

Inspired by **temperature**



# Connectivity

Data communication solutions for temperature control devices

**huber**

# Connectivity

## Introduction



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# Overview matrix

## Device groups, interfaces, protocols

Controller	Device series	Interface included	Interface optional	Protocol
KISS	Immersion circulators	RS232 9 pin Sub-D	–	Huber: PP, LAI
		Mini-USB	–	Huber: PP, LAI
		–	Pt100 sensor connection optional (only at the factory)	none
OLÉ	Minichiller Unichiller	RS232 9 pin Sub-D	–	Huber: PP, LAI
		Mini-USB	–	Huber: PP, LAI
		–	2. RS232 9 pin Sub-D Optional (only at the factory)	Huber: PP, LAI
		–	POKO / ECS Optional (only at the factory)	none
		–	Pt100 sensor connection Optional (only at the factory)	none
Pilot ONE	all	RS232 15 pin Sub-D	–	Huber: PB, PP, LAI
			Profibus	Profibus DP-V0 Profibus DP-V1
	Ministat, CC, Unichiller	RS232 9 pin Sub-D	–	Huber: PB, PP, LAI
Pilot ONE	alle	RJ45 Ethernet	–	Huber: PB, PP, LAI Modbus TCP OPC UA Profinet EtherCAT
Pilot ONE	alle	USB	–	Huber: PB, PP, LAI
Pilot ONE	alle	–	Analogue interfaces 1 input, 3 outputs 4 mA - 20 mA / 0V - 10V	none
Pilot ONE	alle	–	Digital interfaces POKO / ECS	none

E-grade	Basic	Exclusive	Professional	Explore	DV-E-grade	OPC UA
Cat.No.	Standard	#9495	#9496	#10495	#9943	#10561

	Additionally required hardware		Required E-grade level
	Designation	Cat.No.	Designation
	none	–	none
	none	–	none
	Pt100 sensor connection for KISS (only measurement, no control)	#10688	none
	none	–	none
	none	–	none
	2. RS232 interface OLÉ	#10726	none
	Interface module for units with OLÉ controller	#10689	none
	Pt100 sensor connection for OLÉ controller (only measuring, no control)	#10519	none
	none	–	from Basic
	RS232 to Profibus DP-V0	#522248	from Basic
	RS232 to Profibus DP-V1	#10503	from Basic
	none	–	from Basic
	none	–	from Basic
	none	–	OPC UA
	Ethernet to Profinet Gateway	#10965	from Basic
	Ethernet to EtherCAT Gateway	#10966	from Basic
	–	–	from Basic
	Com.G@te external for Unistats	#6915	none
	Com.G@te internal for all other temperature control units (except CC)	#31217	none
	POKO / ECS Interface for Unistats as standard 2. POKO / ECS with Com.G@te external	–	none
	Internal POKO / ECS interface for all other temperature control units	#10003	none
	Com.G@te internal for all other temperature control units (except CC)	#31217	none



# Available parameters

only valid for units with Pilot ONE®

Adress (hex)	Description	Basic Standard	Exclusive #9495	Professional #9496	DV / OPC UA / Explore #9943 / 10561 / 10495
00	Setpoint temperature controller	✓	✓	✓	✓
01	Internal temperature	✓	✓	✓	✓
02	Return flow temperature	-	-	-	✓
03	Pump pressure (absolute)	✓	✓	✓	✓
04	Current output	-	-	-	✓
05	Fault report	✓	✓	✓	✓
06	Warning report	✓	✓	✓	✓
07	Process temperature (Lemosá)	✓	✓	✓	✓
08	Actual value specification internal temperature	-	-	-	✓
09	Specification process temperature	-	-	-	✓
0A	Status of the thermostat	✓	✓	✓	✓
0B	Activate the Blow-Down slider	✓	✓	✓	✓
0C	Activate Blow-Down slider heating	✓	✓	✓	✓
0F	Fill level	✓	✓	✓	✓
12	PID parameter automatic temperature controller	✓	✓	✓	✓
13	Temperature control mode	-	✓	✓	✓
14	Temperature control	✓	✓	✓	✓
15	Operating mode compressor	✓	✓	✓	✓
16	Circulation	✓	✓	✓	✓
17	Operating lock	✓	✓	✓	✓
18	Mode actual value specification internal temperature	-	-	-	✓
19	Mode actual value specification process temperature	-	-	-	✓
1A	Freeze protection	✓	✓	✓	✓
1B + 1C	Serial number	✓	✓	✓	✓
1D	Kp of the internal controller	✓	✓	✓	✓
1E	Tn of the internal controller	✓	✓	✓	✓
1F	Tv of the internal controller	✓	✓	✓	✓
20	Kp of the jacket controller	-	✓	✓	✓
21	Tn of the jacket controller	-	✓	✓	✓
22	Tv of the jacket controller	-	✓	✓	✓
23	Kp of the process controller	-	✓	✓	✓
24	Tn of the process controller	-	✓	✓	✓
25	Tv of the process controller	-	✓	✓	✓
26	Pump speed	✓	✓	✓	✓
2C	Cooling water inlet temperature	-	-	-	✓
2D	Cooling water pressure	-	-	-	✓
2E	Network connection conditions	-	-	-	✓
30	Minimum setpoint	✓	✓	✓	✓
31	Maximum setpoint	✓	✓	✓	✓
33	Over-level limit	✓	✓	✓	✓
34	Sub-level limit	✓	✓	✓	✓
35	Setting the digital level output	✓	✓	✓	✓
3A	Process temperature	-	✓	✓	✓
3C	Status of the thermostat	✓	✓	✓	✓
3D	Interference variables	-	-	-	✓

# depending on the E-grade®

Adress (hex)	Description	Basic Standard	Exclusive #9495	Professional #9496	DV / OPC UA / Explore #9943 / 10561 / 10495
3E	Pressure in return (absolute)	✓	✓	✓	✓
3F	Status Blow-Down	✓	✓	✓	✓
40	Watchdog (Fault)	✓	✓	✓	✓
41	Watchdog (2nd setpoint)	-	-	✓	✓
42	2. Setpoint	-	-	✓	✓
43	PMA Mode	-	-	-	✓
44	Specify PMA output	-	-	-	✓
48	Setpoint pump speed	✓	✓	✓	✓
49	Setpoint pump pressure	✓	✓	✓	✓
4A	VPC bypass operating mode	✓	✓	✓	✓
4B	VPC bypass target position	✓	✓	✓	✓
4C	Cooling water outlet temperature	-	-	-	✓
4D	Thermal fluid volume flow	-	-	-	✓
4E	Setpoint thermal fluid volume flow	-	-	-	✓
4F	Setpoint Delta-T control	-	✓	✓	✓
50	Alarm limit Delta-T	-	✓	✓	✓
51	Upper alarm limit internal temperature	✓	✓	✓	✓
52	Lower alarm limit internal temperature	✓	✓	✓	✓
53	Upper alarm limit process temperature	✓	✓	✓	✓
54	Lower alarm limit process temperature	✓	✓	✓	✓
55	Setting of heating overtemperature protection	✓	✓	✓	✓
56	Setting of overtemperature protection expansion vessel	✓	✓	✓	✓
58	Start temperature control program	-	✓	✓	✓
59	Specify ramp duration	-	✓	✓	✓
5A	Start ramp	-	✓	✓	✓
5B	Specify Blow-Down operating status	✓	✓	✓	✓
5C	Days until maintenance	✓	✓	✓	✓
5D	Days to F-Gas check	✓	✓	✓	✓
5E	Create service packet	✓	✓	✓	✓
5F	Change program status	-	✓	✓	✓
62	Pressure of the VPC bypass	✓	✓	✓	✓
69	Mode actual value specification thermal fluid volume flow	-	-	-	✓
6A	Specification thermal fluid volume flow	-	-	-	✓
6B	Control mode of the pump	✓	✓	✓	✓
6C	External POKO control	-	-	-	✓
6D	POKO status	-	-	-	✓
6E	Current output (high bytes)	-	-	-	✓
6F	Ventilation	✓	✓	✓	✓
70	Emptying	✓	✓	✓	✓
71*	Setpoint temperature controller	✓	✓	✓	✓
72	VPC bypass position	✓	✓	✓	✓
73	Message	✓	✓	✓	✓
74	Disturbance feedforward VPC	-	-	-	✓
75	Actual value specification mode pump pressure	-	-	-	✓
76	Actual value specification pump pressure (relative) for pump control	-	-	-	✓

\*same meaning / function as address 0. Is required for some OPC UA applications.

