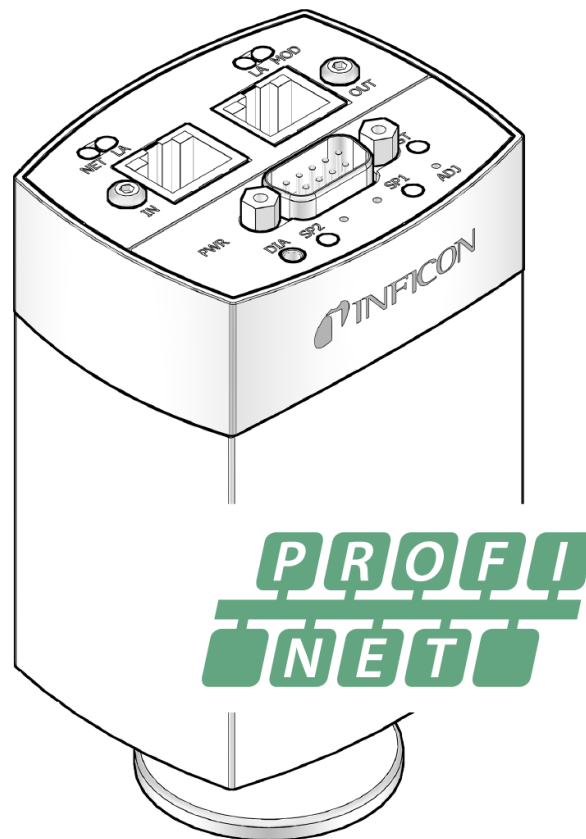




Communication Protocol

PROFINET

for Pirani Capacitance Diaphragm and Pirani Standard Gauges

PCG550, PCG552, PCG554

PSG550, PSG552, PSG554

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For cross-references within this document, the symbol (→  XY) is used, for cross-references to further documents, listed under literature, the symbol (→  [Z]).

General Information



Caution

Data transmission errors

Any attempt to simultaneously operate the gauge via the RS232C Serial Interface and PROFINET interface may result in incorrect data and data transmission errors.

Therefore, it is inadmissible to simultaneously operate the gauge via the RS232C Serial Interface and PROFINET interface.

The terminology in this document corresponds to the PROFINET standardization. For historical reasons, other INFICON product-specific documents (e.g. operating manuals) use the term "setpoint" instead of "trip point".

Intended Use

This Communication Protocol contains instructions for operating PROFINET interfaces (slaves) together with a master.



For safety information, specifications and operation instructions of the vacuum gauges refer to the appropriate documents (→ [1], [2]).

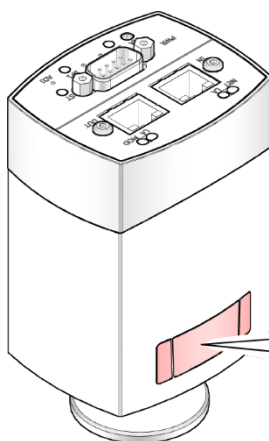
PROFINET Interface

This manual describes the functionality of the PROFINET PxG55x family. The family consists of PSG55x, PCG55x and PCG55x with atmospheric sensor.

For operating the gauge via PROFINET, prior installation of the device specific GSDML file is required on the bus master side. This file can be downloaded from our website. The PCG55x and PSG55x devices use a common PxG55x PROFINET GSDML file (→ [3]).

Product Identification

In all communications with INFICON, please specify the information on the product nameplate. For convenient reference copy that information into the space provided below.



INFICON AG, LI-9496 Balzers		CE
Model:		
PN:		 3103457
SN:		
..... V W; LPS		

Validity

This document applies to products of the Pirani Capacitance Diaphragm (PCG550, PCG552, PCG554) and Pirani Standard Gauges (PSG550, PSG552, PSG554) with PROFINET interface.

Part numbers of standard products are indicated below. OEM products have other part numbers and different parameter settings (e.g. factory setting of trip points) as defined in the corresponding ordering information.

3Pxx-0xx-xxAx

Measuring signal	0 ⇒ 0.61 ... 10.23 V 1 ⇒ 1.2 ... 8.68 V 2 ⇒ 0.375 ... 5.659 V 3 ⇒ 1.57 ... 9.05 V
Receptacle	0 ⇒ FCC 1 ⇒ D-sub, 9-pin 2 ⇒ D-sub HD, 15-pin 4 ⇒ D-sub HD, 15-pin, RS485 INF
Display Switching function	0 ⇒ None 1 ⇒ Display 2 ⇒ 2 switching functions *) 3 ⇒ ATM sensor & 2 switching functions *) 4 ⇒ Display & 2 switching functions *) 5 ⇒ Display & ATM sensor & 2 switching functions *) 6 ⇒ 2 switching functions **)
Flange	1 ⇒ DN 16 ISO-KF 2 ⇒ DN 16 ISO-KF long tube 4 ⇒ DN 16 CF-F 5 ⇒ DN 16 CF-R long tube 6 ⇒ DN 25 ISO-KF D ⇒ 4 VCR female E ⇒ 8 VCR female F ⇒ 1/8" NPT K ⇒ Flange 29×29 mm M ⇒ 4 VCR female 90° N ⇒ 7/16-20 UNF male
Unit	0 ⇒ mbar 1 ⇒ Torr 2 ⇒ Pa 3 ⇒ micron
Filament	1 ⇒ Tungsten 2 ⇒ Nickel 3 ⇒ Ceramic coated 6 ⇒ Tungsten, galvanically isolated 7 ⇒ Nickel, galvanically isolated 8 ⇒ Ceramic coated, galvanically isolated
Product family	C ⇒ Pirani Capacitance Diaphragm Gauge I ⇒ Pirani Standard Gauge

*) Solid state relay

**) Electromechanical relay

The part number (PN) can be taken from the product nameplate.

If not indicated otherwise in the legends, the illustrations in this document correspond to PCG550 gauges with DN 16 ISO-KF vacuum connection. They apply to other gauges by analogy.

Trademark

PROFINET

PROFIBUS Nutzerorganisation e.V., 76131 Karlsruhe, DE

Patents

EP 0689669 B1, 0689670 B1, 0658755 B1

US Patents 5608168, 4031997, 5583297

1 Technical Data



Further technical data →  [1], [2].

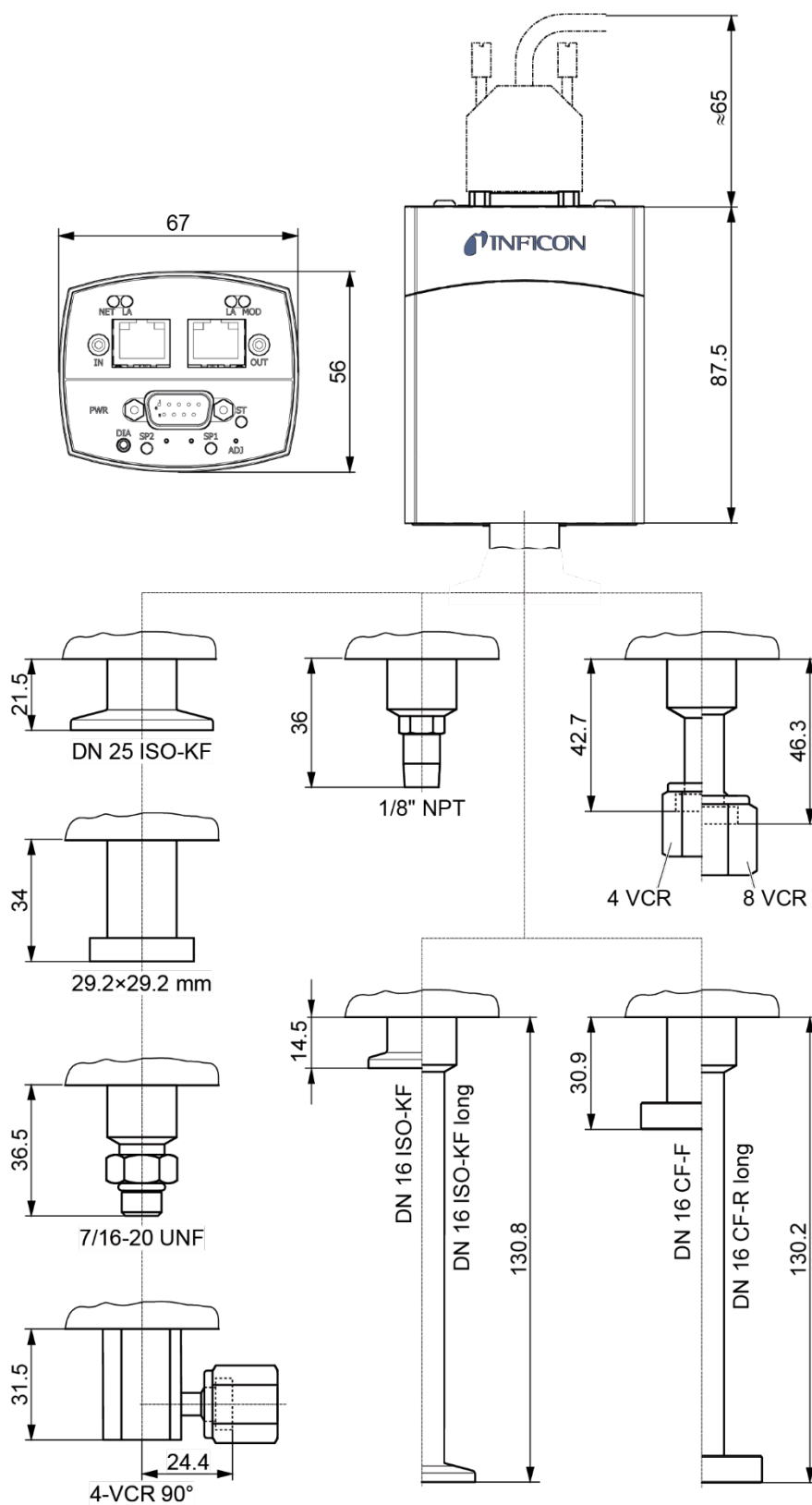
PROFINET Interface

Communication protocol	protocol specialized for PROFINET IO
Type	PROFINET IO-Device
Conformance Class	A, B
Support	MRP
Data rate	100 MBit/s
Physical layer	100BASE-Tx (IEEE 802.3)
PROFINET connector	2 × RJ45, 8-pin (socket) <IN>: PROFINET input <OUT>: PROFINET output
Cable	Shielded Ethernet Patch Cable (CAT5e quality or higher)
Cable length	≤100 m

