



VISY-X

VISY-RF Radio System Version 4

(en)



P/N	Version	Edition
350394	2	2026-06

Content

1	Overview	1
1.1	VISY-RF Radio System	1
1.2	In this Manual	2
1.3	Required Components	2
1.4	Safety Instructions	3
2	Components.....	4
2.1	VISY-Stick/Reed Probes and Sensors.....	4
2.2	VISY-RFT Transmitter	5
2.3	VISY-RFR-S Receiver	6
2.4	VISY-Command RF... Evaluation Unit.....	7
3	Installation of the VISY-RF Radio System.....	8
3.1	Installation Diagram	8
3.2	Installation of the VISY-Stick/Reed Probes and Sensors	8
3.3	Installation of the VISY-RFT Transmitters.....	9
3.3.1	Radio Transmission of the Transmitter inside Manholes.....	9
3.3.2	Installation of the Transmitter in Manholes	11
3.3.3	Installation of the Transmitter outside of Manholes.....	12
3.4	Installation of the VISY-Command RF... Evaluation Unit	12
3.5	Installation of the VISY-RFR-S Receivers	13
3.6	Cabling	14
3.6.1	Connection of VISY-RFR-S and VISY-Command RF.....	14
3.7	Configuration.....	16
3.7.1	Configuration of the VISY-Command RF... ..	16
3.7.2	Configuration of the Radio Transmission.....	17
3.7.3	Transmitter-Receiver Pairing.....	18
3.7.4	Configuration of the Probes/Sensors with VISY-Setup	19
3.8	Radio Signal Quality	19
3.8.1	Display of the RF Field Strength with VISY-Setup.....	19
3.8.2	Insufficient Signal Quality	20
3.8.3	Radio Signal Losses	21
3.8.4	Line of Sight	21
3.8.5	Interference Radiation.....	21

3.9	Final Assembly	21
3.10	Status Codes and Troubleshooting Tips	22
3.11	Battery Status.....	24
4	Technical Data	25
4.1	General Data	25
4.2	VISY-RFT Transmitter	25
4.3	VISY-RFR-S Receiver	25
5	List of Figures	26
6	Tables.....	26
7	Annex.....	27
7.1	EU type-examination certificate for VISY-RFT	27
7.2	Operating Instructions VISY-RFT... ..	29

© Copyright:

Reproduction and translation are permitted solely with the written consent of the FAFNIR GmbH. The FAFNIR GmbH reserves the right to make changes to products without prior notice.

1 Overview

The **VISY-X system** is a highly accurate, continuous level and environmental monitoring system for all commercially available fuels, light liquids and liquefied petroleum gas (LPG) in up to 16 tanks and oil separators. It consists of various VISY probes/sensors and the VISY-Command evaluation unit installed in a building. In most cases, the probes are electrically connected to the evaluation unit via cables.

The **VISY-RF radio system** can be selected if no free cable ducts are available between the probes and the evaluation unit.

1.1 VISY-RF Radio System

In the **VISY-RF radio system**, the VISY probes/sensors are connected to the **VISY-RFT transmitters**, and the readings are transmitted wirelessly to the **VISY-RFR-S receivers**. The VISY-RFR-S receivers pass the readings via data cable to the **VISY-Command RF... evaluation unit**.

 *The VISY-RF radio system supports a maximum of 16 VISY-RFT transmitters and 2 VISY-RFR-S receivers.*

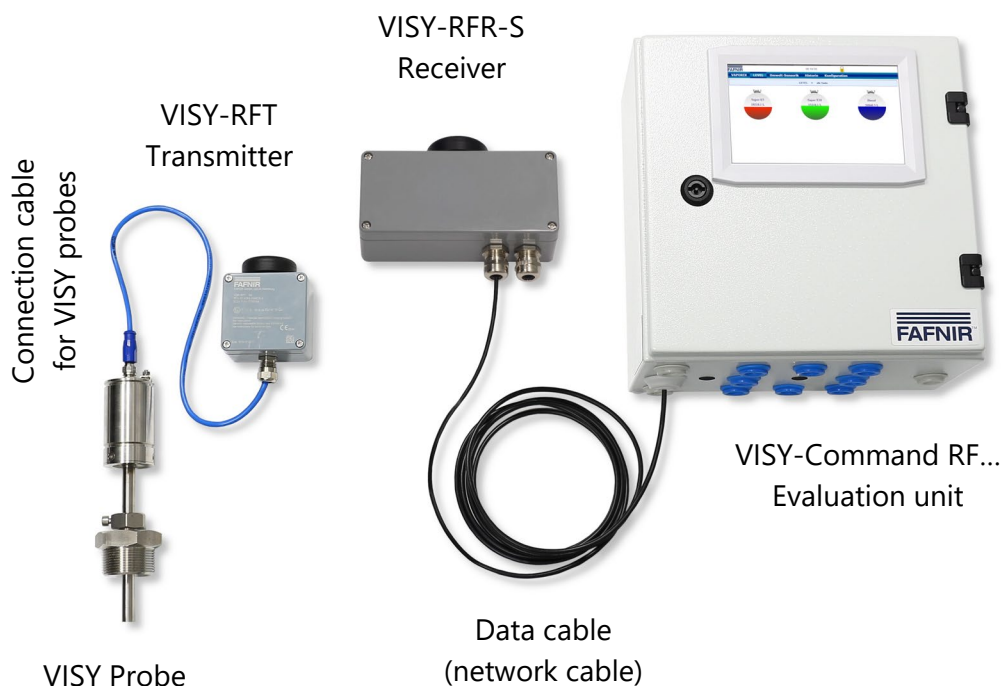


Figure 1: VISY-RF Radio System

1.2 In this Manual ...

... you will be guided through the installation, configuration and commissioning of the VISY-RF radio system with connection to the VISY-Command RF... evaluation unit.

During installation, the VISY-Command RF... evaluation unit is configured using a PC/notebook.

1.3 Required Components

- For configuring the VISY-Command RF... evaluation unit:
 - Serial RS-232 cable with two 9-pin D-Sub connectors
 - Windows PC/notebook with RS-232 interface/adapter
 - installed software "VISY-Setup", downloaded from the FAFNIR website
- Data/network cable (e.g. CAT 6 or better), overall shield, twisted pairs (e.g. S/UTP, S/FTP, S/STP or SF/FTP), diameter 5 ... 10 mm, the installer has to select an appropriate cable in accordance with local requirements, max. length 400 m with RS-485 connection from VISY-Command RF to VISY-RFR-S (Master), max. length 25 m with RS-232 connection from VISY-RFR-S (Master) to VISY-RFR-S (Slave)
- Mounting screws (4x) for VISY-RFR-S receiver:
round head screws, button-head screws, or pan head screws, diameter 4 mm, head diameter 5 ... 7.5 mm, length at least 50 mm

1.4 Safety Instructions



Useful information in this manual 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:



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.



Do not make any changes, additions or modifications to the system without prior approval from the manufacturer.



Only use original parts. These comply with the technical requirements specified by the manufacturer.



The installation and maintenance of the equipment may only be carried out by trained service technicians with appropriate qualification as specialists.



VISY-Command RF... and VISY-RFR-S must be installed outside potentially explosive atmospheres.



If 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.



When installing externally mounted equipment, the applicable regulations for lightning and surge protection, e.g. according to the EN 62305 series of standards, or the local installation regulations must be observed!



The VISY-RFT transmitters are approved for operation in potentially explosive atmospheres.

2 Components

- VISY-Stick/Reed probes and sensors depending on the application
- VISY-RFT transmitters (max. 16) including FAFNIR battery (P/N 900258)
- VISY-RFT installation kit (P/N 910040)
- VISY-RFR-S receiver (max. 2) with integrated antenna (P/N 908923)
- Data/network cable, not included in the delivery, see chapter 1.3
- VISY-Command RF...

for mounting the transmitters outside manholes:

- FAFNIR cable, blue, max. 100 m, oil and fuel resistant (P/N 904110)
- FAFNIR IP68 cable connector (P/N 910035)

Spare parts:

- Intrinsically safe FAFNIR battery (P/N 900095) for VISY-RFT transmitters



To ensure explosion protection, only the FAFNIR batteries may be used with VISY-RFT transmitters!

