

SIMATIC

ET 200SP HA SIMATIC ET 200SP HA GSDML Equipment Manual

Equipment Manual

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.

 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.

 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Preface

Purpose of the documentation

This equipment manual describes the GSDML files for ET 200SP-HA.

Table legend

The following specifications apply to the formatting of the tables:

Formatting	Meaning
Bold	Default value of the parameter

Safety information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit
<https://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
<https://www.siemens.com/cert>.

Using SIMATIC ET 200SP HA with GSDML

This document contains information on using the SIMATIC ET 200SP HA at Integration through GSDML.

For integration via GSDML, you must use an IM155-6PN HA with firmware as of V1.1.

General

- Replacing bus adapters
The bus adapter must be replaced in two steps (each port separately). Only related port pairs may be replaced.
- Server module
For certification reasons of the GSDML the server module is available in the hardware catalog, but configuration of the server module is not required.
- HSP 272 (V1.1)
If the HSP 272 is installed in STEP7, at least version 1.1 must be used for GSDML to be visible in the hardware catalog.

The following functions are not available for GSDML configuration.

- Sequence of Event (SoE)
- IO redundancy
- MultiHART
- Module Shared Input (MSI) / Module Shared Output (MSO)

Configuring a potential group

Parameter	Value range
Potential group	<ul style="list-style-type: none">• Potential group of the left module (dark gray terminal block)• New potential group (light gray terminal block) / no potential group (black terminal block)

AI 4xI 2-/4-wire HART ISOL HA

The module AI 4xI 2-/4-wire HART ISOL HA (6DL1134-6UD00-0PK0) is available as:

- AI 4xI 2-/4-wire HART ISOL HA V1.0, QI
- AI 4xI 2-/4-wire HART ISOL HA V1.0, QI, 4 variables.

Adjustable parameters and their default setting

The following table describes the adjustable parameters of AI 4xI 2-/4-wire HART ISOL HA V1.0.

Table 5-1 Parameter dependencies AI 4xI 2-/4-wire HART HA V1.0

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Number of HART frame repetitions	Failure monitoring (according to NE43)
Current (2-wire)	2 = "0..20 mA"	1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"	0...5...10	
	3 = "4..20 mA"	2 = "50 Hz"			0/1
	7 = "4..20 mA HART"	3 = "10 Hz"			0/1
Current (4-wire)	2 = "0..20 mA"	1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"	0...5...10	
	3 = "4..20 mA"	2 = "50 Hz"			0/1
	7 = "4..20 mA HART"	3 = "10 Hz"			0/1

Measurement type	Measuring range	Diagnostics				
		HART	Overflow	Underflow	Wire break	Sensor supply
Current (2-wire)	2 = "0..20 mA"		0/1	0	0	0/1
	3 = "4..20 mA"		0/1	0/1	0/1	0/1
	7 = "4..20 mA HART"	0/1	0/1	0/1	0/1	0/1
Current (4-wire)	2 = "0..20 mA"		0/1	0	0	0
	3 = "4..20 mA"		0/1	0/1	0/1	0
	7 = "4..20 mA HART"	0/1	0/1	0/1	0/1	0

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
Current (2-wire)	2 = "0..20 mA"	0/1 1...0x7EFE and < High limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 1	0/1 1...0x7EFE and < High limit 2	0/1 1... 0x6C00...0x7EFE and > Low limit 2
	3 = "4..20 mA"	0/1 0xED01... 0...0x7EFE and < High limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0...0x7EFE and < High limit 2	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 2
	7 = "4..20 mA HART"	0/1 0xED01... 0...0x7EFE and < High limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0...0x7EFE and < High limit 2	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 2
Current (4-wire)	2 = "0..20 mA"	0/1 1...0x7EFE and < High limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 1	0/1 1...0x7EFE and < High limit 2	0/1 1... 0x6C00...0x7EFE and > Low limit 2
	3 = "4..20 mA"	0/1 0xED01... 0...0x7EFE and < High limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0...0x7EFE and < High limit 2	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 2
	7 = "4..20 mA HART"	0/1 0xED01... 0...0x7EFE and < High limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0...0x7EFE and < High limit 2	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 2

AI 16xl 2-wire HA

The module AI 16xl 2-wire HA (6DL1134-6GH00-0PH1) is available as AI 16xl 2-wire HA V1.0, QI.

Adjustable parameters and their default setting

The following table describes the adjustable parameters of AI 16xl 2-wire HA V1.0.

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Failure monitoring (according to NE43)
3 = "Current (2-wire)"	2 = "0..20 mA"	1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"	*
	8 = "0...10 mA"	2 = "50 Hz"		*
	3 = "4..20 mA"	3 = "10 Hz"		0/1

Measurement type	Measuring range	Diagnostics		
		Overflow	Underflow	Wire break
3 = "Current (2-wire)"	2 = "0..20 mA"	0/1	0	0
	8 = "0...10 mA"	0/1	0	0
	3 = "4..20 mA"	0/1	0/1	0/1

AI 16xl 2-wire HART HA

7.1 AI 16xl 2-wire HART HA V1.1

The module AI 16xl 2-wire HART HA (6DL1134-6TH00-0PH1) is available as:

- AI 16xl 2-wire HART HA V1.1, QI
- AI 16xl 2-wire HART HA V1.1, QI, 8 variables.

Adjustable parameters and their default setting

The following table describes the parameter dependencies of AI 16xl 2-wire HART HA V1.1.

Changing these parameters can affect the process value. Currently, there is no logic implemented to ensure that the next read process value already matches the new parameters after Configuration in Run.

Table 7-1 Parameter dependencies AI 16xl 2-wire HART HA V1.1

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Number of HART frame repetitions	Failure monitoring (according to NE43)
Current (2-wire)	2 = "0..20 mA"	1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"		
	8 = "0...10 mA"	2 = "50 Hz"			
	3 = "4..20 mA"	3 = "10 Hz"		0...5...10	0/1
	7 = "4..20 mA HART"				0/1

Measurement type	Measuring range	Diagnostics					
		HART	Overflow	Underflow	Wire break	Diagnosis, Short-circuit to L+	Sensor supply
Current (2-wire)	2 = "0..20 mA"	*	0/1	0	0	0/1	0/1
	8 = "0...10 mA"	*	0/1		0	0/1	0/1
	3 = "4..20 mA"	*	0/1	0/1	0/1	0/1	0/1
	7 = "4..20 mA HART"	0/1	0/1		0/1	0/1	0/1

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
Current (2-wire)	2 = "0..20 mA"	0/1 1...0x7EFE and < High limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 2	0/1 1...0x7EFE and < High limit 2
	8 = "0...10 mA"	0/1 1...0x7EFE and < High limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 1	0/1 1... 0x6C00...0x7EFE and > Low limit 2	0/1 1...0x7EFE and < High limit 2
	3 = "4..20 mA" 7 = "4..20 mA HART"	0/1 0xED01... 0...0x7EFE and < High limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0x6C00...0x7EFE and > Low limit 1	0/1 0xED01... 0...0x7EFE and < High limit 2

AI 16xTC/8xRTD 2-/3-/4-wire HA

The module AI 16xTC/8xRTD 2-/3-/4-wire HA (6DL1134-6JH00-0PH1) is available as:

- AI 16xTC/8xRTD 2/3/4-wire HA V1.1, QI
- AI 16xTC/8xRTD 2/3/4-wire HA V1.1, QI, REAL

Adjustable parameters and their default setting

The following table describes the parameters of AI 16xTC/8xRTD 2-/3-/4-wire HA.

Measurement type	Measuring range	Temperature coefficient	Temperature unit	Reference junction
Voltage	±50 mV, ±80 mV, ±250 mV, ±1 V	*	*	*
Resistor (2, 3, 4-wire connection)	150 Ω, 300 Ω, 600 Ω, 3 kΩ, 6 kΩ	*	*	*
Resistor (2-wire connection)	PTC	*	*	*
Thermistor (2, 3, 4-wire connection)	Pt100 Climatic	Pt 0.00385055 Pt 0.003916 Pt 0.003902 Pt 0.00392 Pt 0.00385	Degrees Celsius	Reference channel of group 0, 1, 2, 3 *)
	Pt200 Climatic Pt500 Climatic Pt1000 Climatic			No reference channel mode
	Pt 100 Standard Pt 200 Standard Pt 500 Standard Pt 1000 Standard			No reference channel mode
	Ni100 Climatic Ni120 Climatic Ni200 Climatic Ni500 Climatic Ni1000 Climatic	Ni 0.00618 Ni 0.00672	Degrees Celsius Degrees Fahrenheit	
	Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard			
	LG-Ni 1000 Climatic	LG-Ni 0.005	Degrees Celsius Degrees Fahrenheit	
	LG-Ni 1000 Standard			
	Thermistor (3-wire connection)	Cu 10 Climatic	Cu 0.00427	Degrees Celsius Degrees Fahrenheit Kelvin
Cu 10 Standard				

Measurement type	Measuring range	Temperature coefficient	Temperature unit	Reference junction
Thermocouple	Type B, N, E, R, S, J, L, T, K, U, C, TXK Type B (PtRh-PtRh) Type N (NiCrSi-NiSi) Type E (NiCr-CuNi) Type R (PtRh-Pt) Type S (PtRh-Pt) Type J (Fe-CuNi) Type L (Fe-CuNi) Type T (Cu-CuNi) Type K (NiCr-NiAl) Type U (Cu-CuNi) Type C (WRe-WRe) Type TXK	*		Reference channel of the module Internal reference junction Reference channel of group 0, 1, 2, 3 Fixed reference temperature

*) Not possible with AI 16xTC/8xRTD 2/3/4-wire HA V1.1, QI, REAL

Measurement type	Measuring range	Conductor resistance [0.01 Ohm]	Reference temperature thermocouple
Voltage	±50 mV, ±80 mV ±250 mV, ±1 V	*	*
Resistor (2, 3, 4-wire connection)	150 Ω, 300 Ω, 600 Ω , 3 kΩ, 6 kΩ	For 2-wire connection only	
Resistor (2-wire connection)	PTC		
Thermistor (2, 3, 4-wire connection)	Pt100 Climatic		
	Pt200 Climatic Pt500 Climatic Pt1000 Climatic		
	Pt 100 Standard Pt 200 Standard Pt 500 Standard Pt 1000 Standard		
	Ni100 Climatic Ni120 Climatic Ni200 Climatic Ni500 Climatic Ni1000 Climatic		
	Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard		
	LG-Ni 1000 Climatic		
	LG-Ni 1000 Standard		
Thermistor (3-wire connection)	Cu 10 Climatic	*	
	Cu 10 Standard		
Thermocouple	Type B (PtRh-PtRh) Type N (NiCrSi-NiSi) Type E (NiCr-CuNi) Type R (PtRh-Pt) Type S (PtRh-Pt) Type J (Fe-CuNi) Type L (Fe-CuNi) Type T (Cu-CuNi) Type K (NiCr-NiAl) Type U (Cu-CuNi) Type C (WRe-WRe) Type TXK		

