
# SUPPLEMENTARY INFORMATION

EN

Translation of the Original

# XPT 200 PB | CCT 36X PB | CCT 37X PB

**DigiLine gauge with Profibus interface**

PFEIFFER VACUUM

# Dear Customer,

Thank you for choosing a Pfeiffer Vacuum product. Your new gauge is designed to support you in your individual application with maximum performance and without malfunctions. The name Pfeiffer Vacuum stands for high-quality vacuum technology, a comprehensive and complete range of top-quality products and first-class service. From this extensive, practical experience we have gained a large volume of information that can contribute to efficient deployment and to your personal safety.

In the knowledge that our product must avoid consuming work output, we trust that our product can offer you a solution that supports you in the effective and trouble-free implementation of your individual application.

Please read these operating instructions before putting your product into operation for the first time. If you have any questions or suggestions, please feel free to contact info@pfeiffer-vacuum.de.

Further operating instructions from Pfeiffer Vacuum can be found in the Download Center on our website.

# Disclaimer of liability

These operating instructions describe all models and variants of your product. Note that your product may not be equipped with all features described in this document. Pfeiffer Vacuum constantly adapts its products to the latest state of the art without prior notice. Please take into account that online operating instructions can deviate from the printed operating instructions supplied with your product.

Furthermore, Pfeiffer Vacuum assumes no responsibility or liability for damage resulting from the use of the product that contradicts its proper use or is explicitly defined as foreseeable misuse.

# Copyright

# Table of contents

# 1 About this manual

**IMPORTANT**
Read carefully before use.
Keep the manual for future consultation.

## 1.1 Validity

This supplementary information describes important deviations from the standard product and is valid only in conjunction with the valid operating instructions.

### 1.1.1 Applicable documents

| Designation | Document |
|---|---|
| Operating instructions for "Digital capacitive gauge" CCT 36x | BG 6011 |
| Operating instructions for "Digital capacitive gauge" CCT 37x | BG 6012 |
| Operating instructions for "Digital piezo-resistive gauge" CPT 200 | PG 0021 |
| Operating instructions for "Digital Pirani gauge" PPT 200 | PG 0022 |
| Operating instructions for "Digital piezo/Pirani gauge" RPT 200 | PG 0023 |
| Operating instructions for "Digital Pirani/Bayard Alpert gauge" HPT 200 | PG 0024 |
| Operating instructions for "Digital Pirani/cold cathode gauge" MPT 200 | PG 0025 |
| Declaration of conformity | A component of these instructions |

**Tbl. 1: Applicable documents**

You can find these documents in the Pfeiffer Vacuum Download Center.

### 1.1.2 Variants

This document applies to the following products:

- **DigiLine gauge with Profibus interface**

The part number is found on the rating plate of the product.

Pfeiffer Vacuum reserves the right to make technical changes without prior notification.

Information that relates to only one of the products is indicated accordingly.

The figures in this document are not to scale.

The figures show the product with a DN 16 ISO-KF vacuum connection, however, they also apply to the other vacuum connections where applicable.

Dimensions are in mm unless stated otherwise.

## 1.2 Conventions

### 1.2.1 Abbreviations

| Abbreviation | Explanation |
|---|---|
| ACK | Acknowledgement |
| BA | Bayard-Alpert |
| GND | Ground |
| GSD | Device master data (Profibus) |
| HV | High vacuum |
| IEEE | Institute of Electrical and Electronics Engineers |
| CC | Cold cathode |
| OR | Overrange |

| Abbreviation | Explanation |
| --- | --- |
| Pi | Pirani |
| Profibus DP | Profibus (process field bus) – non-local peripherals |
| TIA | Totally integrated automation |
| UR | Underrange |

**Tbl. 2: Abbreviations used**

## 1.3 Trademark proof

- Binder® is a trademark of Franz Binder GmbH + Co. Elektrische Bauelemente KG.
- Profibus® is a registered trade name of Profibus Nutzerorganisation e.V.
- TIA Portal® is a trademark of Siemens Aktiengesellschaft.

# 2 Product description

## 2.1 Function

It is possible to connect to a Profibus-DP system via the connector (M12, B-coded) designated "Profibus". The interface is galvanically safe and is isolated from the maximum supply voltage. The gauge's voltage supply is provided via the RS-485 connector.

### 2.1.1 Structure of the CCT gauge

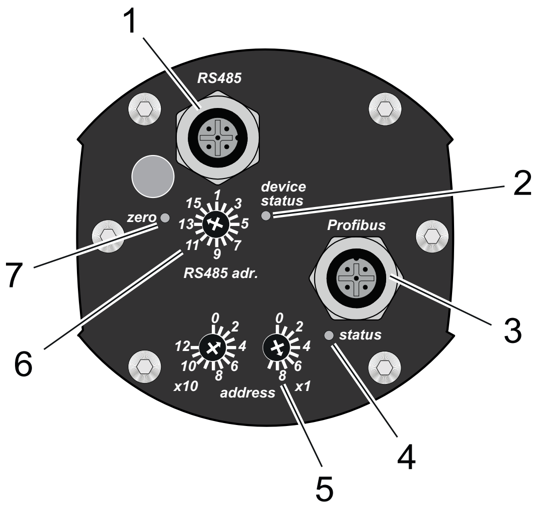



**Fig. 1: Structure of the CCT gauge**

1 "RS-485" connector
2 Status LED for the gauge
3 "Profibus" connection
4 Status LED for Profibus interface
5 Profibus address selector switch
6 RS-485 address selector switch
7 "Zero" button (calibration)

### 2.1.2 Structure of the xPT gauge

**Correction factor for gas type dependent gauges**

You can write the correction factors into the memory of the gauge via the serial interface. Information can be found in the corresponding operating instructions of the gauge standard version.