2.1 VISY-Stick/Reed Probes and Sensors

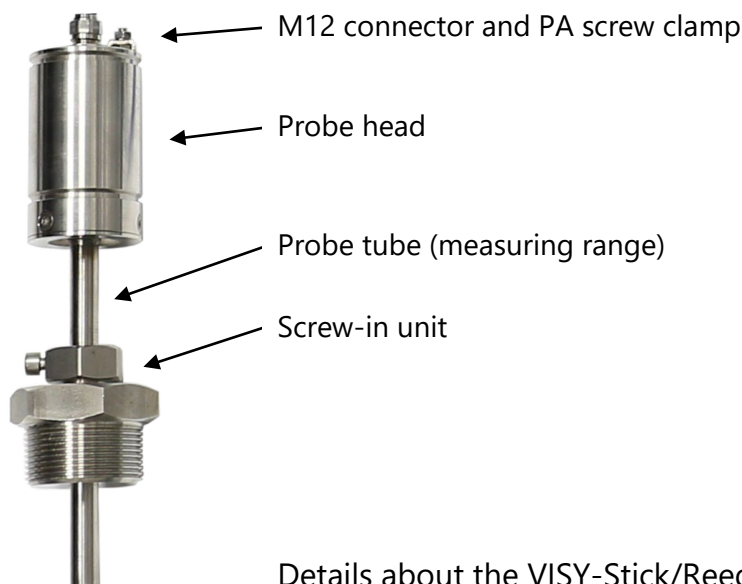


Figure 2: VISY Probe

Details about the VISY-Stick/Reed probes and sensors can be found in the following manual:



Technical Documentation VISY-Stick/Reed, P/N 207194

2.2 VISY-RFT Transmitter

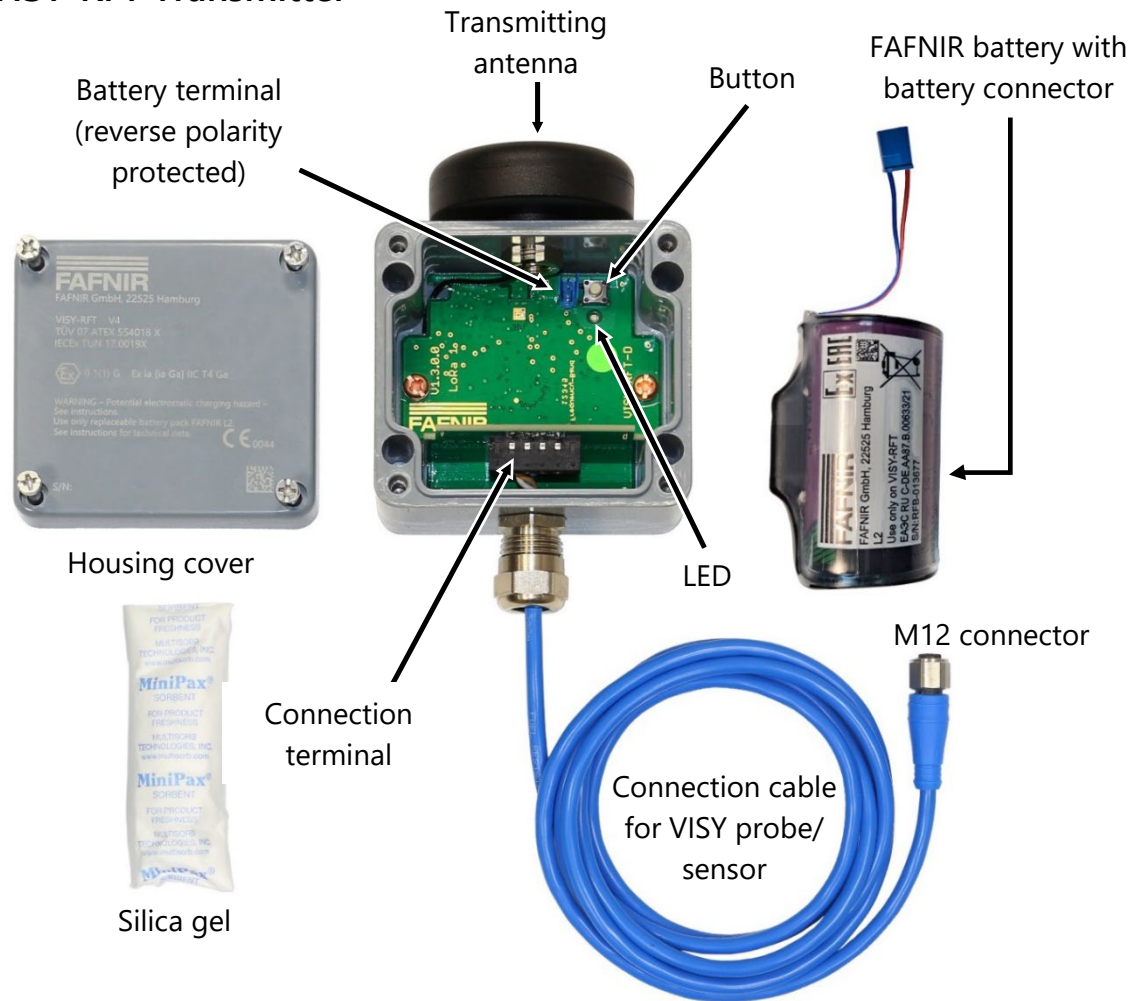


Figure 3: VISY-RFT transmitter with cover removed



The silica gel is part of the VISY-RFT transmitter and must be placed inside the transmitter housing during assembly.



The VISY-RFT transmitter is powered by the intrinsically safe FAFNIR battery. To ensure explosion protection, only these FAFNIR batteries (P/N 900095) may be used with the transmitters!



Make sure the transmitters are never underwater.



Press the button for a long time (> 5 seconds) to reset the VISY-RFT transmitter. The reset is indicated by the LED lighting up.



Press the button briefly to pair the VISY-RFT transmitter with the receiver, see chapter "Configuration".

