PMA Prozeß- und Maschinen-Automation GmbH

rail line
UNIFLEX CI 45, KS 45, TB 45

Interface description

English

9499-040-78111

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Explanation of symbols:

General information

General warning

Caution: ESD-sensitive components

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Content

1 General

We thank you for purchasing a device from the *rail line* - product range.

This document describes the address allocation of the different versions of *rail line* - devices (CI 45, KS 45, TB 45) which will be called 'device' in the rest of this document, for enabling the transmission of process-, parameter- and configurationdata via the device's interface.

1.1 References

Additional documentation of the *rail line* devices:

[1] Universal transmitter UNIFLEX CI 45

- Datasheet CI 45 9498 737 48313
- Operating note CI 45 9499 040 71441
- Operating manual CI 45 9499 040 71711

[2] Universal controller KS 45

- Datasheet KS 45 9498 737 48513
- Operating note KS 45 9499 040 71541
- Operating manual KS 45 9499 040 71811

[3] Temperature limiter TB 45

- Datasheet TB 45 9498 737 48433
- Operating note TB 45 9499 040 71641
- Operating manual TB 45 9499 040 71918

2 MODBUS address areas, and address formats

2.1 Area definitions

The address is coded in 2 bytes. The most significant 3 bits determine the data transmission format.
The following formats are available for *rail line* devices:

- **Integer**
- **Integer with 1 decimal**
- **Float acc. to IEEE**

Address area		Data transfer format	Smallest transferable value	Largest transferable value	Resolution
hex	dez.				
0x0000 ... 0x1FFF	0 … 8191	Integer without decimals	-30000	+32000	+/- 1
0x2000 ... 0x3FFF	8192 ... 16383	Integer with 1 decimal	-3000.0	+3200.0	+/- 0.1
0x4000 ... 0x7FFF	16384...32767	Float (IEEE-Format)	-1.0 E+037	+1.0 E+037	+/-1.4E-045

For integer numbers with and without decimals, the value range -30000 to +32000 is transmitted via the interface. Scaling with the factor 1 or 10 must be carried out by the transmitting device as well as by the receiving device.

Values are transmitted in the Motorola format (big endian).

2.2 Special values

The following special values are defined for transmission in the **integer format**:

- -31000 Sensor fault
  This value is returned for data that do not represent a meaningful value due to a sensor fault.
- -32000 Switch-off value
  The function is disabled.
- -32500 Undefined value
  The device returns this value, if a datum is not defined within the requested range („NOT DEFINED VALUE").
- -32768 Corresponds to 0x8000 hex.
  The value to be transmitted lies outside the transferable integer value range.

The following special values are defined for transmission in the Float format:

- -1.5E37 This datum is not defined.
  The device returns this value, if a datum is not defined within the requested range.

2.3 Composition of the address tables

In the address tables shown in Section 5, the addresses for every parameter of the corresponding data format are specified in decimal values.
The tables are structured as follows:

Name	r/w	Adr.	Integer	real	Type	Value/off	Description
		base 1dP					

- Name — Description of the datum
- R/W — permitted type of access: R = read, W = write
- Address integer — Address for integer values
- base — Integer without decimals
- 1 dP — Integer with 1 decimal
- Real — Floating point number / Float (IEEE format)
- Type — internal data type
- Value/off — permissible value range, switch-off value available
- Description — Explanations

2.4 Internal data types

The following data types are assigned to data used in the device:

- Float
  Floating point number
  Value range: -1999 ... -0.001, 0, 0.001 ... 9999
- INT
  Positive whole integer number
  Value range: 0 ... 65535
  Exception: Switch-off value '-32000'
- Text
  Text string consisting of n characters, currently defined n = 5
  Permissible characters: 20H...7FH
- Long
  Positive whole Long number
  Value range: 0 … 99999
- Enum
  Selection value

3 Adresstables

In the following chapters you'll find the adresstables for the devices;

- **Universal transmitterUNIFLEX CI 45 (Version 2)**
- **Universal controller KS 45 (Version 2)**
- **Temperature limiter TB 45 (Version 1).**

Table Of Contents

1 Cn.Fr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.Fnc	r/w	base 1dP	1120 9312	18624	Enum	*Enum_IFncCnFr*	Function select

0	Control input
1	up counter, positive edge
2	up counter, negative edge
3	down counter, positive edge
4	down counter, negative edge
5	ferquency measurement

Frq.t	r/w	base 1dP	1121 9313	18626	Float	0,1. . . 20 ☐	Frequency gate time [s]

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Cnt.d	r/w	base 1dP	1100 9292	18584	Float	0,1. . . 9999 ☐	Counter divider
Cnt.P	r/w	base 1dP	1101 9293	18586	Float	0. . . 9999 ☐	Counter start value after preset
Cnt.E	r/w	base 1dP	1102 9294	18588	Float	0. . . 9999 ☑	Counter end value
Frq.L	r/w	base 1dP	1103 9295	18590	Float	0. . . 9999 ☐	lower input value [kHz]
Ou.L	r/w	base 1dP	1104 9296	18592	Float	-1999. . . 9999 ☐	lower output value [phys]
Frq.H	r/w	base 1dP	1105 9297	18594	Float	0. . . 9999 ☐	upper input value [kHz]
Ou.H	r/w	base 1dP	1106 9298	18596	Float	-1999. . . 9999 ☐	upper output value [phys]
Frq.F	r/w	base 1dP	1107 9299	18598	Float	0. . . 9999 ☐	filter time [s]

1 Cn.Fr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Cn.Fr.Eff	r	base 1dP	1140 9332	18664	Float	0. . . 0 ☐	Counter/frequency value
Cn.Pres	r/w	base 1dP	1144 9336	18672	Enum	*Enum_CnPres*	Counter preset

0	No counter preset
1	Counter preset

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Cn.Fr	r	base 1dP	1141 9333	18666	Float	-1999. . . 9999 ☐	Counter/frequency value
Cnt.L	r	base 1dP	1142 9334	18668	Float	-1999. . . 9999 ☐	Lower part of counter value
Fail	r	base 1dP	1143 9335	18670	Enum	*Enum_FrFail*	frequency too high at digital input

0	no error
1	Frequency to high

2 Func

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.1	r/w	base 1dP	1262 9454	18908	Enum	*Enum_Fnc1Rail*	function 1

0	standard (process value = Inp1)
2	The process value is calculated from the difference between the two values (Inp1 - Inp2).
3	Maximum value of Inp1 and Inp2. It is controlled with the bigger value. At sensor failure it is controlled with the remaining actual value.
4	Minimum value of Inp1 and Inp2. It is controlled with the smaller value. At sensor failure it is controlled with the remaining actual value.
5	Mean value (Inp1, Inp2). With sensor error, controlling is continued with the remaining process value.
6	Switching between Inp1 and Inp2
7	O2 function with constant sensor temperature. The engineering unit for the O2 setting should be checked under: Other -> parameter unit (ppm / %). The sensor temperature must be defined under: Parameters -> Controller -> Sensor temperature.
8	O2 function with measured sensor temperature. The sensor temperature is required as the second process value Inp2. The engineering unit for the O2 settings (ppm / %) must be checked under 'Other | Parameter unit.'
9	counter/frequency

2 Func

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.2	r/w	base 1dP	1265 9457	18914	Enum	*Enum_Fnc2*	function 2

0	no function
1	2nd power
2	square root

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.3	r/w	base 1dP	1263 9455	18910	Enum	*Enum_Func1*	function 3

0	no function
1	Tare function
2	sample & hold

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
tEmP	r/w	base 1dP	1236 9428	18856	Float	0. . . 9999 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.InP	r	base 1dP	1302 9494	18988	Float	-1999. . . 9999 ☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.
In.Hi	r	base 1dP	1306 9498	18996	Float	-1999. . . 9999 ☐	maximum value
In.Lo	r	base 1dP	1305 9497	18994	Float	-1999. . . 9999 ☐	minimum value

3 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	520 8712	17424	Enum	*Enum_StYP*	Sensor type selection

0	thermocouple type L (-100...900°C), Fe-CuNi DIN
1	thermocouple type J (-100...1200°C), Fe-CuNi
2	thermocouple type K (-100...1350°C), NiCr-Ni
3	thermocouple type N (-100...1300°C), Nicrosil-Nisil
4	thermocouple type S (0...1760°C), PtRh-Pt10%
5	thermocouple type R (0...1760°C), PtRh-Pt13%
6	thermocouple type T (-200...400°C), Cu-CuNi
7	thermocouple type C (0...2315°C), W5%Re-W26%Re
8	thermocouple type D (0...2315°C), W3%Re-W25%Re
9	thermocouple type E (-100...1000°C), NiCr-CuNi
10	thermocouple type B (0/100...1820°C), PtRh-Pt6%
18	Special thermocouple with a linearization characteristic selectable by the user. This enables non-linear signals to be simulated or linearized.
20	Pt100 (-200.0 ... 100.0(150.0)°C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	special 0...450 Ohm
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
40	0...10V / 2...10V
41	special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
45	Special : -5...5 V
46	Special : -10...10 V
47	Special : -200...200 mV
50	potentiometer 0...160 Ohm
51	potentiometer 0...450 Ohm
52	potentiometer 0...1600 Ohm
53	potentiometer 0...4500 Ohm

4wir	r/w	base 1dP	523 8715	17430	Enum	*Enum_4wire*	Connection principle for resistive inputs.

0	3-wire connection
1	4-wire connection

3 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.Lin	r/w	base 1dP	521 8713	17426	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.
						0	No special linearization.
						1	Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.
Corr	r/w	base 1dP	265 8457	16914	Enum	*Enum_Corr*	Measured value correction / scaling
						0	Without scaling
						1	The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.
						2	2-point correction (at CAL level)
						3	Scaling (at PArA level)
In.F	r/w	base 1dP	522 8714	17428	Float	-1999. . . 9999 ☑	Substitute value in case of a fault. This value is used for calculations, if there is a fault at the input (e.g. FAIL).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.1	r/w	base 1dP	500 8692	17384	Float	-1999. . . 9999 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.1	r/w	base 1dP	501 8693	17386	Float	-1999. . . 9999 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.1	r/w	base 1dP	502 8694	17388	Float	-1999. . . 9999 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.1	r/w	base 1dP	503 8695	17390	Float	-1999. . . 9999 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F1	r/w	base 1dP	504 8696	17392	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
b.F1	r/w	base 1dP	505 8697	17394	Float	0. . . 99999 ☐	filter bandwidth

3 InP.1

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.tc1	r/w	base 1dP	506 8698	17396	Float	0. . . 100 ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1r	r	base 1dP	540 8732	17464	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
Fail	r	base 1dP	541 8733	17466	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

In.1	r	base 1dP	542 8734	17468	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
F.Inp	r/w	base 1dP	543 8735	17470	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

4 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.Fnc	r/w	base 1dP	266 8458	16916	Enum	*Enum_IFunc*	Function INP2

0	no measurement
1	measurement

4 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	570 8762	17524	Enum	*Enum_StYP2*	Sensor type selection

0	Thermocouple Type L (-100...900 °C), Fe-CuNi DIN
1	Thermocouple Type J (-100...1200 °C), Fe-CuNi
2	Thermocouple Type K (-100...1350 °C), NiCr-Ni
3	Thermocouple Type N (-100...1300 °C), Nicrosil-Nisil
4	Thermocouple Type S (0...1760 °C), PtRh-Pt 10%
5	Thermocouple Type R (0...1760 °C), PtRh-Pt13%
6	Thermocouple Type T (-200...400 °C), Cu-CuNi
7	Thermocouple Type C (0...2315°C), W5%Re-W26%Re
8	Thermocouple Type D (0...2315°C), W3%Re-W25%Re
9	Thermocouple Type E (-100...1000 °C), NiCr-CuNi
10	Thermocouple Type B (0/100...1820 °C), PtRh-Pt6%
18	special thermocouple
20	Pt100 (-200.0 ... 100.0(150.0) °C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	Special : 0...450 Ohms
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
41	Special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
47	Special : -200...200 mV
50	Potentiometer 0...160 ohms
51	Potentiometer 0...450 ohms
52	Potentiometer 0...1600 ohms
53	Potentiometer 0...4500 ohms

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.Lin	r/w	base 1dP	571 8763	17526	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.

0	No special linearization.
1	Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.

4 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Corr	r/w	base 1dP	267 8459	16918	Enum	*Enum_Corr*	Measured value correction / scaling

0	Without scaling
1	The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.
2	2-point correction (at CAL level)
3	Scaling (at PArA level)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.F	r/w	base 1dP	572 8764	17528	Float	-1999. . . 9999 ☑	Substitute value in case of a fault. This value is used for calculations, if there is a fault at the input (e.g. FAIL).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.2	r/w	base 1dP	550 8742	17484	Float	-1999. . . 9999 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.2	r/w	base 1dP	551 8743	17486	Float	-1999. . . 9999 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.2	r/w	base 1dP	552 8744	17488	Float	-1999. . . 9999 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.2	r/w	base 1dP	553 8745	17490	Float	-1999. . . 9999 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F2	r/w	base 1dP	554 8746	17492	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
b.F2	r/w	base 1dP	555 8747	17494	Float	0. . . 99999 ☐	filter bandwidth
E.tc2	r/w	base 1dP	556 8748	17496	Float	0. . . 100 ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

4 InP.2

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	590 8782	17564	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
Fail	r	base 1dP	591 8783	17566	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

In.2r	r	base 1dP	592 8784	17568	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
F.Inp	r/w	base 1dP	593 8785	17570	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

5 Lim

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.1	r/w	base 1dP	670 8862	17724	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)
3	Signal monitoring for rate of change (per minute).
4	Signal monitoring for rate of change (per minute) + storage of the alarm status.

Src.1	r/w	base 1dP	672 8864	17728	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
10	Measurement value of the counter/frequency input.

5 Lim

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.1	r/w	base 1dP	650 8842	17684	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.1	r/w	base 1dP	651 8843	17686	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.1	r/w	base 1dP	652 8844	17688	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.
dEL.1	r/w	base 1dP	653 8845	17690	Float	0. . . 9999 ☐	Delayed alarm of a limit value. The alarm is only triggered after the defined delay time. It is only indicated, and possibly stored, if it is still present after the delay time has elapsed.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	690 8882	17764	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

6 Lim2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.2	r/w	base 1dP	720 8912	17824	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)
3	Signal monitoring for rate of change (per minute).
4	Signal monitoring for rate of change (per minute) + storage of the alarm status.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.2	r/w	base 1dP	721 8913	17826	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
10	Measurement value of the counter/frequency input.

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	700 8892	17784	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.2	r/w	base 1dP	701 8893	17786	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.2	r/w	base 1dP	702 8894	17788	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.
dEL.2	r/w	base 1dP	703 8895	17790	Float	0. . . 9999 ☐	Delayed alarm of a limit value. The alarm is only triggered after the defined delay time. It is only indicated, and possibly stored, if it is still present after the delay time has elapsed.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	740 8932	17864	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

7 Lim3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.3	r/w	base 1dP	770 8962	17924	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)
3	Signal monitoring for rate of change (per minute).
4	Signal monitoring for rate of change (per minute) + storage of the alarm status.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.3	r/w	base 1dP	771 8963	17926	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
10	Measurement value of the counter/frequency input.

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	750 8942	17884	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	751 8943	17886	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.3	r/w	base 1dP	752 8944	17888	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.
dEL.3	r/w	base 1dP	753 8945	17890	Float	0. . . 9999 ☐	Delayed alarm of a limit value. The alarm is only triggered after the defined delay time. It is only indicated, and possibly stored, if it is still present after the delay time has elapsed.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	790 8982	17964	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

8 LOGI

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L_r	r/w	base 1dP	421 8613	17226	Enum	*Enum_dInPRail1*	Local / remote switchover (Remote: Adjustment of all values via the front panel is blocked).

0	No function (switchover via interface is possible).
1	Always active.
2	DI1 switches.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Err.r	r/w	base 1dP	429 8621	17242	Enum	*Enum_dInPRail2*	Source of the control signal for resetting all stored entries in the error list (the list contains all error messages and alarms). If an alarm is still present, i.e. the source of trouble has not been remedied, stored alarms cannot be acknowledged (reset).

0	No function (switchover via interface is possible).
2	DI1 switches.

8 LOGI

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.ChG	r/w	base 1dP	434 8626	17252	Enum	*Enum_dInPRail2*	Signal source for switching the effective process value between x1 and x2.
						0	No function (switchover via interface is possible).
						2	DI1 switches.
tArA	r/w	base 1dP	435 8627	17254	Enum	*Enum_dInPRail2*	'Tare' function
						0	No function (switchover via interface is possible).
						2	DI1 switches.
HOLd	r/w	base 1dP	436 8628	17256	Enum	*Enum_dInPRail2*	Sample & hold function
						0	No function (switchover via interface is possible).
						2	DI1 switches.
rES.L	r/w	base 1dP	425 8617	17234	Enum	*Enum_dInPRail2*	Reset of minimum value
						0	No function (switchover via interface is possible).
						2	DI1 switches.
rES.H	r/w	base 1dP	426 8618	17236	Enum	*Enum_dInPRail2*	Reset of maximum value
						0	No function (switchover via interface is possible).
						2	DI1 switches.
di.Fn	r/w	base 1dP	420 8612	17224	Enum	*Enum_diFn*	Function of digital inputs (valid for all inputs)
						0	Basic setting 'Off': A permanent positive signal switches this function 'On', which is connected to the digital input. Removal of the signal switches the function 'Off' again.
						1	Basic setting 'On': A permanent positive signal switches this function 'Off', which is connected to the digital input. Removal of the signal switches the function 'On' again.
						2	Push-button function. Basic setting 'Off'. Only positive signals are effective. The first positive signal switches 'On'. Removal of the signal is necessary before the next positive signal can switch 'Off'.

8 LOGI

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Di	r	base 1dP	450 8642	17284	Int	. . . ☐	Status of the digital inputs or of push-buttons (binary coded).
							Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key
L-R	r/w	base 1dP	460 8652	17304	Int	0. . . 1 ☐	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.
rES.L	r/w	base 1dP	472 8664	17328	Int	0. . . 1 ☐	Reset of minimum value
rES.H	r/w	base 1dP	473 8665	17330	Int	0. . . 1 ☐	Reset of maximum value
Err.r	r/w	base 1dP	470 8662	17324	Int	0. . . 1 ☐	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).
F.Di	r/w	base 1dP	480 8672	17344	Int	0. . . 1 ☐	Forcing of digital inputs. Forcing involves the external operation of at least one device input. The device takes over this input value (preset value for device inputs from a superordinate system, e.g. for a function test.)
							Bit 0 Forcing of digital Input 1
I.Chg	r/w	base 1dP	471 8663	17326	Int	0. . . 1 ☐	Signal for switching the effective process value between x1 and x2
tArA	r/w	base 1dP	474 8666	17332	Int	0. . . 1 ☐	Tare
HOLd	r/w	base 1dP	475 8667	17334	Int	0. . . 1 ☐	hold

9 ohnE

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
B.BedEbe	r/w	base 1dP	1839 10031	20062	Int	0. . . 255 ☐	The 3 Operating Levels (Parameter, Configuration, and Calibration) can be disabled here.
B.Bedien	r/w	base 1dP	1838 10030	20060	Int	0. . . 255 ☐	Used to disable various operating functions (e.g. access to the extended Operating Level).

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
C.Sch	r/w	base 1dP	1801 9993	19986	Float	1. . . 9999999	☑	Data defines the number of switching cycles for which the message InF.2 is generated.
C.Std	r/w	base 1dP	1800 9992	19984	Float	1. . . 9999999	☑	Data defines the number of operating hours for which the message InF.1 is generated.
D.ForcIn	r/w	base 1dP	1803 9995	19990	Int	0. . . 255	☐	The data defines the inputs to be forced: Bit 0 analog input 1 Bit 1 analog input 2 Bit 2 not used Bit 3 not used Bit 4 digital input 1 Bit 5 not used Bit 6 not used Bit 7 not used
D.ForcOut	r/w	base 1dP	1804 9996	19992	Int	0. . . 255	☐	The data defines the outputs to be forced. Bit 0 output 1 Bit 1 output 2 Bit 2 output 3 Bit 3 not used Bit 4 not used Bit 5 not used Bit 6 not used Bit 7 not used
Dis2	r/w	base 1dP	1848 10040	20080	Int	256. . . 8190	☐	Datum to be shown in display 2. The basic address of the datum that is to be displayed must be entered.
EOP1	r/w	base 1dP	1840 10032	20064	Int	256. . . 8190	☐	1st datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP2	r/w	base 1dP	1841 10033	20066	Int	256. . . 8190	☐	2nd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP3	r/w	base 1dP	1842 10034	20068	Int	256. . . 8190	☐	3rd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP4	r/w	base 1dP	1843 10035	20070	Int	256. . . 8190	☐	4th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP5	r/w	base 1dP	1844 10036	20072	Int	256. . . 8190	☐	5th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP6	r/w	base 1dP	1845 10037	20074	Int	256. . . 8190	☐	6th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP7	r/w	base 1dP	1846 10038	20076	Int	256. . . 8190	☐	7th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
EOP8	r/w	base 1dP	1847 10039	20078	Int	256. . . 8190	☐	8th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
In.1	r/w	base 1dP	1861 10053	20106	Float	0. . . 2	☐	Input 1 for measurement value 1 (to Output 1 for display value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.10	r/w	base 1dP	1879 10071	20142	Float	0. . . 2	☑	Input 10 for measurement value 10 (to Output 10 for display value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.11	r/w	base 1dP	1881 10073	20146	Float	0. . . 2	☑	Input 11 for measurement value 11 (to Output 11 for display value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.12	r/w	base 1dP	1883 10075	20150	Float	0. . . 2	☑	Input 12 for measurement value 12 (to Output 12 for display value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.13	r/w	base 1dP	1885 10077	20154	Float	0. . . 2	☑	Input 13 for measurement value 13 (to Output 13 for display value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.14	r/w	base 1dP	1887 10079	20158	Float	0. . . 2	☑	Input 14 for measurement value 14 (to Output 14 for display value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.15	r/w	base 1dP	1889 10081	20162	Float	0. . . 2	☑	Input 15 for measurement value 15 (to Output 15 for display value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.16	r/w	base 1dP	1891 10083	20166	Float	0. . . 2	☑	Input 16 for measurement value 16 (to Output 16 for display value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.17	r/w	base 1dP	1893 10085	20170	Float	0. . . 2	☑	input 17
In.18	r/w	base 1dP	1895 10087	20174	Float	0. . . 2	☑	input 18