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Diagnostics			
				Underflow	Overflow	Wire break	Reference junction
Voltage	±50 mV, ±80 mV , ±250 mV, ±1 V	1 = "60 Hz" 2 = "50 Hz" 4 = "16.6 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"	0/1	0/1	0	0
Resistor (2, 3, 4-wire connection)	150 Ω, 300 Ω, 600 Ω , 3 kΩ, 6 kΩ			0/1	0/1	0/1	0
Resistor (2-wire connection)	PTC			0/1	0	0/1	0
Thermistor (2, 3, 4-wire connection)	Pt100 Climat-ic			0/1	0/1	0/1	0
	Pt200 Climat-ic			0/1	0/1	0/1	0
	Pt500 Climat-ic						
	Pt1000 Cli-matic						
	Pt 100 Stand-ard						
	Pt 200 Stand-ard						
	Pt 500 Stand-ard						
	Pt 1000 Stand-ard						
Ni100 Climat-ic							
Ni120 Climat-ic							
Ni200 Climat-ic							
Ni500 Climat-ic							
Ni1000 Cli-matic							
Ni100 Stand-ard							
Ni120 Stand-ard							
Ni200 Stand-ard							
Ni500 Stand-ard							
Ni1000 Stand-ard							
LG-Ni 1000 Climatic				0/1	0/1	0/1	0

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Diagnostics			
				Underflow	Overflow	Wire break	Reference junction
	LG-Ni 1000 Standard			0/1	0/1	0/1	0
Thermistor (3-wire connection)	Cu 10 Climatic			0/1	0/1	0/1	0
	Cu 10 Standard			0/1	0/1	0/1	0
Thermocouple	Type B, N, E, R, S, J, L, T, K, U, C, TXK			0/1	0/1	0/1	0/1
	Type B (PtRh-PtRh), Type N (NiCrSi-NiSi), Type E (NiCr-CuNi), Type R (PtRh-Pt), Type S (PtRh-Pt), Type J (Fe-CuNi), Type L (Fe-CuNi), Type T (Cu-Cu-Ni), Type K (NiCr-NiAl) , Type U (Cu-Cu-Ni), Type C (WRe-WRe), Type TXK			0/1	0/1	0/1	0

Measurement type	Measuring range	Hardware interrupt event				Parameter dependencies
		Low limit 1	High limit 1	Low limit 2	High limit 2	
Voltage	±50 mV	0/1	0/1	0/1	0/1	Only allowed on channels 8... 15. If a measurement type with 3- or 4-wire (measurement type = 4, 5, 7, 8) is configured on channel x (x=8...15), channel y (y=x-8) must be disabled.
	±80 mV	0x8100	UG1	0x8100	UG2	
	±250 mV	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	±1 V	0x7EFF	0x7EFF	0x7EFF	0x7EFF	
Resistor (2, 3, 4-wire connection)	150 Ω	0/1	0/1	0/1	0/1	
	300 Ω	0x0000	UG1	0x0000	UG2	
	600 Ω	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	3000 Ω	0x7EFF	0x7EFF	0x7EFF	0x7EFF	
	6000 Ω					
Resistor (2-wire connection)	PTC	0/1	0/1	0/1	0/1	
Thermistor (2, 3, 4-wire connection)	Pt100 Climatic	0/1	0/1	0/1	0/1	
	Pt200 Climatic	0xC75C	UG1	0xC75C	UG2	
	Pt500 Climatic	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	Pt1000 Climatic	0x3C8C	0x3C8C	0x3C8C	0x3C8C	
	Pt100 Standard	0/1	0/1	0/1	0/1	
	Pt200 Standard	0xF682	UG1	0xF682	UG2	
	Pt500 Standard	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	Pt1000 Standard	0x2710	0x2710	0x2710	0x2710	
	Ni 0.00618	Ni100 Climatic	0/1	0/1	0/1	0/1
		Ni120 Climatic	0xD6FC	UG1	0xD6FC	UG2
		Ni200 Climatic	< UG1 <	< OG1 <	< UG2 <	< OG2 <
		Ni500 Climatic	0x733B	0x733B	0x733B	0x733B
		Ni1000 Climatic				
Ni 0.006720	Ni100 Standard					
	Ni120 Standard					
	Ni200 Standard					
	Ni500 Standard					
	Ni1000 Standard					

Measurement type	Measuring range		Hardware interrupt event				Parameter dependencies
			Low limit 1	High limit 1	Low limit 2	High limit 2	
		Climatic Ni1000 Climatic					
		Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard					
	Ni 0.006170 (GOST)	Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard	0xFBE6 < UG1 < 0x0834	UG1 < OG1 < 0x0834	0xFBE6 < UG2 < 0x0834	UG2 < OG2 < 0x0834	
		Ni100 Climatic Ni120 Climatic Ni200 Climatic Ni500 Climatic Ni1000 Climatic	0xFBE6 < UG1 < 0x060E	UG1 < OG1 < 0x060E	0xFBE6 < UG2 < 0x060E	UG2 < OG2 < 0x060E	
	LG-Ni 1000 Climatic LG-Ni 1000 Standard		0/1	0/1	0/1	0/1	
			0xD6FC < UG1 < 0x733C	UG1 < OG1 < 0x733C	0xD6FC < UG2 < 0x733C	UG2 < OG2 < 0x733C	
Thermistor (3-wire connection)	Cu 10 Climatic		0/1	0/1	0/1	0/1	
			0xE890 < UG1 < 0x4650	UG1 < OG1 < 0x4650	0xE890 < UG2 < 0x4650	UG2 < OG2 < 0x4650	
	Cu 10 Standard		0/1	0/1	0/1	0/1	
			0xF6A0 < UG1 < 0xC30	UG1 < OG1 < 0xC30	0xF6A0 < UG2 < 0xC30	UG2 < OG2 < 0xC30	
	Cu50 Climatic Cu100 Climatic		0/1	0/1	0/1	0/1	
			0xE890 < UG1 <	UG1 < OG1 <	0xE890 < UG2 <	UG2 < OG2 <	

Measurement type	Measuring range	Hardware interrupt event				Parameter dependencies
		Low limit 1	High limit 1	Low limit 2	High limit 2	
		0x4650	0x4650	0x4650	0x4650	
	Cu50 ST	0/1	0/1	0/1	0/1	
	Cu100 ST	0xF768	UG1	0xF768	UG2	
		< UG1 <	< OG1 <	< UG2 <	< OG2 <	
		0x960	0x960	0x960	0x960	

Measurement type	Measuring range	Hardware interrupt event				Parameter dependencies
		Low limit 1	High limit 1	Low limit 2	High limit 2	
Thermocouple	Type B	0/1	0/1	0/1	0/1	<p>If TC (measuring type=10) is configured on channel 0...14 with "Reference channel of the module", a "Thermal resistor Pt100 climatic range" with a "Degrees Celsius" temperature unit must be configured on channel 15.</p> <p>Reference junction = 8...11 (reference channel of group x) is permissible with redundant mode (redundancy=2,3).</p> <p>With redundancy = 3 (station-internal) and reference junction = 8...11 (reference channel of group x), the following applies:</p> <ul style="list-style-type: none"> - The modules which receive the reference junction temperature as "Receiver of group x" with TC channels are configured redundantly. - The modules which acquire the reference junction temperature with RTD channels as "Sender of group x" may not be configured redundantly. - Only one RTD channel may be available per station as "Reference channel of group x" for each group. - All TC channels of the master module, which receive the reference junction temperature via "Reference channel of group x", must use a different group than the corresponding channels of the slave module ("Reference channel of group y"). - The RTD channels that acquire the reference junction temperature as "Reference channel of group x" for the TC channels of the module configured as master must be on a different module than the RTD channels that acquire the reference junction temperature as "Reference channel of group y" of the TC channels of the module configured as slave.
		0xFB50 < UG1 < 0x50DC	UG1 < OG1 < 0x50DC	0xFB50 < UG2 < 0x50DC	UG2 < OG2 < 0x50DC	
	Type C	0/1	0/1	0/1	0/1	
		0xFB50 < UG1 < 0x61A8	UG1 < OG1 < 0x61A8	0xFB50 < UG2 < 0x61A8	UG2 < OG2 < 0x61A8	
	Type E	0/1	0/1	0/1	0/1	
		0x7576 < UG1 < 0x2EE0	UG1 < OG1 < 0x2EE0	0x7576 < UG2 < 0x2EE0	UG2 < OG2 < 0x2EE0	
	Type J	0/1	0/1	0/1	0/1	
		0xF7CC < UG1 < 0x38A4	UG1 < OG1 < 0x38A4	0xF7CC < UG2 < 0x38A4	UG2 < OG2 < 0x38A4	
	Type K	0/1	0/1	0/1	0/1	
		0xF574 < UG1 < 0x3F5C	UG1 < OG1 < 0x3F5C	0xF574 < UG2 < 0x3F5C	UG2 < OG2 < 0x3F5C	
	Type L	0/1	0/1	0/1	0/1	
		0xF830 < UG1 < 0x2CEC	UG1 < OG1 < 0x2CEC	0xF830 < UG2 < 0x2CEC	UG2 < OG2 < 0x2CEC	
	Type N	0/1	0/1	0/1	0/1	
		0xF574 < UG1 < 0x3C8C	UG1 < OG1 < 0x3C8C	0xF574 < UG2 < 0x3C8C	UG2 < OG2 < 0x3C8C	
	Type R Type S	0/1	0/1	0/1	0/1	
		0xF95C < UG1 < 0x4EDE	UG1 < OG1 < 0x4EDE	0xF95C < UG2 < 0x4EDE	UG2 < OG2 < 0x4EDE	
	Type T	0/1	0/1	0/1	0/1	
		0xF574 < UG1 < 0x1518	UG1 < OG1 < 0x1518	0xF574 < UG2 < 0x1518	UG2 < OG2 < 0x1518	
Type U	0/1	0/1	0/1	0/1		
	0xF830 < UG1 < 0x2134	UG1 < OG1 < 0x2134	0xF830 < UG2 < 0x2134	UG2 < OG2 < 0x2134		
Type TXK	0/1	0/1	0/1	0/1		

Measurement type	Measuring range	Hardware interrupt event				Parameter dependencies
		Low limit 1	High limit 1	Low limit 2	High limit 2	
		0xF830 < UG1 < 0x2904	UG1 < OG1 < 0x2904	0xF830 < UG2 < 0x2904	UG2 < OG2 < 0x2904	<p>- The following settings of the groups are valid by default:</p> <ul style="list-style-type: none"> • Master group 0 -> Slave group 1 • Master group 1 -> Slave group 2 • Master group 2 -> Slave group 3 • Master group 3 -> Slave group 0 <p>The setting can be changed channel-granular for the master and for the slave, but always the group at the master must be different to the group for the corresponding channel of the slave.</p>

"LL1 = Low Limit 1"

"LL2 = Low Limit 2"

"HL1 = High Limit 1"

"HL2 = High Limit 2"

AI/DI 16DQ16x24VDC HART

The module AI-DI16/DQ16x24VDC HART (6DL1133-6EW00-0PH1) is available as:

- AI-DI16/DQ16x24VDC HART HA V1.1, Standard
- AI-DI16/DQ16x24VDC HART HA V1.1, Digital
- AI-DI16/DQ16x24VDC HART HA V1.1, QI, 8 variables
- AI-DI16/DQ16x24VDC HART HA V1.1, QI, Count

Adjustable parameters and their default setting

The following tables describe the parameters of AI/DI 16DQ16x24VDC HART.

