Technical Documentation

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VISY

VISY-Command Web

(English)

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FAFNIR™

Table of Contents

1 Overview

VISY-Command Web is an evaluation unit of type **VISY-Command** with a SECON-Client display and web connection for local and remote display of data and alarms from the **VISY-X** and the optional **VAPORIX system**.

The **VISY-X system** is used for data processing and evaluation of tanks with light liquids as well as for environmental monitoring. It consists of the evaluation unit VISY-Command Web installed inside a building and various VISY sensors. The evaluation unit evaluates the data from the sensors and transmits it on request to a higher-level system (e.g. cash register system) and can be extended with a VISY-Lev+ module for connecting a second cash register.

The **VAPORIX system** is used for data processing and evaluation of vapour recovery (Stage II) at petrol station pumps. It consists of the VAPORIX-Flow sensors and the VAPORIX-Control … evaluation units installed in the fuel pumps. During the fuelling process the vapour flow and the fuel flow at the fuelling points are recorded and evaluated. The VAPORIX system can be connected to the VISY-Command Web for monitoring the vapour recovery.

1.1 In this manual …

… you are guided through the installation and commissioning of the VISY-Command Web. The installation of the VISY-Command Web takes place in five steps:

(1) Mounting
(2) Connection of the VISY probes
(3) Optional connection of the VAPORIX-Control … or additional cash register system
(4) VISY-Command Web configuration with the VISY-Setup software
(5) Installation and configuration of the SECON-X software

1.2 Related and optional components

More information about related system components and optional components you find in the following manuals:

VISY-Command Web extensions (optional):

VISY-RF V4 Wireless System	Art. no. 350394
IFSF LON interface converter	Art. no. 207092
VISY-ICI 485	Art. no. 207150
VISY-Lev+ interface	Under preparation!

Filling level and environmental sensors:

VISY-Stick VISY-Reed	Art. no. 207194
VPS pressure sensors (optional)	Art. no. 350204
VAPORIX Flow/Control (II) (optional)	Art. no. 207083 (350251)

Leakage detection with VIMS sensors (optional) from our system partner SGB:

SGB GmbH, Hofstraße 10, 57076 Siegen, Germany, T.: +49 271 48964–0, F.: +49 271 48964–6, e-mail: sgb@sgb.de

COMS Oil Separator Monitoring (optional):

COMS Technical Data multilingual	Art. no. 350273
COMS Installation Quick Guide	Art. no. 350240
COMS Oil-layer table	Art. no. 350007

VISY-Command Web configuration with the VISY-Setup software:

VISY-Setup V4...	Art. no.: 207158

Installation and configuration of the SECON-X software:

SECON-Server Installation	Art. no. 350112
SECON-Server Administrator	Art. no. 350088
SECON-Client Administrator local and remote access	Art. no. 350340
SECON-X Autocalibration	Art. no. 350342
SECON-X Reconciliation	Art. no. 350344

Transmission of signals to and from external systems (optional):

VISY-Output 8	Art. no. 350072
VISY-Output 1	Art. no. 350219
VISY-Input	Art. no. 207166

Operation of VISY-Command Web using the SECON-X software

SECON-Server User	Art. no. 350377
SECON-Client User local access	Art. no. 350263
SECON-Client User remote access	Art. no. 350175

1.3 Requirements for technicians

The VISY-Command Web with the corresponding software VISY-Setup and SECON-X should only be installed by trained service technicians.

1.4 Recommended tools

- Notebook with VISY-Setup
- RS-232 communication cable
- RS-232 – USB adapter
- RJ-45 network cable

2 Safety instructions

The system is used for data recording and evaluation from tank sensors, environmental sensors and optionally vapour recovery. Use the system exclusively for this purpose. The manufacturer accepts no liability for any form of damage resulting from improper use. The system devices have been developed, manufactured and tested in accordance with the latest good engineering practices and generally accepted safety standards. Nevertheless, hazards may arise from their use.

Useful information in this guide you should observe, appear in italics and are identified by this symbol.

Not observing these safety instructions result in the risk of accident or damages to the system.

Observe and follow all product safety instructions and operating instructions. The following safety precautions must be observed to reduce the risk of injury, electric shocks, fire or damage to the equipment:

Installation, operation and maintenance of the devices must only be carried out by expert personnel.

Operators, installers and service technicians must comply with all applicable safety regulations. This also applies to the local safety and accident prevention regulations which are not stated in this manual.

The VISY-Command Web must be installed outside potentially explosive areas, e. g. inside a building!

When the housing door of the VISY-Command is opened, there is a risk of electric shock on touching conductive parts! The housing door must be closed during normal operation.

The device may only be supplied with the permitted auxiliary power. It should only be connected to the power supply after the wiring has been completed!

Use only original parts for installation, operation and maintenance. These comply with the technical requirements specified by the manufacturer.

Do not change, add, modify or repair the equipment of the system without the prior approval of the manufacturer.

3 VISY-Command Web

3.1 Types

VISY-Command Web is an evaluation unit of type **VISY-Command** with display for showing the current tank data, delivery data and various alarms recorded by the **VISY-X** and optionally the VAPORIX system.

The name of the VISY-Command Web depends on the number of sensor terminals, the model, or the transmission technology. The following models of VISY-Command Web are available:

- **VISY-Command 2 Web**: model with 2 sensor terminals
- **VISY-Command 4 Web**: model with 4 sensor terminals
- **VISY-Command 8 Web**: model with 8 sensor terminals
- **VISY-Command 16 Web:** model with 16 sensor terminals
- **VISY-Command RF Web:** model as radio version
- **VISY-Command ... Web Print:** model with printer

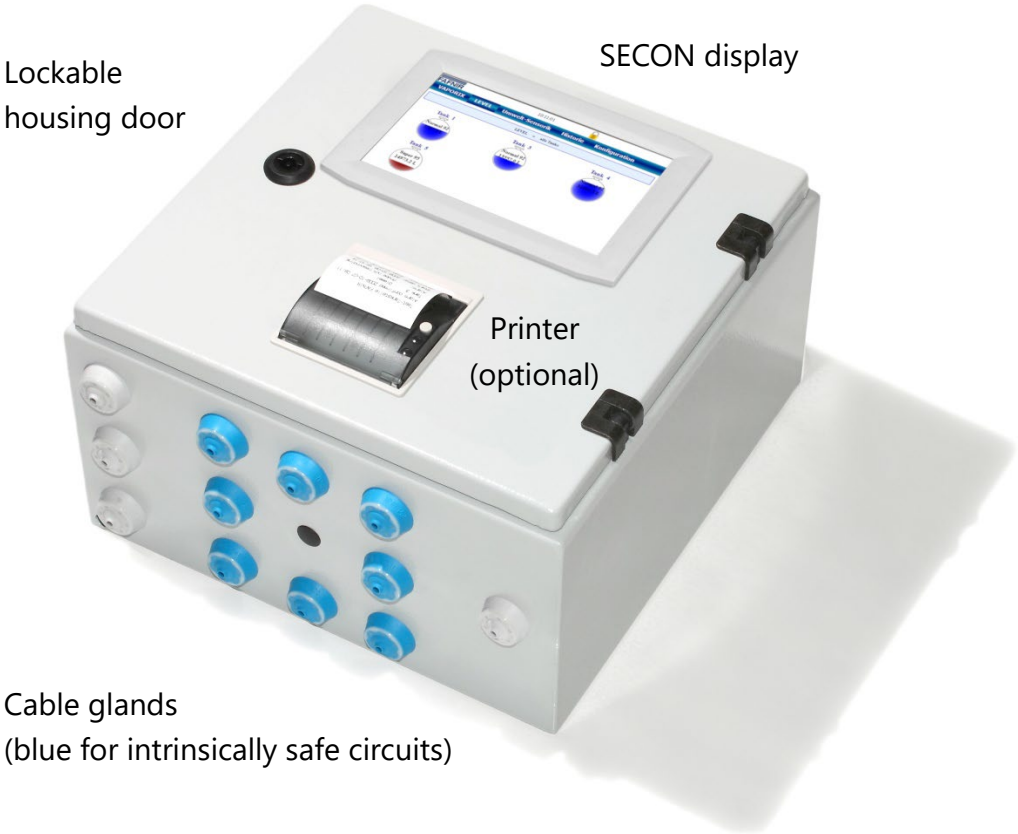


Figure 1: VISY-Command Web, external view

3.2 SECON-X functionality

VISY-Command Web has an integrated SECON-Client user interface and can therefore be operated with the functionality of the SECON-X system.

