

Operating instructions for pressure transmitter PASCAL CV PROFIBUS PA Type series CV3... without display module



Features

- Modular pressure transmitter
- Output signal: PROFIBUS PA per IEC 61158-2
- Watchdog for electronics modules and measuring cell
- Hygienic housing design, stainless steel, excellent moisture protection (IP 66)
- Accuracy: $\leq 0.15\%$
- Turndown 5:1
- Explosion protection for gases and dust
- Degree of protection IP 66
- Piezoresistive measuring cell, directly aerated, fully welded, without inside gasket



Basic modules 4...20 mA



PROFIBUS PA



Function modules

switching module



HART® module



display module



Various modules can easily be added to PASCAL CV

Contents	Page	Page
General		
Safety instructions	2	Electrical connection
Mounting and operating	2	Operation
Certificates / Approvals	3	General instructions PROFIBUS PA
		4
		7
		8

General

These operating instructions refer to installation, commissioning, servicing and adjustment. Statutory regulations, valid standards, additional technical details in the relevant data sheet, details of the type plate and any additional certificates are to be observed along with these operating instructions.



Safety instructions

- Installation, operation and maintenance of the instrument may be executed by authorized personnel, only, using suitable equipment.
- Warning: If the instrument is used incorrectly it is possible that serious injuries or damage can occur!
- Prior to the disassembly of the pressure transmitter the impulse ducts between the measuring transmitter and the process have to be locked and relieved from pressure.
- The standard nominal pressure rating and the permissible operating temperature of the gasket should be observed for all process connections. Operation outside the allowed nominal pressure rating, especially with clamp connections, is only possible with suitable clamps. In this case, note DIN 32676 for stipulations on heat resistance.
- Pressure transmitters that are mechanically defective can cause injuries or give rise to process faults. Suitable precautions should be taken to avoid this.



CE marking

The CE marking on the instruments certifies compliance with valid EU directives for bringing products to market within the European Union. The following directives are met:

EMC directives	EMC	2004/108/EC
Pressure Equipment Directive	PED	97/23/EC
Ex directive	ATEX	94/9/EC



Ex approval

Electrical equipment in hazardous areas should only be installed and commissioned by competent personnel. Modifications to devices and connections destroy the operating safety, the ex-proofing and the guarantee. The limit values detailed in the EC Type-Examination Certificate of conformity are to be observed.

Certificate no. TüV 04 ATEX 2387 X

Ex-protection

intrinsically safe ⊕ II 1/2 G Ex ia IIC T4/T5/T6 Ga/Gb

Ex-protection dust ⊕ II 2 G Ex ia IIC T4/T5/T6 Gb

⊕ II 2 D Ex ia IIIC T xx °C Db

Mounting and operating

Details about electrical connection of the device see page 5-7.

General instructions for PROFIBUS PA see page 18.

Mounting instructions for PROFIBUS PA see

www.profibus.com (Downloads).

- Before mounting the instrument ensure that pressure range, overpressure resistance, media compatibility, thermostability and pressure port are suitable for the process at hand.
- Conduct process installation before electrical installation.
- Measuring instruments that should not have any oil or grease residues in the pressure port are marked „Free of oil and grease“.
- Gaskets must be chosen that are suited to the process connection and resistant to the measured medium.
- Check for pressure tightness when commissioning the transmitter.
- Do not insulate the temperature decoupler, as this would reduce the decoupling effect. Follow DIN 32676.
- Wire up the instrument with power switched off.
- The housing in protection class IP66 consists of a two chamber system in which the measuring cell is aerated directly in relation to the environment by means of a PTFE filter system.

- The instrument can only be protected against electromagnetic interference (EMC) when the conditions for screening, earthing, wiring and potential isolation are met during installation.
- The mounting position should be taken into consideration when checking the zero output. Standard transmitters are adjusted at the factory for vertical mounting. Changes to the mounting position can cause zero shifts at pressure ranges ≤ 2 bar. These drifts can be corrected by adjustment on site.
- When the instrument is opened any contact with the electrical connections can affect the signals. This situation can be avoided by switching off the supply voltage or by disconnecting the signal circuit.
- The types of protection IP66 are only achieved, when the threaded ring has been screwed tight after electrical connection/parameterization.
- The instrument requires no maintenance.

Instructions for the operation with diaphragm seal

- To avoid soiling and damage remove protective cap or wrapping in front of the separating diaphragm before mounting.
- Do not touch the flush mounted separating diaphragm, as there is a danger of deformation at measuring ranges to 10 bar / 150 psi. Instrument zero point and measuring characteristics could also be affected.
- Measuring instrument and diaphragm seal are a closed system and should not be separated.
- Avoid overtightening the process screw joints as this can result in zero displacements at the pressure transmitter (fixing error).
- When using systems with capillary for vacuum measurements always mount the pressure transmitter underneath the diaphragm seal. The instruments are set at the factory with pressure transmitter and diaphragm seal at the same height. Correct any differences in height between diaphragm seal and pressure transmitter arising from conditions on site on the pressure transmitter when placing the instrument into operation (see "Setting the measuring range"). When correcting for elevation be aware of the adjustment limits.
- Be sure to install and securely fasten the capillary to avoid vibrations. Roll up overlengths with a minimum radius of 50 cm. Shock and changes in temperature can impact on measurements.
- Process and ambient temperatures can cause zero displacements at the pressure transmitter with some system designs. We can supply you with an error analysis.

Certificates / Approvals

Interference emission EN 55011
 Noise immunity EN 61326

Ex-approval

The limit values detailed in the EC-Type Examination Certificate are to be observed!

