N120/N125 CONTROLLER

Communication Manual – V1.1x

1. SERIAL COMMUNICATION

1.1 COMMUNICATION INTERFACE

The optional serial interface RS485 allows to address up to 247 controllers in a network communicating remotely with a host computer or master controller.

RS485 Interface

- Compatible line signals with RS485 standard
- 3 wire connection from master to up to 31 slaves indicators in a multidrop bus. It is possible address 247 nodes with multiple outputs converters.
- Maximum communication distance: 1000 meters
- The RS485 signals are:
  - D1 = D: Bidirectional data line.
  - D0 = D̄: Bidirectional inverted data line.
  - C = GND: Optional connection which left communication better.

General Characteristics

- Optically isolated serial interface
- Programmable baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 bps.
- Data Bits: 8
- Parity: None, Even or Odd.
- Stop Bits: 1

Communication Protocol

The MOSBUS RTU slave is implemented, available in most SCADA softwares in the market.

All configurable parameters can be accessed (for reading or writing) through the Registers Table. Broadcast commands are supported as well (address 0).

The available Modbus commands are:

03 - *Read Holding Register*

05 - *Force Single Coil* (Force Digital Output state)

06 - *Preset Single Register*

16 - *Preset Multiple Registers* (Block write to multiple holding registers)

The registers are arranged in a table in such a way that several registers can be read in the same request.

1.2 CONFIGURATION OF SERIAL COMMUNICATION PARAMETERS

Two parameters must be configured in the device for serial communication:

bRud: Baud rate. All devices with same baud rate.

Rddr : Device communication address. Each device must have an exclusive address.

PrtY: Paraty.

1.3 REGISTERS TABLE

Equivalent to the registers referenced as 4XXXX.

The holding registers are basically a list of the internal indicator parameters. All registers above address 12 can be read or written. The registers up to this address in more are read only. Please verify each case. Each table parameter is a 16 bits two complement signed word.

Holding Registers	Parameter	Register Description
0000	Active SP	Read: Active control SP (main SP, from ramp and soak or from remote SP). Write: to main SP Range: from **SPLL** to **SPHL**.
0001	PV	Read: Process Variable. Write: Not allowed. Range: Minimum value is the one configured in **SPLL** and the maximum value is the one configured in **SPHL**. Decimal point position depends on **dPPo** value. In case of temperature reading, the value read is always multiplied by 10, independently of **dPPo** value.
0002	MV	Read: Output Power in automatic or manual mode. Write: Not allowed. See address 28. Range: 0 to 1000 (0.0 to 100.0%).
0003	Remote SP type	Read/Write: Selected input type for remote SP. Range: 0 to 3
0004	Display value	Read: Current value shown on display. Write: Current value shown on display. Range: -1999 to 9999. The range depends on the displayed parameter.
0005	Screen number	Read: Current screen number. Write: not allowed. Range: 0000h to 060Ch Prompt number format: XXYYh, where: XX→menu cycle number (check item 4 - INSTALLATION/CONNECTIONS) YY→prompt number (index).
0006	Status Word 1	Read: Status bits. See table 2. Write: not allowed. Read values: See table 2
0007	Software Version	Read: The firmware version of controller. Write: not allowed. Read values: If V1.00, the read value will be 100.
0008	ID	Read: controller identification number. Write: not allowed. Values: 32 – N120 Controller 37 – N125 Other values: special instruments.
0009	Status Word 2	Read: Status bits. Write: not allowed. Read values: See table 2.
0010	Status Word 3	Read: Status bits. Write: not allowed. Read values: See table 2.
0011	**Ir**	Integral Rate (in repetitions/min) Range: 0 to 9999 (0.00 to 99.99)
0012	**dt**	Derivative Time (in seconds). Range: 0 to 3000 (0.0 to 300.0)
0013	**Pb**	Proportional Band (in percentage) Range: 0 to 5000 (0.0 to 500.0)
0014	**tbRS**	Read/Write: Time base for the ramp and soak programs. Range: 0 – 1 (seconds/minutes)
0015	**ct**	Cycle Time (PWM, in seconds) Range: 5 to 1000 (0.5 to 100.0)
0016	**FrE9**	Read/Write: Mains frequency. Range: 0 – 1 (60/50Hz)
0017	**HYSt**	On/Off Control Hysteresis (in selected type engineering unit). Range: 0 to **SPHL** - **SPLL**
0018	**FLtr**	Read/Write: PV digital filter gain. Range: 0 – 20
0019	**ouLL**	Output Low Limit (minimum output power) Range: 0 to 1000 (0.0 to 100.0%).
0020	**ouHL**	Output High Limit (minimum output power) Range: 0 to 1000 (0.0 to 100.0%).
0021	Reserved	Internal use.
0022	Reserved	Internal use.

0023	Serial number H	Serial Number High (Upper display). Range: 0 to 9999. Read only.
0024	Serial number L	Serial Number Low (Lower display). Range: 0 to 9999. Read only.
0025	SV	Control *Setpoint* (Prompt *Setpoint*). Range: from **SPLL** to **SPHL**.
0026	**SPLL**	*Setpoint* Low limit. Range: minimum value depends on the input type selected in **tYPE** (see Table 1) to **SPHL**.
0027	**SPHL**	*Setpoint* High limit. Range: minimum value is **SPLL** and maximum depends on the input type selected in **tYPE** (see Table 1).
0028	Reserved	Internal use.
0029	**oFFS**	Offset value of PV(Process value). Range: from **SPLL** to **SPHL**.
0030	**dPPo**	PV decimal point position. Range: 0 to 3. $0\rightarrow0.000$; $1\rightarrow00.00$; $2\rightarrow000.0$; $3\rightarrow0000$
0031	**SP.A1**	Alarm 1 Setpoint. Range: From **SPLL** to **SPHL** for non differential; and **SPHL - SPLL** for differential alarm.
0032	**SP.A2**	Alarm 2 Setpoint. Range: same as in **SP.A1**.
0033	**SP.A3**	Alarm 3 Setpoint. Range: same as in **SP.A1**.
0034	**SP.A4**	Alarm 4 Setpoint. Range: same as in **SP.A1**.
0035	**FuA1**	Alarm 1 Function. Range: 0 to 8
0036	**FuA2**	$0 \rightarrow$ **oFF** $1 \rightarrow$ **IErr** $2 \rightarrow$ **t.End** $3 \rightarrow$ **rS**
0037	**FuA3**	$4 \rightarrow$ **Lo** $5 \rightarrow$ **H1** $6 \rightarrow$ **dIF**
0038	**FuA4**	$7 \rightarrow$ **dIFL**; $8 \rightarrow$ **dIFH**;
0039	**HYA1**	Alarm 1 Hysteresis. Range: 0 to 9999 (0.00 to 99.99%)
0040	**HYA2**	Alarm 2 Hysteresis. Range: same as in **HYA1**.
0041	**HYA3**	Alarm 3 Hysteresis. Range: same as in **HYA1**.
0042	**HYA4**	Alarm 4 Hysteresis. Range: same as in **HYA1**.
0043	**tYPE**	PV input type: 0 = J, 1 = K, 2 = T, 3 = N, 4 = R, 5 = S, 6 = B, 7 = E, 8 = Pt100, 9 = 0-20 mA, 10 = 4-20 mA, 11 = 0-50 mV, 12 = 0-5 V, 13 = 0-10 V
0044	**Addr**	Communication slave address. Range: 1 to 247
0045	**bAud**	*Communication Baud-Rate*: $0\rightarrow1200$;$1\rightarrow2400$;$2\rightarrow4800$;$3\rightarrow9600$; $4\rightarrow19200$; $5\rightarrow38400$; $6\rightarrow57600$; $7\rightarrow115200$;

