**

Brake feedback hold off



Note! During brake active state eventual alarms are latched and are reported only in brake idle state, see IPA 7145.

7145 BRK RUN hold off | N/A | RNS | 1 | 0 | 1 | DP | B

Brake feedback holdoff configuration.

0	Off	brake feedback trip is reported immediately
1	On	eventual brake feedback trip is reported at the end of run. This allows the car to arrive at floor in case of faulty brake status switch.

ALARM CONFIG / Brake feedback / Door feedback

7144 Door fbk src | N/A | RWS | IPA 7139 | List 3_I | PIN | B

IPA 7139 Door open mon = Default. (Refer to signals List 3_I of Pick List, see chapter 11)
Source to provide Feedback to check status of the command provided through the input.

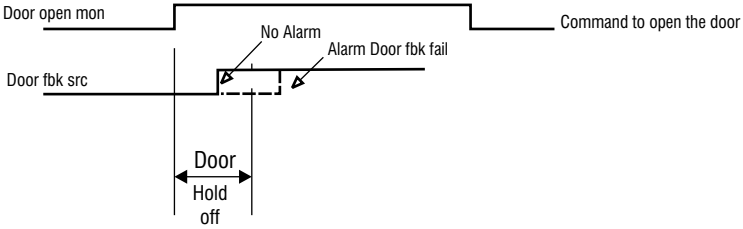
9099 Door activity | N/A | RWS | 3 | 1 | 6 | DP | B

1 Ignore
2 Warning
3 Disable drive
4 Stop
5 Fast stop
6 Curr limstp

Door feedback alarm activity. (from software rel. 3.300)

7137 Door hold off | [ms] | RWS | 200 | 0.00 | 65535 | PP | B

Alarm hold off time: during this time mismatch in command and feedback is ignored.



ALARM CONFIG / Comm card fault

It trips when LAN communication is interrupted (LAN communication between drive and Field Bus optional card)

9074 CCF activity | N/A | RWS | 3 | 2 | 6 | DP | B

2 Warning
3 Disable drive
4 Stop

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	5 Fast stop 6 Curr limstp Comm card fault activity							
4200	**CCF restart**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 off 1 on Comm card fault restart							
4201	**CCF restart time**	**[ms]**	**RWS**	**1000**	**0**	**30000**	**PP**	**B**
	Comm card fault restart time							

ALARM CONFIG / Appl card fault

Note! This parameter are not applicable in this product (AVRy).

ALARM CONFIG / Drive overload

It trips when Drive overload accumulator exceeded trip threshold

9040	**DOL activity**	**N/A**	**RWS**	**1**	**1**	**6**	**DP**	**B**
	1 Ignore 2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp Drive overload activity							

ALARM CONFIG / Motor overload

It trips when Motor overload accumulator exceeded trip threshold

9041	**MOL activity**	**N/A**	**RWS**	**2**	**1**	**6**	**DP**	**B**
	1 Ignore 2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp							

ALARM CONFIG / BU overload

Note! This parameter are not applicable in this product (AVRy).

ALARM CONFIG / Overspeed

It trips when the speed of the motor exceeded speed limit threshold

9220	**OS activity**	**N/A**	**RWS**	**3**	**1**	**6**	**DP**	**B**
	2 Warning 3 Disable drive 4 Stop 5 Fast stop 6 Curr limstp Overspeed activity							
9221	**OS threshold**	**[rmp]**	**RWS**	**Calc**	**0.00**	**8192**	**PP**	**B**
	Overspeed threshold							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9608	**OS hold off**	**[ms]**	**RWS**	**0**	**0**	**30000**	**PP**	**B**
	Overspeed hold off							

ALARM CONFIG / Spd fbk loss

It trips when the speed feedback is not detected or encoder supply failed

9042	**SFL activity**	**N/A**	**RWS**	**3**	**1**	**6**	**DP**	**B**

1 Ignore
2 Warning
3 Disable drive
4 Stop
5 Fast stop
6 Curr limstp

Spd fbk loss activity

ALARM CONFIG / UV repetitive

It trips when more than a programmable number, with “UVR attempts” parameter, of Undervoltage faults are detected in 4 minutes (time programmable with “UVR delay” parameter)

9043	**UVR attempts**	**N/A**	**RWS**	**5**	**1**	**1000**	**PP**	**B**
	It determines the number of Undervoltage faults accepted							
9044	**UVR delay**	**[sec]**	**RWS**	**240**	**1**	**262.14**	**PP**	**B**
	It determines the time window of “UVR attempts” parameter							

ALARM CONFIG / Hw fault

It trips when the communication between drive regulation card and one of its option cards in not detected

4202	**Hw fault mon**	**N/A**	**R**	**0**	**0**	**0**	**DP**	**B**

0 communication OK
1 communication failed

ALARM CONFIG / Alarm status

The alarm state can be reported via three Words. Each bit determines an alarm state. It is therefore possible to determine the state of 48 alarms. Each single bit can be controlled if the corresponding bit of a specific mask is set with 1, otherwise their setting is always 0.
When an alarm becomes active, the word corresponding bit is set with 1. Its setting remains equal to 1 till the alarm becomes inactive and the “State Machine or Sequencer” is not in an alarm condition (see the previous paragraphs).
If the state of a single alarm has to be controlled via an output, then only the mask needed bit has to be set with 1.
If the state of several alarms has to be controlled via an output, then the mask corresponding bits have to be set with 1.
The alarms have to be controlled by the Word itself.

Ex: the state of the External fault alarm has to be read.

Mask W1 S1 = 0x0100 => 0000 0001 0000 0000
Mask W2 S1 = 0x0000 => 0000 0000 0000 0000
Mask W3 S1 = 0x0000 => 0000 0000 0000 0000
DO 0 src = Select ipa Alm W1 S1.

The state of the Undervoltage and Overvoltage alarm has to be read.

Mask W1 S1 = 0x0100 => 0000 0000 0000 0110
Mask W2 S1 = 0x0000 => 0000 0000 0000 0000
Mask W3 S1 = 0x0000 => 0000 0000 0000 0000

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
			DO 0 src = Select ipa Alm W1 S1.					
	The state of the External fault and F_R_C alarm has to be read.							
			Mask W1 S1 = 0x0100 => 0000 0001 0000 0000					
			Mask W2 S1 = 0x0000 => 0000 0000 1000 0000					
			DO 0 src = Select ipa Alm W1 S1					
			DO 1 src = Select ipa Alm W2 S1					
Alarm status / Alm status cfg								
9610	**Mask W1 S1**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
9611	**Mask W2 S1**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
9612	**Mask W3 S1**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
9614	**Mask W1 S2**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
9615	**Mask W2 S2**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
9616	**Mask W3 S2**	**N/A**	**RWS**	**0XFFF**	**0**	**-1**	**DP**	**B**
Alarm status / Alm status mon								
9630	**Alm W1 S1**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**
9631	**Alm W2 S1**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**
9632	**Alm W3 S1**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**
9634	**Alm W1 S2**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**
9635	**Alm W2 S2**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**
9636	**Alm W3 S2**	**N/A**	**R**	**0**	**0**	**Calc**	**DP**	**B**

ALARM NAME	BIT position in the alarm Word	Code in the alarm LIST	Drive activity after Alarm	HOLD OFF	Restart	Restart time	Acknowledgment request	Msg ad alarm	DigOut
Failure supply	1	21	Dis. drive	No	No	No	Yes	Yes	Yes
Undervoltage	2	22	Dis. drive	No	Yes. logic on n° times	Yes	Yes	Yes	Yes
Overvoltage	3	23	Dis. drive	No	Yes	Yes	Yes	Yes	Yes
IGBT desaturat	4	24	Dis. drive	No	Yes. logic on 2 alarms in 30 second	Yes	Yes	Yes	Yes
Inst overcurrent	5	25	Dis. drive	No	Yes. logic on 2 alarms in 30 second	Yes	Yes	Yes	Yes
Ground fault	6	26	Prog.	No	No	No	Yes	Yes	Yes
Curr fbk loss	7	27	Dis. drive	No	No	No	Yes	Yes	Yes
External fault	8	28	Prog.	Yes. Prog.	Yes	Yes. Prog.	Yes	Yes	Yes
Spd fbk loss	9	29	Prog.	No	No	No	Yes	Yes	Yes
Module OT	10	30	Dis. drive	Yes Fixed 10 msec	No	No	Yes	Yes	Yes
Heatsink OT	11	31	Dis. drive	Yes Fixed 1000 msec			Yes	Yes	Yes
Motor OT	12	32	Prog.	Yes. Prog.	Yes	Yes. Prog.	Yes	Yes	Yes
Heatsink S OT	13	33	Prog.	Yes. Prog.	Yes	Yes. Prog.	Yes	Yes	Yes
Regulation S OT	14	34	Prog.	Yes. Prog.	Yes	Yes. Prog.	Yes	Yes	Yes
Intake air S OT	15	35	Prog.	Yes. Prog.	Yes	Yes. Prog.	Yes	Yes	Yes
Cont fbk fail	16	36	Prog.	No	Yes	No	Yes	Yes	Yes
Comm card fault	17	37	Prog.	No	Yes	Yes. Prog.	Yes	Yes	Yes
Appl card fault	18	38	Dis. drive	No	No	No	Yes	Yes	Yes
Drive overload	19	39	Prog.	No	No	No	Yes	Yes	Yes
Motor overload	20	40	Prog.	No	No	No	Yes	Yes	Yes
BU overload	21	41	Prog.	No	No	No	Yes	Yes	Yes
Data lost	22	42	Dis. drive	No	No	No	Yes	Yes	Yes
Brake fbk fail	23	43	Prog.	No	No	No	Yes	Yes	Yes
Max time	24	44	Dis. drive	No	No	No	Yes	Yes	Yes
Sequencer	25	45	Dis. drive	No	No	No	Yes	Yes	No
Door fbk fail	26	46	Prog.	Yes	No	No	Yes	Yes	Yes
Overspeed	27	47	Prog.	Yes. Prog.	No	No	Yes	Yes	Yes
UV repetitive	28	48	Dis. drive	No	No	No	Yes	Yes	Yes
IOC repetitive	29	49	Dis. drive	No	No	No	Yes	Yes	Yes
IGBTdesat repet	30	50	Dis. drive	No	No	No	Yes	Yes	Yes
WatchDog user	31	51	Dis. drive	No	No	No	Yes	Yes	Yes
Hw fail	32	52	Dis. drive	No	No	No	Yes	Yes	Yes

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

COMMUNICATION

The access to COMMUNICATION menu is allowed by Level 1 password: 12345. It must be set in the SERVICE menu.

RS485: The communication protocol can be chosen between Slink4, Modbus, Jbus or ISO 1745 through the "Protocol type" parameter. Each of these protocols allow a multipoint network. See the specific protocol manual for further details.
The Drive address can be defined via the "Slave address" parameter. Editing parameter 105, "Slave address", and saving the new value perform the address change. The new address becomes active after the Drive has been switched off and then back on. A temporary address change is also possible when using the Slink4 protocol with an Slink4 command.
When using the Slink4 protocol, the RS485 serial line operates in half-duplex, where the data cannot be transmitted and received simultaneously. It is sometimes possible during the transition from transmission to reception modes, the Master (PC or PLC) reaches the reception condition after the Drive has already started to send its data package. As a consequence, the package received by the master is not correct. In order to avoid such occurrences, the "Slave res time" parameter can be adjusted to delay the drive response so the Master has sample mode switching time. This situation does not occur with the Modbus and Jbus protocols as the synchronization pause between messages is specified by the protocol and is guaranteed.

