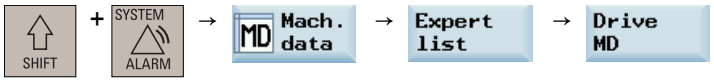
SINAMICS V70 parameters

7

7.1 Overview

The chapter below lists the parameters displayed on the BOP only. For more parameters about the servo drive, refer to SINUMERIK 808D ADVANCED HMI through the following key operations:



All parameters beginning with "p" are editable parameters, for example, p29000.

All parameters beginning with "r" are read-only parameters, for example, r0018.

Effective

Indicates the conditions for making parameterization effective. Two conditions are possible:

- IM (**Im**mediately): Parameter value becomes effective immediately after changing.
- RE (**Re**set): Parameter value becomes effective after repower-on.

Can be changed

Indicates the state in which the parameter is changeable. Two states are possible:

- **U** (R**u**n): Can be changed in the "**Running**" state. The "RDY" LED indicator lights up green.
- **T** (Ready **t**o run): Can be changed in the "**Ready**" state. The "RDY" LED indicator lights up red.

Data type

Type	Description
I16	16-bit integer
I32	32-bit integer
U16	16 bits without sign
U32	32 bits without sign
Uint16	16-bit unsigned integer
Uint32	32-bit unsigned integer
Float	32-bit floating point number