2.3 VISY-RFR-S Receiver

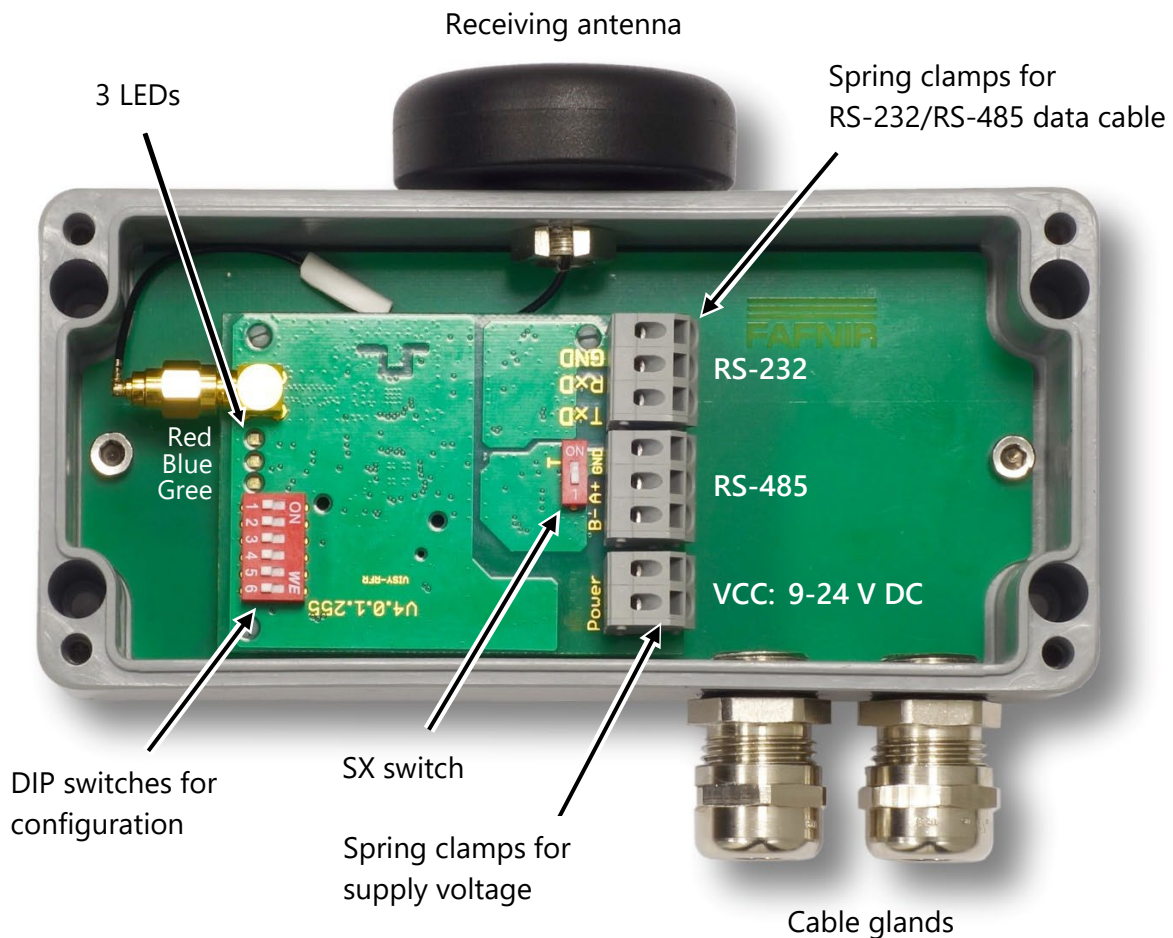


Figure 4: VISY-RFR-S receiver, interior view

The VISY-RFR-S receiver is powered via the VISY-Command RF... evaluation unit.

3 LEDs indicate the following events:

- the firmware version is indicated by the number of times the LEDs blink.
 - green LED: 1st digit of the firmware version
 - blue LED: 2nd digit of the firmware version
 - red LED: 3rd digit of the firmware version
- Pairing mode (green LED lights up)
- Data reception (red LED flashes)

The SX switch is in position 1 (OFF) by default.

2.4 VISY-Command RF... Evaluation Unit

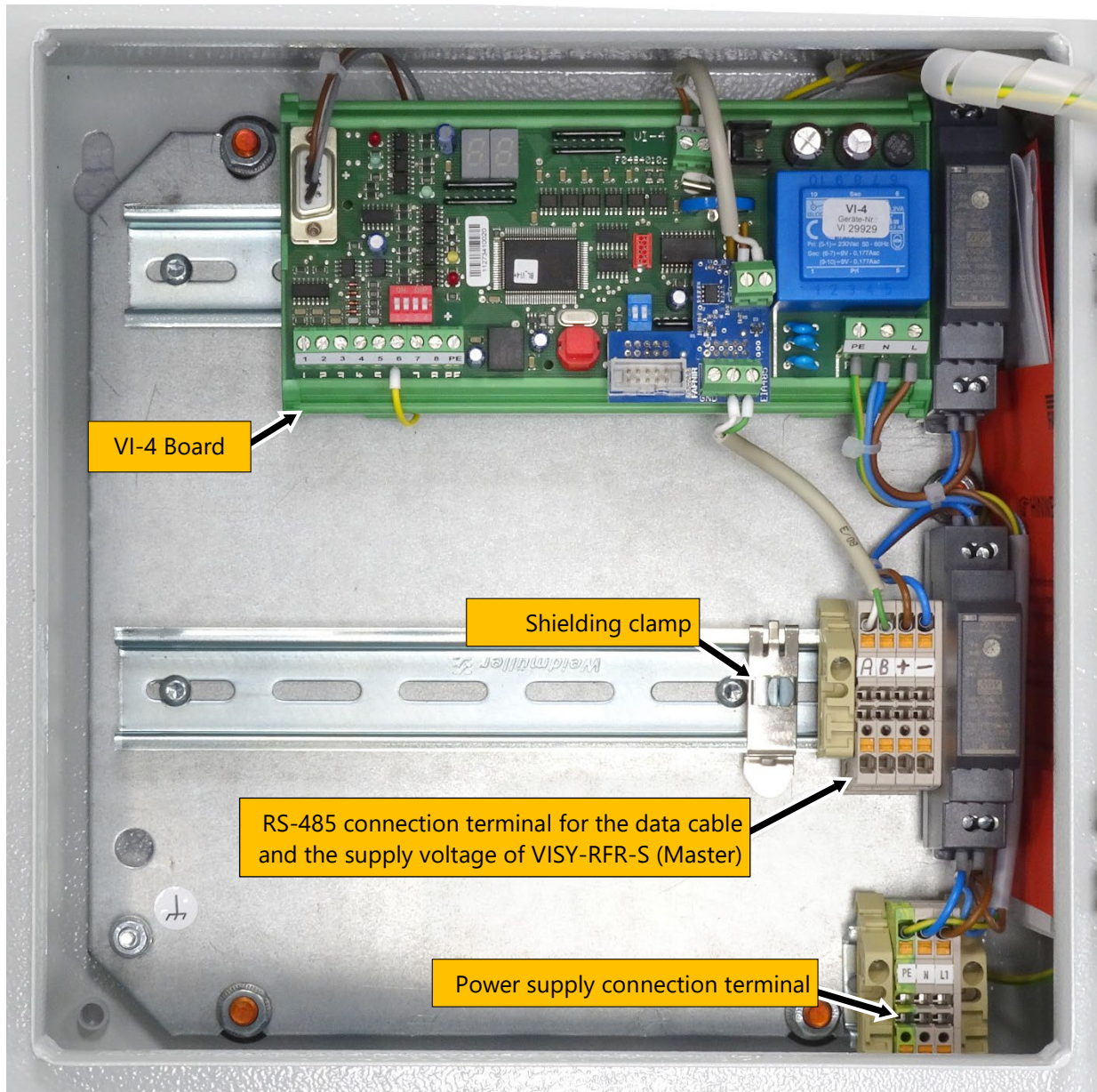


Figure 5: VISY-Command RF Web, interior view

Details on the VISY-Command... evaluation unit can be found in the manuals:



Technical documentation VISY-Command..., P/N 207184



Technical documentation VISY-Command Web, P/N 207218



Technical Documentation VISY-Setup, P/N 207158

3 Installation of the VISY-RF Radio System

3.1 Installation Diagram

The VISY-Stick probe (1) is mounted in the manhole of the tank and is connected to the VISY-RFT transmitter (2). The transmitter generates radio signals, represented in the figures as semicircles. The radio signals are received by the VISY-RFR-S receivers (3/7) and passed via data cable (4/6) to the VISY-Command RF... (5).



The VISY-RF radio system supports a maximum of 16 VISY-RFT transmitters and 2 VISY-RFR-S receivers.

Example:

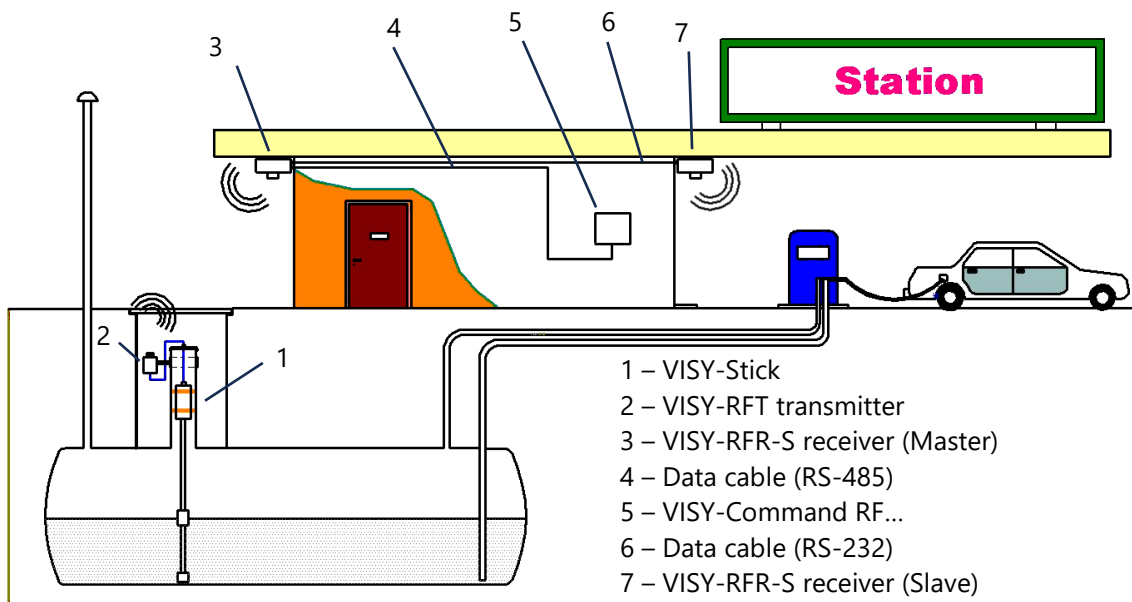


Figure 6: VISY-RF radio system with 2 VISY-RFR-S receivers (example)

