

SePem[®] 300



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Operating Instructions

SePem® 300

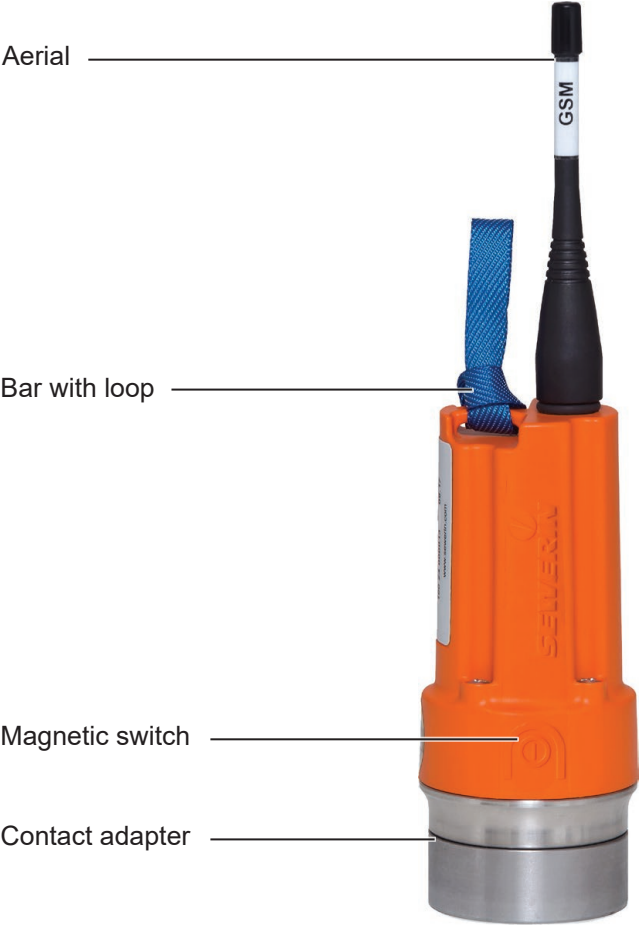


Fig. 1: **SePem 300** with aerial

SePem® 300



Fig. 2: **SePem 300** without aerial

Illustration of warnings in this document



CAUTION!

Risk of personal injury. Could result in injury or health risk.

NOTICE!

Risk of damage to property.

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1 Introduction

1.1 Information about this document

This document is a component part of the product.

- Read the document before putting the product into operation.
- Keep the document within easy reach.
- Pass this document on to any subsequent owners.
- Unless otherwise specified, the information in this document refers to the product as delivered (factory settings) and applies to all product variants.
- Contradictory national legal regulations take precedence over the information in this document.

Translations

Translations are produced to the best of our knowledge. The original German version is authoritative.

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1.2 Purpose

SePem is a measurement data recording and evaluation system. The **SePem 300** Logger is used for the early detection of leaks in water pipe networks. It is designed for stationary operation, i.e. for continuous monitoring at fixed measurement locations over long periods of time (several years). Multiple Loggers are generally used simultaneously to monitor a wide area.

1.3 Intended use

SePem 300 is suitable for the following uses:

- professional
- industrial
- commercial

The product must only be used for the applications specified in section 1.2.

Note:

The appropriate specialist knowledge is required for using this product.

1.4 General safety information

SePem 300 has been manufactured in accordance with all binding legal and safety regulations.

The product is safe to operate when used in accordance with the instructions provided. However, when handling the Logger, there may be risks to persons and property. For this reason, always observe the following safety information.

- Observe all the applicable safety standards and accident prevention regulations.
- Use the product only as intended.
- Do not make any changes or modifications to the product unless these have been expressly approved by Hermann Sewerin GmbH.
- Only use accessories and consumables approved by Hermann Sewerin GmbH.
- Always observe the permitted operating and storage temperatures.
- Never open the housing.
- Handle the product carefully and safely, both during transport and when working.
- Always adequately cordon off the work area.

- Do not use the product if it is damaged or faulty.
- Protect the ports and sockets against dirt, and electrical ports in particular against moisture.
- Keep the contact adapter away from magnetic storage media (e.g. hard drives, credit cards) and medical devices (e.g. pacemakers, insulin pumps).

2 Monitoring water pipe networks with the SePem 300

Note:

SePem is a prelocation system. Indications that a leak is present must, therefore, always be verified using an appropriate method (e.g. correlation).

