Inspired by **temperature**

Connectivity

Data communication solutions for temperature control devices

huber

Connectivity

Introduction

Table of contents

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	all	RJ45 Ethernet	–	Huber: PB, PP, LAI	
				Modbus TCP	
				OPC UA	
				Profinet	
				EtherCAT	
Pilot ONE	all	USB	–	Huber: PB, PP, LAI	
Pilot ONE	all	–	Digital input: ECS Digital output: POKO Analogue interfaces: 1 input, 3 outputs 4 -20 mA / 0 -10 V (switchable) RS232 interface	Huber: PB, PP, LAI	
Pilot ONE	all	–	Digital input: ECS Digital output: POKO RS232 interface	Huber: PB, PP, LAI	

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	–	from Basic
none	–	OPC UA
Ethernet to Profinet Gateway	#10965	from Basic
Ethernet to EtherCAT Gateway	#10966	from Basic
–	–	from Basic
Com.G@te D/A external	#519484	from Basic
Com.G@te D/A internal	#509056	from Basic
Com.G@te D internal	#519485	from Basic

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 (Lemosa)	✓	✓	✓	✓
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.

RJ45 Ethernet (RJ45)

Standard LAN connection, no driver required.
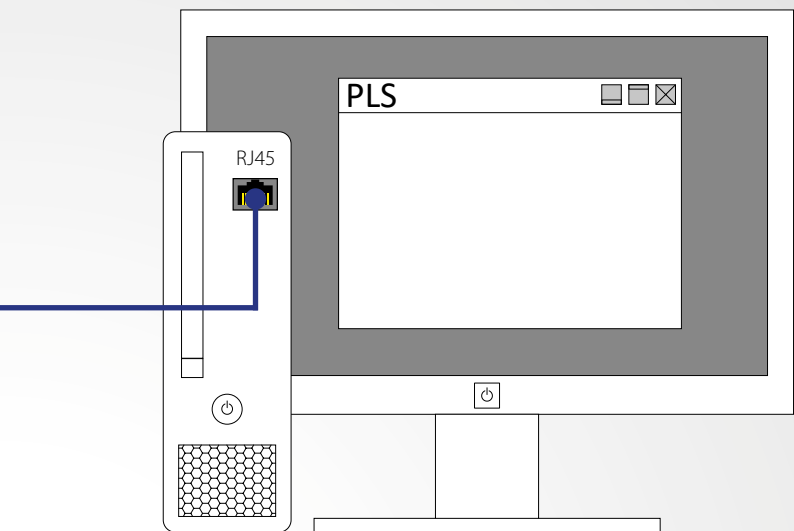The following components are used for an Ethernet setup:
• Cable with RJ45 connector
• Commercially available switch -> when connecting several Pilot ONEs

TCP-IP Setup
Modbus TCP Setup
OPC UA Setup

Standard Ethernet Switch

Pilot ONE

Pilot ONE

Pilot ONE

only for units with Pilot ONE®

PLS
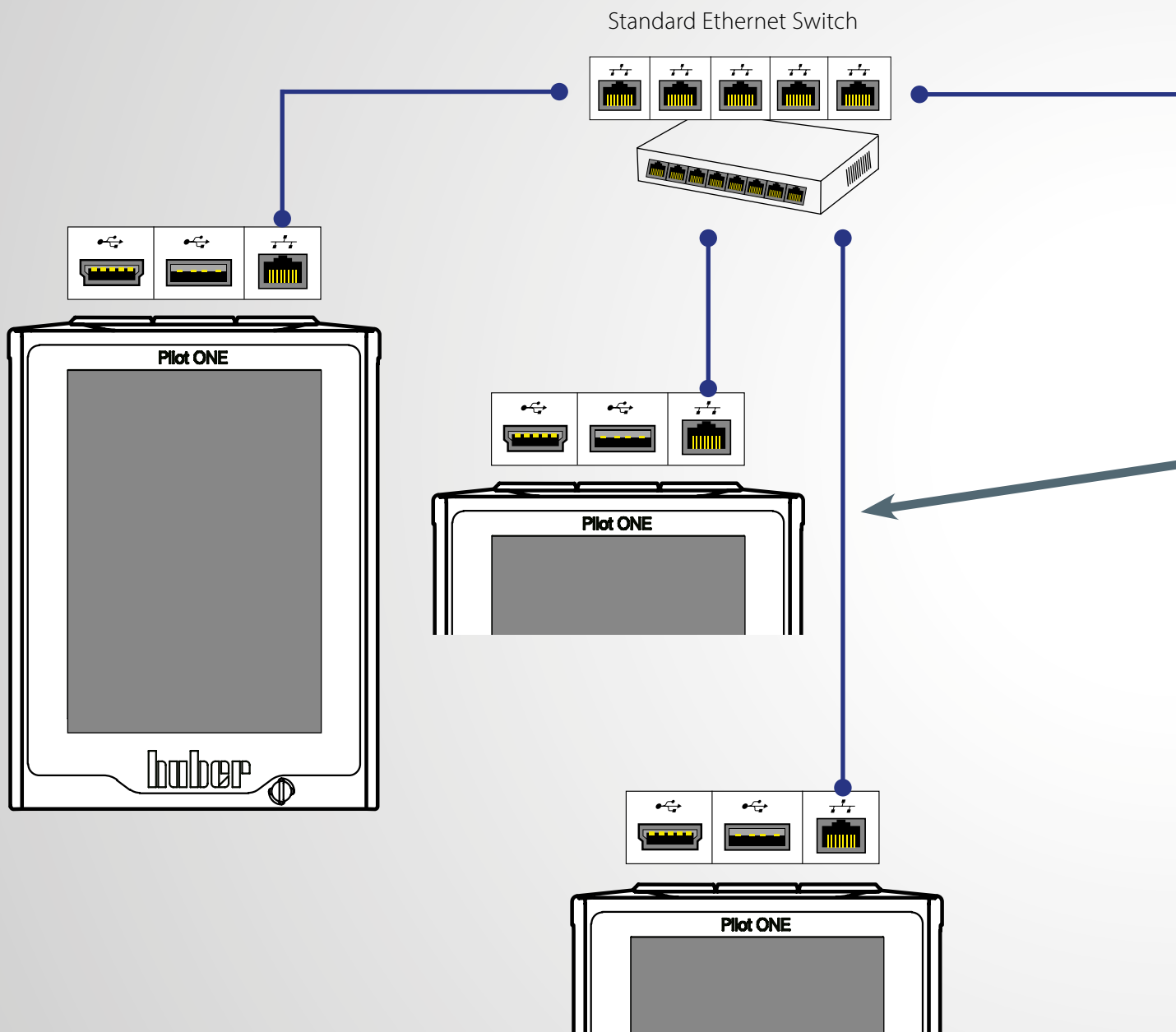
Computer or PLC with Ethernet interface

RJ45

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

Known standard interface
Point-to-point connection
Various Sub-D connectors: 15 pin on the service socket or 9 pin on the ComG@te