SBI: The communication with the SBI Field Bus option cards (Serial Bus Interface) is performed via two channels:
· Synchronous or Process channel (PDC Process Data Channel) for a cyclical value interchange.
· Asynchronous or Configuration channel for a low priority access to all the Drive parameters.
As for the data exchange modes between the SBI card and the Network see the SBI card documentation.
The process data exchange between the Drive and the SBI has the following structure:
- the interface is made of six writing Words and six reading Words.
- the source Drive parameter has to be defined for the six Words: "Drv -> SBI word" transmitting the data from the Drive to the SBI.
- Six Words move the data from the SBI to the Drive: "SBI -> Drv word"
For more information to see the following documents for related information on SBI:

SBI-PDP 33	Interface card Profibus- DP instruction manual
SBI-DN 33	DeviceNet card instruction manual
SBI-COP	CANopen card instruction manual

COMMUNICATION / RS485

105	**Slave address**	**N/A**	**RWS**	**1**	**0**	**255**	**DK**	**B**

It define the drive slave address

106	**Slave res time**	**N/A**	**RWS**	**1**	**0**	**255**	**DK**	**B**

It define the drive slave address time

104	**Protocol type**	**N/A**	**RWS**	**0**	**0**	**2**	**DK**	**B**

0	Slink 4	
1	Modbus	
2	Jbus	
3	ISO 1745	
4	Hiperface protocol	(Used to communicate with Stegmann absolute encoders)

It defines the drive communication protocol type

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
103	**Modbus regs mode**	**N/A**	**RWS**	**0**	**0**	**3**	**DK**	**B**

Mapping of modbus register to parameter index.

0	MSW : LSW	reg=IPA
1	LSW : MSW	reg=IPA
2	MSW : LSW	reg=2*IPA
3	LSW : MSW	reg=2*IPA

MSW = most significant word
LSW = least significant word

COMMUNICATION / SBI config

8999	**SBI enable**	**N/A**	**RWS**	**0**	**0**	**1**	**DK**	**B**

0 Disabled
1 Enabled
It allows to enable SBI Field Bus option cards (SAVE PARAMETERS command and drive recycle power are required)

COMMUNICATION / SBI monitor

8998	**Last SBI error**	**N/A**	**R**	**0**	**0**	**2**	**DP**	**B**

It defines the last found error:
0 = OK (no error)
1 = Hardware fault
2 = Bus Loss

COMMUNICATION / Drv->SBI word

COMMUNICATION / Drv->SBI word / Drv->SBI W src

9010	**Drv SBI W0 src**	**N/A**	**RWS**	**IPA 9020**		**List 40_I**	**PIN**	**B**

IPA 9020 Int Drv SBI W0 = Default
It allows to select the origin of Word 0 to be transmitted from Drive to SBI card (refer to signals List 40_I of Pick List, see chapter 11)

9011	**Drv SBI W1 src**	**N/A**	**RWS**	**IPA 9021**		**List 40_I**	**PIN**	**B**

IPA 9021 Int Drv SBI W1 = Default
It allows to select the origin of Word 1 to be transmitted from Drive to SBI card (refer to signals List 40_I of Pick List, see chapter 11)

9012	**Drv SBI W2 src**	**N/A**	**RWS**	**IPA 9022**		**List 40_I**	**PIN**	**B**

IPA 9022 Int Drv SBI W2 = Default
It allows to select the origin of Word 2 to be transmitted from Drive to SBI card (refer to signals List 40_I of Pick List, see chapter 11)

9013	**Drv SBI W3 src**	**N/A**	**RWS**	**IPA 9023**		**List 40_I**	**PIN**	**B**

IPA 9023 Int Drv SBI W3 = Default
It allows to select the origin of Word 3 to be transmitted from Drive to SBI card (refer to signals List 40_I of Pick List, see chapter 11)

9014	**Drv SBI W4 src**	**N/A**	**RWS**	**IPA 9024**		**List 40_I**	**PIN**	**B**

IPA 9024 Int Drv SBI W4 = Default
It allows to select the origin of Word 4 to be transmitted from Drive to SBI card (refer to signals List 40_I of Pick List, see chapter 11)

9015	**Drv SBI W5 src**	**N/A**	**RWS**	**IPA 9025**		**List 40_I**	**PIN**	**B**

IPA 9025 Int Drv SBI W5 = Default
It allows to select the origin of Word 5 to be transmitted from Drive to SBI card (refer to signals List 40_I of

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Pick List, see chapter 11)							
COMMUNICATION / Drv->SBI word / Drv->SBI W cfg								
9020	**Int Drv SBI W0**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 0 value configuration (default connected to Drv SBI W0 src)							
9021	**Int Drv SBI W1**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 1 value configuration (default connected to Drv SBI W1 src)							
9022	**Int Drv SBI W2**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 2 value configuration (default connected to Drv SBI W2 src)							
9023	**Int Drv SBI W3**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 3 value configuration (default connected to Drv SBI W3 src)							
9024	**Int Drv SBI W4**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 4 value configuration (default connected to Drv SBI W4 src)							
9025	**Int Drv SBI W5**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Internal Word 5 value configuration (default connected to Drv SBI W5 src)							
COMMUNICATION / Drv->SBI word / Drv->SBI W mon								
9030	**Drv SBI W0 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 0 monitor of the PDC channel on the Drive output							
9031	**Drv SBI W1 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 1 monitor of the PDC channel on the Drive output							
9032	**Drv SBI W2 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 2 monitor of the PDC channel on the Drive output							
9033	**Drv SBI W3 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 3 monitor of the PDC channel on the Drive output							
9034	**Drv SBI W4 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 4 monitor of the PDC channel on the Drive output							
9035	**Drv SBI W5 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 5 monitor of the PDC channel on the Drive output							
COMMUNICATION / SBI->Drv word								
COMMUNICATION / SBI->Drv word / SBI->Drv W mon								
9000	**SBI Drv W0 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 0 monitor of the PDC channel on the Drive input							
9001	**SBI Drv W1 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 1 monitor of the PDC channel on the Drive input							
9002	**SBI Drv W2 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 2 monitor of the PDC channel on the Drive input							
9003	**SBI Drv W3 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 3 monitor of the PDC channel on the Drive input							
9004	**SBI Drv W4 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Word 4 monitor of the PDC channel on the Drive input							
9005	**SBI Drv W5 mon**	**N/A**	**R**	**0.00**	**-**	**-**	**PP**	**B**
	Word 5 monitor of the PDC channel on the Drive input							

SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

APPL CARD CONFIG

Note! This menu are not applicable in this product (AVRy).

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

CUSTOM FUNCTIONS

The access to CUSTOM FUNCTIONS menu is allowed by Level 1 password: 12345. It must to be set in the SERVICE menu.

COMPARE: The Block supplies two signal Comparators, Compare 1 and Compare 2, with the same features. Each Comparator is in a position to compare two or three input signals (INP0, INP1, INP2).

Some comparisons allow to set via Cmp x window a window, in count, stating an acceptable range among the signals.

Example:

-INP0 and INP1 have to be compared as "INP0 = INP1"

INP0 = +1000count
INP1 = +1000count
Window = 100count

In this case the equality is true for a maximum overall variation of INP1 between 1100 and 900 counts.

Possible variations:

None	none
I0 = = I1	INP0-window ≤ INP1 ≤ INP0+window
I0 != I1	INP1 lower INP0-window or INP1 higher INP0+window
I0 < I1	INP0 lower INP1
I0 > I1	INP0 higher INP1
I0 < I1 > I2	INP0<INP1<INP2 (INP1 included between..)
|I0| == |I1|	INP0| -window ≤ |INP1| ≤ |INP0| +window
|I0| != |I1|	INP1| lower |INP0| -window,or |INP1| higher |INP0| +window
|I0| < |I1|	INP0| lower |INP1|
|I0| > |I1|	INP0| higher |INP1|
|I0| < |I1| < |I2|	INP0| <|INP1| <|INP2| (|INP1|
I0 AND I1 AND I2	AND logic between I0, I1 and I2
I0 OR I1 OR I2	OR logic between I0, I1 and I2
I0 XOR I1	XOR logic between I0 and I1

CUSTOM FUNCTIONS / Compare / Compare 1

CUSTOM FUNCTIONS / Compare / Compare 1 / Compare 1 src

6049 **Cmp 1 inp 0 src** **N/A** **RWS** **IPA 6041** **List 5_I** **PIN** **B**

IPA 6041 Cmp 1 inp 0 = Default

It allows to select the origin of the input signal 0 to be compared of the Compare 1 block (refer to signals List 5_I of Pick List, see chapter 11)

6050 **Cmp 1 inp 1 src** **N/A** **RWS** **IPA 6042** **List 5_I** **PIN** **B**

IPA 6042 Cmp 1 inp 1 = Default

It allows to select the origin of the input signal 1 to be compared of the Compare 1 block (refer to signals List 5_I of Pick List, see chapter 11)

6051 **Cmp 1 inp 2 src** **N/A** **RWS** **IPA 6043** **List 5_I** **PIN** **B**

IPA 6043 Cmp 1 inp 2 = Default

It allows to select the origin of the input signal 2 to be compared of the Compare 1 block (refer to signals List 5_I of Pick List, see chapter 11)

CUSTOM FUNCTIONS / Compare / Compare 1 / Compare 1 cfg

6041 **Cmp 1 inp 0** **N/A** **RWS** **0.00** **-** **-** **PV** **B**

Value of the internal input signal 0, default connected to Cmp 1 inp 0 src

6042 **Cmp 1 inp 1** **N/A** **RWS** **0.00** **-** **-** **PV** **B**

Value of the internal input signal 1, default connected to Cmp 1 inp 1 src

6043 **Cmp 1 inp 2** **N/A** **RWS** **0.00** **-** **-** **PV** **B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Value of the internal input signal 2, default connected to Cmp 1 inp 2 src							
6044	**Cmp 1 function**	**N/A**	**RWS**	**0**	**0**	**10**	**DP**	**B**
	0 None 1 I0 == I1 2 I0 != I1 3 I0 < I1 4 I0 > I1 5 I0 < I1 < I2 6 |I0| == |I1| 7 |I0| != |I1| 8 |I0| < |I1| 9 |I0| > |I1| 10 |I0| < |I1| < |I2| 11 I0 AND I1 AND I2 12 I0 OR I1 AND I2 13 I0 XOR I1							
6045	**Cmp 1 window**	**[cnt]**	**RWS**	**0.00**	**0.00**	**-**	**PP**	**B**
	It allows to set a window stating an acceptable range among the signals of the Compare 1 block							
6046	**Cmp 1 delay**	**[sec]**	**RWS**	**0.00**	**0.00**	**30**	**PP**	**B**
	It allows to set a delay in seconds on the comparison transition in the Compare 1 block							
6047	**Cmp 1 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted It allows to invert the Compare 1 block output signal							