Common Interface

Analog functions	0 ... 10 V analog output pressure indication
Trip Point relays	2
Relay contact	NO (normally open), potential free
Hysteresis	programmable
Contact rating	≤30 V (ac) / ≤0.3 A (dc) resistive

Dimensions [mm]

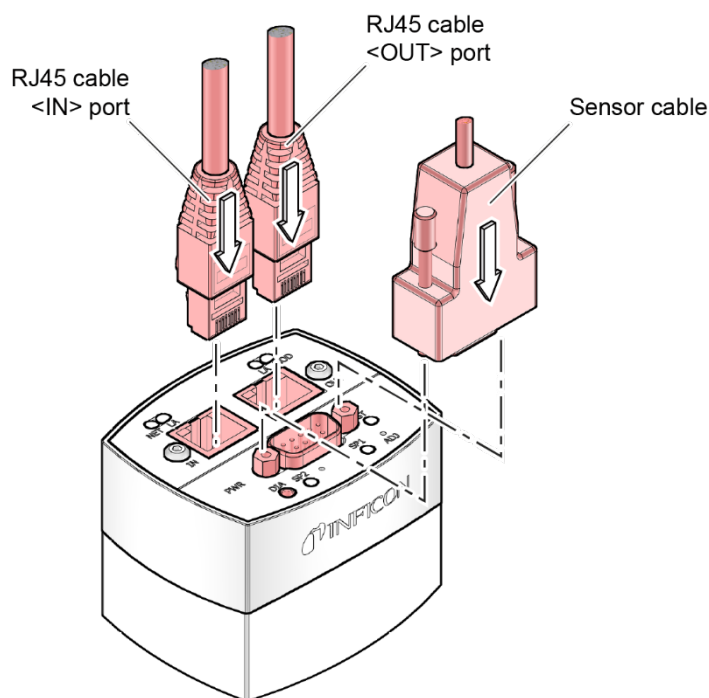


2 Interface Connection

For operating the PxG55x gauge via PROFINET, an Ethernet Patch Cable (CAT5e quality) with RJ45 connector is required.

The device supports daisy-chained operation:

- The previous device or PROFINET Controller has to be connected to the PxG55x IN port.
- Optionally, the cable from the PxG55x OUT port has to be connected to the next PROFINET device.



3 Operation

3.1 Introduction

The following data is exchanged over the PROFINET protocol:

- Pressure reading
- Setting for pressure unit (mTorr, Torr, mbar, Pa)
- Status and error messages
- Status of the switching functions
- Settings for Trip Points of the switching functions
- Adjustment of the Pirani and ATM sensor



Caution

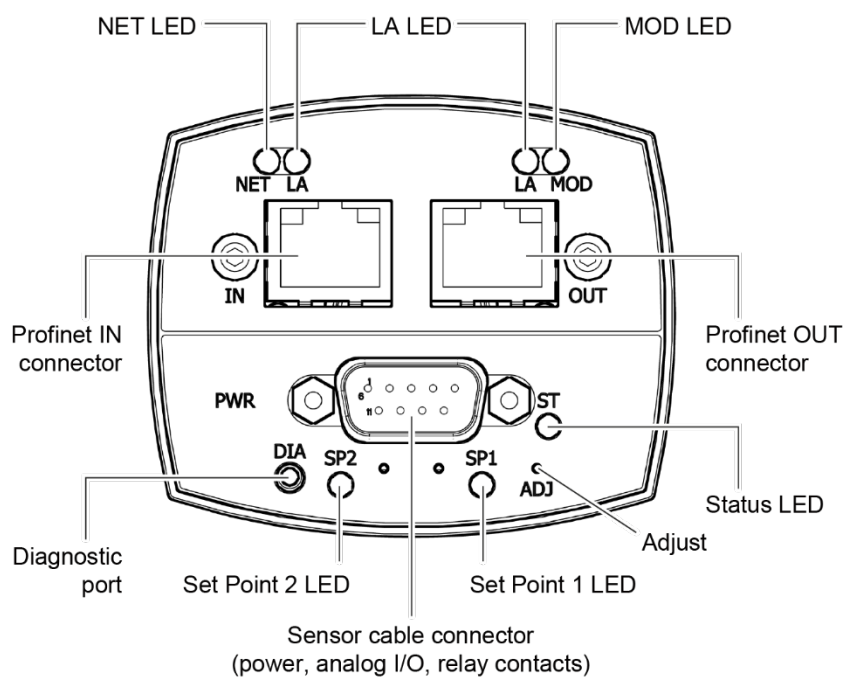


Data transmission errors

Any attempt to simultaneously operate the gauge via the RS232C Serial Interface or PROFINET interface may result in incorrect data and data transmission errors.

Therefore, it is inadmissible to simultaneously operate the gauge via the RS232C Serial Interface and PROFINET interface.

3.2 Front View



Label	Function
NET	The NET LED indicates the network status of the PxG55x gauge
MOD	The MOD LED indicates the module status of the PxG55x gauge
IN	PROFINET IN connector
LA	Link activity PROFINET IN and OUT
OUT	PROFINET OUT connector
PWR	Sensor cable connector (Power, analog I/O and Relay contacts)
ST	Status of the gauge
SP1	Status of Trip Point 1
SP2	Status of Trip Point 2
DIA	Diagnosis port
ADJ	Adjust

3.3 Indicators

For information on the LEDs <ST>, <SP1> and <SP2> indicators see respective operating manual (→  [1], [2]).

3.3.1 <NET> LED



Displays the network status.

Color	LED State	Description
	off	No power No connection with IO Controller
green	1 flash	Connection with IO Controller established IO Controller in STOP state or IO data bad IRT synchronization not finished
	blinking	Used by engineering tools to identify the node on the network
	on	Connection with IO Controller established IO Controller in RUN state
red	on	Major internal error (the indication is combined with a red module status LED)
	1 flash	Station name not set
	2 flashes	IP address not set
	3 flashes	Expected Identification differs from read identification

3.3.2 <MOD> LED



Displays the module status.

Color	LED State	Description
	off	No power OR Module in SETUP or NW_INIT state
green	on	Module has shifted from the NW_INIT state
	1 flash	Diagnostic event(s) present
red	on	Device in state Exception Major internal error (this indication is combined with a red network status LED)
red/ green	alternating (red/green)	Firmware update. Do NOT power off the module. Turning the module off during this phase could cause permanent damage.

3.3.3 <LA> LED (<IN> Port)



Displays the input status.

Color	LED State	Description
green	off	Port not connected or no power applied to device
	blinking	Port connected and communication active
	on	Port connected but no communication

3.3.4 <LA> LED (<OUT> Port)



Displays the output status.

Color	LED State	Description
green	off	Port not connected or no power applied to device
	blinking	Port connected and communication active
	on	Port connected but no communication

4 Communication

PROFINET provides cyclic and acyclic data. Cyclic data is automatically updated on a regular basis. Acyclic data needs to be requested by the user. In order to read or write a parameter Index, Slot and Subslot need to be correct.

This chapter gives an overview of the cyclic (→ ch. 4.1) and acyclic data (→ ch. 4.2). A list of all record data provided in the appendix.

Important abbreviations:

DAP	Device Access Points, PROFINET Slot 0
PAP	Parameter Access Point, PROFINET Subslot 1 (or 10 for DAP)
CDG	Capacitive Diaphragm Sensor
Pir	Pirani / common heat transfer sensor
VPG	Vacuum Pressure Gauge
Fieldbus Unit	Unit, which translates PROFINET commands into commands known to the vacuum pressure gauge and vice versa

For all parameters the following information is provided:

Abbr.	Description
Slot	Slot of the parameter
Subslot	Subslot of the parameter
Index	Index of the parameter
DataType	• Boolean = 1 bit. (0 = false, 1 = true) • Unsigned8 = 8 bit. Unsigned Byte • Unsigned16 = 16 bit. Unsigned integer value • Unsigned32 = 32 bit. Unsigned integer value • Real32 = 32 bit. Floating point • String[n] = Visible string. Characters are based on 8 bit ASCII.
Access	parameter read/write access • RO: object can only be read • RW: object can be both read and written
Name	Name to identify the parameter

4.1 Process Data

The following parameters are provided and updated cyclically. The provided GSDML file describes the PROFINET device and specially its process data (→ [\[3\]](#)).

4.1.1 Trip Points

The vacuum sensor has two independent switching logics named trip points on the fieldbus interface. The operating manual describes the configuration and usage of the Trip Points ("Switching Functions" → [\[1\]](#), [\[2\]](#)).

They can be configured on record data (→ ch. 4.2.7).

Slot	Subslot	Index	DataType	Access	Name
PG(1)	20	0	Unsigned32	RO	Trip Point Output All

Subslot 20:

This status bitfield is composed of the high and low trip point.