# Interfaces

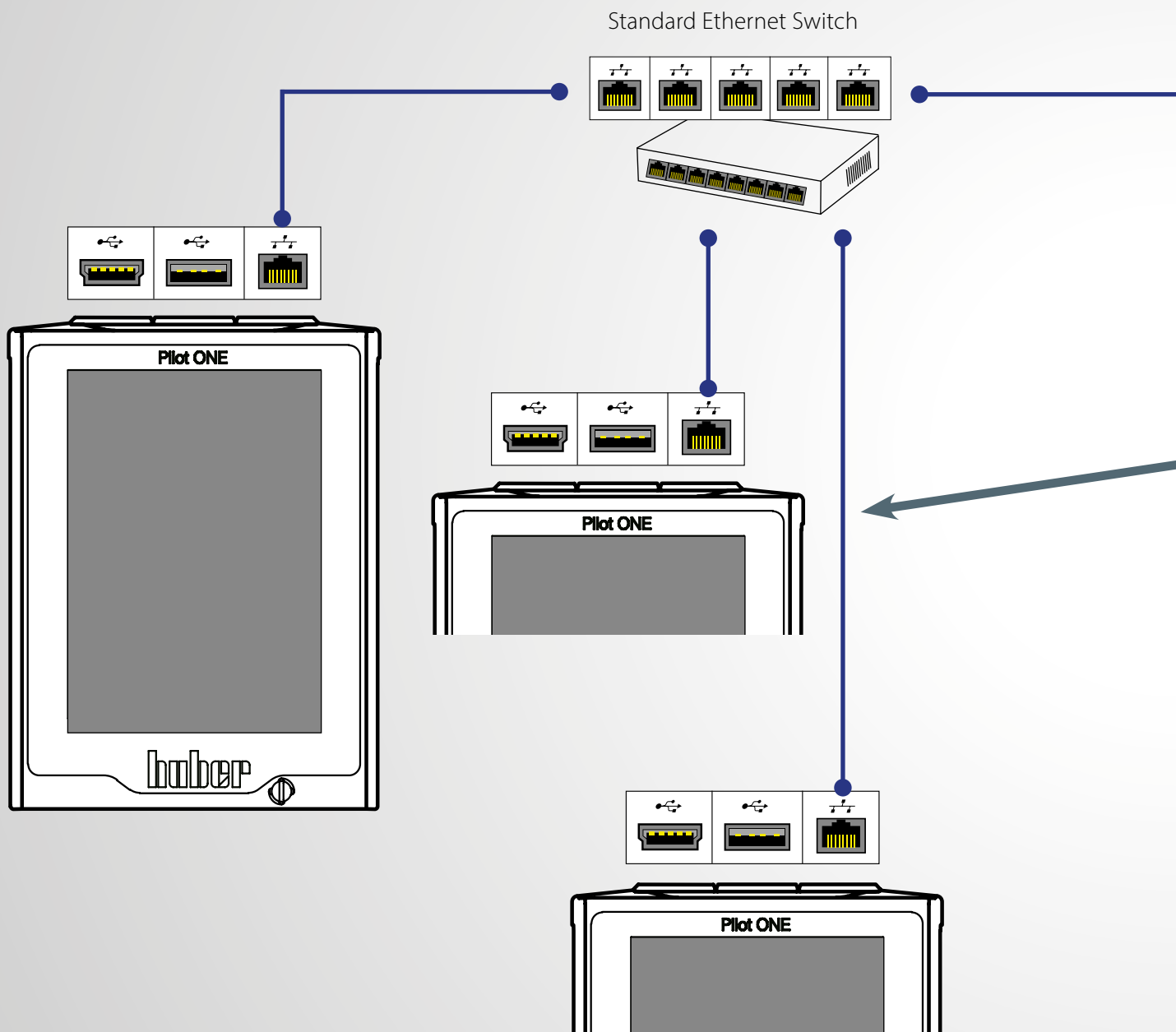
## RJ45 Ethernet (RJ45)

Standard LAN connection, no driver required.

The following components are used for an Ethernet setup:

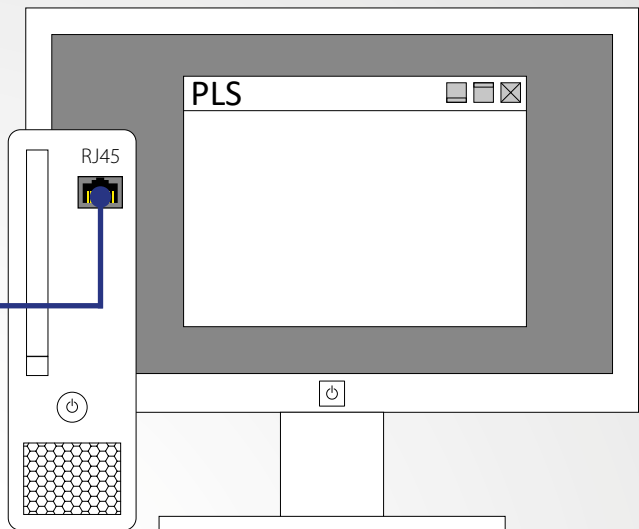
- Cable with RJ45 connector
- Commercially available switch -> when connecting several Pilot ONEs

TCP-IP Setup  
Modbus TCP Setup  
OPC UA Setup





only for units with Pilot ONE®



Computer or PLC with Ethernet interface

Bus system: Fast Ethernet 10/100  
 Cable type: Standard Ethernet100 Base-TX  
 CAT5 10/100 RJ45

Communication via: TCP (Transmission Control Protocol) ▶ Port 8101  
 Modbus TCP ▶ Port 502  
 OPC UA ▶ Port 4840

Protocol	Additionally required hardware	Additional E-grade	Cat.No.
PB, PP, LAI	none	command dependent	see page 6/7
Modbus TCP	none	command dependent	see page 6/7
OPC UA	none	OPC UA E-grade	#10561

