

## SePem® 351 / 351 HY



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# Operating instructions

# SePem® 351



Fig. 1: SePem 351 logger

# SePem® 351 HY



Fig. 2: **SePem 351 HY** logger

## Illustration of warnings in this document



### **CAUTION!**

Risk of personal injury. Could result in injury or pose a risk to health.

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### **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.

### Right of reproduction

No part of this document may be edited, duplicated or circulated in any form without the express consent of Hermann Sewerin GmbH.

### Translations

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

### Registered trademarks

LoRaWAN® (Long Range Wide Area Network) is a brand used under the LoRa Alliance® licence. SePem® is a registered trademark of Hermann Sewerin GmbH. Registered trademarks are not indicated in this document.

## 1.2 Purpose

**SePem** is a system for recording and evaluating measurements. The system's loggers are used for the early detection of leaks in water distribution networks. They are designed for stationary use, i.e. for ongoing monitoring at fixed measurement locations over long periods (several years). Many loggers are usually deployed at the same time in order to be able to monitor a large area.

SEWERIN recommends: The water distribution network should be free from leaks before commissioning the system.

### 1.3 Intended use

The product is suitable for the following uses:

- Professional
- Industrial
- Commercial

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

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#### **Note:**

The appropriate specialist knowledge is required for using this product.

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The logger may only be installed in shafts and stop tap boxes.

### 1.4 Safety information

This product was 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 product, there may be risks to persons and property. For this reason, observe the following safety information without fail.

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

- Keep the contact adapter away from magnetic storage media (e.g. hard drives, credit cards) and medical devices (e.g. pacemakers, insulin pumps).

If the lithium metal battery is faulty:

- Observe the applicable regulations on the transport of hazardous goods when transporting the product commercially.



## 2 Product description

### 2.1 Operating principle

**SePem 351** and **SePem 351 HY** are noise loggers for the preliminary detection of leaks in water distribution networks.

The loggers measure the noises in the pipe network at set times. The measurement data is then prepared for transfer to a receiver (e.g. water utility).

The measurement data receiver can display and evaluate the measurement data in its network information system.

### 2.2 Product variants

#### **SePem 351**

- for distribution networks
- records noises across the pipeline/fitting by microphone
- attaches to pipes or fittings

#### **SePem 351 HY**

- for trunk mains
- records noises directly from the water by hydrophone
- attaches to fittings with direct access to the water column

### 2.3 Setup and features

You will find overviews with the names of the parts of the loggers inside the front cover (fig. 1 and fig. 2).

Loggers with a built-in aerial can be used as an alternative to the aerial shown in fig. 1 / fig. 2.

The loggers are fitted with a radio module (LoRaWAN) for data transmission. The radio module sends the measurement data recorded and buffered by the logger at set time intervals.

## 2.4 LoRaWAN

LoRaWAN is a radio standard based on a special network protocol. Each logger must be registered with the provider to use LoRaWAN.

## **3 Preparing the logger**

### **3.1 Commissioning (overview)**

Commissioning a logger involves the following steps:

1. Screwing the aerial onto the logger (section 3.3)
2. Registering the loggers with the LoRaWAN provider (section 3.2.1)
3. Installing the loggers at the measurement location (section 3.2.2 and section 4)

### **3.2 Other requirements**

#### **3.2.1 Registering the loggers with the LoRaWAN provider**

Each logger must be registered with the LoRaWAN provider before commissioning. Registration cannot be done by the user.

- Contact the service provider who will register the loggers for you.

Suitable service providers might be external companies or your company's own qualified staff for example.

#### **3.2.2 Availability check**

The installation of each logger must finish with an availability check. This makes sure that the logger can connect to the radio network.

How availability is checked depends on the specifications of the radio network.

- Contact the service provider who will explain how availability is checked.

Suitable service providers might be external companies or your company's own qualified staff for example.

#### **3.2.3 Network information system for evaluating measurement data**

Measurement data can only be evaluated if a network information system is installed.

The network information system must be adapted once before commissioning of the loggers so that the measurement data can be evaluated.

- Contact the service provider who will adapt the network information system for you.

Suitable service providers might be external companies or your company's own qualified staff for example.

### 3.3 **Screwing on the aerial**

The aerial must be screwed on with great care.

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#### **NOTICE! Risk of damage to device**

Aerial contacts can get damaged if too much force is used when screwing on the aerial.