0046	**Auto**	Control Mode. Range: $0\rightarrow$manual; $1\rightarrow$automatic.
0047	**run**	Enable control. Range: $0\rightarrow$no; $1\rightarrow$yes.
0048	**Act**	Control action. Range: $0\rightarrow$direct; $1\rightarrow$reverse.
0049	**Atun**	Auto tune enable: 0= off;1= Fast; 2= Full; 3= Self; 4= rSLF; 5= tGHt;
0050	**bLA1**	Alarm power-up inhibit. Range: $0\rightarrow$no; $1\rightarrow$yes.
0051	**bLA2**	
0052	**bLA3**	
0053	**bLA4**	
0054	Key	Key press remote action. Range: 0 to 9. 1: tecla P, 2: tecla ∧, 4: tecla ∨, 8: tecla B, 9: teclas P e B
0062	**A1t1**	Alarm 1 Time 1. Range: 0 to 6500s. Refer to operation manual for more details.
0063	**A1t2**	Alarm 1 Time 2 (in seconds). Range: same as in **A1t1**.
0064	**A2t1**	Alarm 2 Time 1 (in seconds). Range: same as in **A1t1**.
0065	**A2t2**	Alarm 2 Time 2 (in seconds). Range: same as in **A1t1**.
0066	**SFSt**	Soft-Start time (in seconds). Range: 0 to 9999
0067	**unit**	Temperature unit. Range: 0 to 1. $0\rightarrow$°C; $1\rightarrow$°F.
0068	**bIAS**	Bias. Range: -100 to +100%.
0070	R&S Segment	Ramp and Soak segment being executed (read only). Range: 0 to 9.
0071	**Pr n**	Ramp and Soak segment to be viewed or edited. Range: 1 to 20.
0072	**E Pr**	Ramp and Soak segment to be executed. Range: 0 to 20.
0073	Remaining time R&S	Indicates the remaining time of the Ramp and Soak segment.
0074	**S9rt**	Square root of a linear input. Range: 0->Disable;1->Enable.
0075	Calibration PV Low	Enter the low input value currently applied in the PV input for calibration purposes.
0076	Calibration PV High	Enter the high input value currently applied in the PV input for calibration purposes.
0077	Calib. remote SP Low	Enter the low input value currently applied in the remote setpoint input for calibration purposes.
0078	Calib. remote SP High	Enter the high input value currently applied in the remote setpoint input for calibration purposes.
0081	**FLSh**	Enables the top display blinking as a function of the selected alarm: 0-> Disable, 1-> Enable to alarm 1, 2-> Enable to alarm 2, 3-> Enable to alarm 1 and 2
0086	**rStr**	Restores original default calibration. Range: 0 to 1; 0-> do not restore; 1-> restore calibration

0087	PASS	Write: 0
0089	Prty	Serial communication parity. 0-> no parity; 1 - > even parity; 2 - >odd parity;
0090	ctYP	Customized input type.
0091	tiME	Timer set value.
0092	rAtE	Maximum rate of PV.
0093	Reserved	Internal use
0094	Fud1	Digital input function: 0 – oFF 1 – iiAn 2 – rUn 3 – HPrG 4 - Pr1
0100	PE1	Segment 1 Event of R&S Program 1. Range: 0 to 15. Check table 6 of the instruction manual.
0101	PE2	Segment 2 Event of R&S Program 1. Range: same as in PE1
0102	PE3	Segment 3 Event of R&S Program 1. Range: same as in PE1.
0103	PE4	Segment 4 Event of R&S Program 1. Range: same as in PE1.
0104	PE5	Segment 5 Event of R&S Program 1. Range: same as in PE1.
0105	PE6	Segment 6 Event of R&S Program 1. Range: same as in PE1.
0106	PE7	Segment 7 Event of R&S Program 1. Range: same as in PE1.
0107	PE8	Segment 8 Event of R&S Program 1. Range: same as in PE1.
0108	PE9	Segment 9 Event of R&S Program 1. Range: same as in PE1.
0109	PE1	Segment 1 Event of R&S Program 2. Range: same as in PE1 of Program 1.
0110	PE2	Segment 2 Event of R&S Program 2. Range: same as in PE1.
0111	PE3	Segment 3 Event of R&S Program 2. Range: same as in PE1.
0112	PE4	Segment 4 Event of R&S Program 2. Range: same as in PE1.
0113	PE5	Segment 5 Event of R&S Program 2. Range: same as in PE1.
0114	PE6	Segment 6 Event of R&S Program 2. Range: same as in PE1.
0115	PE7	Segment 7 Event of R&S Program 2. Range: same as in PE1.
0116	PE8	Segment 8 Event of R&S Program 2. Range: same as in PE1.
0117	PE9	Segment 9 Event of R&S Program 2. Range: same as in PE1.

0119	PE1	Segment 1 Event of R&S Program 3. Range: same as in PE1 of Program 1.
0120	PE2	Segment 2 Event of R&S Program 3. Range: same as in PE1.
0118	PE3	Segment 3 Event of R&S Program 3. Range: same as in PE1.
0121	PE4	Segment 4 Event of R&S Program 3. Range: same as in PE1.
0122	PE5	Segment 5 Event of R&S Program 3. Range: same as in PE1.
0123	PE6	Segment 6 Event of R&S Program 3. Range: same as in PE1.
0124	PE7	Segment 7 Event of R&S Program 3. Range: same as in PE1.
0125	PE8	Segment 8 Event of R&S Program 3. Range: same as in PE1.
0126	PE9	Segment 9 Event of R&S Program 3. Range: same as in PE1.
0127	PE1	Segment 1 Event of R&S Program 4. Range: same as in PE1 of Program 1.
0128	PE2	Segment 2 Event of R&S Program 4. Range: same as in PE1.
0129	PE3	Segment 3 Event of R&S Program 4. Range: same as in PE1.
0130	PE4	Segment 4 Event of R&S Program 4. Range: same as in PE1.
0131	PE5	Segment 5 Event of R&S Program 4. Range: same as in PE1.
0132	PE6	Segment 6 Event of R&S Program 4. Range: same as in PE1.
0133	PE7	Segment 7 Event of R&S Program 4. Range: same as in PE1.
0134	PE8	Segment 8 Event of R&S Program 4. Range: same as in PE1.
0135	PE9	Segment 9 Event of R&S Program 4. Range: same as in PE1.
0136	PE1	Segment 1 Event of R&S Program 5. Range: same as in PE1 of Program 1.
0137	PE2	Segment 2 Event of R&S Program 5. Range: same as in PE1.
0138	PE3	Segment 3 Event of R&S Program 5. Range: same as in PE1.
0139	PE4	Segment 4 Event of R&S Program 5. Range: same as in PE1.
0140	PE5	Segment 5 Event of R&S Program 5. Range: same as in PE1.
0141	PE6	Segment 6 Event of R&S Program 5. Range: same as in PE1.
0142	PE7	Segment 7 Event of R&S Program 5. Range: same as in PE1.

0143	PE8	Segment 8 Event of R&S Program 5. Range: same as in PE1.	0168	PE6	Segment 6 Event of R&S Program 8. Range: same as in PE1.
0144	PE9	Segment 9 Event of R&S Program 5. Range: same as in PE1.	0169	PE7	Segment 7 Event of R&S Program 8. Range: same as in PE1.
0145	PE1	Segment 1 Event of R&S Program 6. Range: same as in PE1.	0170	PE8	Segment 8 Event of R&S Program 8. Range: same as in PE1.
0146	PE2	Segment 2 Event of R&S Program 6. Range: same as in PE1.	0171	PE9	Segment 9 Event of R&S Program 8. Range: same as in PE1.
0147	PE3	Segment 3 Event of R&S Program 6. Range: same as in PE1.	0172	PE1	Segment 1 Event of R&S Program 9. Range: same as in PE1 of Program 1.
0148	PE4	Segment 4 Event of R&S Program 6. Range: same as in PE1.	0173	PE2	Segment 2 Event of R&S Program 9. Range: same as in PE1.
0149	PE5	Segment 5 Event of R&S Program 6. Range: same as in PE1.	0174	PE3	Segment 3 Event of R&S Program 9. Range: same as in PE1.
0150	PE6	Segment 6 Event of R&S Program 6. Range: same as in PE1.	0175	PE4	Segment 4 Event of R&S Program 9. Range: same as in PE1.
0151	PE7	Segment 7 Event of R&S Program 6. Range: same as in PE1.	0176	PE5	Segment 5 Event of R&S Program 9. Range: same as in PE1.
0152	PE8	Segment 8 Event of R&S Program 6. Range: same as in PE1.	0177	PE6	Segment 6 Event of R&S Program 9. Range: same as in PE1.
0153	PE9	Segment 9 Event of R&S Program 6. Range: same as in PE1.	0178	PE7	Segment 7 Event of R&S Program 9. Range: same as in PE1.
0154	PE1	Segment 1 Event of R&S Program 7. Range: same as in PE1 for Program 1.	0179	PE8	Segment 8 Event of R&S Program 9. Range: same as in PE1.
0155	PE2	Segment 2 Event of R&S Program 7. Range: same as in PE1.	0180	PE9	Segment 9 Event of R&S Program 9. Range: same as in PE1.
0156	PE3	Segment 3 Event of R&S Program 7. Range: same as in PE1.	0181	PE1	Segment 1 Event of R&S Program 10. Range: same as in PE1 of Program 1.
0157	PE4	Segment 4 Event of R&S Program 7. Range: same as in PE1.	0182	PE2	Segment 2 Event of R&S Program 10. Range: same as in PE1.
0158	PE5	Segment 5 Event of R&S Program 7. Range: same as in PE1.	0183	PE3	Segment 3 Event of R&S Program 10. Range: same as in PE1.
0159	PE6	Segment 6 Event of R&S Program 7. Range: same as in PE1.	0184	PE4	Segment 4 Event of R&S Program 10. Range: same as in PE1.
0160	PE7	Segment 7 Event of R&S Program 7. Range: same as in PE1.	0185	PE5	Segment 5 Event of R&S Program 10. Range: same as in PE1.
0161	PE8	Segment 8 Event of R&S Program 7. Range: same as in PE1.	0186	PE6	Segment 6 Event of R&S Program 10. Range: same as in PE1.
0162	PE9	Segment 9 Event of R&S Program 7. Range: same as in PE1.	0187	PE7	Segment 7 Event of R&S Program 10. Range: same as in PE1.
0163	PE1	Segment 1 Event of R&S Program 8. Range: same as in PE1 of Program 1.	0188	PE8	Segment 8 Event of R&S Program 10. Range: same as in PE1.
0164	PE2	Segment 2 Event of R&S Program 8. Range: same as in PE1.	0189	PE9	Segment 9 Event of R&S Program 10. Range: same as in PE1.
0165	PE3	Segment 3 Event of R&S Program 8. Range: same as in PE1.	0190	PE1	Segment 1 Event of R&S Program 11. Range: same as in PE1 of Program 1.
0166	PE4	Segment 4 Event of R&S Program 8. Range: same as in PE1.	0191	PE2	Segment 2 Event of R&S Program 11. Range: same as in PE1.
0167	PE5	Segment 5 Event of R&S Program 8. Range: same as in PE1.	0192	PE3	Segment 3 Event of R&S Program 11. Range: same as in PE1.