CUSTOM FUNCTIONS / Compare / Compare 1 / Compare 1 mon

6048	**Compare 1 output**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	It allows to monitor the state of Compare 1 block output signal 0 = FALSE 1 = TRUE							

CUSTOM FUNCTIONS / Compare / Compare 2

CUSTOM FUNCTIONS / Compare / Compare 2 / Compare 2 src

6064	**Cmp 2 inp 0 src**	**N/A**	**RWS**	**IPA 6056**		**List 6_I**	**PIN**	**B**
	IPA 6056 Cmp 2 inp 0 = Default It allows to select the origin of the input signal 0 to be compared of the Compare 2 block (refer to signals List 6_I of Pick List, see chapter 11)							
6065	**Cmp 2 inp 1 src**	**N/A**	**RWS**	**IPA 6057**		**List 6_I**	**PIN**	**B**
	IPA 6057 Cmp 2 inp 1 = Default It allows to select the origin of the input signal 1 to be compared of the Compare 2 block (refer to signals List 6_I of Pick List, see chapter 11)							
6066	**Cmp 2 inp 2 src**	**N/A**	**RWS**	**IPA 6058**		**List 6_I**	**PIN**	**B**
	IPA 6058 Cmp 2 inp 2 = Default It allows to select the origin of the input signal 2 to be compared of the Compare 2 block (refer to signals List 6_I of Pick List, see chapter 11)							

CUSTOM FUNCTIONS / Compare / Compare 2 / Compare 2 cfg

6056	**Cmp 2 inp 0**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Value of the internal input signal 0, default connected to Cmp 2 inp 0 src							
6057	**Cmp 2 inp 1**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Value of the internal input signal 1, default connected to Cmp 2 inp 1 src							
6058	**Cmp 2 inp 2**	**N/A**	**RWS**	**0.00**	**-**	**-**	**PV**	**B**
	Value of the internal input signal 2, default connected to Cmp 2 inp 2 src							
6059	**Cmp 2 function**	**N/A**	**RWS**	**0**	**0**	**10**	**DP**	**B**
	0 None 1 I0 == I1 2 I0 != I1 3 I0 < I1 4 I0 > I1 5 I0 < I1 < I2 6 |I0| == |I1| 7 |I0| != |I1| 8 |I0| < |I1| 9 |I0| > |I1| 10 |I0| < |I1| < |I2| 11 I0 AND I1 AND I2 12 I0 OR I1 AND I2 13 I0 XOR I1							
6060	**Cmp 2 window**	**[cnt]**	**RWS**	**0.00**	**0.00**	**-**	**PP**	**B**
	It allows to set a window stating an acceptable range among the signals of the Compare 2 block							
6061	**Cmp 2 delay**	**[sec]**	**RWS**	**0.00**	**0.00**	**30**	**PP**	**B**
	It allows to set a delay in seconds on the comparison transition in the Compare 2 block							
6062	**Cmp 2 inversion**	**N/A**	**RWS**	**0**	**0**	**1**	**DP**	**B**
	0 Not inverted 1 Inverted It allows to invert the Compare 2 block output signal							

CUSTOM FUNCTIONS / Compare / Compare 2 / Compare 2 mon

6063	**Compare 2 output**	**N/A**	**R**	**0**	**0**	**1**	**DV**	**B**
	It allows to monitor the state of Compare 2 block output signal 0 = FALSE 1 = TRUE							

CUSTOM FUNCTIONS / Pad parameters

The use variables, “Pads”, are used for the data exchange with the option cards

CUSTOM FUNCTIONS / Pad parameters / Pad param word

9100	**Pad 0**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 0							
9101	**Pad 1**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 1							
9102	**Pad 2**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 2							
9103	**Pad 3**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	Analog Pad 3							
9104	**Pad 4**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 4							
9105	**Pad 5**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 5							
9106	**Pad 6**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 6							
9107	**Pad 7**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 7							
9108	**Pad 8**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 8							
9109	**Pad 9**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 9							
9110	**Pad 10**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 10							
9111	**Pad 11**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 11							
9112	**Pad 12**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 12							
9113	**Pad 13**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 13							
9114	**Pad 14**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 14							
9115	**Pad 15**	**N/A**	**RWS**	**0**	**-**	**-**	**PV**	**B**
	Analog Pad 15							
CUSTOM FUNCTIONS / Pad parameters / Pad param bit								
9116	**Dig pad 0**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 1							
9117	**Dig pad 1**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 2							
9118	**Dig pad 2**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 3							
9119	**Dig pad 3**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 3							
9120	**Dig pad 4**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 4							
9121	**Dig pad 5**	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
	Digital Pad 5							

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
9122	**Dig pad 6** Digital Pad 6	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9123	**Dig pad 7** Digital Pad 7	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9124	**Dig pad 8** Digital Pad 8	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9125	**Dig pad 9** Digital Pad 9	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9126	**Dig pad 10** Digital Pad 10	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9127	**Dig pad 11** Digital Pad 11	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9128	**Dig pad 12** Digital Pad 12	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9129	**Dig pad 13** Digital Pad 13	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9130	**Dig pad 14** Digital Pad 14	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**
9131	**Dig pad 15** Digital Pad 15	**N/A**	**RWS**	**0**	**0**	**1**	**DV**	**B**

CUSTOM FUNCTIONS / Connect

This block function connects signals to programmable block area, using drive parameters that are accessible through the “Conf99” PC program or drive keypad menu.
Connect A, connects up to 7 analog input signals
Connect B, connects up to 7 digital signals inputs

CUSTOM FUNCTIONS / Connect/ Connect A

6070	**ConnectA inp 0 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6071	**ConnectA inp 1 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6072	**ConnectA inp 2 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6073	**ConnectA inp 3 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6074	**ConnectA inp 4 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6075	**ConnectA inp 5 src** IPA 4000 NULL = Default	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
6076	**ConnectA inp 6 src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode
	IPA 4000 NULL = Default							
6077	**ConnectA inp 7 src**	**N/A**	**RWS**	**IPA 4000**		**List 2_I**	**PIN**	**B**
	IPA 4000 NULL = Default							

CUSTOM FUNCTIONS / Connect/ Connect B

6078	**ConnectB inp 0 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6079	**ConnectB inp 1 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6080	**ConnectB inp 2 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6081	**ConnectB inp 3 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6082	**ConnectB inp 4 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6083	**ConnectB inp 5 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6084	**ConnectB inp 6 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							
6085	**ConnectB inp 7 src**	**N/A**	**RWS**	**IPA 4000**		**List 1_I**	**PIN**	**B**
	IPA 4000 NULL = Default							

SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format	Reg.mode

SERVICE

SERVICE menu allows the setting of the password to enable Level 1 drive menus: 12345.
To have the access of Level 1 drive menus, edit 12345 password into “Insert Password” parameter and confirm it using “Enter” button.

Note! Level 1 password must be edit every recycle drive supply

SERVICE menu allows also the setting of the password to enable Level 2 drive menu: ask Level 2 password to the technical support.
To have the access of Level 2 drive menus:

1_ edit 12345 password into “Insert Password” parameter and confirm it using “Enter” button
2_ check the password through “Check password” parameter using “Enter” button

8.3 Regen Parameter list

MONITOR

This menu displays a series of variables useful to check the Drive state.
The variable function is clearly explained by the variable name.

IPA	Description	[Unit]	Access	Default	Min	Max	Format
9406	**Input voltage** Voltage on the drive input terminals	**[V]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
3070	**Input current** Current on the drive input terminals	**[A]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
3080	**Input frequency** Mains input frequency	**[Hz]**	**R**	**50.00F**	**0.00F**	**0.00F**	**PV**
12088	**Input power** Drive input power	**kW**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
9405	**DC link voltage** Drive DC link voltage	**[V]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12005	**DC link current** Drive DC link current	**[A]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
3120	**Active current** Drive active current	**[A]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
3110	**Reactive current** Drive regenerative current	**[A]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12089	**Power factor** Drive power factor	**[--]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PP**
12072	**Phase U voltage** Mains phase U voltage	**[V]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12073	**Phase V voltage** Mains phase V voltage	**[V]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12074	**Phase W voltage** Mains phase W voltage	**[V]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12090	**Unbalance** Unbalance between phases	**[%]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
12110	**Energy [kWh]** Drive consumption monitor; this value is set at 0 each power ON		**RU**	**0.00F**	**0.00F**	**0.00F**	**PP**
1540	**Overload accum** Drive Unit I2t overload accumulator. When 100% is reached Drv overload alarm is generated and output inverter current is reduced to drive continuous current.	**[%]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
162	**Enable SM mon** It shows the drive Enable state [0] Off [1] On		**R**	**0**	**0**	**1**	**DV**
9090	**Sequencer status** Sequencer status of drive State Machine. It controls the drive running and starting, accounting for protection & alarming, command sequence, and reset status.		**R**	**0**	**0**	**0xffff**	**DP**

IPA	Description	[Unit]	Access	Default	Min	Max	Format
	State Sequencer status 1 Magnetization running 2 Magnetization completed, Stop 3 Start 4 Fast stop, Stop 5 Fast stop, Start 9 No alarm, drive is ready to accept all commands 10 Magnetization running and Start command already present 12 Alarm active 16 Alarm not active, waiting for reset						
3230	**CPU1 runtime** Time needed by the CPU1 (microprocessor)	**[%]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
3240	**CPU2 runtime** Time needed by the CPU2 (microprocessor)	**[%]**	**R**	**0.00F**	**0.00F**	**0.00F**	**PP**
MONITOR \ I/O status							
4024	**Dig inputs P321E** The digital input logical state is displayed under each number		**R**	**0**	**0**	**0xffff**	**DP**
4064	**Dig outputs 3210** The digital output logical state is displayed under each number		**R**	**0**	**0**	**0xffff**	**DP**
MONITOR \ Drive ID status							
1460	**Drive cont curr** Drive maximum continuos current rating; its default value depends by the drive size and applicable derating factors.	**[A]**	**RW**	**CALC**	**0.00F**	**0.00F**	**PV**
114	**Drive size** 15 ACAC Rgn-18A 16 ACAC Rgn-32A 17 ACAC Rgn-42A		**R**	**DSIZE**	**1**	**8**	**DK**
300	**Drive type** 42		**R**	**DCSD**	**0**	**0**	**DK**
115	**Drive name** AVRUY	**NULL**	**RWS**	**0.00F**	**0.00F**	**0.00F**	**FK**
	Software version Drive software version (factory installed), example: V 1. 0. 0						
110	**Software type** Software type factory use		**R**	**DVER**	**0**	**0**	**DV**
111	**Software status** Software state factory use		**R**	**DVER**	**0**	**0**	**DV**
99	**Life time[hrs]** Drive life time accumulated with power on		**RU**	**0.00F**	**0.00F**	**0.00F**	**PV**
98	**Sys time-ddmmyy** Time and date setting from PC configurator or serial communications. Clock is active only when the Drive is powered on	**NULL**	**RU**	**0.00F**	**0.00F**	**0.00F**	**PV**

Note! On a new regulation card the variable takes value: 00:00:00 (time) 011299 (date). This parameter does not come updated.