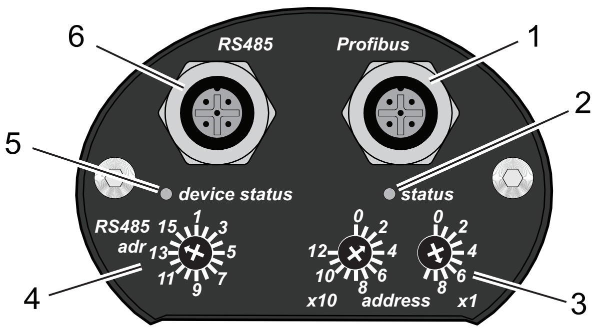



**Fig. 2: Structure of the xPT gauge**

1 "Profibus" connection
2 Status LED for Profibus interface
3 Profibus address selector switch
4 RS-485 address selector switch
5 Status LED for the gauge
6 "RS-485" connector

# 3 Installation

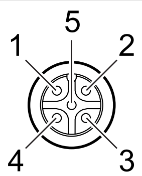
## 3.1 Establish Profibus connection

**NOTICE**

**Property damage on the electronics**

Separating all plug-and-socket connections within the bus system with voltage supply switched on may lead to the destruction of electronic components.

- ▶ Always disconnect the voltage supply before removing the connecting plug.
- ▶ After switching off the power supply pack, wait until the residual load has dispersed completely before disconnecting the plug-and-socket connection.

| | Pin | Assignment |
|---|---|---|
|   | 1 | +5 V DC |
| | 2 | RxD/TxD-N (received data and transmitted data, Line A) |
| | 3 | GND (for Pin 1) |
| | 4 | RxD/TxD-P (received data and transmitted data, Line B) |
| | 5 | not connected |

**Tbl. 3: Terminal lay-out of "Profibus" M12 connection**

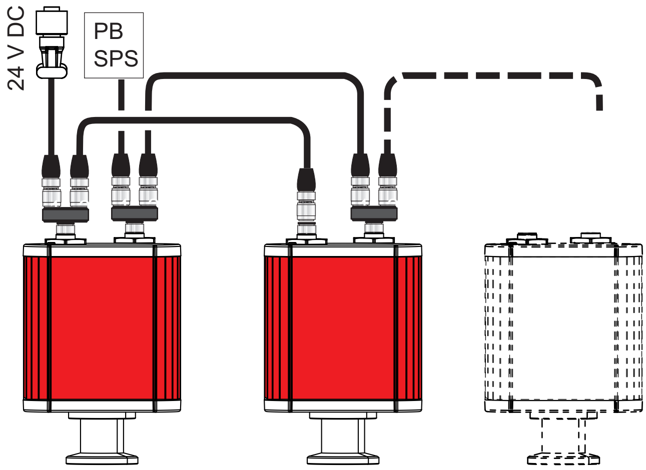



**Fig. 3: Connection diagram**

**Procedure**

1. Select a valid and unique Profibus address at the address selector switches in decimal coding from 1 to 125.
   – If you set the Profibus address while the voltage supply is switched on, the gauge only applies the address change after a restart (supply voltage off/on).
2. Fit the rubber plugs over the address selector switches straight and as deep as possible to achieve the stated protection degree.
3. Establish the Profibus connection in compliance with the applicable guidelines.
4. Connect the voltage supply to the gauge via the RS-485 connector in compliance with the regulations in force.
5. Use a suitable connection cable and components from the Pfeiffer Vacuum line of accessories.

## 3.2 Configure Profibus connection for CCT gauges

**Profibus configuration tools**

There are various suppliers of configuration tools for configuring the Profibus. The configuration procedure is identical. The figures show the Siemens TIA portal by way of an example.