3.2 Installation of the VISY-Stick/Reed Probes and Sensors

Details about the installation of VISY-Stick/Reed probes and sensors can be found in the manual:



Technical Documentation VISY-Stick/Reed, P/N 207194

3.3 Installation of the VISY-RFT Transmitters

3.3.1 Radio Transmission of the Transmitter inside Manholes

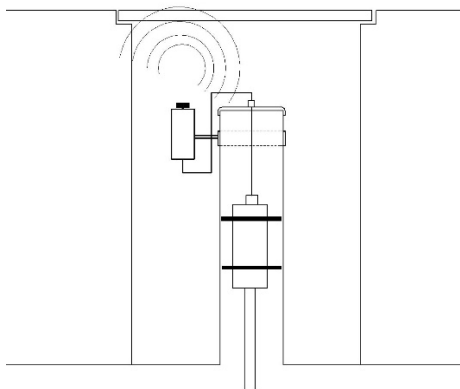


The orientation and position of the transmitter inside manholes can affect the quality of the radio transmission.



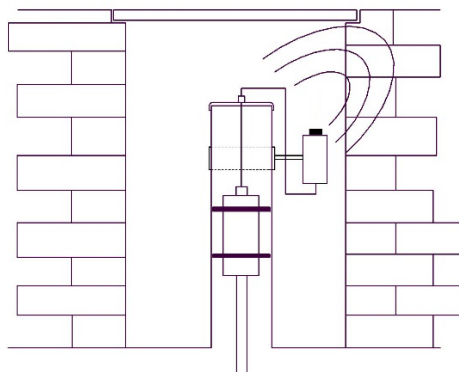
Reception conditions can be significantly reduced if the manhole cover is covered by ice and snow.

The typical propagation of radio waves inside different manholes is shown in the following 4 figures. The transmitters are exemplary connected to VISY-Stick probes in risers (installation pipes). The propagation of the radio waves is identically to VISY-Stick probes with screw-in units. To mount a transmitter, choose a position in the manhole where the shielding of the radio transmission is as low as possible.



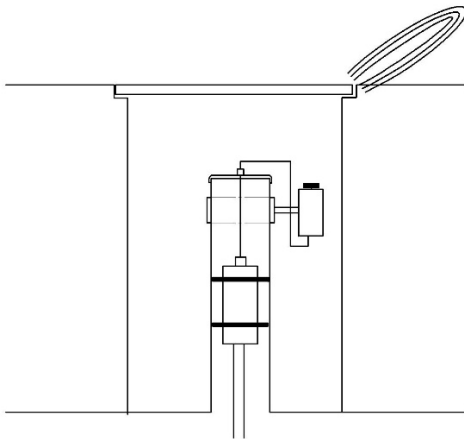
Radio transmission with minimal attenuation

Figure 7: Manhole with plastic cover



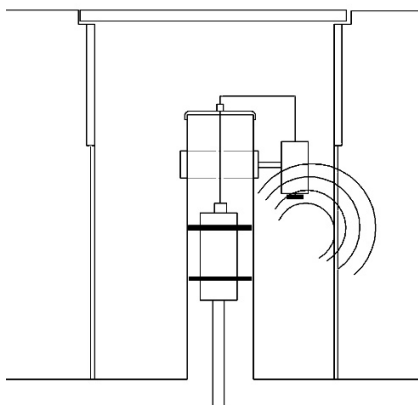
Radio transmission with significant attenuation

Figure 8: Walled manhole with metal cover



Strong shielding (Faraday cage):
only a small part of the radio signal can
pass through a slot at the manhole cover.

Figure 9: Welded (metal) manhole with metal cover



Radio transmission with average value attenuation:
Radio signal passes through the plastic pipe under-
neath the metal ring.

Figure 10: Manhole (plastic pipe) with metal cover and metal ring

3.3.2 Installation of the Transmitter in Manholes



Make sure the transmitter is never underwater.



The desiccant (silica gel) must be inside the transmitter housing to prevent corrosion.



The transmitter should be mounted as high as possible in the manhole and with the antenna pointing towards the manhole cover.

- ➔ Mount the transmitter in the manhole. The transmitter can be attached to a pipe using the VISY-RFT installation kit (P/N 910040).
- ➔ Connect the M12 connector of the connection cable to the VISY probe/sensor.

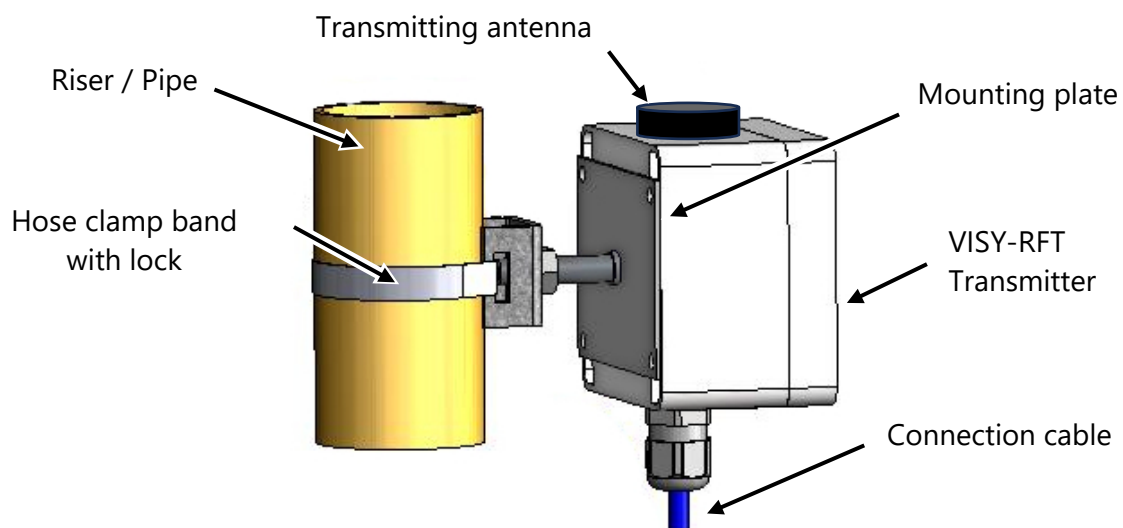


Figure 11: VISY-RFT installation kit

- ➔ For connecting the transmitter to VISY-Stick probes ...
 - ... with screw-in unit, the M12 connector can be directly attached to the probe. Then tighten the M12 connector's union nut by hand and secure it with a spanner by turning it 180°.
 - ... with riser (pipe installation), a cable gland must be present in the pipe cover. The transmitter's connection cable can be removed from the terminal (see Figure 3), inserted through the cable opening in the pipe cover and subsequently reconnected.
- ➔ After assembling all components and setting up the radio transmission, the transmitter can be paired with the receiver, see chapter 3.7.

3.3.3 Installation of the Transmitter outside of Manholes

The same requirements apply to the installation of transmitters both inside and outside of manholes, see chapters 3.1 to 3.3.

Please also note the following information:



Ensure that the transmitters are never underwater and are mounted in a location protected from rain and sun!



When installing externally mounted equipment, the applicable regulations for lightning and surge protection, e.g. according to the EN 62305 series of standards, or the local installation regulations must be observed!