7.2 V70 parameters on BOP

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
r0020	Speed setpoint smoothed	-	-	-	rpm	Float	-	-
	Description: Displays the currently smoothed speed setpoint at the input of the speed controller or U/f characteristic (after the interpolator). Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0021	Actual speed smoothed	-	-	-	rpm	Float	-	-
	Description: Displays the smoothed actual value of the motor speed. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0026	DC link voltage smoothed	-	-	-	V	Float	-	-
	Description: Displays the smoothed actual value of the DC link voltage. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0027	Absolute actual current smoothed	-	-	-	Arms	Float	-	-
	Description: Displays the smoothed absolute actual current value. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
	Dependency: r0068							
r0029	Current actual value field-generating smoothed	-	-	-	Arms	Float	-	-
	Description: Displays the smoothed field-generating actual current. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0030	Current actual value torque-generating smoothed	-	-	-	Arms	Float	-	-
	Description: Displays the smoothed torque-generating actual current. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0031	Actual torque smoothed	-	-	-	Nm	Float	-	-
	Description: Displays the smoothed torque actual value. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							
r0032	Active power actual value smoothed	-	-	-	kW	Float	-	-
	Description: Displays the smoothed actual value of the active power. Significance for the drive: Power output at the motor shaft							
r0033	Torque utilization smoothed	-	-	-	%	Float	-	-
	Description: Displays the smoothed torque utilization as a percentage. Smoothing time constant = 100 ms The signal is not suitable as a process quantity and may only be used as a display quantity.							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
r0037[0...19]	Servo drive temperatures	-	-	-	°C	Float	-	-
	Description: Displays the temperatures in the servo drive. • [0] = Inverter, maximum value • [1] = Depletion layer maximum value • [2] = Rectifier maximum value • [3] = Air intake • [4] = Interior of servo drive • [5] = Inverter 1 • [6] = Inverter 2 • [7] = Inverter 3 • [8] = Inverter 4 • [9] = Inverter 5 • [10] = Inverter 6 • [11] = Rectifier 1 • [12] = Rectifier 2 • [13] = Depletion layer 1 • [14] = Depletion layer 2 • [15] = Depletion layer 3 • [16] = Depletion layer 4 • [17] = Depletion layer 5 • [18] = Depletion layer 6 • [19] = Cooling system liquid intake The value of -200 indicates that there is no measuring signal. • r0037[0]: Maximum value of the inverter temperatures (r0037[5...10]). • r0037[1]: Maximum value of the depletion layer temperatures (r0037[13...18]). • r0037[2]: Maximum value of the rectifier temperatures (r0037[11...12]). The maximum value is the temperature of the hottest inverter, depletion layer, or rectifier.							
r0068	Absolute current actual value	-	-	-	Arms	Float	-	-
	Description: Displays actual absolute current. For A_INF, S_INF the following applies: • The value is updated with the current controller sampling time. The following applies for SERVO: • The value is updated with a sampling time of 1 ms. • Absolute current value = sqrt(Iq^2 + Id^2) • The absolute current actual value is available smoothed (r0027) and unsmoothed (r0068).							
	Dependency: r0027							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
r0069[0...6]	Phase current actual value	-	-	-	A	Float	-	-
	Description: Displays the measured actual phase currents as peak value. • [0] = Phase U • [1] = Phase V • [2] = Phase W • [3] = Phase U offset • [4] = Phase V offset • [5] = Phase W offset • [6] = Total U, V, W In indices 3 ... 5, the offset currents of the 3 phases, which are added to correct the phase currents, are displayed. The sum of the 3 corrected phase currents is displayed in index 6.							
r0079[0...1]	Torque setpoint total	-	-	-	Nm	Float	-	-
	Description: Displays the torque setpoint at the output of the speed controller (before clock cycle interpolation). • [0]: Unsmoothed • [1]: Smoothed							
r0632	Motor temperature model, stator winding temperature	-	-	-	°C	Float	-	-
	Description: Displays the stator winding temperature of the motor temperature model.							
p0918	Drive Bus address	10	15	10	-	U16	RE	T
	Description: Displays or sets the Drive Bus address for Drive Bus interface on the servo drive. The address can be set as follows: Using p0918 • Only if the address 00 hex, 7F hex, 80 hex, or FF hex has been set using the address switch. • The address is saved in a non-volatile fashion using the function "copy from RAM to ROM". • A change only becomes effective after a POWER ON.							
p1058	Jog 1 speed setpoints	0	210000.000	100	rpm	Float	IM	T
	Description: Sets the speed/velocity for jog 1. Jogging is level-triggered and allows the motor to be incrementally moved.							
p1082	Maximum speed	0.000	210000.000	1500.000	rpm	Float	IM	T
	Description: Sets the highest possible speed.							
	Dependency: p0322							
p1083	Speed limit in positive direction of rotation	0.000	210000.000	210000.000	rpm	Float	IM	T, U
	Description: Sets the maximum speed for the positive direction.							
p1086	Speed limit in negative direction of rotation	-210000.000	0.000	-210000.000	rpm	Float	IM	T, U