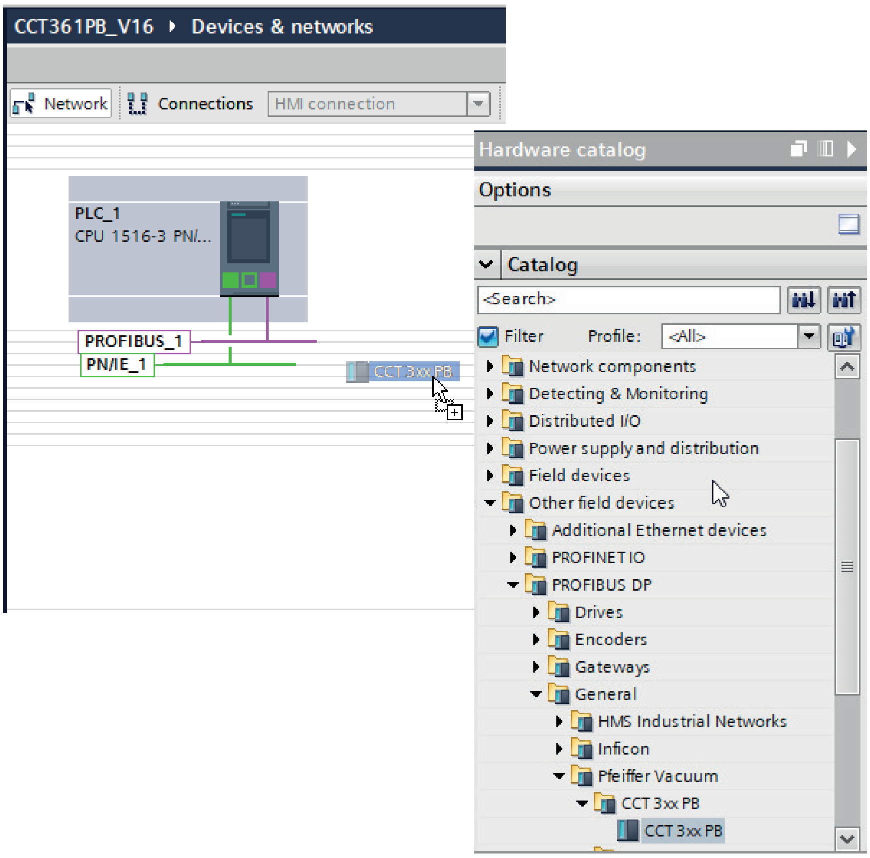



**Fig. 4:** **Drag & drop gauge into network area**

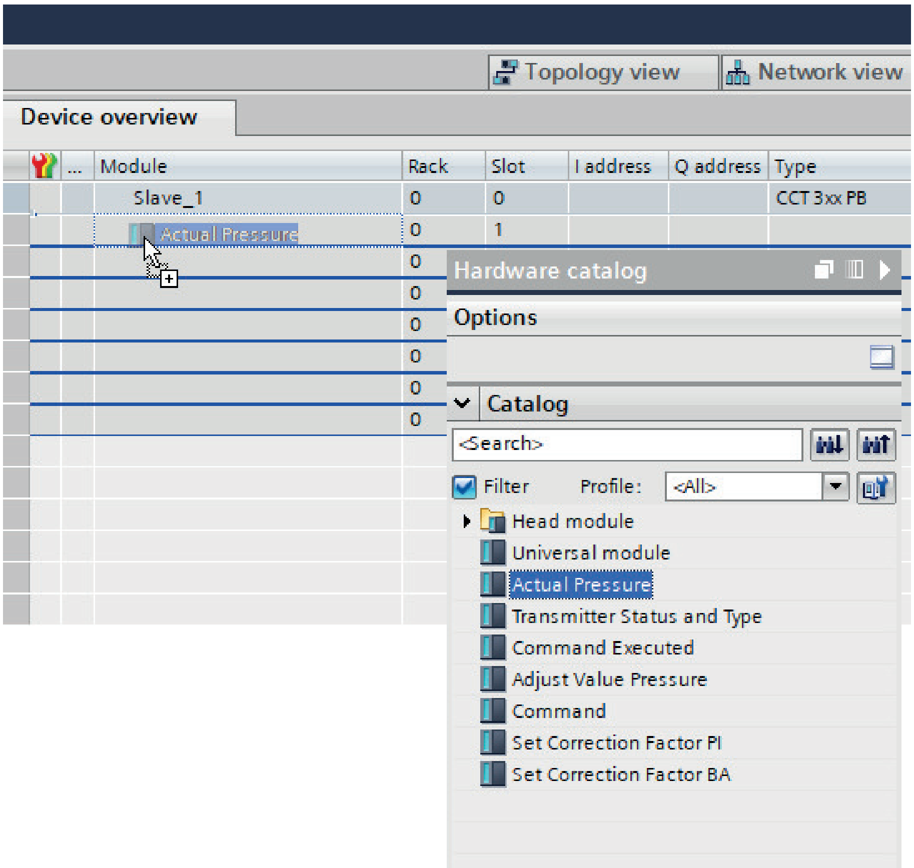



**Fig. 5:** **Drag & drop input and output modules into slots1 to 7.**

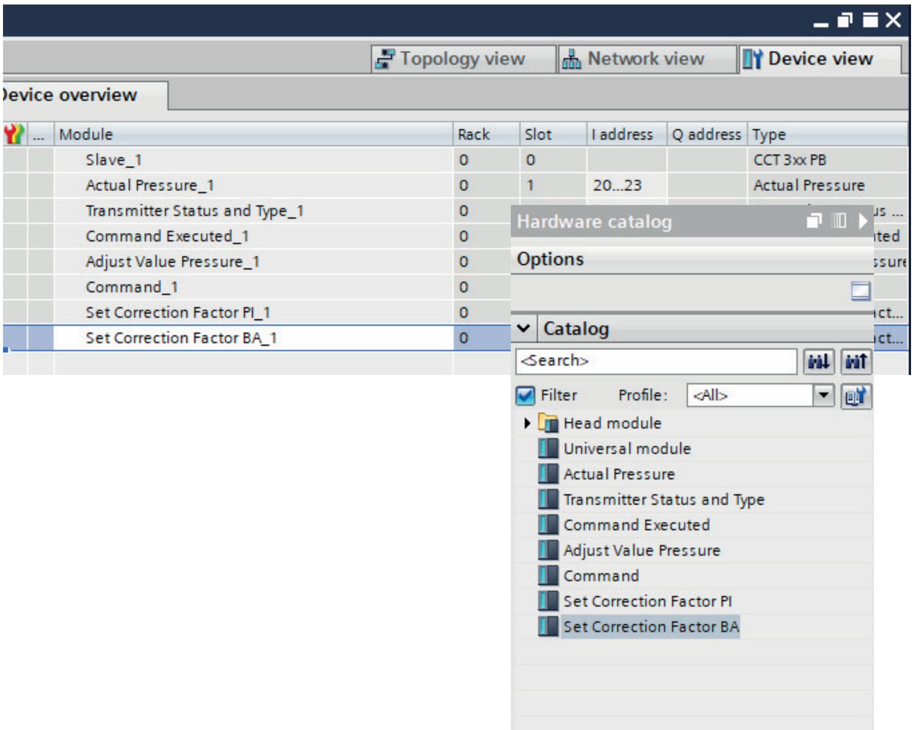



**Fig. 6:** **Integrate input and output modules**

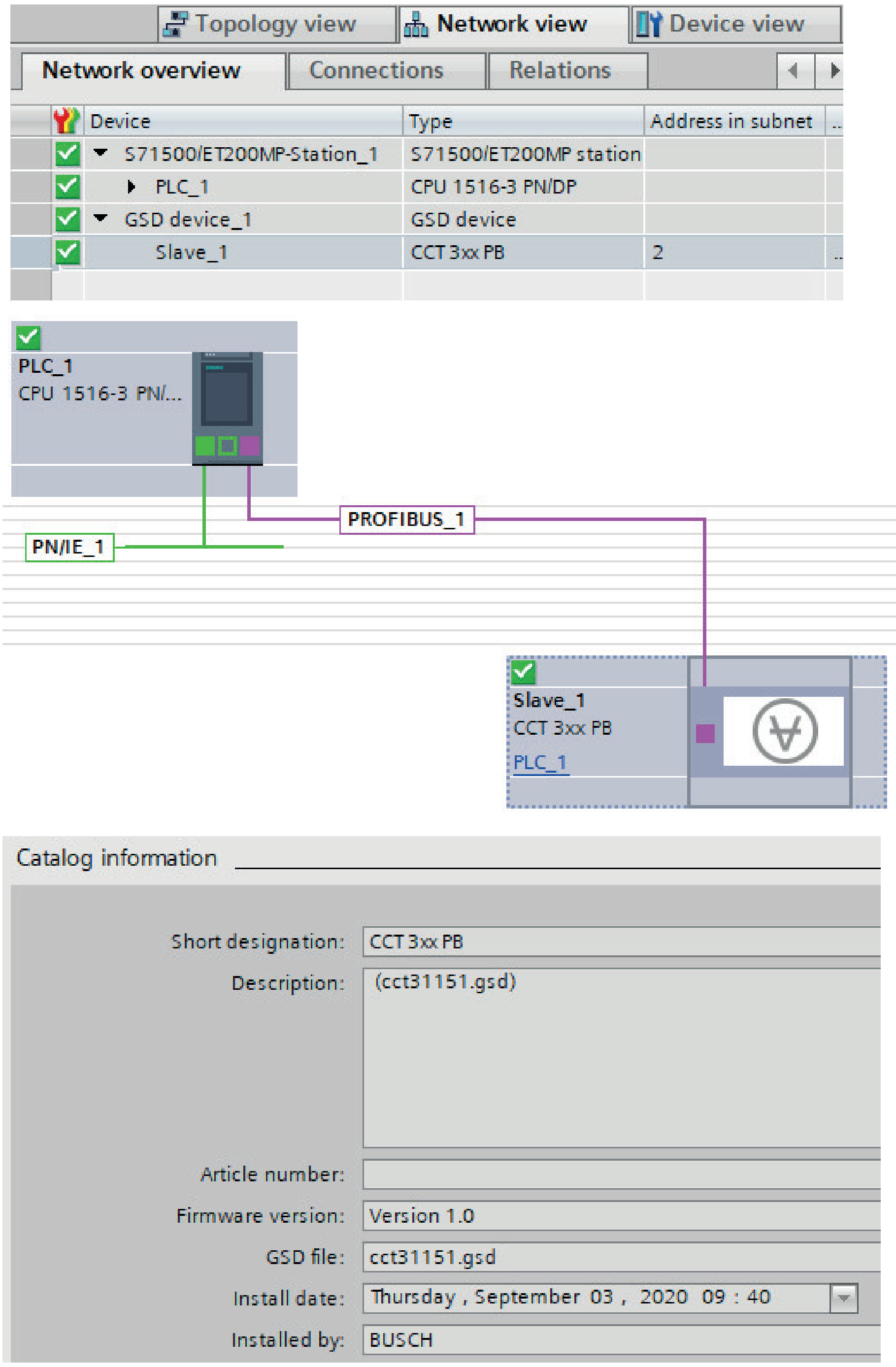



**Fig. 7: View after correct configuration**

**Procedure**

1. Download the gauge's GSD file from the Pfeiffer Vacuum Download Center.
2. Open the configuration tool.
3. Import the unzipped files (GSD file and image) into the process control.
   – You will find the CCT gauge under the path PROFIBUS DP/Gateways/Pfeiffer Vacuum/CCT 3xx PB.
4. Drag and drop CCT 3xx PB into the configuration tool's network area and integrate CCT 3xx PB there.
5. Select the input and output modules for the gauges you are using.
6. Drag all catalog objects from "Actual Pressure" to "Set Correction Factor BA" into the active area.
7. Compile the entries.
8. Check the correct function of the entries online.

## 3.3 Configure Profibus connection for xPT gauges

**Profibus configuration tools**

There are various suppliers of configuration tools for configuring the Profibus. The configuration procedure is identical. The figures show the Siemens TIA portal by way of an example.

**Configure switching ranges for xPT gauges**

You can configure the switching ranges in the Profibus parameter data for the HPT 200 PB, MPT 200 PB and RPT 200 PB gauges. You can find information in the operating instructions of the standard version of the gauge.

If the default setting specified in the operating instructions is OK for your application, you do not need to edit the configuration. Select xPT 200 PB_2_1 and assign the device-specific parameters to the desired switching range.