# Interfaces

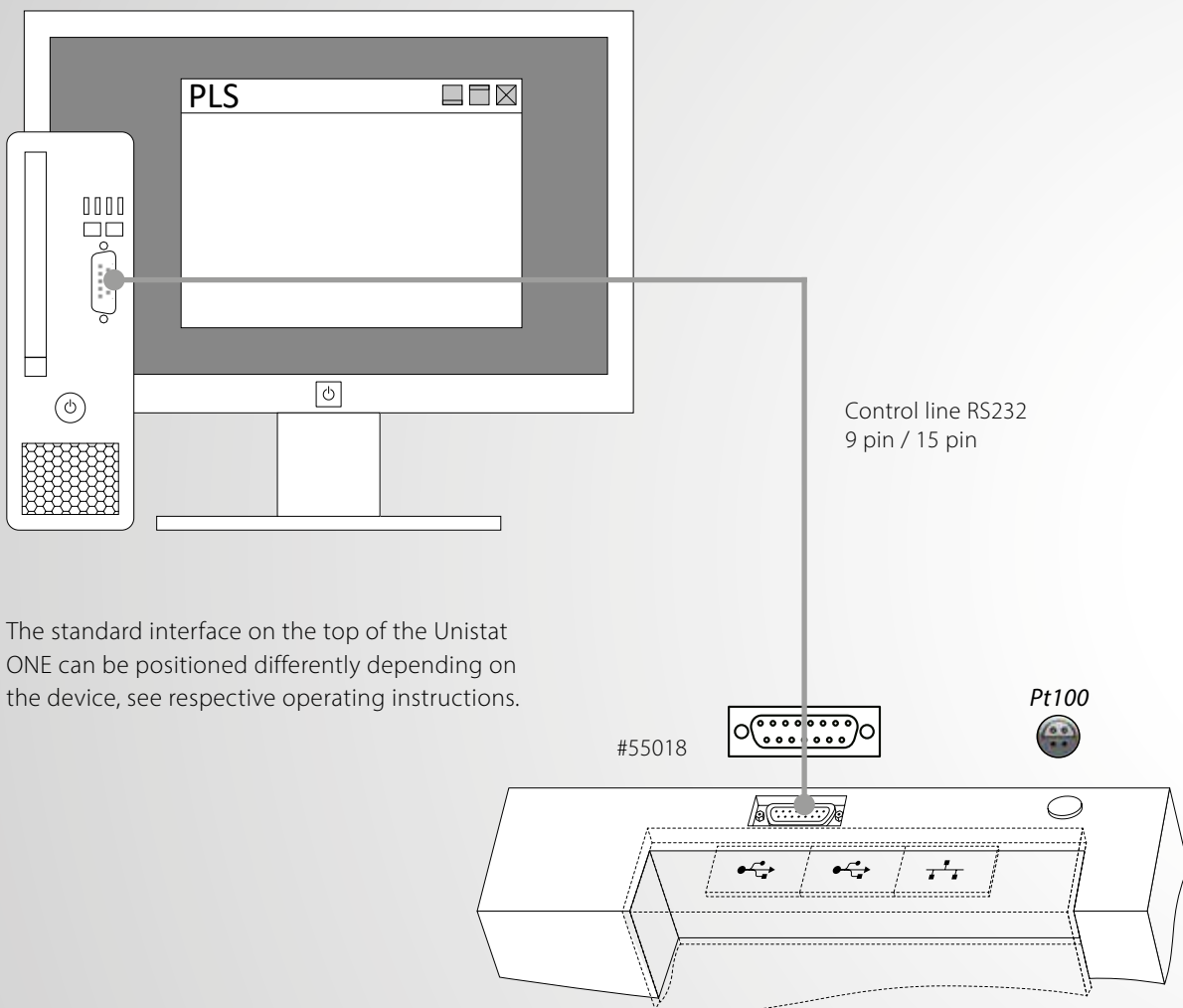
## RS232

### Pilot ONE®-Controller

Known standard interface

Point-to-point connection

Various Sub-D connectors: 15 pin on the service socket or 9 pin on the ComG@te

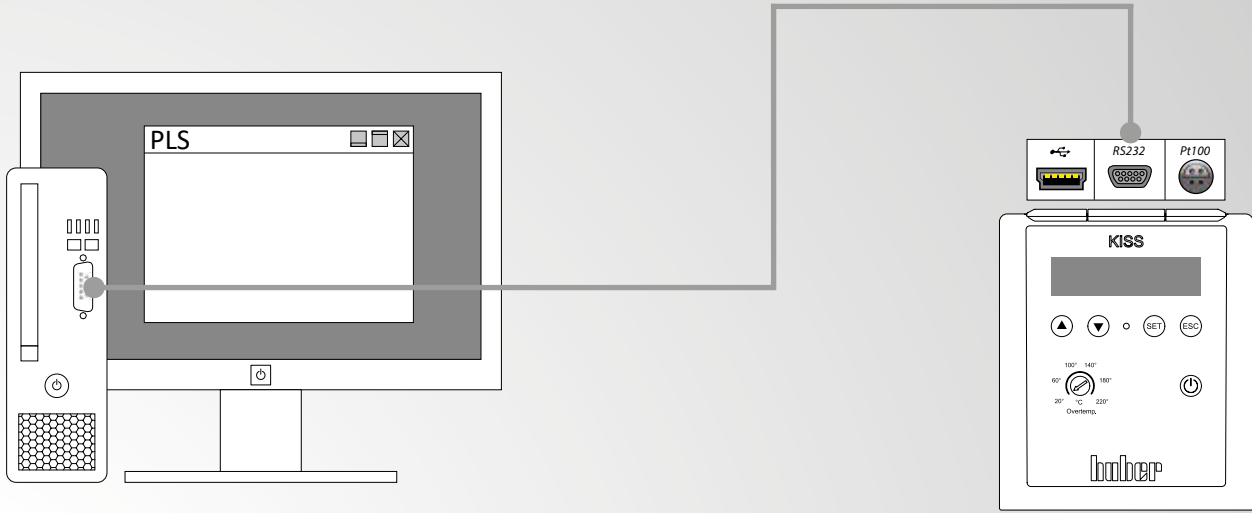


The standard interface on the top of the Unistat ONE can be positioned differently depending on the device, see respective operating instructions.

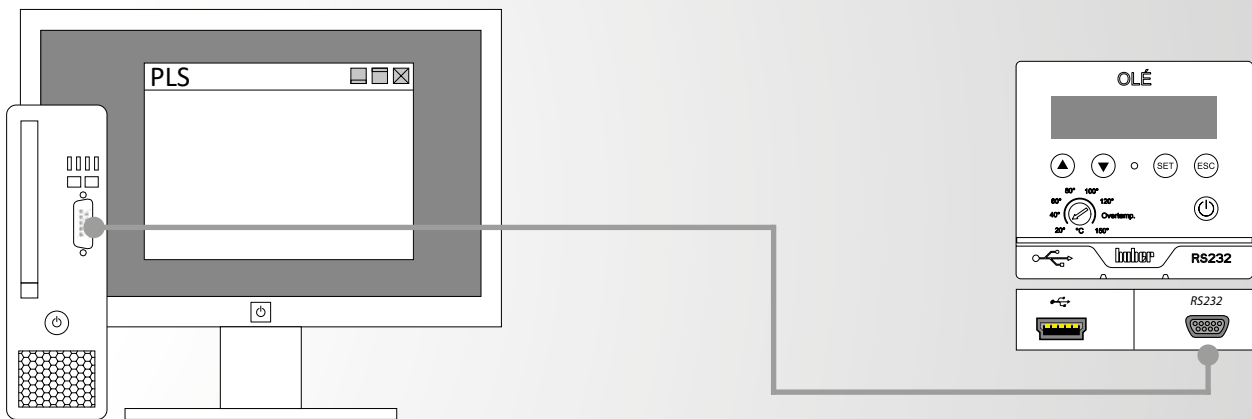
Protocol	Controller	Socket type	Additional hardware	Additional E-grade
Huber: PP, LAI	KISS, OLÉ	9 polig Sub-D*	none	none
Huber: PB, PP, LAI	Pilot ONE	15 polig Sub-D	none	command dependent
Huber: PB, PP, LAI	Pilot ONE	9 polig Sub-D*	none	command dependent

\*unit dependent

# KISS®- / OLÉ-Controller



Controller 9 pin to PC 9 pin



Control cable	Length	Cat.No.
Serial data transfer from device 15 pin Sub-D connector to PC / Notebook 9 pin Sub-D socket	3 m	55018
	5 m	55018-5
	10 m	55018-10
Serial data transmission from device / Com.G@te 9 pin Sub-D connector to PC / Notebook 9 pin Sub-D socket	3 m	6146
	5 m	6146-5
	10 m	6146-10

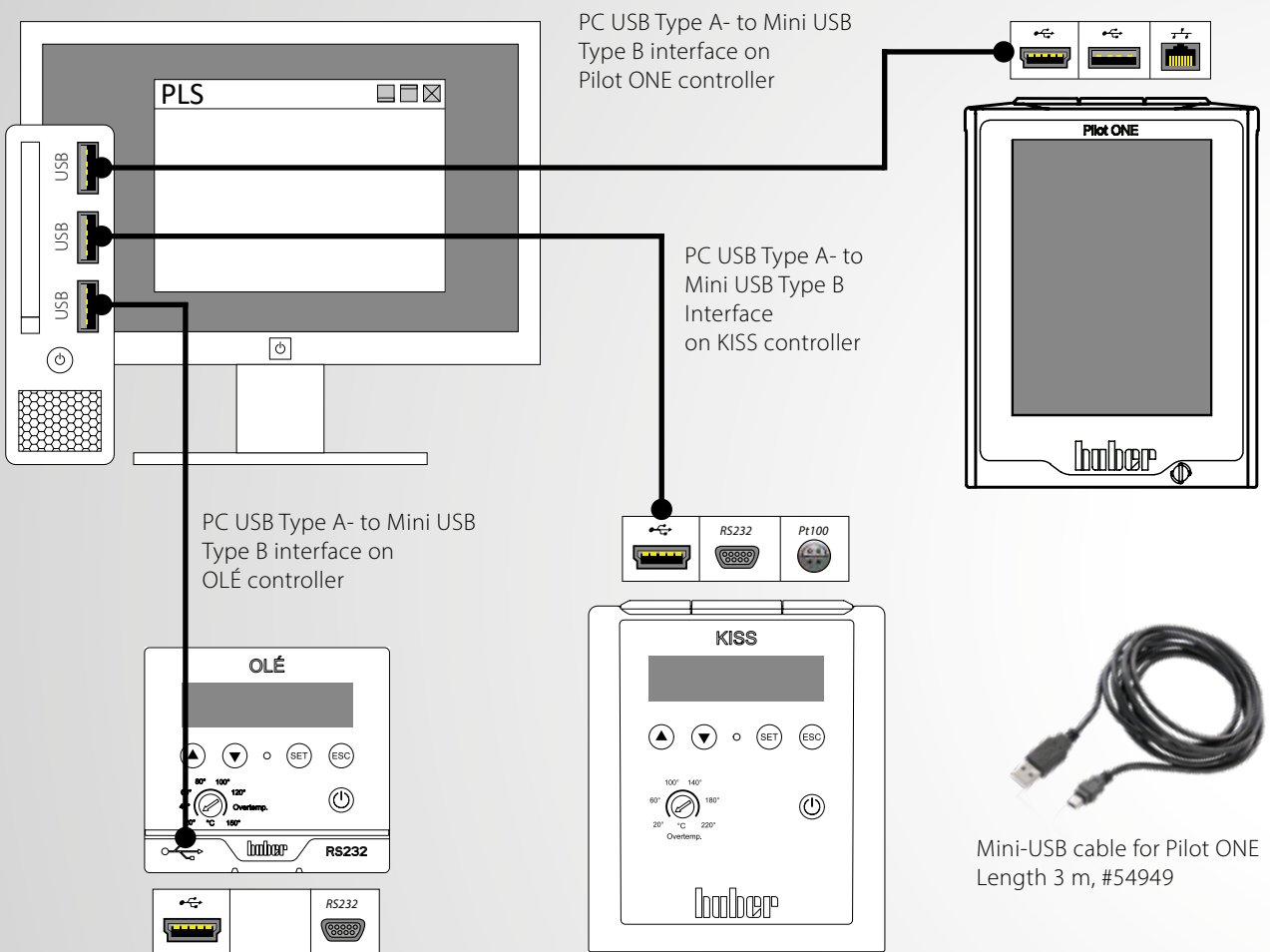


# Interfaces

## Mini-USB data communication

With a direct USB connection, a driver must be installed for the Pilot ONE or for KISS/OLÉ that installs a virtual COM port on a Windows PC. This virtual COM port behaves like an RS232 port and is selected accordingly in communication software (e.g. SpyControl) also as an RS232 port (e.g. COM 5).

