Smartline Vacuum Transmitter PROFINET Communication Manual

VSR/VCR/VSL/VCL/VSP/VCP

VSM/VSI

VSH

Version: 2.1
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Content

1 Introduction / Product Description

1.1 Validity

This supplementary information describes important variations to the standard product and is only valid together with its main operation manual.

1.2 Function

The electrically isolated PROFINET IO-device interface is equipped with an integrated 2-port switch and supports 100 Mbit/s full duplex communication. The connection to a PROFINET system is possible via connections designated "PN P1" and "PN P2" (2 x M12, D-coded, 4pin, female).

1.3 Installation

1.3.1 PROFINET address assignment

Note: on delivery, the gauge has no IP address!
During normal operation (data exchange mode) the IP address is assigned to the device by the PROFINET IO-controller (PLC). For it the device has a device name on which it is addressed (see chapter 1.3.2).
The IP address can be assigned manually or via a DHCP server.

1.3.2 PROFINET device name

Note: on delivery, the gauge has no device name!
The device name is assigned via the configuration software of the device.

1.3.3 Projecting

Use any project planning tool for project planning. You can download the GSDML files from the Thyracont webpage (https://thyracont-vacuum.com/).
Note: There was a rearrangement of the output modules 9 to 12 in GSDML-V2.42. Hence when updating from GSDML-V2.33 to GSDML-V2.42 or higher, please make sure to also adapt the module addresses on your PLC.

1.3.4 Powering / Cabling

Power is always supplied to the transmitter via the RS-485 connector (see operating instruction of the standard version). Make cabling in compliance with the valid regulations.

1.4 Communication

The device is parameterized and configured by the PROFINET IO-controller during startup phase. Only after a correct termination of the startup phase the data exchange with external devices will take place. Communication is via cyclic and acyclic data exchange.

Input Data

- Input Modules

Commands

- Output Modules

2 Modules

2.1 Input Modules

2.1.1 Actual Pressure

Module ID=IDM_1: Actual Pressure				
Module Ident Number	0x00040000			
Information	Contains the actual pressure value.			
Category	Input modules			
Submodule ID=IDS_1: Actual Pressure				
Submodule Ident Number	0x00000001			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Actual Pressure	Float32	*No*	*No*	

Note: This module is also used for acyclic data exchange (3.7) and diagnosis data (4.1).

2.1.2 Relative Pressure

Module ID=IDM_13: Relative Pressure				
Module Ident Number	0x00040000			
Information	Contains the relative pressure value.			
Category	Input modules			
Submodule ID=IDS_13: Relative Pressure				
Submodule Ident Number	0x0000000D			
I&M 5 Supported	No			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Relative Pressure	Float32	No	No	

2.1.3 Actual GCF 1

Module ID=IDM_2: Actual GCF 1				
Module Ident Number	0x00020000			
Category	Input modules			
Submodule ID=IDS_2: Actual GCF 1				
Submodule Ident Number	0x00000002			
Information	Contains the actual Gas Correction Factor (GCF) for Pirani sensor.			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Actual GCF 1	Unsigned16	*No*	*No*	

Actual GCF 1: Contains the actual Gas Correction Factor (GCF) for Pirani sensor of all Smartline transmitters.

Type	Data Range
VSR/VCR	0x0014 – 0x0320 (20 – 800)
VSL/VCL	0x0014 – 0x0320 (20 – 800)
VSP/VCP	0x0014 – 0x0320 (20 – 800)
VSM	0x0014 – 0x0320 (20 – 800)
VSI	0x0000 (0), fixed
VSH	0x0014 – 0x0320 (20 – 800)

2.1.4 Actual GCF 2

Module ID=IDM_3: Actual GCF 2				
Module Ident Number	0x00020000			
Information	Contains the actual Gas Correction Factor (GCF) for hot or cold cathode (0 if sensor not installed).			
Category	Input modules			
Submodule ID=IDS_3: Actual GCF 2				
Submodule Ident Number	0x00000003			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Actual GCF 2	Unsigned16	*No*	*No*	

Actual GCF 2: Contains the actual Gas Correction Factor (GCF) for hot or cold cathode for Smartline transmitters.