Table 9-1 Analog input with AI-DI16/DQ16x24VDC HART HA V1.1, Standard and AI-DI16/DQ16x24VDC HART HA V1.1, QI 8 variables

Measurement type	Measuring range	Number of HART telegram repetitions	Interference frequency suppression	Smoothing	Diagnostics					
					Overflow	Underflow	Wire break	Short-circuit to L+	Sensor supply (*2)	HART
3 = "Current (2-wire)"	2 = "0..20 mA"		1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"	0/1	0	0	0/1	0/1	
	3 = "4..20 mA"		2 = "50 Hz"		0/1	0/1	0/1	0/1	0/1	
	7 = "4..20 mA HART"	0...5...10	3 = "10 Hz"		0/1	0/1	0/1	0/1	0/1	0/1
	8 = "0..10 mA"				0/1	0	0	0/1	0/1	

(*2): Depending on channel mode DO

Measurement type	Measuring range	Failure monitoring (according to NE43)	Hardware interrupt event		High limit 1	Low limit 1	High limit 2	Low limit 2
			Low limit	High limit				
3 = "Current (2-wire)"	2 = "0..20 mA"		0/1	0/1	1... 0x6C00...0x7EFE and > Low limit 1	1...0x7EFE and < High limit 1	1... 0x6C00...0x7EFE and > Low limit 2	1...0x7EFE and < High limit 2
	3 = "4..20 mA"	0/1	0/1	0/1	0xED01... 0x6C00...0x7EFE and > Low limit 1	0xED01... 0...0x7EFE and < High limit 1	0xED01... 0x6C00...0x7EFE and > Low limit 2	0xED01... 0...0x7EFE and < High limit
	7 = "4..20 mA HART"	0/1	0/1	0/1				
	8 = "0..10 mA"		0/1	0/1	1... 0x6C00...0x7EFE and > Low limit 1	1...0x7EFE and < High limit 1	1... 0x6C00...0x7EFE and > Low limit 2	1...0x7EFE and < High limit 2

Table 9-2 Digital output with AI-DI16/DQ16x24VDC HART HA V1.1, Standard and AI-DI16/DQ16x24VDC HART HA V1.1, QI 8 variables

Channel mode DO	Substitute value	Reaction to CPU STOP	Diagnostics, Short-circuit to ground	Diagnostics, Wire break	Wire break check
1 = "Enabled"		0 = "Switch off"	0/1	0	0
		2 = "Keep last value"		0/1	1
	0/1	3 = "Output substitute value"	0	0	
			0/1	1	
2 = "Sensor supply"					

Table 9-3 Digital output with AI-DI16/DQ16x24VDC HART HA V1.1, Digital and AI-DI16/DQ16x24VDC HART HA V1.1, QI, Count

Channel mode DO	Substitute value	Reaction to CPU STOP	Diagnostics, Short-circuit to ground	Diagnostics, Wire break	Wire break check
1 = "Enabled"		0 = "Switch off"	0/1	0	0
		2 = "Keep last value"		0/1	1
	0/1	3 = "Output substitute value"	0	0	
			0/1	1	
2 = "Sensor supply"					

Table 9-4 Digital input with AI-DI16/DQ16x24VDC HART HA V1.1, Standard and AI-DI16/DQ16x24VDC HART HA V1.1, QI 8 variables

Channel mode DI	Pulse stretching	Input delay	Diagnostics, Sensor supply *2)	Hardware interrupt positive edge	Hardware interrupt, negative edge
1 = "Enabled"	0 = "None" 4 = "0.05 s" 5 = "0.1 s" 6 = "0.2 s" 1 = "0.5 s" 2 = "1 s" 3 = "2 s"	15 = "None" 0 = "0.05 ms" 1 = "0.1 ms" 3 = "0.4 ms" 4 = "0.8 ms" 5 = "1.6 ms" 6 = "3.2 ms" 9 = "12.8 ms" 10 = "20 ms"	0/1	0/1	0/1

*2): Depending on channel mode DO

Table 9-5 Digital input with AI-DI16/DQ16x24VDC HART HA V1.1, Digital

Channel mode DI	Pulse stretching	Input delay	Diagnostics, Sensor supply *2)	Hardware interrupt positive edge	Hardware interrupt, negative edge
1 = "Enabled"	0 = "None" 4 = "0.05 s" 5 = "0.1 s" 6 = "0.2 s" 1 = "0.5 s" 2 = "1 s" 3 = "2 s"	15 = "None" 0 = "0.05 ms" 1 = "0.1 ms" 3 = "0.4 ms" 4 = "0.8 ms" 5 = "1.6 ms" 6 = "3.2 ms" 9 = "12.8 ms" 10 = "20 ms"	0/1	0/1	0/1

*2): Depending on channel mode DO

Table 9-6 Digital input with AI-DI16/DQ16x24VDC HART HA V1.1, QI, Count

Channel mode DI	Pulse stretching	Input delay	Diagnostics, Sensor supply *2)	Hardware interrupt event		Operating mode
				Positive edge	Negative edge	
1 = "Enabled"	0 = "None"	15 = "None"	0/1	0/1	0/1	0 = "Count"
	4 = "0.05 s"	0 = "0.05 ms"				1 = "Measure frequency"
	5 = "0.1 s"	1 = "0.1 ms"				
	6 = "0.2 s"	3 = "0.4 ms"				
	1 = "0.5 s"	4 = "0.8 ms"				
	2 = "1 s"	5 = "1.6 ms"				
	3 = "2 s"	6 = "3.2 ms"				
		9 = "12.8 ms"				
		10 = "20 ms"				

(*2): Depending on channel mode DO

Channel mode DI	Set output DQ	Edge selection	Reaction to violation of a count high limit	Comparison value
1 = "Enabled"			0 = "Stop counter"	1...4294967295 and <= Count high limit
	1 = "Between comparison value and count high limit"	1 = "Positive edge"	1 = "Resume counter"	
	2 = "Between comparison value and count low limit"	2 = "Negative edge"		
		3 = "Positive and negative edge"		

Channel mode DI	Hardware interrupt comparison result DQ	Count high limit	Partner channel	Diagnostics, Partner channel
1 = "Enabled"	0/1	1...2147483647... 4294967295	0 = "Not used"	0
			1 = "HW gate"	0/1

AI 8xU/I/TC/4xRTD 2-/3-/4-wire HA

Adjustable parameters and their default setting

The following table describes the parameters for the module AI 8xU/I/TC/4xRTD 2-/3-/4-wire HA (6DL1134-6AF00-0PH1).

Table 10-1 Parameters for signal acquisition (regardless of the measurement type and measurement range)

Measurement type	Interference frequency suppression	Smoothing
• Voltage	400 Hz	none
• Current (2-wire)	60 Hz	weak
• Resistance ¹⁾	50 Hz	medium
• Thermal resistor ¹⁾	10 Hz	strong
• Thermocouple ¹⁾		

¹⁾ Observe the following "Specific settings".

Measurement type	Measuring range	Temperature coefficient	Temperature unit	Reference junction
Voltage	±50 mV, ±80 mV, ±250 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V, 1...5 V, 0...10 V	*	*	*
Resistance ¹⁾ (2-, 3-, 4-wire connection)	150 Ω, 300 Ω, 600 Ω , 3 kΩ, 6 kΩ	*	*	*
Resistance ¹⁾ (2-wire connection)	PTC	*	*	*

Measurement type	Measuring range	Temperature coefficient	Temperature unit	Reference junction	
Thermal resistance ¹⁾ (2-, 3-, 4-wire connection)	Pt100 Climatic	Pt 0.00385055 Pt 0.003916 Pt 0.003902 Pt 0.003920 Pt 0.003850 Pt 0.003910 GOST	Degrees Celsius	Reference channel of group 0 Reference channel of group 1 Reference channel of group 2 Reference channel of group 3	
			Degrees Celsius Degrees Fahrenheit		No reference channel mode
	Pt200 Climatic Pt500 Climatic Pt1000 Climatic		Degrees Celsius Degrees Fahrenheit		
	Pt 100 Standard Pt 200 Standard Pt 500 Standard Pt 1000 Standard	Degrees Celsius Degrees Fahrenheit Kelvin			
	Ni 100 Climatic Ni 120 Climatic Ni 200 Climatic Ni 500 Climatic Ni 1000 Climatic	Ni 0.006170 GOST Ni 0.006180 Ni 0.006720	Degrees Celsius Degrees Fahrenheit		
	Ni 100 Climatic Ni 120 Climatic Ni 200 Climatic Ni 500 Climatic Ni 1000 Climatic		Degrees Celsius Degrees Fahrenheit Kelvin		
	LG-Ni 1000 Climatic	LG-Ni 0.005	Degrees Celsius Degrees Fahrenheit		
	LG-Ni 1000 Standard		Degrees Celsius Degrees Fahrenheit Kelvin		
	Cu50 Climatic Cu100 Climatic	Cu 0.00428 GOST	Degrees Celsius Degrees Fahrenheit		
	Cu50 Standard Cu100 Standard		Degrees Celsius Degrees Fahrenheit Kelvin		
Thermal resistor ¹⁾ (3-wire connection)	Cu 10 Climatic	Cu 0.00427	Degrees Celsius Degrees Fahrenheit		
	Cu 10 Standard		Degrees Celsius Degrees Fahrenheit Kelvin		

Measurement type	Measuring range	Temperature coefficient	Temperature unit	Reference junction
Thermocouple ¹⁾	Type B, N, E, R, S, J, L, T, K, U, C, TXK Type B (PtRh-PtRh) Type N (NiCrSi-NiSi) Type E (NiCr-CuNi) Type R (PtRh-Pt) Type S (PtRh-Pt) Type J (Fe-CuNi) Type L (Fe-CuNi) Type T (Cu-CuNi) Type K (NiCr-NiAl) Type U (Cu-CuNi) Type C (WRe-WRe) Type TXK	*	Degrees Celsius Degrees Fahrenheit Kelvin	Reference channel of the module Internal reference junction Reference channel of group 0 Reference channel of group 1 Reference channel of group 2 Reference channel of group 3 Fixed reference tem- perature 0 °C

¹⁾ Observe the following "Specific settings".