PLS

Control line RS232
9 pin / 15 pin
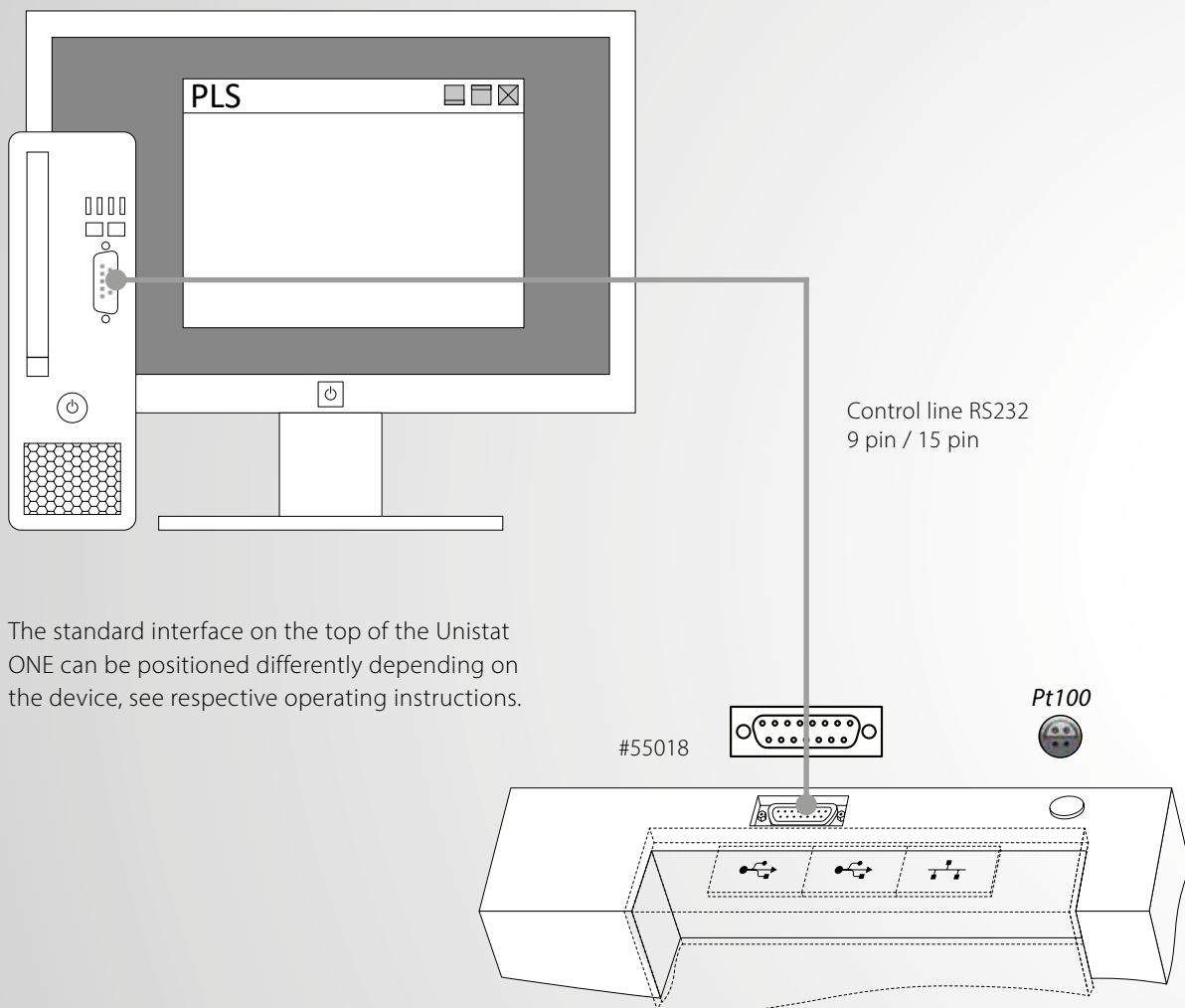
The standard interface on the top of the Unistat
ONE can be positioned differently depending on
the device, see respective operating instructions.

Pt100

#55018

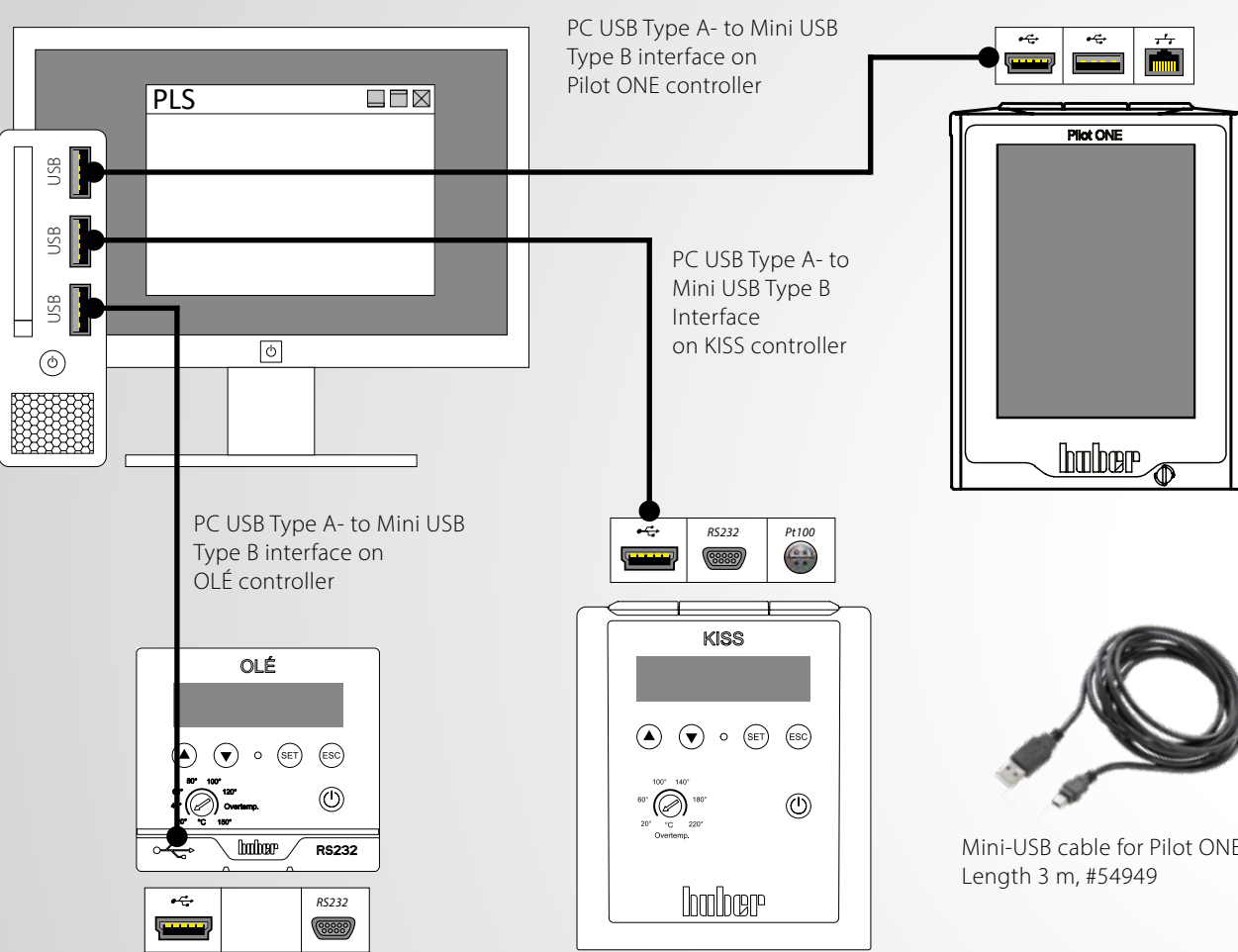| Protocol	Controller	Socket type	Additional hardware	Additional E-grade
Huber: PP, LAI	KISS, OLÉ	9 polig Sub-D*	none	none
Huber: PB, PP, LAI	Pilot ONE	15 polig Sub-D	none	command dependent
Huber: PB, PP, LAI	Pilot ONE	9 polig Sub-D*	none	command dependent