The **SECON-X system** is a universal hardware-software network system for the recording, evaluation and presentation of petrol station data with a worldwide data access, web interface, local and remote display, remote evaluation, and data backup.

At each single petrol station the data is recorded, displayed and made available locally by one **VISY-Command Web** (optionally with VAPORIX-Control ...). A petrol station PC connected to the LAN serves as a local application and the SECON-Server is used for the worldwide transmission of the data. The data is transmitted to the end devices (User) by a protected HTTPS connection.

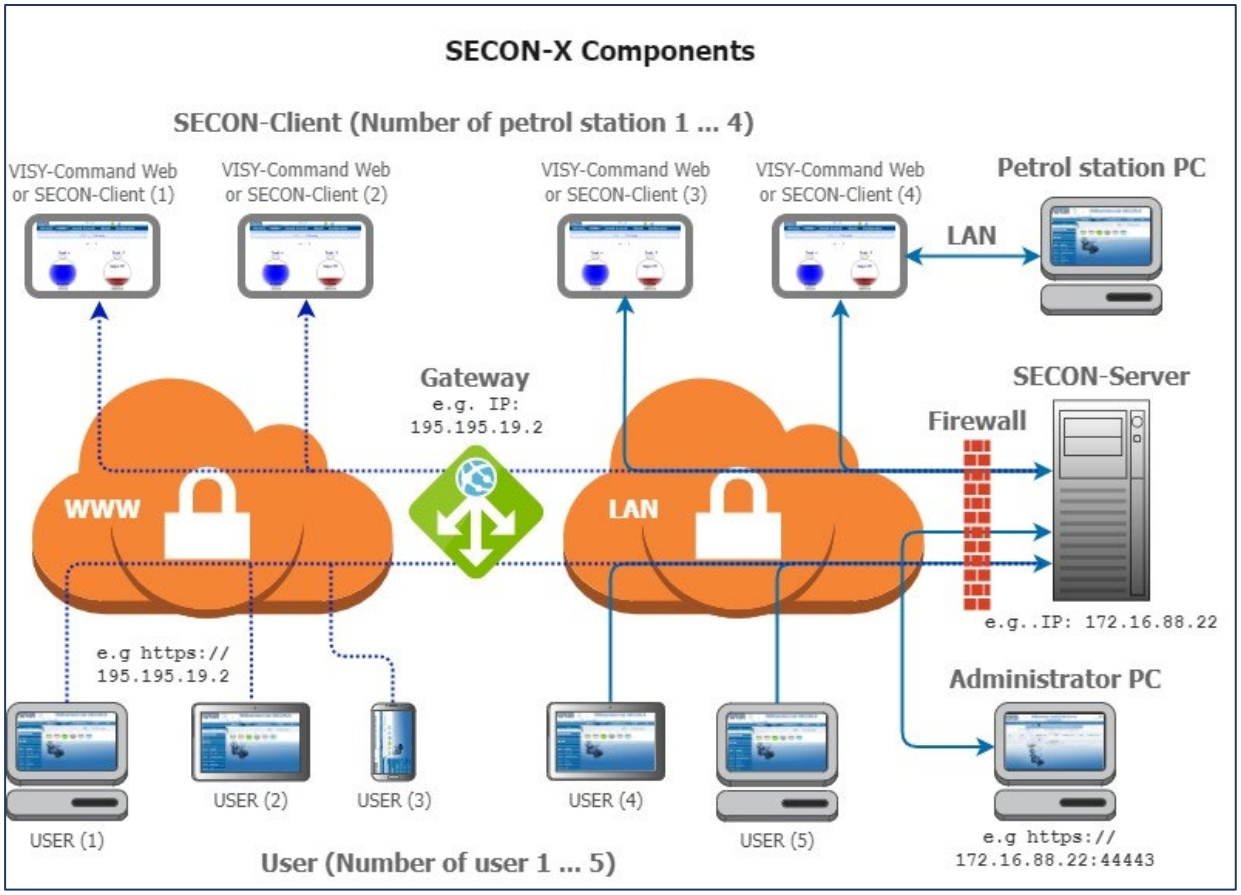


Figure 2: SECON-X components with VISY-Command Web

4 Installation

4.1 Mounting

The VISY-Command Web must be installed outside of potentially explosive areas.

The VISY-Command Web must be mounted inside a building. It is not suitable for outdoor installation.

For installing and operating the VISY-Command Web evaluation unit, the regulations of Industrial Safety and Health Regulations and the Technical Rules for Operational Safety as well as the generally accepted rules of engineering and this manual must be observed.

A drilling template is provided for mounting the VISY-Command Web (scope of delivery).

The housing door can be opened with the corresponding housing key (scope of delivery).