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
Voltage	±50 mV	0/1	0/1	0/1	0/1
	±80 mV	0x8100	UG1	0x8100	UG2
	±250 mV	< UG1 <	< OG1 <	< UG2 <	< OG2 <
	±500 mV	0x7EFF	0x7EFF	0x7EFF	0x7EFF
	±1 V				
	± 2.5 V				
	± 5 V				
	±10 V				
1...5 V 0...10 V		0/1	0/1	0/1	0/1
		0xED00	UG1	0xED00	UG2
		< UG1 <	< OG1 <	< UG2 <	< OG2 <
		0x7EFF	0x7EFF	0x7EFF	0x7EFF
Current	±20 mA	0/1	0/1	0/1	0/1
		0x8100	UG1	0x8100	UG2
		< UG1 <	< OG1 <	< UG2 <	< OG2 <
		0x7EFF	0x7EFF	0x7EFF	0x7EFF
	0...20 mA 4...20 mA	0/1	0/1	0/1	0/1
		0xED00	UG1	0xED00	UG2
		< UG1 <	< OG1 <	< UG2 <	< OG2 <
		0x7EFF	0x7EFF	0x7EFF	0x7EFF

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
Resistance ¹⁾ (2-, 3-, 4-wire connection)	150 Ω	0/1	0/1	0/1	0/1
	300 Ω	0x0000	UG1	0x0000	UG2
	600 Ω	< UG1 <	< OG1 <	< UG2 <	< OG2 <
	3000 Ω	0x7EFF	0x7EFF	0x7EFF	0x7EFF
	6000 Ω				

Measurement type	Measuring range	Hardware interrupt event				
		Low limit 1	High limit 1	Low limit 2	High limit 2	
Thermal resistance ¹⁾ (2-, 3-, 4-wire connection)	Pt100 Climatic	0/1	0/1	0/1	0/1	
	Pt200 Climatic	0xC75C	UG1	0xC75C	UG2	
	Pt500 Climatic	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	Pt1000 Climatic	0x3C8C	0x3C8C	0x3C8C	0x3C8C	
	Pt100 Standard	0/1	0/1	0/1	0/1	
	Pt200 Standard	0xF682	UG1	0xF682	UG2	
	Pt500 Standard	< UG1 <	< OG1 <	< UG2 <	< OG2 <	
	Pt1000 Standard	0x2710	0x2710	0x2710	0x2710	
	Ni 0.00618	Ni100 Climatic Ni120 Climatic Ni200 Climatic Ni500 Climatic Ni1000 Climatic	0/1	0/1	0/1	0/1
		Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard	0xD6FC < UG1 < 0x733B	UG1 < OG1 < 0x733B	0xD6FC < UG2 < 0x733B	UG2 < OG2 < 0x733B
Ni 0.006720	Ni100 Climatic Ni120 Climatic Ni200 Climatic Ni500 Climatic Ni1000 Climatic					
	Ni100 Standard Ni120 Standard Ni200 Standard Ni500 Standard Ni1000 Standard					

Measurement type	Measuring range		Hardware interrupt event			
			Low limit 1	High limit 1	Low limit 2	High limit 2
	Ni 0.0061 70 (GOST)	Ni100 Standard	0xFBE6 < UG1 < 0x0834	UG1 < OG1 < 0x0834	0xFBE6 < UG2 < 0x0834	UG2 < OG2 < 0x0834
		Ni120 Standard				
	Ni200 Standard					
	Ni500 Standard					
	Ni1000 Standard					
		Ni100 Climatic	0xFBE6 < UG1 < 0x060E	UG1 < OG1 < 0x060E	0xFBE6 < UG2 < 0x060E	UG2 < OG2 < 0x060E
		Ni120 Climatic				
		Ni200 Climatic				
		Ni500 Climatic				
		Ni1000 Climatic				
		LG-Ni 1000 Climatic	0/1	0/1	0/1	0/1
		LG-Ni 1000 Standard	0xD6FC < UG1 < 0x733C	UG1 < OG1 < 0x733C	0xD6FC < UG2 < 0x733C	UG2 < OG2 < 0x733C
Thermal resistor¹⁾ (3-wire connection)	Cu 10 Climatic		0/1	0/1	0/1	0/1
			0xE890 < UG1 < 0x4650	UG1 < OG1 < 0x4650	0xE890 < UG2 < 0x4650	UG2 < OG2 < 0x4650
	Cu 10 Standard		0/1	0/1	0/1	0/1
			0xF6A0 < UG1 < 0xC30	UG1 < OG1 < 0xC30	0xF6A0 < UG2 < 0xC30	UG2 < OG2 < 0xC30
	Cu50 Climatic		0/1	0/1	0/1	0/1
		Cu100 Climatic	0xE890 < UG1 < 0x4650	UG1 < OG1 < 0x4650	0xE890 < UG2 < 0x4650	UG2 < OG2 < 0x4650
	Cu50 Standard		0/1	0/1	0/1	0/1
		Cu100 Standard	0xF768 < UG1 < 0x960	UG1 < OG1 < 0x960	0xF768 < UG2 < 0x960	UG2 < OG2 < 0x960

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
Thermocouple ¹⁾	Type B	0/1	0/1	0/1	0/1
		0xFB50 < UG1 < 0x50DC	UG1 < OG1 < 0x50DC	0xFB50 < UG2 < 0x50DC	UG2 < OG2 < 0x50DC
	Type C	0/1	0/1	0/1	0/1
		0xFB50 < UG1 < 0x61A8	UG1 < OG1 < 0x61A8	0xFB50 < UG2 < 0x61A8	UG2 < OG2 < 0x61A8
	Type E	0/1	0/1	0/1	0/1
		0x7576 < UG1 < 0x2EE0	UG1 < OG1 < 0x2EE0	0x7576 < UG2 < 0x2EE0	UG2 < OG2 < 0x2EE0
	Type J	0/1	0/1	0/1	0/1
		0xF7CC < UG1 < 0x38A4	UG1 < OG1 < 0x38A4	0xF7CC < UG2 < 0x38A4	UG2 < OG2 < 0x38A4
	Type K	0/1	0/1	0/1	0/1
		0xF574 < UG1 < 0x3F5C	UG1 < OG1 < 0x3F5C	0xF574 < UG2 < 0x3F5C	UG2 < OG2 < 0x3F5C
	Type L	0/1	0/1	0/1	0/1
		0xF830 < UG1 < 0x2CEC	UG1 < OG1 < 0x2CEC	0xF830 < UG2 < 0x2CEC	UG2 < OG2 < 0x2CEC
	Type N	0/1	0/1	0/1	0/1
		0xF574 < UG1 < 0x3C8C	UG1 < OG1 < 0x3C8C	0xF574 < UG2 < 0x3C8C	UG2 < OG2 < 0x3C8C
	Type R Type S	0/1	0/1	0/1	0/1
		0xF95C < UG1 < 0x4EDE	UG1 < OG1 < 0x4EDE	0xF95C < UG2 < 0x4EDE	UG2 < OG2 < 0x4EDE
	Type T	0/1	0/1	0/1	0/1
		0xF574 < UG1 < 0x1518	UG1 < OG1 < 0x1518	0xF574 < UG2 < 0x1518	UG2 < OG2 < 0x1518
	Type U	0/1	0/1	0/1	0/1
		0xF830 < UG1 < 0x2134	UG1 < OG1 < 0x2134	0xF830 < UG2 < 0x2134	UG2 < OG2 < 0x2134
Type TXK	0/1	0/1	0/1	0/1	

Measurement type	Measuring range	Hardware interrupt event			
		Low limit 1	High limit 1	Low limit 2	High limit 2
		0xF830 < UG1 < 0x2904	UG1 < OG1 < 0x2904	0xF830 < UG2 < 0x2904	UG2 < OG2 < 0x2904

1) Observe the following "Specific settings".

"LL1 = Low Limit 1"

"LL2 = Low Limit 2"

"HL1 = High Limit 1"

"HL2 = High Limit 2"

Specific settings

Note

Resistor or thermal resistor measurement type (only allowable on channel 4...7)

- If a resistor or thermal resistor measurement type is configured on channel x (x=4...7), then channel y (y=x-4) must be disabled.
- Conductor resistance [0.01 Ohm]
The parameter is valid exclusively for the 2-wire connection of resistors and thermal resistors between 0x0000 . and 0x3A98 (0x0000). Else the parameter = 0.

Note

Thermocouple

- Channel layout
 - If the setting with "Reference channel of the module" is selected on channel x (x=0...6), then a "thermal resistor Pt100 climatic range" with "degrees Celsius" as the temperature unit must be configured on channel 7.
 - If the measurement type "TC" is configured on channel 7, the "Reference channel of the module" entry must be excluded from selection for the "Reference junction" parameter (channel 7 is the reference channel).
- Current measurement with failure monitoring (in accordance with NE43)
The parameter can only be selected in the measurement types "Current 2-wire" or "Current 4-wire" (0/1). Else the parameter = 0.

Note

Operation of a 2-wire measuring transducer on channel 7

Module parameter "Pin assignment UV7/Mana":

If the setting "Mana" is selected for the module parameter "Pin assignment UV7/Mana", then only the type of measurement "Voltage" is possible on channel 7.

The measurement type "Current 2-wire" is not allowed.

AQ 8xI HART HA

The module AQ 8xI HART HA (6DL1135-6TF00-0PH1) is available as:

- AQ 8xI HART HA
- AQ 8xI HART HA, 8 variables

Adjustable parameters and their default setting

The following table describes the adjustable parameters of AQ 8xI HART HA.