3.4 Installation of the VISY-Command RF... Evaluation Unit

The VISY-Command RF... evaluation unit is designed for installation inside a building.



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



Since the evaluation unit is designed to be supplied from the mains, an over-current 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.

Further details on the installation of the VISY-Command RF evaluation unit can be found in the manual:



Technical documentation VISY-Command Web, P/N 207218

3.5 Installation of the VISY-RFR-S Receivers



Depending on the reception conditions, one or two VISY-RFR-S receivers (Master-Slave connection) can be installed.



The screws mentioned in the chapter "Required Components" are to be used for mounting the VISY-RFR-S receivers.



Only mount the receivers on a flat surface and in a position as high as possible and protected from rain and sun.



When installing externally mounted equipment, the applicable regulations for lightning and surge protection, e.g. according to the EN 62305 series of standards, or the local installation regulations must be observed!

To facilitate commissioning, it is recommended to set the receiver's DIP switches to the desired position before mounting; see chapter 3.7.2, Configuration of the Radio Transmission.



Find a suitable installation location for each of the VISY-RFR-S receivers:

- The receivers should ideally be mounted in positions with a direct line of sight to all transmitter's mounting locations. The radio path between transmitter and receiver should not be interrupted by objects to ensure barrier-free transmission.
- If possible, the VISY-RFR-S receivers should be mounted in wall angles to achieve a parabolic effect with better reception.



Open the housing covers of the VISY-RFR-S receivers.



First, attach the VISY-RFR-S receivers on a temporary basis only.



The final installation of the receivers should only be carried out after determining the best reception of all transmitters, see chapter 3.8.

3.6 Cabling

The VISY-RFR-S receivers are connected to the VISY-Command RF... via a data cable. A network cable is recommended, see chapter 1.3 Required Components.



The data cable is not included in the delivery!

3.6.1 Connection of VISY-RFR-S and VISY-Command RF...

For the connection diagram, see the following Figure 12.

- ➔ Data cable to VISY-Command RF... :
 - Insert the data cable through the cable entry of the VISY-Command RF...
 - The shielding of the data cable is only connected on one side to the "shielding clamp" in the VISY-Command RF... Remove approximately 1 cm of the outer jacket without cutting through the overall shielding and press the data cable with the exposed shielding into the "shielding clamp".
 - Connect the data line to the RS-485 clamps (A and B) and the power supply line to the power supply clamps (PWR + and -) of the RS-485 interface.
- ➔ Data cable to VISY-RFR-S (master):
 - Insert the data cable through the cable gland of the VISY-RFR-S (master) receiver.
 - Connect the data line to the RS-485 clamps (A and B) and the power supply line to the power supply clamps (PWR).
 - Fix the data cable with the cable gland.
- ➔ Data cable to optional VISY-RFR-S (slave):
 - Insert the data cable through the cable glands of both VISY-RFR-S receivers (master and slave).
 - Connect the RS-232 clamps of both receivers via cross connection (Tx -> Rx, Rx -> Tx), as well as Ground (GND) and the power supply clamps (PWR).
 - Fix the data cables with the cable glands.
- ➔ VISY-Command RF... power supply:

The power supply must be installed as a fixed installation. Connect the clamps PE, N and L1 of the supply terminal to the mains.



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

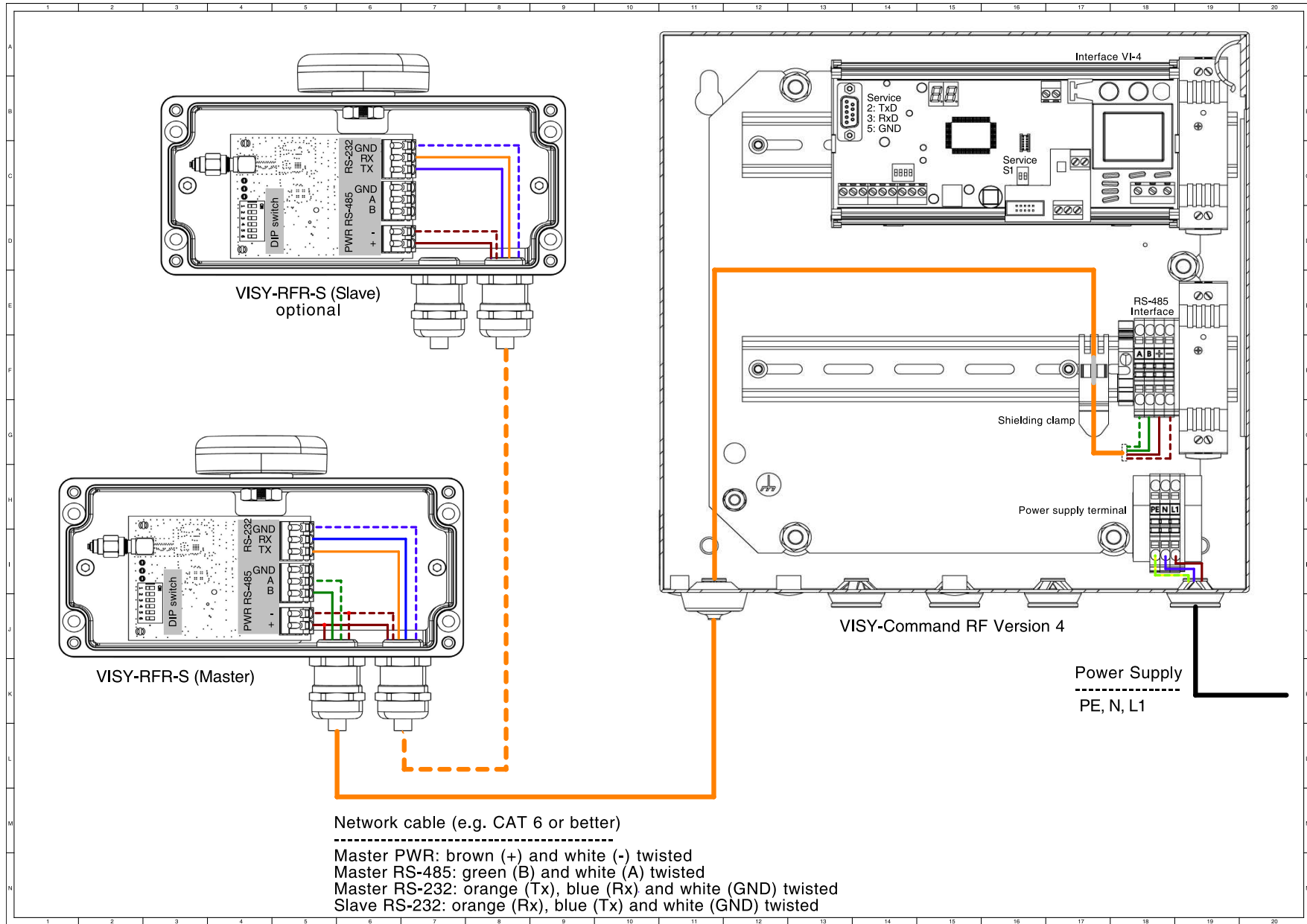


Figure 12: Connection diagram VISY-Command RF with VISY-RFR-S (Master and Slave)

3.7 Configuration

3.7.1 Configuration of the VISY-Command RF...

VISY-Command RF... is configured via an RS-232 serial connection using a Windows PC / Notebook and the software "VISY-Setup", which you can download from the FAFNIR website and install in any directory.



If 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!

- ➔ Disconnect the display's 9-pin D-Sub connector from the VI-4 interface's RS-232 service port and set the DIP switch S1 to the **OFF-OFF** position.
- ➔ Connect the VISY-Command RF... to the PC/notebook via the RS-232 service port and start the software "VISY-Setup".
- ➔ For radio transmission, open menu "Control unit [F2] → Advanced Settings" and select "Multi Probe 1200 bps" as data protocol.
- ➔ In the "Control Unit [F2]" menu, activate the "Wireless Mode activated" function.
- ➔ Reconnect the display's 9-pin D-Sub connector to the RS-232 service port and set the DIP switch S1 to the **OFF-ON** position.