0193	PE4	Segment 4 Event of R&S Program 11. Range: same as in PE1.	0218	PE2	Segment 2 Event of R&S Program 14. Range: same as in PE1.
0194	PE5	Segment 5 Event of R&S Program 11. Range: same as in PE1.	0219	PE3	Segment 3 Event of R&S Program 14. Range: same as in PE1.
0195	PE6	Segment 6 Event of R&S Program 11. Range: same as in PE1.	0220	PE4	Segment 4 Event of R&S Program 14. Range: same as in PE1.
0196	PE7	Segment 7 Event of R&S Program 11. Range: same as in PE1.	0221	PE5	Segment 5 Event of R&S Program 14. Range: same as in PE1.
0197	PE8	Segment 8 Event of R&S Program 11. Range: same as in PE1.	0222	PE6	Segment 6 Event of R&S Program 14. Range: same as in PE1.
0198	PE9	Segment 9 Event of R&S Program 11. Range: same as in PE1.	0223	PE7	Segment 7 Event of R&S Program 14. Range: same as in PE1.
0199	PE1	Segment 1 Event of R&S Program 12. Range: same as in PE1 of Program 1.	0224	PE8	Segment 8 Event of R&S Program 14. Range: same as in PE1.
0200	PE2	Segment 2 Event of R&S Program 12. Range: same as in PE1.	0225	PE9	Segment 9 Event of R&S Program 14. Range: same as in PE1.
0201	PE3	Segment 3 Event of R&S Program 12. Range: same as in PE1.	0226	PE1	Segment 1 Event of R&S Program 15. Range: same as in PE1 of Program 1.
0202	PE4	Segment 4 Event of R&S Program 12. Range: same as in PE1.	0227	PE2	Segment 2 Event of R&S Program 15. Range: same as in PE1.
0203	PE5	Segment 5 Event of R&S Program 12. Range: same as in PE1.	0228	PE3	Segment 3 Event of R&S Program 15. Range: same as in PE1.
0204	PE6	Segment 6 Event of R&S Program 12. Range: same as in PE1.	0229	PE4	Segment 4 Event of R&S Program 15. Range: same as in PE1.
0205	PE7	Segment 7 Event of R&S Program 12. Range: same as in PE1.	0230	PE5	Segment 5 Event of R&S Program 15. Range: same as in PE1.
0206	PE8	Segment 8 Event of R&S Program 12. Range: same as in PE1.	0231	PE6	Segment 6 Event of R&S Program 15. Range: same as in PE1.
0207	PE9	Segment 9 Event of R&S Program 12. Range: same as in PE1.	0232	PE7	Segment 7 Event of R&S Program 15. Range: same as in PE1.
0208	PE1	Segment 1 Event of R&S Program 13. Range: same as in PE1 of Program 1.	0233	PE8	Segment 8 Event of R&S Program 15. Range: same as in PE1.
0209	PE2	Segment 2 Event of R&S Program 13. Range: same as in PE1.	0234	PE9	Segment 9 Event of R&S Program 15. Range: same as in PE1.
0210	PE3	Segment 3 Event of R&S Program 13. Range: same as in PE1.	0235	PE1	Segment 1 Event of R&S Program 16. Range: same as in PE1 of Program 1.
0211	PE4	Segment 4 Event of R&S Program 13. Range: same as in PE1.	0236	PE2	Segment 2 Event of R&S Program 16. Range: same as in PE1.
0212	PE5	Segment 5 Event of R&S Program 13. Range: same as in PE1.	0237	PE3	Segment 3 Event of R&S Program 16. Range: same as in PE1.
0213	PE6	Segment 6 Event of R&S Program 13. Range: same as in PE1.	0238	PE4	Segment 4 Event of R&S Program 16. Range: same as in PE1.
0214	PE7	Segment 7 Event of R&S Program 13. Range: same as in PE1.	0239	PE5	Segment 5 Event of R&S Program 16. Range: same as in PE1.
0215	PE8	Segment 8 Event of R&S Program 13. Range: same as in PE1.	0240	PE6	Segment 6 Event of R&S Program 16. Range: same as in PE1.
0216	PE9	Segment 9 Event of R&S Program 13. Range: same as in PE1.	0241	PE7	Segment 7 Event of R&S Program 16. Range: same as in PE1.
0217	PE1	Segment 1 Event of R&S Program 14. Range: same as in PE1 of Program 1.	0242	PE8	Segment 8 Event of R&S Program 16. Range: same as in PE1.

0243	PE9	Segment 9 Event of R&S Program 16. Range: same as in PE1.
0244	PE1	Segment 1 Event of R&S Program 17. Range: same as in PE1 of Program 1.
0245	PE2	Segment 2 Event of R&S Program 17. Range: same as in PE1.
0246	PE3	Segment 3 Event of R&S Program 17. Range: same as in PE1.
0247	PE4	Segment 4 Event of R&S Program 17. Range: same as in PE1.
0248	PE5	Segment 5 Event of R&S Program 17. Range: same as in PE1.
0249	PE6	Segment 6 Event of R&S Program 17. Range: same as in PE1.
0250	PE7	Segment 7 Event of R&S Program 17. Range: same as in PE1.
0251	PE8	Segment 8 Event of R&S Program 17. Range: same as in PE1.
0252	PE9	Segment 9 Event of R&S Program 17. Range: same as in PE1.
0253	PE1	Segment 1 Event of R&S Program 18. Range: same as in PE1 of Program 1.
0254	PE2	Segment 2 Event of R&S Program 18. Range: same as in PE1.
0255	PE3	Segment 3 Event of R&S Program 18. Range: same as in PE1.
0256	PE4	Segment 4 Event of R&S Program 18. Range: same as in PE1.
0257	PE5	Segment 5 Event of R&S Program 18. Range: same as in PE1.
0258	PE6	Segment 6 Event of R&S Program 18. Range: same as in PE1.
0259	PE7	Segment 7 Event of R&S Program 18. Range: same as in PE1.
0260	PE8	Segment 8 Event of R&S Program 18. Range: same as in PE1.
0261	PE9	Segment 9 Event of R&S Program 18. Range: same as in PE1.
0262	PE1	Segment 1 Event of R&S Program 19. Range: same as in PE1 of Program 1.
0263	PE2	Segment 2 Event of R&S Program 19. Range: same as in PE1.
0264	PE3	Segment 3 Event of R&S Program 19. Range: same as in PE1.
0265	PE4	Segment 4 Event of R&S Program 19. Range: same as in PE1.
0266	PE5	Segment 5 Event of R&S Program 19. Range: same as in PE1.
0267	PE6	Segment 6 Event of R&S Program 19. Range: same as in PE1.
0268	PE7	Segment 7 Event of R&S Program 19. Range: same as in PE1.
0269	PE8	Segment 8 Event of R&S Program 19. Range: same as in PE1.
0270	PE9	Segment 9 Event of R&S Program 19. Range: same as in PE1.
0271	PE1	Segment 1 Event of R&S Program 20. Range: same as in PE1 of Program 1.
0272	PE2	Segment 2 Event of R&S Program 20. Range: same as in PE1.
0273	PE3	Segment 3 Event of R&S Program 20. Range: same as in PE1.
0274	PE4	Segment 4 Event of R&S Program 20. Range: same as in PE1.
0275	PE5	Segment 5 Event of R&S Program 20. Range: same as in PE1.
0276	PE6	Segment 6 Event of R&S Program 20. Range: same as in PE1.
0277	PE7	Segment 7 Event of R&S Program 20. Range: same as in PE1.
0278	PE8	Segment 8 Event of R&S Program 20. Range: same as in PE1.
0279	PE9	Segment 9 Event of R&S Program 20. Range: same as in PE1.
0280	PtoL	R&S Program 1 Tolerance Range: From 0 to (SPHL - SPLL).
0281	PtoL	R&S Program 2 Tolerance Range: From 0 to (SPHL - SPLL).
0282	PtoL	R&S Program 3 Tolerance Range: From 0 to (SPHL - SPLL).
0283	PtoL	R&S Program 4 Tolerance Range: From 0 to (SPHL - SPLL).
0284	PtoL	R&S Program 5 Tolerance Range: From 0 to (SPHL - SPLL).
0285	PtoL	R&S Program 6 Tolerance Range: From 0 to (SPHL - SPLL).
0286	PtoL	R&S Program 7 Tolerance Range: From 0 to (SPHL - SPLL).
0287	PtoL	R&S Program 8 Tolerance Range: From 0 to (SPHL - SPLL).
0288	PtoL	R&S Program 9 Tolerance Range: From 0 to (SPHL - SPLL).
0289	PtoL	R&S Program 10 Tolerance Range: From 0 to (SPHL - SPLL).
0290	PtoL	R&S Program 11 Tolerance Range: From 0 to (SPHL - SPLL).
0291	PtoL	R&S Program 12 Tolerance Range: From 0 to (SPHL - SPLL).
0292	PtoL	R&S Program 13 Tolerance Range: From 0 to (SPHL - SPLL).