EG-Type Examination Certificate

TÜV 04 ATEX 2387 X

Type of ex-protection  II 1/2 G Ex ia IIC T4/T5/T6 Ga/Gb
 II 2 G Ex ia IIC T4/T5/T6 Gb
 II 2 D Ex ia IIIC Txx°C Db

Permissible temperatures for pressure transmitter with category II 1/2 G

Temperature class	Ambient temperature	Medium temperature
T6	-20...+55 °C	-20...+55 °C
T5	-20...+80 °C	-20...+60 °C
T4	-20...+85 °C	-20...+60 °C

Permissible temperatures for pressure transmitter with category II 2G

Temperature class	Ambient temperature	Medium temperature
T6	-20...+55 °C	-20...+55 °C
T5	-20...+80 °C	-20...+80 °C
T4	-20...+85 °C	-20...+85 °C

Permissible temperatures for pressure transmitter with category II 2D

Max. surface temperature	Ambient / Medium temperature
65 °C	40 °C
85 °C	60 °C
105 °C	80 °C
110 °C	85 °C

Electrical data

Sum of maximum values in the intrinsically safe circuits (acc. to IEC 60079-27;FRISCO)

$$U_i = 17,5 \text{ V}$$

$$L_i = 10 \text{ } \mu\text{H}$$

The effective internal capacitance is negligible small.

Special conditions for safe use

The pressure port of the pressure transmitter PASCAL CV type CVxx is allowed to be operated in an explosion hazardous atmosphere, which requires apparatus of the category 1, only if atmospheric conditions exist (Temperature from -20°C to 60°C, pressure from 0.8 bar to 1.1 bar).

The maximum surface temperature regarding dust explosion protection was determined without dust layer. Additional information has to be taken from EN 60079-14.

Electrical connection

General

If you make electrical modifications to the device, add/remove a function module or connect electrical device leads, you must de-energize the device first.

If you open up the device you run the risk of interfering with the signals by making contact with the electrical connections. To avoid this, switch off the supply voltage or isolate the signal circuit.

EMC interference immunity

You can only protect against electromagnetic interference (EMC) by fulfilling the requirements for screening, grounding, wiring and potential isolation during installation and assembly.

To improve interference immunity please observe the following:

- lay signal cable so that it is isolated from all cables with voltages > 60 V
- use cable with twisted strands
- if possible, avoid installing the device near large electrical systems or use shielded cable
- use shielded cable to fully comply with the specification
- do not break or interrupt bus cable shielding
- Be sure to ground the shielding at each cable end. The cable between shielding and ground should be as short as possible
- When there are large differences in potential between different ground connection points, connect only one point to the ground reference plane. Connect all other shield ends to reference voltage across an RF capacitor.
Solid dielectric, e.g. ceramic
 - capacitance ≤ 10 nF
 - dielectric strength > 1500 V

Caution!

Please refer to PROFIBUS PA specification EN 50170 for more instructions on network layout and grounding.

BUS-CABLE

We recommend you use a shielded and twisted two-core cable.

The specifications below apply to installations in hazardous areas (EN 60079-27, FISCO):

- loop resistance (DC): 15 - 150 Ω /km
- inductance per unit length: 0.4 - 1 mH/km
- capacitance per unit length: 45...200 nF/km (including shield)

suitable cables (non-hazardous area):

- Siemens 6XV1830-5EH10 (violet)
- Belden 3076F (orange)

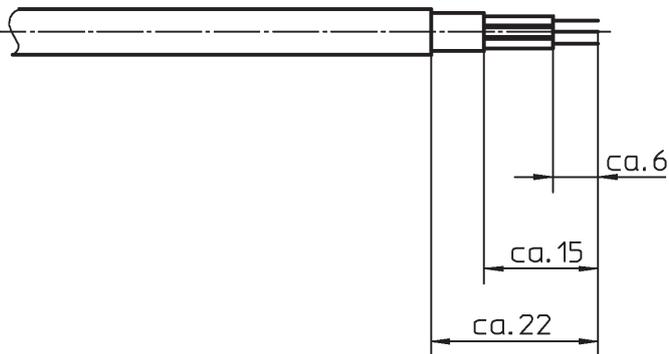
suitable cables (hazardous area):

- Siemens 6XV1831-2A (blue)

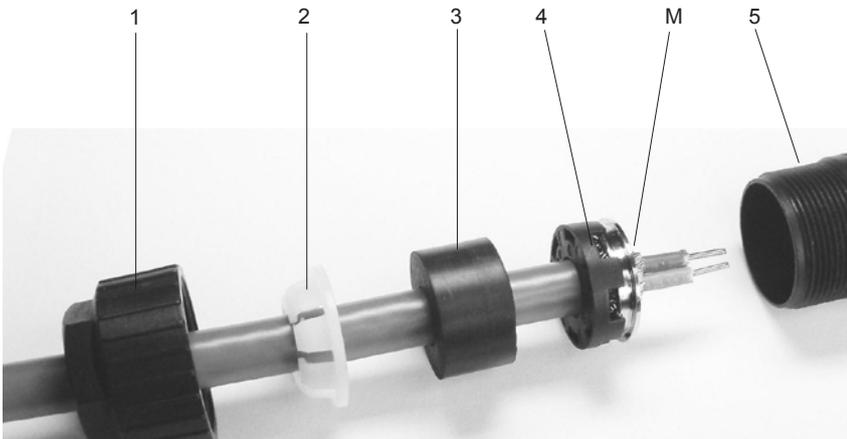
Connection the 4-pole M12x1 connector

The PASCAL CV PROFIBUS PA version with M12 connector is supplied pre-wired. You can connect the device to the bus with a prefabricated cable or a self-fabricated connector.