	Description: Sets the speed limit for the negative direction.							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p1120	Ramp-function generator ramp-up time	0.000	999999.000	10.000	s	Float	IM	T, U
	Description: The ramp-function generator ramps-up the speed setpoint from standstill (setpoint = 0) up to the maximum speed (p1082) in this time.							
	Dependency: p1082							
p1121	Ramp-function generator ramp-down time	0.000	999999.000	10.000	s	Float	IM	T, U
	Description: The ramp-function generator ramps-down the speed setpoint from the maximum speed (p1082) down to standstill (setpoint = 0) in this time. Further, the ramp-down time is always effective for OFF1.							
	Dependency: p1082							
p1215	Motor holding brake configuration	0	3	0	-	I16	IM	T
	Description: Sets the holding brake configuration. • 0: No motor holding brake being used • 1: Motor holding brake according to sequence control • 2: Motor holding brake always open • 3: Motor holding brake like sequence control							
	Dependency: p1216, p1217, p1226, p1227, p1228							
p1216	Motor holding brake, opening time	0	10000	100	ms	Float	IM	T, U
	Description: Sets the time to open the motor holding brake. After controlling the holding brake (opens), the speed/velocity setpoint remains at zero for this time. After this, the speed/velocity setpoint is enabled. This time should be set longer than the actual opening time of the brake, which ensures that the drive cannot accelerate when the brake is applied.							
	Dependency: p1215, p1217							
p1217	Motor holding brake closing time	0	10000	100	ms	Float	IM	T, U
	Description: Sets the time to apply the motor holding brake. After OFF1 or OFF3 and the holding brake is controlled (the brake closes), then the drive remains closed-loop controlled for this time stationary with a speed setpoint/velocity setpoint of zero. The pulses are suppressed when the time expires. This time should be set longer than the actual closing time of the brake, which ensures that the pulses are only suppressed after the brake has closed.							
	Dependency: p1215, p1216							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p1226	Threshold for zero speed detection	0.00	210000.00	20.00	rpm	Float	IM	T, U
	Description: Sets the speed threshold for the standstill identification. Acts on the actual value and setpoint monitoring. • When braking with OFF1 or OFF3, when the threshold is undershot, standstill is identified. The following applies when the brake control is activated: • When the threshold is undershot, the brake control is started and the system waits for the brake closing time in p1217. The pulses are then suppressed. If the brake control is not activated, the following applies: • When the threshold is undershot, the pulses are suppressed and the drive coasts down.							
	Dependency: p1215, p1216, p1217, p1227							
p1227	Zero speed detection monitoring time	0.000	300.000	4.000	s	Float	IM	T, U
	Description: Sets the monitoring time for the standstill identification. When braking with OFF1 or OFF3, standstill is identified after this time has expired, after the setpoint speed has fallen below p1226. After this, the brake control is started, the system waits for the closing time in p1217 and then the pulses are suppressed.							
	Dependency: p1215, p1216, p1217, p1226							
p1228	Pulse suppression delay time	0.000	299.000	0.000	s	Float	IM	T, U
	Description: Sets the delay time for pulse suppression. After OFF1 or OFF3 and zero speed detection, the system waits for this time to expire and the pulses are then suppressed. Standstill is identified in the following cases: • The speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired. • The speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.							
	Dependency: p1226, p1227							
p1414	Speed setpoint filter activation	-	-	0000 bin	-	U16	IM	T, U
	Description: Setting for activating/de-activating the speed setpoint filter. If only one filter is required, filter 1 should be activated and filter 2 de-activated, to avoid excessive processing time.							
	Dependency: The individual speed setpoint filters are parameterized as of p1415.							
p1415	Speed setpoint filter 1 type	0	2	0	-	I16	IM	T, U
	Description: Sets the type for speed setpoint filter 1. • 0: Low pass: PT1 • 1: Low pass: PT2 • 2: General 2nd-order filter							
	Dependency: • PT1 low pass: p1416 • PT2 low pass: p1417, p1418 • General filter: p1417 ... p1420							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p1416	Speed setpoint filter 1 time constant	0.00	5000.00	0.00	ms	Float	IM	T, U
	Description: Sets the time constant for the speed setpoint filter 1 (PT1). This parameter is only effective if the filter is set as a PT1 low pass.							
	Dependency: p1414, p1415							
p1417	Speed setpoint filter 1 denominator natural frequency	0.5	16000.0	1999.0	Hz	Float	IM	T, U
	Description: Sets the denominator natural frequency for speed setpoint filter 1 (PT2, general filter). This parameter is only effective if the speed filter is parameterized as a PT2 low pass or as general filter. The filter is only effective if the natural frequency is less than half of the sampling frequency.							
	Dependency: p1414, p1415							
p1418	Speed setpoint filter 1 denominator damping	0.001	10.000	0.700	-	Float	IM	T, U