Trip Point Output All	
Bit 0	Status High Trip Point 1
Bit 1	Status Low Trip Point 1
Bit 2	Status High Trip Point 2
Bit 3	Status Low Trip Point 2

4.1.2 Pressure Gauge

General information on the gauge consisting of pressure value (gauge active value), active sensor number and Gauge Active Status.

Slot	Subslot	Index	DataType	Access	Name
PG(1)	21	0	Real32	RO	Gauge Active Value
	22	0	Unsigned16	RO	Gauge Active Sensor Number
	23	0	Unsigned8	RO	Gauge Active Status

Subslot 21:

The Gauge Active Value is composed of the measurement of the containing sensor(s).

The pressure data unit can be configured via acyclic data (→ ch. 4.2.2).

Subslot 22:

Gauge Active Sensor Number	
0	No sensor is valid
1	Instance 1: PSG55x: The Pirani is providing the active value PCG55x: The CDG is providing the active value
2	Instance 2: PSG55x: Not supported. PCG55x: The Pirani is providing the active value

Subslot 23:

This overall status of the gauge provides information on the validity of the active gauge value as well as out of range effects.

Gauge Active Status	
Bit 0	Value Valid
Bit 1	Overrange
Bit 2	Underrange
Bit 3...7	Reserved - always 0

4.1.3 Exceptions

The exception status indicates that any error or any warning is present.

Slot	Subslot	Index	DataType	Access	Name
PG(1)	24	0	Unsigned8	RO	Active Exception Status

Subslot 24:

Consolidated parameter to show that the device has any warning or error. The warnings and errors are disaggregated in separate parameters, which are part of the acyclic data (→ ch. 4.2.6).

Active Exception Status	
Bit 0	Any warning active.
Bit 2	Any error active.

4.2 Record Data

The vacuum gauge can be accessed and configured via record data.

4.2.1 Device

4.2.1.1 General Information

The most relevant device data is provided via the I&M data.

The following information is provided additionally:

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0022	Unsigned32	RO	Serial Number VPG
		0x0023	String[18]	RO	Mac Address
		0x00B4	String[14]	RO	SW Version Complete Device
		0x00B5	String[14]	RO	SW Version VPG
		0x00B6	String[14]	RO	SW Version Fieldbus
		0x00B7	String[14]	RO	SW Version NP40
		0x00B8	String[41]	RO	SW Git Hash Fieldbus
		0x00B9	String[41]	RO	SW Git Hash BL Fieldbus
		0x00BA	String[14]	RO	SW Version BL Fieldbus
		0x00BB	String[9]	RO	HW Version Fieldbus
		0x00FE	String[25]	RO	Device Type

Index 0x0022:

Serial number of the vacuum pressure gauge.

Index 0x0023:

Mac address of the device.

Format: AA:BB:CC:DD:EE:FF

Index 0x00B4:

The software version (SW) of the complete device corresponds to the software version of the fieldbus unit.

Format: AA.BB.CC.DDDD

SW Version Complete Device	
AA	Compatibility
BB	Release Version
CC	Development Version
DDDD	Build Version

Index 0x00B5: Software version of the vacuum pressure gauge.
Format: AA.BB.CC.DDDD

SW Version VPG	
AA	Compatibility
BB	Release Version
CC	Development Version
DDDD	Build Version

Index 0x00B6: Software version of the fieldbus unit.
Format: AA.BB.CC.DDDD

SW Version Fieldbus	
AA	Compatibility
BB	Release Version
CC	Development Version
DDDD	Build Version

Index 0x00B7: Software version of the NP40 chip.
Format: AA.BB.CC

SW Version NP40	
AA	Major Version
BB	Minor Version
CC	Build Version

Index 0x00B8: Git hash of the current software version of the fieldbus device.

Index 0x00B9: Git hash of the current software version of the bootloader.

Index 0x00BA: Bootloader (BL) Software version (SW) of the fieldbus unit.
Format: AA.BB.CC.DDDD

SW Version BL Fieldbus	
AA	Compatibility
BB	Release Version
CC	Development Version
DDDD	Build Version

Index 0x00BB: Hardware version of the fieldbus unit.
Format: AA.BB.CC

HW Version Fieldbus	
AA	Compatibility
BB	Release Version
CC	Development Version

Index 0x00FE: Shows the name of the product.

4.2.1.2 Device Reset

The device can be reset (SW reboot) via the following command.



In a PROFINET network you should take into consideration that all devices connected after the device that you'd like to reset are subsequently disconnected from the network.

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0082	Unsigned8[6]	RW	Device Reset Command
		0x0083	Unsigned8[1]	RO	Device Reset Status
		0x0084	Unsigned8[2]	RO	Device Reset Response

Index 0x0082:

A device reset is initiated by sending the following byte pattern:

Device Reset Command	
Byte 0	0x74
Byte 1	0x65
Byte 2	0x73
Byte 3	0x65
Byte 4	0x72
Byte 5	Standard Reset = 0x00, Factory Reset = 0x66

Index 0x0083:

Device Reset Status	
0	Default value if the command has not been initiated
1	Last command completed, no errors, reply available
2	Last command completed, errors present, no reply available
3	Last command completed, errors present, reply available
255	Command is executing

After successfully sending the device reset command, the device will reboot. The status and response might not be able to be called while rebooting and the values will return to the default values after rebooting.

Index 0x0084:

Device Reset Response	
Byte 0	see subindex 2
Byte 1	Reserved - always 0

4.2.2 Pressure Gauge

4.2.2.1 Configuration

The pressure data unit can be configured through the following parameter.

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0021	Unsigned8	RW	Data Unit

Index 0x0021:

Data Unit	
1	Pa
4	mbar
5	Torr
6	mTorr

The Data Unit is stored non-volatile.

4.2.2.2 Sensor Value

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0001	Unsigned8	RO	Gauge Reading Valid
		0x0002	Unsigned8	RO	Gauge Overrange Exceeded
		0x0003	Unsigned8	RO	Gauge Underrange Exceeded
		0x0004	Real32	RO	Gauge Active Value
		0x0005	Unsigned16	RO	Gauge Active Sensor Number

Index 0x0001:

Gauge Reading Valid	
0	The value is invalid.
1	The value is valid.

Index 0x0002:

Gauge Overrange Exceeded	
0	Default value.
1	Gauge is in overrange

Index 0x0003:

Gauge Underrange Exceeded	
0	Default value.
1	Gauge is in underrange

Index 0x0004:

The Gauge Active Value is composed of the measurement of the containing sensor(s).

The pressure data unit can be configured via acyclic data (→ ch. 4.2.2).

Index 0x0005:

Identified the sensor that is influencing the gauge active value the most.

Gauge Active Sensor Number	
0	No sensor is valid
1	Active Instance 1: PSG55x: The Pirani is providing the active value PCG55x: The CDG is providing the active value
2	Active Instance 2 (PCG only): PSG55x: Not supported. PCG55x: The Pirani is providing the active value

4.2.2.3 Status

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0006	Unsigned8	RO	Gauge Active Status

Index 0x0006:

Gauge Active Status	
Bit 0	Value Valid
Bit 1	Overrange
Bit 2	Underrange
Bit 3...7	Reserved - always 0

4.2.3 Heat Transfer (Pirani)

The Pirani is used in medium to low vacuum.

4.2.3.1 Sensor Value

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0300	Real32	RO	Sensor Value
		0x0301	Unsigned8	RO	Reading Valid
		0x0302	Unsigned8	RO	Overrange Exceeded
		0x0303	Unsigned8	RO	Underrange Exceeded

Index 0x0300:

The corrected, converted, calibrated final pressure value of the Pirani sensor.

Index 0x0301:

Reading Valid	
0	The value is invalid.
1	The value is valid.

Index 0x0302:

Overrange Exceeded	
0	Default value.
1	Pirani is in overrange

Index 0x0303:

Underrange Exceeded	
0	Default value.
1	Pirani is in underrange

4.2.3.2 Exceptions

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0340	Unsigned16	RO	Sensor Warning
		0x0341	Unsigned16	RO	Sensor Error

Index 0x0340:

Sensor Warning	
Bit 0	Sensor element warning
Bit 1	Electronics warning

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

Index 0x0341:

Sensor Error	
Bit 0	Sensor element failure
Bit 1	Electronics failure

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

4.2.3.3 Adjusting the Pirani

The gauge is factory calibrated. Due to mounting, long time operation or contamination, a zero drift can occur. If necessary, check the zero drift and adjust the gauge periodically.

For adjusting the zero point, operate the gauge under the same constant ambient conditions and in the same mounting orientation as normally.

Procedure

- 1 If you are using a seal with centering ring and filter, check that they are clean or replace them if necessary ("Deinstallation" (→  [1], [2])).
- 2 Put the gauge into operation and operate it at atmospheric pressure for at least 10 minutes.
- 3 Perform an ATM adjustment. Follow the instruction described under Full Scale Adjust Command Heat Transfer (Pirani).
- 4 Full Scale Adjust Status Pirani and Full Scale Adjust Response Pirani provide you with the information on the successful execution of the ATM adjustment. If it was not successful repeat step 3.
- 5 Evacuate the vacuum system to $p < 5 \times 10^{-5}$ mbar and wait at least 2 minutes (If your system can not evacuate to $p < 5 \times 10^{-5}$ mbar go to step 8).
- 6 Perform a Zero adjustment as described below.
- 7 Zero Adjust Status Pirani and Zero Adjust Response Pirani provide you with the information on the successful execution of the ATM adjustment. If it was not successful repeat step 6.