Preparing the cable:



Design of M12 x 1 circular connector

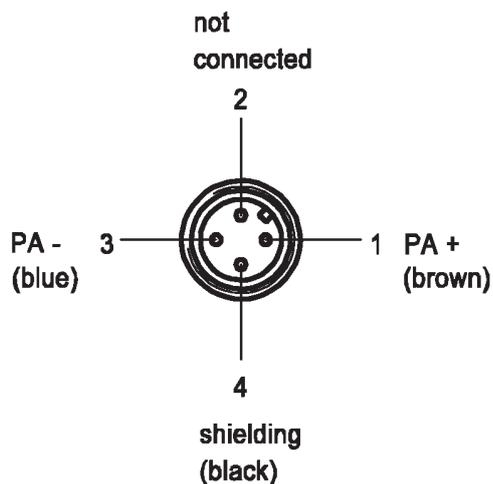


- 1 Nut
- 2 Strain relief
- 3 Gasket
- 4 Shielding contact element
Caution: the metal side (M) of the shielding contact element must point in the direction of the housing.
- 5 Housing

Connection diagram

circular plug connector M12x1

View of pins and connector at device



Connection cable gland M 16 x 1.5



- Preparing cable
- strip cable
 - expose wire braid



- Inserting the cable
- thread cable through union nut
 - slip cable into clamping insert
-
- stretch and spread wire braid over clamping insert
the wire braid must stretch approximately 2 mm beyond the O-ring



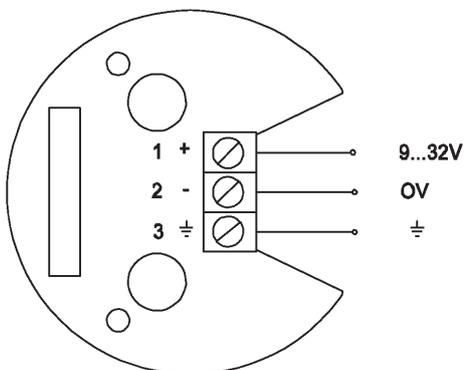
- Fit thread adapter
- slip clamping insert into connecting piece



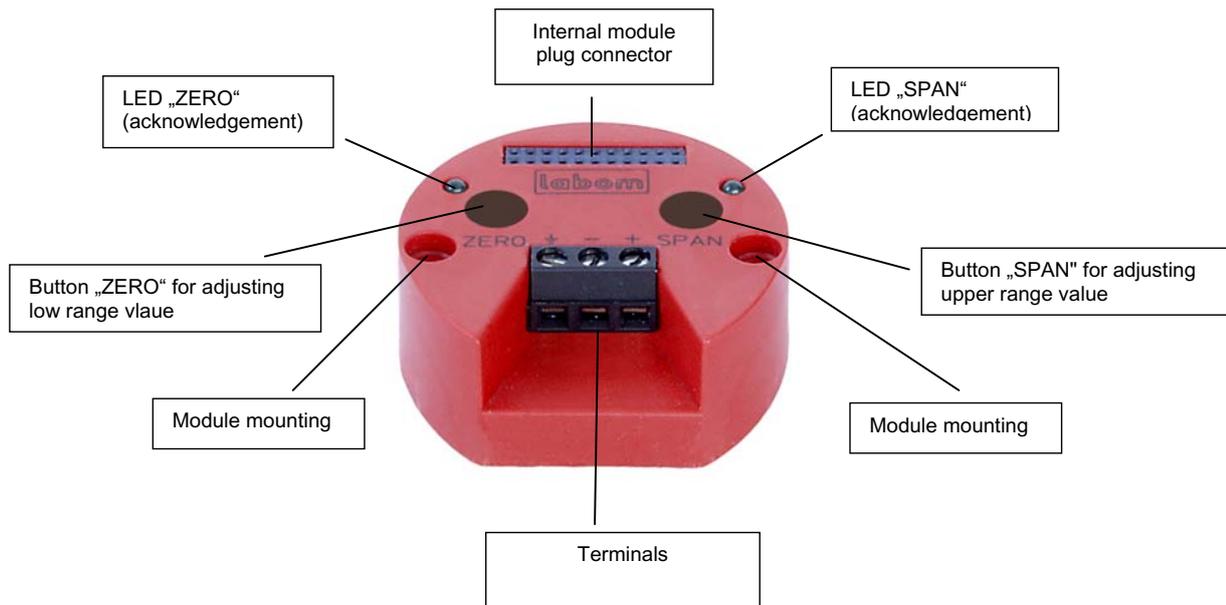
- tighten thread adapter

Connection diagram

PROFIBUS PA-Module



Modules may only be exchanged/added when the power supply has been switched off!



Adjusting the measuring range

Adjusting the lower range limit

1. Create a stable pressure at which the lower range limit is to be adjusted.
2. Hold down the left button (ZERO) for about 3 seconds.
3. The successful adjusting of the lower range limit is acknowledged after you release the button by a flashing „ZERO“ LED.

Adjusting the upper range limit

1. Create a stable pressure at which the upper range limit is to be adjusted.
Note: The applied pressure must be within $\pm 15\%$ of the upper range limit.
2. Hold down the right button (SPAN) for about 3 seconds.
3. The successful adjusting of the upper range limit is acknowledged after you release the button by a flashing „SPAN“ LED.