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
In.19	r/w	base 1dP	1897 10089	20178	Float	0. . . 2	☑	input 19
In.2	r/w	base 1dP	1863 10055	20110	Float	0. . . 2	☐	Input 2 for measurement value 2 (to Output 2 for display value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.20	r/w	base 1dP	1899 10091	20182	Float	0. . . 2	☑	input 20
In.21	r/w	base 1dP	1901 10093	20186	Float	0. . . 2	☑	input 21
In.22	r/w	base 1dP	1903 10095	20190	Float	0. . . 2	☑	input 22
In.23	r/w	base 1dP	1905 10097	20194	Float	0. . . 2	☑	input 23
In.24	r/w	base 1dP	1907 10099	20198	Float	0. . . 2	☑	input 24
In.25	r/w	base 1dP	1909 10101	20202	Float	0. . . 2	☑	input 25
In.26	r/w	base 1dP	1911 10103	20206	Float	0. . . 2	☑	input 26
In.27	r/w	base 1dP	1913 10105	20210	Float	0. . . 2	☑	input 27
In.28	r/w	base 1dP	1915 10107	20214	Float	0. . . 2	☑	input 28
In.29	r/w	base 1dP	1917 10109	20218	Float	0. . . 2	☑	input 29
In.3	r/w	base 1dP	1865 10057	20114	Float	0. . . 2	☑	Input 3 for measurement value 3 (to Output 3 for display value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.30	r/w	base 1dP	1919 10111	20222	Float	0. . . 2	☑	input 30

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
In.31	r/w	base 1dP	1921 10113	20226	Float	0. . . 2	☑	input 31
In.32	r/w	base 1dP	1923 10115	20230	Float	0. . . 2	☑	input 32
In.4	r/w	base 1dP	1867 10059	20118	Float	0. . . 2	☑	Input 4 for measurement value 4 (to Output 4 for display value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.5	r/w	base 1dP	1869 10061	20122	Float	0. . . 2	☑	Input 5 for measurement value 5 (to Output 5 for display value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.6	r/w	base 1dP	1871 10063	20126	Float	0. . . 2	☑	Input 6 for measurement value 6 (to Output 6 for display value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.7	r/w	base 1dP	1873 10065	20130	Float	0. . . 2	☑	Input 7 for measurement value 7 (to Output 7 for display value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.8	r/w	base 1dP	1875 10067	20134	Float	0. . . 2	☑	Input 8 for measurement value 8 (to Output 8 for display value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.9	r/w	base 1dP	1877 10069	20138	Float	0. . . 2	☑	Input 9 for measurement value 9 (to Output 9 for display value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.1	r/w	base 1dP	1862 10054	20108	Float	0. . . 2	☐	Output 1 for display value 1 (to Input 1 for measurement value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.10	r/w	base 1dP	1880 10072	20144	Float	0. . . 2	☑	Output 10 for display value 10 (to Input 10 for measurement value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.11	r/w	base 1dP	1882 10074	20148	Float	0. . . 2	☑	Output 11 for display value 11 (to Input 11 for measurement value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ou.12	r/w	base 1dP	1884 10076	20152	Float	0. . . 2 ☑	Output 12 for display value 12 (to Input 12 for measurement value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.13	r/w	base 1dP	1886 10078	20156	Float	0. . . 2 ☑	Output 13 for display value 13 (to Input 13 for measurement value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.14	r/w	base 1dP	1888 10080	20160	Float	0. . . 2 ☑	Output 14 for display value 14 (to Input 14 for measurement value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.15	r/w	base 1dP	1890 10082	20164	Float	0. . . 2 ☑	Output 15 for display value 15 (to Input 15 for measurement value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.16	r/w	base 1dP	1892 10084	20168	Float	0. . . 2 ☑	Output 16 for display value 16 (to Input 16 for measurement value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.17	r/w	base 1dP	1894 10086	20172	Float	0. . . 2 ☑	output 17
Ou.18	r/w	base 1dP	1896 10088	20176	Float	0. . . 2 ☑	output 18
Ou.19	r/w	base 1dP	1898 10090	20180	Float	0. . . 2 ☑	output 19
Ou.2	r/w	base 1dP	1864 10056	20112	Float	0. . . 2 ☐	Output 2 for display value 2 (to Input 2 for measurement value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.20	r/w	base 1dP	1900 10092	20184	Float	0. . . 2 ☑	output 20
Ou.21	r/w	base 1dP	1902 10094	20188	Float	0. . . 2 ☑	output 21
Ou.22	r/w	base 1dP	1904 10096	20192	Float	0. . . 2 ☑	output 22

9 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ou.23	r/w	base 1dP	1906 10098	20196	Float	0. . . 2 ☑	output 23
Ou.24	r/w	base 1dP	1908 10100	20200	Float	0. . . 2 ☑	output 24
Ou.25	r/w	base 1dP	1910 10102	20204	Float	0. . . 2 ☑	output 25
Ou.26	r/w	base 1dP	1912 10104	20208	Float	0. . . 2 ☑	output 26
Ou.27	r/w	base 1dP	1914 10106	20212	Float	0. . . 2 ☑	output 27
Ou.28	r/w	base 1dP	1916 10108	20216	Float	0. . . 2 ☑	output 28
Ou.29	r/w	base 1dP	1918 10110	20220	Float	0. . . 2 ☑	output 29
Ou.3	r/w	base 1dP	1866 10058	20116	Float	0. . . 2 ☑	Output 3 for display value 3 (to Input 3 for measurement value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.30	r/w	base 1dP	1920 10112	20224	Float	0. . . 2 ☑	output 30
Ou.31	r/w	base 1dP	1922 10114	20228	Float	0. . . 2 ☑	output 31
Ou.32	r/w	base 1dP	1924 10116	20232	Float	0. . . 2 ☑	output 32
Ou.4	r/w	base 1dP	1868 10060	20120	Float	0. . . 2 ☑	Output 4 for display value 4 (to Input 4 for measurement value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.5	r/w	base 1dP	1870 10062	20124	Float	0. . . 2 ☑	Output 5 for display value 5 (to Input 5 for measurement value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

9 ohnE

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ou.6	r/w	base 1dP	1872 10064	20128	Float	0. . . 2 ☑	Output 6 for display value 6 (to Input 6 for measurement value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.7	r/w	base 1dP	1874 10066	20132	Float	0. . . 2 ☑	Output 7 for display value 7 (to Input 7 for measurement value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.8	r/w	base 1dP	1876 10068	20136	Float	0. . . 2 ☑	Output 8 for display value 8 (to Input 8 for measurement value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.9	r/w	base 1dP	1878 10070	20140	Float	0. . . 2 ☑	Output 9 for display value 9 (to Input 9 for measurement value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
PASS	r/w	base 1dP	1850 10042	20084	Int	0. . . 9999 ☑	Password. 4-digit number for the password-protected access to blocked operating functions such as e.g. the Parameter Level.
T.Dis2	r/w	base 1dP	1851 10043	20086	Text	. . . ☐	This address contains 5 bytes for the text that is to appear in Display 2. No text: 1st byte 0x00.
U.LinT	r/w	base 1dP	1860 10052	20104	Enum	*Enum_Unit*	Engineering unit of linearization table: none, °C, °F or K.
						0 without unit 1 °C 2 °F 3 K	
V.Mask	r/w	base 1dP	1810 10002	20004	Int	0. . . 255 ☐	Definition of the visibility templates.The templates define the configurations and parameters displayed for operation (contents on request).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Conf	r/w	base 1dP	256 8448	16896	Int	0. . . 2 ☐	Start/Stop and abortion of the configuration mode 0 = End of configuration 1 = Start of configuration 2 = Abort configuration
tEmP	r/w	base 1dP	91 8283	16566	Float	0. . . 9999 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr. Integer		real	Typ	Value/off		Description
C.InP	r	base 1dP	39 8231	16462	Float	-1999. . . 9999	☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.
CAH	r	base 1dP	390 8582	17164	Long	0. . .	☐	Total operating hours. Count starts with the first switch-on. Internal test routine. Is stored and displayed not more than once per hour.
CPH	r/w	base 1dP	394 8586	17172	Long	0. . .	☐	Operating hours of the current maintenance period. Internal test routine. Is stored and displayed not more than once per hour. Reset when the time limit message is acknowledged.
Diag	r	base 1dP	382 8574	17148	Int	0. . . 255	☐	Result of diagnosis. Any faults detected during the self-test for data, RAM, processor, and EEPROM, as well as an exceeded count for the operating hours (maintenance period) and no. of switching cycles (maintenance period) are stored. Can be reset by acknowledgement.
EE.Ver	r	base 1dP	381 8573	17146	Int	0. . . 0	☐	EEPROM version
Id.NrH	r	base 1dP	370 8562	17124	Int	0. . . 0	☐	More significant part of the device Ident number.
Id.NrL	r	base 1dP	371 8563	17126	Int	0. . . 0	☐	Less significant part of the device Ident number.
Id.NrZ	r	base 1dP	372 8564	17128	Int	0. . . 0	☐	Sequential Ident number of the device.
In.Hi	r	base 1dP	43 8235	16470	Float	-1999. . . 9999	☐	maximum value
In.Lo	r	base 1dP	42 8234	16468	Float	-1999. . . 9999	☐	minimum value
Int.Tmp	r	base 1dP	380 8572	17144	Int	0. . . 0	☐	Max. measured operating temperature. Internal test routine.
Oem.NrH	r	base 1dP	373 8565	17130	Int	0. . . 0	☐	More significant part of the device OEM no.
Oem.NrL	r	base 1dP	374 8566	17132	Int	0. . . 0	☐	Less significant part of the device OEM no.
SAO1	r	base 1dP	391 8583	17166	Long	0. . .	☐	Total number of switching cycles of OUT1. Internal test routine that is stored and displayed not more than once per hour.

9 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SAO2	r	base 1dP	392 8584	17168	Long	0. . . ☐	Total number of switching cycles of OUT2. Internal test routine that is stored and displayed not more than once per hour.
SAO3	r	base 1dP	393 8585	17170	Long	0. . . ☐	Total number of switching cycles of OUT3. Internal test routine that is stored and displayed not more than once per hour.
SPO1	r/w	base 1dP	395 8587	17174	Long	0. . . ☐	Switching cycles of OUT1 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO2	r/w	base 1dP	396 8588	17176	Long	0. . . ☐	Switching cycles of OUT2 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO3	r/w	base 1dP	397 8589	17178	Long	0. . . ☐	Switching cycles of OUT3 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
Sw.Nr	r	base 1dP	375 8567	17134	BCD	0. . . 0 ☐	Digits 7 to 12 of the software order number.
T.CodeNr	r	base 1dP	360 8552	17104	Text	0. . . 0 ☐	15-digit order number of the device.
UPD	r/w	base 1dP	257 8449	16898	Enum	*Enum_Aenderungsflag*	Status message indicating that parameter / configuration have been changed via the front panel.
						0	No change via the front panel keys.
						1	A change has been made via the front panel keys, which must be processed.
L-R	r/w	base 1dP	55 8247	16494	Int	0. . . 1 ☐	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.
Hw.Opt	r	base 1dP	200 8392	16784	Int	0. . . 65535 ☐	Device options: 0000 WXYZ 0000 DCBA Z = 1: Modbus interface Y = 1: System device X = 1: Option 1 W = 1: Option 2 A = 1: OUT1 available B = 1: OUT2 available C = 1: OUT3 available D = 1: OUT3 is an analog output
Sw.Op	r	base 1dP	201 8393	16786	Int	0. . . 255 ☐	Software version XY Major and Minor Release (e.g. 21 = Version 2.1). The software version specifies the firmware in the unit. For the correct interaction of E-Tool and device, it must match the operating version (OpVersion) in the E-Tool.

9 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Bed.V	r	base 1dP	202 8394	16788	Int	0. . . 255 ☐	Operating version (numeric value). For the correct interaction of E-Tool and device, the software version and operating version must match.
rES.L	r/w	base 1dP	65 8257	16514	Int	0. . . 1 ☐	Reset of minimum value
Unit	r	base 1dP	203 8395	16790	Int	0. . . 255 ☐	Identification of the device.
rES.H	r/w	base 1dP	66 8258	16516	Int	0. . . 1 ☐	Reset of maximum value
S.Vers	r	base 1dP	204 8396	16792	Int	100. . . 255 ☐	The sub-version number is given as an additional index for precise definition of software version.
St.Ala	r	base 1dP	23 8215	16430	Int	. . . ☐	Alarm status: Bit-wise coded status of the individual alarms, e.g. exceeded limit value.

Bit 0 Existing/stored exceeded limit 1
Bit 1 Existing/stored exceeded limit 2
Bit 2 Existing/stored exceeded limit 3
Bit 3 Not usedBit 4 Not used
Bits 5 - 7 Not used
Bit 8 Existing exceeded limit 1
Bit 9 Existing exceeded limit 2
Bit 10 Existing exceeded limit 3
Bits 11 - 15 Not used

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Err.r	r/w	base 1dP	63 8255	16510	Int	0. . . 1 ☐	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).
St.Do	r	base 1dP	24 8216	16432	Int	0. . . 15 ☐	Status of the digital outputs
St.Ain	r	base 1dP	22 8214	16428	Int	0. . . 127 ☐	Bit-coded status of the analog input (fault, e.g. short circuit)

Bit 0 Break at Input 1
Bit 1 Reversed polarity at Input 1
Bit 2 Short-circuit at Input 1
Bit 3 Not used
Bit 4 Break at Input 2
Bit 5 Reversed polarity at Input 2
Bit 6 Short-circuit at Input 2
Bits 7-15 Not used

9 ohnE

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Di	r	base 1dP	25 8217	16434	Int	. . . ☐	Status of the digital inputs or of push-buttons (binary coded).
							Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key
F.Di	r/w	base 1dP	28 8220	16440	Int	0. . . 1 ☐	Forcing of digital inputs. Forcing involves the external operation of at least one device input. The device takes over this input value (preset value for device inputs from a superordinate system, e.g. for a function test.)
							Bit 0 Forcing of digital Input 1
F.Do	r/w	base 1dP	29 8221	16442	Int	0. . . 15 ☐	Forcing of digital outputs. Forcing involves the external operation of at least one controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
I.Chg	r/w	base 1dP	64 8256	16512	Int	0. . . 1 ☐	Signal for switching the effective process value between x1 and x2
tArA	r/w	base 1dP	67 8259	16518	Int	0. . . 1 ☐	Tare
HOLd	r/w	base 1dP	68 8260	16520	Int	0. . . 1 ☐	hold

10 ohnE1

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.1	r/w	base 1dP	73 8265	16530	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.1	r/w	base 1dP	74 8266	16532	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
t.F1	r/w	base 1dP	70 8262	16524	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1	r	base 1dP	20 8212	16424	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).

10 ohnE1

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Do1	r/w	base 1dP	31 8223	16446	Enum	*Enum_Ausgang* 0 off 1 on	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
In.1r	r	base 1dP	2005 10197	20394	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
F.Inp	r/w	base 1dP	26 8218	16436	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

11 ohnE2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	75 8267	16534	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
t.F2	r/w	base 1dP	71 8263	16526	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
H.2	r/w	base 1dP	76 8268	16536	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	21 8213	16426	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
F.Do2	r/w	base 1dP	32 8224	16448	Enum	*Enum_Ausgang* 0 off 1 on	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
In.2r	r	base 1dP	2006 10198	20396	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).

11 ohnE2

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Inp	r/w	base 1dP	27 8219	16438	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

12 ohnE3

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	77 8269	16538	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	78 8270	16540	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Do3	r/w	base 1dP	33 8225	16450	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off	
						1 on	
Out.3	r	base 1dP	34 8226	16452	Float	-1999. . . 9999 ☐	Value of the analog output [%]
F.Ou1	r/w	base 1dP	30 8222	16444	Float	-1999. . . 9999 ☐	Forcing value of the analog output. Forcing involves the external operation of a controller output, i.e. the controller has no influence on this output. (Used for the operation of free controller outputs e.g. by a supervisory PLC.)

13 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
bAud	r/w	base 1dP	290 8482	16964	Enum	*Enum_Baud*	Bit rate of the interface (only visible with OPTION). The bit rate determines the transmission speed.
						0 2400 Baud	
						1 4800 Baud	
						2 9600 Baud	
						3 19200 Baud	
						4 38.400 bits/s	
Addr	r/w	base 1dP	291 8483	16966	Int	1. . . 247 ☐	Address on the interface (only visible with OPTION)
PrtY	r/w	base 1dP	292 8484	16968	Enum	*Enum_Parity*	Parity of data on the interface (only visible with OPTION). Simple possibility of checking that transferred data is correct.
						0 No parity, with 2 stop bits.	
						1 even parity	
						2 odd parity	
						3 no parity (1 stop bit)	
dELY	r/w	base 1dP	293 8485	16970	Int	0. . . 200 ☐	Response delay [ms] (only visible with OPTION). Additional delay time before the received message may be answered on the Modbus. (Might be necessary, if the same line is used for transmit/receive.)

13 othr

ConF

Name	r/w	Adr. Integer		real	Typ	Value/off	Description
D.Unt	r/w	base 1dP	284 8476	16952	Enum	*EnumDUnit*	display unit

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

O2	r/w	base 1dP	283 8475	16950	Enum	*O2Unit*	Parameter definition for O2 measurement. With O2 measurement it is necessary to define whether the parameter is to be evaluated in ppm or %.

0	Parameter for O2 function in ppm
1	Parameter for O2 function in %

13 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Unit	r/w	base 1dP	280 8472	16944	Enum	*Enum_Unit_rail*	Physical unit, f.e.°C
						1 °C	
						2 °F	
						3 K	
dP	r/w	base 1dP	281 8473	16946	Enum	*Enum_dP*	Decimal point (max. no of decimals). Format of the measured value display.
						0 no digit behind the decimal point	
						1 Display has one decimal.	
						2 Display has two decimals.	
						3 Display has three decimals.	
SEGm	r/w	base 1dP	300 8492	16984	Enum	*EnumSegm*	Meaning of the display elements '1' and '2'.
						0 OUT1, OUT2	
						1 INP1, INP2	
C.dEL	r/w	base 1dP	294 8486	16972	Int	0. . . 200 ☐	Additional delay time before received message is evaluated by Modbus. This time is needed if data is not transmitted continousely by the modem.
FrEq	r/w	base 1dP	260 8452	16904	Enum	*Enum_FrEq*	Switchover of the applied mains frequency 50 / 60 Hz and adapting the input filter for hum suppression.
						0 Mains frequency is 50 Hz.	
						1 Mains frequency is 60 Hz.	

13 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
D.Unt	r	base 1dP	340 8532	17064	Enum	*EnumDUnit*	Effective display unit (can be used for extended Operating Level or display 2)

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.1	r/w	base 1dP	310 8502	17004	Enum	*Defect*	Err 1 (internal error)

0	No fault exists (Reset).
2	The device is defective.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.2	r/w	base 1dP	311 8503	17006	Enum	*Problem*	Err 2 (internal error, resetable)

0	No fault or reset of the fault exists (Reset).
1	A fault has occurred and has been stored.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.3	r/w	base 1dP	329 8521	17042	Enum	*ConfErr*	Resettable configuration fault. ConfErr(2): a fault has occurred. Typical causes and suggested remedies: Missing or faulty configuration: check interactions in the configuration and parameter settings.

0	No fault or reset of the configuration error exists (Reset).
2	There is a configuration error. The configuration is missing or wrong, or it does not match the parameter settings.

13 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.4	r/w	base 1dP	328 8520	17040	Enum	*Problem*	Hardware fault.Cause: Code number and hardware are not identical. Remedy: Contact PMA Service or replace electronics/Options pcb.
						0	No fault or reset of the fault exists (Reset).
						1	A fault has occurred and has been stored.
FbF.1	r/w	base 1dP	312 8504	17008	Enum	*Break*	Sensor break at input INP1. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.
Sht.1	r/w	base 1dP	313 8505	17010	Enum	*Short*	Short circuit at input INP1. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.1	r/w	base 1dP	314 8506	17012	Enum	*Polarity*	Incorrect polarity at input INP1. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP1.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
FbF.2	r/w	base 1dP	315 8507	17014	Enum	*Break*	Sensor break at input INP2. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.

13 othr

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Sht.2	r/w	base 1dP	316 8508	17016	Enum	*Short*	Short circuit at input INP2. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.2	r/w	base 1dP	317 8509	17018	Enum	*Polarity*	Incorrect polarity at input INP2. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP2.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
Err.F	r/w	base 1dP	330 8522	17044	Enum	*FFail*	Frequency fault.2: Fault is present.1: Fault remedied, but not acknowledged. Typical causes and remedies: Frequency too high (reduce the frequency)
						0	No fault or reset of the frequency fault alarm exists (Reset).
						1	A frequency fault has occurred and has been stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Frequency fault: The applied frequency is too high.
Lim.1	r/w	base 1dP	323 8515	17030	Enum	*Limit*	Limit value 1 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
Lim.2	r/w	base 1dP	324 8516	17032	Enum	*Limit*	Limit value 2 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
Lim.3	r/w	base 1dP	325 8517	17034	Enum	*Limit*	Limit value 3 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.

13 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InF.1	r/w	base	326	17036	Enum	*Time*	Message from the operating hours counter that the preset no. of hours for this maintenance period has been reached. The op-hours counter for the maintenance period is reset when this message is acknowledged. Counting the operating hours is used for preventive maintenance.
		1dP	8518				
						0	No signal or reset of the time limit signal (reset).
						1	Operating hours - limit value (maintenance period) reached.
InF.2	r/w	base	327	17038	Enum	*Switch*	Message from the switching cycle counter that the preset no. of switch cycles for this maintenance period has been reached. The cycle counter for the maintenance period is reset when this message is acknowledged. Counting the switching cycles is used for preventive maintenance.
		1dP	8519				
						0	No error message or reset of the switching cycle counter exists (Reset).
						1	Set limit of the switching cycle counter (maintenance period) has been reached.

14 Out.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base	920	18224	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
		1dP	9112				
						0	direct / normally open
						1	inverse / normally closed
Lim.1	r/w	base	923	18230	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
		1dP	9115				
						0	not active
						1	The output is activated by an alarm from limit value 1.
Lim.2	r/w	base	924	18232	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
		1dP	9116				
						0	not active
						1	The output is activated by an alarm from limit value 2.
Lim.3	r/w	base	925	18234	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
		1dP	9117				
						0	not active
						1	The output is activated by an alarm from limit value 3.

14 Out.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Cnt	r/w	base	926	18236	Enum	*Enum_Cnt*	Message counter end
		1dP	9118				
						0 not active	
						1 The output is activated at the end of the count.	
FAi.1	r/w	base	932	18248	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
		1dP	9124				
						0 not active	
						1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base	933	18250	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
		1dP	9125				
						0 not active	
						1 The output is switched by the error message 'INP2 fault'.	
FAi.F	r/w	base	934	18252	Enum	*Enum_FAiF*	Activation of the output: Frequency fault.The 'Fail' signal is generated if a fault occurs at the counter/frequency input.
		1dP	9126				
						0 not active	
						1 The output is activated by the 'Frequency fault' error message.	
InF.1	r/w	base	935	18254	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
		1dP	9127				
						0 not active	
						1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base	936	18256	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
		1dP	9128				
						0 Not active	
						1 The output is activated by the status message 'Inf.2'.	