	Description: Sets the denominator damping for velocity setpoint filter 1 (PT2, general filter). This parameter is only effective if the speed filter is parameterized as a PT2 low pass or as general filter.							
	Dependency: p1414, p1415							
p1419	Speed setpoint filter 1 numerator natural frequency	0.5	16000.0	1999.0	Hz	Float	IM	T, U
	Description: Sets the numerator natural frequency for speed setpoint filter 1 (general filter). This parameter is only effective if the speed filter is set as a general filter. The filter is only effective if the natural frequency is less than half of the sampling frequency.							
	Dependency: p1414, p1415							
p1420	Speed setpoint filter 1 numerator damping	0.000	10.000	0.700	-	Float	IM	T, U
	Description: Sets the numerator damping for speed setpoint filter 1 (general filter). This parameter is only effective if the speed filter is set as a general filter.							
	Dependency: p1414, p1415							
p1460	Speed controller P gain adaptation speed, lower	0.000	999999.000	0.300	Nms/rad	Float	IM	T, U
	Description: Sets the P gain of the speed controller before the adaptation speed range. This value corresponds to the basic setting of the P gain of the speed controller without adaptation.							
p1462	Speed controller integral time adaptation speed lower	0.00	100000.00	20.00	ms	Float	IM	T, U
	Description: Sets the integration time of the speed controller before the adaptation speed range. This value corresponds to the basic setting of the integral time of the speed controller without adaptation.							
p1520	Torque limit upper/motoring	-10000000.00	20000000.00	0.00	Nm	Float	IM	T, U
	Description: Sets the fixed upper torque limit or the torque limit when motoring.							
	Note: Negative values when setting the upper torque limit (p1520 < 0) can result in the motor accelerating in an uncontrollable fashion. The maximum value depends on the maximum torque of the connected motor.							
	Dependency: p1521							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p1521	Torque limit lower/regenerative	-2000000.00	1000000.00	0.00	Nm	Float	IM	T, U
	Description: Sets the fixed lower torque limit or the torque limit when regenerating.							
	Note: Positive values when setting the lower torque limit (p1521 > 0) can result in the motor accelerating in an uncontrollable fashion. The maximum value depends on the maximum torque of the connected motor.							
	Dependency: p1520							
p1656	Activates current setpoint filter	-	-	0001 bin	-	U16	IM	T, U
	Description: Setting for activating/de-activating the current setpoint filter. If not all of the filters are required, then the filters should be used consecutively starting from filter 1.							
	Dependency: The individual current setpoint filters are parameterized as of p1657.							
p1657	Current setpoint filter 1 type	1	2	1	-	I16	IM	T, U
	Description: Sets the current setpoint filter 1 as low pass (PT2) or as extended general 2nd-order filter. • 1: Low pass: PT2 • 2: General 2nd-order filter							
	Dependency: Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.							
p1658	Current setpoint filter 1 denominator natural frequency	0.5	16000.0	1999.0	Hz	Float	IM	T, U
	Description: Sets the denominator natural frequency for current setpoint filter 1 (PT2, general filter).							
	Dependency: Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.							
p1659	Current setpoint filter 1 denominator damping	0.001	10.000	0.700	-	Float	IM	T, U
	Description: Sets the denominator damping for current setpoint filter 1.							
	Dependency: Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.							
p1660	Current setpoint filter 1 numerator natural frequency	0.5	16000.0	1999.0	Hz	Float	IM	T, U
	Description: Sets the numerator natural frequency for current setpoint filter 1 (general filter)							
	Dependency: Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.							
p1661	Current setpoint filter 1 numerator damping	0.000	10.000	0.700	-	Float	IM	T, U
	Description: Sets the numerator damping for current setpoint filter 1.							
	Dependency: Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.							
r2114[0...1]	System runtime total	-	-	-	-	U32	-	-
	Description: Displays the total system runtime for the drive unit. The time comprises r2114[0] (milliseconds) and r2114[1] (days). After r2114[0] has reached a value of 86.400.000 ms (24 hours) this value is reset and r2114[1] is incremented. • [0] = Milliseconds • [1] = Days							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p2153	Speed actual value filter time constant	0	1000000	0	ms	Float	IM	T, U
	Description: Sets the time constant of the PT1 element to smooth the speed/velocity actual value. The smoothed actual speed/velocity is compared with the threshold values and is only used for messages and signals.							
p29000	Motor type selection	0	54251	-	-	U16	IM	T
	Description: Motor type number is printed on the motor rating plate as motor ID. For a motor with an incremental encoder, users need to manually input the parameter value, ranging from 18 to 39. For a motor with an absolute encoder, the drive automatically reads the parameter value, ranging from 10009 to 10048.							
p29002	BOP operating display selection	0	2	0	-	U16	IM	T, U
	Description: BOP operating display selection. • 0: Actual speed • 1: DC voltage • 2: Actual torque							
r29018	Firmware-Version	-	-	-	-	U32	-	-
	Description: Firmware version.							