If your system can not evacuate to $p < 5 \times 10^{-5}$ mbar:

- 8 Evacuate the vacuum system to the lowest possible value and wait at least 2 minutes.
- 9 Perform a Zero adjustment with target offset as described below.
- 10 Reading Zero Adjust Status Pirani and Zero Adjust Response Pirani provides you with the information if the zero adjustment was successful. If not repeat step 9.

4.2.3.4 Zero Adjustment Pirani

Please follow the described procedure for executing an ZeroAdjust of the Pirani sensor (→ ch. 4.2.3.3).

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0370	Unsigned8[6]	RW	Zero Adjust Command
		0x0371	Unsigned8[1]	RO	Zero Adjust Status
		0x0372	Unsigned8[3]	RO	Zero Adjust Response

Index 0x0370:

Zero Adjust Command	
Byte 0	Mode 0: Zero adjust. It has to be executed at $p \leq 5E-5$ mbar. 1: Zero adjust with target offset.
Byte 1	Index of the Sub Sensor Instance: Pirani at PSG55x: 1 Pirani at PCG55x: 2
Byte 2-5	Offset value (Data format: Real32, BIG ENDIAN) or 0 for zero adjust with no offset.

Example PSG55x: Write 00-01-00-00-00-00 (hex) to this parameter for starting the adjustment at pressure $\leq 5E-5$ mbar.

Example PCG55x: Write 01-02-ED-0D-3E-3B to perform a Zero Adjust with Target Offset a 0.0029 mbar.

Index 0x0371:

Zero Adjust Status	
0	Last command completed, no errors, no reply available
1	Last command completed, no errors, reply available
2	Last command completed, errors present, no reply available
3	Last command completed, errors present, reply available
255	Command is processing

Index 0x0372:

Zero Adjust Response	
Byte 0	See Zero Adjust Status
Byte 1	Unused
Byte 2	0: Zeroing successful 1: Zeroing failed: out-of-range 254: No previous Zero Adjust command issued

4.2.3.5 Full Scale Adjustment Pirani

Please follow the described procedure for executing an ZeroAdjust of the Pirani sensor (→ ch. 4.2.3.3).

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0374	Unsigned8[6]	RW	Full Scale Adjust Command
		0x0375	Unsigned8[1]	RO	Full Scale Adjust Status
		0x0376	Unsigned8[3]	RO	Full Scale Adjust Response

Index 0x0374:

Full Scale Adjust Command	
Byte 0	0: Full Scale Adjust
Byte 1	Index of the Sub Sensor Instance: PSC550 = 1 PCG55x = 2
Byte 2-5	Always 0



For a PSG55x the Pirani is active instance 1, for a PCG55x active instance Pirani is 2.

Read Access: Shows the last command that has been written to this parameter.

Example: Write 00-02-00-00-00-00 (hex) to this parameter for starting the adjustment on atmospheric pressure for PCG55x.

Index 0x0375:

Full Scale Adjust Status	
0	Last command completed, no errors, no reply available
1	Last command completed, no errors, reply available
2	Last command completed, errors present, no reply available
3	Last command completed, errors present, reply available
255	Command is processing

Index 0x0376:

Full Scale Adjust Response	
Byte 0	See Full Scale Adjust Status
Byte 1	Unused
Byte 2	0: Full Scale Adjust successful 1: Full Scale Adjust failed: out-of-range 254: No previous Full Scale Adjust command issued

4.2.4 Capacitance Diaphragm (CDG) - only for PCG55x

The CDG is used in low vacuum to atmosphere.

4.2.4.1 Sensor Value

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0100	Real32	RO	Sensor Value ¹⁾
		0x0101	Unsigned8	RO	Reading Valid ¹⁾
		0x0102	Unsigned8	RO	Overrange Exceeded ¹⁾
		0x0103	Unsigned8	RO	Underrange Exceeded ¹⁾

¹⁾ Only available for PCG55x.

Index 0x0100:

The corrected, converted, calibrated final pressure value of the CDG sensor.

Index 0x0101:

Reading Valid	
0	The value is invalid
1	The value is valid

Index 0x0102:

Overrange Exceeded	
0	Default value
1	CDG sensor is in overrange

Index 0x0103:

Underrange Exceeded	
0	Default value
1	CDG sensor is in underrange

4.2.4.2 Exceptions

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0140	Unsigned16	RO	Sensor Warning ¹⁾
		0x0141	Unsigned16	RO	Sensor Error ¹⁾

¹⁾ Only available for PCG55X.

Index 0x0140:

Sensor Warning	
Bit 1	Electronic Warning

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

Index 0x0141:

Sensor Error	
Bit 0	Diaphragm Failure
Bit 1	Electronic Failure

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

4.2.5 Atmospheric Sensor (ATM) - only for PCG55x with ATM sensor

The atmospheric sensor (ATM) measures the ambient, atmospheric pressure and not the pressure within the vacuum chamber. It is possible to configure the trip points dependent on a certain factor of the measurement value of the atmospheric sensor.

4.2.5.1 Sensor Value

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0200	Real32	RO	Sensor Value ¹⁾
		0x0201	Unsigned8	RO	Reading Valid ¹⁾
		0x0202	Unsigned8	RO	Ovrange Exceeded ¹⁾
		0x0203	Unsigned8	RO	Underrange Exceeded ¹⁾

¹⁾ Only available for PCG55x with ATM sensor.

Index 0x0200:

The corrected, converted, calibrated final pressure value of the ATM sensor.

Index 0x0201:

Reading Valid	
0	The value is invalid.
1	The value is valid.

Index 0x0202:

Ovrange Exceeded	
0	Default value.
1	ATM sensor is in ovrange

Index 0x0203:

Underrange Exceeded	
0	Default value.
1	ATM sensor is in underrange

4.2.5.2 Exceptions

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0240	Unsigned16	RO	Sensor Warning ¹⁾
		0x0241	Unsigned16	RO	Sensor Error ¹⁾

¹⁾ Only available for PCG55x with ATM sensor.

Index 0x0240:

Sensor Warning	
Bit 1	Electronic Warning

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

Index 0x0241:

Sensor Error	
Bit 0	ATM Failure
Bit 1	Electronic Failure

All bits are active high.

The troubleshooting is detailed in the device manual (→  [1], [2]).

4.2.5.3 Adjusting the Atmospheric Sensor

The ambient pressure of the gauge is measured by a separate atmospheric pressure sensor built into the electronics unit of the gauge. The atmospheric pressure sensor can be calibrated against the diaphragm capacitive sensor in the gauge. The gauge electronics compares the output signals of the two sensors and carries out the necessary adjustments to the atmospheric pressure sensor signal.

Procedure

- 1 Perform an ATM adjustment of the sensor described below "Full Scale Adjust ATM".
- 2 Full Scale Adjust Status ATM and Full Scale Adjust Response ATM provide you with the information on the successful execution of the ATM adjustment.

4.2.5.4 Full Scale Adjustment ATM

Please follow the described procedure for executing an ZeroAdjust of the Pirani sensor (→ ch. 4.2.6).

Slot	Subslot	Index	Data Type	Access	Name
DAP(0)	PAP(10)	0x0274	Unsigned8[6]	RW	Full Scale Adjust Command ¹⁾
		0x0275	Unsigned8[1]	RO	Full Scale Adjust Status ¹⁾
		0x0276	Unsigned8[3]	RO	Full Scale Adjust Response ¹⁾

¹⁾ Only available for PCG55x with ATM sensor.

Index 0x0274:

Full Scale Adjust Command	
Byte 0	0: Full Scale Adjust
Byte 1	Index of the Sub Sensor Instance: 3 : ATM at PCG55x
Byte 2-5:	always 0



The atmospheric sensor is optional on the PxG55X. For PCG55x with ATM is instance 3.

Read Access: Shows the last command that has been written to this parameter.

Example: Write 00-03-00-00-00-00 (hex) to this parameter for starting the adjustment of the atmospheric sensor.

Index 0x0275:

Full Scale Adjust Status	
0	Last command completed, no errors, no reply available
1	Last command completed, no errors, reply available
2	Reserved
3	Last command completed, errors present, reply available
255	Command is processing

Index 0x0276:

Full Scale Adjust Response	
Byte 0	See Full Scale Adjust Status
Byte 1	Unused
Byte 2	0: Full Scale Adjust successful 1: Full Scale Adjust failed: out-of-range 254: No previous Full Scale Adjust command issued

4.2.6 Exceptions

The following chapter explains all acyclic requests to gather error or warning information. For further error handling refer to the troubleshooting named in the device manual (→  [1], [2]).

4.2.6.1 Status

The exception status indicates any error or warning present.

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0040	Unsigned8	RO	Active Exception Status

Index 0x0040:

The exception status indicates any error or warning present. The warnings and errors are detailed in separate registers.

Active Exception Status	
Bit 0	Any warning active
Bit 2	Any error active

4.2.6.2 Global Exceptions

Errors and warnings unrelated to a measurement principle are consolidated in the global exception registers.

Slot	Subslot	Index	DataType	Access	Name
DAP(0)	PAP(10)	0x0050	Unsigned16	RO	Active Global Warning Details
		0x0051	Unsigned16	RO	Active Global Error Details

Index 0x0050:

Active Global Warning Details	
Bit 0	Internal Diagnostics: Communication between fieldbus and vacuum pressure gauge is interrupted or sensor does not fit together with electronics → Replace with the correct sensor type

All bits are active high.

Index 0x0051:

Active Global Error Details	
Bit 0	Internal Diagnostics: Communication between fieldbus and vacuum pressure gauge is interrupted or sensor does not fit together with electronics → Replace with the correct sensor type
Bit 1	Time out EEPROM access
Bit 2	CRC error
Bit 3	EEPROM record error
Bit 5	Wrong filament material
Bit 9	Wrong atmospheric sensor configuration
Bit 10	Wrong Insulation configuration
Bit 11	Configuration of sensor is different to configuration of basis board

All bits are active high.