You can find the drivers on our website in the Service & Download --> Software area.



Protocol	Controller	Socket type	Additional hardware	Additional E-grade
Huber: PP, LAI	KISS, OLÉ	Mini-USB	none	none
Huber: PB, PP, LAI	Pilot ONE	Mini-USB	none	command dependent

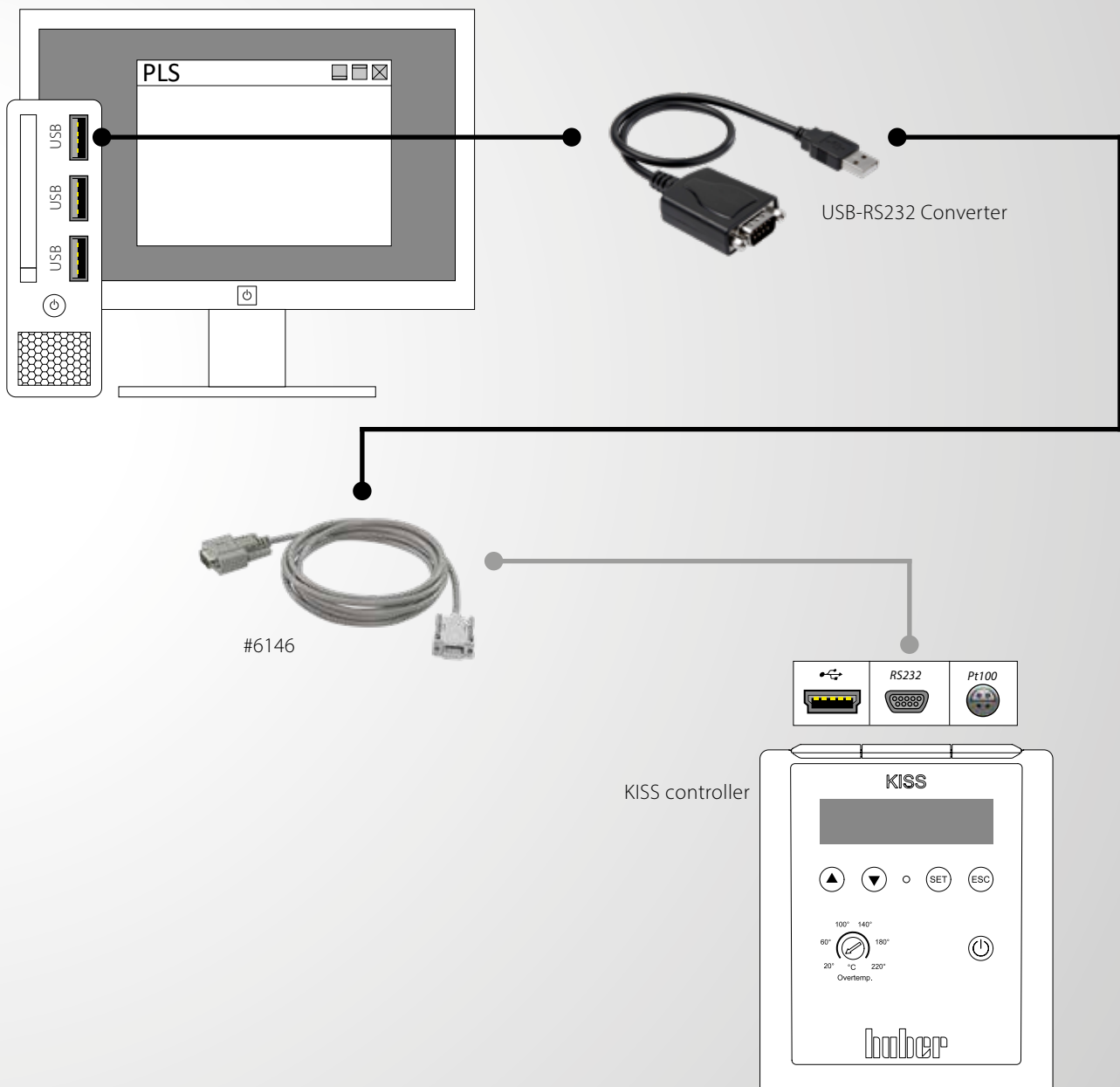
Control cable	Length	Cat.No.
Serial data transfer from controller Pilot ONE, KISS and OLÉ to PC / notebook, USB Type A	3 m	54949

# USB-RS232 Converter

When using a USB-RS232 converter, a virtual COM port is also installed on Windows PCs. This virtual COM port can also be used like a normal hardware RS232 port. Drivers are available from corresponding converter manufacturer.

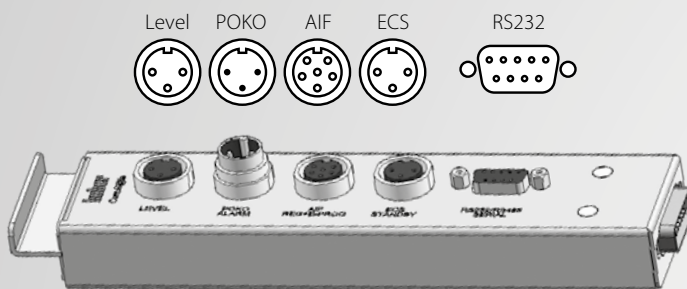


**Important:** The converter must not be connected directly onto Huber devices - neither with Pilot ONE nor with KISS/OLÉ. A null modem cable (crossed cable), e.g. # 6146 must always be used between converter and Huber device.



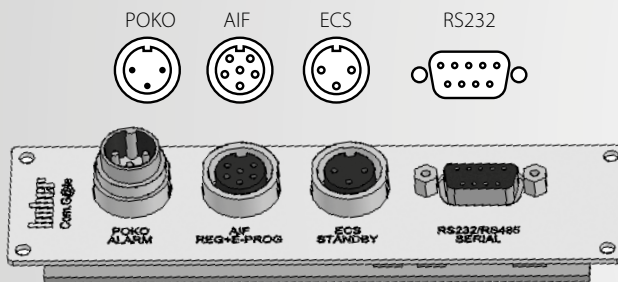
# Interfaces Com.G@te

The Com.G@te provides connections according to the NAMUR standard. It expands devices with Pilot ONE with additional interfaces and connection options. The following interfaces are integrated: RS232 (bidirectional), ECS external control signal (programmable), POKO potential-free contact (programmable), AIF analogue interface 0/4-20 mA or 0-10 V (bidirectional).



Com.G@te external interfaces:

- LEVEL
- POKO
- AIF
- ECS
- RS232



Com.G@te internal interfaces:

- POKO
- AIF
- ECS
- RS232

POKO, AIF, ECS, RS232 can be built into:

Ministat, Petite Fleur, Grande Fleur, Unichiller, CCs ab CC-4xx

Interface module	Description	Cat.No.
Com.G@te intern		31217
Com.G@te extern		6915

Control cable	Length	Cat.No.
POKO – End open	3 m	9490
ECS Standby – End open	3 m	9491
LEVEL – End open	3 m	9492
AIF – End open	3 m	9353



only for units with Pilot ONE®

## POKO connector

(Potential-free contact) alarm

Signal contact for external monitoring.

Note the functional options that POKO offers you in the "Interfaces" category. The switching behaviour can be set in the Pilot ONE, e.g. "Fault". The potential-free contact (POKO) signals the status of the temperature control unit via the contact position. A closed normally open contact means operational readiness. In the event of a fault or error, the normally open contact is opened (this applies to the closer contact between pin 1 and pin 2).

## ECS

(External Control Signal) Stand-by

Control signal for activating a function. The functionality of the ECS is determined by the "Interfaces" category, e.g. the release signal ECS (external control signal) can be used to start/stop the temperature control.

The control takes place via a potential-free contact. ECS becomes electronically active when E1 and E2 are connected by an external potential-free contact. Contact specification: min. 0.1 A/24 V DC.

## AIF Reg-E-Prog

The analogue interface has a programmable input channel and 3 output channels 4 - 20 mA.


The analogue interface of the Com.G@tes is programmed in the "Interfaces" category.

2 output channels are fixed:

- Output 1     Setpoint
- Output 2     Supply line temperature
- Output 3     Freely configurable


## RS232

This socket offers a connection via an RS232 interface, a PLC or a distributed control system (DCS) so that remote control of the controller electronics can be connected.

 When using the interface, the specifications of the generally applicable standards must be observed.

