

## *Operating Instructions*

# ***RM-Fiber 4S***

***Optical Fiber Attenuation Module  
for monitoring optical attenuation  
switches  
for the Rail-Module-Bus***



# Contents

Ordering Data .....	2
Technische Daten .....	3
General Information .....	4
Designated Use .....	4
Safety Instructions .....	5
Installation .....	6
Mounting .....	6
Electrical connection .....	7
Assigning measuring module address .....	8
Function/Commissioning .....	9
Basic functions of the measuring module RM-Fiber 4S .....	10
RM-Fiber 4S measuring module settings .....	11
Signification of the LEDs .....	14
EC Declaration of Conformity .....	16



## Important!

It is imperative to read and observe all safety instructions prior to initial operation!

© 2020 LANCIER Monitoring GmbH.

This operating instruction must not be reproduced or made available, either complete or in extracts, before the specific consent of LANCIER Monitoring GmbH.

## Ordering Data

### Measuring module RM-Fiber 4S

Measuring module for optical attenuation switches with display and keys. Signal output via dry contacts.

**Order no. 074705.09A**

*The value of A is indicated in the connector types table.*

### CoverSensor

Fiber optic sensor for manhole cover monitoring, working without any power supply

**Order no. 075694.000**

### Accessories

#### Basic module RM-Basic

Power supply, communication and display module for the RM-Bus

**Order no. 074001.100**

**19" DIN rail for RM-Series, 3 HU**

**Order no. 075416.000**

## Technical Data

Measurement range line monitoring	-9.9 .. 50 dB
Measurement range switch reading	-9.9 .. 15 dB without attenuation
Resolution	0,1 dB
Supply voltage	12 V / 5 V DC by RM basic module
Operating temperature	-20 °C .. +50 °C
Storing temperature	-40 °C .. +70 °C
Admissible ambient humidity	0 .. 95 % rel. humidity, non-condensing
Display	Monochrome LCD by RM-Basic module
Signal LEDs	
5 x green / red:	Indication Alarm/Acknowledged alarm
1 x blue:	LCD of RM-Basic module is active for this particular sensor
Signal outputs	dry change-over contacts for: 4 x switch alarm 1 x attenuation alarm
Max. switchable voltage	100 V AC
Max. switchable current	0.1 A AC
Dimensions RM-Fiber 4S (W x H x T)	108 x 62.2 x 89.7 mm

### Laserdiode

Light output	-10 dBm, possible aberration $\pm 0.3$ dB
Wavelength	1625 nm single mode
Response time	< 1 sec.

### Photo diode

Receiving range	1,000 - 1,650 nm
-----------------	------------------

### Connector types

ST (Order no. **A**=2)  
SC/PC (Order no. **A**=3)  
DIN/PC (Order no. **A**=4)  
SC/APC (Order no. **A**=5)  
FC/APC (Order no. **A**=6)  
LC (Order no. **A**=7)  
E2000 (Order no. **A**=8)  
FC/PC (Order no. **A**=9)  
Other connectors upon request

## General Information

These operating instructions should make it easier for you to become acquainted with the product. They contain important information to ensure safe, appropriate and cost-effective use of the equipment.

This instruction manual applies to modules supplied individually as well as those pre-installed into fully operational Monitoring systems. In the second scenario, users can disregard the following points

- Installation,
- Electrical connection and
- Set up of the measuring module address.

The operating instructions endorse the directives of national regulations for the prevention of accidents and the protection of the environment.



**These operating instructions shall be read and adopted by anyone assigned to work with/on the equipment, e. g. during operation to include setting-up, maintenance trouble-shooting.**

In addition to the operating instructions and the mandatory regulations for the prevention of accidents, applicable in the operator's country and at the place of use, the recognized technical regulations for safe and professional operation shall also be observed.

## Designated Use

The RM-Fiber 4S measuring module is intended for attenuation measurements on fiber optic communications cables and for the monitoring of up to 4 optical attenuation switches connected in series on the same conductor, e.g. for monitoring manhole cover states (open/closed).

Any other use is considered improper. The manufacturer is not liable for any resulting damage; the user alone bears the risk!

# Safety Instructions

**Important!**

**Read and observe safety instructions prior to initial operation!**

- Keep the operating instructions ready to hand!

**Accident prevention!**

**All circuit lines must be dead before mounting or demounting the system and the opening of its housing!**

- The unit should only be operated in technically-sound condition, for its designated use, with safety and risk awareness in mind, taking into account the operating instructions. In particular, operational faults, which can compromise safety, should be rectified immediately!
- Do not make any modifications to the equipment!