*unit dependent

KISS®- / OLÉ-Controller

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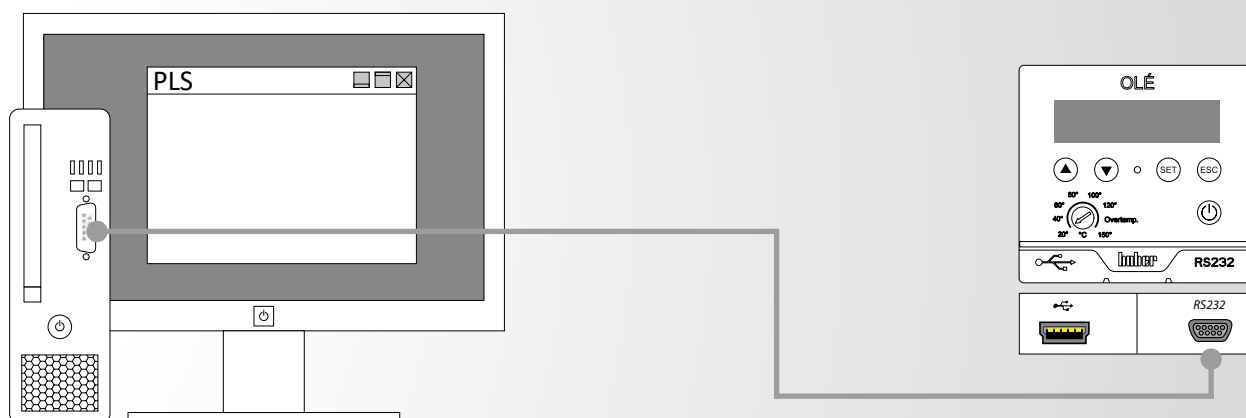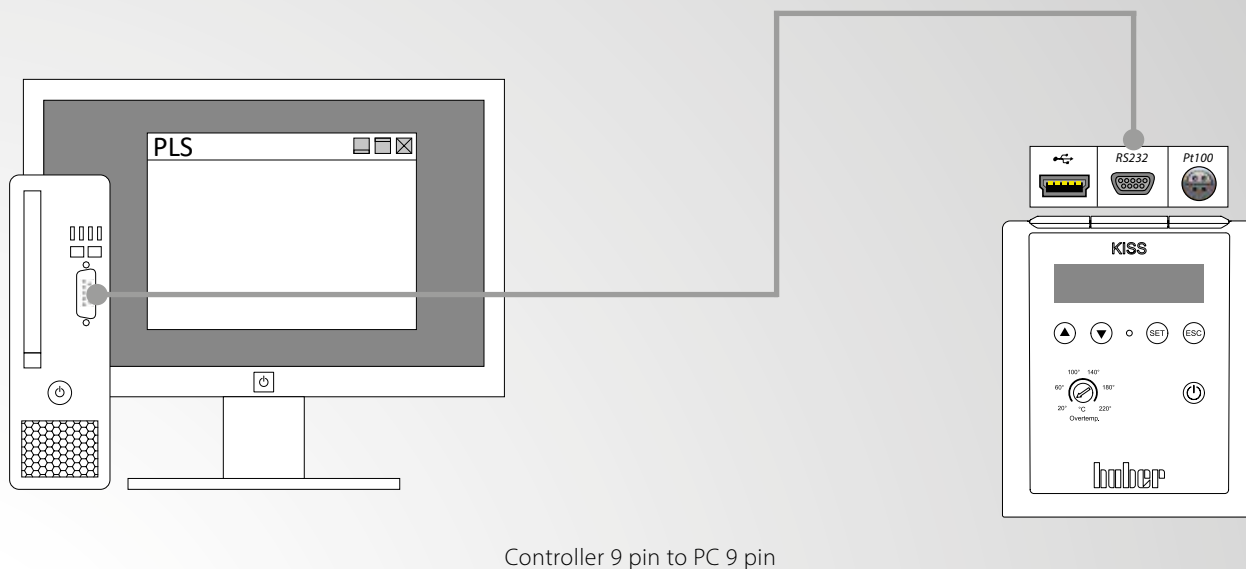
Control cable	Length	Cat.No.
Serial data transfer from device 15 pin Sub-D connector to PC / Notebook 9 pin Sub-D socket	3 m	55018
	5 m	55018-5
	10 m	55018-10
Serial data transmission from device / Com.G@te 9 pin Sub-D connector to PC / Notebook 9 pin Sub-D socket	3 m	6146
	5 m	6146-5
	10 m	6146-10

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.

PC USB Type A- to Mini USB Type B interface on Pilot ONE controller

PC USB Type A- to Mini USB Type B Interface on KISS controller

PC USB Type A- to Mini USB Type B interface on OLÉ controller

Mini-USB cable for Pilot ONE
Length 3 m, #54949

| 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.