Type	Data Range
VSR/VCR	0x0000 (0), fixed
VSL/VCL	0x0000 (0), fixed
VSP/VCP	0x0000 (0), fixed
VSM/VSI	0x0014 – 0x0320 (20 – 800) for cold cathode
VSH	0x0014 – 0x0320 (20 – 800) for hot cathode

2.1.5 Transmitter Status and Type

Module ID=IDM_4: Transmitter Status and Type				
Module Ident Number	0x00010000			
Information	Contains information about Status and Type of the Transmitter.			
Category	Input modules			
Submodule ID=IDS_4: Transmitter Status and Type				
Submodule Ident Number	0x00000004			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Transmitter Status and Type	OctetString	Bit 0: Sensor Type Bit 1: Sensor Type Bit 2: Sensor Type Bit 3: DeGas active Bit 4: High vacuum cathode inactive Bit 5: Spare Filament Bit 6: Sensor Switch Mode Bit 7: Sensor Switch Mode	*No*	1

Bit 0-2: Sensor Type: Contains the Smartline Transmitter Type

Type	Data
VSR/VCR	0x1 (1)
VSP	0x2 (2)
VSM	0x3 (3)
VSH	0x4 (4)
VCP	0x5 (5)
VSI	0x6 (6)
VSL/VCL	0x7 (7)

Bit 3: DeGas active: Indicates the status of DeGas.

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP VSM/VSI	0x0 (0)	fixed
VSH	0x0 (0)	Degas is inactive (default)
	0x1 (1)	Degas is active

Bit 4: High vacuum cathode inactive: For certain vacuum processes it may be favored to suppress the start of the hot cathode (VSH) or cold cathode (VSM/VSI) sensor, which is automatically controlled by the transducer electronics.

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP	0x0 (0)	fixed
VSM/VSI	0x0 (0)	cold cathode is active (default)
	0x1 (1)	cold cathode is inactive
VSH	0x0 (0)	hot cathode is active (default)
	0x1 (1)	hot cathode is inactive

Bit 5: Spare Filament: VSH transmitters have two filaments. This bit indicates that the VSH transmitter has switched to the spare filament, filament 1 is depleted.

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP VSM/VSI	0x0 (0)	fixed
VSH	0x0 (0)	Filament 1 is active, CoE Object is FALSE
	0x1 (1)	Filament 2 (spare Filament) is active, CoE Object is TRUE

Bit 6-7: Sensor Switch Mode: By default a combi transmitter (VSR/VCR, VSL/VCL, VSM, VSH) performs a continuous transition between their sensors principles over a pressure range whereupon an assimilation of the sensor signals is carried out. The Sensor Switch Mode contains the actual mode.

Type	Data	Description
VSR/VCR VSL/VCL	0x0 (0)	no transition, direct switch at 1 mbar
	0x1 (1)	continuous transition between 5 mbar and 15 mbar (default)
	0x3 (3)	custom transition (if set via serial interface or acyclic data)
VSP/VCP /VSI	0x0 (0)	fixed
VSM	0x0 (0)	no transition, direct switch at 1E-3 mbar
	0x1 (1)	continuous transition between 1E-3 mbar and 2E-3 mbar (default)
	0x3 (3)	custom transition (if set via serial interface or acyclic data)
VSH	0x0 (0)	no transition, direct switch at 4E-4 mbar
	0x1 (1)	continuous transition between 1E-3 mbar and 2E-3 mbar (default)
	0x2 (2)	continuous transition between 2E-3 mbar and 5E-3 mbar
	0x3 (3)	custom transition (if set via serial interface or acyclic data)

2.1.6 Transmitter Warnings and Errors

Module ID=IDM_5: Transmitter Warnings and Errors				
Module Ident Number	0x00010000			
Information	Contains Information about Warnings and Errors of the Transmitter.			
Category	Input modules			
Submodule ID=IDS_5: Transmitter Warnings and Errors				
Submodule Ident Number	0x00000005			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Transmitter Warnings and Errors	OctetString	Bit 0: Warning - Overrange Bit 1: Warning - Underrange Bit 3: Error - Filament 1 defect Bit 4: Error - Filament 2 defect Bit 5: Error - Internal Communication Bit 6: Error - EEPROM failure Bit 7: Error - Sensor defect/stacked out	*No*	1

Bit 0: Warning – Overrange

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	overrange detected, pressure level exceeds the measurement range; the Actual Pressure will be set to 2E+38.