## LEVEL

This connection is only available with an external Com.G@te and offers the possibility of connecting an external float switch (#6152), which is positioned in the inspection glass, for level monitoring of an externally closed application. The control takes place via a potential-free contact.

 The interface is specified as a digital input. Do not apply voltage or current!



AIF #9353



ECS #9491



POKO #9490



LEVEL #9492

# Interfaces Profibusgateway



Only for units with Pilot ONE

Two versions are available:

**Profibusgateway DP-V0:**

Preconfigured parameter list for cyclic Profibus communication. Profibus master must support Profibus DP-V0.

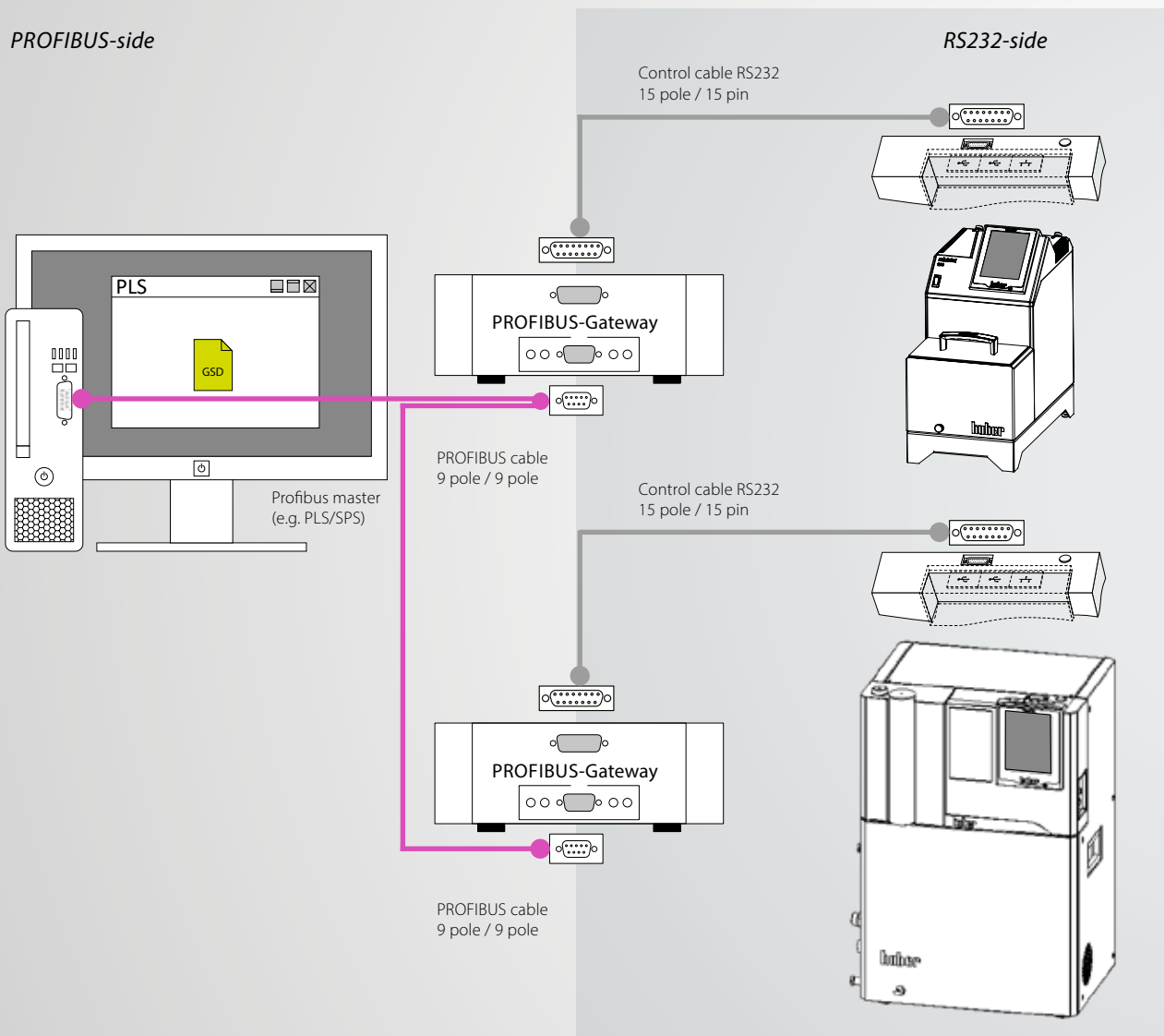
**Profibusgateway DP-V1:**

Configurable parameters via acyclic Profibus communication.

Profibus master must support Profibus DP-V1.

PROFIBUS-side

RS232-side



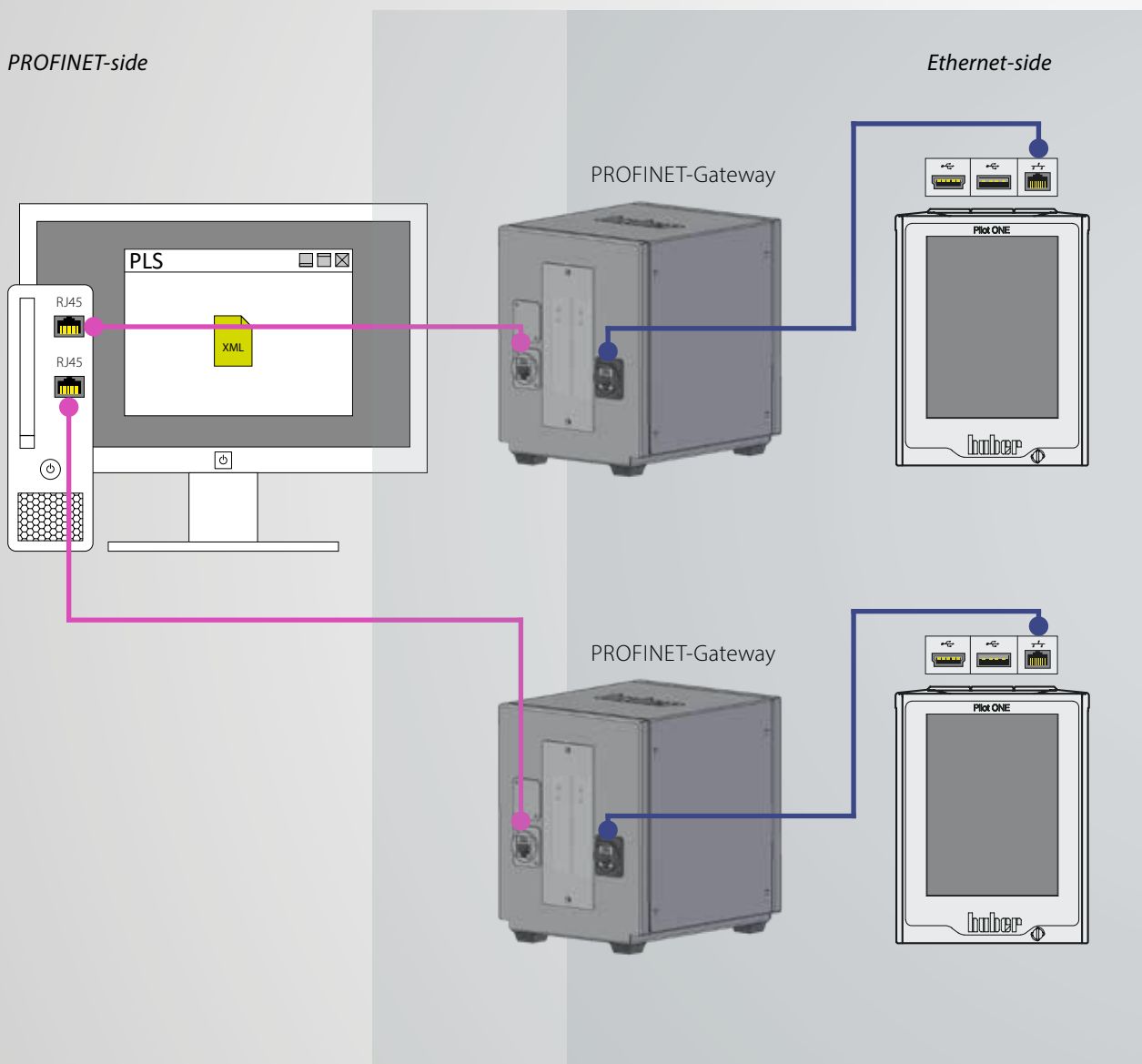
Gateway	Description / Requirement	Cat.No.
Profibus Gateway DP-V0	Parameter fix (Profibus DP-V0)	522248
Profibus Gateway DP-V1	Parameter freely configurable (Profibus DP-V1)	10503



# Interfaces PROFINET-Gateway



PROFINET (Process Field Network) is the open Industrial Ethernet standard of the PROFIBUS user organisation e. V. (PNO) based on Ethernet-TCP/IP and complements PROFIBUS technology for applications that require fast data communication via Ethernet networks in combination with industrial IT functions. PROFINET can be used to implement solutions for manufacturing technology, process automation, building automation and the entire spectrum of drive technology. With the PROFINET-Gateway, Huber temperature control units can be integrated into PROFINET networks easily, flexibly and close to the process. The PROFINET-Gateway is integrated into the project planning software with the aid of the associated GSDML file.