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out1	r	base	940	18264	Enum	*Enum_Ausgang*	Status of the digital output
		1dP	9132				
						0 off	
						1 on	

14 Out.1

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Do1	r/w	base 1dP	941 9133	18266	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off	
						1 on	

15 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base 1dP	970 9162	18324	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0 direct / normally open	
						1 inverse / normally closed	
Lim.1	r/w	base 1dP	973 9165	18330	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 1.	
Lim.2	r/w	base 1dP	974 9166	18332	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 2.	
Lim.3	r/w	base 1dP	975 9167	18334	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 3.	
Cnt	r/w	base 1dP	976 9168	18336	Enum	*Enum_Cnt*	Message counter end
						0 not active	
						1 The output is activated at the end of the count.	
FAi.1	r/w	base 1dP	982 9174	18348	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active	
						1 The output is switched by the error message 'INP1 fault'.	

15 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
FAi.2	r/w	base 1dP	983 9175	18350	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0	not active
						1	The output is switched by the error message 'INP2 fault'.
FAi.F	r/w	base 1dP	984 9176	18352	Enum	*Enum_FAiF*	Activation of the output: Frequency fault.The 'Fail' signal is generated if a fault occurs at the counter/frequency input.
						0	not active
						1	The output is activated by the 'Frequency fault' error message.
InF.1	r/w	base 1dP	985 9177	18354	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0	not active
						1	The output is activated by the status message 'Inf.1'.
InF.2	r/w	base 1dP	986 9178	18356	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0	Not active
						1	The output is activated by the status message 'Inf.2'.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out2	r	base 1dP	990 9182	18364	Enum	*Enum_Ausgang*	Status of the digital output
						0	off
						1	on
F.Do2	r/w	base 1dP	991 9183	18366	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0	off
						1	on

16 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.tYP	r/w	base 1dP	1035 9227	18454	Enum	*Enum_OtYP*	Signal type selection OUT
						0 Relay / logic (only visible with current/logic/voltage).	
						1 0 ... 20 mA continuous (only visible with current/logic/voltage).	
						2 4 ... 20 mA continuous (only visible with current/logic/voltage).	
						3 0...10 V continuous (only visible with current/logic/voltage)	
						4 2...10 V continuous (only visible with current/logic/voltage)	
						5 transmitter supply (only visible with current/logic/voltage)	
O.Act	r/w	base 1dP	1020 9212	18424	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0 direct / normally open	
						1 inverse / normally closed	
Out.0	r/w	base 1dP	1036 9228	18456	Float	-1999. . . 9999 ☐	Lower scaling limit of the analog output (corresponds to 0%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the lower scaling point is indicated in the respective electrical unit (mA / V).
Out.1	r/w	base 1dP	1037 9229	18458	Float	-1999. . . 9999 ☐	Upper scaling limit of the analog output (corresponds to 100%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the upper scaling point is indicated in the respective electrical unit (mA / V).
O.Src	r/w	base 1dP	1038 9230	18460	Enum	*Enum_OSrc*	Signal source of the analog output (only visible when O.TYP=1..5)
						0 not used	
						3 process value	
						7 measured value INP1	
						8 measured value INP2	
						10 The measurement value of the counter/frequency input is supplied.	
O.FAI	r/w	base 1dP	1039 9231	18462	Enum	*Enum_OFail*	fail behaviour
						0 upscale	
						1 downscale	
Lim.1	r/w	base 1dP	1023 9215	18430	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 1.	

16 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Lim.2	r/w	base 1dP	1024 9216	18432	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 2.	
Lim.3	r/w	base 1dP	1025 9217	18434	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 3.	
Cnt	r/w	base 1dP	1026 9218	18436	Enum	*Enum_Cnt*	Message counter end
						0 not active 1 The output is activated at the end of the count.	
FAi.1	r/w	base 1dP	1032 9224	18448	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active 1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base 1dP	1033 9225	18450	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0 not active 1 The output is switched by the error message 'INP2 fault'.	
FAi.F	r/w	base 1dP	1034 9226	18452	Enum	*Enum_FAiF*	Activation of the output: Frequency fault.The 'Fail' signal is generated if a fault occurs at the counter/frequency input.
						0 not active 1 The output is activated by the 'Frequency fault' error message.	
InF.1	r/w	base 1dP	1055 9247	18494	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0 not active 1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base 1dP	1056 9248	18496	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0 Not active 1 The output is activated by the status message 'Inf.2'.	

16 Out.3

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out3	r	base 1dP	1040 9232	18464	Enum	*Enum_Ausgang*	Status of the digital output
						0 off 1 on	
F.Do3	r/w	base 1dP	1041 9233	18466	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off 1 on	
Out.3	r	base 1dP	1043 9235	18470	Float	-1999. . . 9999 ☐	Value of the analog output [%]
F.Ou3	r/w	base 1dP	1042 9234	18468	Float	-1999. . . 9999 ☐	Forcing value of the analog output. Forcing involves the external operation of a controller output, i.e. the controller has no influence on this output. (Used for the operation of free controller outputs e.g. by a supervisory PLC.)

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Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.Fn	r/w	base 1dP	820 9012	18024	Enum	*Enum_SPFN*	Basic configuration for setpoint processing, e.g. 'setpoint controller switchable to external setpoint'. Configuration of special, controller-dependent setpoint functions.

0	set-point controller can be switched over to external set-point (->LOGI/SP.E)
1	Program controller for setpoint profile. The program profile is definable by the user.
2	Timer, operating mode 1 (bandwidth monitoring, switch-off at the end). After timer start, the controller lines out at the defined setpoint. The timer time (t.SP) runs when the process value enters the adjusted band around the setpoint (x = SP ± b.ti). When the timer has elapsed, the controller is switched to Y2 (= fixed positioning value) and the lower display alternates between 'End' and the setpoint.
3	Timer, operating mode 2 (bandwidth monitoring, pause at the end). After timer start, the controller lines out at the defined setpoint. The timer time (t.SP) runs when the process value enters the adjusted band around the setpoint (x = SP ± b.ti). When the timer has elapsed, the controller continues with setpoint SP, and the lower display alternates between 'End' and the setpoint.
4	Timer, operating mode 3 (switch-off at the end). After timer start, the controller lines out at the defined setpoint. The timer time (t.SP) runs immediately after switchover. When the timer has elapsed, the controller is switched to Y2 (= fixed positioning value) and the lower display alternates between 'End' and the setpoint.
5	Timer, operating mode 4 (pause at the end). After timer start, the controller lines out at the defined setpoint. The timer time (t.SP) runs immediately after switchover. When the timer has elapsed, the controller continues with setpoint SP, and the lower display alternates between 'End' and the setpoint.
6	Timer, operating mode 5 (delayed start). The timer starts immediately. The controller continues with Y2 (= fixes positioning value). When the timer (t.SP) has elapsed, the controller switches over to the adjusted setpoint.
7	Timer, operating mode 6 (setpoint switchover). After switching over from SP to SP.2, the controller lines out at SP.2. The time (t.SP) runs when the process value enters the adjusted band around the setpoint (x = SP ± b.ti). When the timer has elapsed, the controller switches back to setpoint SP, and the lower display alternates between 'End' and the setpoint.
8	Setpoint controller switchable to setpoint controller with external setpoint shift (switchable -> LOGI/SP.E).
9	Program controller switchable to program controller with external setpoint shift. (program controller for setpoint profile, the profile can be defined by the user, switchable -> LOGI/SP.E)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
b.ti	r/w	base 1dP	822 9014	18028	Float	0. . . 9999 ☐	Timer tolerance band for operating mode:1 (bandwidth monitoring with switch-off at the end)2 (bandwidth monitoring with pause at the end), and6 (setpoint switchover). The timer runs as long as the process value is within the bandwidth limits (setpoint ± b.ti).

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ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.tYP	r/w	base 1dP	1262 9454	18908	Enum	*Enum_CtYP*	The process value can be assigned directly to an input value, but it can also be computed from the comparison of two input values. For this, various formulas are provided for the user, e.g. the difference or the ratio of the two input values.

0	Standard controller (process value = x1)
1	Ratio controller (x1+oFFS)/x2. An offset is added to the input value x1, and then the ratio is calculated from the result and the input value x2. This ratio is used as process value.
2	The process value is calculated as the difference of the two values (x1 - x2).
3	Maximum value of x1 and x2. The higher value is used for control. In case of a sensor fault, control is continued with the remaining process value.
4	Minimum value of x1 and x2. The lower value is used for control. In case of a sensor fault, control is continued with the remaining process value.
5	Mean value (x1 + x2) / 2. In case of a sensor fault, control is continued with the remaining process value.
6	Switchover between the input values: process value = x1 or process value = x2.
7	O2 function with constant sensor temperature. The engineering unit for the O2 setting should be checked under: Other -> parameter unit (ppm / %). The sensor temperature must be defined under: Parameters -> Controller -> Sensor temperature.
8	O2 function with measured sensor temperature. The sensor temperature is required as the second process value x2. The engineering unit for the O2 setting should be checked under: Other -> Parameter unit (ppm / %).

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.Fnc	r/w	base 1dP	1250 9442	18884	Enum	*Enum_CFnc*	Control behaviour (algorithm) referred to output value: e.g. 2- or 3-point controller, signaller, 3-point stepping control.

0	on/off controller or signaller with one output
1	PID control, e.g. heating, with one output: Switched as a digital output (2-point) or used as an analog output (continuous). PID controllers respond quickly to changes of the control deviation, and typically do not exhibit any permanent control offset.
2	D / Y / Off, or 2-point controller with partial/full load switch-over
3	2 x PID control, e.g. heating/cooling. Two outputs: Switched as a digital output (3-point) or used as an analog output (continuous). PID controllers respond quickly to changes of the control deviation, and typically do not exhibit any permanent control offset.
4	3-point stepping controller, e.g. for motor actuators. Two digital outputs. No actuating pulses are generated when the process is lined out.

1 Cntr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
mAn	r/w	base 1dP	1251 9443	18886	Enum	*Enum_mAn*	Enables the output value to be adjusted in manual operation. If adjustment is not enabled, the output value cannot be changed in manual operation, neither with the front keys nor via the interface.Note: This setting does not affect the auto/manual switchover function.
						0 no	
						1 yes (see also LOGI/mAn)	
C.Act	r/w	base 1dP	1252 9444	18888	Enum	*Enum_CAct*	Operating sense of the controller. Inverse operation (e.g. heating) means increased heat input when the process value falls. Direct operation (e.g. cooling) means increased heat input when the process value increases.
						0 Inverse or opposed-sense response, e.g. heating. The controller output is increased with a falling process value, and decreased with a rising process value.	
						1 Direct or same-sense response, e.g. cooling. The controller output is increased with a rising process value, and decreased with a falling process value.	
FAIL	r/w	base 1dP	1253 9445	18890	Enum	*Enum_FAIL*	With the sensor break response, the operator determines the controller's reaction to a sensor break, thus ensuring a safe process condition.
						0 controller outputs switched off	
						1 y = Y2	
						2 y = mean output. The maximum permissible output can be adjusted with parameter Ym.H. To prevent determination of inadmissible values, mean value formation is only if the control deviation is lower than parameter L.Ym.	
rnG.L	r/w	base 1dP	1259 9451	18902	Float	-1999. . . 9999 ☐	Lower limit for the controller's operating range. The control range is independent of the measurement range. Reducing the control range will increase the sensitivity of the self-tuning process.
rnG.H	r/w	base 1dP	1260 9452	18904	Float	-1999. . . 9999 ☐	Upper limit for the controller's operating range. The control range is independent of the measurement range. Reducing the control range will increase the sensitivity of the self-tuning process.
Adt0	r/w	base 1dP	1261 9453	18906	Enum	*Enum_Adt0*	Optimization of the switching cycles t1 and t2 for the DED conversion can be disabled here. In order to fine-tune the positioning action, the switching periods are changed by the self-tuning function, if automatic tuning is configured.
						0 The cycle duration is determinated by auto-tuning. Thereby the best controlling results are obtained.	
						1 The cycle duration is not determinated by auto-tuning. An oversized cycle duration causes bad control behavior. An undersized cycle duration causes a more frequent switching, which can raise the wearout of mechanical actuators (relay, contactor).	

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Pb1	r/w	base 1dP	1200 9392	18784	Float	1. . . 9999 ☐	Proportional band 1 (heating) in engineering unit, e.g. °C. Pb defines the relationship between controller output and control deviation. The smaller Pb is, the stronger is the control action for a given control deviation. If Pb is too large or too small, the control loop will oscillate (hunting).

1 Cntr

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
Pb2	r/w	base 1dP	1201 9393	18786	Float	1. . . 9999	☐	Proportional band 2 (cooling) in engineering units, e.g. °C. Pb defines the relationship between controller output and control deviation. The smaller Pb is, the stronger is the control action for a given control deviation. If Pb is too large or too small, the control loop will oscillate (hunting).
ti1	r/w	base 1dP	1202 9394	18788	Float	1. . . 9999	☑	Integral action time 1 (heating) [s]. Ti is the time constant of the integral portion. The smaller Ti is, the faster is the response of the integral action. Ti too small: Control tends to oscillate. Ti too large: Control is sluggish and needs a long time to line out.
ti2	r/w	base 1dP	1203 9395	18790	Float	1. . . 9999	☑	Integral action time 2 (cooling) [s]. Ti is the time constant of the integral portion. The smaller Ti is, the faster is the response of the integral action. Ti too small: Control tends to oscillate. Ti too large: Control is sluggish and needs a long time to line out.
td1	r/w	base 1dP	1204 9396	18792	Float	1. . . 9999	☑	Derivative action time 1 (heating) [s], second parameter set. Td is the time constant of the derivative portion. The faster the process value changes, and the larger the value of Td is, the stronger will be the derivative action. Td too small: Very little derivative action. Td too large: Control tends to oscillate.
td2	r/w	base 1dP	1205 9397	18794	Float	1. . . 9999	☑	Derivative action time 2 (cooling) [s], second parameter set. Td is the time constant of the derivative portion. The faster the process value changes, and the larger the value of Td is, the stronger will be the derivative action. Td too small: Very little derivative action. Td too large: Control tends to oscillate.
t1	r/w	base 1dP	1206 9398	18796	Float	0,4. . . 9999	☐	Minimum duty cycle 1 (heating) [s]. With the standard duty cycle converter, the shortest pulse duration is 1/4 x t1. If the duty cycle is not to be optimized, this must be entered in the configuration. (Default: Optimization of the duty cycle during self-tuning, but also if the output value is less than 5%).
t2	r/w	base 1dP	1207 9399	18798	Float	0,4. . . 9999	☐	Minimum duty cycle 2 (cooling) [s]. With the standard duty cycle converter, the shortest pulse duration is 1/4 x t1. If the duty cycle is not to be optimized, this must be entered in the configuration. (Default: Optimization of the duty cycle during self-tuning, but also if the output value is less than 5%).
SH	r/w	base 1dP	1214 9406	18812	Float	0. . . 9999	☐	Neutral zone, or switching difference of the signaller [engineering unit].Too small: unnecessarily high switching frequency.Too large: reduced controller sensitivity.With 3-point controllers this slows down the direct transition from heating to cooling. With 3-point stepping controllers, it reduces the switching operations of the actuator around setpoint.
d.SP	r/w	base 1dP	1216 9408	18816	Float	-1999. . . 9999	☐	Separation of the D / Y switch-over point from the setpoint [engineering unit].
tP	r/w	base 1dP	1209 9401	18802	Float	0,1. . . 9999	☑	Minimum pulse duration [s]. Used for switching with constant periods. For positioning values that require a shorter pulse than adjusted for 'tp', the output is suppressed, but 'remembered'. The controller continues adding the internal short pulses until a value equal to 'tp' can be output.

1 Cntr

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
tt	r/w	base 1dP	1215 9407	18814	Float	3. . . 9999 ☐	Travel time of the actuator motor [s]. If no feedback signal is available, the controller calculates the actuator position by means of an integrator and the adjusted motor travel time. For this reason, a precise definition of the motor travel time between min and max (0% and 100%) is important.
Y.Lo	r/w	base 1dP	1218 9410	18820	Float	-105. . . 105 ☐	Lower output limit [%] The range is depedant of the type of controller: 2 point controller: 0...ymax+1 3 point controller: -105 ymax-1
Y.Hi	r/w	base 1dP	1219 9411	18822	Float	-105. . . 105 ☐	Upper output limit [%] The range is ymin+1 105
Y2	r/w	base 1dP	1217 9409	18818	Float	-100. . . 100 ☐	Second positioning value [%]. Activated Y2 = positioner control. Caution: The parameter 'positioning output Y2' must not be confused with the controller output Y2!
Y.0	r/w	base 1dP	1220 9412	18824	Float	-100. . . 100 ☐	Offset for die positioning value [%]. This is added to the controller output, and has the most effect with P and PD controllers. (With PID controllers, the effect is compensated by the integral action.) With a control deviation = 0, the P controller generates a control output Y0.
Ym.H	r/w	base 1dP	1221 9413	18826	Float	-100. . . 100 ☐	Limit for the mean control output value Ym in case of sensor break [%]. The mean control output value is configurable as the response to sensor break. The maximum mean output value = YmH.
L.Ym	r/w	base 1dP	1222 9414	18828	Float	1. . . 9999 ☐	Max. control deviation (xw), at the start of mean value calculation [engineering unit]. When calculating the mean value, data are only taken into account if the control deviation is small enough. 'Lym' is a preset value that determines how precisely the calculated output value is matched to the setpoint.
oFFS	r/w	base 1dP	1224 9416	18832	Float	-120. . . 120 ☐	Zero point for ratio control. For a given value of X2 (e.g. airflow quantity) the ratio controller changes the corresponding value of X1 (e.g. gas flow quantity), until the required ratio is reached.
tEmP	r/w	base 1dP	1236 9428	18856	Float	0. . . 9999 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.InP	r	base 1dP	1302 9494	18988	Float	-1999. . . 9999 ☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.
Tu2	r	base 1dP	1345 9537	19074	Float	0. . . 9999 ☐	'Cooling' delay time of the loop. Tu is calculated by the self-tuning function: It is the time delay before the process reacts significantly. In effect, Tu is a dead time that is determined by the reaction of the process to a change of the control output. It is used for defining controller action.

1 Cntr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Vmax2	r	base 1dP	1346 9538	19076	Float	0. . . 9999 ☐	Max. rate of change for 'cooling', i.e. the fastest process value increase during self-tuning. Vmax is calculated by the self-tuning function, and is determined by the reaction of the process to a change of the control output. It is used for defining controller action.
Kp2	r	base 1dP	1347 9539	19078	Float	0. . . 9999 ☐	Process gain for 'cooling'. For control loops with self-regulation, process gain is the ratio determined by the change of the control output and the resulting permanent change of the process value. Kp is calculated by the self-tuning function, and is used for defining controller action.
St.Cntr	r	base 1dP	1300 9492	18984	Int	0. . . 65535 ☐	Status informations of the controller.f.e. switching signals, controller off or informations about selftuning. The controller sratus shows the actual adjustments of the controller.

Bit 0: Switching signal heating: 0 off 1 on
Bit 1: Switching signal cooling: 0 off 1 on
Bit 2: Sensor error 0 ok 1 error
Bit 3: Contollsignal manual/atomatic
0 automatic 1 manual
Bit 4: Controllsignal Y2
0 Y2 not activ 1 Y2 activ
Bit 5: Contollsignal ext. default outputsignal
0 not activ 1 activ
Bit 6: Controlsignal controller off
0 contr. on 1 contr. off
Bit 7: The activ parameter set

diFF	r	base 1dP	1304 9496	18992	Float	-1999. . . 9999 ☐	Control deviation, is defined as process value minus setpoint. Positive Xw means that the process value is above the setpoint. A small control deviation indicates precise control.
Tu1	r	base 1dP	1341 9533	19066	Float	0. . . 9999 ☐	'Heating' delay time of the loop. Tu is calculated by the self-tuning function: It is the time delay before the process reacts significantly. In effect, Tu is a dead time that is determined by the reaction of the process to a change of the control output. It is used for defining controller action.
Ypid	r	base 1dP	1303 9495	18990	Float	-120. . . 120 ☐	Output value Ypid is the output signal determined by the controller, and from which the switching pulses for the digital and analog control outputs are calculated. Ypid is also available as an analog signal. e.g. for visualization.
Ada.St	r/w	base 1dP	1350 9542	19084	Enum	*Enum_AdaStart*	Starting / stopping the self-tuning function.After the start signal, the controller waits until the process reaches a stable condition (PIR) before it starts the self-tuning process. Self-tuning can be aborted manually at any time. After a successful self-tuning attempt, the controller automatically resumes normal operation.

0	'Stop' will abort the self-tuning process, and the controller returns to normal operation with the previous parameter settings.
1	Start of the self-tuning process is possible during manual or automatic controller operation.

Yman	r/w	base 1dP	1351 9543	19086	Float	-110. . . 110 ☐	Absolute preset output value, which is used as output value during manual operation. Caution: With 3-point stepping controllers, Yman (evaluated the same as Dyman) is added to the actual output value as a relative shift.

1 Cntr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
dYman	r/w	base 1dP	1352 9544	19088	Float	-220. . . 220 ☐	Differential preset output value, which is added to the actual output value during manual operation. Negative values reduce the output.
Yinc	r/w	base 1dP	1353 9545	19090	Enum	*Enum_YInc*	Increasing the output value. There are two speeds: 40 s or 10 s for the change from 0 % to 100 %. Note: The 3-point stepping controller translates the increments as UP.
						0 Not active 1 increment output	
Ydec	r/w	base 1dP	1354 9546	19092	Enum	*Enum_YDec*	Decreasing the output value. There are two speeds: 40 s or 10 s for the change from 0 % to 100 %. Note: The 3-point stepping controller translates the increments as DOWN.
						0 Not active 1 decrement output	
SP.EF	r	base 1dP	1301 9493	18986	Float	-1999. . . 9999 ☐	Effective setpoint. The value reached at the end of setpoint processing, after taking W2, external setpoint, gradient, boost function, programmer settings, start-up function, and limit functions into account. Comparison with the effective process value leads to the control deviation, from which the necessary controller response is derived.
St.Tune	r	base 1dP	1340 9532	19064	Int	0. . . 65535 ☐	Status information during self-tuning, e.g. the actual condition, and possible results, warnings, and error messages.
						Bit 0 Process lined out; 0 = No; 1 = Yes Bit 1 Operating mode 'Self-tuning controller; 0 = Off; 1 = On Bit 2 Result of controller self-tuning; 0 = OK; 1 = Fault Bit 3 - 7 Not used Bit 8 - 11 Result of the 'heating' attempt 0 0 0 0 No message / Attempt still running 0 0 0 1 Successful 0 0 1 0 Successful, with risk of exceeded setpoint 0 0 1 1 Error: Wrong operating sense 0 1 0 0 Error: No response from process 0 1 0 1 Error: Turning point too low 0 1 1 0 Error: Risk of exceeded setpoint 0 1 1 1 Error: Step output too small 1 0 0 0 Error: Setpoint reserve too small Bit 12 - 15 Result of 'cooling' attempt (same as heating attempt)	
Vmax1	r	base 1dP	1342 9534	19068	Float	0. . . 9999 ☐	Max. rate of change for 'heating', i.e. the fastest process value increase during self-tuning. Vmax is calculated by the self-tuning function, and is determined by the reaction of the process to a change of the control output. It is used for defining controller action.
Kp1	r	base 1dP	1343 9535	19070	Float	0. . . 9999 ☐	Process gain for 'heating'. For control loops with self-regulation, process gain is the ratio determined by the change of the control output and the resulting permanent change of the process value. Kp is calculated by the self-tuning function, and is used for defining controller action.