Table 11-1

Output type	Output range	Number of HART repetitions	HART	Reaction to CPU STOP	Substitute value	Diagnostics HART
Current	1 = "0...20 mA" 8 = "0...10 mA"	*	*	0 = "Switch off"	*	
				2 = "Keep last value"		
				3 = "Output substitute value"		
	2 = "4..20 mA"	*	*	0 = "Switch off"	*	
				2 = "Keep last value"		
				3 = "Output substitute value"		
2 = "4..20 mA HART"	0...5...10	0/1	0 = "Switch off"	*	0/1	
			2 = "Keep last value"			
			3 = "Output substitute value"			0xE500...0... 0x7EFF

Output type	Output range	Diagnostics				
		HART	Overflow	Underflow	Wire break	Short-circuit diagnostics
Current	1 = "0...20 mA" 8 = "0...10 mA"		0/1	0/1	0/1	0/1
			0/1	0/1	0/1	0/1
	2 = "4..20 mA"		0/1	0/1	0/1	0/1
	2 = "4..20 mA HART"	0/1	0/1	0/1	0/1	0/1

AQ 4xI HART ISOL HA

The module AQ 4xI HART ISOL HA (6DL1135-6UD00-0PK0) is available as:

- AQ 4xI HART ISOL HA V1.0, QI
- AQ 4xI HART ISOL HA V1.0, QI, 4 Variables

Adjustable parameters and their default setting

The following table describes the adjustable parameters of AQ 4xI HART ISOL HA.

Table 12-1 Parameter dependencies AQ 4xI HART HA

Output type	Output range	Number of HART repetitions	Reaction to CPU STOP	Substitute value
Current	1 = "0...20 mA"		0 = "Switch off"	
			2 = "Keep last value"	
	2 = "4..20 mA"		3 = "Output substitute value"	0...0x7EFF
			0 = "Switch off"	
	6 = "4..20mA HART"	0...5...10	2 = "Keep last value"	
			3 = "Output substitute value"	0xE500...0...0x7EFF
		0 = "Switch off"		
		2 = "Keep last value"		
		3 = "Output substitute value"	0xE500...0...0x7EFF	

Output type	Output range	Diagnostics				
		HART	Overflow	Underflow	Wire break	Short-circuit diagnostics
Current	1 = "0...20 mA"		0/1	0/1	0/1	0/1
	2 = "4..20 mA"		0/1	0/1	0/1	0/1
	6 = "4..20mA HART"	0/1	0/1	0/1	0/1	0/1

DI 8x24..125VDC HA

Adjustable parameters and their default setting

The following table describes the adjustable parameters for the module DI 8x24..125VDC HA (6DL1131-6DF00-0PK0).

Changing these parameters can affect the process value. Currently, there is no logic implemented to ensure that the next read process value already matches the new parameters after Configuration in Run.

Table 13-1 Parameter dependencies DI 8x24..125VDC HA

Channel activated	Input delay	Hardware interrupt positive edge	Hardware interrupt, negative edge	Wire break check *)	Diagnostics, Wire break
Enabled	15 = "None"	0/1	0/1	1	0/1
	0 = "0.05 ms"			0	0
	1 = "0.1 ms"				
	3 = "0.4 ms"				
	4 = "0.8 ms"				
	5 = "1.6 ms"				
	6 = "3.2 ms"				
	9 = "12.8 ms"				
	10 = "20 ms"				

*) "Wire break diagnostics" can only be enabled when "Wire break check" is enabled. There are no dependencies on other parameters.

DI 8x230VAC HA

Adjustable parameters and their default setting

There are no parameter dependencies for the module DI 8x230VAC HA (6DL1131-6GF00-0PK0).

Table 14-1

Channel activated	Parameter dependencies
Disabled	*
Enabled	

DI 16x24VDC HA

Adjustable parameters and their default setting

The following table describes the adjustable parameters for the module DI 16x24VDC HA (6DL1131-6BH00-0PH1).

Table 15-1

Channel activated	Input delay	Pulse stretching	Hardware interrupt event		Wire break check *)	Diagnostics	
			Positive edge	Negative edge		Wire break	Short-circuit to ground
Enabled	15 = "None"	0 = "None"	0/1	0/1	1	0/1	0/1
	0 = "0.05 ms"	4 = "0.05 s"			0	0	
	1 = "0.1 ms"	5 = "0.1 s"					
	3 = "0.4 ms"	6 = "0.2 s"					
	4 = "0.8 ms"	1 = "0.5 s"					
	5 = "1.6 ms"	2 = "1 s"					
	6 = "3.2 ms"	3 = "2 s"					
	9 = "12.8 ms"						
	10 = "20 ms"						

*) "Wire break" diagnostics" can only be enabled when "Wire break check" is enabled. There are no dependencies on other parameters.

DI 16xNAMUR HA

Adjustable parameters and their default setting

The following table describes the adjustable parameters for the module DI 16xNAMUR HA (6DL1131-6TH00-0PH1).

Sensor type	Digital input	Pulse stretching	Monitoring window	Hardware interrupt positive edge	Hardware interrupt, negative edge
NAMUR sensor	0 = "Normal"	0 = "None"		0/1	0/1
Single contact unwired	1 = "Inverted"	1 = "0.5 s"			
Single contact with 10 Kilohm		2 = "1 s"			
NAMUR change-over contact	0 = "Normal"	3 = "2 s"			
Change-over contact, unconnected					
Change-over contact with 10 Kilohm					
NAMUR sensor	0 = "Normal"	0 = "None"	0 = "0.5 s"	0/1	0/1
Single contact unwired	1 = "Inverted"	1 = "0.5 s"	1 = "1 s"		
Single contact with 10 Kilohm		2 = "1 s"	2 = "2 s"		
NAMUR change-over contact	0 = "Normal"	3 = "2 s"	...		
Change-over contact, unconnected			50 = "50 s"		
Change-over contact with 10 Kilohm			...		
			100 = "100 s"		

Sensor type	Flutter monitoring	Diagnostics			
		Change-over contact error	Wire break	Short-circuit	Flutter error
NAMUR sensor	0 = "Disabled"	0	0/1	0/1	0
Single contact unwired		0	0	0	0
Single contact with 10 Kilohm		0	0/1	0	0
NAMUR change-over contact		0/1	0/1	0/1	0
Change-over contact, unconnected		0/1	0	0	0
Change-over contact with 10 Kilohm		0/1	0/1	0	0

Sensor type	Flutter monitoring	Diagnostics			
		Change-over contact error	Wire break	Short-circuit	Flutter error
NAMUR sensor	1 = "2	0	0/1	0/1	0/1
Single contact unwired	signal change"	0	0	0	0/1
Single contact with 10 Kilohm	... 16 = "17	0	0/1	0	0/1
NAMUR change-over contact	signal change" ...	0/1	0/1	0/1	0/1
Change-over contact, unconnected	31 = "32 signal change"	0/1	0	0	0/1
Change-over contact with 10 Kilohm		0/1	0/1	0	0/1

The following table describes the dependency between channel pair 0/1 up to channel pair 14/15.

Channels 1, 3, 5, 7, 9, 11, 13, 15 are only permitted 0 to 3 if associated channel partners 0, 2, 4, 6, 8, 10, 12, 14 value 0 to 3 are set.

For example, if the value 4 "NAMUR change-over contact is selected for channel 0, channel 1 value 0 must be "Disabled".

Sensor type	
Channel 0	Channel 1
Channel 2	Channel 3
Channel 4	Channel 5
Channel 6	Channel 7
Channel 8	Channel 9
Channel 10	Channel 11
Channel 12	Channel 13
Channel 14	Channel 15
0 = "Disabled" 1 = "NAMUR sensor" 2 = "Single contact unwired" 3 = "Single contact with 10k"	0 = "Disabled" 1 = "NAMUR sensor" 2 = "Single contact unwired" 3 = "Single contact with 10k"
4 = "NAMUR change-over contact" 5 = "Change-over contact not connected" 6 = "Change-over contact with 10k"	0 = "Disabled"

Adjustable parameters and their default setting

The following table describes the adjustable parameters for the module DI 32x24VDC HA (6DL1131-6BL00-0PH1).

Channel activated	Hardware interrupt event		Wire break check (*1)	Diagnostics, Wire break	Parameter dependencies
	Positive edge	Negative edge			
1 (enabled)	0/1	0/1	1	0/1	(*1) "Wire break diagnostics" can only be enabled when "Wire break check" is enabled. There are no dependencies on other parameters.
			0	0	

DQ 16x24VDC/0.5A HA

Adjustable parameters and their default setting

There are no parameter dependencies for the module DQ 16x24VDC/0.5A HA (6DL1132-6BH00-0PH1).

Table 18-1

Channel activated	Reaction to CPU STOP	Substitute value	Wire break check	Diagnostics		
				Short-circuit to L+	Short-circuit to ground	Wire break
1 (enabled)	0 = "Switch off"	DC	0	0/1	0/1	0
			1			0/1
	3 = "Output substitute value"	0/1	0			0
			1			0/1

DQ 32x24VDC/0.5A HA

Adjustable parameters and their default setting

There are no parameter dependencies for the module DQ 32x24VDC/0.5A HA (6DL1132-6BL00-0PH1).

Channel activated	Reaction to CPU STOP	Substitute value	Diagnostics, Short-circuit to ground
1 (enabled)	0 = "Switch off"		0/1
	2 = "Keep last value"		
	3 = "Output substitute value"	0/1	

RQ 4x120VDC-230VAC/5A CO HA

Adjustable parameters and their default setting

There are no parameter dependencies for the module RQ 4x120VDC-230VAC/5A CO HA (6DL1132-6HD50-0PK0).

Table 20-1

Channel activated	Reaction to CPU STOP	Substitute value
1 (enabled)	0 = "Switch off"	DC
	2 = "Keep last value"	
	3 = "Output substitute value"	0/1

Ex-DI 4xNAMUR

Adjustable parameters and their default setting

The module Ex-DI 4xNAMUR (6DL1131-6TD00-0HX1) is available as:

- Ex-DI 4xNAMUR V1.0
- Ex-DI 4xNAMUR V1.0, QI
- Ex-DI 4xNAMUR V1.0, CNT
- Ex-DI 4xNAMUR V1.0, CNT, QI.

The following table describes the adjustable parameters of EX-DI 4xNAMUR.