Model	Cat.No.
PROFINET-Gateway	10965



→ You will find more information in the respective operating instructions of the gateway on our website

# Interfaces

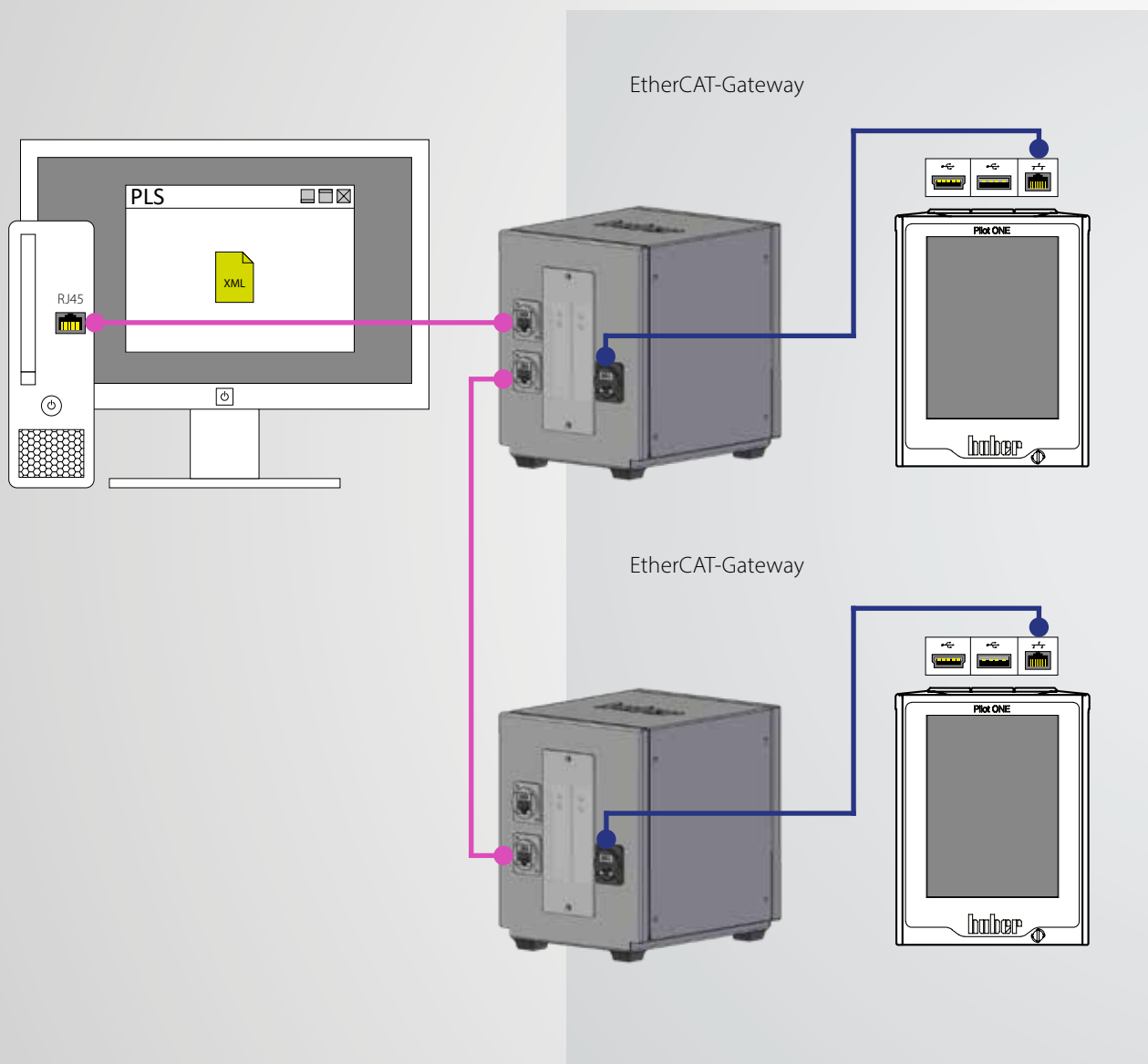
## EtherCAT-Gateway



EtherCAT, short for Ethernet for Control Automation Technology, is an open Ethernet-based fieldbus technology that is standardised in international standards. EtherCAT is a very fast Industrial Ethernet system that is also suitable for use in time-critical applications. With the EtherCAT gateway, Huber temperature control units can be integrated into EtherCAT networks easily, flexibly and close to the process. The EtherCAT gateway is integrated into the configuration software with the aid of the associated GSDML file.

*EtherCAT-side*

*Ethernet-side*



Model	Cat.No.
EtherCAT-Gateway	10966



# Pilot ONE®

Tmin -55°C | Tmax 2

huber

1 0

T Prozess

-35

Intern -35.64

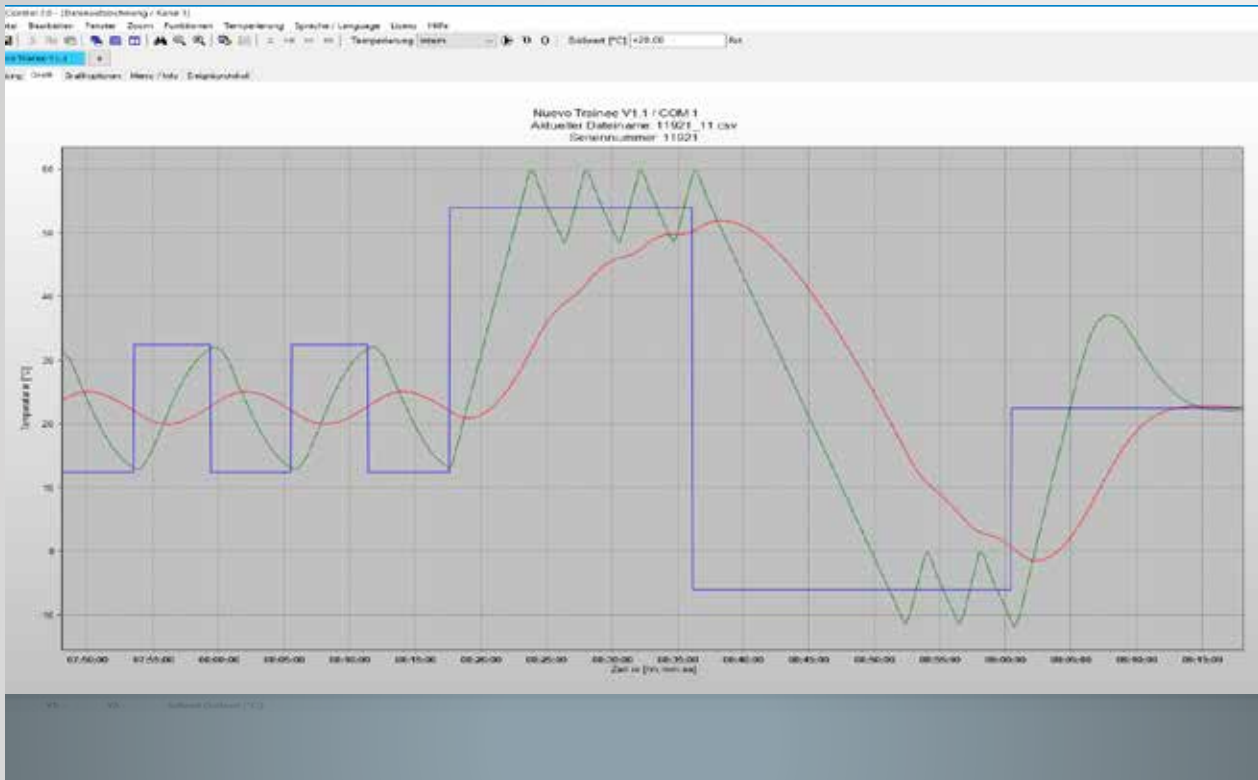
ollwert -35.00 °C



→ You will find more information in the respective operating instructions of the gateway on our website

# Software

## Data communication



## SpyControl

SpyControl is a software solution for Windows PCs for device control as well as for the visualisation and documentation of process-relevant data. Communication with the temperature control unit takes place via RS232, USB or TCP/IP. Recorded data are displayed over time, with the axes of the diagram being freely scalable. A zoom function simplifies the graphic evaluation of individual time segments.

The free version allows the control of a maximum of one device. The paid full version (license key required) can communicate with up to 10 devices at the same time and offers additional functions. A setpoint specification, a start/stop function and a switchover between internal and process temperature control are possible for each channel. The

temperature values and other process data can be recorded and saved as a CSV file. Using a programmer function with a user-friendly graphic editor, an automatically running temperature profile can be specified (for max. 1 channel).