1 Cntr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Msg2	r	base 1dP	1348 9540	19080	Enum	*Enum_Msg*	The result of self-tuning for 'cooling' indicates whether self-tuning was successful, and with what result.

0	No message / Tuning attempt still running
1	Self-tuning has been completed successfully. The new parameters are valid.
2	Self-tuning was successful, but with a warning. The new parameters are valid. Note: Self-tuning was aborted due to the risk of an exceeded setpoint, but useful parameters were determined. Possibly repeat the attempt with an increased setpoint reserve.
3	The process reacts in the wrong direction. Possible remedy: Reconfigure the controller (inverse <-> direct). Check the controller output sense (inverse <-> direct).
4	No response from the process. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
5	The process value turning point of the step response is too low. Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
6	Self-tuning was aborted due to the risk of an exceeded setpoint. No useful parameters were determined. Possible remedy: Repeat the attempt with an increased setpoint reserve.
7	The step output change is not large enough (minimum change > 5 %). Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
8	error: set-point reserve to small

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Msg1	r	base 1dP	1344 9536	19072	Enum	*Enum_Msg*	The result of self-tuning for 'heating' indicates whether self-tuning was successful, and with what result.

0	No message / Tuning attempt still running
1	Self-tuning has been completed successfully. The new parameters are valid.
2	Self-tuning was successful, but with a warning. The new parameters are valid. Note: Self-tuning was aborted due to the risk of an exceeded setpoint, but useful parameters were determined. Possibly repeat the attempt with an increased setpoint reserve.
3	The process reacts in the wrong direction. Possible remedy: Reconfigure the controller (inverse <-> direct). Check the controller output sense (inverse <-> direct).
4	No response from the process. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
5	The process value turning point of the step response is too low. Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
6	Self-tuning was aborted due to the risk of an exceeded setpoint. No useful parameters were determined. Possible remedy: Repeat the attempt with an increased setpoint reserve.
7	The step output change is not large enough (minimum change > 5 %). Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
8	error: set-point reserve to small

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
YGrw	r/w	base 1dP	1355 9547	19094	Enum	*Enum_YGrwLs*	Gradient of Y-variation 'slow' or 'fast'. Changes the positioning output speed. There are two speeds for output variation: from 0% to 100% in 40s or in 10s.

0	Slow change of Y, from 0% to 100% in 40 seconds.
1	Fast change of Y, from 0% to 100% in 10 seconds.

2 InP.1

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.Fnc	r/w	base	270	16924	Enum	*Enum_IFnc*	Selection of the function assigned to the value at INP1, e.g. value at INP1 is the external setpoint.
		1dP	8462				

0	no function (subsequent input data are skipped)
1	Heating current input.
2	External setpoint SP.E or (depending on version) external setpoint shift SP.E. (Switchover is done via -> LOGI/SP.E).
4	Second process value X2. For process value functions such as ratio, min, max, mean. Adjustment via Cntr/C.tYP.
6	No controller input (replaced e.g. by limit value signalling).
7	Process value X1.

2 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	520 8712	17424	Enum	*Enum_StYP*	Sensor type selection

0	thermocouple type L (-100...900°C), Fe-CuNi DIN
1	thermocouple type J (-100...1200°C), Fe-CuNi
2	thermocouple type K (-100...1350°C), NiCr-Ni
3	thermocouple type N (-100...1300°C), Nicrosil-Nisil
4	thermocouple type S (0...1760°C), PtRh-Pt10%
5	thermocouple type R (0...1760°C), PtRh-Pt13%
6	thermocouple type T (-200...400°C), Cu-CuNi
7	thermocouple type C (0...2315°C), W5%Re-W26%Re
8	thermocouple type D (0...2315°C), W3%Re-W25%Re
9	thermocouple type E (-100...1000°C), NiCr-CuNi
10	thermocouple type B (0/100...1820°C), PtRh-Pt6%
18	Special thermocouple with a linearization characteristic selectable by the user. This enables non-linear signals to be simulated or linearized.
20	Pt100 (-200.0 ... 100.0(150.0)°C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	special 0...450 Ohm
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
40	0...10V / 2...10V
41	special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
45	Special : -5...5 V
46	Special : -10...10 V
47	Special : -200...200 mV
50	potentiometer 0...160 Ohm
51	potentiometer 0...450 Ohm
52	potentiometer 0...1600 Ohm
53	potentiometer 0...4500 Ohm

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
4wir	r/w	base 1dP	523 8715	17430	Enum	*Enum_4wire*	Connection principle for resistive inputs.

0	3-wire connection
1	4-wire connection

2 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.Lin	r/w	base 1dP	521 8713	17426	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.
						0	No special linearization.
						1	Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.
Corr	r/w	base 1dP	265 8457	16914	Enum	*Enum_Corr*	Measured value correction / scaling
						0	Without scaling
						1	The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.
						2	2-point correction (at CAL level)
						3	Scaling (at PArA level)
In.F	r/w	base 1dP	522 8714	17428	Float	-1999. . . 9999 ☑	Substitute value in case of a fault. This value is used for calculations, if there is a fault at the input (e.g. FAIL).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.1	r/w	base 1dP	500 8692	17384	Float	-1999. . . 9999 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.1	r/w	base 1dP	501 8693	17386	Float	-1999. . . 9999 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.1	r/w	base 1dP	502 8694	17388	Float	-1999. . . 9999 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.1	r/w	base 1dP	503 8695	17390	Float	-1999. . . 9999 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F1	r/w	base 1dP	504 8696	17392	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
E.tc1	r/w	base 1dP	506 8698	17396	Float	0. . . 100 ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1r	r	base 1dP	540 8732	17464	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
Fail	r	base 1dP	541 8733	17466	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

In.1	r	base 1dP	542 8734	17468	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
F.Inp	r/w	base 1dP	543 8735	17470	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.Fnc	r/w	base 1dP	266 8458	16916	Enum	*Enum_IFnc*	Selection of the function assigned to the value at INP2, e.g. value at INP2 is the external setpoint.

0	no function (subsequent input data are skipped)
1	Heating current input.
2	External setpoint SP.E or (depending on version) external setpoint shift SP.E. (Switchover is done via -> LOGI/SP.E).
4	Second process value X2. For process value functions such as ratio, min, max, mean. Adjustment via Cntr/C.tYP.
6	No controller input (replaced e.g. by limit value signalling).
7	Process value X1.

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	570 8762	17524	Enum	*Enum_StYP2*	Sensor type selection

0	Thermocouple Type L (-100...900 °C), Fe-CuNi DIN
1	Thermocouple Type J (-100...1200 °C), Fe-CuNi
2	Thermocouple Type K (-100...1350 °C), NiCr-Ni
3	Thermocouple Type N (-100...1300 °C), Nicrosil-Nisil
4	Thermocouple Type S (0...1760 °C), PtRh-Pt 10%
5	Thermocouple Type R (0...1760 °C), PtRh-Pt13%
6	Thermocouple Type T (-200...400 °C), Cu-CuNi
7	Thermocouple Type C (0...2315°C), W5%Re-W26%Re
8	Thermocouple Type D (0...2315°C), W3%Re-W25%Re
9	Thermocouple Type E (-100...1000 °C), NiCr-CuNi
10	Thermocouple Type B (0/100...1820 °C), PtRh-Pt6%
18	special thermocouple
20	Pt100 (-200.0 ... 100.0(150.0) °C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	Special : 0...450 Ohms
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
31	0...50 mA current (AC)
41	Special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
47	Special : -200...200 mV
50	Potentiometer 0...160 ohms
51	Potentiometer 0...450 ohms
52	Potentiometer 0...1600 ohms
53	Potentiometer 0...4500 ohms

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.Lin	r/w	base 1dP	571 8763	17526	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.

0	No special linearization.
1	Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Corr	r/w	base 1dP	267 8459	16918	Enum	*Enum_Corr*	Measured value correction / scaling

0	Without scaling
1	The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.
2	2-point correction (at CAL level)
3	Scaling (at PArA level)

In.F	r/w	base 1dP	572 8764	17528	Float	-1999. . . 9999 ☑	Substitute value in case of a fault. This value is used for calculations, if there is a fault at the input (e.g. FAIL).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.2	r/w	base 1dP	550 8742	17484	Float	-1999. . . 9999 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.2	r/w	base 1dP	551 8743	17486	Float	-1999. . . 9999 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.2	r/w	base 1dP	552 8744	17488	Float	-1999. . . 9999 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.2	r/w	base 1dP	553 8745	17490	Float	-1999. . . 9999 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F2	r/w	base 1dP	554 8746	17492	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
E.tc2	r/w	base 1dP	556 8748	17496	Float	0. . . 100 ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	590 8782	17564	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).

3 InP.2

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fail	r	base 1dP	591 8783	17566	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

In.2r	r	base 1dP	592 8784	17568	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
F.Inp	r/w	base 1dP	593 8785	17570	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

4 Lim

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.1	r/w	base 1dP	670 8862	17724	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)

Src.1	r/w	base 1dP	672 8864	17728	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
1	control deviation xw (process value - set-point)
2	Control deviation Xw (= relative alarm) with suppression during start-up and setpoint changes.
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
6	effective set-point Weff
7	correcting variable y (controller output)

HC.AL	r/w	base 1dP	620 8812	17624	Enum	*Enum_HCAL*	Alarm heat current function

0	No heating current alarm.
1	Overload short circuit monitoring
2	Break and short circuit monitoring

4 Lim

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
LP.AL	r/w	base 1dP	1258 9450	18900	Enum	*Enum_LPAL*	Monitoring of control loop interruption (availlable for PID controllers, C.Fnc=1,2,3,...)
						0 switched off / inactive	
						1 active	

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.1	r/w	base 1dP	650 8842	17684	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.1	r/w	base 1dP	651 8843	17686	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.1	r/w	base 1dP	652 8844	17688	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.
HC.A	r/w	base 1dP	600 8792	17584	Float	-1999. . . 9999 ☐	Heating current monitoring limit [A]. Depending on configuration, and apart from short-circuit monitoring, an overload test checks whether the heating current is above the adjusted current limit, or below the limit when the heating is switched off. The heating current is measured by means of a current transformer (accessory), and the current range can be adapted.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.HC	r	base 1dP	640 8832	17664	Int	0. . . 3 ☐	Status of the heating current alarm. Displayable are heating current short-circuit and/or heating current alarm. Depending on configuration, the heating current alarm is either an interruption of heating current (I < limit value) or heating current overload (I > limit value).
HC	r	base 1dP	641 8833	17666	Float	-1999. . . 9999 ☐	Measured heating current [A]. Apart from the short circuit test, and depending on configuration, an overcurrent test (current I > heating current limit) and an open circuit test (current I < heating current limit) is executed. The heating current is measured by means of a (separate) current transformer, whereby the input range can be scaled.
SSr	r	base 1dP	642 8834	17668	Float	-1999. . . 9999 ☐	Measured current with SSr [A]. The heating current (SSR) is short circuited, if there is a current flow even though the controller output is switched off.Suggested remedy: check heating current circuit, replace solid-state relay if necessary.

4 Lim

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	690 8882	17764	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

5 Lim2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.2	r/w	base 1dP	720 8912	17824	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.2	r/w	base 1dP	721 8913	17826	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
1	control deviation xw (process value - set-point)
2	Control deviation Xw (= relative alarm) with suppression during start-up and setpoint changes.
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
6	effective set-point Weff
7	correcting variable y (controller output)

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	700 8892	17784	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.2	r/w	base 1dP	701 8893	17786	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.2	r/w	base 1dP	702 8894	17788	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	740 8932	17864	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

6 Lim3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.3	r/w	base 1dP	770 8962	17924	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.3	r/w	base 1dP	771 8963	17926	Enum	*Enum_Src*	Source for limit value. Selection of which value is to be monitored, e.g. process value or control deviation.

0	Process value = absolute alarm
1	control deviation xw (process value - set-point)
2	Control deviation Xw (= relative alarm) with suppression during start-up and setpoint changes.
3	Measured value of the analog input INP1.
4	Measured value of the analog input INP2.
6	effective set-point Weff
7	correcting variable y (controller output)

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	750 8942	17884	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	751 8943	17886	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
HYS.3	r/w	base 1dP	752 8944	17888	Float	0. . . 9999 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.

6 Lim3

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	790 8982	17964	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

7 LOGI

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L_r	r/w	base 1dP	421 8613	17226	Enum	*Enum_dInPRail1*	Local / remote switchover (Remote: Adjustment of all values via the front panel is blocked).

0	No function (switchover via interface is possible).
1	Always active.
2	DI1 switches.
5	func switches

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.2	r/w	base 1dP	422 8614	17228	Enum	*Enum_dInPRail2*	Source of the control signal for activating the second (safety) setpoint (SP.2=) W2. Note: W2 is not restricted by the setpoint limits.

0	No function (switchover via interface is possible).
2	DI1 switches.
5	func switches

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.E	r/w	base 1dP	423 8615	17230	Enum	*Enum_dInPRail1*	Switching to external setpoint SP.E

0	No function (switchover via interface is possible).
1	Always active.
2	DI1 switches.
5	func switches

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Y2	r/w	base 1dP	424 8616	17232	Enum	*Enum_dInPRail2*	Source of the control signal for activating the second positioning output Y2. Activated Y2 = positioner control. Caution: The parameter 'positioning output Y2' must not be confused with the controller output Y2!

0	No function (switchover via interface is possible).
2	DI1 switches.
5	func switches

7 LOGI

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
mAn	r/w	base 1dP	426 8618	17236	Enum	*Enum_dInPRail1*	Source of the control signal for auto/manual switchover. In the automatic mode, the controller is in charge. In the manual mode, the outputs can be varied independently of the process.
						0	No function (switchover via interface is possible).
						1	Always active.
						2	DI1 switches.
						5	func switches
C.oFF	r/w	base 1dP	427 8619	17238	Enum	*Enum_dInPRail2*	Source of the control signal for disabling all the controller outputs.Note: Forcing has priority, and remains active; alarm processing also remains active.
						0	No function (switchover via interface is possible).
						2	DI1 switches.
						5	func switches
Err.r	r/w	base 1dP	429 8621	17242	Enum	*Enum_dInPRail2*	Source of the control signal for resetting all stored entries in the error list (the list contains all error messages and alarms). If an alarm is still present, i.e. the source of trouble has not been remedied, stored alarms cannot be acknowledged (reset).
						0	No function (switchover via interface is possible).
						2	DI1 switches.
						5	func switches
P.run	r/w	base 1dP	432 8624	17248	Enum	*Enum_dInPRail2*	Source of the control signal for switching the programmer between Run and Stop. On units with a simple programmer (only 1 program), a stop immediately causes a reset, followed by a new start. With units that have been defined as program controllers (several programs), the program is stopped, and then continued.
						0	No function (switchover via interface is possible).
						2	DI1 switches.
						5	func switches
I.ChG	r/w	base 1dP	434 8626	17252	Enum	*Enum_dInPRail2*	Signal source for switching the effective process value between x1 and x2.
						0	No function (switchover via interface is possible).
						2	DI1 switches.
						5	func switches
di.Fn	r/w	base 1dP	420 8612	17224	Enum	*Enum_diFn*	Function of digital inputs (valid for all inputs)
						0	Basic setting 'Off': A permanent positive signal switches this function 'On', which is connected to the digital input. Removal of the signal switches the function 'Off' again.
						1	Basic setting 'On': A permanent positive signal switches this function 'Off', which is connected to the digital input. Removal of the signal switches the function 'On' again.
						2	Push-button function. Basic setting 'Off'. Only positive signals are effective. The first positive signal switches 'On'. Removal of the signal is necessary before the next positive signal can switch 'Off'.

7 LOGI

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Di	r	base 1dP	450 8642	17284	Int	. . . ☐	Status of the digital inputs or of push-buttons (binary coded). Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key
L-R	r/w	base 1dP	460 8652	17304	Int	0. . . 1 ☐	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.
W_W2	r/w	base 1dP	461 8653	17306	Int	0. . . 1 ☐	Signal for activating the second (safety) setpoint (SP.2=) W2. Note: Setpoint W2 is not restricted by the setpoint limits!
Wi_We	r/w	base 1dP	462 8654	17308	Int	0. . . 1 ☐	Signal for activating the external setpoint value. SP.E is the external setpoint, or dependent on the device and configuration of the setpoint shift.
Y_Y2	r/w	base 1dP	463 8655	17310	Int	0. . . 1 ☐	Signal for activating the 2nd output value Y2. With selected Y2, the output is operated as a positioner.Caution: Do not confuse the parameter 'fixed output Y2' with the controller output Y2!
A-M	r/w	base 1dP	464 8656	17312	Int	0. . . 1 ☐	Signal for activating manual operation. In the manual mode, the controller provides output signals independent of the process.
C.Off	r/w	base 1dP	465 8657	17314	Int	0. . . 1 ☐	Signal for disabling all the controller outputs. Note: Forcing has priority; alarm processing remains active.
Err.r	r/w	base 1dP	470 8662	17324	Int	0. . . 1 ☐	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).
SSR.Res	r/w	base 1dP	466 8658	17316	Int	0. . . 1 ☐	Reset of the alarm triggered by a solid-state relay (SSR). SSRs are mostly used for frequent switching of heating elements, because they have no mechanical contacts that can wear out. However, an unnoticed short circuit could lead to overheating of the machine.
ProG	r/w	base 1dP	467 8659	17318	Int	0. . . 1 ☐	Signal for starting the programmer. On units with a simple programmer (only 1 program), a stop immediately causes a reset, followed by a new start. With units that have been defined as program controllers (several programs), the program is stopped, and then continued.
F.Di	r/w	base 1dP	480 8672	17344	Int	0. . . 1 ☐	Forcing of digital inputs. Forcing involves the external operation of at least one device input. The device takes over this input value (preset value for device inputs from a superordinate system, e.g. for a function test.) Bit 0 Forcing of digital Input 1
I.Chg	r/w	base 1dP	471 8663	17326	Int	0. . . 1 ☐	Signal for switching the effective process value between x1 and x2

7 LOGI

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
Func	r/w	base 1dP	476 8668	17336	Int	0. . . 1	☐	OR-linking of several control signals.