Bit 1: Warning – Underrange

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	underrange detected, pressure level is lower than the measurement range; the Actual Pressure will be set to 2E-38.

Bit 3: Error – Filament 1 defect

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP VSM/VSI	0x0 (0)	fixed
VSH	0x0 (0)	no error
	0x1 (1)	Filament 1 is defect

Bit 4: Error – Filament 2 defect

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP VSM/VSI	0x0 (0)	fixed
VSH	0x0 (0)	no error
	0x1 (1)	Filament 2 (spare filament) is defect

Bit 5: Error – Internal Communication

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	internal communication error of the transmitter electronics

Bit 6: Error – EEPROM failure

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	failure on EEPROM

Bit 7: Error – Sensor defect/stacked out

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	sensor head is stacked out or sensor head is defect

2.1.7 Syntax Error

Module ID=IDM_6: Syntax Error				
Module Ident Number	0x00010000			
Information	Contains syntax error information for the last executed command.			
Category	Input modules			
Submodule ID=IDS_6: Syntax Error				
Submodule Ident Number	0x00000006			
I&M 5 Supported	No			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Syntax Error	OctetString	Bit 2: Error - Sensor Switch Mode, Value mismatch Bit 3: Error - GCF 1, Value mismatch Bit 4: Error - GCF 2, Value mismatch Bit 5: Error - Pressure Adjust, Value mismatch Bit 6: Error - Command not supported Bit 7: Error - Command invalid	No	1

Bit 2: Error – Sensor Switch Mode, Value mismatch

Type	Data	Description
VSP/VCP /VSI	0x0 (0)	fixed
VSR/VCR VSL/VCL VSH VSM	0x0 (0)	no error
	0x1 (1)	The value in Data Sensor Switch Mode is wrong or out of range

Bit 3: Error – GCF 1, Value mismatch

Type	Data	Description
VSI	0x0 (0)	fixed
VSR/VCR	0x0 (0)	no error
VSL/VCL VSP/VCP VSM VSH	0x1 (1)	The value in Data GCF 1 is wrong or out of range

Bit 4: Error – GCF 2, Value mismatch

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP	0x0 (0)	fixed
VSH	0x0 (0)	no error
VSM/VSI	0x1 (1)	The value in Data GCF 2 is wrong or out of range

Bit 5: Error – Pressure Adjust, Value mismatch

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	The value in Data Pressure is wrong or out of range

Bit 6: Error – Command not supported

Type	Data	Description
all	0x0 (0)	Command not supported
	0x1 (1)	no error

Bit 7: Error – Command invalid

Type	Data	Description
all	0x0 (0)	no error
	0x1 (1)	Command is invalid and can’t be executed

2.1.8 Command executed

Module ID=IDM_7: Command executed				
Module Ident Number	0x00010000			
Information	Contains the value of the last executed command.			
Category	Input modules			
Submodule ID=IDS_7: Command executed				
Submodule Ident Number	0x00000007			
I&M 5 Supported	*No*			
Cyclic Input Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Command executed	Unsigned8	*No*	*No*	

Command executed

Type	Data	Description
all		Contains the value of the last executed command that was written in Command

2.2 Output Modules

2.2.1 Adjust Value Pressure

Module ID=IDM_8: Adjust Value Pressure				
Module Ident Number	0x00000004			
Information	Reference pressure for readjustment.			
Category	Output modules			
Submodule ID=IDS_8: Adjust Value Pressure				
Submodule Ident Number	0x00000008			
I&M 5 Supported	*No*			
Cyclic Output Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Adjust Value Pressure	Float32	*No*	*No*	

Adjust Value Pressure

Type	Data	Description
all	Var.	Contains a Pressure value as 32bit Real

2.2.2 Set Data GCF 1

Module ID=IDM_9: Set Data GCF 1				
Module Ident Number	0x00000002			
Information	New value for the Gas Correction Factor (GCF), used for Pirani sensor (ignored if sensor not installed).			
Category	Output modules			
Submodule ID=IDS_9: Set Data GCF 1				
Submodule Ident Number	0x00000009			
I&M 5 Supported	*No*			
Cyclic Output Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Set Data GCF 1	Unsigned16	*No*	*No*	