4.2.7 Trip Points

The vacuum sensor has two independent switching logics named trip points on the fieldbus interface. The operating manual describes the configuration and usage of the Trip Points ("Switching Functions" →  [1], [2]).

The status of the trip points determines if the gauge pressure is below or above a certain value.

- The status of the low trip point is on, if the pressure falls below a certain threshold value.
- The status of the high trip point is on, if the pressure surpasses a certain threshold value.

To prevent a toggling behavior of the status at pressure close to the threshold value, a hysteresis is added to the threshold value.

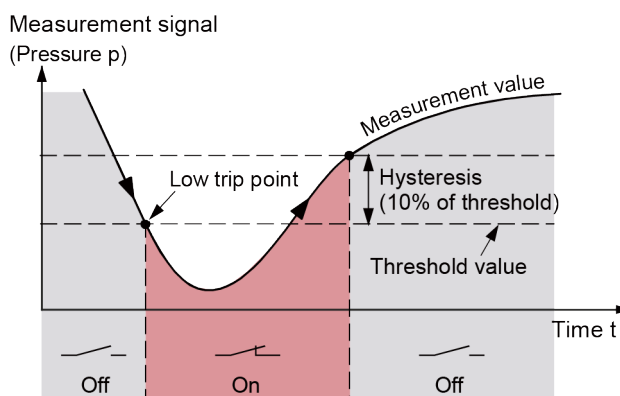
The threshold value can be set directly (Standard mode) or relative to the atmospheric pressure (ATM mode). The ATM mode is only available on devices with atmospheric sensor. The active mode is shown in record Source Index.

- In Standard mode the trip point value is defined by the parameter High Trip Point Limit / Low Trip Point Limit.
- In ATM mode the trip point results from the multiplication of the parameter Percentage Trip Source with the current value of the parameter "Sensor Value ATM".

All parameters for the Trip Points are saved non-volatile on the device.

Low Trip Point (default)

If the pressure in the vacuum system is lower than the trip point, the corresponding LED (<SP1> or <SP2>) 1 is lit solid and Status Low Trip Point 1 / 2 is set to 1. The corresponding relay is closed.



Procedure to set a low trip at 0.05 mbar for the trip point 1:

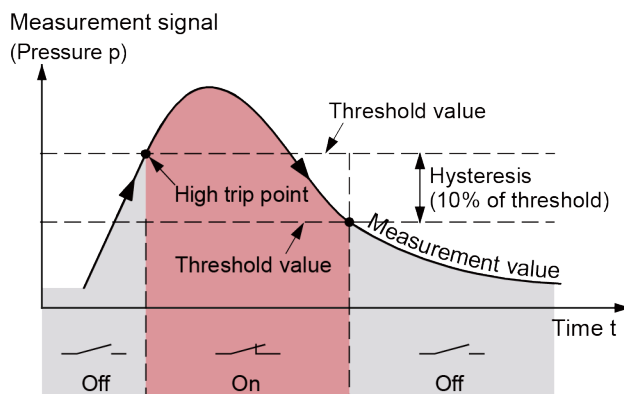
- 1 Make sure that parameter Low Trip Source Index 1 is set to 0x0829.
- 2 Write 0.05 to the parameter Low Trip Point Limit 1.
- 3 Enable the trip point by writing 1 to parameter Low Trip Point Enable 1.

Procedure to set a low trip at 0.3 of the ATM value for the trip point 1:

- 1 Make sure that parameter Low Trip Source Index 1 is set to 0x0200.
- 2 Write 0.3 to the parameter Percentage Low Trip Point 1.
- 3 Enable the trip point by writing 1 to parameter Low Trip Point Enable 1.

High Trip Point

If the pressure in the vacuum system is higher than the trip point, the corresponding LED (<SP1> or <SP2>) is lit solid and Status High Trip Point 1 / 2 is set to 1. The corresponding relay is closed.



Procedure to set at high trip at 5 [current pressure unit (e.g. Pa)] for the trip point 2:

- 1 Make sure that parameter High Trip Source Index 2 is set to 0x0926.
- 2 Write 5 to the parameter High Trip Point Limit 2.
- 3 Enable the trip point by writing 1 to parameter High Trip Point Enable 2.

Procedure to set a high trip at 0.98 of the ATM value for the trip point 2:

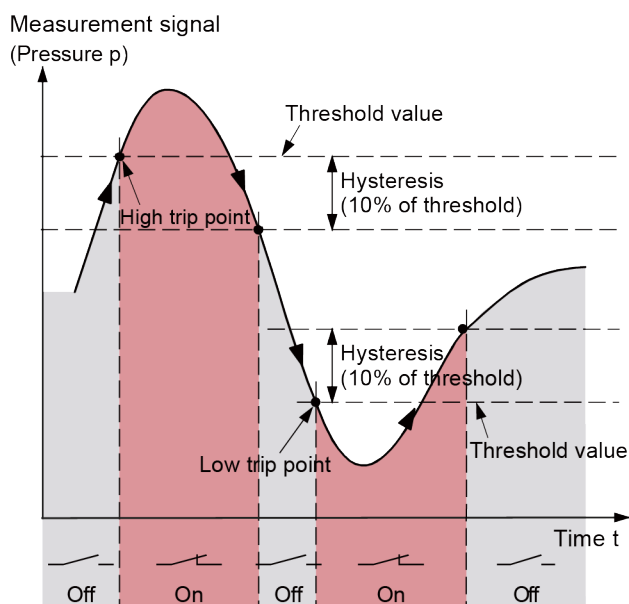
- 1 Make sure that parameter High Trip Source Index 2 is set to 0x0200.
- 2 Write 0.98 to the parameter Percentage High Trip Point 2.
- 3 Enable the trip point by writing 1 to parameter High Trip Point Enable 2.
The current trip point value can be read at parameter High Trip Point Limit 2.

High & Low Trip Point

Both a High Trip Point and a Low Trip Point are active. The output of the logic is controlled by an "OR" logic from High or Low Trip Point.

If the pressure in the vacuum system is higher than the defined High Trip Point threshold, the corresponding LED (<SP1> or <SP2>) is lit and Status High Trip Point 1 / 2 is set to 1. The corresponding relay is closed.

If the pressure in the vacuum system is lower than the defined Low Trip Point threshold, the corresponding LED (<SP1> or <SP2>) is lit and Status Low Trip Point 1 / 2 is set to 1. The corresponding relay is closed.



4.2.7.1 Status

The states of the Trip Points are also visible on the LEDs on the sensor (→ ch. 3.3).

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0010	Unsigned32	RO	Trip Point Output All

Index 0x0010:

This status bitfield is composed from the status of all Trip Points.

Trip Point Output All	
Bit 0	Status High Trip Point 1
Bit 1	Status Low Trip Point 1
Bit 2	Status High Trip Point 2
Bit 3	Status Low Trip Point 2

4.2.7.2 Trip Point 1

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0800	Unsigned8	RO	Status High Trip Point 1
		0x0801	Unsigned8	RO	Status Low Trip Point 1
		0x0812	Unsigned16	RW	High Trip Source Index 1 ¹⁾
		0x0813	Real32	RW	Percentage High Trip Source 1 ¹⁾
		0x0815	Unsigned16	RW	Low Trip Source Index 1 ¹⁾
		0x0816	Real32	RW	Percentage Low Trip Source 1 ¹⁾
		0x0820	Unsigned8	RW	High Trip Point Enable 1
		0x0821	Unsigned8	RW	Low Trip Point Enable 1
		0x0826	Real32	RW	High Trip Point Limit 1
		0x0829	Real32	RW	Low Trip Point Limit 1
		0x082C	Real32	RW	High Trip Hysteresis 1
		0x082D	Real32	RW	Low Trip Hysteresis 1

¹⁾ Only available for PCG55x with ATM sensor.

Index 0x0800:

Status High Trip Point 1	
0	Trip Point is not active
1	Trip Point is active

Index 0x0801:

Status Low Trip Point 1	
0	Trip Point is not active
1	Trip Point is active

Index 0x0812:

This parameter shows if the trip point limit is defined by the Standard Mode or the ATM Mode.

In Standard Mode the trip point equals the Trip Point Limit.

In ATM Mode the trip point equals the multiplication of Percentage Trip Source and the current Sensor Value of the atmospheric sensor.

High Trip Source Index 1	
0x0826	Standard Mode is active Trip Point = High Trip Point Limit 1
0x0200	ATM Mode is active Trip Point = Percentage High Trip Point Source 1 × Sensor Value ATM

Index 0x0813: In ATM Mode (check: HighTripSourceIndex1) the trip point is defined by $\text{PercentageHighTripSource1} \times \text{Sensor Value ATM}$.

This defines how the trip point is related to the Sensor Value of the atmospheric sensor.

Index 0x0815: This parameter shows if the trip point limit is defined by the Standard Mode or the ATM Mode.

In Standard Mode the trip point equals the TripPointLimit.

In ATM Mode the trip point equals the multiplication of PercentageTripSource and the current Sensor Value of the atmospheric sensor.

Low Trip Source Index 1	
0x0829	Standard Mode is active Trip Point = Low Trip Point Limit 1
0x0200	ATM Mode is active Trip Point = PercentageLowTripPointSource1 $\times$ Sensor Value ATM

Index 0x0816: In ATM Mode (check: LowTripSourceIndex1) the trip point is defined by $\text{PercentageLowTripSource1} \times \text{Sensor Value ATM}$.

This defines how the Trip Point is related to the Sensor Value ATM.