2.1 Required device features

The following are required for data logging and evaluation:

- **SePem 300** for recording, processing, caching and sending measurement data
- Computer with
 - access to the internet and a POP3 email account
 - **SePem software** from version 4.4.0.6878 for activating and programming the Logger, as well as evaluating the measurement data
- **SePem Interface** for programming the Logger with
 - USB cable
 - communication cable
- Magnet (e.g. contact adapter) for activating the magnetic switch
- Smart phone or tablet with configured **SePem 300 App** for testing the mobile phone connection when installing the Logger

2.2 Monitoring procedure

Any number of Loggers can be operated at the same time. The system works on the following principle:

1. **Activate and program the SePem 300** on the computer using the **SePem Interface** and **SePem software**.
2. **Install the SePem 300** at the measurement location.

The Logger works independently, i.e. measurement data is recorded at specified times.

The measurement data is automatically sent to the computer at specified intervals.

3. Evaluate the measurement data on the computer.

2.3 Data transmission

The **SePem 300** is fitted with a GSM module for data transmission. The GSM module sends the measurement data recorded and cached in the Logger at specified intervals (e.g. once a week).

2.4 Leak detection

Leak detection is based on a mathematical function that compares measurement data at different points in time (identifies variations). The following points must be taken into consideration when evaluating measurement data:

- The water pipe network must be leak-free before starting up the system.
- A leak alert will only be issued after three measurements have been taken since the first occurrence of the leak; this avoids false detection of leaks due to short-term fluctuations.
- It is possible that false leak alerts may be issued (e.g. as a result of prolonged rain).

Note:

Live cables can produce sound interference which occurs in the frequency of the power supply at 50/60 Hz or 100/120 Hz. If this background noise occurs, a leak alert will not be issued.

3 Preparing the SePem 300 for use

3.1 Function and setup of the Logger

SePem 300 is a noise logger, which records and automatically sends measurement data to a receiver. The Global System for Mobile Communications (GSM) is used to transmit the data.

For an overview, including all part names of the **SePem 300**, please see the front cover flap.

The **SePem 300** is powered by integrated lithium metal batteries.



CAUTION! Risk of explosion and intoxication

- Used lithium metal batteries may only be replaced by SEWERIN Service.
-

3.2 Screwing on the aerial

The Logger may only be installed at the measurement location with the aerial screwed on:

When the aerial is screwed on, the Logger's aerial connector is protected against dirt, moisture and damage.

NOTICE! Risk of equipment damage

Screwing the aerial on with too much force can damage the aerial contacts.

- Do not use any tools to screw on the aerial.
 - Tighten the aerial just enough to ensure there is a good contact and that the connection is sealed.
-

1. Before screwing on the aerial, make sure that all the contacts are clean and dry.
2. Screw the aerial onto the **SePem 300** and hand tighten.

3.3 Activating and programming the Logger

Each individual Logger must be activated and programmed before installing at the measurement location for the first time. Data such as measurement time, measurement duration etc. has to be sent to the **SePem 300** from the computer. The available options depend on the respective pricing plan.

The following is required to program the **SePem 300**:

- Computer with
 - access to the internet and a POP3 email account
 - **SePem software** to program the Logger and evaluate the measurement data
- **SePem Interface** for programming the Logger with
 - USB cable
 - communication cable
- Magnet for activating the Logger for testing the mobile phone connection (e. g. contact adapter).

3.3.1 Function of SePem Interface

The **SePem Interface** (**interface** for short) is used to program the **SePem 300**. The **interface** allows data to be exchanged between the computer and Logger.

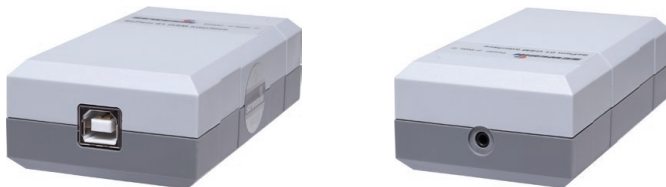


Fig. 3: **SePem Interface**
Image left: USB port
Image right: Port for the communication cable

The **interface** is powered by the computer. As soon as the current starts flowing, the green LED on the **interface** illuminates. The red LED on the **interface** flashes when data is being exchanged.

3.3.2 System setup

The system must be set up as follows to program the Logger (fig. 4):

1. Remove any loop from the bar of the Logger.
2. Connect the **interface** to your computer using the USB cable.
When the **interface** is connected for the first time, the computer will usually recognise the **interface** as new hardware.
3. Connect the Logger to the **interface** using the communication cable.



Fig. 4: System setup for programming the Logger



Fig. 5: Communication cable connection to **SePem 300**

3.3.3 Activating the SePem 300

The Logger must be activated before it is programmed for the first time.

The system must be set up for activation (section 3.3.2).

1. Open the **SePem software** on the computer.
2. Click the **Activate SIM card** button.

The **SePem 300 – Activation** dialog will appear.

3. Click the **Request activation** button.

Activation begins. The activation process can take a few minutes.

4. Click the **Refresh** button.

When the Logger has been activated, **Yes** appears in the **Activated** column.