Note:

If the pressure transmitter is set outside the permissible measuring range limits (nominal range measuring span) then the values will not be applied and the LED will not be acknowledged.

Activating and deactivating the write protection

Activating write protection:

- press the "ZERO" and "SPAN" buttons at the same time (hold down more than 10 seconds).
After write protection has been activated, the "ZERO" and "SPAN" LEDs flash in synchrony four times in succession.

Deactivating write protection:

- press the "ZERO" and "SPAN" buttons at the same time (hold down more than 10 seconds).
After deactivation, the "ZERO" and "SPAN" LEDs flash in synchrony.

PROFIBUS PA

General functions and key benefits

Signal conversion is the same for all variants. The pressure sensor converts the pressure to an electrical signal which is then processed by the micro-electronics and a digital PROFIBUS PA signal (complying with European standard IEC 61158) is output.

The key benefits are:

- saving on installation costs
- in-depth diagnostics with improvements in the availability of system components
- automatic updating of plant documentation
- system optimization during normal operation

PROFIBUS PA transmission technologie

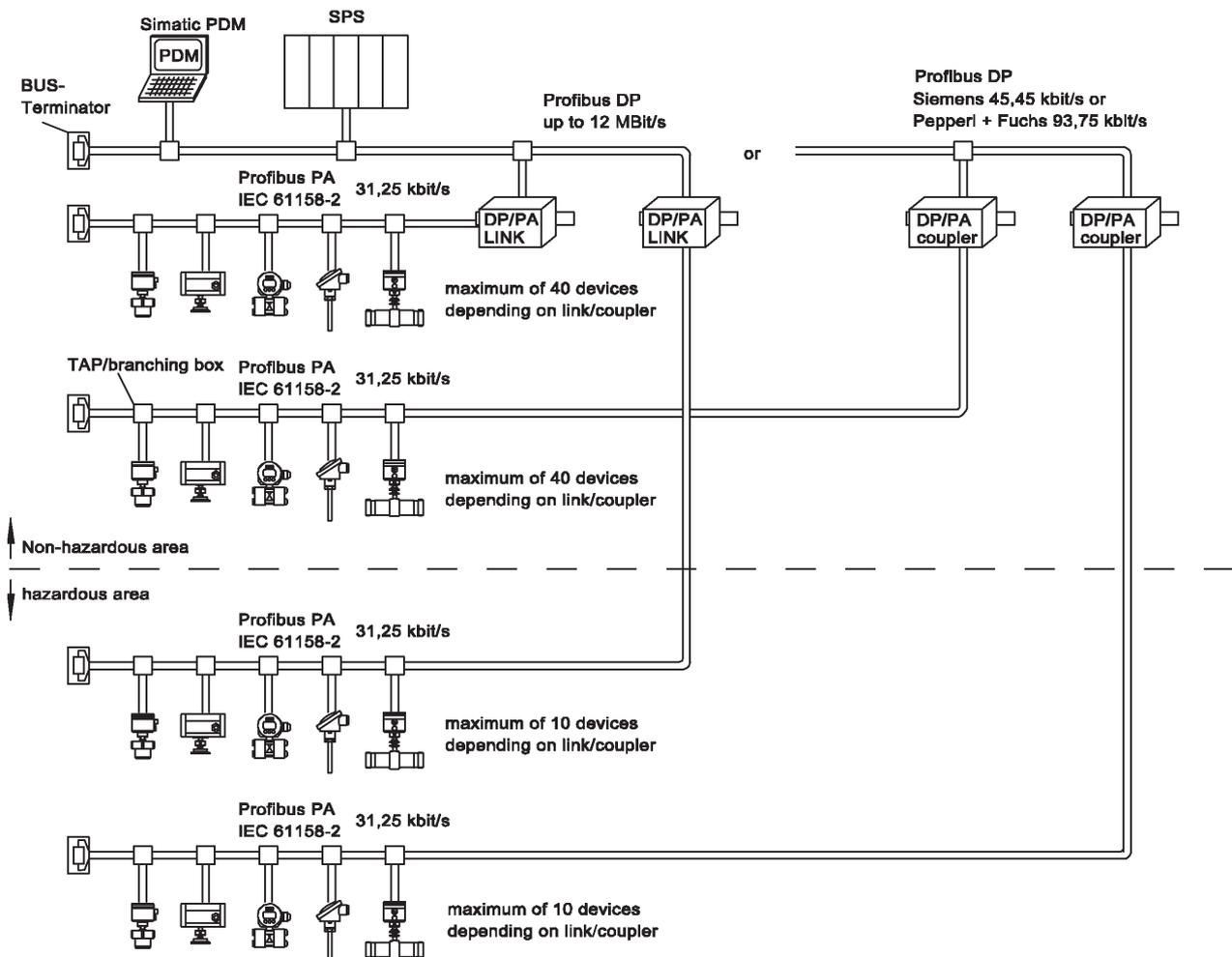
PROFIBUS PA employs special transmission technology in line with the international standard IEC 61158-2 and thus meet the requirements of process automation and process technology. The low baud rate reduces the power loss when compared with PROFIBUS DP. This is an intrinsically safe technology that can be applied in explosion hazardous areas.

A terminating resistor must be fitted at both ends of the PA and DP bus systems.

Topology

The bus topology can be chosen at will. PROFIBUS uses a line structure. Network components such as couplers and repeaters serve to join together individual lines segments to form star/tree structures.

All types of field devices such as transmitters, actuators, analyzers etc. can be connected to PROFIBUS PA.