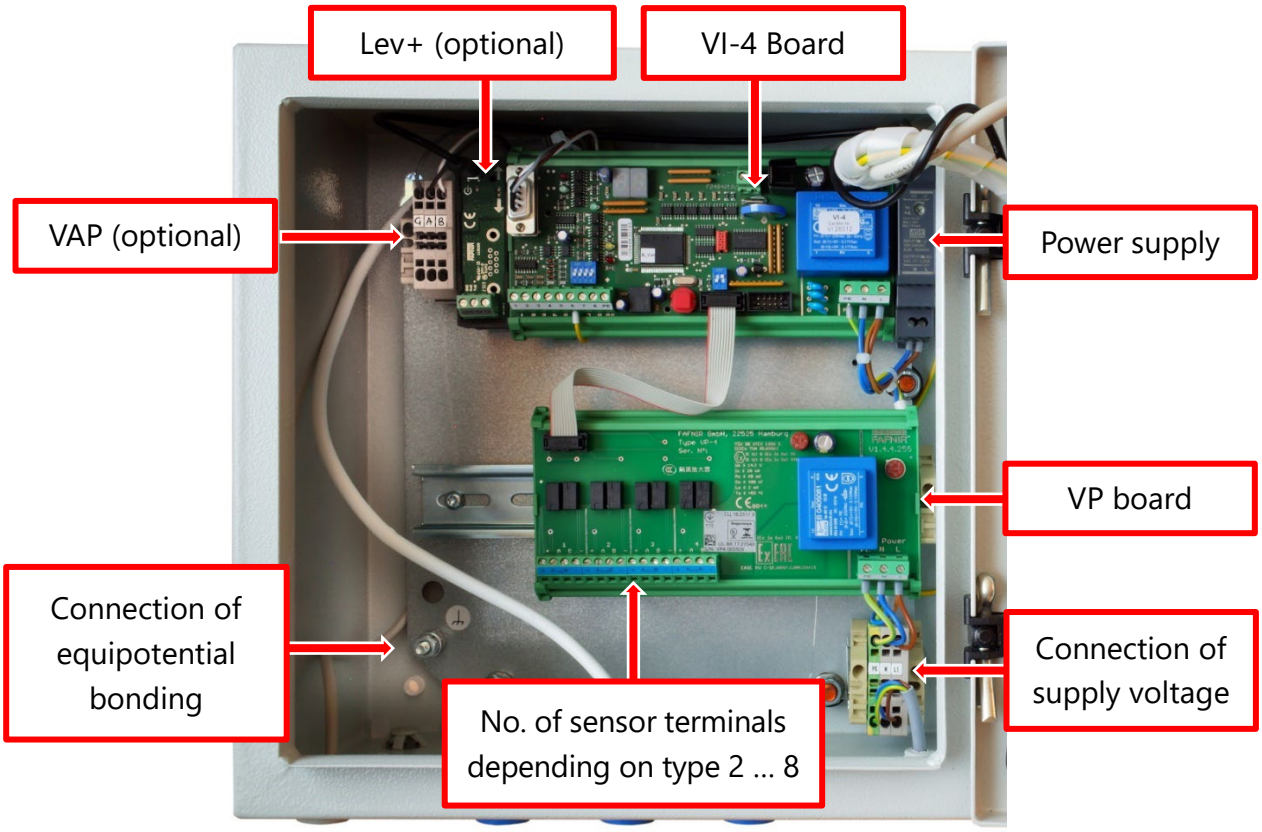


Figure 3: VISY-Command 4 Web, interior view

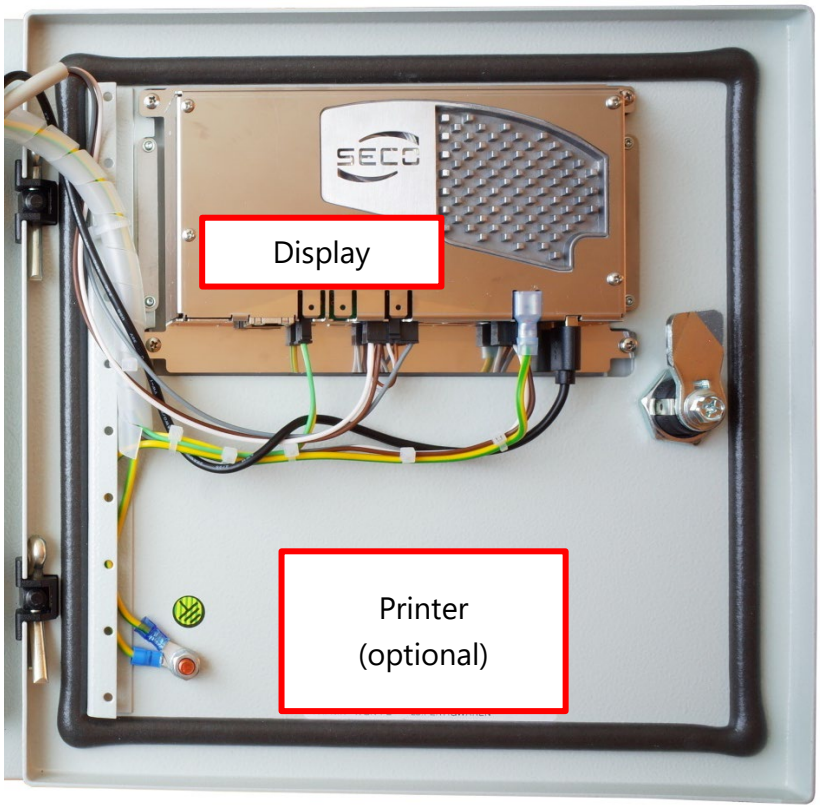


Figure 4: VISY-Command Web housing door, interior view

When the housing door of the VISY-Command is opened, there is a risk of electric shock on touching conductive parts!

Since the evaluation unit is designed to be supplied from the mains, an overcurrent protection device (fuses, circuit breakers, thermal releases, current-limiting impedances or similar devices) must be connected upstream.

A switch or circuit breaker must be available inside the installation building. It must be mounted suitably and easily accessible for the user and marked as a separating device for the evaluation unit. It is recommended to install the switch or circuit breaker near the evaluation unit.

4.2 Connection of the VISY sensors

4.2.1 Connection cable

The connection cable between the sensors and the VISY-Command Web must have the following properties:

- 4-core unshielded, oil-resistant cable
- Cable cross-section (4 x 0.5 mm^2 up to 100 m or 4 x 1.0 mm^2 up to 200 m)
- Colour blue or marked blue (cable for intrinsically safe power circuits)
- Maximum diameter of 10 mm for cable entry in VISY-Command Web

If shielded cables are used to connect the VISY Command Web to the sensors in a potentially explosive area, the shield must be connected to the equipotential bonding (present on the base plate) inside the VISY Command Web and this earthing point must be included in the equipotential bonding system of the potentially explosive area. In addition, the shield must be sufficiently insulated in the potentially explosive area. Insulation with insulation tape alone is not permitted, but the use of heat shrink tubing would meet the requirements.

The maximum permitted external inductance must not exceed 40 mH and the maximum permitted capacitance must not exceed 680 nF including the cable (see data sheet of the used cable).

The terminal box or cable connector in the manhole for extending the sensor connection cables must have the enclosure protection class of IP68.

4.2.2 Sensor terminal

The VISY-Command Web must be disconnected from the power supply before connecting the sensors and must be secured against unintentional switching on.

The sensors are supplied with electricity via the VISY-Command Web. VISY-Command Web receives the measured values, stores them temporarily, evaluates the data and, if required, transmits them to a higher-level system (e.g. central computer).

Connect the sensors to the sensor terminals on the VP-... board (see following figure).
To insert the cables, please use the blue cable glands for intrinsically safe circuits.

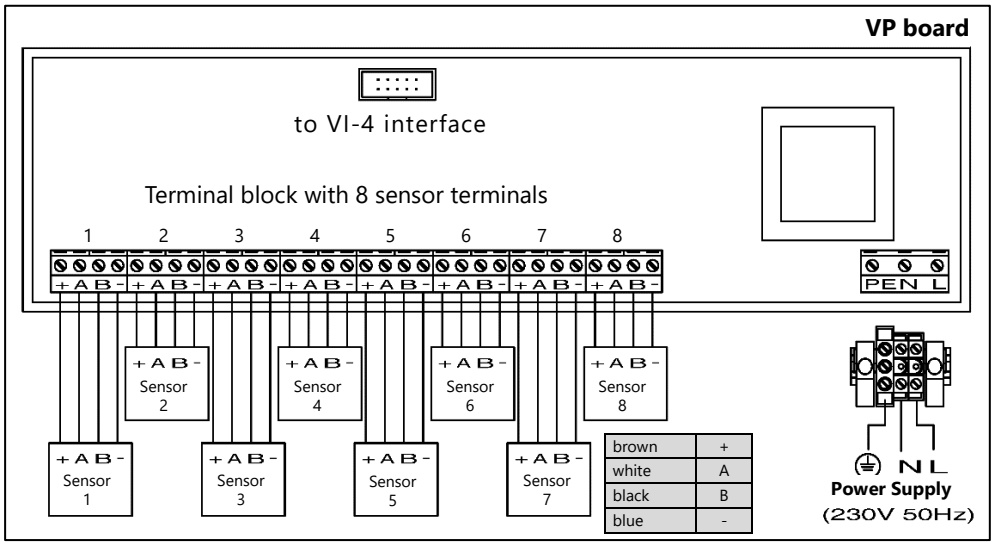


Figure 5: VP board with 8 sensor terminals connected with 8 sensors

The VISY-Command 16 Web contains 2 VP boards with 16 sensor terminals.

At each sensor terminal it is possible to connect up to three different VISY-Stick/Reed types of FAFNIR sensors (e.g. one VISY-Stick, one VISY-Stick Interstitial and one VISY-Reed Sump). The different sensor types can be connected to each other in parallel directly at the installation point. This means that only 1 cable (4-wire) is required for the connection to the VISY-Command Web.

In combination with the VIMS sensors from our system partner for leakage control (SGB GmbH, Siegen), either 2 FAFNIR sensors and 2 SGB sensors or 3 FAFNIR sensors and 1 SGB sensor can be connected to the VISY-Command Web evaluation unit using one single cable (4-wire).

VIMS sensors cannot be operated with the VISY-Command RF Web.

Connecting sensors of the same type (e. g. 3 x VISY-Stick or VISY-Stick Interstitial with VISY-Reed Interstitial) to one sensor terminal is not supported.

For details on installing the sensors see the technical documentation:

VISY-Stick VISY-Reed, art. no. 207194

4.3 Connection of the VAPORIX system (optional)

If a VAP option is available, the VAPORIX-Control … evaluation unit can be connected with the VISY-Command Web. For connection details see technical documentation:

VAPORIX-Flow/Control (II), art. no. 207083 (350251)

4.4 Connections and settings of the VI-4 board

4.4.1 Interface connections

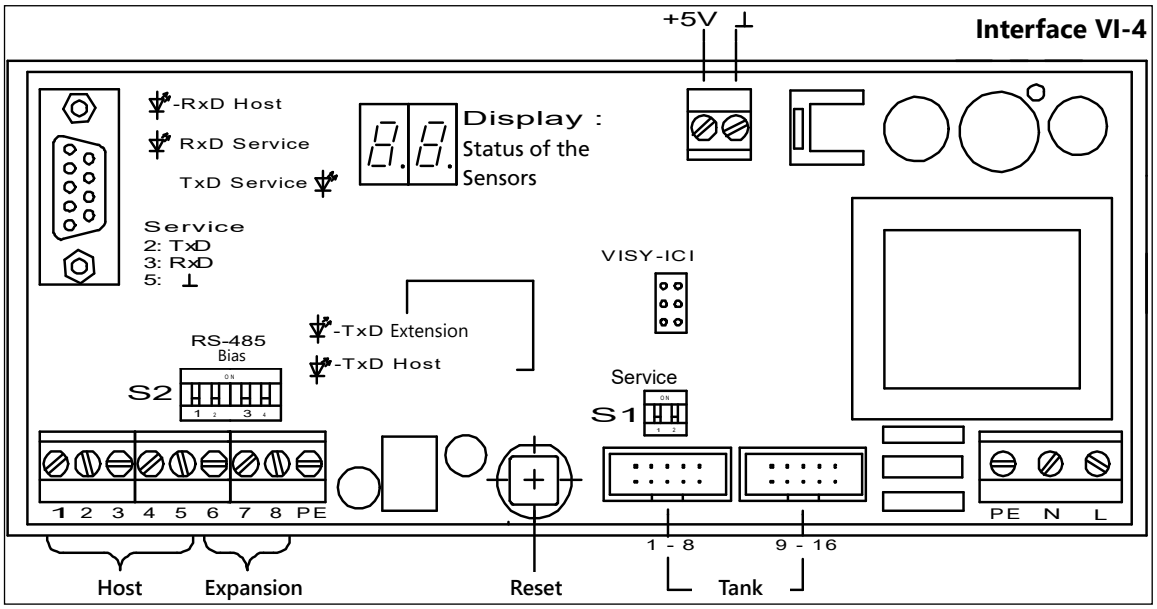


Figure 6: Interface VI-4

4.4.2 RS-232 service interface

The serial RS-232 service interface (9-pin D-sub socket) can be used for three different connections: PC connection for configuration with VISY-Setup, display of VISY-Command Web, or Auxiliary Measurement System. The corresponding settings are made with DIP switch S1 "Service":