0293	PtoL	R&S Program 14 Tolerance Range: From 0 to (SPYL - SPLL).
0294	PtoL	R&S Program 15 Tolerance Range: From 0 to (SPYL - SPLL).
0295	PtoL	R&S Program 16 Tolerance Range: From 0 to (SPYL - SPLL).
0296	PtoL	R&S Program 17 Tolerance Range: From 0 to (SPYL - SPLL).
0297	PtoL	R&S Program 18 Tolerance Range: From 0 to (SPYL - SPLL).
0298	PtoL	R&S Program 19 Tolerance Range: From 0 to (SPYL - SPLL).
0299	PtoL	R&S Program 20 Tolerance Range: From 0 to (SPYL - SPLL).
0300	LP	R&S Program 1 Link. Range: 0 to 20.
0301	LP	R&S Program 2 Link. Range: 0 to 20.
0302	LP	R&S Program 3 Link. Range: 0 to 20.
0303	LP	R&S Program 4 Link. Range: 0 to 20.
0304	LP	R&S Program 5 Link. Range: 0 to 20.
0305	LP	R&S Program 6 Link. Range: 0 to 20.
0306	LP	R&S Program 7 Link. Range: 0 to 20.
0307	LP	R&S Program 8 Link. Range: 0 to 20.
0308	LP	R&S Program 9 Link. Range: 0 to 20.
0309	LP	R&S Program 10 Link. Range: 0 to 20.
0310	LP	R&S Program 11 Link. Range: 0 to 20.
0311	LP	R&S Program 12 Link. Range: 0 to 20.
0312	LP	R&S Program 13 Link. Range: 0 to 20.
0313	LP	R&S Program 14 Link. Range: 0 to 20.
0314	LP	R&S Program 15 Link. Range: 0 to 20.
0315	LP	R&S Program 16 Link. Range: 0 to 20.
0316	LP	R&S Program 17 Link. Range: 0 to 20.
0317	LP	R&S Program 18 Link. Range: 0 to 20.

0318	LP	R&S Program 19 Link. Range: 0 to 20.
0319	LP	R&S Program 20 Link. Range: 0 to 20.
0320	Pt 1	Time 1 of Program 1. Range: 0 to 9999 minutes.
0321	Pt2	Time 2 of Program 1. Range: 0 to 9999 minutes.
0322	Pt3	Time 3 of Program 1. Range: 0 to 9999 minutes.
0323	Pt4	Time 4 of Program 1. Range: 0 to 9999 minutes.
0324	Pt5	Time 5 of Program 1. Range: 0 to 9999 minutes.
0325	Pt6	Time 6 of Program 1. Range: 0 to 9999 minutes.
0326	Pt7	Time 7 of Program 1. Range: 0 to 9999 minutes.
0327	Pt8	Time 8 of Program 1. Range: 0 to 9999 minutes.
0328	Pt9	Time 9 of Program 1. Range: 0 to 9999 minutes.
0329	Pt 1	Time 1 of Program 2. Range: 0 to 9999 minutes.
0330	Pt2	Time 2 of Program 2. Range: 0 to 9999 minutes.
0331	Pt3	Time 3 of Program 2. Range: 0 to 9999 minutes.
0332	Pt4	Time 4 of Program 2. Range: 0 to 9999 minutes.
0333	Pt5	Time 5 of Program 2. Range: 0 to 9999 minutes.
0334	Pt6	Time 6 of Program 2. Range: 0 to 9999 minutes.
0335	Pt7	Time 7 of Program 2. Range: 0 to 9999 minutes.
0336	Pt8	Time 8 of Program 2. Range: 0 to 9999 minutes.
0337	Pt9	Time 9 of Program 2. Range: 0 to 9999 minutes.
0338	Pt 1	Time 1 of Program 3. Range: 0 to 9999 minutes.
0339	Pt2	Time 2 of Program 3. Range: 0 to 9999 minutes.
0340	Pt3	Time 3 of Program 3. Range: 0 to 9999 minutes.
0341	Pt4	Time 4 of Program 3. Range: 0 to 9999 minutes.
0342	Pt5	Time 5 of Program 3. Range: 0 to 9999 minutes.
0343	Pt6	Time 6 of Program 3. Range: 0 to 9999 minutes.
0344	Pt7	Time 7 of Program 3. Range: 0 to 9999 minutes.
0345	Pt8	Time 8 of Program 3. Range: 0 to 9999 minutes.
0346	Pt9	Time 9 of Program 3. Range: 0 to 9999 minutes.
0347	Pt 1	Time 1 of Program 4. Range: 0 to 9999 minutes.
0348	Pt2	Time 2 of Program 4. Range: 0 to 9999 minutes.
0349	Pt3	Time 3 of Program 4. Range: 0 to 9999 minutes.
0350	Pt4	Time 4 of Program 4. Range: 0 to 9999 minutes.
0351	Pt5	Time 5 of Program 4. Range: 0 to 9999 minutes.
0352	Pt6	Time 6 of Program 4. Range: 0 to 9999 minutes.
0353	Pt7	Time 7 of Program 4. Range: 0 to 9999 minutes.
0354	Pt8	Time 8 of Program 4. Range: 0 to 9999 minutes.
0355	Pt9	Time 9 of Program 4. Range: 0 to 9999 minutes.
0356	Pt 1	Time 1 of Program 5. Range: 0 to 9999 minutes.
0357	Pt2	Time 2 of Program 5. Range: 0 to 9999 minutes.
0358	Pt3	Time 3 of Program 5. Range: 0 to 9999 minutes.
0359	Pt4	Time 4 of Program 5. Range: 0 to 9999 minutes.
0360	Pt5	Time 5 of Program 5. Range: 0 to 9999 minutes.
0361	Pt6	Time 6 of Program 5. Range: 0 to 9999 minutes.
0362	Pt7	Time 7 of Program 5. Range: 0 to 9999 minutes.