DP/PA-coupler and DP/PA link

Depending on the number of PROFIBUS PA field devices in the automation system and depending on the required time response, a DP/PA coupler, or a more powerful DP/PA link for higher requirements, is deployed.

DP/PA link

- contains „intelligence.“
- communicates on the DP side at a high baud rate
- communicates on the PA side at a low baud rate
- converts the physics

DP/PA coupler

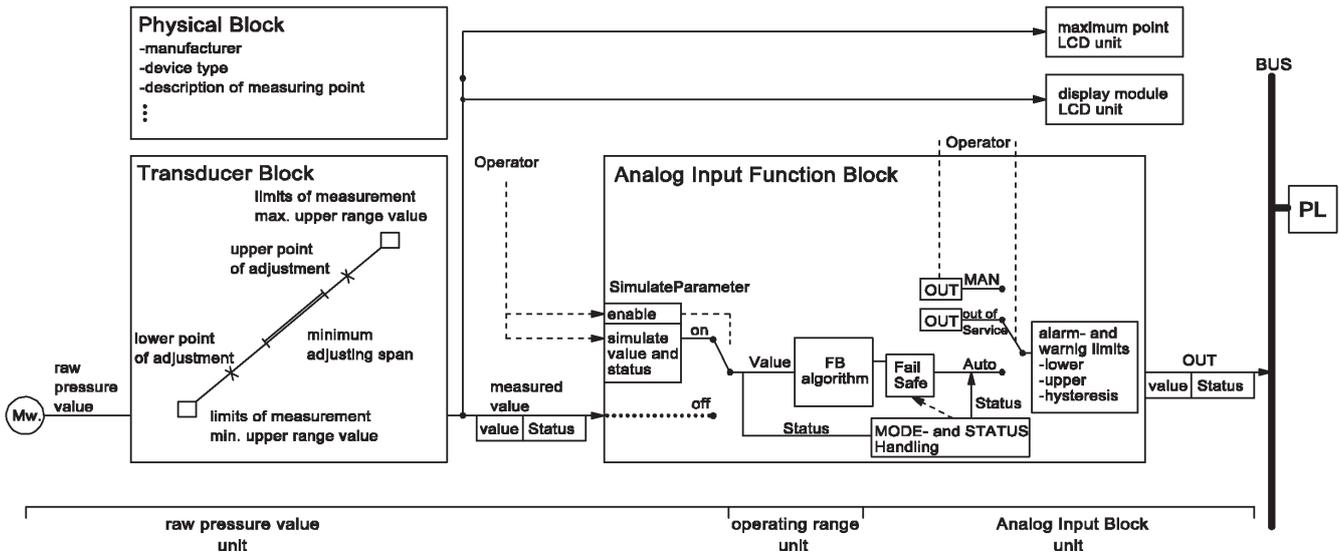
- couples DP + PA only
- the baud rate on the DP side is reduced
example: Siemens coupler 45.45 kBit/s
P&F coupler 93.75 kBit/s
- converts the physics

The maximum number of devices that can be connected to a bus daisy-chain is determined by the sum of the maximum power consumption of the connected devices (as per standard - 10 mA per device) and the available current. A current reserve should be designed into the system for safety reasons. This should be done to prevent a defective device with increased power consumption from overloading the bus system and thus the power supply, and to prevent it disrupting communication with all operational slaves. The necessary level of current reserve is based on the current rise (I_{FED}) in case of malfunction as specified by the device manufacturer.

Please refer to the following documents for more information on the installation and layout of the PROFIBUS network:

1. Technical Guideline
PROFIBUS PA
User and Installation Guideline
Version 2.2 February 2003
Order No: 2.092 PNO
2. PROFIBUS Recommended installation
Version 1.0.6 May 2006
Order No: 8.021 PNO

Further information: www.profibus.com / Downloads



Physical Block (PB)

The physical block contains the characteristic data for a device (e.g. device name, manufacturer, version and serial numbers etc.). A device may only have one physical block.

Transducer Block (TB)

The TB contains all data needed to prepare the raw signal output from a sensor for transfer to a function block.

Funktionsblock (FB)

The FB contains all data needed for final preparation of a measured value before it is transmitted to the control system.

Analog Input Block (AI)

The AI sends the measured value received from the sensor or a TB after further preparation to the control system („Input“ as in „Input on the bus“).

Measured-value conditioning

The measured value is prepared in the transducer block and passed to the LCD display module and to the function block. It is scaled in the function block and passed to the analog input block, where it is assigned a status. The PASCAL CV returns a measured value comprising a floating-point number (4 bytes) and associated quality display (1 byte). The status is encoded in accordance with the specification „PROFIBUS PA Profile for Process Control Devices.“ The status „measured value OK“ is encoded as 0x80 (hexadecimal). The measured value is transmitted as a 32 bit floating-point number in IEEE-754 format.

IEEE-754 Format

Byte n								Byte n*1								Byte n*2								Byte n*3									
Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0		
VZ	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸	2 ⁻⁹	2 ⁻¹⁰	2 ⁻¹¹	2 ⁻¹²	2 ⁻¹³	2 ⁻¹⁴	2 ⁻¹⁵	2 ⁻¹⁶	2 ⁻¹⁷	2 ⁻¹⁸	2 ⁻¹⁹	2 ⁻²⁰	2 ⁻²¹	2 ⁻²²	2 ⁻²³		
Sig. Bit	Exponent							Significant							Significant							Significant											

$$\text{Value} = (-1)^{VZ} \cdot 2^{(\text{Exponent} - 127)} \cdot (1 + \text{Significant})$$

Not all programmable controllers support the IEEE-754 format. In these cases a conversion block must be used or coded. You may have to re-arrange the byte order depending on the data format (most-significant-byte or least-significant-byte) used in the PLC (master).