DIP switch S1 "Service"

1	2	Function
OFF	OFF	VISY-Command Web configuration with the VISY-Setup software
OFF	ON	Display of VISY-Command Web (VISY-Quick protocol)
ON	OFF	Auxiliary measurement system
ON	ON	No function

Table 1: DIP switch S1 "Service" (settings)

The RxD service LED (green) displays incoming data of the service interface.
The TxD service LED (green) displays outgoing data of the service interface.

☞ *To use the service interface, a serial interface cable (standard) with a 9-pin D-Sub connector is required.*

4.4.3 Host interface (RS-232/RS-485)

The serial host interface (galvanically isolated) for communication with a higher-level system (e.g. POS) is available as RS-232 or RS-485 interface. Various protocols can be used for transferring data to the petrol station computers. The data protocol for the interface can be selected using the VISY-Setup software by entering a host code. The VI-4 interface automatically detects which interface the host computer is connected to.

Connect the host computer to the corresponding terminals of the host interface, see the following figure.

<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
<tr><td>RxD</td><td>TxD</td><td>⊥</td><td>A+</td><td>B–</td><td>⊥</td><td>A+</td><td>B–</td><td>PE</td></tr>
<tr><td colspan="3">RS-232</td><td colspan="2">RS-485</td><td colspan="3">RS-485</td><td rowspan="2">⏚</td></tr>
<tr><td colspan="5">Host</td><td colspan="3">Expansion</td></tr>
</table>

Figure 7: Host interface

A simultaneous operation of the RS-232 interface and RS-485 interface is not supported.

If the RS-485 interface is used, a 3-wire cable should be used (for reasons of interference resistance) to connect the interface ground of the VISY-Command Web (terminal ⊥ of the host interface) with the interface ground of the host system (if available as connection terminal).
If shielded lines are used, the shield must be placed on the PE terminal. Please also observe the installation instructions for the device to be connected to the interface. If the shield cannot be fitted on both sides, it is possible to work with a shield fitted to one side of the VISY-Command Web only.

The RxD Host LED (red) indicates incoming data from the host computer.
The TxD Host LED (red) indicates outgoing data to the host computer.

Do not connect the cable shield to the interface ground (⊥/GND).

Please note that the longer the line length, the greater the probability of equipotential currents flowing through a line shield earthed on both sides. Where necessary, an additional equipotential bonding conductor must be provided between the connected devices in accordance with local rules and regulations.

4.4.4 Expansion interface (RS-485)

The expansion interface is a galvanically isolated serial RS-485 interface by which the data can be transmitted to other system components (e.g. if the host interface is busy). The interface is unidirectional. This means that data is only sent from VISY-Command Web to the system components connected there. The system components receive the data without having to send a request. By that, in contrast to bidirectional interfaces, it is possible to connect several system components to the expansion interface in parallel. Theoretically, up to 31 system components can be connected to this interface.

By default, this interface is inactive. It can be activated using the VISY-Setup software. Please refer to the technical documentation of the device to be connected to see if other settings are required.

<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
<tr><td>RxD</td><td>TxD</td><td>⊥</td><td>A+</td><td>B–</td><td>⊥</td><td>A+</td><td>B–</td><td>PE</td></tr>
<tr><td colspan="3">RS-232</td><td colspan="2">RS-485</td><td colspan="3">RS-485</td><td rowspan="2">⏚</td></tr>
<tr><td colspan="5">Host</td><td colspan="3">Expansion</td></tr>
</table>

Figure 8: Expansion interface

If shielded cables are used, the shield must be placed on the PE terminal. Please also observe the installation instructions for the device to be connected to the interface. If the shield cannot be fitted on both sides, it is possible to work with a shield fitted to one side of the VISY-Command Web only.

The yellow TxD LED of the extension interface indicates data being transmitted through the extension interface.

Do not connect the cable shield to the interface ground (⊥/GND).

Please note that the longer the line length, the greater the probability of equipotential currents flowing through a line shield earthed on both sides. Where necessary, an additional equipotential bonding conductor must be provided between the connected devices in accordance with local rules and regulations.

4.4.5 DIP switch S2 for bias (RS-485 host/extension)

With the DIP switch S2, the RS-485 host interface (2.1/2.2) and the RS-485 extension interface (2.3/2.4) can be biased when required, in order to achieve a significant improvement of communication security.

DIP switch S2: RS-485 bias

1	2	3	4	Function
OFF	OFF	OFF	OFF	Bias off (factory setting)
ON	ON	OFF	OFF	Host bias
OFF	OFF	ON	ON	Extension bias
ON	ON	ON	ON	Host and extension bias

Table 2: DIP switch S2 configuration

In an RS-485 network, only one bias point is permitted. For this reason, leave the switches in the OFF position if another device is already biasing the network.

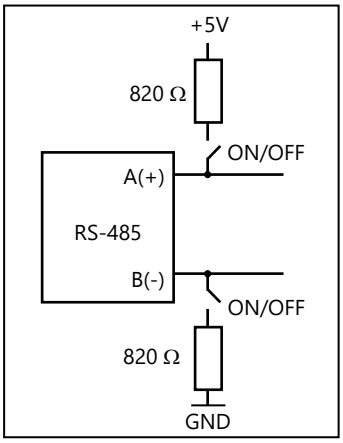


Figure 9: DIP switch S2

4.4.6 IFSF-LON interface (optional)

The IFSF-LON interface is available optionally, see following manual:

IFSF-LON interface converter, art. no. 207092

4.5 Connection of the VISY-Lev+ interface (optional)

Optionally, the VISY-Lev+ interface is available for the connection of a second cash register system, see the following manual:

VISY-Lev+ interface (under preparation)

4.6 Supply voltage connection

The supply of auxiliary power (electrical connection) must be carried out as a fixed installation (no plug installation), and is ducted through the lower right cable gland, see Figure 5.

Connect the supply voltage to the corresponding terminal blocks only after the VISY-Command Web has been completely wired.

When the housing door of the VISY-Command is opened, there is a risk of electric shock on touching conductive parts!

4.7 Display

To use the display, the corresponding function of the RS-232 service interface must be set, see chapter4.4.2

4.8 Configuration

Before configuration, all sensors must be installed and connected to the VISY-Command Web.

The configuration is done in 2 steps (see the following chapters):

(1) Configuration with the VISY-Setup software
(2) Configuration with the SECON-X software

4.8.1 Configuration with the VISY-Setup software

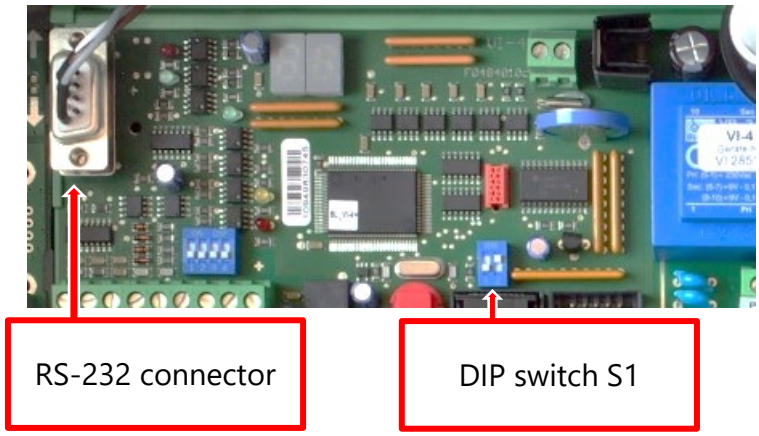
In the first step, the VISY-Command Web is configured with the VISY-Setup software.

The VISY-Command Web is configured with VISY-Setup with the housing door opened. Observe the appropriate safety measures.