PLS

USB-RS232 Converter

#6146

RS232

Pt100

KISS controller

KISS
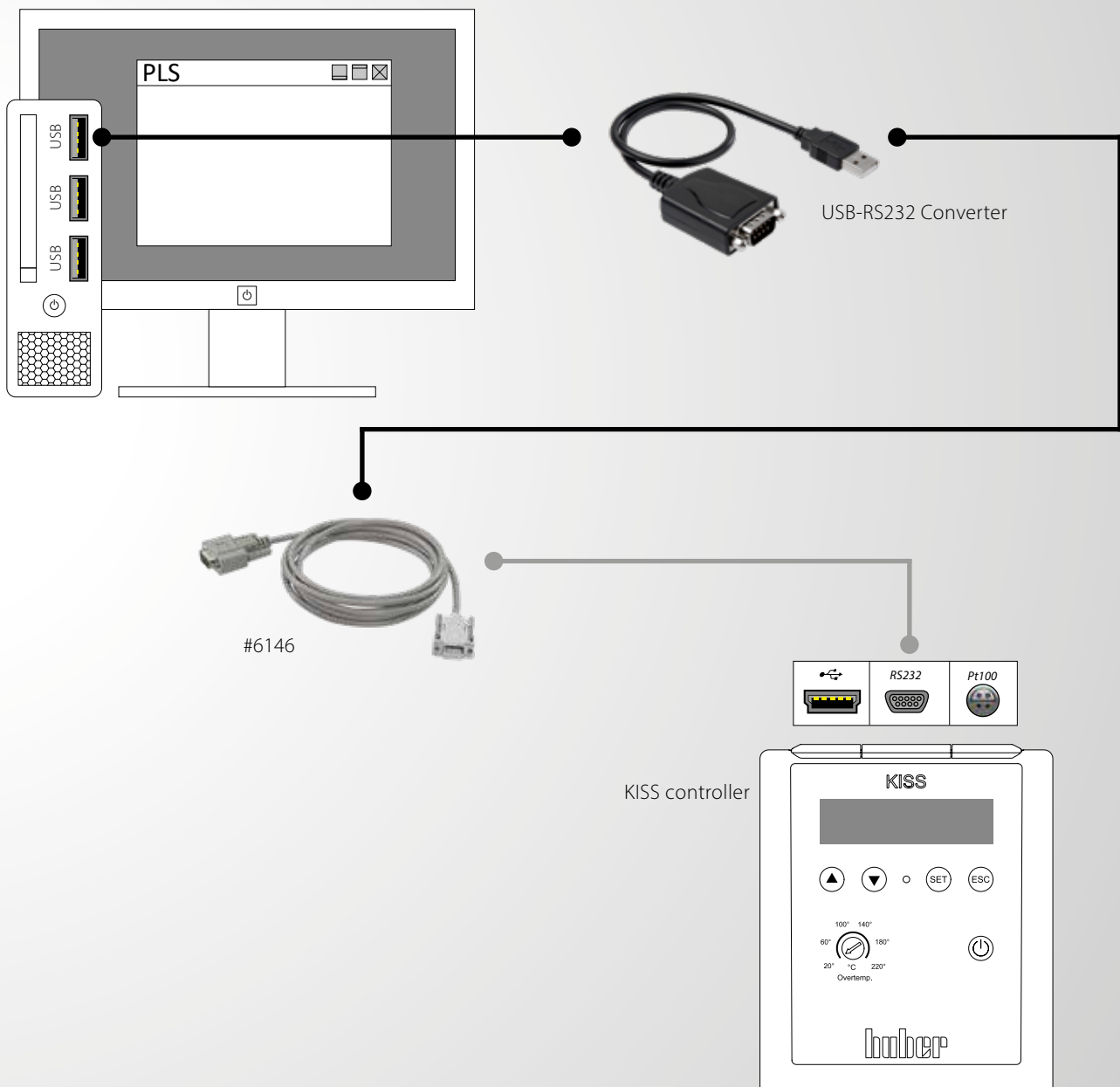
Interfaces
Com.G@te

Units with the Pilot ONE controller have USB and LAN connections fitted as standard. For applications where additional connections are required, depending on the model, the following optional interface modules are available:

Com.G@te D/A intern
Com.G@te D/A extern

- Digital input: ECS
- Digital output: POKO
- Analogue interface:
  - 1 input 4-20 mA / 0-10 V (switchable)
  - 3 outputs 4-20 mA / 0-10 V (switchable)
- RS232 interface
- Up to three Com.G@tes can be combined per temperature control unit, depending on the version of the temperature control unit

Com.G@te D internal
- Digital input: ECS
- Digital output: POKO
- RS232 interface
- Up to three Com.G@tes can be combined per temperature control unit, depending on the version of the temperature control unit

Interface module	Cat.No.
Com.G@te D/A internal	509056
Com.G@te D/A external	519484
Com.G@te D internal	519485

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

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.

AIF #9353   ECS #9491   POKO #9490

Interfaces
Profibusgateway

Only for units with Pilot ONE

Two versions are available:

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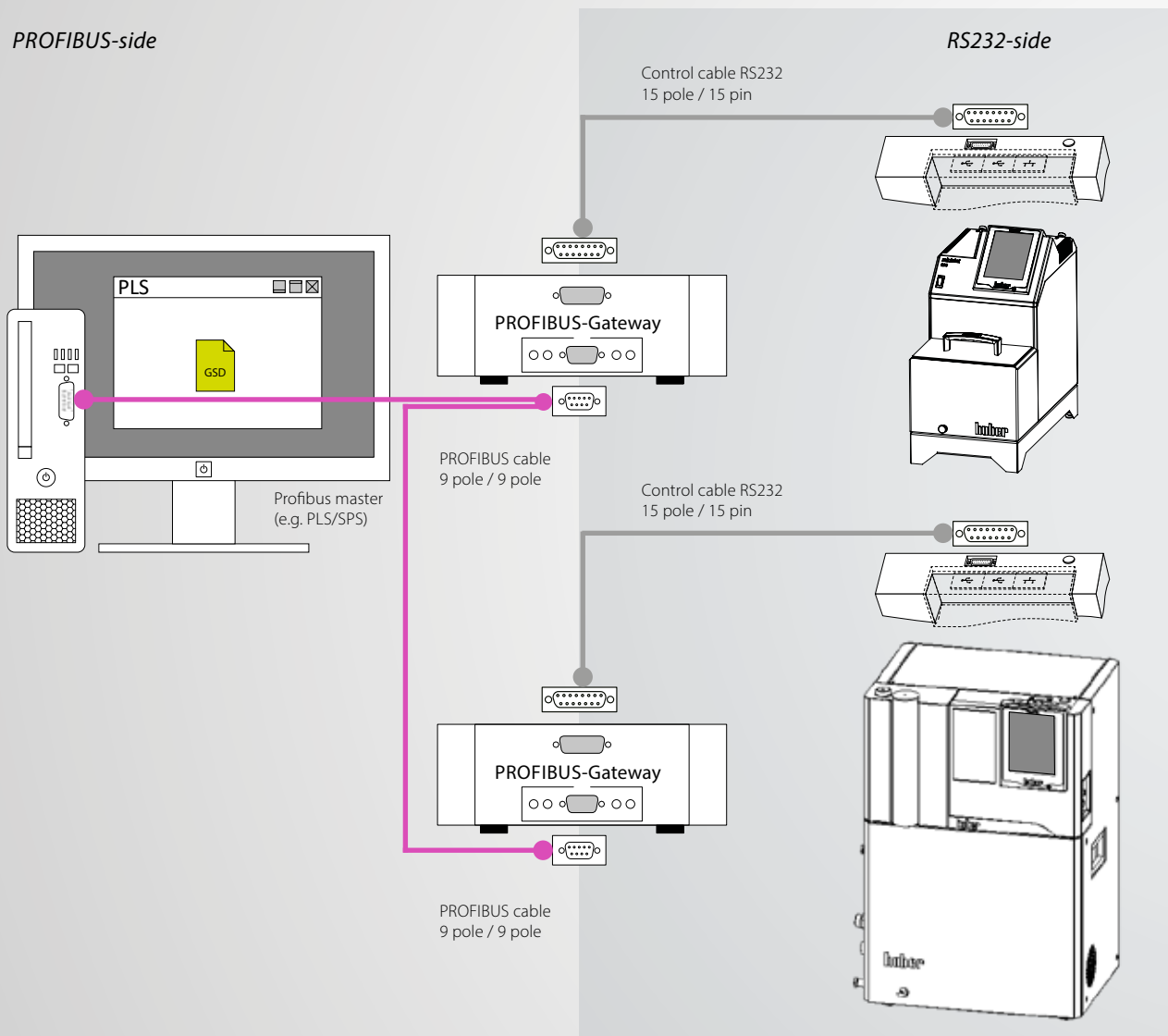Preconfigured parameter list for cyclic Profibus communication. Profibus master must support Profibus DP-V0.