8 ohnE

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
B.BedEbe	r/w	base 1dP	1839 10031	20062	Int	0. . . 255	☐	The 3 Operating Levels (Parameter, Configuration, and Calibration) can be disabled here.
B.Bedien	r/w	base 1dP	1838 10030	20060	Int	0. . . 255	☐	Used to disable various operating functions (e.g. access to the extended Operating Level).
C.Sch	r/w	base 1dP	1801 9993	19986	Float	1. . . 9999999	☑	Data defines the number of switching cycles for which the message InF.2 is generated.
C.Std	r/w	base 1dP	1800 9992	19984	Float	1. . . 9999999	☑	Data defines the number of operating hours for which the message InF.1 is generated.
D.ForcIn	r/w	base 1dP	1803 9995	19990	Int	0. . . 255	☐	The data defines the inputs to be forced: Bit 0 analog input 1 Bit 1 analog input 2 Bit 2 not used Bit 3 not used Bit 4 digital input 1 Bit 5 not used Bit 6 not used Bit 7 not used
D.ForcOut	r/w	base 1dP	1804 9996	19992	Int	0. . . 255	☐	The data defines the outputs to be forced. Bit 0 output 1 Bit 1 output 2 Bit 2 output 3 Bit 3 not used Bit 4 not used Bit 5 not used Bit 6 not used Bit 7 not used
Dis2	r/w	base 1dP	1848 10040	20080	Int	256. . . 8190	☐	Datum to be shown in display 2. The basic address of the datum that is to be displayed must be entered.
EOP1	r/w	base 1dP	1840 10032	20064	Int	256. . . 8190	☐	1st datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP2	r/w	base 1dP	1841 10033	20066	Int	256. . . 8190	☐	2nd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
EOP3	r/w	base 1dP	1842 10034	20068	Int	256. . . 8190	☐	3rd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP4	r/w	base 1dP	1843 10035	20070	Int	256. . . 8190	☐	4th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP5	r/w	base 1dP	1844 10036	20072	Int	256. . . 8190	☐	5th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP6	r/w	base 1dP	1845 10037	20074	Int	256. . . 8190	☐	6th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP7	r/w	base 1dP	1846 10038	20076	Int	256. . . 8190	☐	7th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP8	r/w	base 1dP	1847 10039	20078	Int	256. . . 8190	☐	8th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
In.1	r/w	base 1dP	1861 10053	20106	Float	0. . . 2	☐	Input 1 for measurement value 1 (to Output 1 for display value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.10	r/w	base 1dP	1879 10071	20142	Float	0. . . 2	☑	Input 10 for measurement value 10 (to Output 10 for display value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.11	r/w	base 1dP	1881 10073	20146	Float	0. . . 2	☑	Input 11 for measurement value 11 (to Output 11 for display value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.12	r/w	base 1dP	1883 10075	20150	Float	0. . . 2	☑	Input 12 for measurement value 12 (to Output 12 for display value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.13	r/w	base 1dP	1885 10077	20154	Float	0. . . 2	☑	Input 13 for measurement value 13 (to Output 13 for display value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.14	r/w	base 1dP	1887 10079	20158	Float	0. . . 2	☑	Input 14 for measurement value 14 (to Output 14 for display value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.15	r/w	base 1dP	1889 10081	20162	Float	0. . . 2 ☑	Input 15 for measurement value 15 (to Output 15 for display value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.16	r/w	base 1dP	1891 10083	20166	Float	0. . . 2 ☑	Input 16 for measurement value 16 (to Output 16 for display value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.2	r/w	base 1dP	1863 10055	20110	Float	0. . . 2 ☐	Input 2 for measurement value 2 (to Output 2 for display value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.3	r/w	base 1dP	1865 10057	20114	Float	0. . . 2 ☑	Input 3 for measurement value 3 (to Output 3 for display value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.4	r/w	base 1dP	1867 10059	20118	Float	0. . . 2 ☑	Input 4 for measurement value 4 (to Output 4 for display value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.5	r/w	base 1dP	1869 10061	20122	Float	0. . . 2 ☑	Input 5 for measurement value 5 (to Output 5 for display value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.6	r/w	base 1dP	1871 10063	20126	Float	0. . . 2 ☑	Input 6 for measurement value 6 (to Output 6 for display value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.7	r/w	base 1dP	1873 10065	20130	Float	0. . . 2 ☑	Input 7 for measurement value 7 (to Output 7 for display value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.8	r/w	base 1dP	1875 10067	20134	Float	0. . . 2 ☑	Input 8 for measurement value 8 (to Output 8 for display value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.9	r/w	base 1dP	1877 10069	20138	Float	0. . . 2 ☑	Input 9 for measurement value 9 (to Output 9 for display value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ou.1	r/w	base 1dP	1862 10054	20108	Float	0. . . 2 ☐	Output 1 for display value 1 (to Input 1 for measurement value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.10	r/w	base 1dP	1880 10072	20144	Float	0. . . 2 ☑	Output 10 for display value 10 (to Input 10 for measurement value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.11	r/w	base 1dP	1882 10074	20148	Float	0. . . 2 ☑	Output 11 for display value 11 (to Input 11 for measurement value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.12	r/w	base 1dP	1884 10076	20152	Float	0. . . 2 ☑	Output 12 for display value 12 (to Input 12 for measurement value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.13	r/w	base 1dP	1886 10078	20156	Float	0. . . 2 ☑	Output 13 for display value 13 (to Input 13 for measurement value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.14	r/w	base 1dP	1888 10080	20160	Float	0. . . 2 ☑	Output 14 for display value 14 (to Input 14 for measurement value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.15	r/w	base 1dP	1890 10082	20164	Float	0. . . 2 ☑	Output 15 for display value 15 (to Input 15 for measurement value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.16	r/w	base 1dP	1892 10084	20168	Float	0. . . 2 ☑	Output 16 for display value 16 (to Input 16 for measurement value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.2	r/w	base 1dP	1864 10056	20112	Float	0. . . 2 ☐	Output 2 for display value 2 (to Input 2 for measurement value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.3	r/w	base 1dP	1866 10058	20116	Float	0. . . 2 ☑	Output 3 for display value 3 (to Input 3 for measurement value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
Ou.4	r/w	base 1dP	1868 10060	20120	Float	0. . . 2	☑	Output 4 for display value 4 (to Input 4 for measurement value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.5	r/w	base 1dP	1870 10062	20124	Float	0. . . 2	☑	Output 5 for display value 5 (to Input 5 for measurement value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.6	r/w	base 1dP	1872 10064	20128	Float	0. . . 2	☑	Output 6 for display value 6 (to Input 6 for measurement value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.7	r/w	base 1dP	1874 10066	20132	Float	0. . . 2	☑	Output 7 for display value 7 (to Input 7 for measurement value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.8	r/w	base 1dP	1876 10068	20136	Float	0. . . 2	☑	Output 8 for display value 8 (to Input 8 for measurement value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.9	r/w	base 1dP	1878 10070	20140	Float	0. . . 2	☑	Output 9 for display value 9 (to Input 9 for measurement value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
PASS	r/w	base 1dP	1850 10042	20084	Int	0. . . 9999	☑	Password. 4-digit number for the password-protected access to blocked operating functions such as e.g. the Parameter Level.
T.Dis2	r/w	base 1dP	1851 10043	20086	Text	. . .	☐	This address contains 5 bytes for the text that is to appear in Display 2. No text: 1st byte 0x00.
U.LinT	r/w	base 1dP	1860 10052	20104	Enum	*Enum_Unit*		Engineering unit of linearization table: none, °C, °F or K.
						0	without unit	
						1	°C	
						2	°F	
						3	K	
V.Mask	r/w	base 1dP	1810 10002	20004	Int	0. . . 255	☐	Definition of the visibility templates.The templates define the configurations and parameters displayed for operation (contents on request).

8 ohnE

• PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
Conf	r/w	base 1dP	256 8448	16896	Int	0. . . 2	☐	Start/Stop and abortion of the configuration mode 0 = End of configuration 1 = Start of configuration 2 = Abort configuration
Pb1	r/w	base 1dP	81 8273	16546	Float	1. . . 9999	☐	Proportional band 1 (heating) in engineering unit, e.g. °C. Pb defines the relationship between controller output and control deviation. The smaller Pb is, the stronger is the control action for a given control deviation. If Pb is too large or too small, the control loop will oscillate (hunting).
SP.01	r/w	base 1dP	92 8284	16568	Float	-1999. . . 9999	☑	End setpoint of segment 1. This is the target setpoint that is reached at the end of the first segment. The target setpoint is approached from the previous valid setpoint (when starting the 1st segment, matching to process value!). When the program is completed, the controller continues with the last target setpoint reached.
Pb2	r/w	base 1dP	82 8274	16548	Float	1. . . 9999	☐	Proportional band 2 (cooling) in engineering units, e.g. °C. Pb defines the relationship between controller output and control deviation. The smaller Pb is, the stronger is the control action for a given control deviation. If Pb is too large or too small, the control loop will oscillate (hunting).
Pt.01	r/w	base 1dP	93 8285	16570	Float	0. . . 9999	☐	Segment time 1 defines the duration of the first segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
SP.02	r/w	base 1dP	94 8286	16572	Float	-1999. . . 9999	☑	End setpoint of segment 2. This is the target setpoint that is reached at the end of the second segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.
SP.2	r/w	base 1dP	79 8271	16542	Float	-1999. . . 9999	☐	Second (safety) setpoint. Ramp function as with other setpoints (effective, external). However, SP2 is not restricted by the setpoint limits.
ti1	r/w	base 1dP	83 8275	16550	Float	1. . . 9999	☑	Integral action time 1 (heating) [s]. Ti is the time constant of the integral portion. The smaller Ti is, the faster is the response of the integral action. Ti too small: Control tends to oscillate. Ti too large: Control is sluggish and needs a long time to line out.
Pt.02	r/w	base 1dP	95 8287	16574	Float	0. . . 9999	☐	Segment time 2 defines the duration of the second segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
ti2	r/w	base 1dP	84 8276	16552	Float	1. . . 9999	☑	Integral action time 2 (cooling) [s]. Ti is the time constant of the integral portion. The smaller Ti is, the faster is the response of the integral action. Ti too small: Control tends to oscillate. Ti too large: Control is sluggish and needs a long time to line out.
SP.03	r/w	base 1dP	96 8288	16576	Float	-1999. . . 9999	☑	End setpoint of segment 3. This is the target setpoint that is reached at the end of the third segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.

8 ohnE

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
t.SP	r/w	base 1dP	80 8272	16544	Float	0. . . 9999	☐	The timer (preset) value is entered in minutes with one decimal digit (0,1 minute = 6 seconds). With an activated timer, the preset value is displayed automatically in the extended Operating Level, where it can be changed by means of the parameter t.ti.
td1	r/w	base 1dP	85 8277	16554	Float	1. . . 9999	☑	Derivative action time 1 (heating) [s], second parameter set. Td is the time constant of the derivative portion. The faster the process value changes, and the larger the value of Td is, the stronger will be the derivative action. Td too small: Very little derivative action. Td too large: Control tends to oscillate.
Pt.03	r/w	base 1dP	97 8289	16578	Float	0. . . 9999	☐	Segment time 3 defines the duration of the third segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
td2	r/w	base 1dP	86 8278	16556	Float	1. . . 9999	☑	Derivative action time 2 (cooling) [s], second parameter set. Td is the time constant of the derivative portion. The faster the process value changes, and the larger the value of Td is, the stronger will be the derivative action. Td too small: Very little derivative action. Td too large: Control tends to oscillate.
SP.04	r/w	base 1dP	98 8290	16580	Float	-1999. . . 9999	☑	End setpoint of segment 4. This is the target setpoint that is reached at the end of the fourth segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.
t1	r/w	base 1dP	87 8279	16558	Float	0,4. . . 9999	☐	Minimum duty cycle 1 (heating) [s]. With the standard duty cycle converter, the shortest pulse duration is 1/4 x t1. If the duty cycle is not to be optimized, this must be entered in the configuration. (Default: Optimization of the duty cycle during self-tuning, but also if the output value is less than 5%).
Pt.04	r/w	base 1dP	99 8291	16582	Float	0. . . 9999	☐	Segment time 4 defines the duration of the fourth segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
t2	r/w	base 1dP	88 8280	16560	Float	0,4. . . 9999	☐	Minimum duty cycle 2 (cooling) [s]. With the standard duty cycle converter, the shortest pulse duration is 1/4 x t1. If the duty cycle is not to be optimized, this must be entered in the configuration. (Default: Optimization of the duty cycle during self-tuning, but also if the output value is less than 5%).
HC.A	r/w	base 1dP	72 8264	16528	Float	-1999. . . 9999	☐	Heating current monitoring limit [A]. Depending on configuration, and apart from short-circuit monitoring, an overload test checks whether the heating current is above the adjusted current limit, or below the limit when the heating is switched off. The heating current is measured by means of a current transformer (accessory), and the current range can be adapted.
Y.0	r/w	base 1dP	89 8281	16562	Float	-105. . . 105	☐	Offset for die positioning value [%]. This is added to the controller output, and has the most effect with P and PD controllers. (With PID controllers, the effect is compensated by the integral action.) With a control deviation = 0, the P controller generates a control output Y0.

8 ohnE

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
oFFS	r/w	base 1dP	90 8282	16564	Float	-120. . . 120 ☐	Zero point for ratio control. For a given value of X2 (e.g. airflow quantity) the ratio controller changes the corresponding value of X1 (e.g. gas flow quantity), until the required ratio is reached.
tEmP	r/w	base 1dP	91 8283	16566	Float	0. . . 9999 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.InP	r	base 1dP	39 8231	16462	Float	-1999. . . 9999 ☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.
CAH	r	base 1dP	390 8582	17164	Long	0. . . ☐	Total operating hours. Count starts with the first switch-on. Internal test routine. Is stored and displayed not more than once per hour.
CPH	r/w	base 1dP	394 8586	17172	Long	0. . . ☐	Operating hours of the current maintenance period. Internal test routine. Is stored and displayed not more than once per hour. Reset when the time limit message is acknowledged.
Diag	r	base 1dP	382 8574	17148	Int	0. . . 255 ☐	Result of diagnosis. Any faults detected during the self-test for data, RAM, processor, and EEPROM, as well as an exceeded count for the operating hours (maintenance period) and no. of switching cycles (maintenance period) are stored. Can be reset by acknowledgement.
EE.Ver	r	base 1dP	381 8573	17146	Int	0. . . 0 ☐	EEPROM version
Id.NrH	r	base 1dP	370 8562	17124	Int	0. . . 0 ☐	More significant part of the device Ident number.
Id.NrL	r	base 1dP	371 8563	17126	Int	0. . . 0 ☐	Less significant part of the device Ident number.
Id.NrZ	r	base 1dP	372 8564	17128	Int	0. . . 0 ☐	Sequential Ident number of the device.
Int.Tmp	r	base 1dP	380 8572	17144	Int	0. . . 0 ☐	Max. measured operating temperature. Internal test routine.
Oem.NrH	r	base 1dP	373 8565	17130	Int	0. . . 0 ☐	More significant part of the device OEM no.

8 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Oem.NrL	r	base 1dP	374 8566	17132	Int	0. . . 0 ☐	Less significant part of the device OEM no.
SAO1	r	base 1dP	391 8583	17166	Long	0. . . ☐	Total number of switching cycles of OUT1. Internal test routine that is stored and displayed not more than once per hour.
SAO2	r	base 1dP	392 8584	17168	Long	0. . . ☐	Total number of switching cycles of OUT2. Internal test routine that is stored and displayed not more than once per hour.
SAO3	r	base 1dP	393 8585	17170	Long	0. . . ☐	Total number of switching cycles of OUT3. Internal test routine that is stored and displayed not more than once per hour.
SPO1	r/w	base 1dP	395 8587	17174	Long	0. . . ☐	Switching cycles of OUT1 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO2	r/w	base 1dP	396 8588	17176	Long	0. . . ☐	Switching cycles of OUT2 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO3	r/w	base 1dP	397 8589	17178	Long	0. . . ☐	Switching cycles of OUT3 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
Sw.Nr	r	base 1dP	375 8567	17134	BCD	0. . . 0 ☐	Digits 7 to 12 of the software order number.
T.CodeNr	r	base 1dP	360 8552	17104	Text	0. . . 0 ☐	15-digit order number of the device.
UPD	r/w	base 1dP	257 8449	16898	Enum	*Enum_Aenderungsflag*	Status message indicating that parameter / configuration have been changed via the front panel.
						0 No change via the front panel keys.	
						1 A change has been made via the front panel keys, which must be processed.	
HC	r	base 1dP	54 8246	16492	Float	-1999. . . 9999 ☐	Measured heating current [A]. Apart from the short circuit test, and depending on configuration, an overcurrent test (current I > heating current limit) and an open circuit test (current I < heating current limit) is executed. The heating current is measured by means of a (separate) current transformer, whereby the input range can be scaled.
L-R	r/w	base 1dP	55 8247	16494	Int	0. . . 1 ☐	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.

8 ohnE

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Hw.Opt	r	base 1dP	200 8392	16784	Int	0. . . 65535 ☐	Device options: 0000 WXYZ 0000 DCBA Z = 1: Modbus interface Y = 1: System device X = 1: Option 1 W = 1: Option 2 A = 1: OUT1 available B = 1: OUT2 available C = 1: OUT3 available D = 1: OUT3 is an analog output
SP	r/w	base 1dP	44 8236	16472	Float	-1999. . . 9999 ☐	Setpoint for the interface (without the additional function 'Controller off'). SetpInterface acts on the internal setpoint before the setpoint processing stage. Note: The value in RAM is always updated. To protect the EEPROM, storage of the value in the EEPROM is timed (at least one value per half hour).
W_W2	r/w	base 1dP	56 8248	16496	Int	0. . . 1 ☐	Signal for activating the second (safety) setpoint (SP.2=) W2. Note: Setpoint W2 is not restricted by the setpoint limits!
SP.d	r/w	base 1dP	45 8237	16474	Float	-1999. . . 9999 ☐	The effective setpoint is shifted by this value. In this way, the setpoints of several controllers can be shifted together, regardless of the individually adjusted effective setpoints.
Sw.Op	r	base 1dP	201 8393	16786	Int	0. . . 255 ☐	Software version XY Major and Minor Release (e.g. 21 = Version 2.1). The software version specifies the firmware in the unit. For the correct interaction of E-Tool and device, it must match the operating version (OpVersion) in the E-Tool.
Wi_We	r/w	base 1dP	57 8249	16498	Int	0. . . 1 ☐	Signal for activating the external setpoint value. SP.E is the external setpoint, or dependent on the device and configuration of the setpoint shift.
Bed.V	r	base 1dP	202 8394	16788	Int	0. . . 255 ☐	Operating version (numeric value). For the correct interaction of E-Tool and device, the software version and operating version must match.
St.Cntr	r	base 1dP	35 8227	16454	Int	0. . . 65535 ☐	Status informations of the controller.f.e. switching signals, controller off or informations about selftuning. The controller sratus shows the actual adjustments of the controller.
							Bit 0: Switching signal heating: 0 off 1 on Bit 1: Switching signal cooling: 0 off 1 on Bit 2: Sensor error 0 ok 1 error Bit 3: Contollsignal manual/atomatic 0 automatic 1 manual Bit 4: Controllsignal Y2 0 Y2 not activ 1 Y2 activ Bit 5: Contollsignal ext. default outputsignal 0 not activ 1 activ Bit 6: Controlsignal controller off 0 contr. on 1 contr. off Bit 7: The activ parameter set
t.ti	r/w	base 1dP	46 8238	16476	Float	0. . . 9999 ☐	Current timer count in minutes. Count-down timer. The run time is only visible, if the timer is active. Configuration in the extended Operating Level.

8 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Y_Y2	r/w	base 1dP	58 8250	16500	Int	0. . . 1 ☐	Signal for activating the 2nd output value Y2. With selected Y2, the output is operated as a positioner.Caution: Do not confuse the parameter 'fixed output Y2' with the controller output Y2!
diFF	r	base 1dP	38 8230	16460	Float	-1999. . . 9999 ☐	Control deviation, is defined as process value minus setpoint. Positive Xw means that the process value is above the setpoint. A small control deviation indicates precise control.
Unit	r	base 1dP	203 8395	16790	Int	0. . . 255 ☐	Identification of the device.
A-M	r/w	base 1dP	59 8251	16502	Int	0. . . 1 ☐	Signal for activating manual operation. In the manual mode, the controller provides output signals independent of the process.
S.Vers	r	base 1dP	204 8396	16792	Int	100. . . 255 ☐	The sub-version number is given as an additional index for precise definition of software version.
C.Off	r/w	base 1dP	60 8252	16504	Int	0. . . 1 ☐	Signal for disabling all the controller outputs. Note: Forcing has priority; alarm processing remains active.
St.Ala	r	base 1dP	23 8215	16430	Int	. . . ☐	Alarm status: Bit-wise coded status of the individual alarms, e.g. exceeded limit value or Loop.
							Bit 0 Existing/stored exceeded limit 1 Bit 1 Existing/stored exceeded limit 2 Bit 2 Existing/stored exceeded limit 3 Bit 3 Not used Bit 4 Existing/stored loop alarm Bit 5 Existing/stored heating current alarm Bit 6 Existing/stored SSR alarm Bit 7 Not used Bit 8 Existing exceeded limit 1 Bit 9 Existing exceeded limit 2 Bit 10 Existing exceeded limit 3 Bit 11 Not used Bit 12 Existing loop alarm Bit 13 Existing heating current alarm Bit 14 Existing SSR alarm Bit 15 Not used
Ypid	r	base 1dP	37 8229	16458	Float	-120. . . 120 ☐	Output value Ypid is the output signal determined by the controller, and from which the switching pulses for the digital and analog control outputs are calculated. Ypid is also available as an analog signal. e.g. for visualization.

8 ohnE

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ada.St	r/w	base 1dP	41 8233	16466	Enum	*Enum_AdaStart*	Starting / stopping the self-tuning function.After the start signal, the controller waits until the process reaches a stable condition (PIR) before it starts the self-tuning process. Self-tuning can be aborted manually at any time. After a successful self-tuning attempt, the controller automatically resumes normal operation.
						0	'Stop' will abort the self-tuning process, and the controller returns to normal operation with the previous parameter settings.
						1	Start of the self-tuning process is possible during manual or automatic controller operation.
Err.r	r/w	base 1dP	63 8255	16510	Int	0. . . 1 ☐	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).
St.Do	r	base 1dP	24 8216	16432	Int	0. . . 15 ☐	Status of the digital outputs
SSR.Res	r/w	base 1dP	61 8253	16506	Int	0. . . 1 ☐	Reset of the alarm triggered by a solid-state relay (SSR). SSRs are mostly used for frequent switching of heating elements, because they have no mechanical contacts that can wear out. However, an unnoticed short circuit could lead to overheating of the machine.
St.Ain	r	base 1dP	22 8214	16428	Int	0. . . 127 ☐	Bit-coded status of the analog input (fault, e.g. short circuit)
						Bit 0 Break at Input 1 Bit 1 Reversed polarity at Input 1 Bit 2 Short-circuit at Input 1 Bit 3 Not used Bit 4 Break at Input 2 Bit 5 Reversed polarity at Input 2 Bit 6 Short-circuit at Input 2 Bits 7-15 Not used	
Yman	r/w	base 1dP	40 8232	16464	Float	-110. . . 110 ☐	Absolute preset output value, which is used as output value during manual operation. Caution: With 3-point stepping controllers, Yman (evaluated the same as Dyman) is added to the actual output value as a relative shift.
St.Di	r	base 1dP	25 8217	16434	Int	. . . ☐	Status of the digital inputs or of push-buttons (binary coded).
						Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key	

8 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Di	r/w	base 1dP	28 8220	16440	Int	0. . . 1 ☐	Forcing of digital inputs. Forcing involves the external operation of at least one device input. The device takes over this input value (preset value for device inputs from a superordinate system, e.g. for a function test.)
						Bit 0 Forcing of digital Input 1	
F.Do	r/w	base 1dP	29 8221	16442	Int	0. . . 15 ☐	Forcing of digital outputs. Forcing involves the external operation of at least one controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
ProG	r/w	base 1dP	62 8254	16508	Int	0. . . 1 ☐	Signal for starting the programmer. On units with a simple programmer (only 1 program), a stop immediately causes a reset, followed by a new start. With units that have been defined as program controllers (several programs), the program is stopped, and then continued.
St.Prog	r	base 1dP	47 8239	16478	Int	0. . . 255 ☐	The programmer's status contains bit-wise coded data, e.g. which point of the program sequence the program has reached.
						Bit 0,1,2 Type of segment 0: rising 1: falling 2: hold (dwell) Bit 3 Program 'Run' Bit 4 Program 'End' Bit 5 Program 'Reset' Bit 6 Program 'StartFlankMissing' Bit 7 Program 'BandHold + FailHold'	
SP.EF	r	base 1dP	36 8228	16456	Float	-1999. . . 9999 ☐	Effective setpoint. The value reached at the end of setpoint processing, after taking W2, external setpoint, gradient, boost function, programmer settings, start-up function, and limit functions into account. Comparison with the effective process value leads to the control deviation, from which the necessary controller response is derived.
SP.Pr	r	base 1dP	48 8240	16480	Float	-1990. . . 9999 ☐	The programmer's setpoint is displayed as the effective setpoint while the program is running.
T1.Pr	r	base 1dP	49 8241	16482	Float	0. . . 9999 ☐	Only with a running program. The net (elapsed) time of the programmer is shown in a simplified form as time elapsed since program start.Caution: Stop times are not counted! If the first segment is defined as a gradient, the program starts at the process value, whereby the offset is defined as the time that the controller would have needed with the gradient beginning at the setpoint valid at program start.
I.Chg	r/w	base 1dP	64 8256	16512	Int	0. . . 1 ☐	Signal for switching the effective process value between x1 and x2
T3.Pr	r	base 1dP	50 8242	16484	Float	0. . . 9999 ☐	Only with running program. The remaining programmer time is given by the sum of the currently running segment plus the times of the remaining program segments (without hold times).

8 ohnE

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
T2.Pr	r	base 1dP	51 8243	16486	Float	0. . . 9999	☐	Only while program is running. The net segment time corresponds to the elapsed segment time.Caution: Stop times are not counted! If the first segment has been defined as a gradient, the start commences at process value, and the offset specified for the first segment corresponds to the time that the controller would have required with a gradient beginning at the actual process value when the program was started.
T4.Pr	r	base 1dP	52 8244	16488	Float	0. . . 9999	☐	Only with running program. The remaining time of the running program segment (without hold times).
Func	r/w	base 1dP	69 8261	16522	Int	0. . . 1	☐	OR-linking of several control signals.
SG.Pr	r	base 1dP	53 8245	16490	Int	0. . . 4	☐	A program consists of one or more segments which are arranged and defined by means of the segment numbers. By means of the segment number(s), the program can be changed quickly and specifically at the required point.