For configuration with VISY-Setup, the display connector must be removed from the RS-232 service interface of the VI-4 board!

(1) Remove the power supply connector from the display (left black connector)

(2) Remove the RS-232 connector of the display from the VI-4 board, see chapter4.4.2 and set the DIP switch S1 to position OFF – OFF



(3) Connect the VISY-Command Web to your PC/notebook via the RS-232 service interface

(4) Configure the VISY-Command Web with the VISY-Setup software on your PC/notebook

For further details of the configuration with VISY-Setup see the following manual:

VISY-Setup V4..., art. no. 207158

(5) Plug the RS-232 connector of the display back into the RS-232 service interface, set the DIP switch S1 to the OFF – ON position and connect the power supply connector to the display.

4.8.2 Configuration with the SECON-X software

In the second step, the VISY-Command Web is configured with the SECON-X software. The SECON-X system consists of the SECON server, which is connected to the VISY-Command Web via the network and which retrieves the measurement data from it, and the users who receive the measurement data from the SECON server locally or via the Internet. For installation and configuration of the SECON-X software, see the following manuals:

Installation/configuration of the SECON-X software:

SECON-Server Installation	Art. no. 350112
SECON-Server Administrator	Art. no. 350088
SECON-Client Administrator local and remote access	Art. no. 350340
SECON-X Autocalibration	Art. no. 350342
SECON-X Reconciliation	Art. no. 350344

5 Operation

5.1 Applications

The VISY-Command Web is operated via a touch-screen display and can be used with the **VAPORIX application** for monitoring the vapour recovery, with the **LEVEL application** for filling level measurement, and with the **Environmental application** including **Oil separator monitoring**, also see the following manuals:

SECON-Server User,	art. no. 350377
SECON-Client User local access,	art. no. 350263
SECON-Client User remote access,	art. no. 350175

5.1.1 VAPORIX application (optional)

With the VAPORIX application, the vapour recovery of the individual fuel pumps is monitored and evaluated, see the following figure:

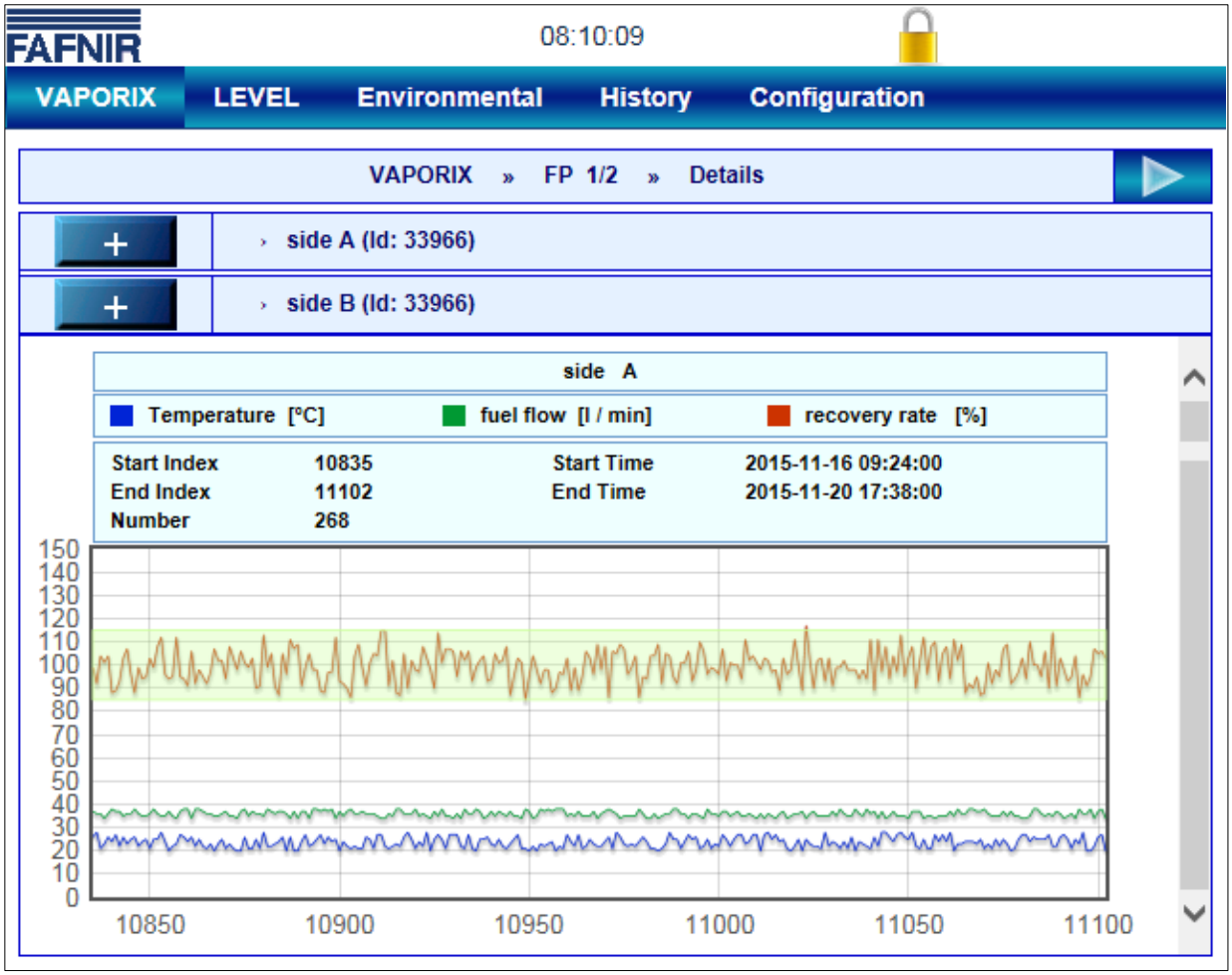


Figure 10: VAPORIX application

5.1.2 LEVEL application

With the LEVEL application, the filling levels of the individual fuel tanks is monitored and evaluated, see the following figure:

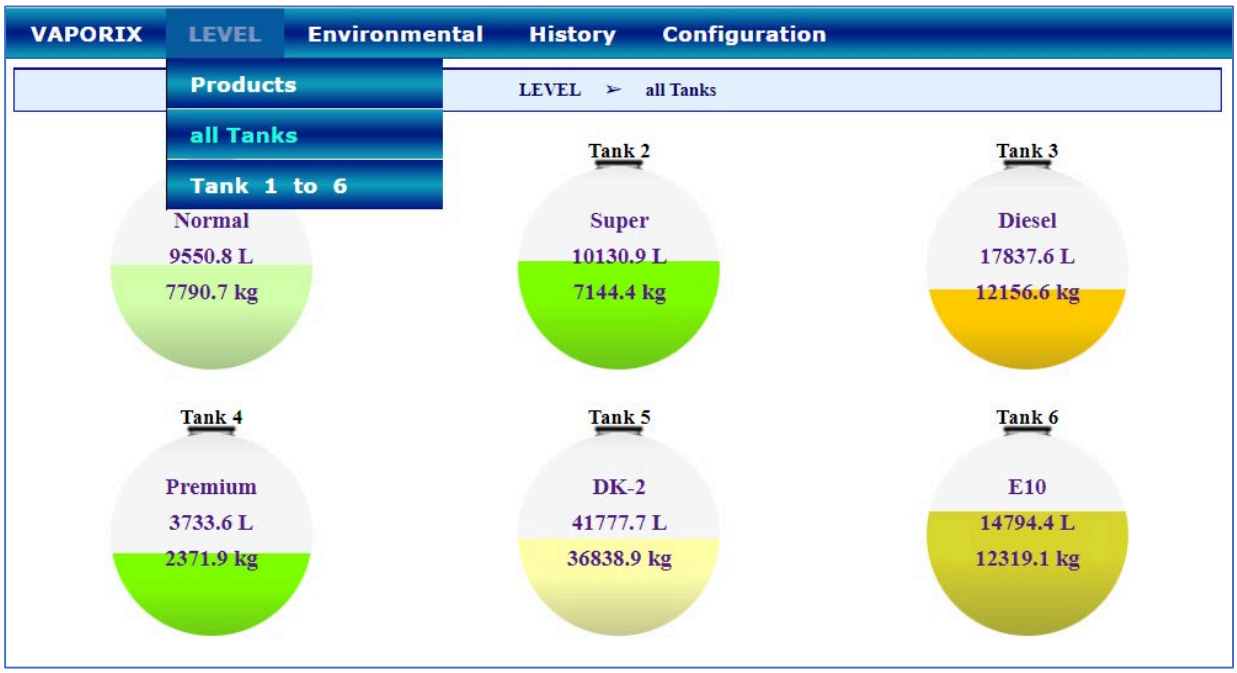


Figure 11: LEVEL application

5.1.3 Environmental application

With the environmental application, leakages, drip trays (sumps) and oil separators are checked and monitored, see the following figure:

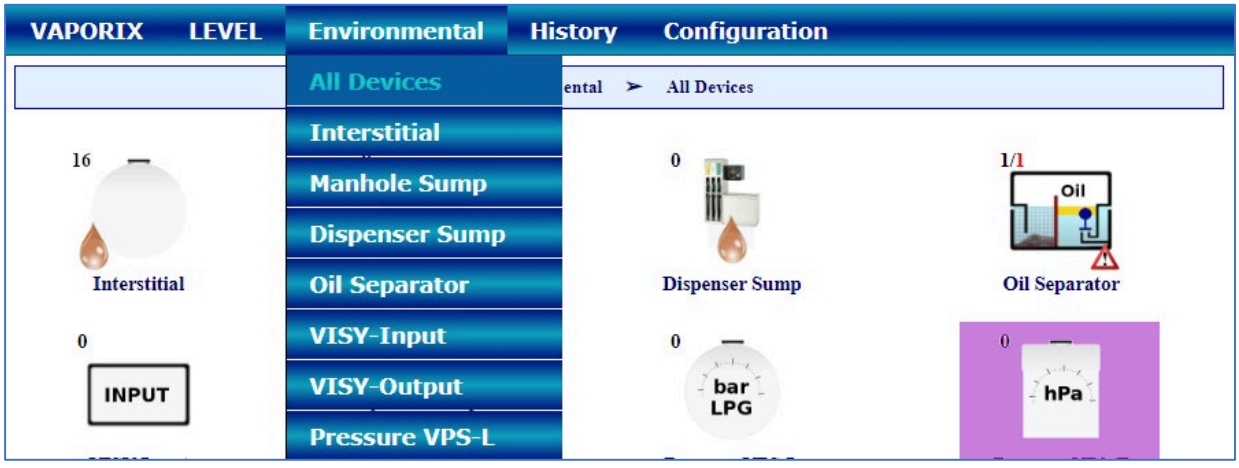


Figure 12: Application of environmental sensors

5.2 Status display of the VI-4 board

After switching on or resetting the VI... interface, the firmware checksum is initially checked. If an error in the firmware is detected, the display shows permanently SE (Signature Error). Otherwise, the firmware version of the interface is displayed. This is shown in form of three numbers displayed in sequence, e. e.g. 4 – 2 – 3 represents version 4.2.3.

Then, for all configured connections of the VP... isolation amplifier, first the connection number and then the sensor type appear in sequence, represented as a symbol, see the following table:

	VISY-Stick fitted in the tank
	VISY-Stick/Reed Interstitial (monitoring of the intermediate chamber in double-walled tanks)
	VISY-Stick/Reed Sump Manhole (monitoring the manhole)
	VISY-Stick/Reed Sump Dispenser (monitoring the dispenser sump)
	VPS pressure sensor
	VISY-Sludge
	VISY-Stick Temp (temperature measurement with up to 31 sensors)
	VIMS Tank (monitoring the intermediate chamber in double-walled tanks)
	VIMS Product Pipe (monitoring the intermediate chamber in double-walled product pipes)
	VIMS Delivery Pipe (monitoring the intermediate chamber in double-walled filling pipes)
	VISY-Input
	VISY-Output

Table 3: Sensor symbols

If no sensor has been configured, the display will show 99 continually.

Finally, the status of the respective sensors is displayed in the form of a number, see below.

5.2.1 Status messages of the VI-4 board

Once the configuration with VISY-Setup is complete, you can monitor the operation of the sensors with the status display of the VI-4 interface. The display consecutively shows the terminal number of a particular sensor, the sensor symbol and the associated status code, e. g.  ...  ...  (VP board terminal no. 5 with VISY-Stick in operation). One sensor after another is queried in an endless loop. The meaning of the individual status codes is shown in the following table.

Status Code	Message (in VISY-Setup) Description	▶ Possible cause ☑ Troubleshooting
0	Probe running	☑ No measures required
1	Probe not running The measured values are no longer being recorded and are set to “0” by the evaluation unit.	▶ If this status is displayed permanently, it can be assumed that the sensor is defective. ☑ The sensor must be replaced.
2	Mounting error All measured values are processed normally. However, it must be assumed that the measured values provided by the sensor are not correct.	▶ The sensor is not installed correctly. ☑ Check the installation position of the sensor and correct it if necessary. The sensor must be placed vertically on a flat surface.
5	Probe cannot determine temperature The evaluation unit is no longer capturing the temperature and sets the value to 0.0 °C. The temperature compensation of the filling volume is no longer carried out. The product and water level continue to be processed.	▶ If this status is displayed permanently, it can be assumed that the sensor is defective. ☑ The sensor must be replaced.
6	Probe cannot determine filling level The product level and water level are set to “0” by the evaluation unit, the temperature continues to be transmitted.	▶ If this status is displayed permanently, it can be assumed that the sensor is defective. ☑ The sensor must be replaced.
7	Reduced measuring accuracy All measured values are being processed normally. However, it must be assumed that total measurement accuracy is not being achieved.	▶ Powerful fluid movements prevent a fully accurate measurement value determination. This may be the case during fuel deliveries, for example. ☑ No measures required
8	Only for wireless operation: Checksum error: Probe - RF-transmitter The VISY-RF transmitter is reporting an error in communication with the sensor. The evaluation unit does not receive any data from the sensor.	▶ Dirty or damaged plug connection, loose connection, strong interference radiation, or defective VISY-RF transmitter. ☑ Check cable and plug connection, replace VISY-RFT transmitter, replace sensor, check surrounding area for powerful sources of radiation (e.g. three-phase supply cables, motors).

Status Code	Message (in VISY-Setup) Description	▶ Possible cause ☑ Troubleshooting
9	Only for wireless operation: RF transmitter does not receive any data from the sensor. The VISY-RFT transmitter reports that the sensor is no longer responding.	▶ Dirty or damaged plug connection, connection cable defective, sensor or VISY-RFT transmitter defective ☑ Check the cable and plug connection, replace VISY-RFT transmitter, replace VISY-Stick/Reed.
10	Checksum error: Probe - Evaluation unit The evaluation unit reports an error when communicating with the sensor or the RF receiver.	▶ In case of wired operation, the cable connection (and/or plugs and terminals) to the sensor is loose, dirty, or damaged, or there is a strong interference. ▶ In wireless operation, the cable connection (also plugs and terminals) between RF receiver and VI-4 interface is loose, damaged, or there is a strong interference. ☑ Check cables, plugs and terminal connections. ☑ In wired operation, replace the sensor, VP-... isolation amplifier, VI-4 interface. ☑ In wireless operation, replace RF receiver, VI-4 interface. Check surrounding area for strong interference sources (e.g. three-phase cables, power switches, etc.).
11	No communication with probe The evaluation unit is no longer able to establish data communication with the sensor. The measured values are not recorded and are set to "0" by the evaluation unit.	▶ Sensor not connected / not present / defective, wiring error, incorrect sensor serial number configured, evaluation unit defective (VI-4 interface or VP-... isolation amplifier). ☑ Take the necessary measures appropriate to the causes.
12	Incompatible data The data communication with the sensor runs without transmission errors, but the data cannot be interpreted by the evaluation unit. The measured values are not recorded and are set to "0" by the evaluation unit.	▶ The sensor or particular type of the sensor is not supported by the evaluation unit. ☑ Ask the manufacturer if the sensor and the evaluation unit are compatible, and if updates are available. Please have the type/model and the serial number of

Status Code	Message (in VISY-Setup) Description	▶ Possible cause ☑ Troubleshooting
		the evaluation unit and of the sensor (e.g. number of floats or density module) available.
13	Only for wireless operation: Waiting for first wireless transmission After switching on or after a reset, the VISY-Command RF reports that no data has been received from the sensor.	▶ Data from the sensors is transmitted only at intervals. ☑ Not required because of normal reset/switch-on behaviour. If no data has been received after the timeout (1 ... 99 hours) configured for VISY-Command Web, the status automatically is changed from 13 to 11.
99	Sensor or tank not configured The evaluation unit detects no sensor connection. There is no data communication via the associated sensor terminal (tank 1 ... 16). All the measured values of this connection terminal are set to "0".	▶ In the delivery state of the evaluation unit, all the connected sensors/tanks initially show this status. To establish communication with a sensor via the sensor terminal, it is necessary to enter the serial number of the sensor and the type of product. If this status is displayed, one or both entries have not been made. ☑ The evaluation unit must be configured using VISY-Setup.
--	Reset evaluation unit The evaluation unit is not working. During a reset, there is no communication with the sensors, the host and VISY-Setup. In this case, VISY-Setup reports that the evaluation unit is no longer responding.	▶ The evaluation unit is reset by switching it on or by pressing the reset button. If this status is displayed permanently even after pressing the reset button, it can be assumed that the evaluation unit (VI-4 interface) is defective. ☑ Replace the VI-4 interface of the evaluation unit.