- Always screw on the aerial by hand, i.e. do not use any tools.
  - Tighten the aerial just enough to ensure that there is a good contact and seal in the joint.
- 

1. If necessary:

- Clean and dry the aerial port of the logger and the thread of the aerial.

2. Screw the aerial onto the logger so that it is hand-tight.

## 4 Installing the loggers at the measurement location

### 4.1 General information on installation

- The logger must only be installed if an aerial is screwed on.
- Installation must be carried out with great care. This applies in particular to positioning of the aerial.
- The aerial must not come into contact with metal parts at the measurement location.

This does not apply to the built-in aerial, as it is fed through a hole in the stop tap box.

- The aerial must stay straight when the stop tap box is closed with the cover.
- Information about the availability check can be found in section 3.2.2.

### 4.2 Installing the SePem 351

The logger can be installed on:

- pipelines
- fittings (slide gates, underground hydrants)

In plastic pipes, the logger cannot be attached to the pipe, but must be mounted on the fittings.

The logger is attached using a contact adapter. The contact adapter comes protected by a short circuit disc.

- Remove the short circuit disc from the contact adapter before installing the logger.

1. Install the logger.

- Install the logger as upright as possible.

Otherwise use an installation adapter (section 4.4).

- Use a safety rope if the contact point is so deep 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.
  - Make sure that there is a good connection between the contact point and the contact adapter.
  - The sound transmission must not be muted by dirt, sludge or rust. Clean the contact point if necessary before attaching the contact adapter.
2. Check that the logger is available.

### 4.3 Installing the SePem 351 HY

The logger is installed in the water column. Any points in the water distribution networks that are already a designated measuring location or where a measuring location can be set up.



#### **CAUTION! Risk of drinking water contamination**

Water in drinking water networks are subject to special quality standards.

- Make sure that no contamination ends up in the pipe network during assembly.
  - Only use disinfectants approved for drinking water to disinfect the logger.
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The hydrophone comes covered by a protective cap.

- Unscrew the protective cap before installing the logger.
1. Rinse the pipe until the water is free from dirt.
  2. Disinfect all parts of the logger that could come into contact with drinking water.
  3. Attach the logger to the measuring location.
    - Carefully seal the connection when screwing in the logger.
  4. Open the fitting fully.

5. Vent the measuring location using the vent valve on the logger.
6. Check that the logger is available.

#### 4.4 Using the installation adapter for SePem 351

At some measurement locations it is difficult or impossible to attach the **SePem 351** logger upright using the contact adapter. An installation adapter can help here. The installation adapter is ideal for installing the logger horizontally.

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**Note:**

The installation adapter cannot be used for **SePem 351 HY**.

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The installation adapter consists of an angled stainless steel sheet with slotted hole and a contact adapter. The contact adapter can be pushed into the slot until the optimal position has been found for the measurement location. The contact adapter is then fastened with a nut. The logger is attached to the short part of the sheet.



Fig. 3: Logger on installation adapter

The installation adapter is available to buy as an accessory.

#### 4.5 Using a built-in aerial

A built-in aerial can considerably improve the reception quality of the radio signals of a logger.

When using a built-in aerial, a hole needs to be drilled into the wall of the stop tap box, through which the aerial can be fed.

## Drill hole requirements

When closing the stop tap box with the cover, the built-in aerial must not be pinched or kinked. This also applies to the flexible part of the aerial (aerial cable).

Minimum dimensions:

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

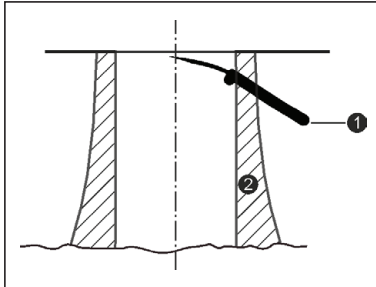


Fig. 4: Built-in aerial in stop tap box (simplified diagram)  
1 Built-in aerial  
2 Wall of stop tap box



## **5 Information for loggers in operation**

### **5.1 Unstable radio connection**

If the radio connection is unstable, the logger may not send any measurement data, even if the availability test has been successful.

- Change the position of the logger at the installation site. Even small adjustments to the alignment can help improve the radio connection.

Then check the availability again.