High Trip Point Enable 1	
0	Disable
1	Enable

Low Trip Point Enable 1	
0	Disable
1	Enable

Index 0x0826: Threshold value to trigger the High Trip Point 1 condition if pressure is above this value.

Index 0x0829: Threshold value to trigger the Low Trip Point 1 condition if pressure is below this value.

Index 0x082C: Hysteresis value for High Trip Point 1.

This value is subtracted from the High Trip Point Limit. The resulting value indicates the lower hysteresis point for the High Trip Point 1.

Index 0x082D: Hysteresis value for Low Trip Point 1.

This value is added to the Low Trip Point Limit. The resulting value indicates the upper hysteresis point for the Low Trip Point 1.

4.2.7.3 Trip Point 2

Slot	Subslot	Index	DataType	Access	Name
PG(1)	PAP(1)	0x0900	Unsigned8	RO	Status High Trip Point 2
		0x0901	Unsigned8	RO	Status Low Trip Point 2
		0x0912	Unsigned16	RW	High Trip Source Index 2 ¹⁾
		0x0913	Real32	RW	Percentage High Trip Source 2 ¹⁾
		0x0915	Unsigned16	RW	Low Trip Source Index 2 ¹⁾
		0x0916	Real32	RW	Percentage Low Trip Source 2 ¹⁾
		0x0920	Unsigned8	RW	High Trip Point Enable 2
		0x0921	Unsigned8	RW	Low Trip Point Enable 2
		0x0926	Real32	RW	High Trip Point Limit 2
		0x0929	Real32	RW	Low Trip Point Limit 2
		0x092C	Real32	RW	High Trip Hysteresis 2
		0x092D	Real32	RW	Low Trip Hysteresis 2

¹⁾ Only available for PCG55x with ATM sensor.

Index 0x0900:

Status High Trip Point 2	
0	Trip is not active
1	Trip is active

Index 0x0901:

Status Low Trip Point 2	
0	Trip is not active
1	Trip is active

Index 0x0912:

This parameter shows if the trip point limit is defined by the Standard Mode or the ATM Mode.

In Standard Mode the trip point equals the TripPointLimit.

In ATM Mode the trip point equals the multiplication of PercentageTripSource and the current Sensor Value ATM.

High Trip Source Index 2	
0x0926	Standard Mode is active -> Trip Point = High Trip Point Limit 2
0x0200	ATM Mode is active -> Trip Point = PercentageHighTripPointSource2 × Sensor Value ATM

Index 0x0913:

In ATM Mode (check: HighTripSourceIndex2) the trip point is defined by PercentageHighTripSource2 × Sensor Value ATM.

This defines how the trip point is related to the Sensor Value ATM.

Index 0x0915:

This parameter shows if the trip point limit is defined by the Standard Mode or the ATM Mode.

In Standard Mode the trip point equals the TripPointLimit.

In ATM Mode the trip point equals the multiplication of PercentageTripSource and the current Sensor Value ATM.

Low Trip Source Index 2	
0x0929	Standard Mode is active Trip Point = Low Trip Point Limit 2
0x0200	ATM Mode is active Trip Point = PercentageLowTripPointSource2 × Sensor Value ATM

Index 0x0916: In ATM Mode (check: LowTripSourceIndex2) the trip point is defined by $\text{PercentageLowTripSource2} \times \text{Sensor Value ATM}$.
This defines how the trip point is related to the Sensor Value ATM.

Index 0x0920:

High Trip Point Enable 2	
0	Disable
1	Enable

Index 0x0921:

Low Trip Point Enable 2	
0	Disable
1	Enable

Index 0x0926:

High limit to trigger the High Trip Point 2 condition if logic input value is above this limit.

Index 0x0929:

Low limit to trigger the Low Trip Point 2 condition if logic input value is below this limit.

Index 0x092C:

Hysteresis value for High Trip Point 2.

This value is subtracted from the High Trip Point Limit. The resulting value indicates the lower hysteresis point for the High Trip Point 2.

Index 0x092D:

Hysteresis value for Low Trip Point 2.

This value is added to the Low Trip Point Limit. The resulting value indicates the upper hysteresis point for the Low Trip Point 2.

Appendix

A: List of Parameters for a PCG55x with ATM

Slot	Subslot	Index	DataType	Access	Group	Name
DAP(0)	PAP(10)	0x0021	Unsigned8	RW	Pressure Gauge	Data Unit
DAP(0)	PAP(10)	0x0022	Unsigned32	RO	Device	Serial Number VPG
DAP(0)	PAP(10)	0x0023	String[18]	RO	Device	Mac Address
DAP(0)	PAP(10)	0x0040	Unsigned8	RO	Exceptions	Active Exception Status
DAP(0)	PAP(10)	0x0050	Unsigned16	RO	Exceptions	Active Global Warning Details
DAP(0)	PAP(10)	0x0051	Unsigned16	RO	Exceptions	Active Global Error Details
DAP(0)	PAP(10)	0x0082	Unsigned8[6]	RW	Device	Device Reset Command
DAP(0)	PAP(10)	0x0083	Unsigned8[1]	RO	Device	Device Reset Status
DAP(0)	PAP(10)	0x0084	Unsigned8[2]	RO	Device	Device Reset Response
DAP(0)	PAP(10)	0x00B4	String[14]	RO	Device	SW Version Complete Device
DAP(0)	PAP(10)	0x00B5	String[14]	RO	Device	SW Version VPG
DAP(0)	PAP(10)	0x00B6	String[14]	RO	Device	SW Version Fieldbus
DAP(0)	PAP(10)	0x00B7	String[14]	RO	Device	SW Version NP40
DAP(0)	PAP(10)	0x00B8	String[41]	RO	Device	SW Git Hash Fieldbus
DAP(0)	PAP(10)	0x00B9	String[41]	RO	Device	SW Git Hash BL Fieldbus
DAP(0)	PAP(10)	0x00BA	String[14]	RO	Device	SW Version BL Fieldbus
DAP(0)	PAP(10)	0x00BB	String[9]	RO	Device	HW Version Fieldbus
DAP(0)	PAP(10)	0x00FE	String[25]	RO	Device	Device Type
DAP(0)	PAP(10)	0x0274	Unsigned8[6]	RW	Pressure Gauge ATM	Full Scale Adjust Command
DAP(0)	PAP(10)	0x0275	Unsigned8[1]	RO	Pressure Gauge ATM	Full Scale Adjust Status
DAP(0)	PAP(10)	0x0276	Unsigned8[3]	RO	Pressure Gauge ATM	Full Scale Adjust Response
DAP(0)	PAP(10)	0x0370	Unsigned8[6]	RW	Pressure Gauge Pirani	Zero Adjust Command
DAP(0)	PAP(10)	0x0371	Unsigned8[1]	RO	Pressure Gauge Pirani	Zero Adjust Status
DAP(0)	PAP(10)	0x0372	Unsigned8[3]	RO	Pressure Gauge Pirani	Zero Adjust Response
DAP(0)	PAP(10)	0x0374	Unsigned8[6]	RW	Pressure Gauge Pirani	Full Scale Adjust Command
DAP(0)	PAP(10)	0x0375	Unsigned8[1]	RO	Pressure Gauge Pirani	Full Scale Adjust Status
DAP(0)	PAP(10)	0x0376	Unsigned8[3]	RO	Pressure Gauge Pirani	Full Scale Adjust Response
PG(1)	PAP(1)	0x0001	Unsigned8	RO	Pressure Gauge	Gauge Reading Valid
PG(1)	PAP(1)	0x0002	Unsigned8	RO	Pressure Gauge	Gauge Overrange Exceeded
PG(1)	PAP(1)	0x0003	Unsigned8	RO	Pressure Gauge	Gauge Underrange Exceeded
PG(1)	PAP(1)	0x0004	Real32	RO	Pressure Gauge	Gauge Active Value
PG(1)	PAP(1)	0x0005	Unsigned16	RO	Pressure Gauge	Gauge Active Sensor Number
PG(1)	PAP(1)	0x0006	Unsigned8	RO	Pressure Gauge	Gauge Active Status
PG(1)	PAP(1)	0x0010	Unsigned32	RO	Trip Points	Trip Point Output All
PG(1)	PAP(1)	0x0100	Real32	RO	Pressure Gauge CDG	Sensor Value
PG(1)	PAP(1)	0x0101	Unsigned8	RO	Pressure Gauge CDG	Reading Valid
PG(1)	PAP(1)	0x0102	Unsigned8	RO	Pressure Gauge CDG	Overrange Exceeded
PG(1)	PAP(1)	0x0103	Unsigned8	RO	Pressure Gauge CDG	Underrange Exceeded
PG(1)	PAP(1)	0x0140	Unsigned16	RO	Pressure Gauge CDG	Sensor Warning
PG(1)	PAP(1)	0x0141	Unsigned16	RO	Pressure Gauge CDG	Sensor Error
PG(1)	PAP(1)	0x0200	Real32	RO	Pressure Gauge ATM	Sensor Value