Set Data GCF 1

Type	Data	Description
VSI		all data values will be ignored
VSR/VCR VSL/VCL VSP/VCP VSM VSH	0x0014 – 0x0320 (20 – 800)	New value for the GCF 1, used for Pirani sensor (default: 100)

2.2.3 Set Data GCF 2

Module ID=IDM_10: Set Data GCF 2				
Module Ident Number	0x00000002			
Information	New value for the Gas Correction Factor (GCF), used for hot cathode or cold cathode (ignored if sensor not installed).			
Category	Output modules			
Submodule ID=IDS_10: Set Data GCF 2				
Submodule Ident Number	0x0000000A			
I&M 5 Supported	*No*			
Cyclic Output Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Set Data GCF 2	Unsigned16	*No*	*No*	

Set Data GCF 2

Type	Data	Description
VSR/VCR VSL/VCL VSP/VCP		all data values will be ignored
VSH VSM/VSI	0x0014 – 0x0320 (20 – 800)	New value for the GCF 2, used for hot cathode and cold cathode (default: 100)

2.2.4 Set Data Sensor Switch Mode

Module ID=IDM_11: Set Data Sensor Switch Mode				
Module Ident Number	0x00000001			
Information	The set value determines the mode of the sensor transition.			
Category	Output modules			
Submodule ID=IDS_11: Set Data Sensor Switch Mode				
Submodule Ident Number	0x0000000B			
I&M 5 Supported	*No*			
Cyclic Output Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Set Data Sensor Switch Mode	Unsigned8	*No*	*No*	

Set Data Sensor Switch Mode

Type	Data	Description
VSR/VCR VSL/VCL	0x0 (0)	no transition, direct switch at 1 mbar
	0x1 (1)	continuous transition between 5 mbar and 15 mbar (default)
VSP/VCP /VSI	-	VSP/VCP/VSI has no transition
VSM	0x0 (0)	no transition, direct switch at 1E-3 mbar
	0x1 (1)	continuous transition between 1E-3 mbar and 2E-3 mbar (default)
VSH	0x0 (0)	no transition, direct switch at 4E-4 mbar
	0x1 (1)	continuous transition between 1E-3 mbar and 2E-3 mbar (default)
	0x2 (2)	continuous transition between 2E-3 mbar and 5E-3 mbar

2.2.5 Command

Module ID=IDM_12: Command				
Module Ident Number	0x00000001			
Information	Command to be executed.			
Category	Output modules			
Submodule ID=IDS_12: Command				
Submodule Ident Number	0x0000000C			
I&M 5 Supported	*No*			
Cyclic Output Data				Item consistency
Name	Data Type	Display as Bits	Subordinate	Length [Bytes]
Command	Unsigned8	*No*	*No*	

Command

Type	Data	Description
all	0x00 (0)	Zero Command
	0x01 (1)	Adjust High Vacuum
	0x02 (2)	Adjust Atmospheric Pressure
	0x03 (3)	Set Gas Correction Factors (GCF)
VSL/VCL	0x04 (4)	Adjust Relative Pressure
	0x39 (57)	Set Sensor Switch Mode
VSR/VCR	0x39 (57)	Set Sensor Switch Mode
VSP/VCP	-	no special VSP/VCP commands
VSM/VSI	0x46 (70)	Activate Cold Cathode
	0x47 (71)	Deactivate Cold Cathode
VSM	0x4D (77)	Set Sensor Switch Mode
VSH	0x50 (80)	Active Hot Cathode
	0x51 (81)	Deactivate Hot Cathode
	0x55 (85)	Activate DeGas
	0x56 (86)	Deactivate DeGas
	0x57 (87)	Set Sensor Switch Mode

3 Commands

3.1 Command List

All commands are separated into two groups:

- General Commands, that are valid for all Smartline transmitter
- Commands, that are valid only for a specific transmitter

Rules for commands:

- Each command will be executed only once.
- Always the last executed command will be written into Command executed

Type	Data	Name
all	0x00 (0)	Zero Command
	0x01 (1)	Adjust High Vacuum
	0x02 (2)	Adjust Atmospheric Pressure
	0x03 (3)	Set Gas Correction Factors (GCF)
VSL/VCL	0x04 (4)	Adjust Relative Pressure
	0x39 (57)	Set Sensor Switch Mode
VSR/VCR	0x39 (57)	Set Sensor Switch Mode
VSP/VCP	-	No special VSP commands
VSM/VSI	0x46 (70)	Activate Cold Cathode
	0x47 (71)	Deactivate Cold Cathode
VSM	0x4D (77)	Set Sensor Switch Mode
VSH	0x50 (80)	Active Hot Cathode
	0x51 (81)	Deactivate Hot Cathode
	0x55 (85)	Activate DeGas
	0x56 (86)	Deactivate DeGas
	0x57 (87)	Set Sensor Switch Mode

3.2 General Command Chain for all Smartline Transmitter

3.2.1 0x00 (0) – Zero Command

Type	Chain	Name	Data	Description
all	1.	Zero Command	0x00 (0)	clear Command executed

3.2.2 0x01 (1) – Adjust High Vacuum

Type	Chain	Name	Data	Description
all	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x01 (1)
	2.	Adjust Value Pressure	0x00000000 (0)	mandatory
	3.	Command	0x01 (1)	adjust high vacuum

3.2.3 0x02 (2) – Adjust Atmospheric Pressure

Type	Chain	Name	Data	Description
VSL/VCL VSR/VCR	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x02 (2)
	2.	Adjust Value Pressure	variable	actual atmospheric pressure
	3.	Command	0x02 (2)	adjust atmospheric pressure
VSP VCP VSM VSH	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x02 (2)
	2.	Adjust Value Pressure	0x447A0000 (1000)	1000 mbar
	3.	Command	0x02 (2)	adjust atmospheric pressure

3.2.4 0x03 (3) – Set Gas Correction Factors

Type	Chain	Name	Data	Description
VSL/VCL VSR/VCR VSP VCP	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x03 (3)
	2.	Set Data GCF 1	0x0014 (20) – 0x0320 (800)	Gas Correction Factor for Pirani
	3.	Set Data GCF 2	d.c.	will be ignored, value
	4.	Command	0x03 (3)	set GCF factors
VSM VSH	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x03 (3)
	2.	Set Data GCF 1	0x0014 (20) – 0x0320 (800)	Gas Correction Factor for Pirani
	3.	Set Data GCF 2	0x0014 (20) – 0x0320 (800)	Gas Correction Factor for Hot Cathode (BA) or Cold Cathode (CC)
	4.	Command	0x03 (3)	set GCF factors
VSI	1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x03 (3)
	2.	Set Data GCF 1	d.c.	will be ignored, value
	3.	Set Data GCF 2	0x0014 (20) – 0x0320 (800)	Gas Correction Factor for Cold Cathode (CC)
	4.	Command	0x03 (3)	set GCF factors

3.3 VSL/VCL Commands

3.3.1 0x04 (4) – Adjust Relative Pressure

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x04 (4)
2.	Data Pressure	d.c.	Value will be ignored
3.	Command	0x04 (4)	adjust relative pressure to zero

3.3.2 0x39 (57) – Set Sensor Switch Mode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x39 (57)
2.	Set Data Sensor Switch Mode	0x0 (0) or 0x1 (1)	
3.	Command	0x39 (57)	set sensor switch mode

3.4 VSR/VCR Commands

3.4.1 0x39 (57) – Set Sensor Switch Mode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x39 (57)
2.	Set Data Sensor Switch Mode	0x0 (0) or 0x1 (1)	
3.	Command	0x39 (57)	set sensor switch mode

3.5 VSM/VSI Commands

3.5.1 0x46 (70) – Activate Cold Cathode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x46 (70)
2.	Command	0x46 (70)	activate cold cathode

3.5.2 0x47 (71) – Deactivate Cold Cathode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x47 (71)
2.	Command	0x47 (71)	deactivate cold cathode