Table 16-1 Parameter dependencies of EX-DI 4xNAMUR and Ex-DI 4xNAMUR, QI

Sensor type	Digital input	Pulse stretching	Hardware interrupt positive edge	Hardware interrupt, negative edge	Flutter monitoring Number of signal changes
1 = "NAMUR sensor"	0 = "Normal"	0 = "None"	0/1	0/1	0 = "Disabled"
2 = "Single contact unwired"	1 = "Inverted"	1 = "0.5 s"			
3 = "Single contact with 10 kOhm"		2 = "1 s"			
		3 = "2 s"			
1 = "NAMUR sensor"	0 = "Normal"	0 = "None"	0/1	0/1	1 = "2 signal changes"
2 = "Single contact unwired"	1 = "Inverted"	1 = "0.5 s"			...
3 = "Single contact with 10 kOhm"		2 = "1 s"			16 = "17 signal changes"
		3 = "2 s"			...
					31 = "32 signal changes"

Sensor type	Flutter monitoring window	Diagnostics		
		Flutter error	Wire break	Short-circuit
1 = "NAMUR sensor"		0	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)
2 = "Single contact unwired"		0	0	0
3 = "Single contact with 10 kOhm"		0	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0

Sensor type	Flutter monitoring window	Diagnostics		
		Flutter error	Wire break	Short-circuit
1 = "NAMUR sensor"	0 = "0.5 s" 1 = "1 s" 2 = "2 s"	0/1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)
2 = Single contact unwired	...	0/1	0	0
3 = Single contact with 10 kOhm	50 = "50 s" ... 100 = "100 s"	0/1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0

Table 16-2 Parameter dependencies Ex-DI 4xNAMUR, CNT and Ex-DI 4xNAMUR, CNT, QI

Sensor type	Flutter monitoring Number of signal changes	Flutter monitoring: Monitoring window	Diagnostics: Flutter error	Diagnostics: Wire break	Diagnostics: Short-circuit	Digital input
1 = "NAMUR sensor"	0 = "Disabled"		0	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0 = "Normal" 1 = "Inverted"
2 = "Single contact unwired"			0	0	0	
3 = "Single contact with 10 kOhm"			0	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0	
1 = "NAMUR sensor"	1 = "2 signal changes" ... 16 = "16 signal changes"	0 = "0.5 s" 1 = "1 s" 2 = "2 s" ... 50 = "50 s"	0/1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0 = "Normal" 1 = "Inverted"
2 = "Single contact unwired"			0/1	0	0	
3 = "Single contact with 10 kOhm"			0/1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0	

Sensor type	Pulse stretching	Hardware interrupt positive edge	Hardware interrupt, negative edge	Operating mode	Edge selection	Set output DQ
1 = "NAMUR sensor"	0 = "None"	0/1	0/1	0 = "Count"	1 = "Positive edge"	1 = "Between comparison value and count high limit"
2 = "Single contact unwired"	1 = "0.5 s"			1 = "Measure frequency"	2 = "Negative edge" (only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)	2 = "Between comparison value and count low limit"
3 = "Single contact with 10 kOhm"	2 = "1 s"					(only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)
	3 = "2 s"					

Sensor type	Reaction to violation of a count high limit	Count high limit	Comparison value	Hardware interrupt comparison result DQ
1 = "NAMUR sensor"	0 = "Stop counter"	1...2147483647...4294967295 (only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)	1...4294967295	0/1
2 = "Single contact unwired"	1 = "Resume counter"		and <= Count high limit	(only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)
3 = "Single contact with 10 kOhm"	(only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)		(only relevant for operating mode 0 = "Count". With operating mode 1 = "Measure frequency" not relevant)	

Ex-AI 2xI 2-wire HART

Adjustable parameters and their default setting

The module Ex-AI 2xI 2-wire HART (6DL1134-6TB00-0HX1) is available as:

- Ex-AI 2xI 2-wire HART V1.0
- Ex-AI 2xI 2-wire HART V1.0, QI
- Ex-AI 2xI 2-wire HART V1.0, 4 variables
- Ex-AI 2xI 2-wire HART V1.0, 4 variables, QI.

The following table describes the adjustable parameters of Ex-AI 2xI 2-wire HART.

Table 17-1 Parameter dependencies Ex-AI 2xI 2-wire HART V1.0 (QI) and Ex-AI 2xI 2-wire HART V1.0, 4 Variables (QI)

Measurement type	Measuring range	Interference frequency suppression	Smoothing	Number of HART frame repetitions	Failure monitoring (according to NE43)
3 = "Current (2-wire)"	2 = "0..20 mA"	1 = "60 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"		
	3 = "4..20 mA"	2 = "50 Hz"			0/1
	7 = "4..20 mA HART"	3 = "10 Hz"		0...5...10	0/1

Measurement type	Measuring range	Diagnostics				
		HART	Overflow	Underflow	Wire break	Short-circuit
3 = "Current (2-wire)"	2 = "0..20 mA"		0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0	0	0/1 (otherwise) 0/1 (ET200SP in the TIAP)
	3 = "4..20 mA"		0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)
	7 = "4..20 mA HART"	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (otherwise) 0/1 (ET200SP in the TIAP)

Measurement type	Measuring range	Hardware interrupt event				High limit 1	High limit 2	Low limit 1	Low limit 2
		Low limit 1	High limit 1	Low limit 2	High limit 2				
3 = "Current (2-wire)"	2 = "0..20 mA"	0/1	0/1	0/1	0/1	1... 0x6C00...0x7EFE and > Low limit 1	1... 0x6C00...0x7EFE and > Low limit 2	1...0x7EFE and < High limit 1	1...0x7EFE and < High limit 2
	3 = "4..20 mA"	0/1	0/1	0/1	0/1	0xED01... 0x6C00 ...0x7EFE and > Low limit 1	0xED01... 0x6C00 ...0x7EFE and > Low limit 2	0xED01... 0 ...0x7EFE and < High limit 1	0xED01... 0 ...0x7EFE and < High limit 2
	7 = "4..20 mA HART"	0/1	0/1	0/1	0/1				

Ex-AI 4xTC/2xRTD 2-/3-/4-wire

Adjustable parameters and their default setting

The module Ex-AI 4xTC/2xRTD 2-/3-/4-wire (6DL1134-6JD00-0HX1) is available as:

- Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0
- Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0, QI
- Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0, REAL
- Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0, REAL, QI.

The following table describes the adjustable parameters for Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0.

Table 18-1 Parameter dependencies Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0 (QI) and Ex-AI 4xTC/2xRTD 2-/3-/4-wire V1.0, REAL (QI)

Measurement type	Measuring range	Conductor resistance [0.01 Ohm] **)	Interference frequency suppression	Smoothing
1="Voltage"	1 = "+/- 50 mV" 2 = "+/- 80 mV" 3 = "+/- 250 mV" 5 = "+/- 1 V"		1 = "60 Hz" 2 = "50 Hz" 4 = "16.6 Hz"	0 = "None" 1 = "Weak" 2 = "Medium" 3 = "Strong"
4 = "Resistor (4-wire connection)" 5 = "Resistor (3-wire connection)" 6 = "Resistor (2-wire connection)"	1 = "150 Ohm" 2 = "300 Ohm" 3 = "600 Ohm" 4 = "3 Kilohm" 5 = "6 Kilohm"	0x0000 .. 0x1388 (0x0000) For 2-wire connection only! Otherwise disabled (0)!		
6 = "Resistor (2-wire connection)"	15 = "PTC"			

Measurement type	Measuring range	Temperature coefficient **)	Temperature unit	Reference junction
7 = "Thermal resistor (4-wire connection)" 8 = "Thermal resistor (3-wire connection)" 9 = "Thermal resistor (2-wire connection)"	0 = "Pt 100 climatic range"	0 = "Pt 0.00385055" 1 = "Pt 0.003916" 2 = "Pt 0.003902" 3 = "Pt 0.00392" 4 = "Pt 0.003850"	0 = "Degrees Celsius"	8 = "Reference channel of group 0" *) 9 = "Reference channel of group 1" *) 10 = "Reference channel of Group 2" *) 11 = "Reference channel of Group 3" *)
	7 = "Pt 200 climatic range" 8 = "Pt 500 climatic range" 9 = "Pt 1000 climatic range"		0 = "Degrees Celsius" 1 = "Degrees Fahrenheit"	0 = "No reference channel operation"
			0 = "Degrees Celsius" 1 = "Degrees Fahrenheit"	
			0 = "Degrees Celsius" 1 = "Degrees Fahrenheit" 2 = "Kelvin"	
	1 = "Ni 100 climatic range" 13 = "Ni 120 climatic range" 17 = "Ni 200 climatic range" 19 = "Ni 500 climatic range" 10 = "Ni 1000 climatic range"		8 = "Ni 0.00618" 9 = "Ni 0.006720"	0 = "Degrees Celsius" 1 = "Degrees Fahrenheit"
	3 = "Ni 100 standard range" 12 = "Ni 120 standard range" 16 = "Ni 200 standard range" 18 = "Ni 500 standard range"			0 = "Degrees Celsius" 1 = "Degrees Fahrenheit" 2 = "Kelvin"

Measurement type	Measuring range	Temperature coefficient **)	Temperature unit	Reference junction
	6 = "Ni 1000 standard range"			
	29 = "LG-Ni 1000 climatic range"	10 = "LG-Ni 0.005"	0 = "Degrees Celsius" 1 = "Degrees Fahrenheit"	
	28 = "LG-Ni 1000 standard range"		0 = "Degrees Celsius" 1 = "Degrees Fahrenheit" 2 = "Kelvin"	
8 = "Thermal resistor (3-wire connection)"	14 = "Cu 10 climatic range"	12 = "Cu 0.00427"	0 = "Degrees Celsius" 1 = "Degrees Fahrenheit"	
	15 = "Cu 10 standard range"		0 = "Degrees Celsius" 1 = "Degrees Fahrenheit" 2 = "Kelvin"	
10 = "Thermocouple"	0 = "Type B (PtRh-PtRh)" 1 = "Type N (NiCrSi-NiSi)" 2 = "Type E (NiCr-CuNi)" 3 = "Type R (PtRh-Pt)" 4 = "Type S (PtRh-Pt)" 5 = "Type J (Fe-CuNi)" 6 = "Type L (Fe-CuNi)" 7 = "Type T (Cu-CuNi)" 8 = "Type K (NiCr-NiAl)" 9 = "Type U (Cu-CuNi)" 10 = "Type C (WRe-WRe)" 11 = "Type TXK"	0	0 = "Degrees Celsius" 1 = "Degrees Fahrenheit" 2 = "Kelvin"	2 = "Reference channel of the module" 3 = "Internal reference junction" 8 = "Reference channel of Group 0" 9 = "Reference channel of Group 1" 10 = "Reference channel of Group 2" 11 = "Reference channel of Group 3"
				15 = "Fixed reference temperature" 0x0000 = "0 degrees Celsius"