0363	Pt8	Time 8 of Program 5. Range: 0 to 9999 minutes.	0410	Pt1	Time 1 of Program 11. Range: 0 to 9999 minutes.
0364	Pt9	Time 9 of Program 5. Range: 0 to 9999 minutes.	0411	Pt2	Time 2 of Program 11. Range: 0 to 9999 minutes.
0365	Pt1	Time 1 of Program 6. Range: 0 to 9999 minutes.	0412	Pt3	Time 3 of Program 11. Range: 0 to 9999 minutes.
0366	Pt2	Time 2 of Program 6. Range: 0 to 9999 minutes.	0413	Pt4	Time 4 of Program 11. Range: 0 to 9999 minutes.
0367	Pt3	Time 3 of Program 6. Range: 0 to 9999 minutes.	0414	Pt5	Time 5 of Program 11. Range: 0 to 9999 minutes.
0368	Pt4	Time 4 of Program 6. Range: 0 to 9999 minutes.	0415	Pt6	Time 6 of Program 11. Range: 0 to 9999 minutes.
0369	Pt5	Time 5 of Program 6. Range: 0 to 9999 minutes.	0416	Pt7	Time 7 of Program 11. Range: 0 to 9999 minutes.
0370	Pt6	Time 6 of Program 6. Range: 0 to 9999 minutes.	0417	Pt8	Time 8 of Program 11. Range: 0 to 9999 minutes.
0371	Pt7	Time 7 of Program 6. Range: 0 to 9999 minutes.	0418	Pt9	Time 9 of Program 11. Range: 0 to 9999 minutes.
0372	Pt8	Time 8 of Program 6. Range: 0 to 9999 minutes.	0419	Pt1	Time 1 of Program 12. Range: 0 to 9999 minutes.
0373	Pt9	Time 9 of Program 6. Range: 0 to 9999 minutes.	0420	Pt2	Time 2 of Program 12. Range: 0 to 9999 minutes.
0374	Pt1	Time 1 of Program 7. Range: 0 to 9999 minutes.	0421	Pt3	Time 3 of Program 12. Range: 0 to 9999 minutes.
0375	Pt2	Time 2 of Program 7. Range: 0 to 9999 minutes.	0422	Pt4	Time 4 of Program 12. Range: 0 to 9999 minutes.
0376	Pt3	Time 3 of Program 7. Range: 0 to 9999 minutes.	0423	Pt5	Time 5 of Program 12. Range: 0 to 9999 minutes.
0377	Pt4	Time 4 of Program 7. Range: 0 to 9999 minutes.	0424	Pt6	Time 6 of Program 12. Range: 0 to 9999 minutes.
0378	Pt5	Time 5 of Program 7. Range: 0 to 9999 minutes.	0425	Pt7	Time 7 of Program 12. Range: 0 to 9999 minutes.
0379	Pt6	Time 6 of Program 7. Range: 0 to 9999 minutes.	0426	Pt8	Time 8 of Program 12. Range: 0 to 9999 minutes.
0380	Pt7	Time 7 of Program 7. Range: 0 to 9999 minutes.	0427	Pt9	Time 9 of Program 12. Range: 0 to 9999 minutes.
0381	Pt8	Time 8 of Program 7. Range: 0 to 9999 minutes.	0428	Pt1	Time 1 of Program 13. Range: 0 to 9999 minutes.
0382	Pt9	Time 9 of Program 7. Range: 0 to 9999 minutes.	0429	Pt2	Time 2 of Program 13. Range: 0 to 9999 minutes.
0383	Pt1	Time 1 of Program 8. Range: 0 to 9999 minutes.	0430	Pt3	Time 3 of Program 13. Range: 0 to 9999 minutes.
0384	Pt2	Time 2 of Program 8. Range: 0 to 9999 minutes.	0431	Pt4	Time 4 of Program 13. Range: 0 to 9999 minutes.
0385	Pt3	Time 3 of Program 8. Range: 0 to 9999 minutes.	0432	Pt5	Time 5 of Program 13. Range: 0 to 9999 minutes.
0386	Pt4	Time 4 of Program 8. Range: 0 to 9999 minutes.	0433	Pt6	Time 6 of Program 13. Range: 0 to 9999 minutes.
0387	Pt5	Time 5 of Program 8. Range: 0 to 9999 minutes.	0434	Pt7	Time 7 of Program 13. Range: 0 to 9999 minutes.
0388	Pt6	Time 6 of Program 8. Range: 0 to 9999 minutes.	0435	Pt8	Time 8 of Program 13. Range: 0 to 9999 minutes.
0389	Pt7	Time 7 of Program 8. Range: 0 to 9999 minutes.	0436	Pt9	Time 9 of Program 13. Range: 0 to 9999 minutes.
0390	Pt8	Time 8 of Program 8. Range: 0 to 9999 minutes.	0437	Pt1	Time 1 of Program 14. Range: 0 to 9999 minutes.
0391	Pt9	Time 9 of Program 8. Range: 0 to 9999 minutes.	0438	Pt2	Time 2 of Program 14. Range: 0 to 9999 minutes.
0392	Pt1	Time 1 of Program 9. Range: 0 to 9999 minutes.	0439	Pt3	Time 3 of Program 14. Range: 0 to 9999 minutes.
0393	Pt2	Time 2 of Program 9. Range: 0 to 9999 minutes.	0440	Pt4	Time 4 of Program 14. Range: 0 to 9999 minutes.
0394	Pt3	Time 3 of Program 9. Range: 0 to 9999 minutes.	0441	Pt5	Time 5 of Program 14. Range: 0 to 9999 minutes.
0395	Pt4	Time 4 of Program 9. Range: 0 to 9999 minutes.	0442	Pt6	Time 6 of Program 14. Range: 0 to 9999 minutes.
0396	Pt5	Time 5 of Program 9. Range: 0 to 9999 minutes.	0443	Pt7	Time 7 of Program 14. Range: 0 to 9999 minutes.
0397	Pt6	Time 6 of Program 9. Range: 0 to 9999 minutes.	0444	Pt8	Time 8 of Program 14. Range: 0 to 9999 minutes.
0398	Pt7	Time 7 of Program 9. Range: 0 to 9999 minutes.	0445	Pt9	Time 9 of Program 14. Range: 0 to 9999 minutes.
0399	Pt8	Time 8 of Program 9. Range: 0 to 9999 minutes.	0446	Pt1	Time 1 of Program 15. Range: 0 to 9999 minutes.
0400	Pt9	Time 9 of Program 9. Range: 0 to 9999 minutes.	0447	Pt2	Time 2 of Program 15. Range: 0 to 9999 minutes.
0401	Pt1	Time 1 of Program 10. Range: 0 to 9999 minutes.	0448	Pt3	Time 3 of Program 15. Range: 0 to 9999 minutes.
0402	Pt2	Time 2 of Program 10. Range: 0 to 9999 minutes.	0449	Pt4	Time 4 of Program 15. Range: 0 to 9999 minutes.
0403	Pt3	Time 3 of Program 10. Range: 0 to 9999 minutes.	0450	Pt5	Time 5 of Program 15. Range: 0 to 9999 minutes.
0404	Pt4	Time 4 of Program 10. Range: 0 to 9999 minutes.	0451	Pt6	Time 6 of Program 15. Range: 0 to 9999 minutes.
0405	Pt5	Time 5 of Program 10. Range: 0 to 9999 minutes.	0452	Pt7	Time 7 of Program 15. Range: 0 to 9999 minutes.
0406	Pt6	Time 6 of Program 10. Range: 0 to 9999 minutes.	0453	Pt8	Time 8 of Program 15. Range: 0 to 9999 minutes.
0407	Pt7	Time 7 of Program 10. Range: 0 to 9999 minutes.	0454	Pt9	Time 9 of Program 15. Range: 0 to 9999 minutes.
0408	Pt8	Time 8 of Program 10. Range: 0 to 9999 minutes.	0455	Pt1	Time 1 of Program 16. Range: 0 to 9999 minutes.
0409	Pt9	Time 9 of Program 10. Range: 0 to 9999 minutes.	0456	Pt2	Time 2 of Program 16. Range: 0 to 9999 minutes.