Please note that the evaluation unit performs an internal reset whenever the wireless mode is enabled or disabled and sets all readings to zero (0) until new data are received from the probes.

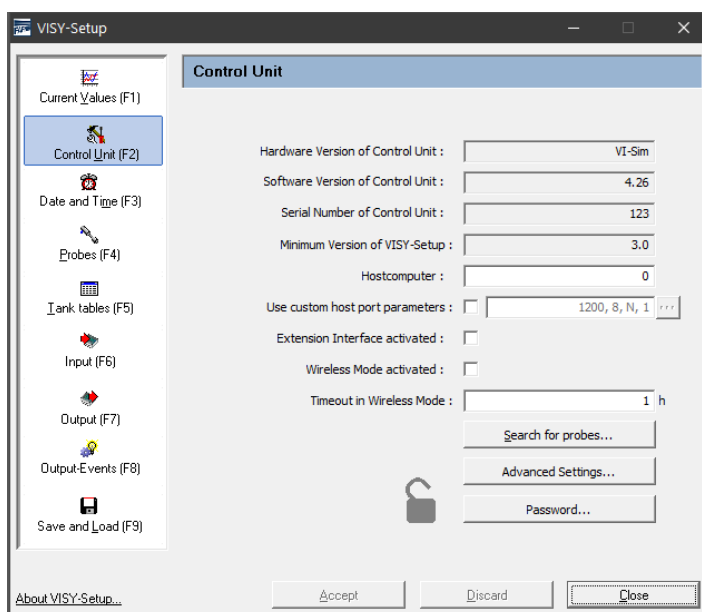
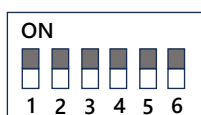


Figure 13: VISY-Setup menu "Control Unit [F2]"

3.7.2 Configuration of the Radio Transmission

Configure the radio transmission using the DIP switches **S1** ... **S4** of each receiver, see Figure 4: VISY-RFR-S receiver, interior view.

- ➔ Open the receiver's housing cover.
- ➔ Use the DIP switches **S1** and **S2** to set the desired radio frequency permitted in your country. The choices are 868 MHz, 915 MHz, 922 MHz.
- ➔ Two transmission intervals (1 min / 5 min) are available for operating the transmitters. Use the DIP switch **S3** to set the desired interval. The interval is applied to all transmitters.



Example DIP switch (white): S1=**OFF**, S2=**OFF**, S3=**OFF**, S4=**OFF**, Function:
Radio frequency 868 MHz, transmission interval 5 min, no new transmitters

S1	S2	S3	S4	S5	S6	Function
OFF	OFF	-	-	-	-	Radio frequency 868 MHz
OFF	ON	-	-	-	-	Radio frequency 915 MHz
ON	OFF	-	-	-	-	Radio frequency 922 MHz
ON	ON	-	-	-	-	Not defined
-	-	ON	-	-	-	Transmission interval 1 min. (shorter battery life)
-	-	OFF	-	-	-	Transmission interval 5 min. (longer battery life)
-	-	-	OFF	-	-	No new senders are accepted by the receiver
-	-	-	ON	-	-	The receiver accepts new transmitters for 5 hours from the time it is switched to the "ON" position. The green LED lights up in pairing mode.

- ➔ By setting the DIP switch **S4** to the "ON" position, you activate the pairing mode for the pairing with the transmitter. The pairing mode is active for 5 hours or can be manually switched off by setting it to the "OFF" position. Furthermore, the pairing mode is active for 5 hours if DIP switch **S4** is set to "ON" and the power supply is switched on.



*The DIP switches **S5** and **S6** are non-functional.*

- ➔ Close the receiver's housing cover.

For transmitter-receiver pairing see the next chapter ...

3.7.3 Transmitter-Receiver Pairing

For wireless data transmission, the VISY-RFT transmitters must be paired with the VISY-RFR-S receivers:

- ➔ Set the DIP switch S4 of the VISY-RFR-S receivers to “ON” position to activate the pairing mode, see previous chapter.
- ➔ Open the housing cover of the VISY-RFT transmitter.
- ➔ Put the silica gel aside for the final assembly.
- ➔ Plug the battery connector into the battery terminal (see the following figure). The connector is reverse polarity protected.
- ➔ To pair the devices, press the button in the VISY-RFT transmitter once.

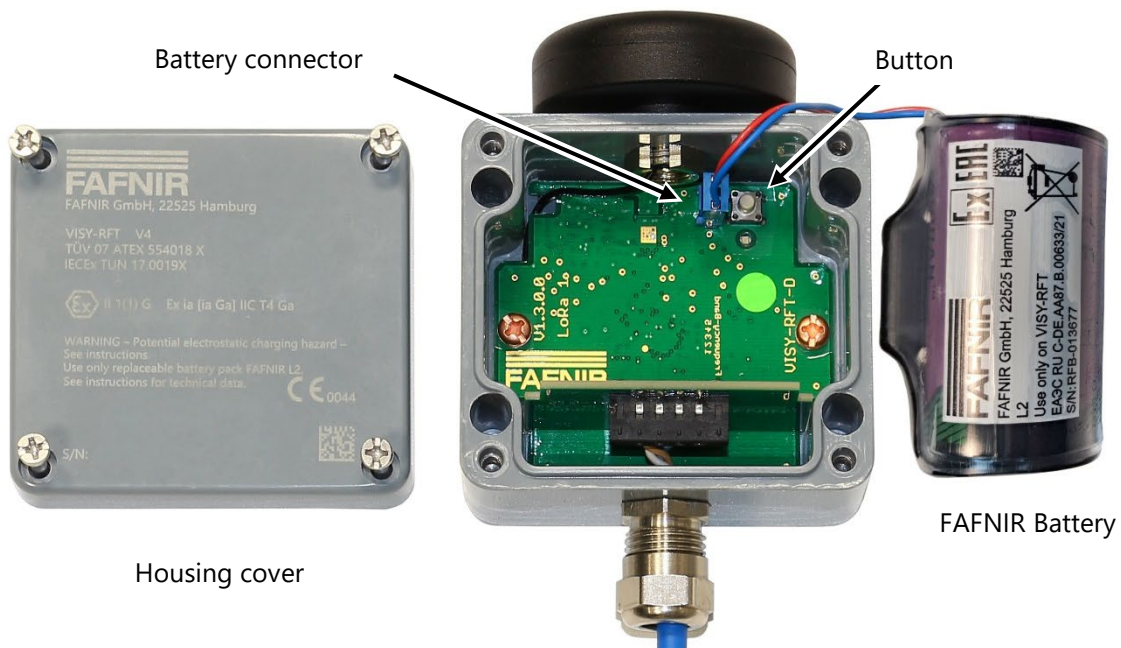


Figure 14: VISY-RFT transmitter; interior view

- ➔ When the receiver has registered the sender, communication is established.
- ➔ Place the silica gel back into the housing of the VISY-RFT transmitter!
- ➔ Close the housing cover.
- ➔ Repeat the pairing process for each transmitter.

3.7.4 Configuration of the Probes/Sensors with VISY-Setup



For technical reasons, the probes/sensors cannot be automatically detected in radio operation and must be manually entered in VISY-Setup.

The configuration of the probes/sensors is described in the following manual:



Technical Documentation VISY-Setup V4, P/N 207158

3.8 Radio Signal Quality

3.8.1 Display of the RF Field Strength with VISY-Setup

To check the RF field strength, the transmission interval should be set to 1 minute using the DIP switch S3 of the VISY-RFR-S receiver, see chapter 3.7.2.