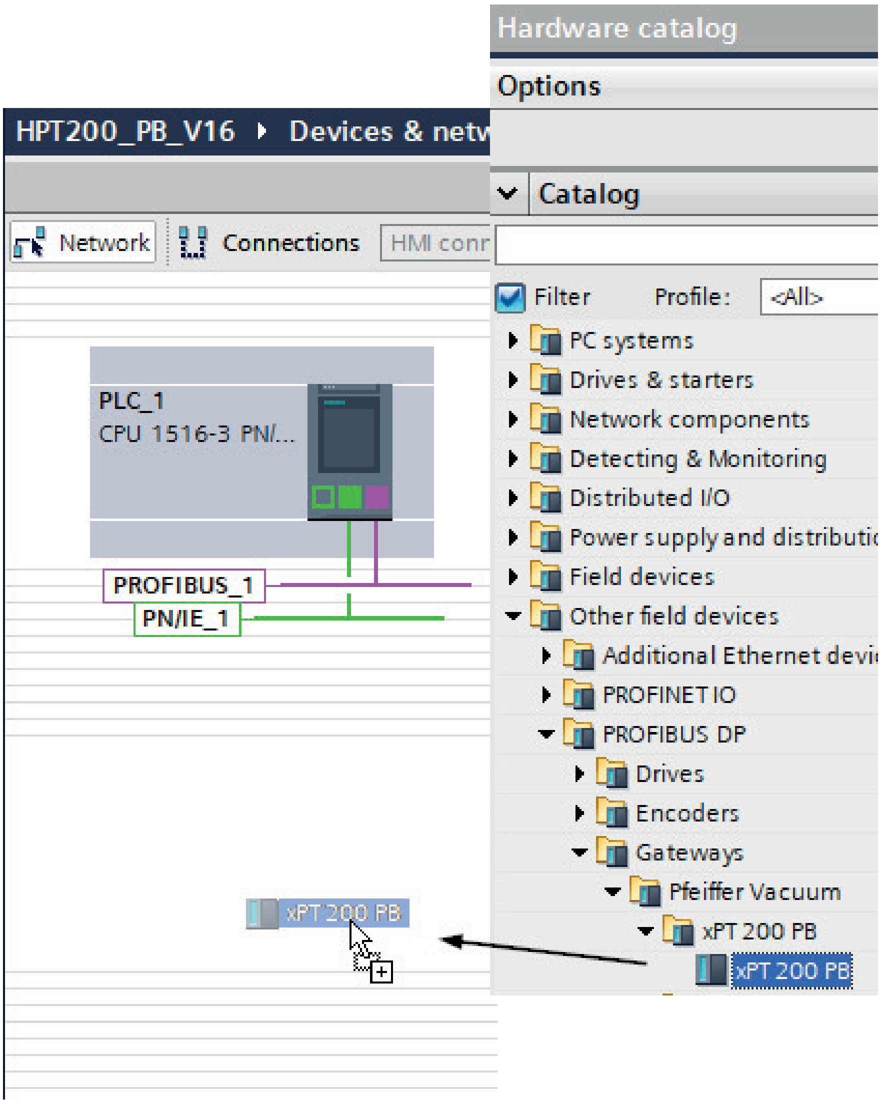



**Fig. 8:** **Drag & drop gauge into network area**

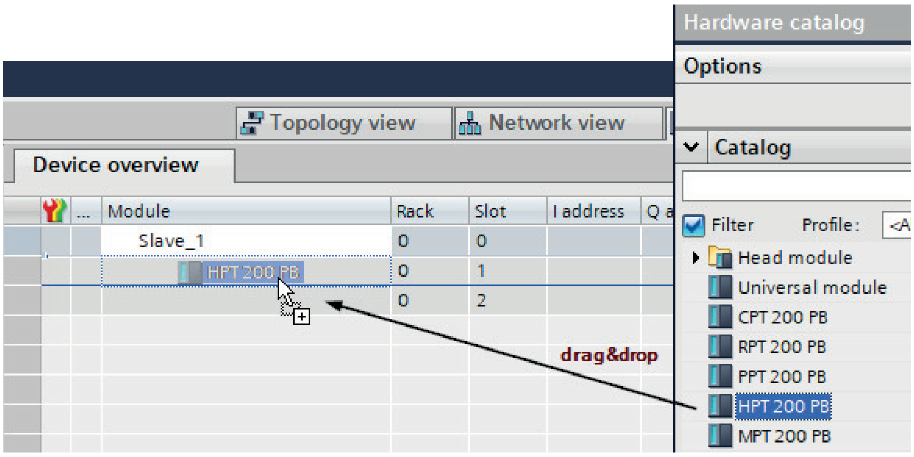



**Fig. 9:** **Drag & drop gauge type for inputs and outputs into slot 1 of modules**

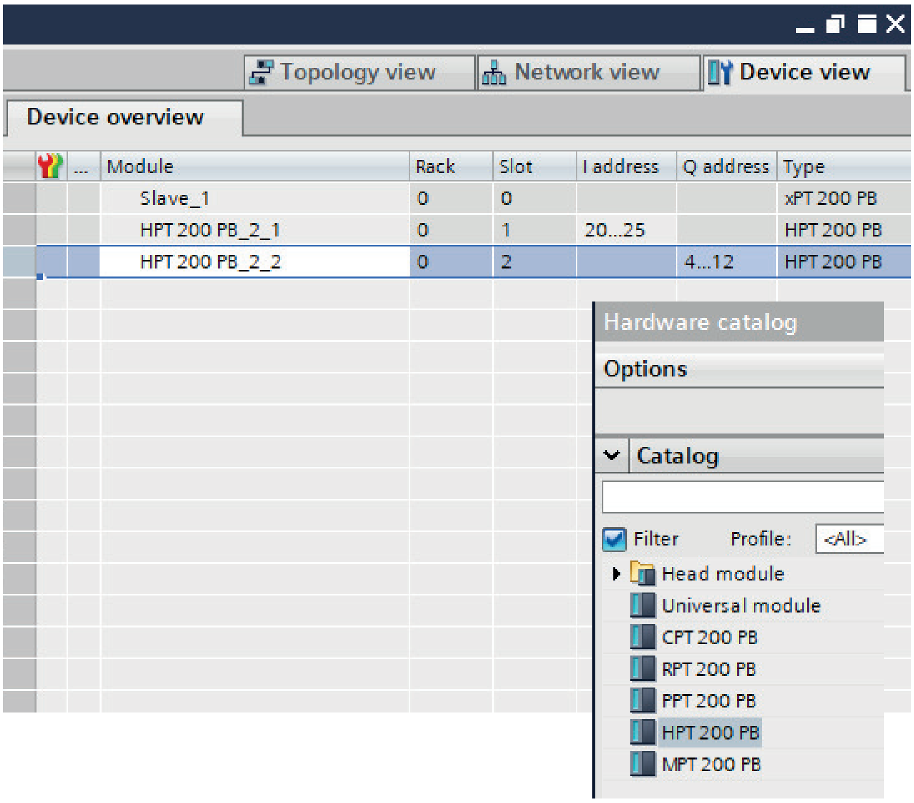



**Fig. 10:** **Integrate input and output modules on TIA portal**

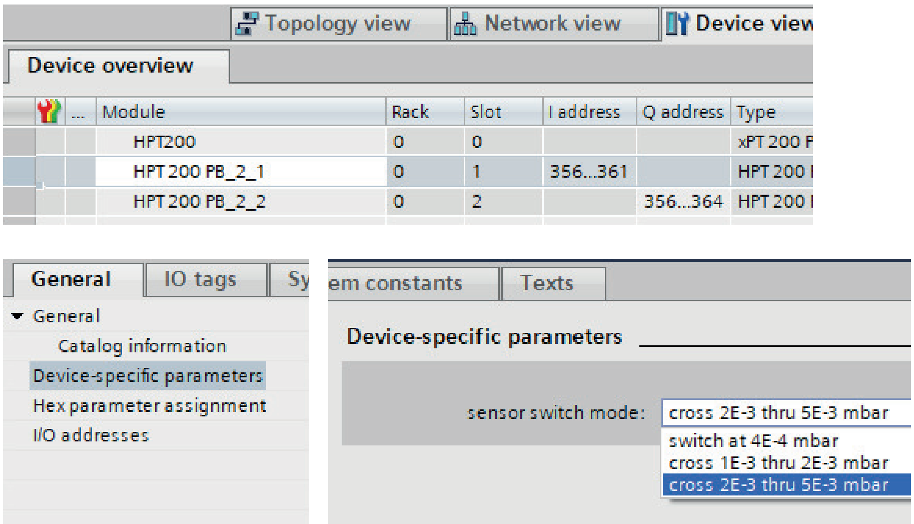



**Fig. 11: Define switching range**

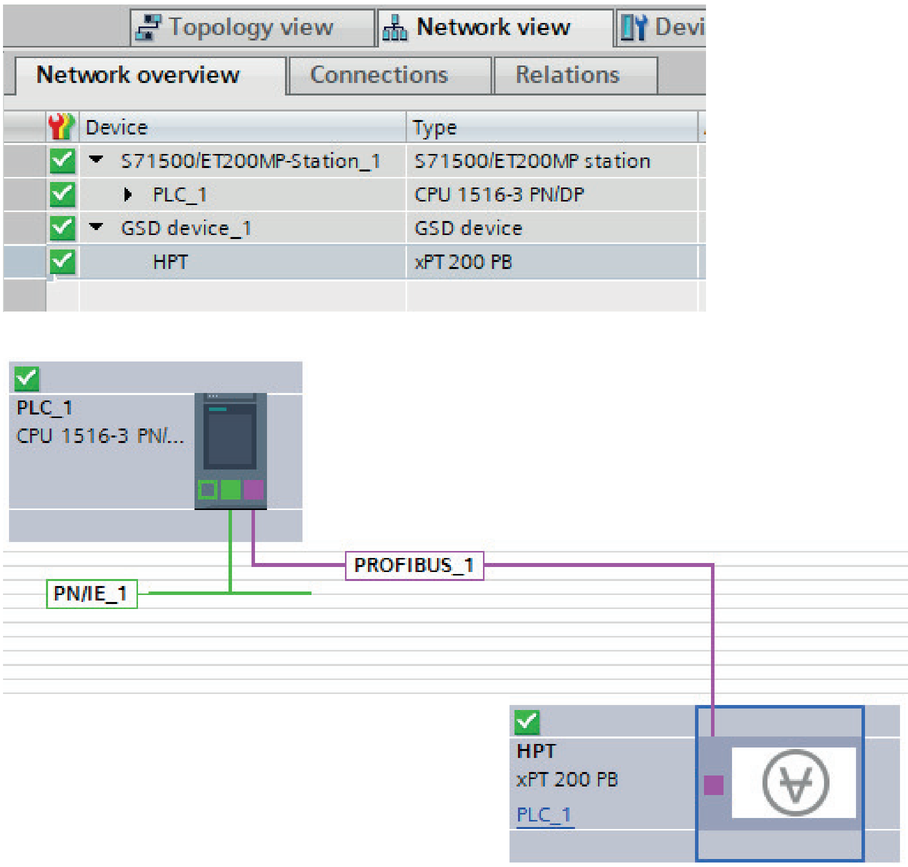



**Fig. 12: View after correct configuration**

**Procedure**

1. Download the gauge's GSD file from the Pfeiffer Vacuum Download Center.
2. Open the configuration tool.
3. Import the unzipped files (GSD file and image) into the process control.
   – You will find the xPT gauge under the path PROFIBUS DP/Gateways/Pfeiffer Vacuum/xPT 200 PB.
4. Drag and drop xPT 200 PB into the configuration tool's network area and integrate xPT 200 PB there.
5. Select the input and output modules for the gauges you are using.
6. Configure the switching ranges if necessary.