Profibusgateway DP-V1:
Configurable parameters via acyclic Profibus communication.
Profibus master must support Profibus DP-V1.

PROFIBUS-side

RS232-side

Control cable RS232
15 pole / 15 pin

PLS

GSD

PROFIBUS-Gateway

Profibus master
(e.g. PLS/SPS)

PROFIBUS cable
9 pole / 9 pole

Control cable RS232
15 pole / 15 pin

PROFIBUS-Gateway

PROFIBUS cable
9 pole / 9 pole

| 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.

PROFINET-side   *Ethernet-side*

PROFINET-Gateway
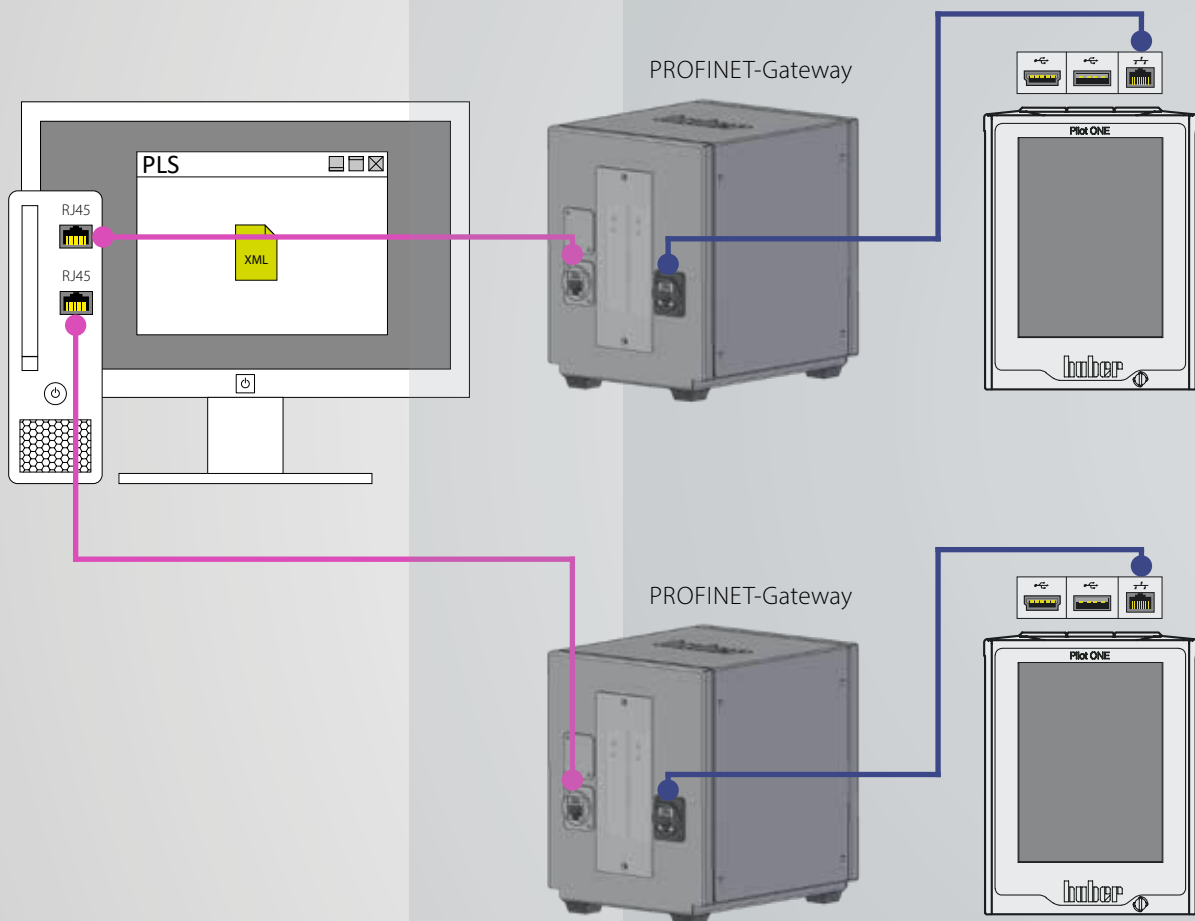
PROFINET-Gateway

Model	Cat.No.
PROFINET-Gateway	10965

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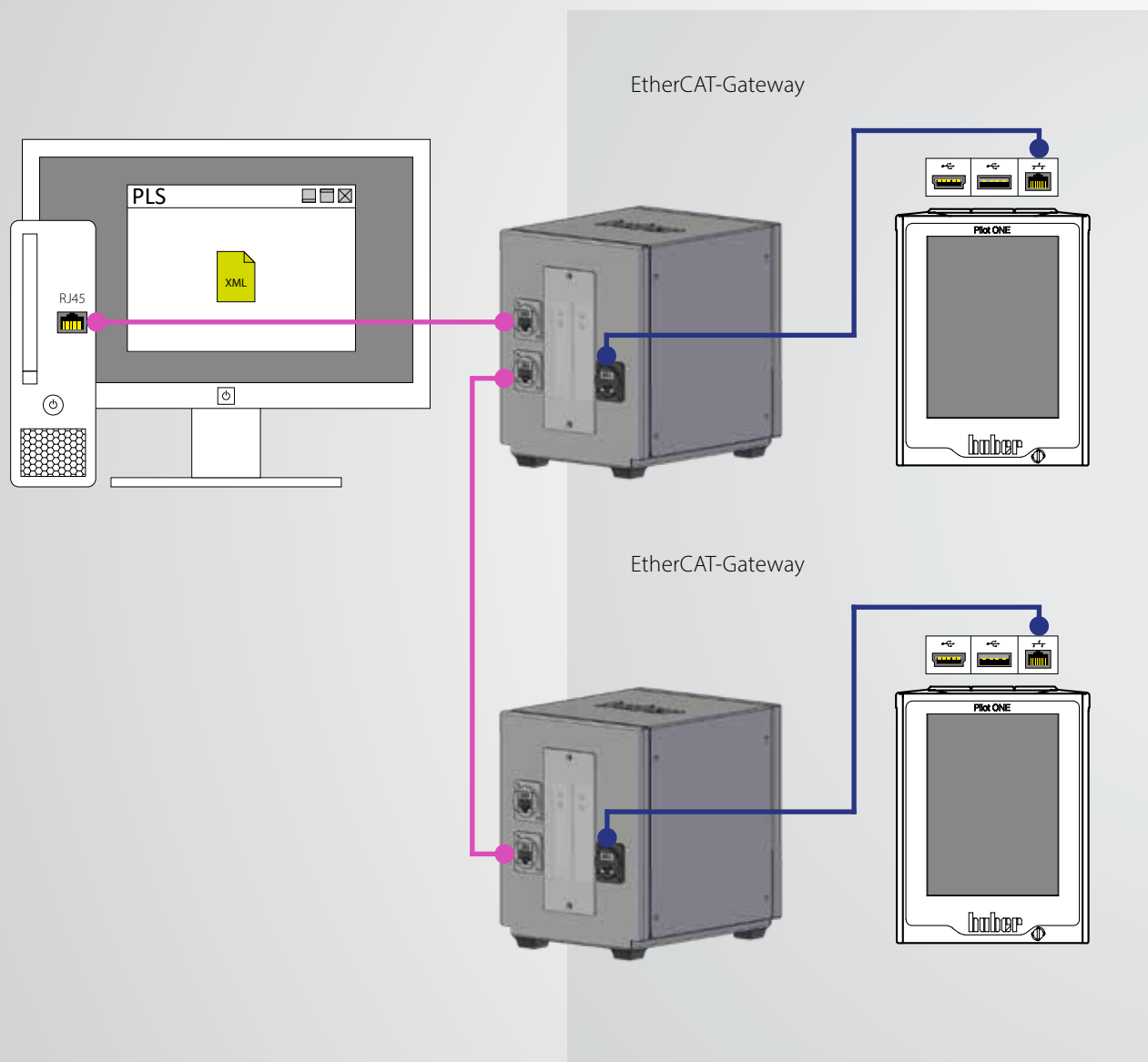of the gateway on our website