Coding the status byte for the OUT parameter

Status-code	Description as per PROFIBUS norm	Possible cause
0x0F	bad - device failure	<ul style="list-style-type: none"> - the basic electronics has been replaced - there is no sensor connected - sensor type is unknown - display module is unknown or faulty - no connection to sensor electronics - configuration data in the sensor is invalid - error in parameter data - error in compensating data - invalid serial number - program execution error has occurred
0x13	bad - sensor failure	<ul style="list-style-type: none"> - measuring bridge faulty - pressure is higher than data sheet spec. - pressure is lower than data sheet spec. - temperature sensor defective - temperature at sensor higher than data sheet spec. - temperature at sensor lower than data sheet spec.
0x1F	bad - out of service	- appears when the AI block is not executed e.g.: target mode of AI block is set to „out of service“
0x44	uncertain - last useable value	measured value invalid, latest valid measured value is used. Appears when a sensor or device error has occurred and AI parameter FSAVE_TYPE is set to 1.
0x48	uncertain - substitute-set	measured value faulty, default value is used. Appears when a sensor or device error has occurred and AI parameter FSAVE_TYPE is set to 0. The FSAVE_VALUE value stored in the AI parameter is used as measured value.
0x4C	uncertain - initial value	no valid measured value is available. This situation occurs when the device is switched on during start-up.
0x80	good - ok	measured value is OK
0x84	good - update event	appears when a permanent parameter in the AI block in the device is changed. Is reset after 10 sec.
0x89	good - active advisory alarm low limited	lower warning limit undershoot
0x8A	good - active advisory alarm high limited	upper warning limit overshoot
0x8D	good - active critical alarm low limited	lower alarm limit undershoot
0x8E	good - active critical alarm high limited	upper alarm limit overshoot

Acyclical data exchange (master class 2)

Device parameters in the physical, transducer and analog input blocks may be accessed with the acyclical service. A programmable PC with Simatic PDM is a class 2 master.

The following parameters are defined in PASCAL CV PA:

Parameter	Value	Unit	Status
PASCAL CV31xx PA			
» Identification			
» » Operation Unit			
TAG	PASCAL CV		loaded
Descriptor			loaded
Message			loaded
» » Device			
Manufacturer	LABOM		loaded
Product designation	PASCAL CV31xx PA		loaded
Device Serial Number	0000000/00/016		loaded
Basis Serial Number	800015		loaded
Software Revision	1.0.0		loaded
Firmware-Version	1.1.4		loaded
Hardware Revision	1.0.0		loaded
Profil Revision	3.0		loaded
Static Revision No.	5		loaded
PROFIBUS Ident Number	Manufacturer specific		loaded
Installation Date	12.07.2005		loaded
Sensor Type	Gage 16 bar		loaded
Sensor Serial Number	10396		loaded
HW Write Protection	not HW write protected		loaded
Write Locking	not write protected		loaded
» Input			
» » Transducer Block 1			
Static Revision No.	5		loaded
Transmitter Type	Pressure		loaded
» » » Measuring Limits			
Unit Pressure Raw Value	bar		loaded
Lower Value Min	-1.05	bar	loaded
Upper Value Max	16.8	bar	loaded
» » » Working Range			
Unit	bar		loaded
» » » Process Value Scale			
Lower Value	-1.000	bar	loaded
Upper Value	16.000	bar	loaded
» » » Characterization			
Characterization Type	Linear		loaded
» » » Sensor Temperature			
Temperature Unit	°C		loaded
» » » Peak values (max values)			
Pressure Value Min	- 0 .01	bar	loaded
Pressure Value Max	15.80	bar	loaded
Sensor Temperature Min	22.83	°C	loaded
Sensor Temperature Max	25.27	°C	loaded
» Output			
» » Function Block 1 - Analog input			
Static Revision No.	20		loaded
Unit	bar		loaded
Filter Time Const	0	s	loaded
» » » Batch Information			
Batch ID	0		loaded
Batch Unit	0		loaded
Batch Operation	0		loaded
Batch Phase	0		loaded
» » » Output scale			
Lower Value	-1.000	bar	loaded
Upper Value	16.000	bar	loaded
» » » Output Limits			
Lower Limit Alarm	-1.000	bar	loaded
Lower Limit Warning	-0.800	bar	loaded
Upper Limit Warning	14.000	bar	loaded
Upper Limit Alarm	16.000	bar	loaded
Limit Hysteresis	0.010	bar	loaded
» » » Fail Safe Mode			
Fail Safe Mode	Default value is used as output value.		loaded
Fail Safe Default Value	8		loaded
» » » Human Interface			
Decimal Point	3		loaded
» Human Local Interface			
LCD Present	LCD present		loaded
LCD Serial Number	301281		loaded
LCD Unit	bar		loaded
Local Operation	Enabled		loaded
» Operating conditions			
» » Sensor Calibration			
Lower Calibration Point	0	bar	loaded
Upper Calibration Point	16	bar	loaded
Calibration Span Min	3.2	bar	loaded
» Certificates and Approvals			
Device Certification	CE, NE 21, Exmarking: Kein		loaded

The parameters have the following meaning:

IDENTIFICATION

TAG

This is an apparatus marking. The tag can be up to 32 characters long and the characters can be chosen at will. We recommend you use a unique tag for the field device in the system.