0457	*Pt3*	Time 3 of Program 16. Range: 0 to 9999 minutes.	0503	*PSP3*	Setpoint 3 of Program 1 (R&S). Range: same as in *PSP0*.
0458	*Pt4*	Time 4 of Program 16. Range: 0 to 9999 minutes.	0504	*PSP4*	Setpoint 4 of Program 1 (R&S). Range: same as in *PSP0*.
0459	*Pt5*	Time 5 of Program 16. Range: 0 to 9999 minutes.	0505	*PSP5*	Setpoint 5 of Program 1 (R&S). Range: same as in *PSP0*.
0460	*Pt6*	Time 6 of Program 16. Range: 0 to 9999 minutes.	0506	*PSP6*	Setpoint 6 of Program 1 (R&S). Range: same as in *PSP0*.
0461	*Pt7*	Time 7 of Program 16. Range: 0 to 9999 minutes.	0507	*PSP7*	Setpoint 7 of Program 1 (R&S). Range: same as in *PSP0*.
0462	*Pt8*	Time 8 of Program 16. Range: 0 to 9999 minutes.	0508	*PSP8*	Setpoint 8 of Program 1 (R&S). Range: same as in *PSP0*.
0463	*Pt9*	Time 9 of Program 16. Range: 0 to 9999 minutes.	0509	*PSP9*	Setpoint 9 of Program 1 (R&S). Range: same as in *PSP0*.
0464	*Pt1*	Time 1 of Program 17. Range: 0 to 9999 minutes.	0510	*PSP0*	Setpoint 0 of Program 2.. Range: From *SPLL* to *SPHL*.
0465	*Pt2*	Time 2 of Program 17. Range: 0 to 9999 minutes.	0511	*PSP1*	Setpoint 1 of Program 2 (. &S). Range: same as in *PSP0*.
0466	*Pt3*	Time 3 of Program 17. Range: 0 to 9999 minutes.	0512	*PSP2*	Setpoint 2 of Program (R&S). Range: same as in *PSP0*.
0467	*Pt4*	Time 4 of Program 17. Range: 0 to 9999 minutes.	0513	*PSP3*	Setpoint 3 of Program 2 (R&S). Range: same as in *PSP0*.
0468	*Pt5*	Time 5 of Program 17. Range: 0 to 9999 minutes.	0514	*PSP4*	Setpoint 4 of Program 2 (R&S). Range: same as in *PSP0*.
0469	*Pt6*	Time 6 of Program 17. Range: 0 to 9999 minutes.	0515	*PSP5*	Setpoint 5 of Program 2 (R&S). Range: same as in *PSP0*.
0470	*Pt7*	Time 7 of Program 17. Range: 0 to 9999 minutes.	0516	*PSP6*	Setpoint 6 of Program 2 (R&S). Range: same as in *PSP0*.
0471	*Pt8*	Time 8 of Program 17. Range: 0 to 9999 minutes.	0517	*PSP7*	Setpoint 7 of Program 2 (R&S). Range: same as in *PSP0*.
0472	*Pt9*	Time 9 of Program 17. Range: 0 to 9999 minutes.	0518	*PSP8*	Setpoint 8 of Program 2 (R&S). Range: same as in *PSP0*.
0473	*Pt1*	Time 1 of Program 18. Range: 0 to 9999 minutes.	0519	*PSP9*	Setpoint 9 of Program 2 (R&S). Range: same as in *PSP0*.
0474	*Pt2*	Time 2 of Program 18. Range: 0 to 9999 minutes.	0520	*PSP0*	Setpoint 0 of Program 3. Range: From *SPLL* to *SPHL*.
0475	*Pt3*	Time 3 of Program 18. Range: 0 to 9999 minutes.	0521	*PSP1*	Setpoint 1 of Program 3 (R&S). Range: same as in *PSP0*.
0476	*Pt4*	Time 4 of Program 18. Range: 0 to 9999 minutes.	0522	*PSP2*	Setpoint 2 of Program 3 (R&S). Range: same as in *PSP0*.
0477	*Pt5*	Time 5 of Program 18. Range: 0 to 9999 minutes.	0523	*PSP3*	Setpoint 3 of Program 3 (R&S). Range: same as in *PSP0*.
0478	*Pt6*	Time 6 of Program 18. Range: 0 to 9999 minutes.	0524	*PSP4*	Setpoint 4 of Program 3 (R&S). Range: same as in *PSP0*.
0479	*Pt7*	Time 7 of Program 18. Range: 0 to 9999 minutes.	0525	*PSP5*	Setpoint 5 of Program 3 (R&S). Range: same as in *PSP0*.
0480	*Pt8*	Time 8 of Program 18. Range: 0 to 9999 minutes.	0526	*PSP6*	Setpoint 6 of Program 3 (R&S). Range: same as in *PSP0*.
0481	*Pt9*	Time 9 of Program 18. Range: 0 to 9999 minutes.	0527	*PSP7*	Setpoint 7 of Program 3 (R&S). Range: same as in *PSP0*.
0482	*Pt1*	Time 1 of Program 19. Range: 0 to 9999 minutes.	0528	*PSP8*	Setpoint 8 of Program 3 (R&S). Range: same as in *PSP0*.
0483	*Pt2*	Time 2 of Program 19. Range: 0 to 9999 minutes.	0529	*PSP9*	Setpoint 9 of Program 3 (R&S). Range: same as in *PSP0*.
0484	*Pt3*	Time 3 of Program 19. Range: 0 to 9999 minutes.	0530	*PSP0*	Setpoint 0 of Program 4. Range: From *SPLL* to *SPHL*.
0485	*Pt4*	Time 4 of Program 19. Range: 0 to 9999 minutes.	0531	*PSP1*	Setpoint 1 of Program 4 (&S). Range: same as in *PSP0*.
0486	*Pt5*	Time 5 of Program 19. Range: 0 to 9999 minutes.	0532	*PSP2*	Setpoint 2 of Program 4 (R&S). Range: same as in *PSP0*.
0487	*Pt6*	Time 6 of Program 19. Range: 0 to 9999 minutes.	0533	*PSP3*	Setpoint 3 of Program 4 (R&S). Range: same as in *PSP0*.
0488	*Pt7*	Time 7 of Program 19. Range: 0 to 9999 minutes.	0534	*PSP4*	Setpoint 4 of Program 4 (R&S). Range: same as in *PSP0*.
0489	*Pt8*	Time 8 of Program 19. Range: 0 to 9999 minutes.	0535	*PSP5*	Setpoint 5 of Program 4 (R&S). Range: same as in *PSP0*.
0490	*Pt9*	Time 9 of Program 19. Range: 0 to 9999 minutes.	0536	*PSP6*	Setpoint 6 of Program 4 (R&S). Range: same as in *PSP0*.
0491	*Pt1*	Time 1 of Program 20. Range: 0 to 9999 minutes.	0537	*PSP7*	Setpoint 7 of Program 4 (R&S). Range: same as in *PSP0*.
0492	*Pt2*	Time 2 of Program 20. Range: 0 to 9999 minutes.	0538	*PSP8*	Setpoint 8 of Program 4 (R&S). Range: same as in *PSP0*.
0493	*Pt3*	Time 3 of Program 20. Range: 0 to 9999 minutes.	0539	*PSP9*	Setpoint 9 of Program 4 (R&S). Range: same as in *PSP0*.
0494	*Pt4*	Time 4 of Program 20. Range: 0 to 9999 minutes.	0540	*PSP0*	Setpoint 0 of Program 5. Range: From *SPLL* to *SPHL*.
0495	*Pt5*	Time 5 of Program 20. Range: 0 to 9999 minutes.	0541	*PSP1*	Setpoint 1 of Program 5 (R&S). Range: same as in *PSP0*.
0496	*Pt6*	Time 6 of Program 20. Range: 0 to 9999 minutes.	0542	*PSP2*	Setpoint 2 of Program 5 (R&S). Range: same as in *PSP0*.
0497	*Pt7*	Time 7 of Program 20. Range: 0 to 9999 minutes.	0543	*PSP3*	Setpoint 3 of Program 5 (R&S). Range: same as in *PSP0*.
0498	*Pt8*	Time 8 of Program 20. Range: 0 to 9999 minutes.	0544	*PSP4*	Setpoint 4 of Program 5 (R&S) Range: same as in *PSP0*.
0499	*Pt9*	Time 9 of Program 20. Range: 0 to 9999 minutes.	0545	*PSP5*	Setpoint 5 of Program 5 (R&S) Range: same as in *PSP0*.
0500	*PSP0*	Setpoint 0 of Program 1. Range: From *SPLL* to *SPHL*.	0546	*PSP6*	Setpoint 6 of Program 5 (R&S) Range: same as in *PSP0*.
0501	*PSP1*	Setpoint 1 of Program 1 (R&S). Range: same as in *PSP0*.			
0502	*PSP2*	Setpoint 2 of Program 1 (R&S). Range: same as in *PSP0*.			