9 ohnE1

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
L.1	r/w	base 1dP	73 8265	16530	Float	-1999. . . 9999	☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.1	r/w	base 1dP	74 8266	16532	Float	-1999. . . 9999	☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.
t.F1	r/w	base 1dP	70 8262	16524	Float	0. . . 999	☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
In.1	r	base 1dP	20 8212	16424	Float	-1999. . . 9999	☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
F.Do1	r/w	base 1dP	31 8223	16446	Enum	*Enum_Ausgang*		Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0	off	
						1	on	

9 ohnE1

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1r	r	base 1dP	2005 10197	20394	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
F.Inp	r/w	base 1dP	26 8218	16436	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

10 ohnE2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	75 8267	16534	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
t.F2	r/w	base 1dP	71 8263	16526	Float	0. . . 999 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
H.2	r/w	base 1dP	76 8268	16536	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	21 8213	16426	Float	-1999. . . 9999 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
F.Do2	r/w	base 1dP	32 8224	16448	Enum	*Enum_Ausgang* 0 off 1 on	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
In.2r	r	base 1dP	2006 10198	20396	Float	-1999. . . 9999 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
F.Inp	r/w	base 1dP	27 8219	16438	Float	-1999. . . 9999 ☐	Forcing the value for an analog input INP. Forcing involves the external operation of a controller input. The controller takes over the value at this input like a measurement value (preset value for controller inputs from a superordinate system, e.g. for a function test.)

11 ohnE3

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	77 8269	16538	Float	-1999. . . 9999 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	78 8270	16540	Float	-1999. . . 9999 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Do3	r/w	base 1dP	33 8225	16450	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).

0	off
1	on

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
F.Ou1	r/w	base 1dP	30 8222	16444	Float	-1999. . . 9999 ☐	Forcing value of the analog output. Forcing involves the external operation of a controller output, i.e. the controller has no influence on this output. (Used for the operation of free controller outputs e.g. by a supervisory PLC.)

12 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
bAud	r/w	base 1dP	290 8482	16964	Enum	*Enum_Baud*	Bit rate of the interface (only visible with OPTION). The bit rate determines the transmission speed.

0	2400 Baud
1	4800 Baud
2	9600 Baud
3	19200 Baud
4	38.400 bits/s

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Addr	r/w	base 1dP	291 8483	16966	Int	1. . . 247 ☐	Address on the interface (only visible with OPTION)
PrtY	r/w	base 1dP	292 8484	16968	Enum	*Enum_Parity*	Parity of data on the interface (only visible with OPTION). Simple possibility of checking that transferred data is correct.

0	No parity, with 2 stop bits.
1	even parity
2	odd parity
3	no parity (1 stop bit)

12 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
dELY	r/w	base 1dP	293 8485	16970	Int	0. . . 200 ☐	Response delay [ms] (only visible with OPTION). Additional delay time before the received message may be answered on the Modbus. (Might be necessary, if the same line is used for transmit/receive.)
D.Unt	r/w	base 1dP	284 8476	16952	Enum	*EnumDUnit*	display unit

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

O2	r/w	base 1dP	283 8475	16950	Enum	*O2Unit*	Parameter definition for O2 measurement. With O2 measurement it is necessary to define whether the parameter is to be evaluated in ppm or %.

0	Parameter for O2 function in ppm
1	Parameter for O2 function in %

Unit	r/w	base 1dP	280 8472	16944	Enum	*Enum_Unit_rail*	Physical unit, f.e.°C

1	°C
2	°F
3	K

dP	r/w	base 1dP	281 8473	16946	Enum	*Enum_dP*	Decimal point (max. no of decimals). Format of the measured value display.

0	no digit behind the decimal point
1	Display has one decimal.
2	Display has two decimals.
3	Display has three decimals.

12 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.dEL	r/w	base 1dP	294 8486	16972	Int	0. . . 200 ☐	Additional delay time before received message is evaluated by Modbus. This time is needed if data is not transmitted continousely by the modem.
FrEq	r/w	base 1dP	260 8452	16904	Enum	*Enum_FrEq*	Switchover of the applied mains frequency 50 / 60 Hz and adapting the input filter for hum suppression.

0	Mains frequency is 50 Hz.
1	Mains frequency is 60 Hz.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
D.Unt	r	base 1dP	340 8532	17064	Enum	*EnumDUnit*	Effective display unit (can be used for extended Operating Level or display 2)

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.1	r/w	base 1dP	310 8502	17004	Enum	*Defect*	Err 1 (internal error)

0	No fault exists (Reset).
2	The device is defective.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.2	r/w	base 1dP	311 8503	17006	Enum	*Problem*	Err 2 (internal error, resetable)

0	No fault or reset of the fault exists (Reset).
1	A fault has occurred and has been stored.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.3	r/w	base 1dP	329 8521	17042	Enum	*ConfErr*	Resettable configuration fault. ConfErr(2): a fault has occurred. Typical causes and suggested remedies: Missing or faulty configuration: check interactions in the configuration and parameter settings.
						0	No fault or reset of the configuration error exists (Reset).
						2	There is a configuration error. The configuration is missing or wrong, or it does not match the parameter settings.
E.4	r/w	base 1dP	328 8520	17040	Enum	*Problem*	Hardware fault.Cause: Code number and hardware are not identical. Remedy: Contact PMA Service or replace electronics/Options pcb.
						0	No fault or reset of the fault exists (Reset).
						1	A fault has occurred and has been stored.
FbF.1	r/w	base 1dP	312 8504	17008	Enum	*Break*	Sensor break at input INP1. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.
Sht.1	r/w	base 1dP	313 8505	17010	Enum	*Short*	Short circuit at input INP1. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.1	r/w	base 1dP	314 8506	17012	Enum	*Polarity*	Incorrect polarity at input INP1. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP1.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
FbF.2	r/w	base 1dP	315 8507	17014	Enum	*Break*	Sensor break at input INP2. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Sht.2	r/w	base 1dP	316 8508	17016	Enum	*Short*	Short circuit at input INP2. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.2	r/w	base 1dP	317 8509	17018	Enum	*Polarity*	Incorrect polarity at input INP2. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP2.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
HCA	r/w	base 1dP	318 8510	17020	Enum	*HeatCurr*	Heating current alarm.Possible fault s are an open heating current circuit with current I < heating current limit, or current I > heating current limit (depending on configuration), or defective heater band.Suggested remedy: check heating current circuit, replace heater band if necessary.
						0	No fault or reset of the heating current alarm exists (Reset).
						1	A heating current fault has occurred and has been stored.
SSr	r/w	base 1dP	319 8511	17022	Enum	*Short*	Alarm message: SSr Possible causes: a current flow in the heating circuit although controller is 'off', or the SSR is defective. Suggested remedy: check heating current circuit, replace the solid-state relay, if necessary.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
LooP	r/w	base 1dP	320 8512	17024	Enum	*LoopAlarm*	Alarm message: LooP Possible causes: faulty or incorrectly connected input circuit, or output not connected correctly. Suggested remedy: check heating or cooling circuit, check sensor function and replace if necessary, check controller and output switching actuator.
						0	No fault or reset of the loop alarm exists (Reset).
						1	A control loop fault has occurred and has been stored.
						2	A control loop fault has occurred, there was no clear process response following a step change of the output.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
AdA.H	r/w	base 1dP	321 8513	17026	Enum	*Tune*	Error message from "heating" self-tuning and reason for aborted tuning attempt. Hints for trouble-shooting: Check operating sense of actuator. – Is the loop closed? – Is there an output limit? – Adapt the setpoint. – Increase step output for Yopt.
						0	no error
						3	Process responds in the wrong direction. Possible remedy: Check the output signal sense (inverse <-> direct), and re-configure the controller if necessary (inverse <-> direct).
						4	No response from the process. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
						5	The process value turning point of the step response is too low. Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
						6	Self-tuning was aborted due to the risk of an exceeded setpoint. Possible remedy: Repeat the attempt with an increased setpoint reserve.
						7	The step output change is not large enough (minimum change > 5 %). Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
						8	insufficient set-point reserve
						9	The pulse response attempt has failed. No useful parameters were determined. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
AdA.C	r/w	base 1dP	322 8514	17028	Enum	*Tune*	Error message from "cooling" self-tuning and reason for aborted tuning attempt. Hints for trouble-shooting: Check operating sense of actuator. Is the loop closed? Is there an output limit? Adapt the setpoint. Increase step output for Yopt.
						0	no error
						3	Process responds in the wrong direction. Possible remedy: Check the output signal sense (inverse <-> direct), and re-configure the controller if necessary (inverse <-> direct).
						4	No response from the process. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
						5	The process value turning point of the step response is too low. Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
						6	Self-tuning was aborted due to the risk of an exceeded setpoint. Possible remedy: Repeat the attempt with an increased setpoint reserve.
						7	The step output change is not large enough (minimum change > 5 %). Possible remedy: Increase the permitted step output range, i.e. increase the parameter Y.Hi ('heating') or reduce the parameter Y.Lo ('cooling').
						8	insufficient set-point reserve
						9	The pulse response attempt has failed. No useful parameters were determined. Perhaps the control loop is open. Possible remedy: Check sensor, connections, and process.
Lim.1	r/w	base 1dP	323 8515	17030	Enum	*Limit*	Limit value 1 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Lim.2	r/w	base 1dP	324 8516	17032	Enum	*Limit*	Limit value 2 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
Lim.3	r/w	base 1dP	325 8517	17034	Enum	*Limit*	Limit value 3 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
InF.1	r/w	base 1dP	326 8518	17036	Enum	*Time*	Message from the operating hours counter that the preset no. of hours for this maintenance period has been reached. The op-hours counter for the maintenance period is reset when this message is acknowledged. Counting the operating hours is used for preventive maintenance.
						0	No signal or reset of the time limit signal (reset).
						1	Operating hours - limit value (maintenance period) reached.
InF.2	r/w	base 1dP	327 8519	17038	Enum	*Switch*	Message from the switching cycle counter that the preset no. of switch cycles for this maintenance period has been reached. The cycle counter for the maintenance period is reset when this message is acknowledged. Counting the switching cycles is used for preventive maintenance.
						0	No error message or reset of the switching cycle counter exists (Reset).
						1	Set limit of the switching cycle counter (maintenance period) has been reached.

13 Out.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base 1dP	920 9112	18224	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0	direct / normally open
						1	inverse / normally closed
Y.1	r/w	base 1dP	921 9113	18226	Enum	*Enum_Y1*	Activation of controller output Y1
						0	not active
						1	This output provides the controller output Y1.

13 Out.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Y.2	r/w	base 1dP	922 9114	18228	Enum	*Enum_Y2*	Activation of controller output Y2. Caution: Do not confuse the controller output Y2 with the parameter 'Fixed output Y2' !
						0 not active 1 This output provides the controller output Y2.	
Lim.1	r/w	base 1dP	923 9115	18230	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 1.	
Lim.2	r/w	base 1dP	924 9116	18232	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 2.	
Lim.3	r/w	base 1dP	925 9117	18234	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 3.	
LP.AL	r/w	base 1dP	927 9119	18238	Enum	*Enum_OUT_LPAL*	Interruption alarm signal (LOOP)
						0 not active 1 The loop alarm (= open loop alarm) is assigned to this output.	
HC.AL	r/w	base 1dP	928 9120	18240	Enum	*Enum_OUT_HCAL*	Heat current alarm signal
						0 not active 1 The heating current alarm is assigned to this output.	
HC.SC	r/w	base 1dP	929 9121	18242	Enum	*Enum_HCSC*	Activation of the output: Solid-state relay (SSR) short circuit. The short circuit alarm of the SSR is triggered, if a current is detected in the heating circuit, although the controller output is switched off.
						0 not active 1 Output activated by an SSR fault.	
timE	r/w	base 1dP	930 9122	18244	Enum	*Enum_time*	Activation of output: Timer running.This message is generated by the setpoint processing, if a timer mode has been configured, and the time has elapsed.
						0 not active 1 activated	

13 Out.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
P.End	r/w	base 1dP	931 9123	18246	Enum	*Enum_PEnd*	Generation of the message: Program end. This message is available when the program has been completed (only when configured as a program controller).
						0 not active 1 This output is activated by the message 'Program end'.	
FAi.1	r/w	base 1dP	932 9124	18248	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active 1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base 1dP	933 9125	18250	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0 not active 1 The output is switched by the error message 'INP2 fault'.	
InF.1	r/w	base 1dP	935 9127	18254	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0 not active 1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base 1dP	936 9128	18256	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0 Not active 1 The output is activated by the status message 'Inf.2'.	

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out1	r	base 1dP	940 9132	18264	Enum	*Enum_Ausgang*	Status of the digital output
						0 off 1 on	
F.Do1	r/w	base 1dP	941 9133	18266	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off 1 on	

14 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base 1dP	970 9162	18324	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0 direct / normally open	
						1 inverse / normally closed	
Y.1	r/w	base 1dP	971 9163	18326	Enum	*Enum_Y1*	Activation of controller output Y1
						0 not active	
						1 This output provides the controller output Y1.	
Y.2	r/w	base 1dP	972 9164	18328	Enum	*Enum_Y2*	Activation of controller output Y2. Caution: Do not confuse the controller output Y2 with the parameter 'Fixed output Y2' !
						0 not active	
						1 This output provides the controller output Y2.	
Lim.1	r/w	base 1dP	973 9165	18330	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 1.	
Lim.2	r/w	base 1dP	974 9166	18332	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 2.	
Lim.3	r/w	base 1dP	975 9167	18334	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 3.	
LP.AL	r/w	base 1dP	977 9169	18338	Enum	*Enum_OUT_LPAL*	Interruption alarm signal (LOOP)
						0 not active	
						1 The loop alarm (= open loop alarm) is assigned to this output.	
HC.AL	r/w	base 1dP	978 9170	18340	Enum	*Enum_OUT_HCAL*	Heat current alarm signal
						0 not active	
						1 The heating current alarm is assigned to this output.	

14 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
HC.SC	r/w	base 1dP	979 9171	18342	Enum	*Enum_HCSC*	Activation of the output: Solid-state relay (SSR) short circuit. The short circuit alarm of the SSR is triggered, if a current is detected in the heating circuit, although the controller output is switched off.
						0 not active	
						1 Output activated by an SSR fault.	
timE	r/w	base 1dP	980 9172	18344	Enum	*Enum_time*	Activation of output: Timer running.This message is generated by the setpoint processing, if a timer mode has been configured, and the time has elapsed.
						0 not active	
						1 activated	
P.End	r/w	base 1dP	981 9173	18346	Enum	*Enum_PEnd*	Generation of the message: Program end. This message is available when the program has been completed (only when configured as a program controller).
						0 not active	
						1 This output is activated by the message 'Program end'.	
FAi.1	r/w	base 1dP	982 9174	18348	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active	
						1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base 1dP	983 9175	18350	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0 not active	
						1 The output is switched by the error message 'INP2 fault'.	
InF.1	r/w	base 1dP	985 9177	18354	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0 not active	
						1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base 1dP	986 9178	18356	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0 Not active	
						1 The output is activated by the status message 'Inf.2'.	

14 Out.2

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out2	r	base 1dP	990 9182	18364	Enum	*Enum_Ausgang*	Status of the digital output
						0 off	
						1 on	
F.Do2	r/w	base 1dP	991 9183	18366	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off	
						1 on	

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.tYP	r/w	base 1dP	1035 9227	18454	Enum	*Enum_OtYP*	Signal type selection OUT
						0 Relay / logic (only visible with current/logic/voltage).	
						1 0 ... 20 mA continuous (only visible with current/logic/voltage).	
						2 4 ... 20 mA continuous (only visible with current/logic/voltage).	
						3 0...10 V continuous (only visible with current/logic/voltage)	
						4 2...10 V continuous (only visible with current/logic/voltage)	
						5 transmitter supply (only visible with current/logic/voltage)	
O.Act	r/w	base 1dP	1020 9212	18424	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0 direct / normally open	
						1 inverse / normally closed	
Out.0	r/w	base 1dP	1036 9228	18456	Float	-1999. . . 9999 ☐	Lower scaling limit of the analog output (corresponds to 0%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the lower scaling point is indicated in the respective electrical unit (mA / V).
Out.1	r/w	base 1dP	1037 9229	18458	Float	-1999. . . 9999 ☐	Upper scaling limit of the analog output (corresponds to 100%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the upper scaling point is indicated in the respective electrical unit (mA / V).

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Src	r/w	base 1dP	1038 9230	18460	Enum	*Enum_OSrc*	Signal source of the analog output (only visible when O.TYP=1..5)

0	not used
1	Controller output y1 (continuous)
2	Controller output y2 (continuous)
3	process value
4	The effective setpoint Weff, which is used for control. Example: The gradient changes the effective setpoint until it reaches the internal (target) setpoint.
5	control deviation xw (process value - set-point)
7	measured value INP1
8	measured value INP2

O.FAI	r/w	base 1dP	1039 9231	18462	Enum	*Enum_OFail*	fail behaviour

0	upscale
1	downscale

Y.1	r/w	base 1dP	1021 9213	18426	Enum	*Enum_Y1*	Activation of controller output Y1

0	not active
1	This output provides the controller output Y1.

Y.2	r/w	base 1dP	1022 9214	18428	Enum	*Enum_Y2*	Activation of controller output Y2. Caution: Do not confuse the controller output Y2 with the parameter 'Fixed output Y2' !

0	not active
1	This output provides the controller output Y2.

Lim.1	r/w	base 1dP	1023 9215	18430	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.

0	not active
1	The output is activated by an alarm from limit value 1.

Lim.2	r/w	base 1dP	1024 9216	18432	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.

0	not active
1	The output is activated by an alarm from limit value 2.

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Lim.3	r/w	base 1dP	1025 9217	18434	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active 1 The output is activated by an alarm from limit value 3.	
LP.AL	r/w	base 1dP	1027 9219	18438	Enum	*Enum_OUT_LPAL*	Interruption alarm signal (LOOP)
						0 not active 1 The loop alarm (= open loop alarm) is assigned to this output.	
HC.AL	r/w	base 1dP	1028 9220	18440	Enum	*Enum_OUT_HCAL*	Heat current alarm signal
						0 not active 1 The heating current alarm is assigned to this output.	
HC.SC	r/w	base 1dP	1029 9221	18442	Enum	*Enum_HCSC*	Activation of the output: Solid-state relay (SSR) short circuit. The short circuit alarm of the SSR is triggered, if a current is detected in the heating circuit, although the controller output is switched off.
						0 not active 1 Output activated by an SSR fault.	
timE	r/w	base 1dP	1030 9222	18444	Enum	*Enum_time*	Activation of output: Timer running.This message is generated by the setpoint processing, if a timer mode has been configured, and the time has elapsed.
						0 not active 1 activated	
P.End	r/w	base 1dP	1031 9223	18446	Enum	*Enum_PEnd*	Generation of the message: Program end. This message is available when the program has been completed (only when configured as a program controller).
						0 not active 1 This output is activated by the message 'Program end'.	
FAi.1	r/w	base 1dP	1032 9224	18448	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active 1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base 1dP	1033 9225	18450	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0 not active 1 The output is switched by the error message 'INP2 fault'.	

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InF.1	r/w	base 1dP	1055 9247	18494	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0 not active 1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base 1dP	1056 9248	18496	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0 Not active 1 The output is activated by the status message 'Inf.2'.	

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out3	r	base 1dP	1040 9232	18464	Enum	*Enum_Ausgang*	Status of the digital output
						0 off 1 on	
F.Do3	r/w	base 1dP	1041 9233	18466	Enum	*Enum_Ausgang*	Forcing of this digital output. Forcing involves the external operation of a controller output. The controller has no influence on this output (use of free controller outputs by superordinate system).
						0 off 1 on	
F.Ou3	r/w	base 1dP	1042 9234	18468	Float	-1999. . . 9999 ☐	Forcing value of the analog output. Forcing involves the external operation of a controller output, i.e. the controller has no influence on this output. (Used for the operation of free controller outputs e.g. by a supervisory PLC.)

16 ProG

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.01	r/w	base 1dP	1600 9792	19584	Float	-1999. . . 9999 ☑	End setpoint of segment 1. This is the target setpoint that is reached at the end of the first segment. The target setpoint is approached from the previous valid setpoint (when starting the 1st segment, matching to process value!). When the program is completed, the controller continues with the last target setpoint reached.
Pt.01	r/w	base 1dP	1601 9793	19586	Float	0. . . 9999 ☐	Segment time 1 defines the duration of the first segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.

16 ProG

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.02	r/w	base 1dP	1602 9794	19588	Float	-1999. . . 9999 ☑	End setpoint of segment 2. This is the target setpoint that is reached at the end of the second segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.
Pt.02	r/w	base 1dP	1603 9795	19590	Float	0. . . 9999 ☐	Segment time 2 defines the duration of the second segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
SP.03	r/w	base 1dP	1604 9796	19592	Float	-1999. . . 9999 ☑	End setpoint of segment 3. This is the target setpoint that is reached at the end of the third segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.
Pt.03	r/w	base 1dP	1605 9797	19594	Float	0. . . 9999 ☐	Segment time 3 defines the duration of the third segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.
SP.04	r/w	base 1dP	1606 9798	19596	Float	-1999. . . 9999 ☑	End setpoint of segment 4. This is the target setpoint that is reached at the end of the fourth segment. The target setpoint is approached from the previous valid setpoint. When the program is completed, the controller continues with the last target setpoint reached.
Pt.04	r/w	base 1dP	1607 9799	19598	Float	0. . . 9999 ☐	Segment time 4 defines the duration of the fourth segment. The gradient of this segment is calculated using the segment time and the setpoint difference (SP – segment starting setpoint).Note: The 1st segment is started at process value.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Prog	r	base 1dP	1670 9862	19724	Int	0. . . 255 ☐	The programmer's status contains bit-wise coded data, e.g. which point of the program sequence the program has reached.
							Bit 0,1,2 Type of segment 0: rising 1: falling 2: hold (dwell) Bit 3 Program 'Run' Bit 4 Program 'End' Bit 5 Program 'Reset' Bit 6 Program 'StartFlankMissing' Bit 7 Program 'BandHold + FailHold'
SP.Pr	r	base 1dP	1671 9863	19726	Float	-1990. . . 9999 ☐	The programmer's setpoint is displayed as the effective setpoint while the program is running.