3.5.3 0x4D (77) – Set Sensor Switch Mode (VSM only)

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x4D (77)
2.	Set Data Sensor Switch Mode	0x0 (0) or 0x1 (1)	
3.	Command	0x4D (77)	set sensor switch mode

3.6 VSH Commands

3.6.1 0x50 (80) – Activate Hot Cathode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x50 (80)
2.	Command	0x50 (80)	activate hot cathode

3.6.2 0x51 (81) – Deactivate Hot Cathode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x51 (81)
2.	Command	0x51 (81)	deactivate hot cathode

3.6.3 0x55 (85) – Activate DeGas

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x55 (85)
2.	Command	0x55 (85)	activate DeGas

3.6.4 0x56 (86) – Deactivate DeGas

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x56 (86)
2.	Command	0x56 (86)	deactivate DeGas

3.6.5 0x57 (87) – Set Sensor Switch Mode

Chain	Name	Data	Description
1.	Zero Command	0x00 (0)	mandatory if Command executed is 0x57 (87)
2.	Set Data Sensor Switch Mode	0x0 (0), 0x1 (1) or 0x2 (2)	Data value depends on transmitter
3.	Command	0x57 (87)	set sensor switch mode

3.7 Acyclic Data Exchange

Using acyclic data records, the limited range of commands in cyclic data communication to configure a gauge is now extended to all commands available (see the corresponding transmitter manual). For sending and receiving acyclic data records a simplified version of the Thyracont communication protocol V2 needs to be applied. The protocol documentation with more information regarding the commands, as well as a demo on how to use the acyclic data exchange with our PROFINET gauges, can be found on our homepage (see also chapter 5). The following table shows the parameters to apply in a project planning tool for using the acyclic data exchange:

	Write Record	Read Record
ID	IDM_1 (Actual Pressure)	IDM_1 (Actual Pressure)
INDEX	1	1
LEN / MLEN	Number of bytes to be transmitted (max. 104)	110 (max. number of bytes allowed to be transmitted)
RECORD	See Thyracont communication protocol V2	See Thyracont communication protocol V2

In general, each command (independent of writing data to, or reading data from the gauge) needs to be sent via "Write Record". The response of the device can then be read out via "Read Record" within **6 seconds**. After this time, the response will be a PROFINET timeout error.
In case of configuration commands, it is recommended to evaluate the device response for success or error.
Note: Applying acyclic data records decreases the refresh rate of the cyclic data records by factor 2.

4 Device Diagnostics

4.1 Manufacturer Specific Channel Diagnosis

Value (Hex)	Content
0x0013	Internal communication error The internal communication could not be reset automatically. The device must be switched off and back on again. If this warning occurs frequently, please inform the service.
0x001B	Sensor error The sensor was stacked out, or is defect and must be exchanged.

5 Web Interface

The device offers a small web interface with basic information about the gauge and PROFINET interface, and the possibility to update the PROFINET firmware. It can be accessed by entering its assigned IP address in your web browser. In case of PROFINET firmware updates please contact Thyracont for more information.

6 Additional Files (GSDML, Documentation)

You can download the GSDML files and related documents (transmitter, communication protocol) from the Thyracont webpage:

1. Open Thyracont webpage https://thyracont-vacuum.com/
2. Browse to Support → Download Center
3. Section “Smartline - Intelligent Vacuum Measurement”
    a. Transmitter manuals (PDF)
    b. GSDML files (ZIP)
4. Section “Software and Apps, protocols, drivers and other”
    a. Communication manuals (PDF)

7 Document History

Date	Version	Comment	Script-Revision Number	Firmware Version
2019-01-09	1.0	Initial Release v1.0	V 3.1.2_0615_1	3.1.3
2020-02-17	1.1	VSL PN communication manual added	V 3.1.3	3.1.3
2021-06-25	1.2	VCL, VCR added	V 3.1.3	3.1.3
2021-xx-xx	1.3	Fixes	V 3.1.3	3.1.3
2023-02-22	2.0	Removed parts of old PROFINET interface; Added parts for new PROFINET interface and Acyclic Data Exchange	-	1.0.0.1 (5.4.0.6)
2023-11-22	2.1	Added chapter “Web Interface”		

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