0547	PSP7	Setpoint 7 of Program 5 (R&S)
		Range: same as in PSP0.
0548	PSP8	Setpoint 8 of Program 5 (R&S)
		Range: same as in PSP0.
0549	PSP9	Setpoint 9 of Program 5 (R&S)
		Range: same as in PSP0.
0550	PSP0	Setpoint 0 of Program 6.
		Range: From SPLL to SPHL.
0551	PSP1	Setpoint 1 of Program 6 (R&S)
		Range: same as in PSP0.
0552	PSP2	Setpoint 2 of Program 6 (R&S)
		Range: same as in PSP0.
0553	PSP3	Setpoint 3 of Program 6 (R&S)
		Range: same as in PSP0.
0554	PSP4	Setpoint 4 of Program 6 (R&S)
		Range: same as in PSP0.
0555	PSP5	Setpoint 5 of Program 6 (R&S)
		Range: same as in PSP0.
0556	PSP6	Setpoint 6 of Program 6 (R&S)
		Range: same as in PSP0.
0557	PSP7	Setpoint 7 of Program 6 (R&S)
		Range: same as in PSP0.
0558	PSP8	Setpoint 8 of Program 6 (R&S)
		Range: same as in PSP0.
0559	PSP9	Setpoint 9 of Program 6 (R&S)
		Range: same as in PSP0.
0560	PSP0	Setpoint 0 of Program 7.
		Range: From SPLL to SPHL.
0561	PSP1	Setpoint 1 of Program 7 (R&S)
		Range: same as in PSP0.
0562	PSP2	Setpoint 2 of Program 7 (R&S)
		Range: same as in PSP0.
0563	PSP3	Setpoint 3 of Program 7 (R&S)
		Range: same as in PSP0.
0564	PSP4	Setpoint 4 of Program 7 (R&S)
		Range: same as in PSP0.
0565	PSP5	Setpoint 5 of Program 7 (R&S)
		Range: same as in PSP0.
0566	PSP6	Setpoint 6 of Program 7 (R&S)
		Range: same as in PSP0.
0567	PSP7	Setpoint 7 of Program 7 (R&S)
		Range: same as in PSP0.
0568	PSP8	Setpoint 8 of Program 7 (R&S)
		Range: same as in PSP0.
0569	PSP9	Setpoint 9 of Program 7 (R&S)
		Range: same as in PSP0.
0570	PSP0	Setpoint 0 of Program 8.
		Range: From SPLL to SPHL.
0571	PSP1	Setpoint 1 of Program 8 (R&S)
		Range: same as in PSP0.
0572	PSP2	Setpoint 2 of Program 8 (R&S)
		Range: same as in PSP0.
0573	PSP3	Setpoint 3 of Program 8 (R&S)
		Range: same as in PSP0.
0574	PSP4	Setpoint 4 of Program 8 (R&S)
		Range: same as in PSP0.
0575	PSP5	Setpoint 5 of Program 8 (R&S)
		Range: same as in PSP0.
0576	PSP6	Setpoint 6 of Program 8 (R&S)
		Range: same as in PSP0.
0577	PSP7	Setpoint 7 of Program 8 (R&S)
		Range: same as in PSP0.
0578	PSP8	Setpoint 8 of Program 8 (R&S)
		Range: same as in PSP0.
0579	PSP9	Setpoint 9 of Program 8 (R&S)
		Range: same as in PSP0.
0580	PSP0	Setpoint 0 of Program 9.
		Range: From SPLL to SPHL.
0581	PSP1	Setpoint 1 of Program 9 (R&S)
		Range: same as in PSP0.
0582	PSP2	Setpoint 2 of Program 9 (R&S)
		Range: same as in PSP0.
0583	PSP3	Setpoint 3 of Program 9 (R&S)
		Range: same as in PSP0.
0584	PSP4	Setpoint 4 of Program 9 (R&S)
		Range: same as in PSP0.
0585	PSP5	Setpoint 5 of Program 9 (R&S)
		Range: same as in PSP0.
0586	PSP6	Setpoint 6 of Program 9 (R&S)
		Range: same as in PSP0.
0587	PSP7	Setpoint 7 of Program 9 (R&S)
		Range: same as in PSP0.
0588	PSP8	Setpoint 8 of Program 9 (R&S)
		Range: same as in PSP0.
0589	PSP9	Setpoint 9 of Program 9 (R&S)
		Range: same as in PSP0.
0590	PSP0	Setpoint 0 of Program 10.
		Range: From SPLL to SPHL.
0591	PSP1	Setpoint 1 of Program 10 (R&S)
		Range: same as in PSP0.
0592	PSP2	Setpoint 2 of Program 10 (R&S)
		Range: same as in PSP0.
0593	PSP3	Setpoint 3 of Program 10 (R&S)
		Range: same as in PSP0.
0594	PSP4	Setpoint 4 of Program 10 (R&S)
		Range: same as in PSP0.

0595	P5P5	Setpoint 5 of Program 10 (R&S)
		Range: same as in P5P0.
0596	P5P6	Setpoint 6 of Program 10 (R&S)
		Range: same as in P5P0.
0597	P5P7	Setpoint 7 of Program 10 (R&S)
		Range: same as in P5P0.
0598	P5P8	Setpoint 8 of Program 10 (R&S)
		Range: same as in P5P0.
0599	P5P9	Setpoint 9 of Program 10 (R&S)
		Range: same as in P5P0.
0600	P5P0	Setpoint 0 of Program 11.
		Range: From SPLL to SPHL.
0601	P5P1	Setpoint 1 of Program 11 (R&S)
		Range: same as in P5P0.
0602	P5P2	Setpoint 2 of Program 11 (R&S)
		Range: same as in P5P0.
0603	P5P3	Setpoint 3 of Program 11 (R&S)
		Range: same as in P5P0.
0604	P5P4	Setpoint 4 of Program 11 (R&S)
		Range: same as in P5P0.
0605	P5P5	Setpoint 5 of Program 11 (R&S)
		Range: same as in P5P0.
0606	P5P6	Setpoint 6 of Program 11 (R&S)
		Range: same as in P5P0.
0607	P5P7	Setpoint 7 of Program 11 (R&S)
		Range: same as in P5P0.
0608	P5P8	Setpoint 8 of Program 11 (R&S)
		Range: same as in P5P0.
0609	P5P9	Setpoint 9 of Program 11 (R&S)
		Range: same as in P5P0.
0610	P5P0	Setpoint 0 of Program 12.
		Range: From SPLL to SPHL.
0611	P5P1	Setpoint 1 of Program 12 (R&S)
		Range: same as in P5P0.
0612	P5P2	Setpoint 2 of Program 12 (R&S)
		Range: same as in P5P0.
0613	P5P3	Setpoint 3 of Program 12 (R&S)
		Range: same as in P5P0.
0614	P5P4	Setpoint 4 of Program 12 (R&S)
		Range: same as in P5P0.
0615	P5P5	Setpoint 5 of Program 12 (R&S)
		Range: same as in P5P0.
0616	P5P6	Setpoint 6 of Program 12 (R&S)
		Range: same as in P5P0.
0617	P5P7	Setpoint 7 of Program 12 (R&S)
		Range: same as in P5P0.
0618	P5P8	Setpoint 8 of Program 12 (R&S)
		Range: same as in P5P0.

0619	P5P9	Setpoint 9 of Program 12 (R&S)
		Range: same as in P5P0.
0620	P5P0	Setpoint 0 of Program 13.
		Range: From SPLL to SPHL.
0621	P5P1	Setpoint 1 of Program 13 (R&S)
		Range: same as in P5P0.
0622	P5P2	Setpoint 2 of Program 13 (R&S)
		Range: same as in P5P0.
0623	P5P3	Setpoint 3 of Program 13 (R&S)
		Range: same as in P5P0.
0624	P5P4	Setpoint 4 of Program 13 (R&S)
		Range: same as in P5P0.
0625	P5P5	Setpoint 5 of Program 13 (R&S)
		Range: same as in P5P0.
0626	P5P6	Setpoint 6 of Program 13 (R&S)
		Range: same as in P5P0.
0627	P5P7	Setpoint 7 of Program 13 (R&S)
		Range: same as in P5P0.
0628	P5P8	Setpoint 8 of Program 13 (R&S)
		Range: same as in P5P0.
0629	P5P9	Setpoint 9 of Program 13 (R&S)
		Range: same as in P5P0.
0630	P5P0	Setpoint 0 of Program 14.
		Range: From SPLL to SPHL.
0631	P5P1	Setpoint 1 of Program 14 (R&S)
		Range: same as in P5P0.
0632	P5P2	Setpoint 2 of Program 14 (R&S)
		Range: same as in P5P0.
0633	P5P3	Setpoint 3 of Program 14 (R&S)
		Range: same as in P5P0.
0634	P5P4	Setpoint 4 of Program 14 (R&S)
		Range: same as in P5P0.
0635	P5P5	Setpoint 5 of Program 14 (R&S)
		Range: same as in P5P0.
0636	P5P6	Setpoint 6 of Program 14 (R&S)
		Range: same as in P5P0.
0637	P5P7	Setpoint 7 of Program 14 (R&S)
		Range: same as in P5P0.
0638	P5P8	Setpoint 8 of Program 14 (R&S)
		Range: same as in P5P0.
0639	P5P9	Setpoint 9 of Program 14 (R&S)
		Range: same as in P5P0.
0640	P5P0	Setpoint 0 of Program 15.
		Range: From SPLL to SPHL.
0641	P5P1	Setpoint 1 of Program 15 (R&S)
		Range: same as in P5P0.
0642	P5P2	Setpoint 2 of Program 15 (R&S)
		Range: same as in P5P0.