If the Logger has not been activated, wait for a while and then click **Refresh** again.

3.3.4 Programming the SePem 300

The Logger can be programmed once it has been activated. The Logger can be reprogrammed at any time.

Note:

When programming measurement times, any measurement values in the Logger will be deleted.

- Read out the measurement values if necessary before programming.
-

The system must be set up for programming (section 3.3.2).

1. Open the **SePem software** on the computer.
2. Set the measurement times. To do this, select **Devices > Set measurement times > Simplified** from the menu.

The **Set measurement times** dialog appears.

3. Set the parameters for transmitting the measurement values. To do this, select **Devices > Set GSM parameters** from the menu.

The **Set GSM parameters** dialog appears.

4 Installing the SePem 300 at the measurement location

4.1 Suitable measurement locations

The Logger can be mounted on:

- Pipes
- Fittings (slide gate, underground hydrant)

It is fitted using a contact adapter.

- Please note in the case of plastic pipes:
 - Plastic pipes are not as good at carrying sound as metal pipe systems.
 - The Logger cannot be mounted directly on the pipe, instead it has to be attached to a fitting.

4.2 Distance between two Loggers

The distance between two Loggers – and thus the choice of connector – depends on local conditions (special features of the network, pressure fluctuations etc.).

Water pipe material	Recommended distance between two Loggers [m]
Plastic	50 – 300
Metal	300 – 500

For highly intermeshed water pipe networks, the distance between Loggers may have to be reduced accordingly.

4.3 Installation instructions

Please observe the following installation instructions to ensure optimal sound transmission and the best possible mobile phone connection:

- Use a safety rope if the contact point is so deep down that you cannot position the Logger by hand. The safety rope is attached to the loop. (The safety rope is available to buy as an accessory.)
- Install the Logger so that it is as upright as possible.

- Make sure there is a good connection between the metal parts on the contact point and the contact adapter.

The sound transmission must not be muted by dirt, mud or rust. Clean the contact point if necessary before attaching the contact adapter.

- Prevent the aerial from coming into contact with metal parts at the installation location (does not apply to conformal aerial if it is fed through a hole in the valve box cover).
- Make sure that none of the cables gets jammed.
- Make sure that the aerial remains straight when the valve box cover is closed.

4.3.1 Using an installation adapter

At some installation locations it can be very difficult or even impossible to fit the Logger upright using the contact adapter. If this is the case, an installation adapter can help. The installation adapter is ideal for installing the Logger horizontally. The installation adapter is available to buy as an accessory.



Fig. 6: **SePem 300** on installation adapter

The installation adapter consists of a tilted stainless steel sheet with slot and a contact adapter. The contact adapter can be moved in the slot until the optimal position has been found for the installation location. The contact adapter is then secured with a nut. The Logger is attached to the short part of the sheet.

4.3.2 Using the conformal aerial

A conformal aerial can considerably improve the reception quality of radio signals of a Logger.

When using a conformal aerial, a hole of the following dimensions must be drilled into the valve box cover:

- Diameter: 15 mm
- Drill depth: approx. 160 mm

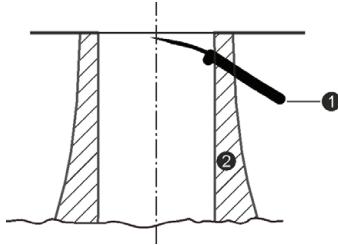


Fig. 7: Conformal aerial in valve box cover (simplified diagram)
1 Conformal aerial 2 Valve box cover

4.4 Installing the SePem 300 and checking availability

The Logger is secured at the measurement location using the contact adapter. Great care must be taken during installation, especially when positioning the aerial. Following installation, the availability must be tested, i.e. whether the Logger can establish a connection with the mobile phone network.

The following is required to test the availability:

- Smart phone or tablet with configured **SePem 300 app**
- Magnet (e.g. contact adapter) for activating the magnetic switch

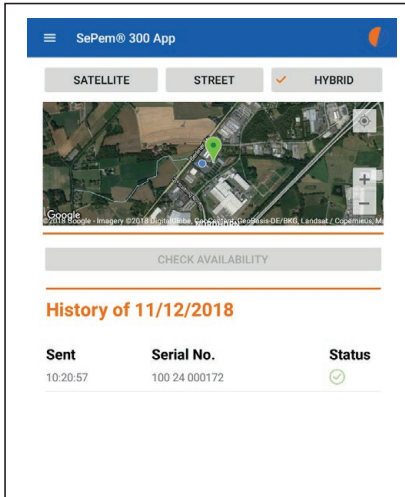


Fig. 8: **SePem 300 App**: Availability tested

Once all the preparatory work has been completed, installation of the Logger can begin.