SpyControl is available as a download from the Huber website. The free version is included in the download (max. 1 device) as well as a 30-day trial version of the paid full version (max. 10 devices). If you want to continue using the full version after the test period has expired, you will need to purchase a license key.

Description	Cat.No.
SpyControl full version license key (10 channels)	66108



## Pilot Remote Software

The Pilot Remote software enables the complete remote control of Huber temperature control units with Pilot ONE via any PC/laptop with Microsoft Windows.

The familiar Pilot ONE user interface is displayed on the PC, i.e. identical operation on PC and temperature control unit. Communication takes place via an Ethernet network connection with secure authentication and encryption.

The software is executable under Microsoft Windows 7/8/10 (32/64 bit). To operate the software, the E-grade Remote GUI must be activated on the connected Pilot ONE units. A 30-day evaluation version can be activated directly on the Pilot ONE free of charge.

Description	Cat.No.
Pilot Remote Software	free
E-grade Remote GUI	520450



## python™ PyCommand

This Python programming example makes it easier to familiarise yourself with the subject of interface communication (Ethernet, RS232, USB) with Huber temperature control devices. The components Python 2.7.4 and pySerial 2.6 from the runtime package are required.

PyCommand is a graphic program as an aid for Huber command sets. With the software, individual commands can be sent to Huber devices and commands can be tried out without having to program. The program can be used with the interfaces RS232, USB and Ethernet.

With PySoftcheck, a free Python programming example is also available as a download, which facilitates familiarization with the topic of interface communication (Ethernet, RS232, USB) with Huber temperature control units. The components Python 2.7.4 and pySerial 2.6 from the Runtime Package are required.

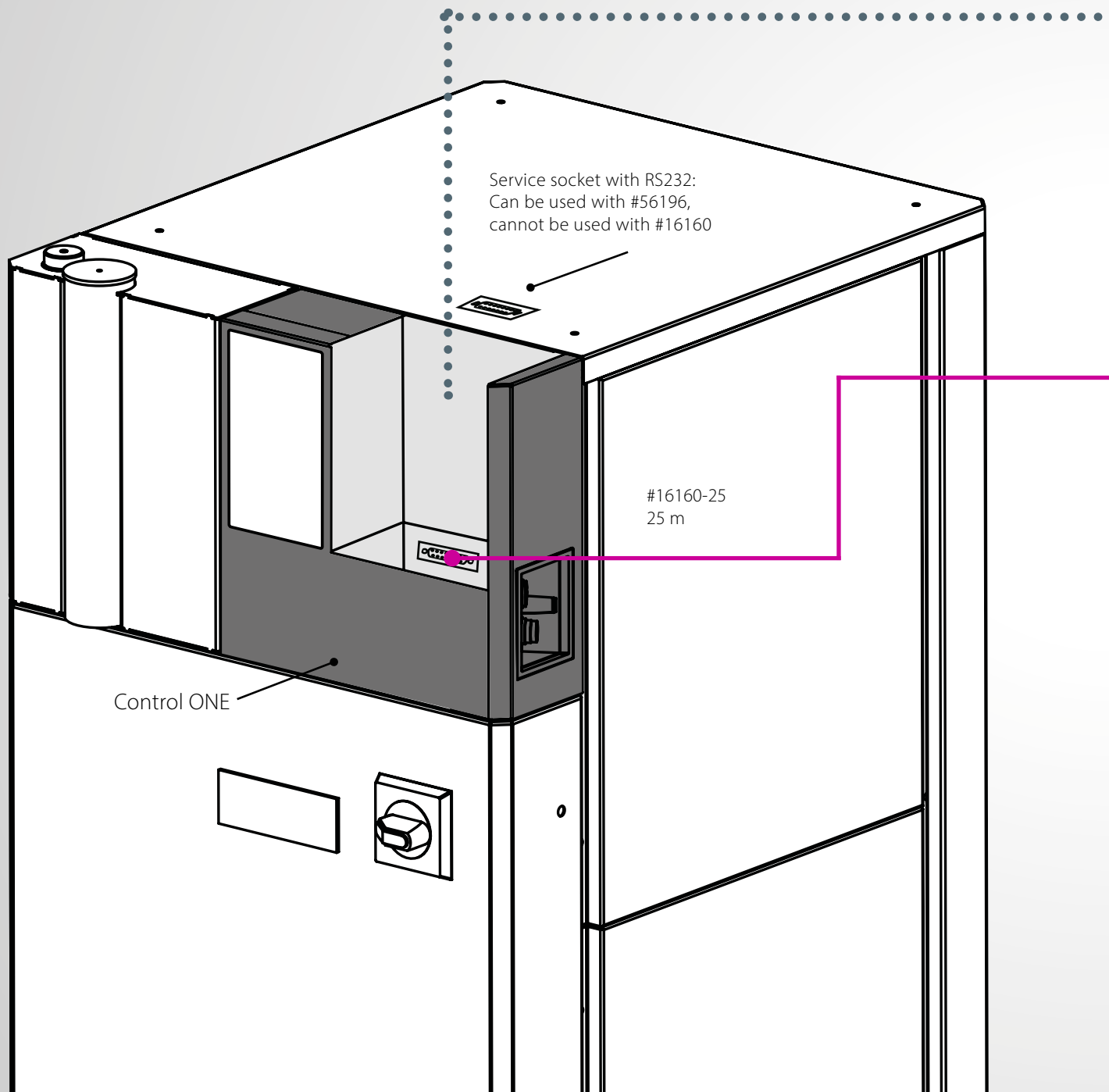
➔ Free download on [www.huber-online.com](http://www.huber-online.com)

# Connection / Accessories

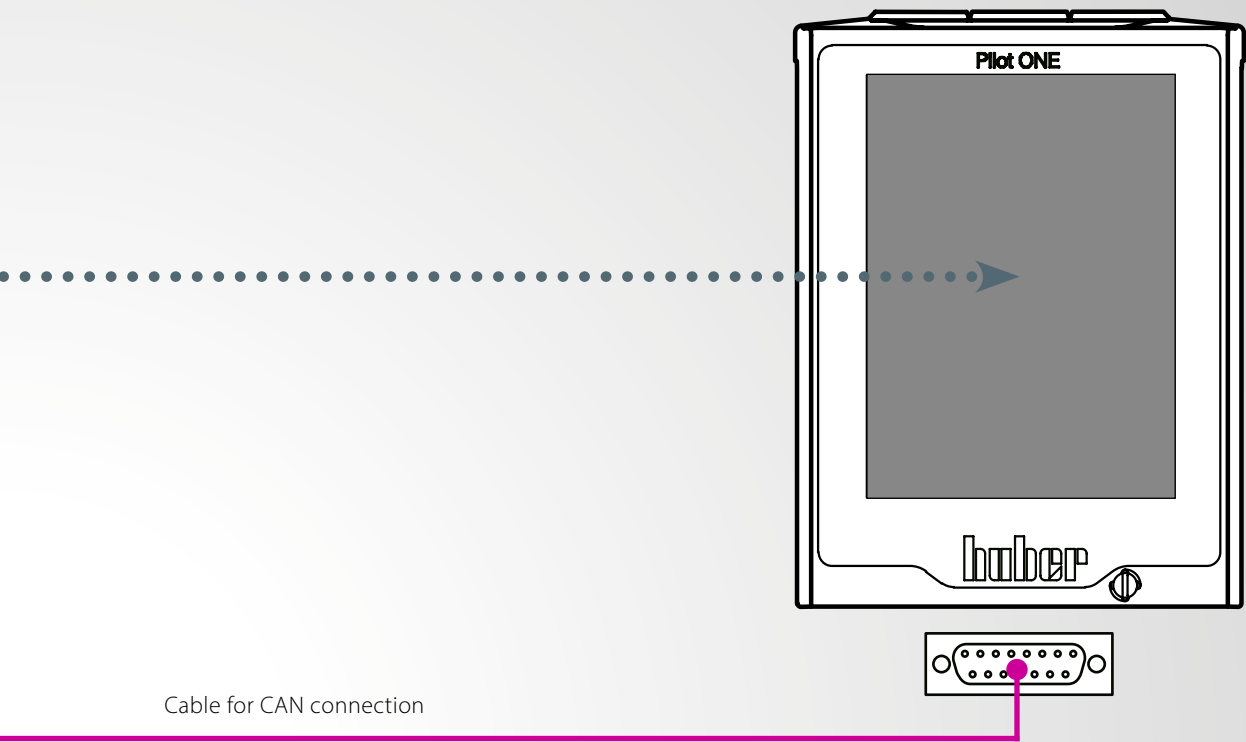
## Remote operation

### Standard variant

Modules that are connected as accessories to devices with Pilot ONE communicate via an internal CAN bus. For remote operation, please note that the RS232 interface can only be used in conjunction with a special cable. The interfaces on the Pilot ONE (USB / Ethernet) can be used without restrictions.