16 ProG

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
T1.Pr	r	base 1dP	1672 9864	19728	Float	0. . . 9999	☐	Only with a running program. The net (elapsed) time of the programmer is shown in a simplified form as time elapsed since program start.Caution: Stop times are not counted! If the first segment is defined as a gradient, the program starts at the process value, whereby the offset is defined as the time that the controller would have needed with the gradient beginning at the setpoint valid at program start.
T3.Pr	r	base 1dP	1673 9865	19730	Float	0. . . 9999	☐	Only with running program. The remaining programmer time is given by the sum of the currently running segment plus the times of the remaining program segments (without hold times).
T2.Pr	r	base 1dP	1674 9866	19732	Float	0. . . 9999	☐	Only while program is running. The net segment time corresponds to the elapsed segment time.Caution: Stop times are not counted! If the first segment has been defined as a gradient, the start commences at process value, and the offset specified for the first segment corresponds to the time that the controller would have required with a gradient beginning at the actual process value when the program was started.
T4.Pr	r	base 1dP	1675 9867	19734	Float	0. . . 9999	☐	Only with running program. The remaining time of the running program segment (without hold times).
SG.Pr	r	base 1dP	1676 9868	19736	Int	0. . . 4	☐	A program consists of one or more segments which are arranged and defined by means of the segment numbers. By means of the segment number(s), the program can be changed quickly and specifically at the required point.

17 SEtP

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
SP.LO	r/w	base 1dP	800 8992	17984	Float	-1999. . . 9999	☐	Lower setpoint limit. The setpoint is raised to this value automatically, if a lower setpoint is adjusted. BUT: The (safety) setpoint W2 is not restricted by the setpoint limits! The setpoint reserve for the step function is 10% of SPHi - SPLo.
SP.Hi	r/w	base 1dP	801 8993	17986	Float	-1999. . . 9999	☐	Upper setpoint limit. The setpoint is reduced to this value automatically, if a higher setpoint is adjusted. BUT: The (safety) setpoint W2 is not restricted by the setpoint limits! The setpoint reserve for the step function is 10% of SPHi - SPLo.
SP.2	r/w	base 1dP	802 8994	17988	Float	-1999. . . 9999	☐	Second (safety) setpoint. Ramp function as with other setpoints (effective, external). However, SP2 is not restricted by the setpoint limits.
r.SP	r/w	base 1dP	803 8995	17990	Float	0,01. . . 9999	☑	Setpoint gradient [/min] or ramp. Max. rate of change in order to avoid step changes of the setpoint. The gradient acts in the positive and negative directions. Note for self-tuning: with activated gradient function, the setpoint gradient is started from the process value, so that there is no sufficient setpoint reserve.

17 SEtP

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
t.SP	r/w	base 1dP	804 8996	17992	Float	0. . . 9999 ☐	The timer (preset) value is entered in minutes with one decimal digit (0,1 minute = 6 seconds). With an activated timer, the preset value is displayed automatically in the extended Operating Level, where it can be changed by means of the parameter t.ti.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
SP.EF	r	base 1dP	830 9022	18044	Float	-1999. . . 9999 ☐	Effective setpoint. The value reached at the end of setpoint processing, after taking W2, external setpoint, gradient, boost function, programmer settings, start-up function, and limit functions into account. Comparison with the effective process value leads to the control deviation, from which the necessary controller response is derived.
SP	r/w	base 1dP	840 9032	18064	Float	-1999. . . 9999 ☐	Setpoint for the interface (without the additional function 'Controller off'). SetpInterface acts on the internal setpoint before the setpoint processing stage. Note: The value in RAM is always updated. To protect the EEPROM, storage of the value in the EEPROM is timed (at least one value per half hour).
SP.d	r/w	base 1dP	841 9033	18066	Float	-1999. . . 9999 ☐	The effective setpoint is shifted by this value. In this way, the setpoints of several controllers can be shifted together, regardless of the individually adjusted effective setpoints.
t.ti	r/w	base 1dP	842 9034	18068	Float	0. . . 9999 ☐	Current timer count in minutes. Count-down timer. The run time is only visible, if the timer is active. Configuration in the extended Operating Level.

Table Of Contents

1 Func

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.1	r/w	base 1dP	1262 9454	18908	Enum	*Enum_Fnc1Rail*	function 1

0	standard (process value = Inp1)
2	The process value is calculated from the difference between the two values (Inp1 - Inp2).
3	Maximum value of Inp1 and Inp2. It is controlled with the bigger value. At sensor failure it is controlled with the remaining actual value.
4	Minimum value of Inp1 and Inp2. It is controlled with the smaller value. At sensor failure it is controlled with the remaining actual value.
7	O2 function with constant sensor temperature. The engineering unit for the O2 setting should be checked under: Other -> parameter unit (ppm / %). The sensor temperature must be defined under: Parameters -> Controller -> Sensor temperature.
8	O2 function with measured sensor temperature. The sensor temperature is required as the second process value Inp2. The engineering unit for the O2 settings (ppm / %) must be checked under 'Other | Parameter unit.'

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
tEmP	r/w	base 1dP	1236 9428	18856	Float	. —8888 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.InP	r	base 1dP	1302 9494	18988	Float	,0888—8888 ☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.

2 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	520 8712	17424	Enum	*Enum_StYP*	Sensor type selection

0	thermocouple type L (-100...900°C), Fe-CuNi DIN
1	thermocouple type J (-100...1200°C), Fe-CuNi
2	thermocouple type K (-100...1350°C), NiCr-Ni
3	thermocouple type N (-100...1300°C), Nicrosil-Nisil
4	thermocouple type S (0...1760°C), PtRh-Pt10%
5	thermocouple type R (0...1760°C), PtRh-Pt13%
6	thermocouple type T (-200...400°C), Cu-CuNi
7	thermocouple type C (0...2315°C), W5%Re-W26%Re
8	thermocouple type D (0...2315°C), W3%Re-W25%Re
9	thermocouple type E (-100...1000°C), NiCr-CuNi
10	thermocouple type B (0/100...1820°C), PtRh-Pt6%
18	Special thermocouple with a linearization characteristic selectable by the user. This enables non-linear signals to be simulated or linearized.
20	Pt100 (-200.0 ... 100.0(150.0)°C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	special 0...450 Ohm
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
40	0...10V / 2...10V
41	special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
45	Special : -5...5 V
46	Special : -10...10 V
47	Special : -200...200 mV
50	potentiometer 0...160 Ohm
51	potentiometer 0...450 Ohm
52	potentiometer 0...1600 Ohm
53	potentiometer 0...4500 Ohm

2 InP.1

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
4wir	r/w	base 1dP	523 8715	17430	Enum	*Enum_4wire*	Connection principle for resistive inputs.
						0 3-wire connection	
						1 4-wire connection	
S.Lin	r/w	base 1dP	521 8713	17426	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.
						0 No special linearization.	
						1 Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.	
Corr	r/w	base 1dP	265 8457	16914	Enum	*Enum_Corr*	Measured value correction / scaling
						0 Without scaling	
						1 The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.	
						2 2-point correction (at CAL level)	
						3 Scaling (at PArA level)	

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.1	r/w	base 1dP	500 8692	17384	Float	,0888—8888 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.1	r/w	base 1dP	501 8693	17386	Float	,0888—8888 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.1	r/w	base 1dP	502 8694	17388	Float	,0888—8888 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.1	r/w	base 1dP	503 8695	17390	Float	,0888—8888 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F1	r/w	base 1dP	504 8696	17392	Float	. —888 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.

2 InP.1

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.tc1	r/w	base 1dP	506 8698	17396	Float	. —0. . ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1r	r	base 1dP	540 8732	17464	Float	,0888—8888 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).
Fail	r	base 1dP	541 8733	17466	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1	r	base 1dP	542 8734	17468	Float	,0888—8888 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
I.Fnc	r/w	base 1dP	266 8458	16916	Enum	*Enum_IFunc*	Function INP2

0	no measurement
1	measurement

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.tYP	r/w	base 1dP	570 8762	17524	Enum	*Enum_StYP2*	Sensor type selection

0	Thermocouple Type L (-100...900 °C), Fe-CuNi DIN
1	Thermocouple Type J (-100...1200 °C), Fe-CuNi
2	Thermocouple Type K (-100...1350 °C), NiCr-Ni
3	Thermocouple Type N (-100...1300 °C), Nicrosil-Nisil
4	Thermocouple Type S (0...1760 °C), PtRh-Pt 10%
5	Thermocouple Type R (0...1760 °C), PtRh-Pt13%
6	Thermocouple Type T (-200...400 °C), Cu-CuNi
7	Thermocouple Type C (0...2315°C), W5%Re-W26%Re
8	Thermocouple Type D (0...2315°C), W3%Re-W25%Re
9	Thermocouple Type E (-100...1000 °C), NiCr-CuNi
10	Thermocouple Type B (0/100...1820 °C), PtRh-Pt6%
18	special thermocouple
20	Pt100 (-200.0 ... 100.0(150.0) °C) Measuring range at reduced lead resistance up to 150°C. Measuring range in Fahrenheit: -328...212(302) °F
21	Pt100 (-200.0 ... 850,0 °C) Measuring range in Fahrenheit: -328...1562 °F
22	Pt 1000 (-200.0...850.0 °C) Measuring range in Fahrenheit: -328...1562 °F
23	Special : 0...4500 Ohms. For KTY 11-6 with preset special linearization (-50...150 °C or -58...302 °F).
24	Special : 0...450 Ohms
25	Special : 0...1,6 kOhms
26	Special : 0...160 Ohms
30	Current : 0...20 mA / 4...20 mA
41	Special -2.5...115 mV
42	Special : -25...1150 mV
43	Special : -25...90 mV
44	Special : -500...500 mV
47	Special : -200...200 mV
50	Potentiometer 0...160 ohms
51	Potentiometer 0...450 ohms
52	Potentiometer 0...1600 ohms
53	Potentiometer 0...4500 ohms

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
S.Lin	r/w	base 1dP	571 8763	17526	Enum	*Enum_SLin*	Linearization (not adjustable for all sensor types S.tYP). Special linearization. The linearization table can be created with the BlueControl® Engineering Tool. The default characteristic is for KTY 11-6 temperature sensors.

0	No special linearization.
1	Special linearization. Definition of the linearization table is possible with the BlueControl Engineering Tool. The default setting is the characteristic of the KTY 11-6 temperature sensor.

3 InP.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Corr	r/w	base 1dP	267 8459	16918	Enum	*Enum_Corr*	Measured value correction / scaling

0	Without scaling
1	The offset correction (in the CAL Level) can be done on-line in the process. If InL.x shows the lower input value of the scaling point, then OuL.x must be adjusted to the corresponding display value. Adjustments are made via the front panel keys of the device.
2	2-point correction (at CAL level)
3	Scaling (at PArA level)

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InL.2	r/w	base 1dP	550 8742	17484	Float	,0888—8888 ☐	Input value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the lower scaling point (e.g. 4 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuL.2	r/w	base 1dP	551 8743	17486	Float	,0888—8888 ☐	Display value of the lower scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the lower scaling point, e.g. 4 mA is displayed as 2 [pH].
InH.2	r/w	base 1dP	552 8744	17488	Float	,0888—8888 ☐	Input value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The display of the input value of the upper scaling point (e.g. 20 mA) is done using the corresponding electrical value, e.g. mA, V, Ohm.
OuH.2	r/w	base 1dP	553 8745	17490	Float	,0888—8888 ☐	Display value of the upper scaling point. Depending on sensor type, the input value can be scaled to the required display value in the Parameter Level. The operator can change the display value of the upper scaling point, e.g. 20 mA is displayed as 12 [pH].
t.F2	r/w	base 1dP	554 8746	17492	Float	. —888 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
E.tc2	r/w	base 1dP	556 8748	17496	Float	. —0. . ☑	External temperature compensation (temperature at the junction of thermocouple/copper lead with external temperature compensation).

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	590 8782	17564	Float	,0888—8888 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).

3 InP.2

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fail	r	base 1dP	591 8783	17566	Enum	*Enum_InpFail*	Input circuit fault: faulty or incorrectly connected sensor.

0	no error
1	sensor break
2	Incorrect polarity at input.
4	Short circuit at input.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2r	r	base 1dP	592 8784	17568	Float	,0888—8888 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).

4 Lim

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.1	r/w	base 1dP	671 8863	17726	Enum	*Enum_Fcn1*	Function of the limit value '?' . Activation of the limit value alarm (e.g. for input circuit monitoring) with or without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)
3	Temperature limiter for exceeded limit: Measurement value monitoring + storage of the max. alarm limit status. A stored limit value can be reset via a digital input or the RESET key (-> LOGI/Err.r).
4	Temperature limiter for exceeded limit: Measurement value monitoring + storage of the min. alarm limit status. A stored limit value can be reset via a digital input, or the RESET key (-> LOGI/Err.r).
5	Temperature monitoring function for exceeded max. limits. As opposed to the temperature limiting function, there is no storage.
6	Temperature monitoring function for exceeded min. limits. As opposed to the temperature limiting function, there is no storage.

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.1	r/w	base 1dP	650 8842	17684	Float	,0888—8888 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
LC	r/w	base 1dP	655 8847	17694	Float	,0888—8888 ☐	Limit value LC. The limit value LC is the main function of the temperature limiter/monitor. It complies with certain switching and wiring specifications, and has a fixed hysteresis of 0.5 K.
H.1	r/w	base 1dP	651 8843	17686	Float	,0888—8888 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

4 Lim

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
HYS.1	r/w	base 1dP	652 8844	17688	Float	. —8888 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	690 8882	17764	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

5 Lim2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.2	r/w	base 1dP	720 8912	17824	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.2	r/w	base 1dP	721 8913	17826	Enum	*Enum_SrcTB*	Source for the limit value. Selection of the value that is to be monitored by the limit, e.g. process value.

0	Process value = absolute alarm
1	Process value – Limit value LC = Relative alarm
3	Measured value of the analog input INP1
4	Measured value of the analog input INP2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	700 8892	17784	Float	,0888—8888 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.2	r/w	base 1dP	701 8893	17786	Float	,0888—8888 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

5 Lim2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
HYS.2	r/w	base 1dP	702 8894	17788	Float	. —8888 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	740 8932	17864	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

6 Lim3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Fnc.3	r/w	base 1dP	770 8962	17924	Enum	*Enum_Fcn*	Activation and adjustment of the limit value alarm (e.g. for input circuit monitoring), e.g. with/without storage.

0	No limit value monitoring.
1	measured value monitoring
2	Measured value monitoring + alarm status latch. A stored limit value can be reset via error list, A/M-key or a digital input (-> LOGI/Err.r)

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Src.3	r/w	base 1dP	771 8963	17926	Enum	*Enum_SrcTB*	Source for the limit value. Selection of the value that is to be monitored by the limit, e.g. process value.

0	Process value = absolute alarm
1	Process value – Limit value LC = Relative alarm
3	Measured value of the analog input INP1
4	Measured value of the analog input INP2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	750 8942	17884	Float	,0888—8888 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	751 8943	17886	Float	,0888—8888 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

6 Lim3

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
HYS.3	r/w	base 1dP	752 8944	17888	Float	. —8888 ☐	Hysteresis of the limit value. Switching difference for upper and lower limit value. The limit value must change by this amount (rise above upper limit or fall below lower limit) before the limit value alarm is reset.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Lim	r	base 1dP	790 8982	17964	Enum	*Enum_LimStatus*	Limit value status: No alarm present or stored.

0	no alarm
1	lached alarm
2	A limit value has been exceeded.

7 LOGI

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L_r	r/w	base 1dP	421 8613	17226	Enum	*Enum_dInPRail1*	Local / remote switchover (Remote: Adjustment of all values via the front panel is blocked).

0	No function (switchover via interface is possible).
1	Always active.
2	DI1 switches.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Err.r	r/w	base 1dP	429 8621	17242	Enum	*Enum_dInPRail3*	Source of the control signal for resetting all stored entries in the error list (the list contains all error messages and alarms). If an alarm is still present, i.e. the source of trouble has not been remedied, stored alarms cannot be acknowledged (reset).

2	DI1 switches.
6	Switch reset keys.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
di.Fn	r/w	base 1dP	420 8612	17224	Enum	*Enum_diFn*	Function of digital input (not valid for Err.r)

0	Basic setting 'Off': A permanent positive signal switches this function 'On', which is connected to the digital input. Removal of the signal switches the function 'Off' again.
1	Basic setting 'On': A permanent positive signal switches this function 'Off', which is connected to the digital input. Removal of the signal switches the function 'On' again.
2	Push-button function. Basic setting 'Off'. Only positive signals are effective. The first positive signal switches 'On'. Removal of the signal is necessary before the next positive signal can switch 'Off'.

7 LOGI

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Di	r	base 1dP	450 8642	17284	Int	— Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key	Status of the digital inputs or of push-buttons (binary coded).
L-R	r/w	base 1dP	460 8652	17304	Int	. —0	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.
Err.r	r/w	base 1dP	470 8662	17324	Int	. —0	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).

8 ohnE

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
B.BedEbe	r/w	base 1dP	1839 10031	20062	Int	. —144	The 3 Operating Levels (Parameter, Configuration, and Calibration) can be disabled here.
B.Bedien	r/w	base 1dP	1838 10030	20060	Int	. —144	Used to disable various operating functions (e.g. access to the extended Operating Level).
C.Sch	r/w	base 1dP	1801 9993	19986	Float	0—8888888	Data defines the number of switching cycles for which the message InF.2 is generated.
C.Std	r/w	base 1dP	1800 9992	19984	Float	0—8888888	Data defines the number of operating hours for which the message InF.1 is generated.
Dis1	r/w	base 1dP	1849 10041	20082	Enum	*Enum_dis1* 0 1	Selection of the value to be shown in line 1 of the display.
Dis2	r/w	base 1dP	1848 10040	20080	Int	145—708.	Datum to be shown in display 2. The basic address of the datum that is to be displayed must be entered.
EOP1	r/w	base 1dP	1840 10032	20064	Int	145—708.	1st datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off		Description
EOP2	r/w	base 1dP	1841 10033	20066	Int	145—708.	☐	2nd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP3	r/w	base 1dP	1842 10034	20068	Int	145—708.	☐	3rd datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP4	r/w	base 1dP	1843 10035	20070	Int	145—708.	☐	4th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP5	r/w	base 1dP	1844 10036	20072	Int	145—708.	☐	5th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP6	r/w	base 1dP	1845 10037	20074	Int	145—708.	☐	6th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP7	r/w	base 1dP	1846 10038	20076	Int	145—708.	☐	7th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
EOP8	r/w	base 1dP	1847 10039	20078	Int	145—708.	☐	8th datum of the extended Operating Level. The basic address of the datum that is to be displayed must be entered.
In.1	r/w	base 1dP	1861 10053	20106	Float	. —1	☐	Input 1 for measurement value 1 (to Output 1 for display value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.10	r/w	base 1dP	1879 10071	20142	Float	. —1	☑	Input 10 for measurement value 10 (to Output 10 for display value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.11	r/w	base 1dP	1881 10073	20146	Float	. —1	☑	Input 11 for measurement value 11 (to Output 11 for display value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.12	r/w	base 1dP	1883 10075	20150	Float	. —1	☑	Input 12 for measurement value 12 (to Output 12 for display value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.13	r/w	base 1dP	1885 10077	20154	Float	. —1	☑	Input 13 for measurement value 13 (to Output 13 for display value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.14	r/w	base 1dP	1887 10079	20158	Float	. —1 ☑	Input 14 for measurement value 14 (to Output 14 for display value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.15	r/w	base 1dP	1889 10081	20162	Float	. —1 ☑	Input 15 for measurement value 15 (to Output 15 for display value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.16	r/w	base 1dP	1891 10083	20166	Float	. —1 ☑	Input 16 for measurement value 16 (to Output 16 for display value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.2	r/w	base 1dP	1863 10055	20110	Float	. —1 ☐	Input 2 for measurement value 2 (to Output 2 for display value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.3	r/w	base 1dP	1865 10057	20114	Float	. —1 ☑	Input 3 for measurement value 3 (to Output 3 for display value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.4	r/w	base 1dP	1867 10059	20118	Float	. —1 ☑	Input 4 for measurement value 4 (to Output 4 for display value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.5	r/w	base 1dP	1869 10061	20122	Float	. —1 ☑	Input 5 for measurement value 5 (to Output 5 for display value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.6	r/w	base 1dP	1871 10063	20126	Float	. —1 ☑	Input 6 for measurement value 6 (to Output 6 for display value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.7	r/w	base 1dP	1873 10065	20130	Float	. —1 ☑	Input 7 for measurement value 7 (to Output 7 for display value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
In.8	r/w	base 1dP	1875 10067	20134	Float	. —1 ☑	Input 8 for measurement value 8 (to Output 8 for display value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.9	r/w	base 1dP	1877 10069	20138	Float	. —1 ☑	Input 9 for measurement value 9 (to Output 9 for display value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.1	r/w	base 1dP	1862 10054	20108	Float	. —1 ☐	Output 1 for display value 1 (to Input 1 for measurement value 1). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.10	r/w	base 1dP	1880 10072	20144	Float	. —1 ☑	Output 10 for display value 10 (to Input 10 for measurement value 10). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.11	r/w	base 1dP	1882 10074	20148	Float	. —1 ☑	Output 11 for display value 11 (to Input 11 for measurement value 11). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.12	r/w	base 1dP	1884 10076	20152	Float	. —1 ☑	Output 12 for display value 12 (to Input 12 for measurement value 12). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.13	r/w	base 1dP	1886 10078	20156	Float	. —1 ☑	Output 13 for display value 13 (to Input 13 for measurement value 13). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.14	r/w	base 1dP	1888 10080	20160	Float	. —1 ☑	Output 14 for display value 14 (to Input 14 for measurement value 14). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.15	r/w	base 1dP	1890 10082	20164	Float	. —1 ☑	Output 15 for display value 15 (to Input 15 for measurement value 15). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.16	r/w	base 1dP	1892 10084	20168	Float	. —1 ☑	Output 16 for display value 16 (to Input 16 for measurement value 16). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.2	r/w	base 1dP	1864 10056	20112	Float	. —1 ☐	Output 2 for display value 2 (to Input 2 for measurement value 2). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.

8 ohnE

• ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Ou.3	r/w	base 1dP	1866 10058	20116	Float	. —1 ☑	Output 3 for display value 3 (to Input 3 for measurement value 3). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.4	r/w	base 1dP	1868 10060	20120	Float	. —1 ☑	Output 4 for display value 4 (to Input 4 for measurement value 4). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.5	r/w	base 1dP	1870 10062	20124	Float	. —1 ☑	Output 5 for display value 5 (to Input 5 for measurement value 5). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.6	r/w	base 1dP	1872 10064	20128	Float	. —1 ☑	Output 6 for display value 6 (to Input 6 for measurement value 6). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.7	r/w	base 1dP	1874 10066	20132	Float	. —1 ☑	Output 7 for display value 7 (to Input 7 for measurement value 7). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.8	r/w	base 1dP	1876 10068	20136	Float	. —1 ☑	Output 8 for display value 8 (to Input 8 for measurement value 8). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
Ou.9	r/w	base 1dP	1878 10070	20140	Float	. —1 ☑	Output 9 for display value 9 (to Input 9 for measurement value 9). Special linearization is possible for certain sensor types, which is stored as a table. This linearization can be adapted with up to 16 segments, whereby every point of the linearization curve is defined by one input or one output.
PASS	r/w	base 1dP	1850 10042	20084	Int	. —8888 ☐	Password. 4-digit number for the password-protected access to blocked operating functions such as e.g. the Parameter Level.
T.Dis2	r/w	base 1dP	1851 10043	20086	Text	— ☐	This address contains 5 bytes for the text that is to appear in Display 2. No text: 1st byte 0x00.
U.LinT	r/w	base 1dP	1860 10052	20104	Enum	*Enum_Unit*	Engineering unit of linearization table: none, °C, °F or K.