Slot	Subslot	Index	DataType	Access	Group	Name
PG(1)	PAP(1)	0x0201	Unsigned8	RO	Pressure Gauge ATM	Reading Valid
PG(1)	PAP(1)	0x0202	Unsigned8	RO	Pressure Gauge ATM	Overrange Exceeded
PG(1)	PAP(1)	0x0203	Unsigned8	RO	Pressure Gauge ATM	Underrange Exceeded
PG(1)	PAP(1)	0x0240	Unsigned16	RO	Pressure Gauge ATM	Sensor Warning
PG(1)	PAP(1)	0x0241	Unsigned16	RO	Pressure Gauge ATM	Sensor Error
PG(1)	PAP(1)	0x0300	Real32	RO	Pressure Gauge Pirani	Sensor Value
PG(1)	PAP(1)	0x0301	Unsigned8	RO	Pressure Gauge Pirani	Reading Valid
PG(1)	PAP(1)	0x0302	Unsigned8	RO	Pressure Gauge Pirani	Overrange Exceeded
PG(1)	PAP(1)	0x0303	Unsigned8	RO	Pressure Gauge Pirani	Underrange Exceeded
PG(1)	PAP(1)	0x0340	Unsigned16	RO	Pressure Gauge Pirani	Sensor Warning
PG(1)	PAP(1)	0x0341	Unsigned16	RO	Pressure Gauge Pirani	Sensor Error
PG(1)	PAP(1)	0x0800	Unsigned8	RO	Trip Points	Status High Trip Point 1
PG(1)	PAP(1)	0x0801	Unsigned8	RO	Trip Points	Status Low Trip Point 1
PG(1)	PAP(1)	0x0812	Unsigned16	RW	Trip Points	High Trip Source Index 1
PG(1)	PAP(1)	0x0813	Real32	RW	Trip Points	Percentage High Trip Source 1
PG(1)	PAP(1)	0x0815	Unsigned16	RW	Trip Points	Low Trip Source Index 1
PG(1)	PAP(1)	0x0816	Real32	RW	Trip Points	Percentage Low Trip Source 1
PG(1)	PAP(1)	0x0820	Unsigned8	RW	Trip Points	High Trip Point Enable 1
PG(1)	PAP(1)	0x0821	Unsigned8	RW	Trip Points	Low Trip Point Enable 1
PG(1)	PAP(1)	0x0826	Real32	RW	Trip Points	High Trip Point Limit 1
PG(1)	PAP(1)	0x0829	Real32	RW	Trip Points	Low Trip Point Limit 1
PG(1)	PAP(1)	0x082C	Real32	RW	Trip Points	High Trip Hysteresis 1
PG(1)	PAP(1)	0x082D	Real32	RW	Trip Points	Low Trip Hysteresis 1
PG(1)	PAP(1)	0x0900	Unsigned8	RO	Trip Points	Status High Trip Point 2
PG(1)	PAP(1)	0x0901	Unsigned8	RO	Trip Points	Status Low Trip Point 2
PG(1)	PAP(1)	0x0912	Unsigned16	RW	Trip Points	High Trip Source Index 2
PG(1)	PAP(1)	0x0913	Real32	RW	Trip Points	Percentage High Trip Source 2
PG(1)	PAP(1)	0x0915	Unsigned16	RW	Trip Points	Low Trip Source Index 2
PG(1)	PAP(1)	0x0916	Real32	RW	Trip Points	Percentage Low Trip Source 2
PG(1)	PAP(1)	0x0920	Unsigned8	RW	Trip Points	High Trip Point Enable 2
PG(1)	PAP(1)	0x0921	Unsigned8	RW	Trip Points	Low Trip Point Enable 2
PG(1)	PAP(1)	0x0926	Real32	RW	Trip Points	High Trip Point Limit 2
PG(1)	PAP(1)	0x0929	Real32	RW	Trip Points	Low Trip Point Limit 2
PG(1)	PAP(1)	0x092C	Real32	RW	Trip Points	High Trip Hysteresis 2
PG(1)	PAP(1)	0x092D	Real32	RW	Trip Points	Low Trip Hysteresis 2

B: List of Parameters for a PCG55x without ATM

Slot	Subslot	Index	DataType	Access	Group	Name
DAP(0)	PAP(10)	0x0021	Unsigned8	RW	Pressure Gauge	Data Unit
DAP(0)	PAP(10)	0x0022	Unsigned32	RO	Device	Serial Number VPG
DAP(0)	PAP(10)	0x0023	String[18]	RO	Device	Mac Address
DAP(0)	PAP(10)	0x0040	Unsigned8	RO	Exceptions	Active Exception Status
DAP(0)	PAP(10)	0x0050	Unsigned16	RO	Exceptions	Active Global Warning Details
DAP(0)	PAP(10)	0x0051	Unsigned16	RO	Exceptions	Active Global Error Details
DAP(0)	PAP(10)	0x0082	Unsigned8[6]	RW	Device	Device Reset Command
DAP(0)	PAP(10)	0x0083	Unsigned8[1]	RO	Device	Device Reset Status
DAP(0)	PAP(10)	0x0084	Unsigned8[2]	RO	Device	Device Reset Response
DAP(0)	PAP(10)	0x00B4	String[14]	RO	Device	SW Version Complete Device
DAP(0)	PAP(10)	0x00B5	String[14]	RO	Device	SW Version VPG
DAP(0)	PAP(10)	0x00B6	String[14]	RO	Device	SW Version Fieldbus
DAP(0)	PAP(10)	0x00B7	String[14]	RO	Device	SW Version NP40
DAP(0)	PAP(10)	0x00B8	String[41]	RO	Device	SW Git Hash Fieldbus
DAP(0)	PAP(10)	0x00B9	String[41]	RO	Device	SW Git Hash BL Fieldbus
DAP(0)	PAP(10)	0x00BA	String[14]	RO	Device	SW Version BL Fieldbus
DAP(0)	PAP(10)	0x00BB	String[9]	RO	Device	HW Version Fieldbus
DAP(0)	PAP(10)	0x00FE	String[25]	RO	Device	Device Type
DAP(0)	PAP(10)	0x0370	Unsigned8[6]	RW	Pressure Gauge Pirani	Zero Adjust Command
DAP(0)	PAP(10)	0x0371	Unsigned8[1]	RO	Pressure Gauge Pirani	Zero Adjust Status
DAP(0)	PAP(10)	0x0372	Unsigned8[3]	RO	Pressure Gauge Pirani	Zero Adjust Response
DAP(0)	PAP(10)	0x0374	Unsigned8[6]	RW	Pressure Gauge Pirani	Full Scale Adjust Command
DAP(0)	PAP(10)	0x0375	Unsigned8[1]	RO	Pressure Gauge Pirani	Full Scale Adjust Status
DAP(0)	PAP(10)	0x0376	Unsigned8[3]	RO	Pressure Gauge Pirani	Full Scale Adjust Response
PG(1)	PAP(1)	0x0001	Unsigned8	RO	Pressure Gauge	Gauge Reading Valid
PG(1)	PAP(1)	0x0002	Unsigned8	RO	Pressure Gauge	Gauge Overrange Exceeded
PG(1)	PAP(1)	0x0003	Unsigned8	RO	Pressure Gauge	Gauge Underrange Exceeded
PG(1)	PAP(1)	0x0004	Real32	RO	Pressure Gauge	Gauge Active Value
PG(1)	PAP(1)	0x0005	Unsigned16	RO	Pressure Gauge	Gauge Active Sensor Number
PG(1)	PAP(1)	0x0006	Unsigned8	RO	Pressure Gauge	Gauge Active Status
PG(1)	PAP(1)	0x0010	Unsigned32	RO	Trip Points	Trip Point Output All
PG(1)	PAP(1)	0x0100	Real32	RO	Pressure Gauge CDG	Sensor Value
PG(1)	PAP(1)	0x0101	Unsigned8	RO	Pressure Gauge CDG	Reading Valid
PG(1)	PAP(1)	0x0102	Unsigned8	RO	Pressure Gauge CDG	Overrange Exceeded
PG(1)	PAP(1)	0x0103	Unsigned8	RO	Pressure Gauge CDG	Underrange Exceeded
PG(1)	PAP(1)	0x0140	Unsigned16	RO	Pressure Gauge CDG	Sensor Warning
PG(1)	PAP(1)	0x0141	Unsigned16	RO	Pressure Gauge CDG	Sensor Error
PG(1)	PAP(1)	0x0300	Real32	RO	Pressure Gauge Pirani	Sensor Value
PG(1)	PAP(1)	0x0301	Unsigned8	RO	Pressure Gauge Pirani	Reading Valid
PG(1)	PAP(1)	0x0302	Unsigned8	RO	Pressure Gauge Pirani	Overrange Exceeded
PG(1)	PAP(1)	0x0303	Unsigned8	RO	Pressure Gauge Pirani	Underrange Exceeded
PG(1)	PAP(1)	0x0340	Unsigned16	RO	Pressure Gauge Pirani	Sensor Warning
PG(1)	PAP(1)	0x0341	Unsigned16	RO	Pressure Gauge Pirani	Sensor Error
PG(1)	PAP(1)	0x0800	Unsigned8	RO	Trip Points	Status High Trip Point 1
PG(1)	PAP(1)	0x0801	Unsigned8	RO	Trip Points	Status Low Trip Point 1

Slot	Subslot	Index	DataType	Access	Group	Name
PG(1)	PAP(1)	0x0820	Unsigned8	RW	Trip Points	High Trip Point Enable 1
PG(1)	PAP(1)	0x0821	Unsigned8	RW	Trip Points	Low Trip Point Enable 1
PG(1)	PAP(1)	0x0826	Real32	RW	Trip Points	High Trip Point Limit 1
PG(1)	PAP(1)	0x0829	Real32	RW	Trip Points	Low Trip Point Limit 1
PG(1)	PAP(1)	0x082C	Real32	RW	Trip Points	High Trip Hysteresis 1
PG(1)	PAP(1)	0x082D	Real32	RW	Trip Points	Low Trip Hysteresis 1
PG(1)	PAP(1)	0x0900	Unsigned8	RO	Trip Points	Status High Trip Point 2
PG(1)	PAP(1)	0x0901	Unsigned8	RO	Trip Points	Status Low Trip Point 2
PG(1)	PAP(1)	0x0920	Unsigned8	RW	Trip Points	High Trip Point Enable 2
PG(1)	PAP(1)	0x0921	Unsigned8	RW	Trip Points	Low Trip Point Enable 2
PG(1)	PAP(1)	0x0926	Real32	RW	Trip Points	High Trip Point Limit 2
PG(1)	PAP(1)	0x0929	Real32	RW	Trip Points	Low Trip Point Limit 2
PG(1)	PAP(1)	0x092C	Real32	RW	Trip Points	High Trip Hysteresis 2
PG(1)	PAP(1)	0x092D	Real32	RW	Trip Points	Low Trip Hysteresis 2