0643	*PSP3*	Setpoint 3 of Program 15 (R&S)
		Range: same as in *PSP0*.
0644	*PSP4*	Setpoint 4 of Program 15 (R&S)
		Range: same as in *PSP0*.
0645	*PSP5*	Setpoint 5 of Program 15 (R&S)
		Range: same as in *PSP0*.
0646	*PSP6*	Setpoint 6 of Program 15 (R&S)
		Range: same as in *PSP0*.
0647	*PSP7*	Setpoint 7 of Program 15 (R&S)
		Range: same as in *PSP0*.
0648	*PSP8*	Setpoint 8 of Program 15 (R&S)
		Range: same as in *PSP0*.
0649	*PSP9*	Setpoint 9 of Program 15 (R&S)
		Range: same as in *PSP0*.
0650	*PSP0*	Setpoint 0 of Program 16.
		Range: From *SPLL* to *SPHL*.
0651	*PSP1*	Setpoint 1 of Program 16 (R&S)
		Range: same as in *PSP0*.
0652	*PSP2*	Setpoint 2 of Program 16 (R&S)
		Range: same as in *PSP0*.
0653	*PSP3*	Setpoint 3 of Program 16 (R&S)
		Range: same as in *PSP0*.
0654	*PSP4*	Setpoint 4 of Program 16 (R&S)
		Range: same as in *PSP0*.
0655	*PSP5*	Setpoint 5 of Program 16 (R&S)
		Range: same as in *PSP0*.
0656	*PSP6*	Setpoint 6 of Program 16 (R&S)
		Range: same as in *PSP0*.
0657	*PSP7*	Setpoint 7 of Program 16 (R&S)
		Range: same as in *PSP0*.
0658	*PSP8*	Setpoint 8 of Program 16 (R&S)
		Range: same as in *PSP0*.
0659	*PSP9*	Setpoint 9 of Program 16 (R&S)
		Range: same as in *PSP0*.
0660	*PSP0*	Setpoint 0 of Program 17.
		Range: From *SPLL* to *SPHL*.
0661	*PSP1*	Setpoint 1 of Program 17 (R&S)
		Range: same as in *PSP0*.
0662	*PSP2*	Setpoint 2 of Program 17 (R&S)
		Range: same as in *PSP0*.
0663	*PSP3*	Setpoint 3 of Program 17 (R&S)
		Range: same as in *PSP0*.
0664	*PSP4*	Setpoint 4 of Program 17 (R&S)
		Range: same as in *PSP0*.
0665	*PSP5*	Setpoint 5 of Program 17 (R&S)
		Range: same as in *PSP0*.
0666	*PSP6*	Setpoint 6 of Program 17 (R&S)
		Range: same as in *PSP0*.
0667	*PSP7*	Setpoint 7 of Program 17 (R&S)
		Range: same as in *PSP0*.
0668	*PSP8*	Setpoint 8 of Program 17 (R&S)
		Range: same as in *PSP0*.
0669	*PSP9*	Setpoint 9 of Program 17 (R&S)
		Range: same as in *PSP0*.
0670	*PSP0*	Setpoint 0 of Program 18.
		Range: From *SPLL* to *SPHL*.
0671	*PSP1*	Setpoint 1 of Program 18 (R&S)
		Range: same as in *PSP0*.
0672	*PSP2*	Setpoint 2 of Program 18 (R&S)
		Range: same as in *PSP0*.
0673	*PSP3*	Setpoint 3 of Program 18 (R&S)
		Range: same as in *PSP0*.
0674	*PSP4*	Setpoint 4 of Program 18 (R&S)
		Range: same as in *PSP0*.
0675	*PSP5*	Setpoint 5 of Program 18 (R&S)
		Range: same as in *PSP0*.
0676	*PSP6*	Setpoint 6 of Program 18 (R&S)
		Range: same as in *PSP0*.
0677	*PSP7*	Setpoint 7 of Program 18 (R&S)
		Range: same as in *PSP0*.
0678	*PSP8*	Setpoint 8 of Program 18 (R&S)
		Range: same as in *PSP0*.
0679	*PSP9*	Setpoint 9 of Program 18 (R&S)
		Range: same as in *PSP0*.
0680	*PSP0*	Setpoint 0 of Program 19.
		Range: From *SPLL* to *SPHL*.
0681	*PSP1*	Setpoint 1 of Program 19 (R&S)
		Range: same as in *PSP0*.
0682	*PSP2*	Setpoint 2 of Program 19 (R&S)
		Range: same as in *PSP0*.
0683	*PSP3*	Setpoint 3 of Program 19 (R&S)
		Range: same as in *PSP0*.
0684	*PSP4*	Setpoint 4 of Program 19 (R&S)
		Range: same as in *PSP0*.
0685	*PSP5*	Setpoint 5 of Program 19 (R&S)
		Range: same as in *PSP0*.
0686	*PSP6*	Setpoint 6 of Program 19 (R&S)
		Range: same as in *PSP0*.
0687	*PSP7*	Setpoint 7 of Program 19 (R&S)
		Range: same as in *PSP0*.
0688	*PSP8*	Setpoint 8 of Program 19 (R&S)
		Range: same as in *PSP0*.
0689	*PSP9*	Setpoint 9 of Program 19 (R&S)
		Range: same as in *PSP0*.
0690	*PSP0*	Setpoint 0 of Program 1.
		Range: From *SPLL* to *SPHL*.

0691	PSP1	Setpoint 1 of Program 1 (R&S)
		Range: same as in PSP0.
0692	PSP2	Setpoint 2 of Program 1 (R&S)
		Range: same as in PSP0.
0693	PSP3	Setpoint 3 of Program 1 (R&S)
		Range: same as in PSP0.
0694	PSP4	Setpoint 4 of Program 1 (R&S)
		Range: same as in PSP0.
0695	PSP5	Setpoint 5 of Program 1 (R&S)
		Range: same as in PSP0.
0696	PSP6	Setpoint 6 of Program 1 (R&S)
		Range: same as in PSP0.
0697	PSP7	Setpoint 7 of Program 1 (R&S)
		Range: same as in PSP0.
0698	PSP8	Setpoint 8 of Program 1 (R&S)
		Range: same as in PSP0.
0699	PSP9	Setpoint 9 of Program 1 (R&S)
		Range: same as in PSP0.
0700	Reserved	Internal use

1.4 STATUS WORDS

Register	Value format
Status Word 1	bit 0 – Alarm 1 (0-inactive; 1-active) bit 1 – Alarm 2 (0-inactive; 1-active) bit 2 – Alarm 3 (0-inactive; 1-active) bit 3 – Alarm 4 (0-inactive; 1-active) bit 4 – Input 0 – I/O 5 (0- inactive; 1- active) bit 5 – Input 1 – I/O 3 (0- inactive; 1- active) bit 6 – Input 2 – I/O 4 (0- inactive; 1- active) bit 7 – Reserved bit 8 – Hardware detection value bit 9 – Hardware detection value bit 10 – Reserved bit 11 – Reserved bit 12 – Reserved bit 13 – Reserved bit 14 – Reserved bit 15 – Reserved

Status Word 2	bit 0 – Automatic (0- manual; 1- automatic) bit 1 – Run (0-stop; 1-run) bit 2 – Control Action (0-direct; 1-reverse) bit 3 – Reserved bit 4 – Auto-tune (0-no; 1-yes) bit 5 – Alarm 1 power-up inhibit (0-no; 1-yes) bit 6 – Alarm 2 power-up inhibit (0-no; 1-yes) bit 7 – Alarm 3 power-up inhibit (0-no; 1-yes) bit 8 – Alarm 4 power-up inhibit (0-no; 1-yes) bit 9 – Unit (0-°C; 1-°F) bit 10 – Reserved bit 11 – Output 1 status bit 12 – Output 2 status bit 13 – Output 3 status bit 14 – Output 4 status bit 15 – Output 5 status
Status Word 3	bit 0 – Very low PV conversion (0-no; 1-yes) bit 1 – Negative conversion after calibration (0-no; 1-yes) bit 2 – Very high PV conversion (0-no; 1-yes) bit 3 – Exceeded linearization limit (0-no; 1-yes) bit 4 – Very high Pt100 cable resistance (0-no; 1-yes) bit 5 – Self zero conversion out of range (0-no; 1-yes) bit 6 – Self span conversion out of range (0-no; 1-yes) bit 7 – Reserved bit 8 – Reserved bit 9 – Reserved bit 10 – Reserved bit 11 – Reserved bit 12 – Reserved bit 13 – Reserved bit 14 – Reserved bit 15 – Reserved

Table 2: Values of Status Words

Writing to an output bit is only possible if the output has no function assigned to it (the output is configured to **OFF** in Alarm Cycle).

Coil Status	Output description
0	Output 1 Status (I/O1)
1	Output 2 Status (I/O2)
2	Output 3 Status (I/O3)
3	Output 4 Status (I/O4)
4	Output 5 Status (I/O5)

1.5 EXCEPTION RESPONSES – ERROR CONDITIONS

The MODBUS RTU protocol checks the CRC in the data blocks received. Reception errors are detected by the CRC, causing the controller to discard the packet, not sending any reply to the master.

After receiving an error-free packet, the controller processes the packet and verifies whether the request is valid or not, sending back an exception error code in case of an invalid request. Response frames containing error codes have the most significant bit of the Modbus command set.

If a WRITE command sends an out-of-range value to a parameter, the controller will clamp the value to the parameter range limits, replying with a value that reflects these limits (maximum or minimum value allowed for the parameter).

The controller ignores broadcast READ commands; the controller processes only broadcast WRITE commands.

Error Code	Error Description
01	Invalid Command
02	Invalid Register Number or out of range
03	Invalid Register Quantity or out of range

Table 3 – Exception response error codes