via internal CAN bus - only for units with Pilot ONE®



Cable for CAN connection

Item	Length	Cat.No.
Extension cable for controller Pilot ONE for using the controller as remote control	3 m (Standard) 5 m (Optional) 10 m (Optional) 15 m (Optional) 20 m (Optional) 25 m (Optional) 30 m (Optional)	16160
RS232 only possible with	0,5 m (Optional) 1 m (Optional) 3 m (Standard) 5 m (Optional) 6 m (Optional) 10 m (Optional)	56196

★ Note:

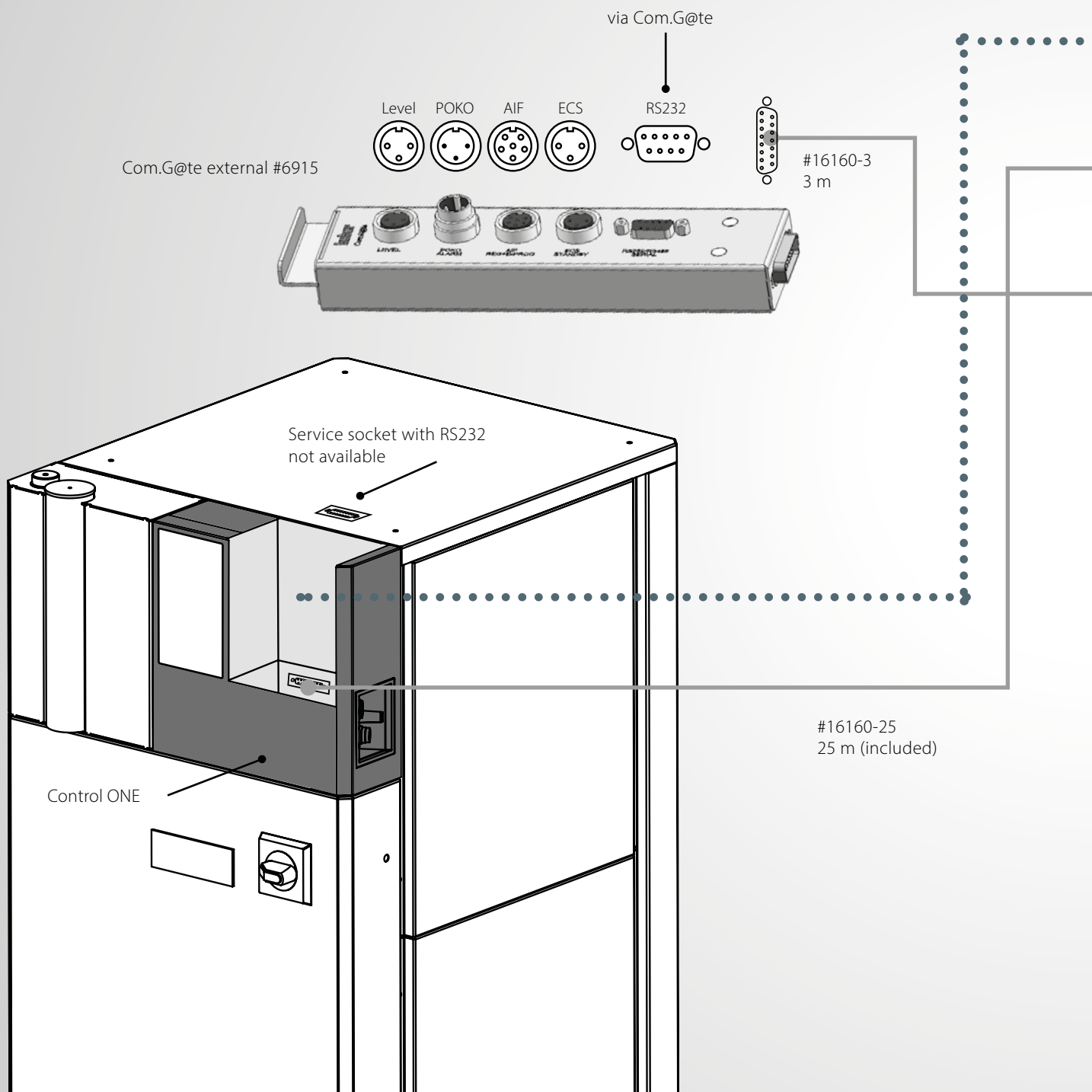
If only the Pilot ONE is remote, no CAN switch is necessary. However, this can be retrofitted at any time if necessary.

# Connection / Accessories

## Remote operation

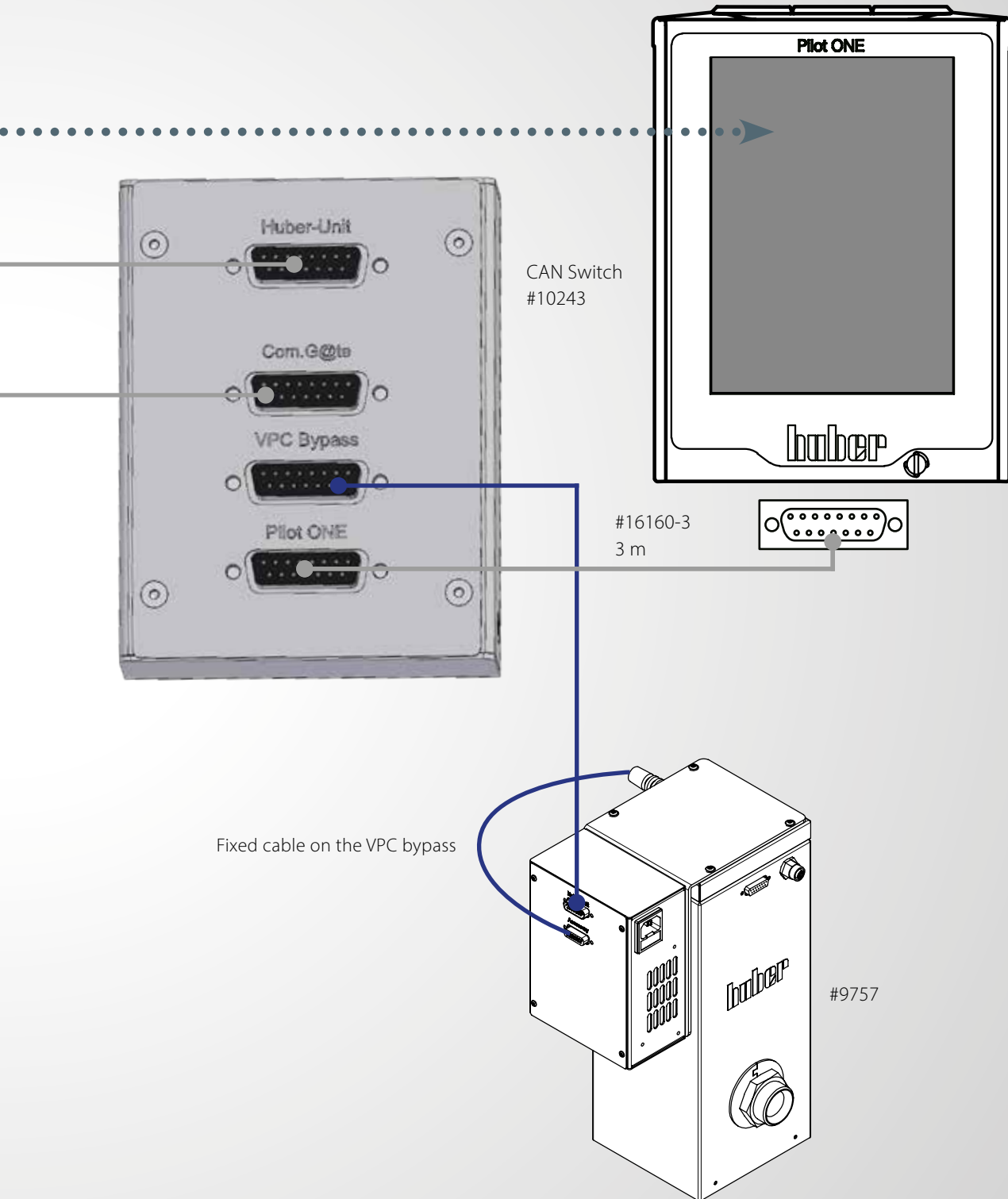
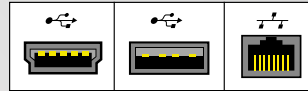
### Example variant

The Pilot ONE is used in remote operation and expanded with a Com.G@te and a VPC bypass for pressure control. A CAN switch is required for this.





USB and Ethernet can both be used without restriction



Fixed cable on the VPC bypass

CAN Switch  
#10243

#16160-3  
3 m

#9757

Inspired by **temperature**  
designed for you



**Peter Huber Kältemaschinenbau SE**

Werner-von-Siemens-Str. 1 · 77656 Offenburg / Germany

Phone +49 (0)781 9603-0 · Fax +49 (0)781 57211

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