C: List of Parameters for a PSG55x

Slot	Subslot	Index	DataType	Access	Group	Name
DAP(0)	PAP(10)	0x0021	Unsigned8	RW	Pressure Gauge	Data Unit
DAP(0)	PAP(10)	0x0022	Unsigned32	RO	Device	Serial Number VPG
DAP(0)	PAP(10)	0x0023	String[18]	RO	Device	Mac Address
DAP(0)	PAP(10)	0x0040	Unsigned8	RO	Exceptions	Active Exception Status
DAP(0)	PAP(10)	0x0050	Unsigned16	RO	Exceptions	Active Global Warning Details
DAP(0)	PAP(10)	0x0051	Unsigned16	RO	Exceptions	Active Global Error Details
DAP(0)	PAP(10)	0x0082	Unsigned8[6]	RW	Device	Device Reset Command
DAP(0)	PAP(10)	0x0083	Unsigned8[1]	RO	Device	Device Reset Status
DAP(0)	PAP(10)	0x0084	Unsigned8[2]	RO	Device	Device Reset Response
DAP(0)	PAP(10)	0x00B4	String[14]	RO	Device	SW Version Complete Device
DAP(0)	PAP(10)	0x00B5	String[14]	RO	Device	SW Version VPG
DAP(0)	PAP(10)	0x00B6	String[14]	RO	Device	SW Version Fieldbus
DAP(0)	PAP(10)	0x00B7	String[14]	RO	Device	SW Version NP40
DAP(0)	PAP(10)	0x00B8	String[41]	RO	Device	SW Git Hash Fieldbus
DAP(0)	PAP(10)	0x00B9	String[41]	RO	Device	SW Git Hash BL Fieldbus
DAP(0)	PAP(10)	0x00BA	String[14]	RO	Device	SW Version BL Fieldbus
DAP(0)	PAP(10)	0x00BB	String[9]	RO	Device	HW Version Fieldbus
DAP(0)	PAP(10)	0x00FE	String[25]	RO	Device	Device Type
DAP(0)	PAP(10)	0x0370	Unsigned8[6]	RW	Pressure Gauge Pirani	Zero Adjust Command
DAP(0)	PAP(10)	0x0371	Unsigned8[1]	RO	Pressure Gauge Pirani	Zero Adjust Status
DAP(0)	PAP(10)	0x0372	Unsigned8[3]	RO	Pressure Gauge Pirani	Zero Adjust Response
DAP(0)	PAP(10)	0x0374	Unsigned8[6]	RW	Pressure Gauge Pirani	Full Scale Adjust Command
DAP(0)	PAP(10)	0x0375	Unsigned8[1]	RO	Pressure Gauge Pirani	Full Scale Adjust Status
DAP(0)	PAP(10)	0x0376	Unsigned8[3]	RO	Pressure Gauge Pirani	Full Scale Adjust Response
PG(1)	PAP(1)	0x0001	Unsigned8	RO	Pressure Gauge	Gauge Reading Valid
PG(1)	PAP(1)	0x0002	Unsigned8	RO	Pressure Gauge	Gauge Overrange Exceeded
PG(1)	PAP(1)	0x0003	Unsigned8	RO	Pressure Gauge	Gauge Underrange Exceeded
PG(1)	PAP(1)	0x0004	Real32	RO	Pressure Gauge	Gauge Active Value
PG(1)	PAP(1)	0x0005	Unsigned16	RO	Pressure Gauge	Gauge Active Sensor Number
PG(1)	PAP(1)	0x0006	Unsigned8	RO	Pressure Gauge	Gauge Active Status
PG(1)	PAP(1)	0x0010	Unsigned32	RO	Trip Points	Trip Point Output All
PG(1)	PAP(1)	0x0300	Real32	RO	Pressure Gauge Pirani	Sensor Value
PG(1)	PAP(1)	0x0301	Unsigned8	RO	Pressure Gauge Pirani	Reading Valid
PG(1)	PAP(1)	0x0302	Unsigned8	RO	Pressure Gauge Pirani	Overrange Exceeded
PG(1)	PAP(1)	0x0303	Unsigned8	RO	Pressure Gauge Pirani	Underrange Exceeded
PG(1)	PAP(1)	0x0340	Unsigned16	RO	Pressure Gauge Pirani	Sensor Warning
PG(1)	PAP(1)	0x0341	Unsigned16	RO	Pressure Gauge Pirani	Sensor Error
PG(1)	PAP(1)	0x0800	Unsigned8	RO	Trip Points	Status High Trip Point 1
PG(1)	PAP(1)	0x0801	Unsigned8	RO	Trip Points	Status Low Trip Point 1
PG(1)	PAP(1)	0x0820	Unsigned8	RW	Trip Points	High Trip Point Enable 1
PG(1)	PAP(1)	0x0821	Unsigned8	RW	Trip Points	Low Trip Point Enable 1
PG(1)	PAP(1)	0x0826	Real32	RW	Trip Points	High Trip Point Limit 1
PG(1)	PAP(1)	0x0829	Real32	RW	Trip Points	Low Trip Point Limit 1
PG(1)	PAP(1)	0x082C	Real32	RW	Trip Points	High Trip Hysteresis 1
PG(1)	PAP(1)	0x082D	Real32	RW	Trip Points	Low Trip Hysteresis 1

Slot	Subslot	Index	DataType	Access	Group	Name
PG(1)	PAP(1)	0x0900	Unsigned8	RO	Trip Points	Status High Trip Point 2
PG(1)	PAP(1)	0x0901	Unsigned8	RO	Trip Points	Status Low Trip Point 2
PG(1)	PAP(1)	0x0920	Unsigned8	RW	Trip Points	High Trip Point Enable 2
PG(1)	PAP(1)	0x0921	Unsigned8	RW	Trip Points	Low Trip Point Enable 2
PG(1)	PAP(1)	0x0926	Real32	RW	Trip Points	High Trip Point Limit 2
PG(1)	PAP(1)	0x0929	Real32	RW	Trip Points	Low Trip Point Limit 2
PG(1)	PAP(1)	0x092C	Real32	RW	Trip Points	High Trip Hysteresis 2
PG(1)	PAP(1)	0x092D	Real32	RW	Trip Points	Low Trip Hysteresis 2

D: PROFINET Certificate



Certificate

PROFIBUS Nutzerorganisation e.V. grants to

INFICON AG

Alte Landstrasse 6, 9496 Balzers, Liechtenstein

the Certificate No: **Z13943** for the PROFINET IO Device:

Model Name: PxG55x
 Revision: SW/FW: V3.0.0; HW: 1
 Identnumber: 0x017A; 0x0101
 GSD: GSDML-V2.43-INFICON_AG-PXG55X-20240402.xml
 DAP: ID_MODULE_DAP: Inficon PXG55X; 0x00000100

This certificate confirms that the product has successfully passed the certification tests with the following scope:

☒ PNIO_Version	V2.43
☒ Conformance Class	B
☒ Optional Features	Legacy, MRP
☒ Netload Class	III
☒ PNIO_Tester_Version	Version V2.44.1
☒ Tester	SIEMENS AG, Fürth, Germany; PN846-1

This certificate is granted according to the document:

"Framework for testing and certification of PROFIBUS and PROFINET products".

For all products that are placed in circulation by **July 17, 2027** the certificate is valid for life.

Karlsruhe, November 05, 2024

Board of PROFIBUS Nutzerorganisation e. V.

(Official in Charge)



(Xaver Schmidt)

(Frank Moritz)

E: Literature

-  [1] Operating Manual
PCG550, PCG552, PCG554
 tina56d1 (German)
 tina56e1 (English)
 INFICON AG, LI-9496 Balzers, Liechtenstein
-  [2] Operating Manual
PSG550, PSG552, PSG554
 tina60d1 (German)
 tina60e1 (English)
 INFICON AG, LI-9496 Balzers, Liechtenstein
-  [3] PROFINET Device Description GSDML
PCG550, PCG552, PCG554
PSG550, PSG552, PSG554
 INFICON AG, LI-9496 Balzers, Liechtenstein
-  [4] www.profibus.com
 Profibus user organization

F: Change History

Revision	Chapter	Description
-	all	Initial revision
A	all	Rework of document for revision A
	4.1.2	added process data "Gauge Active Status" on Slot 1, Subslot 23
	4.2.7	moved record data "Trip Point Output All" to Slot 1, Index 0x0010
	4.2.2	added record data "Gauge Active Status" in Slot 1, Index 0x0006
	4.2.1	added record data "SW Version BL Fieldbus" in Slot 0, Index 0x00BA
	4.2.1	changed format of "SW Version NP40" in Slot 0, Index 0x00B7
	-	Removed "Active Manufacturer Warning Details"
	-	Removed "Active Manufacturer Error Details"
	4.2.6	Simplified Global Exceptions to "Active Global Warning Details" in Slot 0, Index 0x0050 and "Active Global Error Details" in Slot 0, Index 0x0051
	Appendix	PROFINET Certificate included

Notes

Original: English



TNRB72E1-A



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