IPA	Description	[Unit]	Access	Default	Min	Max	Format

MONITOR \ Alarm log

This function provides a list of last 30 drive trips or various system error messages. Together with cause indications also time and data informations is provided. Alarm log message is referred to “Sys time - dd mm yy” variable.

Example:

01:02:36	01 02 00	
Undervoltage		
	01:02:36	time of alarm
	02 02 00	date of alarm
	Undervoltage	alarm description

IPA	Description	[Unit]	Access	Default	Min	Max	Format

STARTUP

STARTUP \ Startup config

Enter setup mode command allows the access to SETUP MODE to set drive basic parameters and motor plate data. Drive will reboot and few seconds are required. All changes and operations done in the SETUP MODE will be automatically saved, every time the user executes exits setup mode.

STARTUP \ Startup config \ Converter data

380 **Mains voltage** **[V]** **RW** **2** **DSIZE** **5** **DK**

Drive power supply voltage.
Select supply voltage parameter accurately, according to actual drive supply voltage.
[1] 380 V
[2] 400 V
[3] 415 V
[4] 440 V
[5] 460 V

330 **Mains frequency** **[Hz]** **RW** **0** **DSIZE** **1** **DK**

[0] 50 Hz
[1] 60 Hz

2240 **DClink capacitor** **[uF]** **RW** **SIZE** **0.00F** **0.00F** **FK**

1022 **Input inductance** **[mH]** **RW** **SIZE** **0.00F** **3.00F** **FK**

12066 **Input resistance** **[ohm]** **RW** **SIZE** **0.00F** **1.00F** **FK**

170 **Switching freq** **RW** **DSIZE** **DSIZE** **DSIZE** **DK**

Drive PWM switching frequency. Selecting higher switching frequency then default, results in drive derating, see table 2.3.4.1. Selecting lower value results in higher continuous output current.
After changing this parameter, selftune data are initialized to default, self-tuning must be repeated !
[0] 2 kHz
[1] 4 kHz
[2] 8 kHz
[3] 16 kHz
Selections from 0 to 1 are disabled

1350 **Ambient temp** **[°C]** **RW** **0** **0** **1** **DK**

Drive ambient temperature. Selecting 50°C will result in drive derating, see chapter 2.1. After changing this parameter selftune data are initialized to default, self-tuning must be repeated !
[0] 40°C
[1] 50°C

Startup config \ Load default ?

Load default ?
Drive reset with default parameter values in the selected regulation mode only.
Each regulation mode has its own “Load default ?” command.

Note! “Load default ?” command does not reset SETUP MODE with default parameter values; Drive, Motor data and Autotune values are mantained.

Use Save config command to save default parameter values such that are preserved for next power up.

IPA	Description	[Unit]	Access	Default	Min	Max	Format

Startup config \ Load saved ?

Load saved ?

Reload of the last saved database selected.

STARTUP \ Save config ?

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format

REGULATION PARAM

Most of the parameters in this menu are initialized by autotune procedure. The access to Regulation Param menu is allowed by Level 1 password: 12345. It must to be set in the SERVICE menu.

REGULATION PARAM \ Volt regulator

REGULATION PARAM \ Vlt regulator \ Percent values

12022	**VdcP gain %**	**[%]**	**RWS**	**CALC**	**0.00F**	**100.00F**	**PP**
	Value of the DC voltage regolator Proportional gain						
12023	**VdcI gain %**	**[%]**	**RWS**	**CALC**	**0.00F**	**100.00F**	**PP**
	Value of the DC voltage regolator Integral gain						

REGULATION PARAM \ Vlt regulator \ Base values

12069	**VdcP base value**	**A_V**	**RWS**	**CALC**	**0.00F**	**CALC**	**FK**
	Basic value of the DC voltage regolator Proportional gain						
12070	**VdcI base value**	**A_V_s**	**RWS**	**CALC**	**0.00F**	**CALC**	**FK**
	Basic value of the DC voltage regolator Integral gain						

REGULATION PARAM \ Curr regulator

REGULATION PARAM \ Curr regulator \ Percent values

1999	**CurrP gain %**	**[%]**	**RWS**	**CALC**	**0.00F**	**100.00F**	**PP**
	Value of the current regolator Proportional gain						
2000	**CurrI gain %**	**[%]**	**RWS**	**CALC**	**0.00F**	**100.00F**	**PP**
	Value of the current regolator Integral gain						

REGULATION PARAM \ Curr regulator \ Base values

2005	**CurrP base value**	**V_A**	**RWS**	**CALC**	**0.00F**	**CALC**	**FK**
	Basic value of the current regolator Proportional gain						
2007	**CurrI base value**	**V_A_s**	**RWS**	**CALC**	**0.00F**	**CALC**	**FK**
	Basic value of the current regolator Integral gain						

REGULATION PARAM \ Regulator select

12000	**Curr reg mode**		**RWS_Z**	**3**	**0**	**4**	**DP**
	[0] Deadbeat [1] State fbk [2] State fbk integ [3] PI [4] Deadbeat stat						
12001	**Volt reg mode**		**RWS_Z**	**0**	**0**	**1**	**DP**
	[0] PI [1] State fbk integ						
12004	**Feedfwd type**		**RWS_Z**	**0**	**0**	**2**	**DP**
	[0] Off [1] DC link power [2] Motor power 1 [3] Motor power 2						
12015	**Full scale power**	**[kW]**	**RWS**	**0.00F**	**0.00F**	**CALC**	**PP**
	Set automatically for each size						

REGULATION PARAM \ React curr ref

IPA	Description	[Unit]	Access	Default	Min	Max	Format
REGULATION PARAM \ React curr ref \ RC ref src							
12103	**RC ref src** It allows to select the origin of the Reactive current reference		**RWS**	**IPA12020**		**List 8_R**	**PIN**
REGULATION PARAM \ React curr ref \ RC ref cfg							
12020	**Int RC ref** Reactive current internal reference	**A**	**RWS**	**0.00F**	**CALC**	**0.00F**	**PV**
REGULATION PARAM \ React curr ref \ RC ref mon							
3130	**RC ref mon** Reactive current reference displaying	**A**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
REGULATION PARAM \ React curr ref							
REGULATION PARAM \ React curr ref \ DC volt ref src							
12105	**DC volt ref src** It allows to select the origin of the reference for DC link voltage		**RWS**	**IPA12071**		**List 7_R**	**PIN**
REGULATION PARAM \ React curr ref \ DC volt ref cfg							
12071	**Int DC volt ref** DC link voltage internal reference	**V**	**RWS**	**CALC**	**CALC**	**CALC**	**PV**
REGULATION PARAM \ React curr ref \ DC volt ref mon							
12104	**DC volt ref mon** DC link voltage reference displaying	**V**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
REGULATION PARAM \ Active curr lim							
REGULATION PARAM \ Active curr lim \ Act curr lim cfg							
1190	**Act curr lim sel** [0] Off None [1] Limit +/- Positive or negative limit		**RWS**	**0** Limits depend on drive rating. Limits depend on IPA 1210, IPA1220	**0**	**1**	**DV**
1210	**Active curr lim+** Positive current limit or Motor (Positive power) limit.	**A**	**RWS**	**CALC**	**0.00F**	**CALC**	**PV**
1220	**Active curr lim-** Negative current limit or Generator (Negative power) limit.	**A**	**RWS**	**CALC**	**0.00F**	**CALC**	**PV**
12093	**Precharge curlim** Precharge current limit	**A**	**RWS**	**CALC**	**0.00F**	**CALC**	**PV**
REGULATION PARAM \ Active curr lim \ Act curr lim mon							
1250	**InuseActCur lim+** Monitor of the positive current limit in use	**A**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
1260	**InuseActCur lim-** Monitor for the negative current limit in use	**A**	**R**	**0.00F**	**0.00F**	**0.00F**	**PV**
2445	**Act curlim state** Current limit state		**R**	**0**	**0**	**1**	**DV**

REGULATION PARAM \ Test generator

The tuning of the regulators can be done using an internal test signal generator in order to evaluate the regulator response. This operation requires the use of a digital oscilloscope. The “Test generator” generates signal shaped as a rectangular wave with a programmable frequency and amplitude.
Using the Test generator function it is possible to carry out the manual tunings of Current regulator, Flux

IPA	Description	[Unit]	Access	Default	Min	Max	Format

regulator Voltage regulator and Speed regulator.

REGULATION PARAM \ Test generator \ Test gen mode

2756	**Test gen mode**		**RWS**	**0**	**0**	**2**	**DK**

[0] Off
[1] React curr ref
[2] DC link volt ref
This parameter defines where the test signal is connected in the control scheme.

Select new mode

REGULATION PARAM \ Test generator \ Test gen cfg

2745	**Gen Hi ref**	**[cnt]**	**RWS**	**0.0F**	**INT_MIN**	**INT_MAX**	**PV**

Value in count of the higher amplitude signal value

2750	**Gen Low ref**	**[cnt]**	**RWS**	**0.0F**	**INT_MIN**	**INT_MAX**	**PV**

Value in count of the lower amplitude signal value

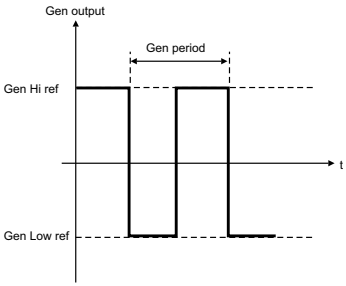
2755	**Gen Period**	**[s]**	**RWS**	**10.00F**	**0.00F**	**10000.0F**	**PV**

Period of the square wave

REGULATION PARAM \ Test generator \ Test gen mon

2760	**Gen output**	**[cnt]**	**R**	**INT_MIN**	**0.00F**	**0.00F**	**PV**

Monitorig the test generator output signal.



REGULATION PARAM \ SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:
- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.
It is recommended every time the user made any changes into STARTUP menu.
“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.
When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format

ALARM CONFIG

The access to ALARM CONFIG menu is allowed by Level 1 password: 12345. It must to be set in the SERVICE menu.