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

EtherCAT
Out

EtherCAT
In

RJ45 Ethernet
Pilot One
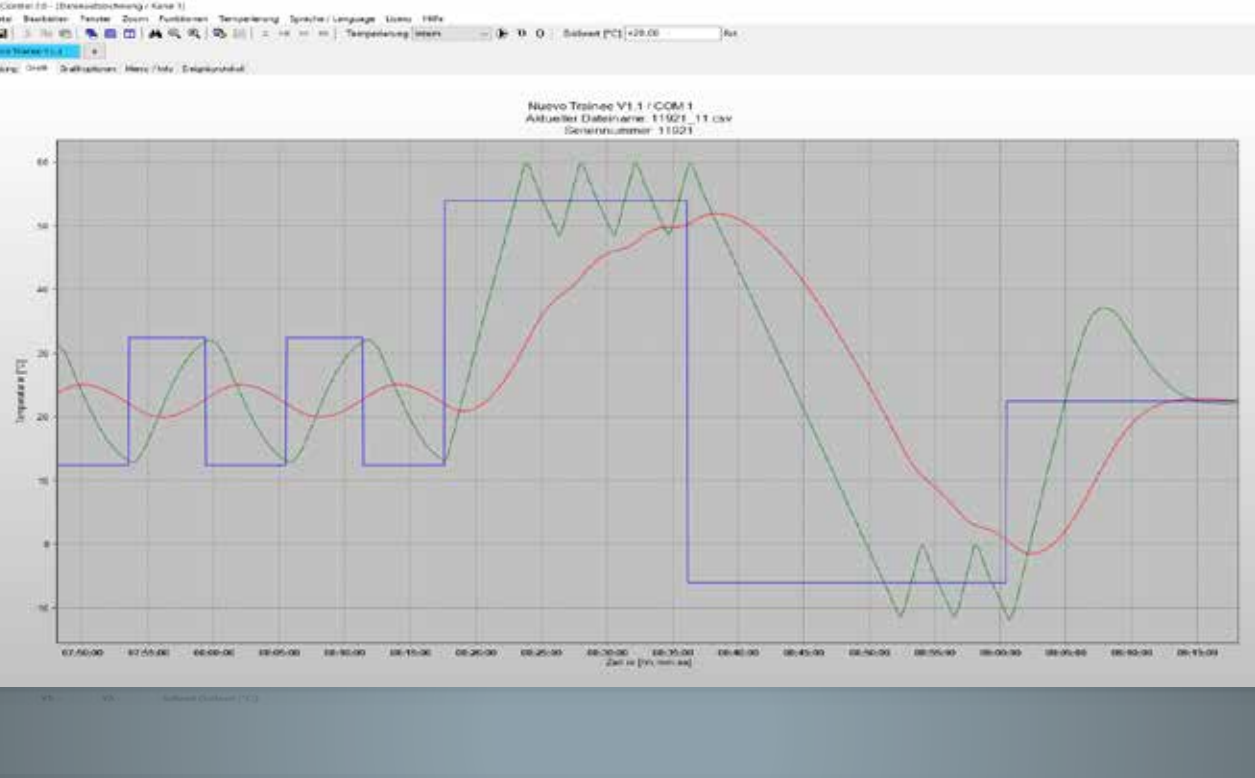
Prozess -35

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 visualisation and documentation of process relevant data. Communication with the temperature control unit occurs over RS232, USB or TCP/IP. Recorded data are displayed over a time axis, with freely scalable axes of the diagram. A zoom function simplifies the graphical evaluation of individual time segments.

The charged full version (license key required) supports the communication with up to 10 devices simultaneously and offers additional functions. The setpoint can be specified for each channel. In addition, a start/stop function and a switchover between internal and process temperature control is possible. The temperature values and other pro-

cess data can be recorded and stored as CSV file. A programmer function with user-friendly graphic editor can be used to create a self-running temperature profile.

The installation package includes a free version for recording from one device as well as a 30-day trial of the full version. If you want to continue using the trial version after the trial period has expired, you must 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.