Note:

The contact adapter comes protected with a short-circuit disk.

- Before installing the Logger, remove the short-circuit disk from the contact adapter.
-

1. Install the Logger at the measurement location to test it. Follow the installation instructions in section 4.3.
2. Remove the Logger again.
3. Open the **SePem 300 App** and select **SCAN**.
4. Scan the code on the identification plate of the Logger.





When the identification plate has been successfully scanned, the following will appear in the app:

- Position of Logger on map
- Serial no. of Logger

You have 60 seconds to complete steps 5–7 below.

5. Check the availability of the Logger.
 - a) Select the **CHECK AVAILABILITY** button in the **SePem 300 App**.
 - b) Move a magnet over the magnetic switch of the Logger.
An LED will start flashing at a frequency of one pulse per second in the Logger housing.
6. Reinstall the Logger at the measurement location.
7. Close the valve box cover.
8. Wait until the **SePem 300 App** displays the result of the test.
The test can take up to 20 minutes.

The **SePem 300 App** displays the result of the test as follows:

	Logger available	Logger not available
Status		
Position marker on the map		

If the Logger was not available during the test:

- a) Change the installation position of the Logger.
- b) Repeat steps 5 to 8.

Installation of the Logger is complete when availability has been confirmed.

5 Troubleshooting

Causes of problems can include:

- Error on **SePem 300**
- Quality of mobile phone connection

The quality of the mobile phone connection can vary considerably. It can depend, for example, on the weather or parked cars. This means that in reality, even a tested mobile phone connection can suddenly drop out.

Tips for certain situations

- When testing availability: the LED in the Logger does not flash after a magnet has been moved over the magnetic switch.
 - Use a stronger magnet.
- The mobile phone connection is intermittent, even though the Logger was available immediately after installation.
 - Change the position of the Logger. Sometimes even changing the alignment slightly can make a difference.

If you are unable to resolve an issue, SEWERIN Service is always happy to help.

6 Appendix

6.1 Technical data

6.1.1 SePem 300

Device data

Dimensions (H x Ø):	126 x 54 mm (without contact adapter and aerial)
Weight:	765 g (without aerial)

Certificates

Certificate	CE, FCC, IC
Marking	contains FCC-ID : QIPBGS2 IC : 7830A BGS2

Device elements

Signal light	1 LED
Memory	128 kB
Processor	Microcontroller 16 bit
Operation	magnetic activation via reed contact

Operating conditions

Operating temperature	-20 °C – +55 °C
Storage temperature	-20 °C – +70 °C
Humidity	100 % r.h.
Atmospheric pressure	900 – 1180 hPa
Protection rating	IP68
Permitted operating environments	outdoors submersible to 1 m
Non-permitted operating environments	in liquids other than water in aggressive media in potentially explosive areas

Power supply

Power supply	1 battery pack [1355-0018] with 2 lithium metal batteries (can only be replaced by manufacturer)
Lithium mass per battery	1.0 g max.
Operating time, typical	5 years (when using default settings)

Data logging

Sampling rate	adjustable 1 s – 1 h
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Data transmission

Transmission frequency	Quad-band GSM 850/900/1800/1900 MHz
Communication	GSM and cable
Power	GSM 850/900: Class 4 GSM 1800/1900: Class 1

Additional data

Attachment option	magnetic at measurement location
Shipping instructions	UN 3091: lithium-metal batteries contained in equipment or lithium metal batteries packed with equipment net weight of battery/batteries: 0.056 kg

6.1.2 SePem Interface

Model:	plastic
Protection rating:	IP20
Power supply:	external via USB, i.e. powered by computer
Weight:	approx. 70 g
Dimensions (W×D×H):	100 × 54 × 30 mm
Operating temperature:	0°C – +50°C
Storage temperature:	-20 °C – +70 °C
Communication:	USB
Permitted operating environments:	indoors in vehicles
Non-permitted operating environments:	outdoors in liquids in aggressive media in potentially explosive areas
Permitted humidity:	80 % r.h.

6.2 Accessories

Part	Order number
Safety rope 1.2 m	SF01-Z0300
Aerial TNC GSM 1.5 m	SF02-Z0900
Installation adapter	SF02-Z2000

Other accessories are available for the product. Please contact our SEWERIN sales department for further information.

6.3 Declaration of conformity

Hermann Sewerin GmbH hereby declares that the **SePem 300** fulfils the requirements of the following guidelines:

- 2011/65/EU
- 2014/53/EU

The complete declaration of conformity can be found online.

6.4 Advice on disposal

The European Waste Catalogue (EWC) governs the disposal of appliances and accessories.

Description of waste	Allocated EWC waste code
Device	16 02 13
Disposable battery	16 06 05

Alternatively, equipment can be returned to Hermann Sewerin GmbH.

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