In the ALARM CONFIG menu it is possible to configure Drive alarms behavior through the following functions:

- Activity — It allows to set the action to be performed after the alarm intervention as:
  - 0 Only msg alarmq — Actions: Message
  - 1 Ignore — Actions: none
  - 2 Warning — Actions: Message – Status
  - 3 Disable drive — Actions: Message – Commands for SM – Status
  - 4 Stop — Actions: Message – Commands for SM – Status
  - 5 Fast stop — Actions: Message – Commands for SM – Status
  - 6 Curr limstop — Actions: Message – Commands for SM – Status

  Actions meaning:
  - Message — It means that the message has been sent to the "Alarm List"and to the "Alarm log list".
  - Commands for SM — - State Machine commands : A change in the drive state has been forced (alarm intervention).
    - Status: The active alarm signal is immediately set; it is reset when the alarm is not more present and the state machine is not in an alarm condition.
- Restart — It allows to enable the automatic start after the alarm cause has been removed.
  - 0 — Off
  - 1 — On
- Restart Time — It allows to set a period of time, within which the alarm state has to be removed, in order to perform an automatic start.
- Hold Off Time — It allows to set a period of time, in which a specific alarm condition has to remain active (it has to persist) in order to be considered an alarm situation.
  It is possible to set a millisecond period of time, in which the Drive does not recognize the alarm state. Therefore, the alarm is recognized only if it persists for a period longer than the set "Hold off time"

ALARM CONFIG \ Fault reset

9076	**Fault reset src**		**RWS**	**IPA50**		**List 4_R**	**PIN**

IPA 4027 DI 7 monitor = Default

By using the "Fault reset src" source, it is possible to select the origin of the "reset" command signal, for example a command via the terminal strip through a digital Input (refer to signals List 4_R of Pick List, see chapter 12)

ALARM CONFIG \ Undervoltage AC

12097	**UVAC activity** [0] Disable drive [1] Warning [2] Only msg alarm q [3] Ignore		**RWS**	**0**	**0**	**3**	**DP**
12098	**UVAC restart** [0] Off [1] On		**RWS**	**0**	**0**	**1**	**DP**
12099	**UVACrestart time** Undervoltage restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
12084	**UV AC hold off** Undervoltage hold off	**ms**	**RWS**	**60.00F**	**0.00F**	**30000.0F**	**PP**

IPA	Description	[Unit]	Access	Default	Min	Max	Format
ALARM CONFIG \ Overvoltage AC							
12094	**OVAC activity** [0] Disable drive [1] Warning [2] Only msg alarm q [3] Ignore		**RWS**	**0**	**0**	**3**	**DP**
12095	**OVAC restart** [0] Off [1] On		**RWS**	**0**	**0**	**1**	**DP**
12096	**OVACrestart time** Overvoltage restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
12082	**OV AC hold off** Overvoltage hold off	**ms**	**RWS**	**60.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ Undervoltage DC							
9050	**UVDC restart** [0] Off [1] On Undervoltage restart		**RWS**	**0**	**0**	**1**	**DP**
9051	**UVDCrestart time** Undervoltage restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ Overvoltage DC							
9052	**OVDC restart** [0] Off [1] On Overvoltage restart		**RWS**	**0**	**0**	**1**	**DP**
9053	**OVDCrestart time** Overvoltage restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ IGBT desaturat							
9046	**DES restart** [0] Off [1] On IGBT desaturation restart		**RWS**	**0**	**0**	**1**	**DP**
9047	**DESrestart time** IGBT desaturation restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ Inst overcurrent							
9063	**IOC restart** [0] Off [1] On Instantaneous overcurrent restart		**RWS**	**0**	**0**	**1**	**DP**
9064	**IOCrestart time** Instantaneous overcurrent restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ Ground fault							
9640	**GF activity** [0] Disable drive [1] Warning		**RWS**	**0**	**0**	**3**	**DP**

IPA	Description	[Unit]	Access	Default	Min	Max	Format
	[2] Only msg alarm q [3] Ignore Ground fault activity						
ALARM CONFIG \ External fault							
	It trips when the External fault input is active						
9075	**EF src** IPA 4000 NULL = Default It allows to connect the External fault input terminal strip (refer to signals List 3_R of Pick List, see chapter 12)		**RWS**	**IPA4000**		**List 3_R**	**PIN**
9060	**EF activity** [0] Disable drive [1] Warning [2] Only msg alarm q [3] Ignore External fault activity		**RWS**	**0**	**0**	**3**	**DP**
9061	**EF restart** [0] Off [1] On External fault restart		**RWS**	**0**	**0**	**1**	**DP**
9062	**EFrestart time** External fault restart time	**ms**	**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
9600	**EF hold off** External fault hold off	**ms**	**RWS**	**0.00F**	**0.00F**	**30000.0F**	**PP**
ALARM CONFIG \ Pcharge fbk loss							
12101	**PFL restart** [0] Off [1] On		**RWS**	**0**	**0**	**1**	**DP**
12102	**PFLrestart time** Pre-charge feedback loss restart time		**RWS**	**000.00F**	**0.00F**	**30000.0F**	**PP**
12119	**PFL hold off** Pre-charge feedback loss hold off	**ms**	**RWS**	**500.0F**	**8.00F**	**30000.0F**	**PP**
ALARM CONFIG \ UV repetitive							
	It trips when more than a programmable number, with “UVR attempts” parameter, of Undervoltage faults are detected in 4 minutes (time programmable with “UVR delay” parameter). This alarm is referred to Undervoltage AC.						
9043	**UVR attempts** It determines the number of Undervoltage faults accepted	**NULL**	**RWS**	**5.00F**	**1.00F**	**1000.0F**	**PP**
9044	**UVR delay** It determines the time window of “UVR attempts” parameter	**[s]**	**RWS**	**240.00F**	**1.00F**	**CALC**	**PP**
ALARM CONFIG \ Conv overload							
9040	**COL activity** 0 Disable drive 1 Warning 2 Only msg alarm q 3 Ignore		**RWS**	**0**	**0**	**3**	**DP**

IPA	Description	[Unit]	Access	Default	Min	Max	Format
	Conv overload activity						

ALARM CONFIG \ Alarm status

The alarm state can be reported via three Words. Each bit determines an alarm state. It is therefore possible to determine the state of 48 alarms. Each single bit can be controlled if the corresponding bit of a specific mask is set with 1, otherwise their setting is always 0.

When an alarm becomes active, the word corresponding bit is set with 1. Its setting remains equal to 1 till the alarm becomes inactive and the "State Machine or Sequencer" is not in an alarm condition (see the previous paragraphs).

If the state of a single alarm has to be controlled via an output, then only the mask needed bit has to be set with 1.

If the state of several alarms has to be controlled via an output, then the mask corresponding bits have to be set with 1.

The alarms have to be controlled by the Word itself.

Ex: the state of the External fault alarm has to be read.

Mask W1 S1 = 0x0100 => 0000 0001 0000 0000
Mask W2 S1 = 0x0000 => 0000 0000 0000 0000
Mask W3 S1 = 0x0000 => 0000 0000 0000 0000
DO 0 src = Select ipa Alm W1 S1.

The state of the Undervoltage and Overvoltage alarm has to be read.

Mask W1 S1 = 0x0100 => 0000 0000 0000 0110
Mask W2 S1 = 0x0000 => 0000 0000 0000 0000
Mask W3 S1 = 0x0000 => 0000 0000 0000 0000
DO 0 src = Select ipa Alm W1 S1.

The state of the External fault and F_R_C alarm has to be read.

Mask W1 S1 = 0x0100 => 0000 0001 0000 0000
Mask W2 S1 = 0x0000 => 0000 0000 1000 0000
DO 0 src = Select ipa Alm W1 S1
DO 1 src = Select ipa Alm W2 S1

ALARM CONFIG \ Alarm status \ Alm status cfg

9610	**Mask Status W1**	**RWS**	**0xffff**	**0**	**0xffff**	**DP**
9614	**Mask Status W2**	**RWS**	**0xffff**	**0**	**0xffff**	**DP**

ALARM CONFIG \ Alarm status \ Alm status mon

9630	**Alm Status W1**	**R**	**0**	**0**	**0xffff**	**DV**
9634	**Alm Status W2**	**R**	**0**	**0**	**0xffff**	**DV**

ALARM CONFIG \ SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, "Save Config?" command
- by all other menus, "SAVE PARAMETERS" command

Any changes made in STARTUP menu require "Save Config?" command, which saves all entire regulation mode selected.

It is recommended every time the user made any changes into STARTUP menu.

"SAVE PARAMETERS" command saves all the changes made out of STARTUP menu only.

When on the keypad display appears blinking message "Use Save Config", use "Save Config?" command

IPA	Description	[Unit]	Access	Default	Min	Max	Format

COMMUNICATION

The access to COMMUNICATION menu is allowed by Level 1 password: 12345. It must be set in the SERVICE menu.

RS485: The communication protocol can be chosen between Slink4, Modbus, Jbus or ISO 1745 through the “Protocol type” parameter. Each of these protocols allow a multipoint network. See the specific protocol manual for further details.
The Drive address can be defined via the “Slave address” parameter. Editing parameter 105, “Slave address”, and saving the new value perform the address change. The new address becomes active after the Drive has been switched off and then back on. A temporary address change is also possible when using the Slink4 protocol with an Slink4 command.
When using the Slink4 protocol, the RS485 serial line operates in half-duplex, where the data cannot be transmitted and received simultaneously. It is sometimes possible during the transition from transmission to reception modes, the Master (PC or PLC) reaches the reception condition after the Drive has already started to send its data package. As a consequence, the package received by the master is not correct. In order to avoid such occurrences, the “Slave res time” parameter can be adjusted to delay the drive response so the Master has sample mode switching time. This situation does not occur with the Modbus and Jbus protocols as the synchronization pause between messages is specified by the protocol and is guaranteed.

COMMUNICATION \ RS485

105	**SLink4 address** It define the drive slave address	**RWS**	**1**	**0**	**255**	**DK**
106	**SLink4 res time** It define the drive slave address time	**RWS**	**0**	**0**	**255**	**DK**

COMMUNICATION \ SAVE PARAMETERS

AVRy drive allows two different commands to save the parameters modified in the regulation mode selected:

- by STARTUP menu, “Save Config?” command
- by all other menus, “SAVE PARAMETERS” command

Any changes made in STARTUP menu require “Save Config?” command, which saves all entire regulation mode selected.
It is recommended every time the user made any changes into STARTUP menu.
“SAVE PARAMETERS” command saves all the changes made out of STARTUP menu only.
When on the keypad display appears blinking message “Use Save Config”, use “Save Config?” command

IPA	Description	[Unit]	Access	Default	Min	Max	Format

SERVICE

SERVICE menu allows also the setting of the password to enable Level 2 drive menu: ask Level 2 password to the technical support.

To have the access of Level 2 drive menus:

1_ edit 12345 password into “Insert Password” parameter and confirm it using “Enter” button

2_ check the password through “Check password” parameter using “Enter” button

9 - Maintenance

9.1 Care

The drives of the AVRy series must be installed according to the relevant installation regulations.
They do not require any particular maintenance.
They should not be cleaned with a wet or moist cloth.
The power supply must be switched off before cleaning.

9.2 Service

The screws of all terminals on the drive should be re-tightened two weeks after initial commissioning.
This should be repeated each year. If the drives have been stored for more than three years, the capacitance of the intermediate circuit capacitors may have been impaired.
Before commissioning these drives, it is advisable to supply power to the drives for at least two hours in order to regain the capacitor original ratings.
To this purpose apply an input voltage without applying any load on the output.
After these steps, the drive is ready to be installed without limits.