Table4: Status messages

6 Maintenance

6.1 Servicing

FAFNIR devices are generally maintenance-free.

6.2 Replacement of components

The VI-4 interface board and the VP-... isolation amplifier board can each be exchanged as a complete assembly. The boards are mounted on a DIN mounting rail from which they can be easily removed using a screwdriver.

6.3 Return shipment

Before returning any FAFNIR device, the Return Material Authorization (RMA) is required. Please contact your account manager or the technical support team, who will inform you about the details of the return.

Phone	+49 / 40 / 39 82 07 – 0
Availability (CET)	Mon. to Thu. 7:00 a.m. to 5:00 p.m., Fri. 7:00 a.m. to 4:00 p.m.

☞ *The return of FAFNIR devices is only possible after approval (RMA) by the FAFNIR customer service.*

7 Technical data

Supply connection:	~ 230 VAC ± 10 %; 50 Hz; 20 VA
Sensors connection:	Only for connection of certified sensors according to EN 60079 (observe operating instructions)
Ambient temperature:	0 °C to +55 °C (without printer) 0 °C to +50 °C (with printer)
Relative humidity:	20% to 90% (without printer) 30% to 85% (with printer)
Voltage overload category	II
Degree of pollution:	2
Degree of enclosure protection:	IP40

☞ *More Information on the technical data can be found in the approvals and instructions.*

8 List of figures

9 List of tables

CE

FAFNIR™

EU–Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité

FAFNIR GmbH
Schnackenburgallee 149 c
22525 Hamburg / Germany

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
declares as manufacturer under sole responsibility that the product
déclare sous sa seule responsabilité en qualité de fabricant que le produit

Messauswertung
Evaluation Unit
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VISY-Command ...

den Vorschriften der europäischen Richtlinien
complies with the regulations of the European directives
est conforme aux réglementations des directives européennes suivantes

2011/65/EU	Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten	RoHS
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment	RoHS
2011/65/UE	Limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques	RoHS
2014/30/EU	Elektromagnetische Verträglichkeit	EMV
2014/30/EU	Electromagnetic compatibility	EMC
2014/30/UE	Compatibilité électromagnétique	CEM
2014/34/EU	Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen	ATEX
2014/34/EU	Equipment and protective systems intended for use in potentially explosive atmospheres	ATEX
2014/34/UE	Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles	ATEX
2014/35/EU	Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt	NSRL
2014/35/EU	Making available on the market of electrical equipment designed for use within certain voltage limits	LVD
2014/35/UE	Mise à disposition sur le marché du matériel électrique destiné à être employé dans certaines limites de tension	DBT
2014/53/EU	Bereitstellung von Funkanlagen auf dem Markt und zur Aufhebung der Richtlinie 1999/5/EG	FAR
2014/53/EU	Making available on the market of radio equipment and repealing Directive 1999/5/EC	RED
2014/53/UE	Mise à disposition sur le marché d'équipements radioélectriques et abrogeant la directive 1999/5/CE	DER

durch die Anwendung folgender harmonisierter Normen entspricht
by applying the harmonised standards
par l'application des normes

RoHS / RoHS / RoHS	**EN 50581:2012**
EMV / EMC / CEM	**EN 55022:2010**
	EN 55024:2010
	EN 61000-3-2:200 + A1:2009 + A2:2009
	EN 61000-3-3:2008
	EN 61000-6-2:2005
	EN 61326-1:2013
	ETSI EN 300 220-1 V2.4.1
ATEX / ATEX / ATEX	**EN 60079-0:2009**
	EN 60079-11:2007
	EN 60079-14:2014
	EN 60079-26:2007
NSRL / LVD / DBT	**EN 61010-1:2010**
FAR / RED / DER	**ETSI EN 300 220-2 V2.4.1**

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FAFNIR™

Das Produkt ist bestimmt als Elektro- und Elektronikgerät der RoHS-
The product is determined as electrical and electronic equipment of RoHS
Le produit est déterminés comme des équipements électriques et électroniques de RoHS

Kategorie / Category / Catégorie	**Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels**

Das Produkt entspricht den EMV-Anforderungen
The product complies with the EMC requirements
Le produit est conforme aux exigences CEM

Störaussendung / Emission / Émission	**Klasse B / Class B / Classe B**
Störfestigkeit / Immunity / D'immunité	**Industrielle elektromagnetische Umgebung / Industrial electromagnetic environment / Environnement électromagnétique industriel**
Empfänger / Receiver / Récepteur (VISY-Command RF)	**Kategorie 2 / Category 2 / Catégorie 2**

Die notifizierte Stelle TÜV NORD CERT GmbH, 0044 hat eine EG-Baumusterprüfung durchgeführt und folgende Bescheinigung ausgestellt
The notified body TÜV NORD CERT GmbH, 0044 performed a EC-type examination and issued the certificate
L'organisme notifié TÜV NORD CERT GmbH, 0044 a effectué examen CE de type et a établi l'attestation

VP-...	**TÜV 98 ATEX 1380**

Das Produkt entspricht dem NSRL-Konformitätsbewertungsverfahren
The product complies with the LVD conformity assessment procedure
Le produit est conforme avec la procédure d'évaluation DBT de la conformité

VISY-Command ...	**Modul A / Module A / Module A**

Das Produkt entspricht dem FAR-Konformitätsbewertungsverfahren
The product complies with the RED conformity assessment procedure
Le produit est conforme conformes avec la procédure d'évaluation DER de la conformité

VISY-Command RF ...	**Modul A / Module A / Module A**

Hamburg, 13.06.2016
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

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EU–Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité

FAFNIR GmbH
Schnackenburgallee 149 c
22525 Hamburg
Deutschland / Germany / Allemagne

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
declares as manufacturer under sole responsibility that the product
déclare sous sa seule responsabilité en qualité de fabricant que le produit

Trennverstärker / Isolating Amplifier / Amplificateurs d'isolement

VP-...

den Vorschriften der europäischen Richtlinien
complies with the regulations of the European directives
est conforme aux réglementations des directives européennes suivantes

2011/65/EU	**Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten**	**RoHS**
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2014/34/EU	**Equipment and protective systems intended for use in potentially explosive atmospheres**	**ATEX**
2014/34/UE	**Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles**	**ATEX**

durch die Anwendung folgender harmonisierter Normen entspricht
by applying the harmonised standards
par l'application des normes

RoHS / RoHS / RoHS	**EN 50581:2012**
EMV / EMC / CEM	**EN 61326-1:2013**
ATEX / ATEX / ATEX	**EN 60079-0:2012 + A11:2013**
	EN 60079-11:2012

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Kategorie / Category / Catégorie	**Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels**

Das Produkt entspricht den EMV-Anforderungen
The product complies with the EMC requirements
Le produit est conforme aux exigences CEM

Störaussendung / Emission / Émission	**Klasse B / Class B / Classe B**
Störfestigkeit / Immunity / D'immunité	**Industrielle elektromagnetische Umgebung / Industrial electromagnetic environment / Environnement électromagnétique industriel**

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L'organisme notifié TÜV NORD CERT GmbH, 0044 a effectué examen UE de type et a établi l'attestation

VP-...	**TÜV 98 ATEX 1380 X**

Hamburg, 15.09.2017
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

CE

FAFNIR™

EU–Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité

FAFNIR GmbH
Bahrenfelder Straße 19
22765 Hamburg / Germany

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
declares as manufacturer under sole responsibility that the product
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Messauswertung
Evaluation Unit
Unité d'analyse

VI-4

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by applying the harmonised standards
par l'application des normes

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EMV / EMC / CEM	**EN 61326-1:2013**
NSRL / LVD / DBT	**EN 61010-1:2010**

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Kategorie / Category / Catégorie	**Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels**

Das Produkt entspricht den EMV-Anforderungen
The product complies with the EMC requirements
Le produit est conforme aux exigences CEM

Störaussendung / Emission / Émission	**Klasse B / Class B / Classe B**
Störfestigkeit / Immunity / D'immunité	**Industrielle elektromagnetische Umgebung / Industrial electromagnetic environment / Environnement électromagnétique industriel**

Hamburg, 20.04.2016
Ort, Datum / Place, Date / Lieu, Date

Geschäftsführer / Managing Director / Gérant: René Albrecht

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Translation

(1) # EU-Type Examination Certificate

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**

(3) **Certificate Number** **TÜV 98 ATEX 1380 X** **issue:** 00

(4) for the product: Isolating amplifier VP-1, VP-2 resp. VP-4

(5) of the manufacturer: **FAFNIR GmbH**

(6) Address: Schnackenburgallee 149 c, 22525 Hamburg, Germany

Order number: 8000466920

Date of issue: 2017-09-05

(7) The design of this product and any acceptable variation thereto are specified in the schedule to this EU-Type Examination Certificate and the documents therein referred to.