The signal quality is displayed in the "Current Values [F1]" menu under the label "RF Field Strength", see the following figure:

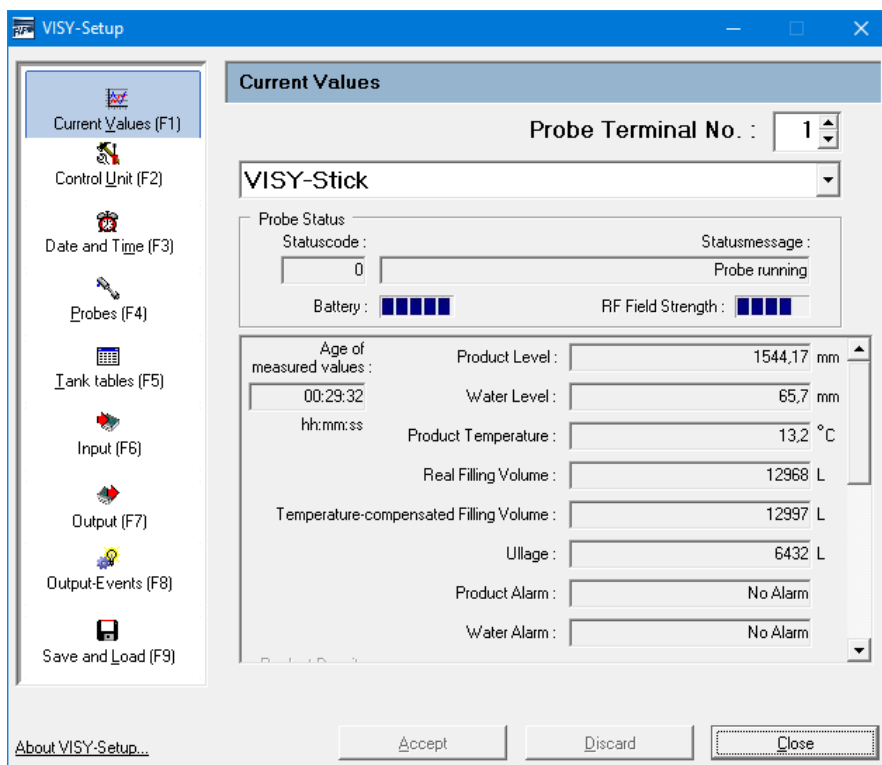


Figure 15: VISY-Setup menu "Current Values [F1]"



If the RF field strength is represented by at least one bar, the system is working properly.

3.8.3 Radio Signal Losses

Radio signals are influenced by objects located in the propagation area. This must be taken into account when choosing mounting points. Whenever a radio signal strikes an object, part of the signal power is absorbed or reflected by the object and the useful signal is weakened. This attenuation can vary with the type of object penetrated by the radio signal. Losses are significantly increased by objects that have a high metal content, for example.



Reception conditions can be significantly reduced if the line of sight between the transmitters and the receivers is blocked (e.g. by vehicles) or if the manholes are covered.

- Price towers, dispensers, and other objects common to filling stations, can lead to losses of 5 – 15 dB, depending on object size and material.
- Walls can cause losses of 10 – 30 dB, depending on construction.
- Bushes, trees or earth can be responsible for losses of 10 – 30 dB.

3.8.4 Line of Sight

The line of sight refers to the clear, unimpeded signal path between transmitter and receiver. For the VISY-RF radio system, it is preferable to place the receiver in a direct line of sight to the mounting location of the transmitter (e.g. in a manhole).

3.8.5 Interference Radiation

Radio interferences distort or completely overlap the received signal with the effect that it becomes impossible to be evaluated. Interferences can be caused by devices nearby, e.g. transmitters on the same frequency.

3.9 Final Assembly

After the radio signal quality of all transmitters has been checked and optimized, the transmitters and receivers can be fixed in their final positions.

3.10 Status Codes and Troubleshooting Tips

The following status codes can be displayed as errors with VISY-Setup; the same status codes are displayed with two 7-segment LEDs in the VISY-Command RF... :

Status Code	"Message" ▷ Description	► Possible cause ☑ Troubleshooting
0	"Probe running"	☑ No measures required.
1	"Probe not running" ▷ The measured values are no longer being recorded and have been set to "0" by the central unit.	► If this status is displayed permanently, it must be assumed that the sensor is defective. ☑ The sensor must be replaced.
10	"Checksum error: Probe – central unit" ▷ The central unit displays an error message when communicating with the RF receiver.	► The cable connection (also connectors and terminals) between RF receiver and VI... interface is loose or damaged or there is severe interference. ☑ Check cables, plugin connections and terminal connections. Replace RF receiver, VI... interface. Check surrounding area for powerful sources of radiation (e.g. three-phase cables, power switches etc.).
11	"No communication with probe" ▷ The central unit is no longer able to establish data communication with the sensor. The measured values are not being captured and have been set to "0" by the central unit.	► Sensor not connected / not available / defective, wiring incorrect, incorrect serial number configured for the sensor, VI... interface defective. ☑ Take the necessary measures as appropriate to the possible causes.
12	"Incompatible data" ▷ There are no transmission errors in the data communication with the sensor, but the central unit cannot interpret the data. The measured values are not being captured and have been set to "0" by the central unit.	► The sensor or the particular version of the sensor is not supported by the central unit. ☑ Ask the manufacturer whether the sensor and the central unit are compatible and whether any updates are available. When doing so, please have the type and version number of the central unit, and the type, serial number and/or version number and possibly the model of the sensor (e.g. number of floats or

Status Code	"Message" ▷ Description	► Possible cause ☑ Troubleshooting
		density measurements installed) to hand.
13	"Waiting for first wireless transmission" ▷ After switching on or resetting, the VISY-Command RF reports that no data have been received from the sensors.	► Data from the sensors is being transmitted only periodically. ☑ Not required because of normal reset/switch-on behaviour. If data are still not being received following expiry of the configurable timeout (1 – 99 hours) in VISY-Command RF, the status automatically changes from 13 to 11.
99	"Probe or tank not configured" ▷ The central unit assumes that the sensor is not connected. No data communication is taking place via the relevant connection point (tank 1 ... 16). All the measured values for this connection have been set to "0".	► When the central unit is delivered, all the connected sensors/tanks show this status initially. In order to set up communication with a sensor via a connection point, the serial number of the sensor and the product quality must be input. If this status is displayed, either one or both of these items of data have not been entered. ☑ The central unit must be configured using the VISY-Setup.
--	"Reset central unit." ▷ The central unit is not working. During a reset, there is no communication with the sensors, host and VISY-Setup. Here, the VISY-Setup is reporting that the central unit is no longer responding.	► The central unit is reset by switching it on or pressing the reset button. If this status continues to be displayed even after you have pressed the reset button, it should be assumed that the central unit (VI... interface) is defective. ☑ Replace the VI... interface.

Table 1: Status Codes

For more information on the status codes, please refer to the following manual:



Technical Documentation VISY-Setup, P/N 207158

3.11 Battery Status

The battery status of the VISY-RFT transmitters can be checked using the "VISY-Setup" software. The status is displayed in the "Current Values [F1]" menu under the label "Battery", see Figure 15.

Five bars indicate a fully charged battery.

Even if only one bar is displayed for the battery, it can still be used for a few more weeks. However, the next battery change should already be planned in order to avoid a failure of the VISY-RFT transmitter.

If no bars are displayed, the battery has completely expired.



Battery performance is temperature-dependent. The battery operates only in the temperature range of -40 to +60 °C.



The battery may be replaced in potentially explosive areas (Zone 1).



To ensure explosion protection, only the intrinsically safe FAFNIR batteries (P/N 900095) may be used!