Measurement type	Measuring range	Diag-nostics: Over-flow	Diag-nostics: Under-flow	Diag-nostics: Wire break	Reference junction	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2
0 = "Disabled"									
1="Voltage"	1 = "+/- 50 mV" 2 = "+/- 80 mV" 3 = "+/- 250 mV" 5 = "+/- 1 V"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0	0/1	0/1	0/1	0/1
						0x8100 < UG1 < 0x7EFF	UG1 < OG1 < 0x7EFF	0x8100 < UG2 < 0x7EFF	UG2 < OG2 < 0x7EFF
4 = "Resistor (4-wire connection)" 5 = "Resistor (3-wire connection)" 6 = "Resistor (2-wire connection)"	1 = "150 Ohm" 2 = "300 Ohm" 3 = "600 Ohm" 4 = "3 Kil-ohm" 5 = "6 Kil-ohm"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0/1	0/1	0/1	0/1
						0x0000 < UG1 < 0x7EFF	UG1 < OG1 < 0x7EFF	0x0000 < UG2 < 0x7EFF	UG2 < OG2 < 0x7EFF
6 = "Resistor (2-wire connection)"	15 = "PTC"	0	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0	0	0	0	0

Measurement type	Measuring range	Diagnostics: Overflow	Diagnostics: Underflow	Diagnostics: Wire break	Reference junction	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2	
7 = "Thermal resistor (4-wire connection)" 8 = "Thermal resistor (3-wire connection)" 9 = "Thermal resistor (2-wire connection)"	0 = "Pt 100 climatic range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0/1 0xC75C < UG1 < 0x3C8C	0/1 UG1 < OG1 < 0x3C8C	0/1 0xC75C < UG2 < 0x3C8C	0/1 UG2 < OG2 < 0x3C8C	
		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xC75C < UG1 < 0x3C8C	0/1 UG1 < OG1 < 0x3C8C	0/1 0xC75C < UG2 < 0x3C8C	0/1 UG2 < OG2 < 0x3C8C	
		7 = "Pt 200 climatic range" 8 = "Pt 500 climatic range" 9 = "Pt 1000 climatic range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 0xC75C < UG1 < 0x3C8C	0/1 UG1 < OG1 < 0x3C8C	0/1 0xC75C < UG2 < 0x3C8C	0/1 UG2 < OG2 < 0x3C8C
		2 = "Pt 100 standard range" 11 = "Pt 200 standard range" 4 = "Pt 500 standard range" 5 = "Pt 1000 standard range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 0xF682 < UG1 < 0x2710	0/1 UG1 < OG1 < 0x2710	0/1 0xF682 < UG2 < 0x2710	0/1 UG2 < OG2 < 0x2710
		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xD6FC < UG1 < 0x733B	0/1 UG1 < OG1 < 0x733B	0/1 0xD6FC < UG2 < 0x733B	0/1 UG2 < OG2 < 0x733B	
		1 = "Ni 100 climatic range" 13 = "Ni 120 climatic range" 17 = "Ni 200 climatic range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 0xD6FC < UG1 < 0x733B	0/1 UG1 < OG1 < 0x733B	0/1 0xD6FC < UG2 < 0x733B	0/1 UG2 < OG2 < 0x733B

Measurement type	Measuring range	Diagnos- tics: Over- flow	Diagnos- tics: Under- flow	Diagnos- tics: Wire break	Refer- ence junc- tion	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2
	19 = "Ni 500 climat- ic range" 10 = "Ni 1000 cli- matic range"								
	3 = "Ni 100 standard range" 12 = "Ni 120 stand- ard range" 16 = "Ni 200 stand- ard range" 18 = "Ni 500 stand- ard range" 6 = "Ni 1000 stand- ard range"	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (other- wise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xFBE6 < UG1 < 0x0834	0/1 UG1 < OG1 < 0x0834	0/1 0xFBE6 < UG2 < 0x0834	0/1 UG2 < OG2 < 0x0834
	29 = "LG-Ni 1000 cli- matic range"	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (other- wise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xD6FC < UG1 < 0x733C	0/1 UG1 < OG1 < 0x733C	0/1 0xD6FC < UG2 < 0x733C	0/1 UG2 < OG2 < 0x733C
	28 = "LG-Ni 1000 stand- ard range"	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (other- wise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xD6FC < UG1 < 0x733C	0/1 UG1 < OG1 < 0x733C	0/1 0xD6FC < UG2 < 0x733C	0/1 UG2 < OG2 < 0x733C
		0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (oth- erwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (other- wise) 0/1 (ET2 OOSP in the TIAP)					

Measurement type	Measuring range	Diagnostics: Overflow	Diagnostics: Underflow	Diagnostics: Wire break	Reference junction	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2
8 = "Thermal resistor (3-wire connection)"	14 = "Cu 10 climatic range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0/1 0xE890 < UG1 < 0x4650	0/1 UG1 < OG1 < 0x4650	0/1 0xE890 < UG2 < 0x4650	0/1 UG2 < OG2 < 0x4650
		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xF6A0 < UG1 < 0xC30	0/1 UG1 < OG1 < 0xC30	0/1 0xF6A0 < UG2 < 0xC30	0/1 UG2 < OG2 < 0xC30
	15 = "Cu 10 standard range"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0/1 0xF6A0 < UG1 < 0xC30	0/1 UG1 < OG1 < 0xC30	0/1 0xF6A0 < UG2 < 0xC30	0/1 UG2 < OG2 < 0xC30
		0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)		0/1 0xF6A0 < UG1 < 0xC30	0/1 UG1 < OG1 < 0xC30	0/1 0xF6A0 < UG2 < 0xC30	0/1 UG2 < OG2 < 0xC30

Measurement type	Measuring range	Diag-nostics: Over-flow	Diag-nostics: Under-flow	Diag-nostics: Wire break	Reference junction	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2	
10 = "Thermocouple"	0 = "Type B (PtRh-PtRh)"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP) 0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1	0/1	0/1	0/1	0/1	
						-120 °C < UG1 < 2070 °C	UG1 < OG1 < 2070 °C	-120 °C < UG2 < 2070 °C	UG2 < OG2 < 2070 °C	
	1 = "Type N (NiCrSi-Ni-Si)"	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0/1 (otherwise) 0/1 (ET2 OOSP in the TIAP)	0	0/1	0/1	0/1	0/1
							0xF574 < UG1 < 0x3C8C	UG1 < OG1 < 0x3C8C	0xF574 < UG2 < 0x3C8C	UG2 < OG2 < 0x3C8C
	2 = "Type E (NiCr-Cu-Ni)"						0/1	0/1	0/1	0/1
							0x7576 < UG1 < 0x2EE0	UG1 < OG1 < 0x2EE0	0x7576 < UG2 < 0x2EE0	UG2 < OG2 < 0x2EE0
	3 = "Type R (PtRh-Pt)" 4 = "Type S (PtRh-Pt)"						0/1	0/1	0/1	0/1
							0xF95C < UG1 < 0x4EDE	UG1 < OG1 < 0x4EDE	0xF95C < UG2 < 0x4EDE	UG2 < OG2 < 0x4EDE
	5 = "Type J (Fe-CuNi)"						0/1	0/1	0/1	0/1
							0xF7CC < UG1 < 0x38A4	UG1 < OG1 < 0x38A4	0xF7CC < UG2 < 0x38A4	UG2 < OG2 < 0x38A4
	6 = "Type L (Fe-CuNi)"						0/1	0/1	0/1	0/1
							0xF830 < UG1 < 0x2CEC	UG1 < OG1 < 0x2CEC	0xF830 < UG2 < 0x2CEC	UG2 < OG2 < 0x2CEC
	7 = "Type T (Cu-CuNi)"						0/1	0/1	0/1	0/1
							0xF574	UG1	0xF574	UG2

Measurement type	Measuring range	Diagnostics: Overflow	Diagnostics: Underflow	Diagnostics: Wire break	Reference junction	Hardware interrupt low limit 1	Hardware interrupt high limit 1	Hardware interrupt low limit 2	Hardware interrupt high limit 2
						< UG1 < 0x1518	< OG1 < 0x1518	< UG2 < 0x1518	< OG2 < 0x1518
	8 = "Type K (NiCr-NiAl)"					0/1	0/1	0/1	0/1
						0xF574 < UG1 < 0x3F5C	UG1 < OG1 < 0x3F5C	0xF574 < UG2 < 0x3F5C	UG2 < OG2 < 0x3F5C
	9 = "Type U (Cu-CuNi)"					0/1	0/1	0/1	0/1
						0xF830 < UG1 < 0x2134	UG1 < OG1 < 0x2134	0xF830 < UG2 < 0x2134	UG2 < OG2 < 0x2134
	10 = "Type C (WRe-WRe)"					0/1	0/1	0/1	0/1
						0xFB50 < UG1 < 0x61A8	UG1 < OG1 < 0x61A8	0xFB50 < UG2 < 0x61A8	UG2 < OG2 < 0x61A8
	11 = "Type TXK"					0/1	0/1	0/1	0/1
						0xF830 < UG1 < 0x2904	UG1 < OG1 < 0x2904	0xF830 < UG2 < 0x2904	UG2 < OG2 < 0x2904

"LL1 = Low Limit 1"

"LL2 = Low Limit 2"

"HL1 = High Limit 1"

"HL2 = High Limit 2"

Parameter dependencies

The "Resistance" and "Thermal resistor" measuring types are only allowed on channel 2 and 3. If a measuring type with 3-wire or 4-wire (measuring type = 4,5,7,8) is configured on channel x (x=2,3), channel y (y=x-2) must be disabled.

If TC (measurement type=10) is configured on channel 3, the "Reference channel of the module" entry must be excluded from selection for the "Reference junction" parameter (channel 3 is the reference channel), if TC (measurement type=10) is configured on channel 0...2 with "Reference channel of the module", a "Thermal resistor Pt100 climatic range" with the "Degrees Celsius" temperature unit must be configured on channel 3.

Reference

*) Not possible with float submodule (0x00004100 / 0x00004000)

***) This parameter is unused (NULL (reserved byte) for channel 0 and 1)

Ex-AQ 2xI HART

Adjustable parameters and their default setting

The module Ex-AQ 2xI HART (6DL1135-6TB00-0HX1) is available as:

- Ex-AQ 2xI HART V1.0
- Ex-AQ 2xI HART V1.0, QI
- Ex-AQ 2xI HART V1.0, 4 variables
- Ex-AQ 2xI HART V1.0, 4 variables, QI.

