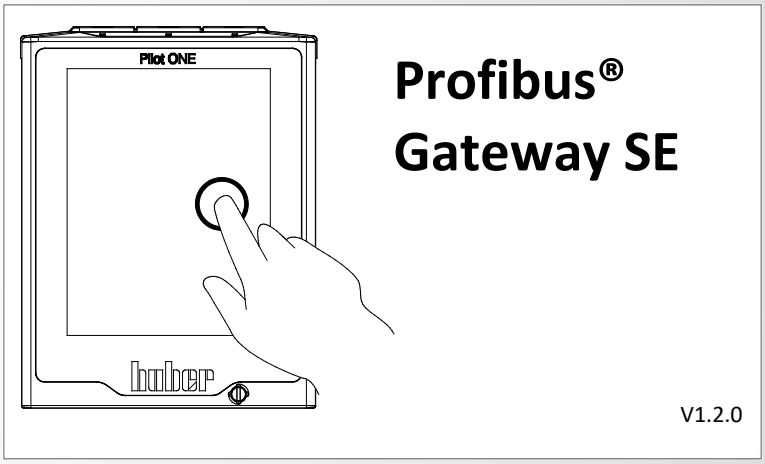
Inspired by
temperature



Profibus®
Gateway SE

V1.2.0

Technical Bulletin

huber

Profibus®
Gateway SE

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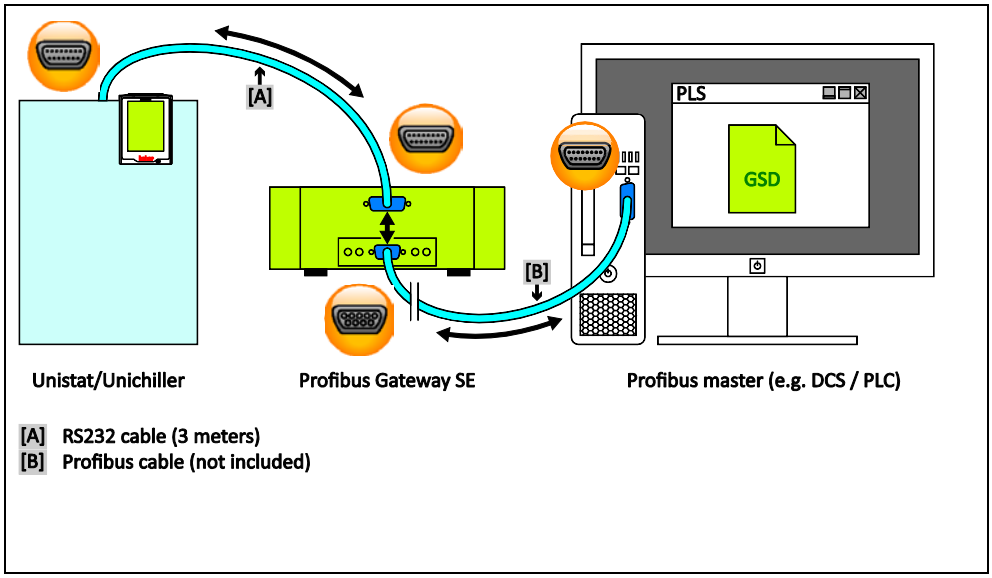
1 Description

Schematic structure



Profibus DP is an established device for industrial applications. It is therefore of paramount importance to integrate temperature control units in automation solutions as simple, flexible and process-oriented as possible. The excellent standardization of Profibus DP results in very short start-up times in the field. When delivered, the Profibus Gateway SE can be immediately integrated via the configuration software using the GSD file.

Setpoints, actual values and control functions are defined. This results in the programming of the Profibus Gateway SE and the creation of the GSD file. The standard version presented is designed to cover a large number of process requirements. We can offer a customized version if you have additional requirements. Please note the inherent restrictions of E-grade “Basic”, E-grade “Exclusive” and DV-E-grade. For more information, please refer to the data in the Data Transmission Manual at www.huber-online.com.