Descriptor

You may enter an additional description of the measuring point here. The description can be up to 32 characters long.

Message

You may enter any message you wish in the message field. For example, you may want to enter the date of the next device adjustment.

The message can be up to 32 characters long

Manufacturer

Indicates the manufacturer of the field device. This is typically the name of the company that manufactured the device.

Product designation

The designation of a manufacturer's device type. The product designation comprises up to 16 characters.

Device serial number

It comprises 16 characters and is unique. The device manufacturer can thus be identified. This number describes the whole unit and all its modules.

Basis serial number

Six digit serial number for the basic module integrated in the device..

Software Revision

PROFIBUS communications software version.

Firmware-Version

Version of measured-value conditioning software.

Hardware Revision

Revision level of electronics.

Profile Revision

PROFIBUS PA profile version for process controllers.

Static Revision No.

Revision level of static data (stored in the device) associated with this block. The version number is incremented every time data is changed.

PROFIBUS Ident Number

PASCAL CV PA can be addressed via two different GSD files. Typically, the parameter is set to „manufacturer-specific,“ and the GSD file LAB_0954.GSD is used. If this file is not available, the parameter can be changed to „profile-specific“ and the standard GSD file PA139700.GSD used.

Installation Date

The date on which the device was installed. You may select this date at will; it can have up to 16 characters.

Sensor Type

Describes the type of sensor fitted in the device (relative or absolute sensor including measuring range and sensor element).

Sensor Serial Number

Defines the actual serial number of the sensor in the device.

HW Write Protection

Can only be enabled/disabled with the device buttons. If write protection is enabled, no more parameters (except the bus address) can be changed.

Write Locking

Can be enabled/disabled per software.

INPUT

Static Revision No.

Revision level of static data (stored in the device) associated with this block. The version number is incremented every time data is changed.

Transmitter Type

Defines the device type (pressure or absolute pressure).

Unit Pressure Raw Value

Engineering unit for measured process pressure

Lower Value Min

Defines the lower limit of the measuring range.

Upper Value Max

Defines the upper limit of the measuring range

Unit

Engineering unit of the lower and upper range values for measured value scaling.

Lower Value

The measured value passed from the transducer block to the AI function block can be scaled. This parameter is the minimum value of input scaling.

Upper Value

The upper value is the maximum value of input scaling.

Characterization

Defines the type of linearization. Linear means that the measured value is processed without any alterations..

Sensor Temperature

The sensor temperature unit can be set here. The unit also applies to the maximum pointer temperatures.

Pressure Value Min

The minimum measured pressure value.

Pressure Value Max

The maximum measured pressure value.

Sensor Temperature Min

The minimum temperature measured at the sensor.

Sensor Temperature Max

The maximum temperature measured at the sensor.

Output**Static Revision No.**

Revision level of static data (stored in the device) associated with this block. The version number is incremented every time data is changed.

Unit

The unit of pressure value for the analog input block and the variable OUT (see figure on page 20)

Filter time constant

Duration of a 63 % rise in output due to a change in voltage at the input.

Batch ID

Identifies a particular batch, in order to allow device information (e.g. faults, ...) to be assigned.

Batch Unit

Identifies the assigned unit (e.g. dryer, ...) or the current master recipe.

Batch Operation

Identifies the current master recipe operation.

Batch Phase

Identifies the current master recipe step.

Lower Value

Defines the lower value of output scaling in the output unit.

Upper Value

Defines the upper value of output scaling in the output unit.

Lower Limit Alarm

Output value at which a lower alarm is triggered.

Lower Limit Warning

Output value at which a lower warning is triggered.

Upper Limit Warning

Output value at which an upper warning is triggered

Upper Limit Alarm

Output value at which an upper alarm is triggered.

Limit Hysteresis

Hysteresis value that is added/subtracted to the lower/upper alarm and warning limits in order to rescind the alarm/warning.

Fail Safe Mode

Defines the response of the device when the actual network value is lost or the desired value status „Go to fail-safe mode“ is returned.

The following responses are available:

- the default value is loaded to the output value
- save the latest valid output value
- the incorrectly calculated measured value is provided at the output

Fail Safe Default Value

The default setting for OUT when the actual measured value is lost and fail-safe mode is enabled: „The default value is loaded into the output value.“ The unit is the same as for OUT.

Decimal Point

Defines the number of decimal places for the AI block as displayed in the user interface (PDM).

LCD Present

Defines whether a display module is integrated in the device

LCD Serial Number

Contains the serial number of the built-in display module.

LCD Unit

Defines the engineering unit used in the pressure value display.

Local Operation

Defines whether the user can make changes on the local display module.

Operating conditions**Lower Calibration Point**

The lowest point at which the measuring signal was adjusted.

Upper Calibration Point

The upper point at which the measuring signal was adjusted.

Calibration Span Min

The minimum pressure should lie between the lower and upper adjustment points.

Certificates and Approvals**Device Certification**

Indicates device certification and operation in explosion hazardous areas.

Device master and type files (GSD)

PROFIBUS devices have different features. They differ with respect to the available functionality (e.g. number of I/O signals, diagnostic messages) or possible bus parameters such as baud rate and time watchdogs. These parameters are specific for each device type and manufacturer. In order to facilitate a basic plug & play configuration for PROFIBUS, electronic device data sheets (GSD files) have been created for the device communications features.