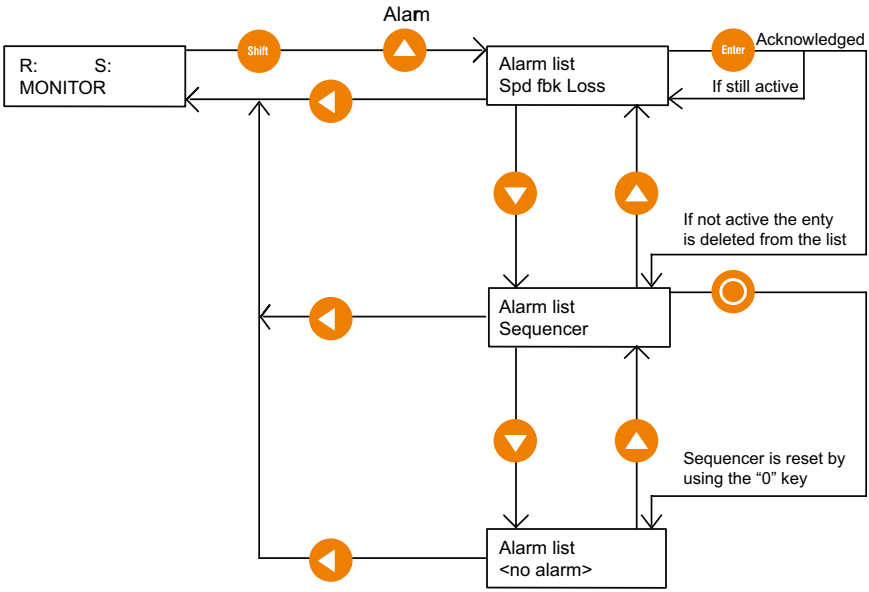
9.3 Repairs

Repairs of the drive should only be carried out by qualified personnel (suggested by the manufacturer).
If you carry out a repair on your own, observe the following points:
- When ordering spare parts do not only state the drive type but also the drive serial number.
It is also useful to state the type of the regulation card and the system software version.
- When changing the cards ensure that the positions of switches and jumpers are observed!

9.4 Customer Service

For customer service, please refer to your Gefran office.

When the red “Alarm” LED blinks, it is indicating one (or more) alarm conditions. See following steps to view alarm and reset it:



1) Press Shift + Alarm . The “Alarm list” will be displayed.

2) Press Enter one or more times untill “Sequencer” message appears, to acknowledge the alarms.

Note! If the alarm is still active, red LED will blink again. If it not active, red LED will stop.

3) Press [O] key to reset the Sequencer. The Alarm List shows all the occurred alarms, both if they are due to protections and to errors when limit values are exceeded.In order to disappear from the alarm list, alarm have to be acknowledged. The acknowledgement is possible only if the alarm is no longer active. The alarms are automatically acknowledged after two minutes.

Note! Pressing Enter will acknowledge the alarm. Acknowledging the alarm will only remove it from the active alarm list. If the alarm condition also resulted in a drive trip, the sequence will also need to be reset. This can be done by pressing the [O] key. The drive cannot be re-enabled or started after a trip condition unless the drive sequencer is reset.

The drive State Machine, controls the drive running and starting, accounting for protection & alarming, command sequence, and reset status.
The table below displays various operation states by Sequencer status number:

Sequencer status	State
1	Magnetization running
2	Magnetization completed, Stop
3	Start
4	Fast stop, Stop
5	Fast stop, Start
9	No alarm, drive is ready to accept all commands
10	Magnetization running and Start command already present
12	Alarm active
16	Alarm not active, waiting for reset

To read the sequencer status of the State Machine, go to :
MONITOR / Advanced status menu, **Sequencer status** parameter.

10.1 List of Regulation Alarm Events

Table 10.1 provides a description of regulation alarm events and information on how to configure the intended drive behaviour on their occurrence (where applicable).

Table 10.1: Regulation Alarm Events

Alarm name Description	Drive activity after alarm	Hold off	Hold off	Restart	Code in the Alarm list	Bit position in Alarm list
Failure supply	Disable drive	No	No	NA	21	1
One or more of the power supply circuits in the control section failed						
Undervoltage	Disable drive	No	Yes	Yes Logic is based on the number of attempts	22	2
Voltage on the drive DC link is lower than the minimum threshold for the given Mains voltage setting.						
Overvoltage	Disable drive	No	Yes	Yes	23	3
Voltage on the drive DC link is higher than the maximum threshold for the given Mains voltage setting						
IGBT desat flt	Disable drive	No	Yes	Yes No more than 2 attempts in 30 seconds	24	4
IGBT instantaneous overcurrent was detected by gate desaturation sensing circuit						
Inst Overcurrent	Disable drive	No	Yes	Yes No more than 2 attempts /30sec.	25	5
IGBT instantaneous overcurrent was detected by output current sensor						
Ground fault	Programmable		No	No	26	6
Output phase discharge to ground						
Curr fbk loss	Disable drive	No	No	No	27	7
A failure of current sensor feeedback or power supply was detected						
External fault	Programmable	Programmable	Yes	Programmable	28	8
External fault input is active						
Spd fbk loss	Programmable	No	No	No	28	9
A failure of the speed feedback sensor or power supply was detected						
Module OT	Disable drive	Constant, 10 ms	No	No	30	10
IGBT overtemperature was detected by internal sensor						
Heatsink OT	Disable drive	Const., 1000 ms	No	No	31	11
Heatsink overtemperature was detected by thermal contact						
Motor OT	Programmable	Programmable	Yes	Programm	32	12
Motor overtemperature was detected by thermal contact or PTC thermistor						
Heatsink S OT	Programmable	Programmable	Yes	Programm	33	13
Heatsink linear temperature sensor threshold was exceeded						
Regulat S OT	Programmable	Programmable	Yes	Programm	34	14
Regulation board linear temperature sensor threshold was exceeded						
Intake Air S OT	Programmable	Programmable	Yes	Programm	35	15
Cooling air intake linear temperature sensor threshold was exceeded						
Cont fbk fail	Programmable	No	Yes	No	36	16
It trips when the contact feedback signal is not detected						
Comm card fault	Programmable	No	Yes	Programm	37	17
Fault of optional LAN communication board						
Appl card fault	Disable drive	No	No	No	38	18

Alarm name Description	Drive activity after alarm	Hold off	Hold off	Restart	Code in the Alarm list	Bit position in Alarm list
Fault of optional application coprocessor board						
Drv overload	Programmable	No	No	No	39	19
Drive overload accumulator exceeded trip threshold						
Mot overload	Programmable	No	No	No	40	20
Motor overload accumulator exceeded trip threshold						
BU overload	Programmable	No	No	No	41	21
Braking resistor overload accumulator exceeded trip threshold						
Data lost	Disable drive	No	No	No	42	22
Data corrupted in non-volatile memory						
Brake fbk fail	Programmable	No	No	No	43	23
It trips when the brake feedback signal is not detected						
Max time	Disable drive	No	No	No	44	24
Software task time overrun was detected						
Sequencer	Disable drive	No	No	No	45	25
Alarm event caused drive disable						
Door fbk fail	Disable drive	No	No	No	46	26
It trips when the door feedback signal is not detected						
Overspeed	No	No	No	No	47	27
Maximum speed threshold was exceeded while drive in RUN state						
UV repetitive	Disable drive If n. of faults is set to max the Alarm is disabled.	No	No	No	48	28
More than a programmable number of UV fault were detected in 5 minutes						
IOC repetitive	Disable drive	No	No	No	49	29
More than 2 OC faults were detected in 30 sec.						
IGBTdesat repet	Disable drive	No	No	No	50	30
More than 2 IGBT desat faults were detected in 30 sec.						
WatchDog user	Disable drive	No	No	No	51	31
The drive failed to retrigger the communication watchdog within the specified time						
Hw fail	Disable drive	No	No	No	52	32
Communication failure between Drive Regulation board and one of its options or I/O expansions.						

10.2 List of Configuration and DataBase Error Alarm Events

Entering bad data or conflicting data into the drive configuration will cause user errors to be displayed.
These type of errors can be:
- Configuration errors
- Database errors (DB errors)

Refer to the following paragraphs for descriptions.

Drive size setting

Note!

If the User changes the Drive size, the drive will display: Drv size: new size - old size. For example: Drive size: 0 - 1

10.2.1 Configuration Errors

Configuration errors can occur by entering incompatible or invalid parameter data. The drive reports configuration error by the following example description:
Calc error: Calc error number
Param: Param error number

The Calc error number denotes the cause of invalid calculation. The Calc error number is composed as follows:
Calc error number = Offset + Error code

The Offset denotes the type of error:

0	for specific errors
100	for errors originated by the database calculation (see DB error paragraph)
500	for errors due to floating point calculation (exception, divide by zero etc..)
600	for errors originated by the configuration calculations (range and so on).

The Error code denotes the origin cause of the error, see values list below.

Error code values lists

Error code values for Offset 0 :

0	no error
1	signal not managed in current configurator state
2	cannot stop regulation
3	recipe export error
4	recipe import error
5	error while loading selftune data
6	error while loading motor data
7	reserved
8	error while loading customer specific data
9	error while loading drive size data
10	error while writing file size.ini
11	error while apply database. The operation is refused because errors arised during group calculation.To reset the errors it is necessary re-enter the data, and confirm correctness
12	error while saving too changes

Error code values for Offset 100:
See DB errors, section 10.2.3

Error code values for Offset 500 (500 + error code):

3	Integer overflow
4	Floating overflow
5	Floating underflow
7	Divide by zero
9	Undefined float
10	Conversion error
11	Floating point stack underflow
12	Floating point stack overflow

Error code values for Offset 600 (600 + error code):

0	no error
1	switching freq. error
2	mains voltage error
3	ambient temperature error
4	regulation mode error
5	take selection error
6	base speed error
7	drive size error

For example, Calc error number 606 is a configuration error (600) caused by speed base value (6) out of range.
The Param error number is not meaningful.

10.2.2 Database Errors (DB Errors)

DB errors are caused by a incorrect setting in a single parameter. This problem is originated in the database calculation. For example the most common are:

- DB error Limit HIGH
- DB error Limit LOW

The message DB error is displayed by the drive in this format:
DB err IPA: error code

The IPA denotes the parameter number which caused the DB error calculation. The error code denotes the type error.
Example of message DB error displayed: DB ERR 7060: 4
This means that the DB error is caused by IPA 7060 which is high limit of **Multi speed 0**; Error code 4 denotes the type error (for the DB error code values list see below). To find the low limit, which depends on drive configuration, it is possible to go to the **Multi speed 0** parameter on the keypad. Press the Shift key and then the Help key, the following will be displayed:

Max Value
Min Value
Def(ault) Value
Unit
Raw value
IPA
Description
(Access) mode
In most cases it is enough to set a new value which is within the limits.

DB error code list

0	No error
1	SBI PROBLEM 0x01
2	Generic error
3	Attribute not exist
4	Limit High
5	Limit Low
11	Division by zero
12	Int Overflow
13	Int Underflow
14	Long Overflow
15	Long Underflow

16 Domain Error
17 Indirection Error
18 Reached wrong eof
19 Dbase not configured
20 Value not valid
21 Process doesn't reply
22 Wrong record size
23 Attribute read only
24 SBI PROBLEM 0x18
25 Command not yet implemented
26 Command wrong
27 Read file error
28 Header wrong
29 Reserved for internal use
30 Parameter not exist
31 Parameter read only
32 Parameter "z" only
48 SBI PROBLEM 0x30

10.2.3 List of Error Codes for All Autotune Procedures

The different autotune procedures for Current regulator, Flux regulator, Speed regulator or Analog input calibration may generate error messages that are described in section 10.2.2 .