2 Information on the functioning of the Profibus Gateway SE

2.1 Position of the Profibus Gateway SE within the data transmission

There are two participants from the viewpoint of the Profibus Gateway SE: The Profibus device (PLC as PB master) and the temperature control unit with RS-232 communication (slave). Moreover, the temperature control unit must be controlled and measures have to be taken in case a failure occurs.

The temperature control unit receives the information from the Profibus Gateway SE. The PLC does not directly access the temperature control unit.

3 Installation instructions

3.1 Installation provided by the customer

The Profibus Gateway SE is installed in a stainless steel housing with a mains socket for fee-standing installation or for hanging it to the side wall of the device. The device is connected via a 3 m RS-232 cable.

The Profibus cable with D-SUB 9 connector is routed directly to the Profibus Gateway SE. The user must guarantee compliance with the Profibus parameters and the bus topology in accordance with the requirements of the PROFIBUS user organization. A bus termination can be enabled on the Profibus Gateway SE. The Profibus Gateway SE has been built and qualified in accordance with the specifications of the PROFIBUS user organization. The customer must comply with the applicable standards for the internal wiring of the device. This applies in particular to a well-functioning functional earth and potential equalization.

4 Commissioning of the Profibus Gateway SE

There are five controls on the front side of the Profibus Gateway SE. These must have the following positions:

Position of the control elements

Element	Position
S4	0
S5	0
Termination	Depending on the position of the Profibus Gateway SE within the bus
ID High	Profibus slave address
ID Low	

5 Integration into the process automation system

For process control purposes it is important that the relevant process data are available in the PLC map. The GSD file describes the number of input and output bytes of the Profibus Gateway SE. The configuration software determines how to integrate the GSD file.

In regards to the data transmission, the temperature control unit is generally a slave. The Profibus Gateway SE works with 9600 Bd on the RS-232 side. The interface parameters on the temperature control unit must be set accordingly. Process variables may be E-grade and device dependent.

INFORMATION

All provisions of the temperature control unit's operating manual must be complied with.

5.1 Basic mode of operation of the Profibus Gateway SE

The Profibus Gateway SE constantly updates the process variables of the temperature control unit. The actual process parameters are therefore always available when retrieving the process image. The temperature control unit can immediately return the current process values when a Profibus frame is received. On the other hand, the update loop sends the new process values to the temperature control temperature control unit. This data loop runs at about 300 ms per process value.

5.2 Description of the standard variant

For more information, please refer to the data in the Data Transmission Manual at www.huber-online.com.

Standardvarianten

From E-grade	Address (hex)	Variable	Description	Variable type	Unit	LSB	Location in the table according to GSD	
							R	W
Basic	00	vSP	Setpoint, temperature controller	Process value	°C	0,01 °C	1	1
Basic	01	vTI	Internal temperature	Process value	°C	0,01 °C	2	-
Basic	03	vpP	Pump pressure (absolute)	Process value	mbar	1 mbar	3	-
Basic	05	vError	Error report	Process value	-	1	4	-
Basic	06	vWarn	Warning message	Process value	-	1	5	-
Basic	07	vTE	Process temperature (Lemosa)	Process value	°C	1 °C	6	-
Basic	0A	vStatus1	Status of the thermostat	Process value	-	-	7	-
Exclusive	13	vTmpMode	Temperature control mode	Process control	-	1	8	2
Basic	14	vTmpActive	Temperature control	Process control	-	1	9	3
Basic	1B	vSNRL	Serial number (low)	-	-	1	10	-
Basic	1C	vSNRH	Serial number (high)	-	-	1	11	-

6 Properties of standard variables

6.1 “vSP” – Setpoint, temperature controller

The setpoint is used by the temperature controller. With internal regulation, the setpoint applies for the internal temperature, with process regulation it applies for the process temperature.
Please note: The setpoint specification can be overwritten by other setpoint indicators (e.g. temperature control program, analog 4…20 mA interface, …).

6.2 “vTI” – Internal temperature

From the point of view of the temperature control device, the current temperature of the thermal fluid which is flowing to the application. The internal temperature is sometimes also called the flow, jacket or bath temperature.

6.3 “vpP” – Pump pressure (absolute)

Absolute pump pressure at the pressure sensor in the thermal fluid circuit of the thermostat (only if there is a pressure sensor).