GSD file for LABOM PASCAL CV31xx PA

```
#Profibus_DP
GSD_Revision          = 3
Vendor_Name           = „Labom GmbH“
Model_Name            = „PASCAL CV31xx“
Revision              = „3.0 (blue)“
Ident_Number          = 0x0954
Protocol_Ident        = 0
Station_Type          = 0
FMS_supp              = 0
Hardware_Release      = „1.0“
Software_Release      = „1.0.1“
Bitmap_Device         = „Lab0954n“
31.25_supp            = 1
45.45_supp            = 1
93.75_supp            = 1
MaxTsdR_31.25         = 100
MaxTsdR_45.45         = 250
MaxTsdR_93.75         = 1000
Redundancy             = 0
Repeater_Ctrl_Sig     = 0
24V_Pins              = 0
Freeze_Mode_supp      = 0
Sync_Mode_supp        = 0
Set_Slave_Add_supp    = 1
Min_Slave_Intervall   = 250
Modular_Station       = 1
Max_Module             = 1
Max_Input_Len         = 5           ; maximum Input Length
Max_Output_Len        = 0           ; maximum Output Length
Max_Data_Len          = 5           ; maximum In-Output Length
Slave_Family           = 12
Max_Diag_Data_Len     = 20
Max_User_Prm_Data_Len = 3
Ext_User_Prm_Data_Const(0) = 0x00, 0x00, 0x00

;----- Description of extended DP features: -----
;
DPV1_Slave = 1
C2_Read_Write_supp    = 1
C2_Max_Data_Len       = 128
C2_Read_Write_required = 1
C2_Max_Count_Channels = 1
Max_Initiate_PDU_Length = 52
C2_Response_Timeout   = 4000
DPV1_Data_Types       = 1

;--- Description of physical interface for async. and sync. transmission: ---
Physical_Interface = 0           ; RS-485 Standard Copper
Transmission_Delay_45.45 = 0
Reaction_Delay_45.45     = 0
Transmission_Delay_93.75 = 0
Reaction_Delay_93.75     = 0
End_Physical_Interface
;
Physical_Interface = 1           ; IEC61158-2
Transmission_Delay_31.25 = 0
Reaction_Delay_31.25     = 0
End_Physical_Interface
```

```

;----- Description of device related diagnosis: -----
;
Unit_Diag_Bit(16) = „Error appears“
Unit_Diag_Bit(17) = „Error disappears“
Unit_Diag_Bit(24) = „Hardware failure electronics“
Unit_Diag_Bit(25) = „Hardware failure mechanics“
Unit_Diag_Bit(26) = „Motor temperature too high“
Unit_Diag_Bit(27) = „Electronic temperature too high“
Unit_Diag_Bit(28) = „Memory error“
Unit_Diag_Bit(29) = „Measurement failure“
Unit_Diag_Bit(30) = „Device not initialized“
Unit_Diag_Bit(31) = „Device initialization failed“
Unit_Diag_Bit(32) = „Zero point error“
Unit_Diag_Bit(33) = „Power supply failed“
Unit_Diag_Bit(34) = „Configuration invalid“
Unit_Diag_Bit(35) = „Restart“
Unit_Diag_Bit(36) = „Coldstart“
Unit_Diag_Bit(37) = „Maintenance required“
Unit_Diag_Bit(38) = „Characteristics invalid“
Unit_Diag_Bit(39) = „Ident_Number violation“
Unit_Diag_Bit(55) = „Extension Available“
;-----
;
;Modules for Analog Input
Module = „Analog Input (AI)short“ 0x94
1
EndModule
;Modules for Analog Input
Module = „Analog Input (AI)long“ 0x42,0x84,0x08,0x05
2
EndModule

;----- Description of the module assignment: -----
;
SlotDefinition
Slot(1) = „Analog Input“ 1 1,2
EndSlotDefinition

```

The PNO makes available a standard database file called PA139700.GSD for devices with a profile-specific analog input block (Profile 3.0).

Sources in the Internet:

PNO	http://www.PROFIBUS.com in the GSD Library link
LABOM	http://www.labom.com
	http://www.pascal-cv.com

Certificate

PROFIBUS Nutzerorganisation e.V. grants to

LABOM Mess- und Regeltechnik GmbH
Im Gewerbepark 13, 27798 Hude

the Certificate No: **Z01108** for the PROFIBUS Slave:

Model Name: Pascal CV31.. H41
Revision: 1.0; SW/FW: 1.0.4/1.20; HW: 2.2.0
GSD: LAB_0954.GSD File Version 01.03.2005
 PA139700.GSD

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

<input checked="" type="checkbox"/>	DP-V0	MS0, Set_Slave_Add
<input checked="" type="checkbox"/>	DP-V1	MS2
<input checked="" type="checkbox"/>	Profiles	PROFIBUS PA 3.0

Test Report Number: 074-02
Authorized Test Laboratory: ifak, Magdeburg, Germany

The tests were executed in accordance with the following documents:
 "Test Specifications for PROFIBUS DP Slaves, Version 3.0 from November 2005",
 "Test Specifications for PROFIBUS PA Profile 3.0, Version 4.1".

This certificate is granted according to the document:
 "Framework for testing and certification of PROFIBUS products".

For all products that are placed in circulation by April 13, 2013 the certificate is valid for life.

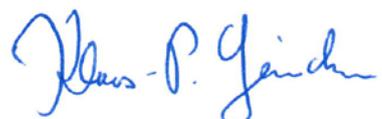


(Official in Charge)

Board of PROFIBUS Nutzerorganisation e.V.



(Jörg Freitag)

(K.-P. Lindner)