(8) The TÜV NORD CERT GmbH, Notified Body No. 0044, in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in the confidential ATEX Assessment Report No. 17 203 191840.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 **EN 60079-11:2012**

except in respect of those requirements listed at item 18 of the schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions for Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design, and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the product shall include the following:

II (1) G [Ex ia Ga] IIC
II (1) D [Ex ia Da] IIIC

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the notified body

Andreas Meyer

Hanover office, Am TÜV 1, 30519 Hannover, Tel. +49 511 998-61455, Fax +49 511 998-61590

(13) **SCHEDULE**

(14) **EU-Type Examination Certificate No. TÜV 98 ATEX 1380 X issue 00**

(15) Description of product

The isolating amplifier type VP-... is an associated apparatus which is used for the transmission of electrical signals from the hazardous explosive area to the non-hazardous explosive area resp. preferably for powering of electronic filling level sensors and forwarding of measuring values to a superordinate evaluation system. It is designed as a module of a tank level measuring system. The types vary in the number of IS sensor circuit.
The isolating amplifier shall be only used outside the hazardous area and must be installed inside an IP20 enclosure according to IEC 60529.

Type Code

VP-1: Eight intrinsically safe sensor circuits
VP-2: Two intrinsically safe sensor circuits
VP-4: Four intrinsically safe sensor circuits

Technical data

Supply circuit "Power" (terminals L, N, PE)

U_n = 230 VAC ± 10%; approx. 2 VA, U_m = 253 V resp.
U_n = 115 VAC ± 10%; approx. 2 VA, U_m = 138 V resp.
U_n = 24 VAC ± 10%; approx. 2 VA, U_m = 36 V

Sensor circuits "1" to "8" (terminals +, A, B, -)

in Type of Protection "Intrinsic Safety" Ex ia IIC/IIB/IIIC
Maximum values per circuit:
U_o = 14.3 V
I_o = 27.5 mA
P_o = 98.1 mW

Characteristic line: linear

C_i negligibly small
L_i negligibly small

The maximum permissible values for the external inductance (L_o) and capacitance (C_o) shall be taken from the following table:

	Ex ia IIC		Ex ia IIB/IIIC	
L_o	5 mH	2 mH	20 mH	10 mH
C_o	380 nF	480 nF	1.5 µF	1.8 µF

The aforementioned maximum values for L_o and C_o consider the coincidental appearance of concentrated capacitance and inductance.

Communication circuit (plug connector)

U_n = 5 V
U_m = 134 V

The intrinsically safe sensor circuits are safely galvanically separated from the supply circuit (terminals L, N, PE) up to a peak crest value of the voltage of 375 V and from the communication circuit (plug connector) up to a peak crest value of the voltage of 190 V.

Permissible range of ambient temperature: -20 °C to +55 °C.

Schedule to EU-Type Examination Certificate No. TÜV 98 ATEX 1380 X issue 00

(16) Drawings and documents are listed in the ATEX Assessment Report No. 17 203 191840

(17) Specific Conditions for Use

The isolating amplifier has to be installed in a housing in such a way, that a degree of protection of at least IP20 according to EN 60529 is reached.

(18) Essential Health and Safety Requirements

no additional ones

- End of Certificate -

11.4.1 Instructions VP-...

Instructions in accordance with Directive 2014/34/EU

TÜV 98 ATEX 1380 X

Isolating amplifier VP-…

Edition: 08.2017

I Range of application

The isolating amplifiers VP-… are primarily used to supply electronic fill level sensors and forward the measured data to a superordinate evaluation system.

II Standards

The isolating amplifier is designed in accordance with the following European standards

EN 60079-0:2012 + A11:2013	Equipment - General Requirements
EN 60079-11:2012	Equipment protection by intrinsic safety "i"

III Instructions for safe …

III.a … use

The isolating amplifier serves as associated equipment and is not approved for use in potentially explosive areas. The intrinsically safe sensor circuits may be routed into the Zone 0 or Zone 20 and are applicable for all gas groups (IIA, IIB and IIC) as well as all dust groups (IIIA, IIIB and IIIC).

The approval applies to the device versions

VP-1	Isolating amplifier with eight intrinsically safe sensor circuits
VP-2	Isolating amplifier with two intrinsically safe sensor circuits
VP-4	Isolating amplifier with four intrinsically safe sensor circuits

III.b … assembling and dismantling

The isolating amplifier is manufactured with an open plastic housing for DIN rail mounting. The housing must not be opened!

III.c … installation

Wiring work may only be performed with the power disconnected. Special rules and regulations, including EN 60079-14 and local installation regulations, must be observed.

The isolating amplifier must be installed outside the potentially explosive area in a housing with degree of protection of at least IP20. If the isolating amplifier is mounted outdoors, the housing protection class must be at least IP54.

For the wiring (preferably blue cable) from the sensor to the isolating amplifier, the permissible inductance and capacitance under item V must not be exceeded.

Terminal designation:

Connection	Terminal	Contacts
Auxiliary power	Power	PE, N, L
Sensor circuits	VP-1: 1 … 8 VP-2: 1 … 2 VP-4: 1 … 4	+, A, B, -
Communication	(Cradle connector)	1 … 10

Table III.c: Terminal designation on the isolating amplifier

III.d … **adjustment**

No Ex-relevant equipment is required for operating the isolating amplifier.

III.e … **putting into service**

Before putting into service, all devices must be checked to ensure they are properly connected and installed. The power supply, as well of connected devices, must be checked.

III.f … **maintenance (servicing and emergency repair)**

The isolation amplifier generally is maintenance-free. In case of a defect, it must be send back to FAFNIR or one of its representations.

There is consistency with the requirements for the dielectric strength (according to EN 60079-11, clause 6.3.13) between the intrinsically safe sensor circuits and the auxiliary energy as well as the communication connection.

IV Equipment marking

1	Manufacturer:	FAFNIR GmbH, 22525 Hamburg
2	Type designation:	VP-…
3	Certificate number:	TÜV 98 ATEX 1380 X
4	Ex marking:	 II (1) G [Ex ia Ga] IIC II (1) D [Ex ia Da] IIIC
5	CE marking:	CE 0044
6	Technical Data	$U_o \leq$ 14.3 V $I_o \leq$ 28 mA $P_o \leq$ 98 mW $L_o \leq$ 2 mH $C_o \leq$ 480 nF $T_a \leq$ +55 °C

V Technical data

The auxiliary power for the isolating amplifier depends on the model:

U = 24 V_{AC}/115 V_{AC}/230 V_{AC} ± 10 %, 50 Hz … 60 Hz
P ≈ 2 VA
U_m = 36 V@24 V_{AC} / 138 V@115 V_{AC} / 253 V@230 V_{AC}

The electric circuits of the sensors have "Intrinsic safety" [ia] ignition protection class with a linear output characteristic. Output values per electric circuit are

Output voltage	U_o	14.3 V
Output current	I_o	27.5 mA
Output power	P_o	98.1 mW
Internal inductance	L_i	negligibly small
Internal capacitance	C_i	negligibly small

The permissible external inductance and capacitance are:

		IIC		IIB / IIIC	
L_o	≤	5 mH	**2 mH**	20 mH	10 mH
C_o	≤	380 nF	**480 nF**	1.5 µF	1.8 µF

The maximum values of the parameter pairings may simultaneously be used as concentrated capacitance and concentrated inductance. The values written in bold can be found also in the device marking.

The signal and maximum safety voltage of the communication interface is

U = 5 V
U_m = 134 V

The isolating amplifier can be used in the following ambient temperature range:

T_a = -20 °C … +55 °C

The isolating amplifier achieves a housing protection rating of:

Degree of protection	IP00

VI Specific conditions for use

The isolating amplifier must be installed in a housing which has a degree of protection according to EN 60529 of at least IP20.

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QR code to access the
Technical Documentation website

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