6.4 “vError” – Error report

The number of the error report that appeared first.
If 0 is returned, no error has occurred and the device is ready for use; otherwise, the nature of the error can be determined by the number.

6.5 “vWarn” – Warning message

The number of the most recent warning message to appear.
The thermostat may possibly require your attention if a number that is not 0 is returned. If 0 is returned, no new warning has been issued, otherwise the nature of the warning can be determined by the number. If the warning was requested, 0 is returned at the next inquiry again unless a new warning has been issued.

6.6 “vTE” – Process temperature (Lemosa)

The current process temperature is returned.
Strictly speaking, the measured value of the Pt100 sensor which is connected to the LEMOSA connector is returned. Typically the processor sensor is connected here.
If no sensor is connected, the value -151 °C is returned.

6.7 “vStatus1” – Status of the thermostat

Query current thermostat status.
The returned value is a bit field. The individual bits must be considered independently of each other.

“vStatus1”

Bit	Meaning	Explanation	
		“1”	“0”
0	Temperature control operating mode	active	Inactive
1	Circulation operating mode	active	Inactive
2	Refrigerator compressor	enabled	disabled
3	Temperature control mode “Process control”	active	Inactive
4	Circulating pump	enabled	disabled
5	Cooling power available	available	unavailable
6	Tkeylock	active	Inactive
7	PID parameter set, temperature controller	automatic mode	expert mode
8	Error	fault occurred	no fault
9	Warning	new warning received	no new warning
10	Mode for presetting the internal temperature	active	inactive
11	Mode for presetting the external temperature	active	inactive
12	DV E-grade	activated	not activated
14	Restart electronics / Power failure (*)	no restart	restart
15	Freeze protection (not available on all devices)	active	inactive
(*) This bit is reset to 0 when the control is restarted. If the variable vStatus1 is read for the first time after a restart, this bit has not been set. In all further reading procedures, this bit will send back a 1. In this way, an unexpected restart can be recognized.			

6.8 “vTmpMode” – Temperature control mode

Set and query the temperature control mode of the thermostat.
0: Temperature control mode internal
1: Temperature control mode process (cascade control)

6.9 “vTmpActive” – Temperature control

Start or stop temperature control of the thermostat or query current status.
0: Temperature control not active
1: Temperature control active

6.10 “vSNRL + vSNRH” – Serial number

Query the serial number of the thermostat.
Because the serial number can have larger values than 65535 but only 2 bytes per variable are available, the serial number is made up of 2 data words (Low + High) each with 2 bytes into a 4 byte value.
Variable 0x1B (vSNRL) contains the low value bytes, Variable 0x1C (vSNRH) contains the high value bytes.

7 Diagnostic functions

7.1 On commissioning

The LEDs 1 (LSB), 2, 4 and 8 show the binary value of the version stored in the module if the Profibus plug is unplugged and the position of the two switches S4 and S5 is set to zero. The standard version has the number 1. The module immediately goes into communication mode with the device connected to the serial interface if switch S4 is set to zero and the switch S5 to one before applying the operating voltage. This tests the wiring to the temperature control unit. LED “8” has a special role. It is illuminated when a command is sent from the Profibus Gateway SE via the serial interface and turns off after a response has been received.

The Profibus plug must not be plugged in when in this mode!
To exit this mode, reset the two switches S4 and S5 to zero and interrupt the operating voltage for about 30 seconds.

7.2 During operation

When communication is transmitted via the Profibus - recognizable by the green illuminated LEDs Bus and State - LED “8” signals a communication of the Profibus Gateway SE via the serial interface. The procedure is the same as described above.

7.3 Troubleshooting

Verify on the Profibus side whether the bus termination is set correctly. A difference between the GSD file and the program in the Profibus Gateway SE may cause bus errors or incorrect data content. The version is specified in the GSD file. It can be checked with the diagnostics function.

Inspired by **temperature** designed for you

Peter Huber Kältemaschinenbau SE
Werner-von-Siemens-Str. 1
77656 Offenburg / Germany

Telefon +49 (0)781 9603-0
Telefax +49 (0)781 57211

info@huber-online.com
www.huber-online.com

Technischer Service: +49 (0)781 9603-244

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