7. Compile the entries.
8. Check the correct function of the entries online.

# 4 Profibus modules

## 4.1 Input data

| Byte | | Bit | Meaning | Gauges | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | CCT | CPT | HPT | MPT | PPT | RPT |
| 0 | Actual pressure value | - | Actual pressure value in IEEE 754 format (floating point) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | Status bits | 0 | Degas active or filament switched off | | | ✓ | ✓ | | |
| | | 1 | Value range infringement pressure value in output data | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 2 | Command supported in output data | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 3 | Value range infringement Pi correction factor in output data | | | ✓ | ✓ | ✓ | ✓ |
| | | 4 | Value range infringement BA/CC correction factor in output data | | | ✓ | ✓ | | |
| | | 5 | Invalid command in output data | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 6 | Value range exceeded actual pressure value (OR) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 7 | Actual pressure value below value range (UR) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 5 | ACK | - | Acknowledge command in output data | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Tbl. 4: Input data: Gauge to Profibus master**

## 4.2 Output data

| Byte | | Value | Meaning | Gauge | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | CCT | CPT | HPT | MPT | PPT | RPT |
| 0 | Actual pressure value | - | Actual pressure value for adjustment in IEEE 754 format (floating point) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | Command value | 0 | No command (zero command) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 1 | Activate degas | | | ✓ | | | |
| | | 2 | Adjust low pressure, "**pressure**" contains the pressure adjustment value | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 3 | Adjust high pressure, "**pressure**" contains the pressure adjustment value | | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | 4 | Set correction factor, "**Corr Pi**" and "**Corr BA/CC**" contain correction factors | | | ✓ | ✓ | ✓ | ✓ |
| | | 5 | HV off | | | ✓ | ✓ | | |
| | | 6 | HV on | | | ✓ | ✓ | | |
| 5 | Corr Pi | - | Pi correction factor | | | ✓ | ✓ | ✓ | ✓ |
| 6 | | | | | | | | | |
| 7 | Corr BA/CC | - | BA/CC correction factor | | | ✓ | ✓ | | |
| 8 | | | | | | | | | |

**Tbl. 5: Output data: Profibus master to gauge**

**Compute effective correction factor**

The admissible value range of the entered correction factors is between 1 and 800. It is equivalent to effective correction factors between 0.01 and 8.00.

- Multiply the entered correction factor by 0.01 to calculate the effective correction factor.

## 4.3 Diagnostics data

| Byte | Bit | Meaning |
|---|---|---|
| 0 to 5 | - | See Profibus specification |
| 6 | | 5 |
| 7 to 9 | | Do not evaluate |
| 10 | 0 | Internal communication error |
| | 1 | Sensor defective or missing |
| | 2 | Memory defective |
| | 3 | Wrong gauge |
| | 4 to 7 | - |

**Tbl. 6: Diagnostics data**

# 5 Operation

## 5.1 Operate gauge via Profibus interface

**NOTICE**

**Data transmission error due to simultaneous operation on both interfaces**

If you attempt to operate the gauge simultaneously via the RS-485 and Profibus interfaces, this will result in incorrect data and interference with the data transmission.

- ▶ Operate the gauge via only one of the two interfaces.
- ▶ Only use the RS-485 connector in Profibus operation to supply voltage to the gauge.

| Function | Gauges | | | | | |
|---|---|---|---|---|---|---|
| | CCT | CPT | HPT | MPT | PPT | RPT |
| Activate degas | | | ✓ | | | |
| Adjust pressure | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Switch HV on/off | | | ✓ | ✓ | | |
| Adjust correction factor | | | ✓ | ✓ | ✓ | ✓ |

**Tbl. 7: Function overview**

**Zero command**

The new setting sequence always starts with the zero command.

**Activate degas**

1. Write the **zero command** to the output data.
2. Write the **Degas** command to the output data.

**Adjust pressure**

1. Write the **zero command** to the output data.
2. Write the **pressure value** to the output data.
   – Information on this can be found under "Calibrate gauge" in the operating instructions of the standard version of the gauge.
3. Write the command for **low pressure** or **high pressure** [1)] to the output data.

**Switch HV on/off**

1. Write the **zero command** to the output data.
2. Write the command **HV on** or **HV off** to the output data.

**Adjust correction factor**

1. Write the **zero command** to the output data.
2. Write the **valid correction factor** to the output data.
3. Write the command for the **correction factor** to the output data.

1) High pressure is not possible for CCT gauges.

## 5.2 Profibus operating mode display via LED

| LED status | Display | Meaning | |
|---|---|---|---|
| | | xPT gauge | CCT gauge |
| Off | | Profibus on device side not active | Profibus on device side not active<br>No Baud rate detected<br>Baud rate detected, no user data exchange<br>Profibus not possible (invalid address, initialization error) |
| green/red/off |  | one-off test phase after reset | - |
| green and red, lit |  | - | one-off test phase after reset |
| Green flashing |  | Baud rate detected, no user data exchange | Fail-safe |
| 2x green flashing |  | Fail-safe | - |
| Green illuminated |  | User data exchange | User data exchange |
| Red flashing |  | No Baud rate detected | Parameterization data faulty |
| 2x red flashing |  | Parameterization/configuration data incorrect | Configuration data faulty |
| Red illuminated |  | Profibus not possible (invalid address, initialization error) | - |

**Tbl. 8: Behavior and meaning of the Profibus LED**

# 6 Accessories

View the range of accessories for DigiLine on our website.

| Description | Part number |
|---|---|
| Y-distributor M12B for Profibus | P 4723 015 |
| Y-distributor with M12B cable for Profibus, length 0.5 m | P 4723 018 |
| T-distributor M12B for Profibus | P 4723 020 |
| Terminal resistor M12B for Profibus | P 4723 030 |
| Plug and socket M12B for Profibus | PM 051 927 -T |

# 7 Technical data

| Parameter | CCT 36x PB | CCT 37x PB |
|---|---|---|
| Interfaces | RS-485, Profibus DP | |
| "Profibus" interface, device side | Analog, Binder M12 socket, 5-pin, B-coded | |
| Supply: Power consumption max. | 5 W | 15 W |