### **5.2 Erroneously suspected leak**

The loggers save all the noises they can technically record during the measurement. These can include noises caused by unwanted external influences, e. g. from prolonged rain or the proximity of power cables.

- Please allow for this when evaluating and interpreting the measurement data.

### **5.3 Reprogramming loggers**

The loggers come with certain settings for the measuring time, measuring duration, time of data transmission etc.. These settings can be changed.

- Contact your service provider if you want to reprogram the loggers.

Suitable service providers might be external companies or your company's own qualified staff for example.

## 6 Appendix

### 6.1 Technical data

#### 6.1.1 SePem 351

##### Device data

Dimensions (H x Ø)	126 x 54 mm (without aerial)
Weight	approx. 760 g (without aerial)

##### Certificates

Marking	CE
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##### Features

Signal light	1 LED
Memory	128 kB
Processor	microcontroller 16 bit
Ports	<ul style="list-style-type: none"><li>• TNC port</li><li>• 3-pin communication contact</li></ul>
Control	Reed switch for testing the radio connection

##### Operating conditions

Operating temperature	-20 – 55°C
Storage temperature	-20 – 70 °C
Humidity	100% r.h.
Atmospheric pressure	up to 16 bar
Protection rating	IP68
Permitted operating environments	submersible up to 1 m
Non-permitted operating environments	<ul style="list-style-type: none"><li>• in liquids other than water</li><li>• in aggressive media</li><li>• in potentially explosive areas</li></ul>

##### Power supply

Power supply	lithium metal battery [1355-0022]
Lithium mass per cell	2.8 g
Net weight of batteries	61 g
Operating time, typical	9 years when using the default settings

## Measurement data recording

Type	noise sensor
Sampling rate	1 s – 1 h (adjustable)
Measuring range	0 – 3000

## Data transmission

Communication	<ul style="list-style-type: none"><li>• LoRaWAN</li><li>• cable</li></ul>
Frequency bands	LoRaWAN AS923, AU915, EU868, KR920, IN865

## Additional data

Attachment option	magnetically to the measuring location
Shipping instructions	contains: <ul style="list-style-type: none"><li>• 1 lithium metal battery packed with equipment (UN 3091)</li><li>• with 2.8 g lithium</li></ul> transport as per ADR class 9 and VA 970 part I IATA possible

### 6.1.2 SePem 351 HY

## Device data

Dimensions (L × D × H)	55 × 65 × 170 mm (without aerial)
Weight	approx. 820 g (without aerial)

## Certificates

Marking	CE
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## Features

Signal light	1 LED
Memory	128 kB
Processor	microcontroller 16 bit
Ports	<ul style="list-style-type: none"><li>• TNC port</li><li>• 3-pin communication contact</li></ul>
Control	Reed switch for testing the radio connection
Threaded connection	G1 Whitworth pipe thread DIN EN ISO 228-1

## Operating conditions

Operating temperature	0 – 55°C
Storage temperature	-20 – 70 °C
Humidity	100% r.h.
Atmospheric pressure	up to 16 bar
Protection rating	IP68
Permitted operating environments	submersible up to 1 m
Non-permitted operating environments	<ul style="list-style-type: none"><li>• in liquids other than water</li><li>• in aggressive media</li><li>• in potentially explosive areas</li></ul>

## Power supply

Power supply	lithium metal battery [1355-0022]
Lithium mass per cell	2.8 g
Net weight of battery	61 g
Operating time, typical	9 years when using the default settings

## Measurement data recording

Type	hydrophone
Sampling rate	1 s – 1 h (adjustable)
Measuring range	0 – 3000

## Data transmission

Communication	<ul style="list-style-type: none"><li>• LoRaWAN</li><li>• cable</li></ul>
Frequency bands	LoRaWAN AS923, AU915, EU868, KR920, IN865

## Additional data

Attachment option	1" external thread
Shipping instructions	contains: <ul style="list-style-type: none"><li>• 1 lithium metal battery packed with equipment (UN 3091)</li><li>• with 2.8 g lithium</li></ul> transport as per ADR class 9 and VA 970 part I IATA possible

## 6.2 Accessories

Part	Order number
Safety rope 1.2 m	SF01-Z0350
Built-in aerial 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 351** and **SePem 351 HY** loggers fulfil 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.

Alternatively, devices can be returned to Hermann Sewerin GmbH.



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