The following table describes the adjustable parameters of Ex-AQ 2xI HART V1.0

Table 19-1 Parameter dependencies Ex-AQ 2xI HART (QI) and Ex-AQ 2xI HART, 4 Variables (QI)

Output type	Output range	Number of HART frame repetitions	Reaction to CPU STOP	Substitute value
3 = "Current"	1 = "0..20 mA"		0 = "Switch off"	
			2 = "Keep last value"	
	2 = "4..20 mA"		0 = "Switch off"	0...0x7166
			2 = "Keep last value"	
	6 = "4..20mA HART"	0...5...10	0 = "Switch off"	0xE500...0...0x72C0
			2 = "Keep last value"	
		3 = "Output substitute value"	0xE500...0...0x72C0	

Output type	Output range	Diagnostics				
		HART	Overflow	Underflow	Wire break	Short-circuit
3 = "Current"	1 = "0..20 mA"		0/1 (otherwise)	0/1 (otherwise)	0/1 (otherwise)	0/1 (otherwise)
	2 = "4..20 mA"		0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)
	6 = "4..20mA HART"	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)	0/1 (ET200SP in the TIAP)

Ex-DQ 2x17.4VDC/27mA

Adjustable parameters and their default setting

The module Ex-DQ 2x17.4VDC/27mA (6DL1132-6CB00-0HX1) is available as:

- Ex-DQ 2x17.4VDC/27mA V1.0
- Ex-DQ 2x17.4VDC/27mA V1.0, QI.

The following table describes the parameter dependencies for Ex-DQ 2x17.4VDC/27mA V1.0.

Table 20-1 Parameter dependencies Ex-DQ 2x17.4VDC/27mA (QI)

Channel activated	Reaction to CPU STOP	Substitute value	Diagnostics: Short-circuit	Wire-break check	Diagnostics: Wire break	Channels connected in parallel
0 = "Disabled"						
1 = "Enabled"	0 = "Switch off" 2 = "Keep last value"	DC	0/1 (ET200SP HA) 0/1 (otherwise)	0	0	0/1
				1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	
	3 = "Output substitute value"	0/1		0	0	
				1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)	

Ex-DQ 2x23.1VDC/20mA

Adjustable parameters and their default setting

The module Ex-DQ 2x23.1VDC/20mA (6DL1132-6EB00-0HX1) is available as:

- Ex-DQ 2x23.1VDC/20mA V1.0
- Ex-DQ 2x23.1VDC/20mA V1.0, QI.

The following table describes the adjustable parameters for DQ 2x23.1VDC/20mA V1.0.

Table 21-1 Parameter dependencies Ex-DQ 2x23.1VDC/20mA (QI)

Channel activated	Reaction to CPU STOP	Substitute value	Diagnostics: Short-circuit	Wire-break check	Diagnostics: Wire break
1 = "Enabled"	0 = "Switch off" 2 = "Keep last value"	DC	0/1 (ET200SP HA) 0/1 (otherwise)	0	0
				1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)
	3 = "Output substitute value"	0/1		0	0
				1	0/1 (otherwise) 0/1 (ET200SP in the TIAP)

Ex-PM E

Adjustable parameters and their default setting

There are no parameter dependencies for Ex-PM-E (6DL1133-6PX00-0HW0).

Table 22-1

Diagnostics:	No supply voltage L+
	0/1

F-DI 16x24VDC HA

When configuring the fail-safe modules of the ET 200SP HA with GSDML file for PROFINET IO, keep the following dependencies in mind.

Note

- Use of the fail-safe modules of the SIMATIC ET 200SP HA on the basis of GSDML is currently only approved for PRONETA as of version 3.4 SP1.
 - A system integration based on GSDML and the concomitant use in production operations is currently not approved.
-

Parameter dependencies

When configuring the module F-DI 16x24VDC HA (6DL1136-6BA00-0PH1), note the following parameter dependencies.

- The permissible values available for the input delay depend on the time for short-circuit test of the internal sensor supply.
- The value of "Time for short-circuit test (ms)" must be more than twice as much as the configured "Input delay (ms)".
- The short-circuit test of the sensor supply may only be enabled for channels with an internal sensor supply.
- The flutter monitoring can only be used with sensor evaluation "1oo1 evaluation".

Dependencies with 1oo2 evaluation:

- Both channels (channel n and channel n+8) must be activated.
- The values for the parameters "input delay (ms)" and "pulse stretching (s)" must be set identically for the channel pair (channel n and channel n+8).
- The "input delay (ms)" must be less than the configured "discrepancy time (ms)".
- The flutter monitoring must be disabled on both channels (channel n and channel n+8).
- If the "Sensor supply for 1oo2" parameter is set to "Both sensors on one sensor supply", the "Sensor supply" parameter must be set to "external" at the partner channel (channel n+8).

Note

- If the conditions mentioned above are not satisfied, a parameterization error occurs, or the parameterization is rejected.
 - When using the fail-safe modules of the ET 200SP HA, pay attention to the warnings, instructions and cross-references to other manuals, which are given in the device manuals of the F modules.
-

F-DQ 10x24VDC/2A PP HA

When configuring the fail-safe modules of the ET 200SP HA with GSDML file for PROFINET IO, keep the following dependencies in mind.

Note

- Use of the fail-safe modules of the SIMATIC ET 200SP HA on the basis of GSDML is currently only approved for PRONETA as of version 3.4 SP1.
 - A system integration based on GSDML and the concomitant use in production operations is currently not approved.
-

Parameter dependencies

When configuring the module F-DQ 10x24VDC/2A PP HA (6DL1136-6DA00-0PH1), note the following parameter dependencies.

- The light tests must always be activated for active channels.
 - When a channel is disabled, the light test for that channel must also be disabled.
-

Note

- If the conditions mentioned above are not satisfied, a parameterization error occurs, or the parameterization is rejected.
 - When using the fail-safe modules of the ET 200SP HA, pay attention to the warnings, instructions and cross-references to other manuals, which are given in the device manuals of the F modules.
-

F-AI 8xI 2-/4-wire HART HA

When configuring the fail-safe modules of the ET 200SP HA with GSDML file for PROFINET IO, keep the following dependencies in mind.

Note

- Use of the fail-safe modules of the SIMATIC ET 200SP HA on the basis of GSDML is currently only approved for PRONETA as of version 3.4 SP1.
- A system integration based on GSDML and the concomitant use in production operations is currently not approved.

Parameter dependencies

When configuring the module F-AI 8xI 2-/4-wire HART HA (6DL1136-6AA00-0PH1), note the following parameter dependencies.

- For the measuring range "0..20mA", "Diagnostics wire break" must be activated.
- For deactivated channels, "Diagnostics: wire break" must be activated.
- "HART activated" can only be configured if "HART gate" is activated and the measuring range "4..20mA" is set.
- If "HART activated" is deactivated, the parameter "HART Message Frame Repetitions" must be set to "5".
- "Diagnostics HART" must be activated if the "HART gate" is deactivated.

The following table describes the dependencies of the channel parameters and HART parameters.

Module	Channel / HART-channel						
HART gate	Measurement type	Measuring range	Smoothing	Diagnostics, Wire break	HART activated	Number of HART message frame repetitions	Diagnostics HART
disabled	disabled	4..20 mA	1	activated	disabled	5	activated
	4-wire	0..20 mA	1, 4, 16, 64	activated	disabled	5	activated
		4..20 mA		activated / deactivated	disabled	5	activated
	2-wire	4..20 mA		disabled	disabled	5	activated

Module	Channel / HART-channel						
HART gate	Measurement type	Measuring range	Smoothing	Diagnostics, Wire break	HART activated	Number of HART message frame repetitions	Diagnostics HART
activated	disabled	4..20 mA	1	activated	disabled	5	activated
	4-wire	0..20 mA	1, 4, 16, 64	activated	disabled	5	activated
		4..20 mA		activated / deactivated	activated / deactivated	0 - 10	activated / deactivated
	2-wire	4..20 mA					

Note

- If the conditions mentioned above are not satisfied, a parameterization error occurs, or the parameterization is rejected.
- When using the fail-safe modules of the ET 200SP HA, pay attention to the warnings, instructions and cross-references to other manuals, which are given in the device manuals of the F modules.

More modules

31.1 SP modules

The following table contains the modules from the ET 200SP portfolio, which can be run in the ET 200SP HA.

Modules	FW version	MLFB
CM PTP	V1.0	6ES7 137-6AA00-0BA0
CM PTP	V2.0	6ES7 137-6AA01-0BA0
TM SIWAREX WP321	V1.0	7MH4 138-6AA00-0BA0
TM SIWAREX WP351 HF	V1.0	7MH4 138-6BA00-0CU0
AI Energy Meter CT HF	V8.0	6ES7 134-6PA01-0CU0
AI Energy Meter RC HF	V8.0	6ES7 134-6PA21-0CU0
AI Energy Meter 480V AC ST	V4.0	6ES7 134-6PA20-0BD0
Motor starter:		3RK1308-0..00-0CP0
DS 0.1 - 0.4A HF	V1.2	3RK1 308-0AA00-0CP0
DS 0.3 - 1A HF	V1.0 V1.1 V1.2	3RK1 308-0AB00-0CP0
DS 0.9 - 3A HF	V1.0 V1.1 V1.2	3RK1 308-0AC00-0CP0
DS 2.8 - 9A HF	V1.0 V1.1 V1.2	3RK1 308-0AD00-0CP0
DS 4.0 - 12A HF	V1.0 V1.2	3RK1 308-0AE00-0CP0
RS 0.1 - 0.4A HF V1.2	V1.2	3RK1 308-0BA00-0CP0
RS 0.3 - 1A HF	V1.0 V1.1 V1.2	3RK1 308-0BB00-0CP0
RS 0.9 - 3A HF	V1.0 V1.1 V1.2	3RK1 308-0BC00-0CP0
RS 2.8 - 9A HF	V1.0 V1.1 V1.2	3RK1 308-0BD00-0CP0
RS 4.0 - 12A HF	V1.0 V1.2	3RK1 308-0BE00-0CP0

Note

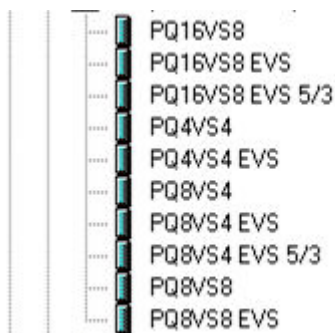
You can find more information on the various modules in the *SIMATIC ET 200SP Manual Collection* under <https://support.industry.siemens.com/cs/ww/de/view/84133942> (<https://support.industry.siemens.com/cs/ww/en/view/84133942>)

31.2 AirLINE SP, Type 8647

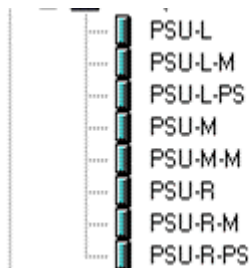
Disclaimer

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Pneumatic modules



Pneumatic connection modules



Note

More information

For more information on the AirLINE SP, Type 8647 (for example, data sheet, operating manual) please contact the Bürkert company directly: <http://www.buerkert.de/de/type/8647>

See also

AirLINE SP_Type 8647 (<https://www.burkert-usa.com/en/type/8647>)