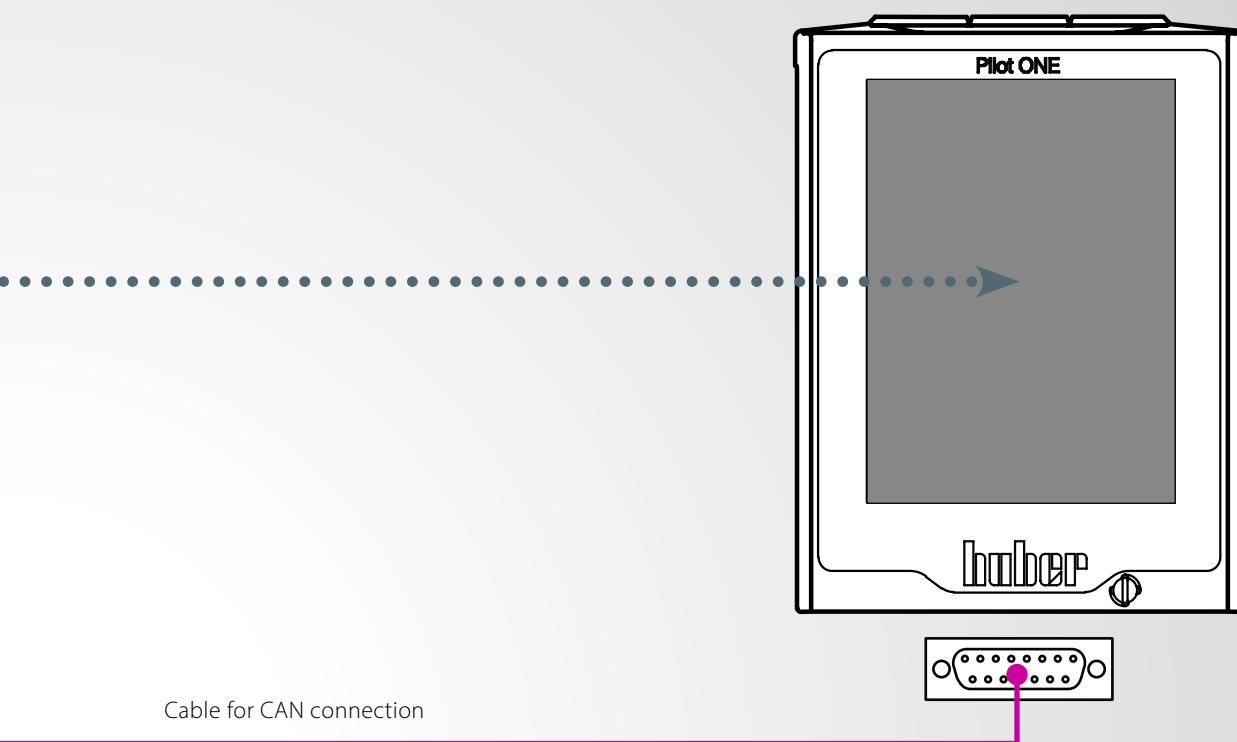➲ Free download on www.huber-online.com

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.

Service socket with RS232:
Can be used with #56196,
cannot be used with #16160

#16160-25
25 m

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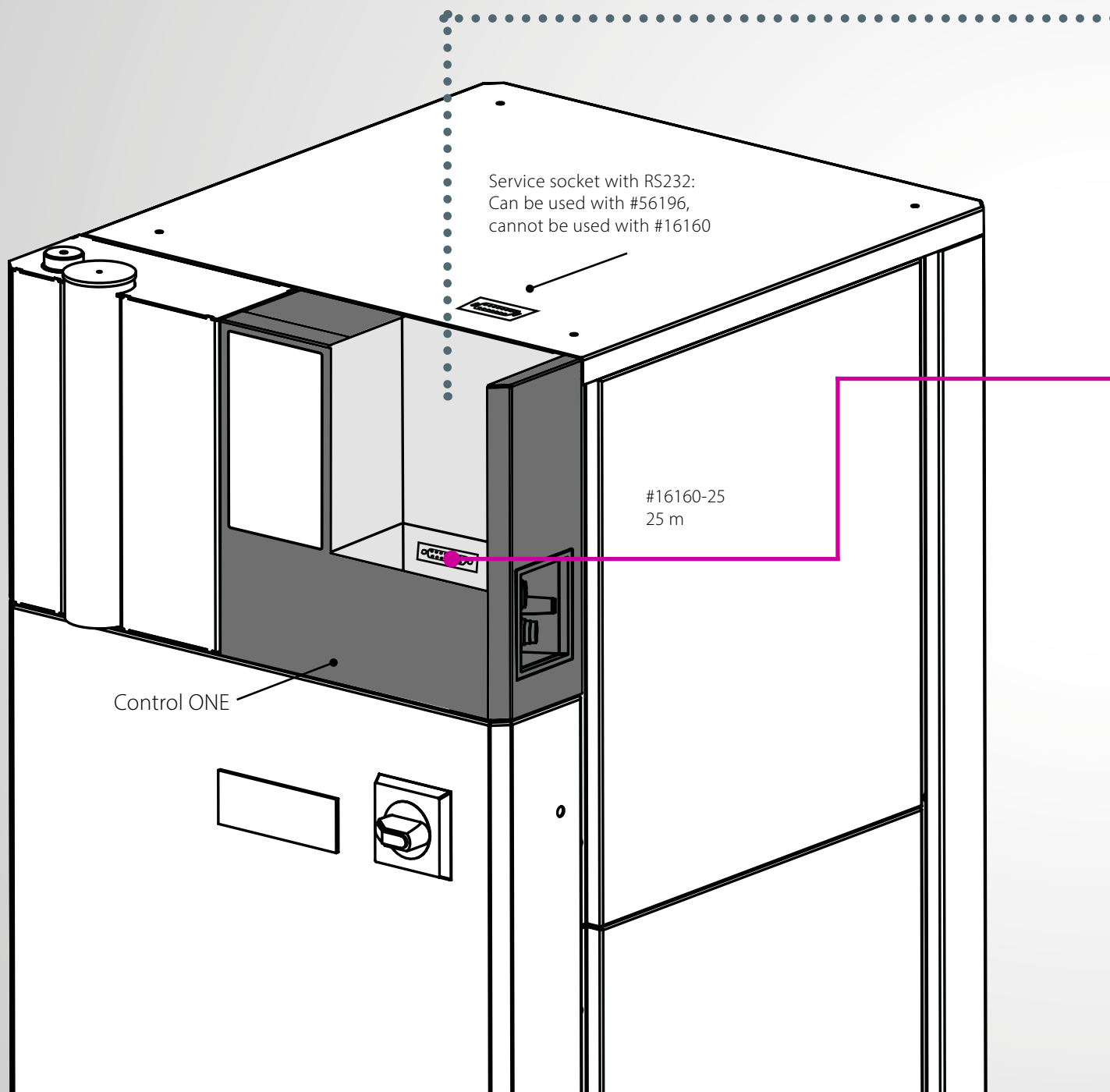
via internal CAN bus - only for units with Pilot ONE®