Table 10.2.3.1: Error Messages from Autotune Procedures

error No.	error text	description
0	No error	
1	Abort	The user entered Escape or 0 key, or removed enable permissive (term 12 low)
2	DB access <IPA>	An attempt to access the database at the speficied index occurred during autotune procedure
3	No break point	Failure in measuring inverter voltage distortion
4	Rs high lim	Failure in measuring motor stator Resistance
5	Rs low lim	Failure in measuring motor stator Resistance
6	DTL high lim	Failure in computing compensation for the inverter voltage distortion
7	DTL low lim	Failure in computing compensation for the inverter voltage distortion
8	DTS high lim	Failure in computing compensation for the inverter voltage distortion
9	DTS low lim	Failure in computing compensation for the inverter voltage distortion
10	LsS high lim	Failure in calculating motor leakage inductance
11	LsS low lim	Failure in calculating motor leakage inductance
12	ImNom not found	Identification of rated magnetizing current failed
13	ImNom not found	Identification of maximum magnetizing current failed
14	RrV low lim	Voltage limit exceeded during measurement for the calculation of motor rotor resistance
15	RrV high lim	Voltage limit exceeded during measurement for the calculation of motor rotor resistance
16	Rr high lim	Failure in calculating motor rotor resistance

error No.	error text	description
17	Rr low lim	Failure in calculating motor rotor resistance
18	AI too high	Value of analog input is too high for full scale autocalibration
19	AI too low	Value of analog input is too low for full scale autocalibration
20	Rr2 high lim	Failure in calculating motor rotor resistance
21	Rr2 low lim	Failure in calculating motor rotor resistance
22	Drive disabled	Enable permissive (term 12) was found low when attempting to start autotune procedure
23	Rr timeout	Timeout occurred during measurement for the calculation of motor rotor resistance
24	Rr2 timeout	Timeout occurred during measurement for the calculation of motor rotor resistance
25	LsS timeout	Timeout occurred during measurement for the calculation of motor leakage inductance
26	Drive enabled	Drive was found to be already enabled when attempting to initiate autotune procedure
32	Calc error	An error occurred when processing measurement data
33	Config error<errcode>	The specified Configurator error occurred during database configuration based on autotune data
35	Cmd not supported	Command not supported in the current state

Table 10.3; Regen alarms

Alarm name	(1) Alarm number	(2) Code	Causal relation / Description	Drive activity after alarm	Hold off Def	Hold off Min	Hold off Max	Restart	Restart time	Ack required	Msg to alarmq	DigOut	Menù
Inst overcurrent	1	21	Too many current on output bridge	Disable drive	No	No	No	Yes if less than 2 alarms within 30 s	Yes	Yes	Yes	Yes	Yes
Overvoltage DC	2	22	Vdc link > OV Thr	Disable drive	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Undervoltage DC	3	23	Vdc link < UV Thr	Disable drive	No	No	No	Yes if less than selected number of attempts	Yes	Yes	Yes	Yes	Yes
Curr fbk loss	4	24	Loose of the reading of the current sensor	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
IGBT desaturat	5	25	Too many current on output bridge	Disable drive	No	No	No	Yes if less than 2 alarms within 30 s	Yes	Yes	Yes	Yes	Yes
Failure supply	6	26	Failure of power supply	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
UV DC repetitive	7	27	In 5 minutes xx UV fault occurred. Xx programmable. If xx is set equal to the maximum, the allarm is disable	Disable drive	No	No	No	No	No	Yes	Yes	Yes	Yes
IOC repetitive	8	28	2 UC fault in 30 second	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
IGBTdesat repet	9	29	2 DES fault in 30 second	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
Ground fault	10	30	Output Phase discharge to ground	Program	No	No	No	No	No	Yes	Yes	Yes	Yes
Max time	11	31	Exceeded max CPU time	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
WatchDog user	12	32	User WatchDog not refreshed	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
Sequencer	13	33	State machine error	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
Module OT	14	34	Only for size <= 15kW Module Overtemperature	Disable drive	10 ms	0 ms	30 s	No	No	Yes	Yes	Yes	No
Heatsink OT	15	35	Only for size > 15kW Heat sink Overtemperature	Disable drive	1000 ms	0 ms	30 s	No	No	Yes	Yes	Yes	No
Intake air OT	16	36	Only for size > 15kW Intake air Overtemperature	Program	1000 ms Program	0 ms	30 s	Yes	Yes	Yes	Yes	Yes	Yes

Alarm name	(1) Alarm number	(2) Code	Causal relation / Description	Drive activity after alarm	Hold off Def	Hold off Min	Hold off Max	Restart	Restart time	Ack required	Msg to alarmq	DigOut	Menù
Overvoltage AC	17	37	Vac > OV Thr	Program	10 ms Program	0 ms	30 s	Yes	Yes	Yes	Yes	Yes	Yes
Undervoltage AC	18	38	Vac < UV Thr	Program	10 ms Program	0 ms	30 s	Yes	Yes	Yes	Yes	Yes	Yes
External fault	19	39	Input pin. Programmable	Program	0 ms Program	0 ms	30 s	Yes	Yes	Yes	Yes	Yes	Yes
Converter overload	20	40	Reached Converter Ovld limit	Program	No	No	No	No	No	Yes	Yes	Yes	Yes
Data lost	21	41	E2prom error	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
ISBus fault	22	42	Isbus card	Program	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Comm card fault	23	43	Sbi Card	Program	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Contact fbk loss	24	44	Loose of the reading of the mains contactor: SM timeout	Disable drive	500 ms. Program	8 ms	30 s	Yes	Yes	Yes	Yes	Yes	Yes
Precharge fault	25	45	DC link voltage not reached ready threshold in the expected time: SM timeout	Disable drive	2000 ms	8 ms	30 s	No	No	Yes	Yes	Yes	No
Phase sequence	26	46	Network voltage vector not rotating in the “right” direction	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
No power supply	27	47	Enable comand without power	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
FREE	28	48	-	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
FREE	29	49	-	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
FREE	30	50	-	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No
FREE	31	51	-	Disable drive	No	No	No	No	No	Yes	Yes	Yes	No

11 Inverter pick lists

Description	IPA

List_1_I

Description	IPA
NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Enable cmd mon	150
Start cmd mon	151
FastStop cmd mon	152
An inp 1 < thr	5010
An inp 2 < thr	5030
An inp 3 < thr	5050
An inp 1X < thr	5068
An inp 2X < thr	5088
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
Ramp acc state	8023
Ramp dec state	8024
Ramp out != 0	8025
Spd is zero	3728
Ref is zero	3729
Spd is zero dly	3730
Ref is zero dly	3731
Tcurr lim state	2445
Drv OL trip	1570
Drv OL warning	1580
Mot OL trip	1680
BU OL trip	1782
Act spd fbk sel 1	941
Std enc fail	3224
Exp enc fail	3225
Alm W1 S1	9630
Alm W2 S1	9631
Alm W3 S1	9632
Alm W1 S2	9634
Alm W2 S2	9635
Alm W3 S2	9636
Compare 1 output	6048
Compare 2 output	6063
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131
Mlt param status	8102
Mlt param actsel	8104

List _2_I

Description	IPA
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556
Pre-torque E mon	9655

List _3_I

Description	IPA
NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133

Description	IPA
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131
Compare 1 output	6048
Compare 2 output	6063
An inp 1 < thr	5010
An inp 2 < thr	5030
An inp 3 < thr	5050
An inp 1X < thr	5068
An inp 2X < thr	5088
Gen output	2760

Description	IPA

List _4_I

Description	IPA
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _5_I

Description	IPA
Cmp 1 inp 0	6041
Cmp 1 inp 1	6042
Cmp 1 inp 2	6043
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
Compare 1 output	6048
Compare 2 output	6063
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _6_I

Description	IPA
Cmp 2 inp 0	6056
Cmp 2 inp 1	6057
Cmp 2 inp 2	6058
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056

Description	IPA
Compare 1 output	6048
Compare 2 output	6063
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse OutvIt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _7_I

Int ramp ref 1	7030
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

List _8_I

Int ramp ref 2	7031
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

List _10_I

Int speed ref 2	7041
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

Description	IPA

List _11_I

Multi speed 0	7060
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

List _12_I

NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

List _13_I

NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _14_I

NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Inertia comp mon	2625
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Pre-torque out	9433

List _15_I

Int torque ref 2	2440
NULL	4000
ONE	4001
Gen output 2	760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Inertia comp mon	2625
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109

Description	IPA
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Pre-torque out	9433

List _16_I

NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056

List _17_I

NULL	4000
ONE	4001
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

List _18_I

NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131
Lift Enable mon	7128
Lift Start mon	7129

List _19_I

Int SGP ref	3710
Ramp ref	3200
Speed ref	3210
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100

Description	IPA
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _20_I

Int spd 0 ref	3721
NULL	4000
Ramp ref	3200
Speed ref	3210

List _21_I

NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107

Description	IPA
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _22_I

Speed fbk sel	1940
NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367

Description	IPA
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131
Compare 1 output	6048
Compare 2 output	6063
An inp 1 < thr	5010
An inp 2 < thr	5030
An inp 3 < thr	5050
An inp 1X < thr	5068
An inp 2X < thr	5088
Gen output	2760

List _24_I

Int flx maxlim	1120
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029

Description	IPA
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _25_I

Int Inertia	2054
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122

Description	IPA
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _26_I

Description	IPA
W0 decomp inp	2121
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760

Description	IPA
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _27_I

Description	IPA
W1 decomp inp	9360
NULL	4000
ONE	4001
Output voltage	3060

Description	IPA
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167

Description	IPA
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _28_I

Description	IPA
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356

Description	IPA
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _29_I

Int DrvDGFC-S W0	4105
Int DrvDGFC-S W1	4106
Int DrvDGFC-S W2	4107
Int DrvDGFC-S W3	4108
Int DrvDGFC-S W4	4109
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090

Description	IPA
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100

Description	IPA
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _30_I

Int DrvDGFC-A W0	4140
Int DrvDGFC-A W1	4141
Int DrvDGFC-A W2	4142
Int DrvDGFC-A W3	4143
Int DrvDGFC-A W4	4144
Int DrvDGFC-A W5	4145
Int DrvDGFC-A W6	4146
Int DrvDGFC-A W7	4147
Int DrvDGFC-A W8	4148
Int DrvDGFC-A W9	4149
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760

Description	IPA
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _31_I

Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090

Description	IPA
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Ramp out mon	8022

List _32_I

Description	IPA
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _33_I

Description	IPA
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _34_I

Description	IPA
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

Description	IPA
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _35_I

Description	IPA
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _36_I

Description	IPA
Ramp ref	3200
Speed ref	3210
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _37_I

Description	IPA
Ramp ref	3200
Speed ref	3210
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _38_I

Description	IPA
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164

Description	IPA
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _39_I

Int IS ctrl	9551
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108

Description	IPA
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _40_I

Int Drv SBI W0	9020
Int Drv SBI W1	9021
Int Drv SBI W2	9022
Int Drv SBI W3	9023
Int Drv SBI W4	9024
Int Drv SBI W5	9025
NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260