0	without unit
1	°C
2	°F
3	K

8 ohnE

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
V.Mask	r/w	base 1dP	1810 10002	20004	Int	. —144 ☐	Definition of the visibility templates.The templates define the configurations and parameters displayed for operation (contents on request).

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Conf	r/w	base 1dP	256 8448	16896	Int	. —1 ☐	Start/Stop and abortion of the configuration mode 0 = End of configuration 1 = Start of configuration 2 = Abort configuration
tEmP	r/w	base 1dP	91 8283	16566	Float	. —8888 ☐	Constant sensor temperature. With O2 measurement, the actual oxygen content is derived from the constant sensor temperature and the EMF (electromotive force in volts) generated by the sensor.Note: A constant sensor temperature is only ensured with heated lambda sensors.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
C.InP	r	base 1dP	39 8231	16462	Float	,0888—8888 ☐	Process value is the calculated result of process value processing. It represents the actual value of the process (controlled variable) that is to be lined out at setpoint.
CAH	r	base 1dP	390 8582	17164	Long	. — ☐	Total operating hours. Count starts with the first switch-on. Internal test routine. Is stored and displayed not more than once per hour.
CPH	r/w	base 1dP	394 8586	17172	Long	. — ☐	Operating hours of the current maintenance period. Internal test routine. Is stored and displayed not more than once per hour. Reset when the time limit message is acknowledged.
Diag	r	base 1dP	382 8574	17148	Int	. —144 ☐	Result of diagnosis. Any faults detected during the self-test for data, RAM, processor, and EEPROM, as well as an exceeded count for the operating hours (maintenance period) and no. of switching cycles (maintenance period) are stored. Can be reset by acknowledgement.
EE.Ver	r	base 1dP	381 8573	17146	Int	. —. ☐	EEPROM version
Id.NrH	r	base 1dP	370 8562	17124	Int	. —. ☐	More significant part of the device Ident number.
Id.NrL	r	base 1dP	371 8563	17126	Int	. —. ☐	Less significant part of the device Ident number.
Id.NrZ	r	base 1dP	372 8564	17128	Int	. —. ☐	Sequential Ident number of the device.

8 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Int.Tmp	r	base 1dP	380 8572	17144	Int	. —. ☐	Max. measured operating temperature. Internal test routine.
Oem.NrH	r	base 1dP	373 8565	17130	Int	. —. ☐	More significant part of the device OEM no.
Oem.NrL	r	base 1dP	374 8566	17132	Int	. —. ☐	Less significant part of the device OEM no.
PASS	r/w	base 1dP	350 8542	17084	Int	. —8888 ☐	This enables the bus interface during 15 s for writing. For this, the pass code defined here must coincide with the configured pass code.
SAO1	r	base 1dP	391 8583	17166	Long	. — ☐	Total number of switching cycles of OUT1. Internal test routine that is stored and displayed not more than once per hour.
SAO2	r	base 1dP	392 8584	17168	Long	. — ☐	Total number of switching cycles of OUT2. Internal test routine that is stored and displayed not more than once per hour.
SAO3	r	base 1dP	393 8585	17170	Long	. — ☐	Total number of switching cycles of OUT3. Internal test routine that is stored and displayed not more than once per hour.
SPO1	r/w	base 1dP	395 8587	17174	Long	. — ☐	Switching cycles of OUT1 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO2	r/w	base 1dP	396 8588	17176	Long	. — ☐	Switching cycles of OUT2 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
SPO3	r/w	base 1dP	397 8589	17178	Long	. — ☐	Switching cycles of OUT3 during the present maintenance period. Internal test routine that is stored and displayed not more than once per hour. Resetting is done by acknowledging the switching cycle message.
St.Pass	r	base 1dP	351 8543	17086	Int	. —0 ☐	This signal indicates whether writing via the interface is allowed (enabling via pass code).
Sw.Nr	r	base 1dP	375 8567	17134	BCD	. —. ☐	Digits 7 to 12 of the software order number.
T.CodeNr	r	base 1dP	360 8552	17104	Text	. —. ☐	15-digit order number of the device.

8 ohnE

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
UPD	r/w	base 1dP	257 8449	16898	Enum	*Enum_Aenderungsflag*	Status message indicating that parameter / configuration have been changed via the front panel.
						0 No change via the front panel keys.	
						1 A change has been made via the front panel keys, which must be processed.	
L-R	r/w	base 1dP	55 8247	16494	Int	. —0 ☐	Remote operation. Remote means that all values can only be adjusted via the interface. Adjustments via the front panel are blocked.
Hw.Opt	r	base 1dP	200 8392	16784	Int	. —54424 ☐	Device options: 0000 WXYZ 0000 DCBA Z = 1: Modbus interface Y = 1: System device X = 1: Option 1 W = 1: Option 2 A = 1: OUT1 available B = 1: OUT2 available C = 1: OUT3 available D = 1: OUT3 is an analog output
Sw.Op	r	base 1dP	201 8393	16786	Int	. —144 ☐	Software version XY Major and Minor Release (e.g. 21 = Version 2.1). The software version specifies the firmware in the unit. For the correct interaction of E-Tool and device, it must match the operating version (OpVersion) in the E-Tool.
Bed.V	r	base 1dP	202 8394	16788	Int	. —144 ☐	Operating version (numeric value). For the correct interaction of E-Tool and device, the software version and operating version must match.
Unit	r	base 1dP	203 8395	16790	Int	. —144 ☐	Identification of the device.
S.Vers	r	base 1dP	204 8396	16792	Int	0. . —144 ☐	The sub-version number is given as an additional index for precise definition of software version.
St.Ala	r	base 1dP	23 8215	16430	Int	— ☐	Alarm status: Bit-wise coded status of the individual alarms, e.g. exceeded limit value.
						Bit 0 Existing/stored exceeded limit 1 Bit 1 Existing/stored exceeded limit 2 Bit 2 Existing/stored exceeded limit 3 Bit 3 Not usedBit 4 Not used Bits 5 - 7 Not used Bit 8 Existing exceeded limit 1 Bit 9 Existing exceeded limit 2 Bit 10 Existing exceeded limit 3 Bits 11 - 15 Not used	
Err.r	r/w	base 1dP	63 8255	16510	Int	. —0 ☐	Signal for resetting the entire error list. The error list contains all errors that are reported, e.g. device faults and limit values. It also contains queued as well as stored errors after their correction. The reset acknowledges all errors, whereby queued errors will reappear after the next error detection (measurement).

8 ohnE

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
St.Do	r	base 1dP	24 8216	16432	Int	. —04 ☐	Status of the digital outputs
St.Ain	r	base 1dP	22 8214	16428	Int	. —016 ☐	Bit-coded status of the analog input (fault, e.g. short circuit)
						Bit 0 Break at Input 1 Bit 1 Reversed polarity at Input 1 Bit 2 Short-circuit at Input 1 Bit 3 Not used Bit 4 Break at Input 2 Bit 5 Reversed polarity at Input 2 Bit 6 Short-circuit at Input 2 Bits 7-15 Not used	
St.Di	r	base 1dP	25 8217	16434	Int	— ☐	Status of the digital inputs or of push-buttons (binary coded).
						Bit 0: Input di1 Bit 8: Status of Enter key Bit 9: Status of 'Down' key Bit 10: Status of 'Up' key	

9 ohnE1

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
LC	r/w	base 1dP	73 8265	16530	Float	,0888—8888 ☐	Limit value LC. The limit value LC is the main function of the temperature limiter/monitor. It complies with certain switching and wiring specifications, and has a fixed hysteresis of 0.5 K.
t.F1	r/w	base 1dP	70 8262	16524	Float	. —888 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.1	r	base 1dP	20 8212	16424	Float	,0888—8888 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
In.1r	r	base 1dP	2005 10197	20394	Float	,0888—8888 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).

10 ohnE2

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.2	r/w	base 1dP	75 8267	16534	Float	,0888—8888 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
t.F2	r/w	base 1dP	71 8263	16526	Float	. —888 ☐	Filter time constant [s]. Every input is fitted with a digital (software) low-pass filter for suppressing process-related disturbances on the input leads. Higher filter settings improve the suppression, but increase the delay of the input signals.
H.2	r/w	base 1dP	76 8268	16536	Float	,0888—8888 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
In.2	r	base 1dP	21 8213	16426	Float	,0888—8888 ☐	Measurement value after the measurement value correction (e.g. with offset or 2-point correction, and scaling).
In.2r	r	base 1dP	2006 10198	20396	Float	,0888—8888 ☐	Measurement value before the measurement value correction (unprocessed, read directly from the input).

11 ohnE3

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
L.3	r/w	base 1dP	77 8269	16538	Float	,0888—8888 ☑	Lower limit value. The alarm is triggered if the value falls below the limit, and is reset with lower limit value plus hysteresis.
H.3	r/w	base 1dP	78 8270	16540	Float	,0888—8888 ☑	Upper limit value. The alarm is triggered if the value rises above the limit, and is reset with upper lower limit value plus hysteresis.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out.3	r	base 1dP	34 8226	16452	Float	,0888—8888 ☐	Value of the analog output [%]

12 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
bAud	r/w	base 1dP	290 8482	16964	Enum	*Enum_Baud*	Bit rate of the interface (only visible with OPTION). The bit rate determines the transmission speed.

0	2400 Baud
1	4800 Baud
2	9600 Baud
3	19200 Baud
4	38.400 bits/s

Addr	r/w	base 1dP	291 8483	16966	Int	0—136 ☐	Address on the interface (only visible with OPTION)
PrtY	r/w	base 1dP	292 8484	16968	Enum	*Enum_Parity*	Parity of data on the interface (only visible with OPTION). Simple possibility of checking that transferred data is correct.

0	No parity, with 2 stop bits.
1	even parity
2	odd parity
3	no parity (1 stop bit)

dELY	r/w	base 1dP	293 8485	16970	Int	. —1. . ☐	Response delay [ms] (only visible with OPTION). Additional delay time before the received message may be answered on the Modbus. (Might be necessary, if the same line is used for transmit/receive.)
D.Unt	r/w	base 1dP	284 8476	16952	Enum	*EnumDUnit*	display unit

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

12 othr

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O2	r/w	base 1dP	283 8475	16950	Enum	*O2Unit*	Parameter definition for O2 measurement. With O2 measurement it is necessary to define whether the parameter is to be evaluated in ppm or %.
						0	Parameter for O2 function in ppm
						1	Parameter for O2 function in %
Unit	r/w	base 1dP	280 8472	16944	Enum	*Enum_Unit_rail*	Physical unit, f.e.°C
						1	°C
						2	°F
						3	K
dP	r/w	base 1dP	281 8473	16946	Enum	*Enum_dP*	Decimal point (max. no of decimals). Format of the measured value display.
						0	no digit behind the decimal point
						1	Display has one decimal.
						2	Display has two decimals.
						3	Display has three decimals.
dISP	r/w	base 1dP	282 8474	16948	Enum	*Enum_diSP*	Format of the measured value display, in digits. In order to ensure a steady display, the value of the last displayed digit is defined by a multiple of the total selected number of display digits.Example with a resolution of 2 decimals:The measured value '1.234' is displayed as 1.23; with a 2-digit display it is 1.24; with a 5-digit display it is 1.25, and with 10 digits it is 1.20.
						0	No display of measured value.Note: In case of a fault, the process value is displayed with the highest resolution until the fault has been remedied or the alarm has been reset.
						1	Full display resolution.
						2	Display resolution = 2 digits
						3	Display resolution = 5 digits
						4	Display resolution = 10 digits
C.dEL	r/w	base 1dP	294 8486	16972	Int	. —1. . ☐	Additional delay time before received message is evaluated by Modbus. This time is needed if data is not transmitted continousely by the modem.
FrEq	r/w	base 1dP	260 8452	16904	Enum	*Enum_FrEq*	Switchover of the applied mains frequency 50 / 60 Hz and adapting the input filter for hum suppression.
						0	Mains frequency is 50 Hz.
						1	Mains frequency is 60 Hz.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
D.Unt	r	base 1dP	340 8532	17064	Enum	*EnumDUnit*	Effective display unit (can be used for extended Operating Level or display 2)

0	without unit
1	Temperature unit
2	O2 unit
3	%
4	bar
5	mbar
6	Pa
7	kPa
8	psi
9	l
10	l/s
11	l/min
12	Ohm
13	kOhm
14	m
15	A
16	mA
17	V
18	mV
19	kg
20	g
21	t
22	Text of phys. Unit

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.1	r/w	base 1dP	310 8502	17004	Enum	*Defect*	Err 1 (internal error)

0	No fault exists (Reset).
2	The device is defective.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.2	r/w	base 1dP	311 8503	17006	Enum	*Problem*	Err 2 (internal error, resetable)

0	No fault or reset of the fault exists (Reset).
1	A fault has occurred and has been stored.

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.3	r/w	base 1dP	329 8521	17042	Enum	*ConfErr*	Resettable configuration fault. ConfErr(2): a fault has occurred. Typical causes and suggested remedies: Missing or faulty configuration: check interactions in the configuration and parameter settings.

0	No fault or reset of the configuration error exists (Reset).
2	There is a configuration error. The configuration is missing or wrong, or it does not match the parameter settings.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
E.4	r/w	base 1dP	328 8520	17040	Enum	*Problem*	Hardware fault.Cause: Code number and hardware are not identical. Remedy: Contact PMA Service or replace electronics/Options pcb.
						0	No fault or reset of the fault exists (Reset).
						1	A fault has occurred and has been stored.
FbF.1	r/w	base 1dP	312 8504	17008	Enum	*Break*	Sensor break at input INP1. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.
Sht.1	r/w	base 1dP	313 8505	17010	Enum	*Short*	Short circuit at input INP1. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP1 sensor. Wiring fault: check connections of INP1.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.1	r/w	base 1dP	314 8506	17012	Enum	*Polarity*	Incorrect polarity at input INP1. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP1.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
FbF.2	r/w	base 1dP	315 8507	17014	Enum	*Break*	Sensor break at input INP2. Break(2): a fault has occurred. Break(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the sensor break alarm exists (Reset).
						1	The sensor fault alarm has been triggered and stored; the fault is no longer present. The operator must acknowledge the error message in order to delete it from the error list.
						2	Sensor break: The sensor is defective or there is a wiring fault.

12 othr

• Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Sht.2	r/w	base 1dP	316 8508	17016	Enum	*Short*	Short circuit at input INP2. Short(2): a fault has occurred. Short(1): fault remedied but not acknowledged. Typical causes and suggested remedies: Sensor fault: replace INP2 sensor. Wiring fault: check connections of INP2.
						0	No fault or reset of the short-circuit alarm exists (Reset).
						1	A short-circuit fault has occurred and has been stored.
						2	A short-circuit fault has occurred.
POL.2	r/w	base 1dP	317 8509	17018	Enum	*Polarity*	Incorrect polarity at input INP2. Polarity(2): a fault has occurred. Latched(1): fault remedied but not acknowledged. Suggested remedy: reverse the polarity at INP2.
						0	No fault or reset of incorrect polarity alarm exists (Reset).
						1	An incorrect polarity fault has occurred and has been stored.
						2	Incorrect polarity. The wiring of the input circuit is not correct.
Lim.1	r/w	base 1dP	323 8515	17030	Enum	*Limit*	Limit value 1 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
Lim.2	r/w	base 1dP	324 8516	17032	Enum	*Limit*	Limit value 2 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
Lim.3	r/w	base 1dP	325 8517	17034	Enum	*Limit*	Limit value 3 exceeded. Active (2): a fault has occurred. Latched (1): fault remedied but not acknowledged. Hint for trouble-shooting: check the process.
						0	No fault or reset of the limit value alarm exists (Reset).
						1	The limit value has been exceeded, and the fault has been stored.
						2	The limit value has been exceeded; the monitored (measurement) value is outside the set limits.
InF.1	r/w	base 1dP	326 8518	17036	Enum	*Time*	Message from the operating hours counter that the preset no. of hours for this maintenance period has been reached. The op-hours counter for the maintenance period is reset when this message is acknowledged. Counting the operating hours is used for preventive maintenance.
						0	No signal or reset of the time limit signal (reset).
						1	Operating hours - limit value (maintenance period) reached.

12 othr

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
InF.2	r/w	base 1dP	327 8519	17038	Enum	*Switch*	Message from the switching cycle counter that the preset no. of switch cycles for this maintenance period has been reached. The cycle counter for the maintenance period is reset when this message is acknowledged. Counting the switching cycles is used for preventive maintenance.
						0	No error message or reset of the switching cycle counter exists (Reset).
						1	Set limit of the switching cycle counter (maintenance period) has been reached.

13 Out.1

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out1	r	base 1dP	940 9132	18264	Enum	*Enum_Ausgang*	Status of the digital output
						0	off
						1	on

14 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base 1dP	970 9162	18324	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0	direct / normally open
						1	inverse / normally closed
Lim.1	r/w	base 1dP	973 9165	18330	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0	not active
						1	The output is activated by an alarm from limit value 1.
Lim.2	r/w	base 1dP	974 9166	18332	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0	not active
						1	The output is activated by an alarm from limit value 2.
Lim.3	r/w	base 1dP	975 9167	18334	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0	not active
						1	The output is activated by an alarm from limit value 3.

14 Out.2

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
FAi.1	r/w	base 1dP	982 9174	18348	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0	not active
						1	The output is switched by the error message 'INP1 fault'.
FAi.2	r/w	base 1dP	983 9175	18350	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0	not active
						1	The output is switched by the error message 'INP2 fault'.
InF.1	r/w	base 1dP	985 9177	18354	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0	not active
						1	The output is activated by the status message 'Inf.1'.
InF.2	r/w	base 1dP	986 9178	18356	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0	Not active
						1	The output is activated by the status message 'Inf.2'.

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out2	r	base 1dP	990 9182	18364	Enum	*Enum_Ausgang*	Status of the digital output
						0	off
						1	on

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.tYP	r/w	base 1dP	1035 9227	18454	Enum	*Enum_OtYP*	Signal type selection OUT
						0	Relay / logic (only visible with current/logic/voltage).
						1	0 ... 20 mA continuous (only visible with current/logic/voltage).
						2	4 ... 20 mA continuous (only visible with current/logic/voltage).
						3	0...10 V continuous (only visible with current/logic/voltage)
						4	2...10 V continuous (only visible with current/logic/voltage)
						5	transmitter supply (only visible with current/logic/voltage)

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
O.Act	r/w	base 1dP	1020 9212	18424	Enum	*Enum_OAct*	Operating sense of the switching output OUT x. Direct: Active function (e.g. limit value) switches the output ON; Inverse: Active function (e.g. limit value) switches the output OFF.
						0 direct / normally open	
						1 inverse / normally closed	
Out.0	r/w	base 1dP	1036 9228	18456	Float	,0888—8888 ☐	Lower scaling limit of the analog output (corresponds to 0%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the lower scaling point is indicated in the respective electrical unit (mA / V).
Out.1	r/w	base 1dP	1037 9229	18458	Float	,0888—8888 ☐	Upper scaling limit of the analog output (corresponds to 100%). If current and voltage signals are used as output values, the display can be scaled to the output value in the Parameter Level. The output value of the upper scaling point is indicated in the respective electrical unit (mA / V).
O.Src	r/w	base 1dP	1038 9230	18460	Enum	*Enum_OSrc*	Signal source of the analog output (only visible when O.TYP=1..5)
						0 not used	
						3 process value	
						7 measured value INP1	
						8 measured value INP2	
O.FAI	r/w	base 1dP	1039 9231	18462	Enum	*Enum_OFail*	fail behaviour
						0 upscale	
						1 downscale	
Lim.1	r/w	base 1dP	1023 9215	18430	Enum	*Enum_Lim1*	Activation of output function: Adjusted limit value 1 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 1.	
Lim.2	r/w	base 1dP	1024 9216	18432	Enum	*Enum_Lim2*	Activation of output function:Adjusted limit value 2 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 2.	
Lim.3	r/w	base 1dP	1025 9217	18434	Enum	*Enum_Lim3*	Activation of output function: Adjusted limit value 3 has been exceeded.
						0 not active	
						1 The output is activated by an alarm from limit value 3.	

15 Out.3

ConF

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
FAi.1	r/w	base 1dP	1032 9224	18448	Enum	*Enum_FAi1*	Activation of the message: INP1 fault. The fail signal is generated, if a fault occurs at the analog Input INP1.
						0 not active 1 The output is switched by the error message 'INP1 fault'.	
FAi.2	r/w	base 1dP	1033 9225	18450	Enum	*Enum_FAi2*	Activation of the message: INP2 fault. The fail signal is generated, if a fault occurs at the analog Input INP2.
						0 not active 1 The output is switched by the error message 'INP2 fault'.	
InF.1	r/w	base 1dP	1055 9247	18494	Enum	*Enum_Inf1*	Activation of the output: Inf.1 status.The Inf.1 signal is generated, when the preset value of the operating hours counter has been reached.
						0 not active 1 The output is activated by the status message 'Inf.1'.	
InF.2	r/w	base 1dP	1056 9248	18496	Enum	*Enum_Inf2*	Activation of the output: Inf.2 status.The Inf.2 signal is generated, when the preset value of the switching cycle counter has been reached.
						0 Not active 1 The output is activated by the status message 'Inf.2'.	

Signal

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
Out3	r	base 1dP	1040 9232	18464	Enum	*Enum_Ausgang*	Status of the digital output
						0 off 1 on	
Out.3	r	base 1dP	1043 9235	18470	Float	,0888—8888 ☐	Value of the analog output [%]

16 rnG

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
rnG.L	r/w	base 1dP	660 8852	17704	Float	,0888—8888 ☐	Lower limit value. The lower setting limit for den limit value LC. The limit value LC is the main function of the temperature limiter / monitor.

16 rnG

PArA

Name	r/w	Adr.	Integer	real	Typ	Value/off	Description
rnG.H	r/w	base 1dP	661 8853	17706	Float	,0888—8888 ☐	Upper limit value. The upper setting limit for den limit value LC. The limit value LC is the main function of the temperature limiter / monitor.

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