*Separate collection:
Batteries must be disposed of as hazardous waste.*



4 Technical Data

4.1 General Data

Frequencies	868 MHz 915 MHz 922 MHz
Transmission distance (line of sight)	max. 250 m
Radio power output	< 25 mW

4.2 VISY-RFT Transmitter

Antenna	integrated
Battery pack	Lithium
Battery capacity	19 Ah
Expected battery life at 20 °C ambient temperature and average tank filling time of 30 minutes/day	
	4 years (5 minutes mode)
	2 years (1 minute mode)
Battery article number	900095
Housing	[80 x 82 x 55] mm
Protection class	IP67
Connection cable	blue, 2 m, oil and fuel resistant with M12 connector
Operating temperature range	-20 °C ... +60 °C

4.3 VISY-RFR-S Receiver

Antenna	integrated
Housing	[160 x 75 x 55] mm
Housing incl. antenna and cable glands	[160 x 120 x 55] mm
Protection class	IP 66
Power supply	9 ... 24 V _{DC}
Operating temperature	-30 °C ... +80 °C

5 List of Figures

Figure 1: VISY-RF Radio System.....	1
Figure 2: VISY Probe.....	4
Figure 3: VISY-RFT transmitter with cover removed.....	5
Figure 4: VISY-RFR-S receiver, interior view	6
Figure 5: VISY-Command RF Web, interior view.....	7
Figure 6: VISY-RF radio system with 2 VISY-RFR-S receivers (example)	8
Figure 7: Manhole with plastic cover	9
Figure 8: Walled manhole with metal cover.....	9
Figure 9: Welded (metal) manhole with metal cover	10
Figure 10: Manhole (plastic pipe) with metal cover and metal ring	10
Figure 11: VISY-RFT installation kit.....	11
Figure 12: Connection diagram VISY-Command RF with VISY-RFR-S (Master and Slave)	15
Figure 13: VISY-Setup menu "Control Unit [F2]"	16
Figure 14: VISY-RFT transmitter; interior view	18
Figure 15: VISY-Setup menu "Current Values [F1]"	19
Figure 16: Outdoor installation of the VISY-RFT transmitter.....	20
Figure 17: FAFNIR IP68 cable connector (4 pole)	20

6 Tables

Table 1: Status Codes.....	23
----------------------------	----



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 07 ATEX 554018 X **Issue:** 01

(4) for the product: Radio Transmitter type VISY-RFT

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

(6) Address: Schnackenburgallee 149 c
22525 Hamburg
Germany

Order number: 8003057266

Date of issue: See date of signature

- (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. 23 203346077.

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

EN IEC 60079-0:2018/AC:2020-02

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(1) G Ex ia [ia Ga] IIC T4 Ga

TÜV NORD CERT GmbH, Am TÜV 1, 45307 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

TÜV NORD Digital unterschrieben
von Roder Christian
Datum: 2023.11.16
11:52:19 +01'00'

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

(13) SCHEDULE

(14) EU-Type Examination Certificate TÜV 07 ATEX 554018 X Issue 01

(15) Description of product

The radio transmitter is an intrinsically safe apparatus for transmitting sensor data from potentially explosive atmospheres. The radio transmitter is operated with a replaceable battery pack.

Type code and Marking:

VISY-RFT	Radio Frequency Transmitter	Ex ia [ia Ga] IIC T4 Ga
L2	Replaceable Batterie Pack	Use only on VISY-RFT

Electrical data:

Auxiliary power	Nominal voltage 3.6 V from internal battery pack type L2 from FAFNIR GmbH
-----------------	--

Sensor circuit
(terminals +, A, B, -)

in type of protection intrinsic safety Ex ia IIC/IIB
Maximum values:

$U_o = 7.8 \text{ V}$
 $I_o = 59 \text{ mA}$
 $P_o = 98 \text{ mW}$
 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	
L_o	10 mH	5 mH	50 mH	20 mH
C_o	0.78 μF	1.0 μF	4.6 μF	6.1 μF

The aforementioned maximum values of L_o and C_o consider the coincidental appearance of capacitance and inductance with the intention to allow the use of long connecting cables.

Permissible ambient temperature range:

-40 °C ... +60 °C

(16) Drawings and documents are listed in the ATEX Assessment Report No. 23 203 346077

(17) Specific Conditions for Use

The radio transmitter is built in a plastic enclosure. The risk of ignition by static electricity due to friction on the enclosure is to be avoided. The equipment shall be cleaned only with damp or antistatic cloth.

(18) Essential Health and Safety Requirements

no additional ones

- End of EU-Type Examination Certificate -



Instructions in accordance with directive 2014/34/EU

TÜV 07 ATEX 554018 X

Radio Transmitter type VISY-RFT

Edition: 06.2023

I Range of application

The radio transmitter is an intrinsically safe apparatus for transmitting sensor data from potentially explosive atmospheres. The radio transmitter is operated with a replaceable battery pack.

II Standards

The radio transmitter is designed according to the following European standards

EN IEC 60079-0:2018/AC:2020-02	Equipment – General requirements
EN 60079-11:2012	Equipment protection by intrinsic safety "i"

III Instructions for safe ...

III.a ... use

The radio transmitter in type of protection intrinsic safety is suitable for use in potentially explosive atmospheres (Zone 0). The intrinsically safe sensor circuit may be led into Zone 0 and can be used for all gas groups (IIA, IIB and IIC).

The certificate applies to the device version VISY-RFT with the battery pack "L2".

III.b ... assembling and dismantling

To install or make changes to the radio transmitter, such as changing the battery unit, it is necessary to disassemble the upper enclosure part from the lower enclosure part. To do this, loosen the four screws on the upper enclosure part. After the work, the enclosure must be closed again with the four screws.

III.c ... installation

Special requirements inter alia EN 60079-14 or the local installation regulations must be observed.

The radio transmitter is suitable for wall mounting. To reach the mounting holes, the enclosure has to be dismantled.

At the wiring (preferably blue cable) from the radio transmitter to the sensor, the permissible inductance and capacitance under point V must not be exceeded.

III.d ... adjustment

No Ex-relevant adjustments are necessary for the operation of the radio transmitter.

III.e ... putting into service

Before putting into service, all devices must be checked for correct connection and installation.

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

The radio transmitter is generally maintenance-free. In the event of a defect, this must be returned to FAFNIR or one of its distributors.

Warning: The cleaning of the enclosure may only be carried out with a damp cloth.

There is consistency with the requirements for the dielectric strength between the intrinsic circuit and the chassis of the radio transmitter in accordance with EN 60079-11, section 6.3.13.

When replacing the battery pack, only FAFNIR battery packs (L2) may be used. Replacing the battery pack does not require the exclusion of an explosive atmosphere.



IV Equipment marking

- | | | |
|---|---------------------|--|
| 1 | Manufacturer: | FAFNIR GmbH, 22525 Hamburg |
| 2 | Type designation: | VISY-RFT |
| 3 | Certificate number: | TÜV 07 ATEX 554018 X |
| 4 | Ex marking: | Ⓔ II 1(1) G Ex ia [ia Ga] IIC T4 Ga |
| 5 | Warning marking: | WARNING – Potential electrostatic charging hazard – See instructions |
| 6 | CE marking: | CE 0044 |
| 7 | Use of battery: | Use only replaceable battery pack FAFNIR L2 |
| 8 | Technical data: | See instructions for technical data |

In addition, the battery pack is marked as follows:

- | | | |
|---|-------------------|----------------------------|
| 1 | Manufacturer: | FAFNIR GmbH, 22525 Hamburg |
| 2 | Type designation: | L2 |
| 3 | Use: | Use only on VISY-RFT |

V Technical data

Only FAFNIR battery pack L2 may be used as auxiliary energy for the radio transmitter!

The sensor circuit is designed in the type of protection "intrinsic safety" (ia), with a linear output characteristic. The initial values are:

Output voltage	$U_o \leq 7.8 \text{ V}$
Output current	$I_o \leq 59 \text{ mA}$
Output power	$P_o \leq 98 \text{ mW}$
Inner inductance	L_i negligibly small
Inner capacitance	C_i negligibly small

The permissible external inductance and capacitance are:

	IIB		IIC	
$L_o \leq$	10 mH	5 mH	50 mH	20 mH
$C_o \leq$	780 nF	1 μF	4.6 μF	6.1 μF

The maximum values of the pairs of values may simultaneously be used as concentrated capacity and concentrated inductance.

The permissible external inductance to resistance ratio is:

$$L_o/R_o \leq 309 \mu\text{H}/\Omega$$

The maximum temperature is:

$$T_a = -40^\circ\text{C} \dots +60^\circ\text{C}$$

The radio transmitter achieves a degree of protection provided by enclosure of:

$$\text{Degree of protection} \geq \text{IP66}$$

VI Special conditions of use

The radio transmitter is built in a plastic enclosure. The risk of ignition by static electricity due to friction on the enclosure is to be avoided. The equipment shall be cleaned only with damp or antistatic cloth.

Blank page

Blank page

QR code to the website
Technical Documentation



FAFNIR GmbH
Schnackenburgallee 149 c
22525 Hamburg, Germany
Tel.: +49/40/39 82 07-0
E-mail: info@fafnir.com
Web: www.fafnir.com