7.3 Drive basic list on HMI

The drive basic list on HMI contains the most frequently used drive parameters for commissioning. You can view them through the following key operations:

Drive basic list on HMI

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p0977	Save all parameters	0	1013	[0] 0	-	U16	IM	T, U
	Description: Saves all parameters of the drive system to the non-volatile memory. When saving, only the adjustable parameters intended to be saved are taken into account.							
	Dependency: p0976							
	Caution: Memory card inserted: The drive parameterization is also saved on the card. Any backed-up data is overwritten!							
	Notice: The Control Unit power supply may only be powered down after data has been saved (i.e. after data save has been started, wait until the parameter again has the value 0). Writing to parameters is inhibited while saving.							
	Note: Parameters saved with p0977 = 10, 11 or 12 can be downloaded again with p0976 = 10, 11 or 12.							
p1460[0...n]	Speed controller P gain adaptation speed lower	0.000	999999.000	0.300	Nms/rad	Float	IM	T, U
	Description: Sets the P gain of the speed controller before the adaptation speed range (0 ... p1464). This value corresponds to the basic setting of the P gain of the speed controller without adaptation (p1461 = 100 %).							
	Dependency: p1461							
	Note: When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 > 1 or p1498 > 0), you are advised to check the speed controller gain.							
p1461[0...n]	Speed controller Kp adaptation speed upper scaling	0.0	200000.0	[0] 100.0	[%]	Float	IM	T, U
	Description: Sets the P gain of the speed controller for the upper adaptation speed range (> p1465). The entry is made referred to the P gain for the lower adaptation speed range of the speed controller (% referred to p1460).							
	Dependency: p1460							
	Note: When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 > 1 or p1498 > 0), you are advised to check the speed controller gain.							
p1462	Speed controller integral time adaptation speed lower	0.00	100000.00	20.00	ms	Float	IM	T, U
	Description: Sets the integration time of the speed controller before the adaptation speed range (0 ... p1464). This value corresponds to the basic setting of the integral time of the speed controller without adaptation (p1461 = 100 %).							
	Dependency: p1463							

Par. No.	Name	Min	Max	Factory setting	Unit	Data type	Effective	Can be changed
p1821[0...n]	Direction of rotation	0	1	[0] 0	-	I16	IM	-
	Description: Setting to change the direction of rotation. If the parameter is changed, it reverses the direction of rotation of the motor and the encoder actual value without changing the setpoint.							
	Dependency: F07434							
	Caution: Changing the direction using p1820 or p1821 is not recognized by the "Safe Direction without encoder". As a consequence, the limit provided by SDI (Safe Direction) from r9733 no longer functions.							
	Notice: An appropriate fault is output for a drive data set changeover where the direction of rotation changes and the pulses are enabled.							
	Note: For operation with the phase sequence U/V/W, the direction of rotation is defined when viewing the face side of the motor output shaft. When changing the direction of rotation, the rotating field direction of the current controller is reversed. The speed actual value (e.g. r0063) is also reversed so that the control sense is kept and internally causing the direction of rotation to be reversed with the same setpoint. Further, the position actual values of the actual encoder are reversed (e.g. r0482[0...2]).							
p29000	Motor ID	0	54251	[0] 0	-	U16	IM	T
	Description: Motor type number is printed on the motor rating plate as motor ID. For a motor with an incremental encoder, users need to manually input the parameter value, ranging from 18 to 39. For a motor with an absolute encoder, the drive automatically reads the parameter value, ranging from 10009 to 10048.							
	Dependency: -							
r3998[0...n]	First drive commissioning	0	65535	-	-	U16	IM	-
	Description: Displays whether the drive still has to be commissioned for the first time. 0 = Yes 2 = No							
	Dependency: -							