Description	IPA
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _42_I

Int Outvlt lim	1140
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122

Description	IPA
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _43_I

NULL	4000
ONE	4001
Output voltage	3060
Output current	3070
Output frequency	3080
Output power	3090
DC link voltage	3100
Magnetizing curr	3110
Torque curr	3120
Magn curr ref	3130
Torque curr ref	3140
Current phase U	3150
Current phase V	3160
Current phase W	3170
Ramp ref	3200
Speed ref	3210
Speed	3220
Norm Speed	3221
Fault Pin	9098
Norm Std enc spd	3222
Norm Exp enc spd	3223
Drv OL accum %	1540
Mot OL accum %	1670
BU OL accum %	1781
Int Pre-torque	9431
Pre-torque out	9433
Drive ready	161
Enable SM mon	162
Start SM mon	163
FastStop SM mon	164
ALM Sequencer	9096
Drive OK	9097
Gen output	2760
An inp 1 output	5009

Description	IPA
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Ramp out mon	8022
Mlt spd out mon	7070
Lift out spd mon	7130
Inertia comp mon	2625
Torque ref	2450
Tcurr lim +	1210
Tcurr lim -	1220
Inuse Tcurr lim+	1250
Inuse Tcurr lim-	1260
Inuse Outvlt ref	1180
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Std enc position	9553
Exp enc position	9554
H Index register	9555
L Index register	9556

List _44_l

NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029

Description	IPA
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
Inertia comp mon	2625
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Pre-torque out	9433

List _45_l

Int ramp ref 3	7038
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120

Description	IPA
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653

List _46_l

Int speed ref 1	7040
NULL	4000
ONE	4001
Gen output	2760
An inp 1 output	5009
An inp 2 output	5029
An inp 3 output	5049
An inp 1X output	5067
An inp 2X output	5087
W0 comp out	2116
W1 comp out	9356
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164

Description	IPA
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 10	9110
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115
Norm Std enc spd	3222
Norm Exp enc spd	3223
Mlt spd out mon	7070
Lift out spd mon	7130
Speed ref E mon	9653
LZ speed ref	9408

List _47_l

NULL	4000
ONE	4001
UP cont mon	7120
DOWN cont mon	7121
RUN cont mon	7122
BRAKE cont mon	7123
BRAKE2 cont mon	7146
Lift Landing mon	7124
Lift DCbrake mon	7125
Door open mon	7139
Door fail mon	7140
Short floor mon	7149
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4024
DI 5 monitor	4025
DI 6 monitor	4026
DI 7 monitor	4027
DI 0X monitor	4045
DI 1X monitor	4046
DI 2X monitor	4047
DI 3X monitor	4048
DI 4X monitor	4049
DI 5X monitor	4050
DI 6X monitor	4051
DI 7X monitor	4052
DI 8X monitor	4053
DI 9X monitor	4054
DI 10X monitor	4055
DI 11X monitor	4056
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125

Description	IPA
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124
DGFC-A Drv W0mon	4160
DGFC-A Drv W1mon	4161
DGFC-A Drv W2mon	4162
DGFC-A Drv W3mon	4163
DGFC-A Drv W4mon	4164
DGFC-A Drv W5mon	4165
DGFC-A Drv W6mon	4166
DGFC-A Drv W7mon	4167
DGFC-A Drv W8mon	4168
DGFC-A Drv W9mon	4169
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 10	9126
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

Description	IPA
Compare 1 output	6048
Compare 2 output	6063
An inp 1 < thr	5010
An inp 2 < thr	5030
An inp 3 < thr	5050
An inp 1X < thr	5068
An inp 2X < thr	5088
Gen output	2760
LZ ramp ctrl	9409

List _48_I

Description	IPA
NULL	4000
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005

List _49_I

Description	IPA
Accel E mon	9654
NULL	4000
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
DGFC-S Drv W0mon	4120
DGFC-S Drv W1mon	4121
DGFC-S Drv W2mon	4122
DGFC-S Drv W3mon	4123
DGFC-S Drv W4mon	4124

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Description	IPA

List _1_R

Description	IPA
NULL	4000
ONE	4001
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Enable cmd mon	0151
An inp < thr	5010
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
Drv OL trip	1570
Drv OL warning	1580
Alm Status W1	9630
Alm Status W2	9634
Compare 1 output	6048
Compare 2 output	6063
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

List _2_R

Description	IPA
NULL	4000
ONE	4001
Input voltage	3060
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _3_R

Description	IPA
NULL	4000
ONE	4001
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

List _4_R

Description	IPA
Int fault reset	0050
NULL	4000
ONE	4001
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305

Description	IPA
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

List _5_R

Cmp 1 inp 0	6041
Cmp 1 inp 1	6042
Cmp 1 inp 2	6043
NULL	4000
ONE	4001
Input voltage	3060
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303

Description	IPA
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _6_R

Cmp 2 inp 0	6056
Cmp 2 inp 1	6057
Cmp 2 inp 2	6058
NULL	4000
ONE	4001
Input voltage	3060
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301

Description	IPA
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _7_R

Int DC volt ref	12071
Keys +/- mon	7090
An inp output	5009
Gen output	2760

List _8_R

Int RC ref	12020
Keys +/- mon	7090
An inp output	5009
Gen output	2760

List _9_R

NULL	4000
ONE	4001
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025
B0 W0 decomp	2123
B1 W0 decomp	2124
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365

Description	IPA
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131
Precharge cmd	12114

List _16_R

NULL	4000
ONE	4001
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025

List _18_R

NULL	4000
ONE	4001
DI 0 Enable mon	4020
DI 1 monitor	4021
DI 2 monitor	4022
DI 3 monitor	4023
DI 4 monitor	4025
B0 W0 decomp	2123
B1 W0 decomp	2124

Description	IPA
B2 W0 decomp	2125
B3 W0 decomp	2126
B4 W0 decomp	2127
B5 W0 decomp	2128
B6 W0 decomp	2129
B7 W0 decomp	2130
B8 W0 decomp	2131
B9 W0 decomp	2132
B10 W0 decomp	2133
B11 W0 decomp	2134
B12 W0 decomp	2135
B13 W0 decomp	2136
B14 W0 decomp	2137
B15 W0 decomp	2138
B0 W1 decomp	9363
B1 W1 decomp	9364
B2 W1 decomp	9365
B3 W1 decomp	9366
B4 W1 decomp	9367
B5 W1 decomp	9368
B6 W1 decomp	9369
B7 W1 decomp	9370
B8 W1 decomp	9371
B9 W1 decomp	9372
B10 W1 decomp	9373
B11 W1 decomp	9374
B12 W1 decomp	9375
B13 W1 decomp	9376
B14 W1 decomp	9377
B15 W1 decomp	9378
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Dig pad 0	9116
Dig pad 1	9117
Dig pad 2	9118
Dig pad 3	9119
Dig pad 4	9120
Dig pad 5	9121
Dig pad 6	9122
Dig pad 7	9123
Dig pad 8	9124
Dig pad 9	9125
Dig pad 11	9127
Dig pad 12	9128
Dig pad 13	9129
Dig pad 14	9130
Dig pad 15	9131

List _26_R

W0 decomp inp	2121
NULL	4000
ONE	4001
Input voltage	3060

Description	IPA
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _27_R

W1 decomp inp	9360
NULL	4000
ONE	4001
Input voltage	3060

Description	IPA
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

List _28_R

Int Drv ISBus W0	9320
Int Drv ISBus W1	9321
Int Drv ISBus W2	9322
Int Drv ISBus W3	9323

Description	IPA
Int Drv ISBus W4	9324
Int Drv ISBus W5	9325
Int Drv ISBus W6	9326
Int Drv ISBus W7	9327
NULL	4000
ONE	4001
Input voltage	3060
Input current	3070
Input frequency	3080
DC link voltage	3100
Reactive current	3110
Active current	3120
Active curr ref	3140
DC link current	12005
FFwd act rms cur	12019
Active pk volt	12049
Phase U voltage	12072
Phase V voltage	12073
Phase W voltage	12074
Unbalance	12090
Overload accum	1540
Drive ready	0161
Enable SM mon	0162
ALM Sequencer	9096
Drive OK	9097
Precharge cmd	12114
Mains cmd	12115
Gen output	2760
An inp output	5009
W0 comp out	2116
W1 comp out	9356
Keys +/- mon	7090
Int RC ref	12020
Active curr lim+	1210
Active curr lim-	1220
InuseActCur lim+	1250
InuseActCur lim-	1260
SBI Drv W0 mon	9000
SBI Drv W1 mon	9001
SBI Drv W2 mon	9002
SBI Drv W3 mon	9003
SBI Drv W4 mon	9004
SBI Drv W5 mon	9005
ISBus Drv W0 mon	9300
ISBus Drv W1 mon	9301
ISBus Drv W2 mon	9302
ISBus Drv W3 mon	9303
ISBus Drv W4 mon	9304
ISBus Drv W5 mon	9305
ISBus Drv W6 mon	9306
ISBus Drv W7 mon	9307
Pad 0	9100
Pad 1	9101
Pad 2	9102
Pad 3	9103
Pad 4	9104
Pad 5	9105
Pad 6	9106
Pad 7	9107
Pad 8	9108
Pad 9	9109
Pad 11	9111
Pad 12	9112
Pad 13	9113
Pad 14	9114
Pad 15	9115

Description	IPA	Description	IPA	Description	IPA	Description	IPA

List _40_R

Int Drv SBI W0 9020
Int Drv SBI W1 9021
Int Drv SBI W2 9022
Int Drv SBI W3 9023
Int Drv SBI W4 9024
Int Drv SBI W5 9025
NULL 4000
ONE 4001
Input voltage 3060
Input current 3070
Input frequency 3080
DC link voltage 3100
Reactive current 3110
Active current 3120
Active curr ref 3140
DC link current 12005
FFwd act rms cur 12019
Active pk volt 12049
Phase U voltage 12072
Phase V voltage 12073
Phase W voltage 12074
Unbalance 12090
Overload accum 1540
Drive ready 0161
Enable SM mon 0162
ALM Sequencer 9096
Drive OK 9097
Precharge cmd 12114
Mains cmd 12115
Gen output 2760
An inp output 5009
W0 comp out 2116
W1 comp out 9356
Keys +/- mon 7090
Int RC ref 12020
Active curr lim+ 1210
Active curr lim- 1220
InuseActCur lim+ 1250
InuseActCur lim- 1260
SBI Drv W0 mon 9000
SBI Drv W1 mon 9001
SBI Drv W2 mon 9002
SBI Drv W3 mon 9003
SBI Drv W4 mon 9004
SBI Drv W5 mon 9005
ISBus Drv W0 mon 9300
ISBus Drv W1 mon 9301
ISBus Drv W2 mon 9302
ISBus Drv W3 mon 9303
ISBus Drv W4 mon 9304
ISBus Drv W5 mon 9305
ISBus Drv W6 mon 9306
ISBus Drv W7 mon 9307
Pad 0 9100
Pad 1 9101
Pad 2 9102
Pad 3 9103
Pad 4 9104
Pad 5 9105
Pad 6 9106
Pad 7 9107
Pad 8 9108
Pad 9 9109
Pad 11 9111
Pad 12 9112
Pad 13 9113
Pad 14 9114
Pad 15 9115

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