**Tbl. 9: Technical data CCT gauge**

| Parameter | CPT 200 PB | PPT 200 PB | RPT 200 PB | HPT 200 PB | MPT 200 PB |
|---|---|---|---|---|---|
| Interfaces | RS-485, Profibus DP | | | | |
| "Profibus" interface, device side | Analog, Binder M12 socket, 5-pin, B-coded | | | | |
| Supply: Power consumption max. | 3 W | 4 W | 4 W | 10.5 W | 4.5 W |

**Tbl. 10: Technical data xPT gauge**

C US

The products CCT 36x PB and CCT 37x PB

- conform to the UL standards

  UL 61010-1, 3rd edition (2016), R:2019
  Safety requirements for electrical equipment for measurement, control and laboratory use
  Part 1: General requirements

- are certified to the CSA standards

  CSA C22.2 No. 61010-1-12, 3rd edition (2012), U1, U2, A1
  Safety requirements for electrical equipment for measurement, control and laboratory use
  Part 1: General requirements

The products CPT 200 PB, PPT 200 PB, RPT 200 PB and MPT 200 PB

- conform to the UL standards

  UL 61010-1, 3rd edition (2016), R:2019
  Safety requirements for electrical equipment for measurement, control and laboratory use
  Part 1: General requirements

- are certified to the CSA standards

  CSA C22.2 No. 61010-1-12, 3rd edition (2012), U1, U2, A1
  Safety requirements for electrical equipment for measurement, control and laboratory use
  Part 1: General requirements

# EC Declaration of Conformity

This declaration of conformity has been issued under the sole responsibility of the manufacturer.

Declaration for product(s) of the type:

**DigiLine gauge with Profibus interface**

| | |
|---|---|
| CCT 361 PB | CCT 371 PB |
| CCT 362 PB | CCT 372 PB |
| CCT 363 PB | CCT 373 PB |
| CCT 364 PB | CCT 374 PB |
| CCT 365 PB | CCT 375 PB |

We hereby declare that the listed product satisfies all relevant provisions of the following **European Directives**.

**Electromagnetic compatibility 2014/30/EU**

**Restriction of the use of certain hazardous substances 2011/65/EU**

**Restriction of the use of certain hazardous substances, delegated directive 2015/863/EU**

**Harmonized standards and applied national standards and specifications:**

DIN EN IEC 61000-6-2:2019

DIN EN IEC 61000-6-3:2022

DIN EN 61010-1:2020

DIN EN IEC 61326-1:2022

DIN EN IEC 63000:2019

Signature:

Pfeiffer Vacuum GmbH
Berliner Straße 43
35614 Asslar
Germany

(Daniel Sälzer)
Managing Director

Asslar, 2023-01-23

CE

PFEIFFER VACUUM

# EC Declaration of Conformity

This declaration of conformity has been issued under the sole responsibility of the manufacturer.

Declaration for product(s) of the type:

**DigiLine gauge with Profibus interface**

CPT 200 PB

PPT 200 PB

RPT 200 PB

MPT 200 PB

HPT 200 PB

We hereby declare that the listed product satisfies all relevant provisions of the following **European Directives**.

**Electromagnetic compatibility 2014/30/EU**

**Restriction of the use of certain hazardous substances 2011/65/EU**

**Restriction of the use of certain hazardous substances, delegated directive 2015/863/EU**

**Harmonized standards and applied national standards and specifications:**

DIN EN IEC 61326-1:2022

DIN EN IEC 63000:2019

Signature:

Pfeiffer Vacuum GmbH
Berliner Straße 43
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Germany

(Daniel Sälzer)
Managing Director

Asslar, 2023-01-23

# UK Declaration of Conformity

This declaration of conformity has been issued under the sole responsibility of the manufacturer.

Declaration for product(s) of the type:

**DigiLine gauge with Profibus interface**

| | |
|---|---|
| CCT 361 PB | CCT 371 PB |
| CCT 362 PB | CCT 372 PB |
| CCT 363 PB | CCT 373 PB |
| CCT 364 PB | CCT 374 PB |
| CCT 365 PB | CCT 375 PB |

We hereby declare that the listed product satisfies all relevant provisions of the following **British Directives**.

**Electromagnetic Compatibility Regulations 2016**

**The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012**

**Applied standards and specifications:**

EN IEC 61000-6-2:2019

EN IEC 61000-6-3:2021

EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019

EN IEC 61326-1:2021

EN IEC 63000:2018

The manufacturer's authorized representative in the United Kingdom and the authorized agent for compiling the technical documentation is Pfeiffer Vacuum Ltd, 16 Plover Close, Interchange Park, MK169PS Newport Pagnell.

Signature:

Pfeiffer Vacuum GmbH
Berliner Straße 43
35614 Asslar
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(Daniel Sälzer)
Managing Director

Asslar, 2023-01-23

UK
CA

PFEIFFER VACUUM

# UK Declaration of Conformity

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**DigiLine gauge with Profibus interface**

CPT 200 PB

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MPT 200 PB

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**The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012**

**Applied standards and specifications:**

EN IEC 61326-1:2021

EN IEC 63000:2018

The manufacturer's authorized representative in the United Kingdom and the authorized agent for compiling the technical documentation is Pfeiffer Vacuum Ltd, 16 Plover Close, Interchange Park, MK169PS Newport Pagnell.

| Signature: | Pfeiffer Vacuum GmbH<br>Berliner Straße 43<br>35614 Asslar<br>Germany |
|---|---|
| (Daniel Sälzer)<br>Managing Director | Asslar, 2023-01-23 |

UK
CA

PFEIFFER VACUUM

## VACUUM SOLUTIONS FROM A SINGLE SOURCE

**Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.**

## COMPLETE RANGE OF PRODUCTS

**From a single component to complex systems:**
**We are the only supplier of vacuum technology that provides a complete product portfolio.**

## COMPETENCE IN THEORY AND PRACTICE

**Benefit from our know-how and our portfolio of training opportunities!**
**We support you with your plant layout and provide first-class on-site service worldwide.**

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