Pilot ONE

huber

Cable for CAN connection

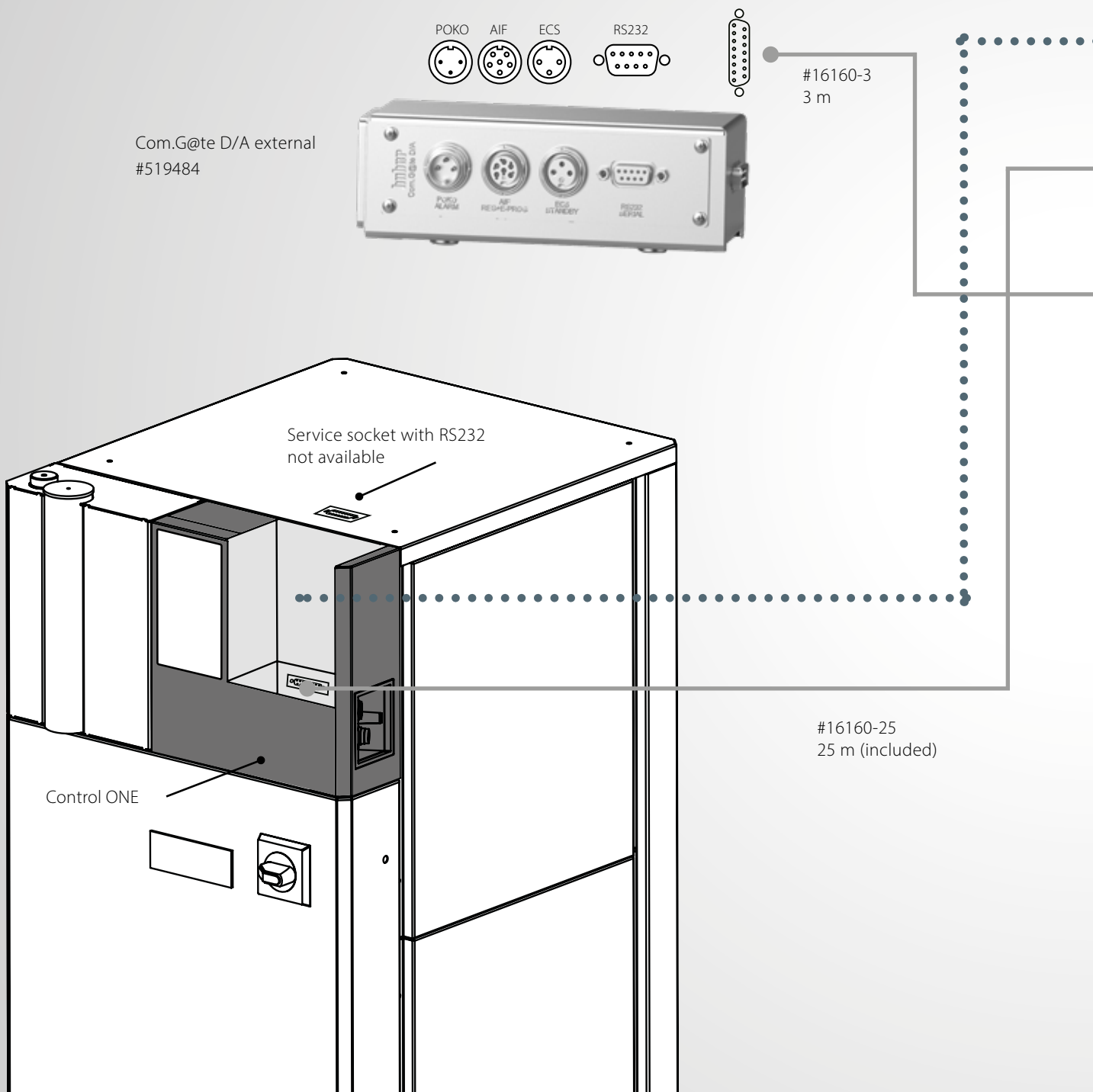| Item	Length	Cat.No.
Extension cable for controller Pilot ONE for using the controller as remote control	3 m (Standard) 5 m (Optional) 10 m (Optional) 15 m (Optional) 20 m (Optional) 25 m (Optional) 30 m (Optional)	16160
RS232 only possible with	0,5 m (Optional 1 m (Optional) 3 m (Standard) 5 m (Optional)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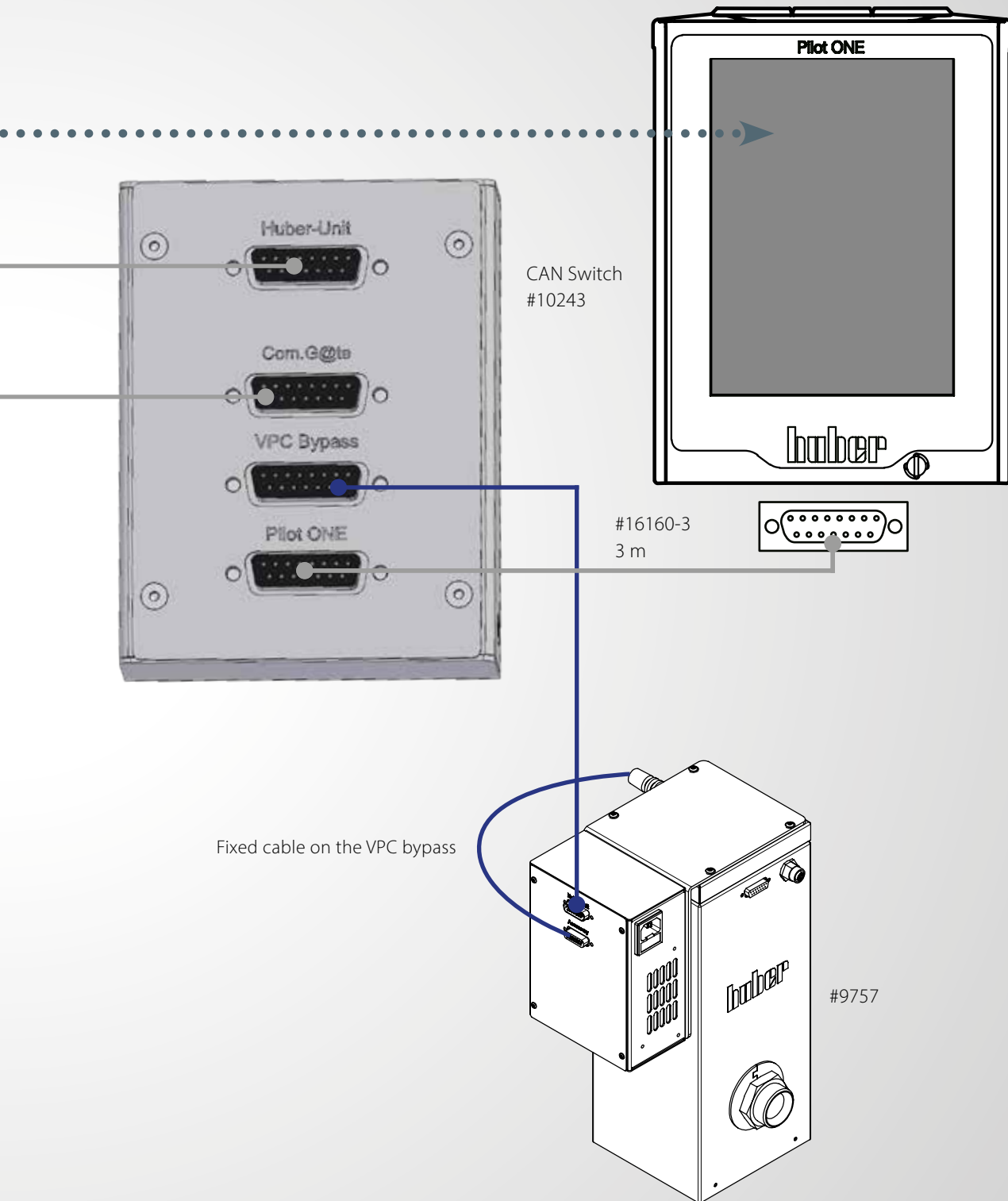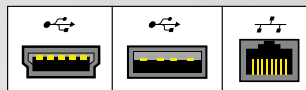
Connection / Accessories
Remote operation

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.

POKO   AIF   ECS   RS232

#16160-3
3 m

Com.G@te D/A external
#519484

Service socket with RS232
not available

#16160-25
25 m (included)

Control ONE

USB and Ethernet can both
be used without restriction

Pilot ONE

Huber-Unit

CAN Switch
#10243

Com.G@te

VPC Bypass

#16160-3
3 m

Pilot ONE

Fixed cable on the VPC bypass

#9757

huber

Inspired by **temperature**
designed for you

huber