**INVISIBLE LASER RADIATION!**

**Class 1 Laser Product**

**LASER CLASS 1**

DIN EN 60825-1/10.2003

**Laser Class 1** products are safe under reasonable foreseeable conditions of operation, including the use of optical instruments (e.g. eye loupes or magnifiers) to view the beam (DIN EN 60825-1/10.2003).

- Mounting, maintenance and repair work should only be performed by trained personnel!
- Only use original LANCIER Monitoring replacement parts!

**Important!**

**Obey handling instructions. Electrostatic discharge (ESD) damage.**

**WARNING!**

**The place of installation of the device should have a complete lightning protection plan that covers power supply cables as well as data and telecommunications cables.**

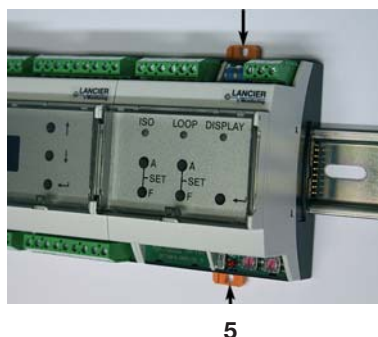
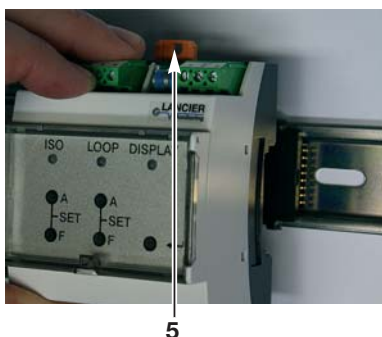
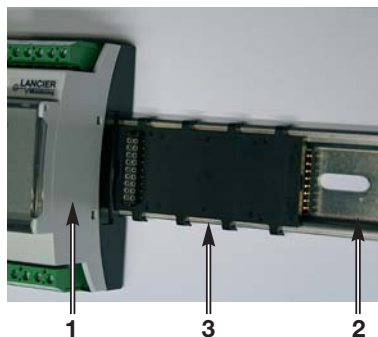
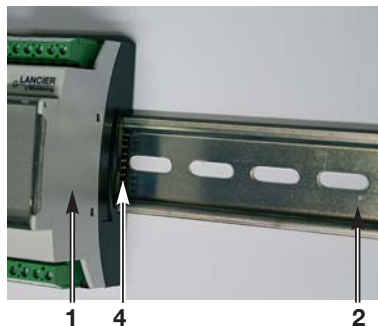
# Installation

## Mounting

The Rail-Module-Bus-System is composed of a basic module and various measuring modules (1), which are clipped on a DIN rail (2). When screwing on the DIN rail (2) make sure that the spacing of the mounting screws matches the spacing of the ports on the back of the connecting plates (3).

Each measuring module (1) has a bus connecting plate (3) that plugs into the interfaces (4) of the existing neighbouring module and subsequently clips into the DIN rail (2).

The measuring module can now be attached to the Bus connecting plate (3) using opened connecting clips (5). The connecting clips (5) must be pushed in until they lock into place to secure them.



## Electrical connection



### Accident prevention!

Before working on the bus system the supply voltage **MUST** be switched off!



### WARNING,

Adhere to EMC directives!

RM-Fiber 4S modules are connected to each other using a bus connecting plate (3). Communication between modules is carried out by a CAN bus.

The fiber optic cable will be connected directly to the measurement module.

## Terminal assignment

### Module RM-Fiber 4S

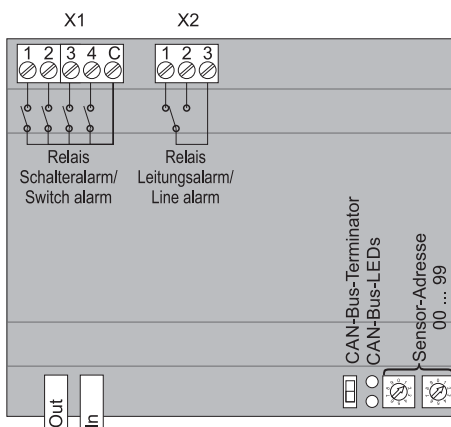
**X1.1 bis 4 Output contacts**  
Switch alarm 1 - 4

**X1C Common**  
Common contact  
for switch alarm  
1 - 4

**X2.1 bis 3 Signal contacts**  
Line alarm

**In Fiber input**  
connector type as  
ordered

**Out Fiber output,**  
connector type as  
ordered



### INVISIBLE LASER RADIATION!

Class 1 Laser Product

## LASER CLASS 1

DIN EN 60825-1/10.2003

(others optionally)

**Laser Class 1** products are safe under reasonable foreseeable conditions of operation, including the use of optical instruments (e.g. eye loupes or magnifiers) to view the beam (DIN EN 60825-1/10.2003).



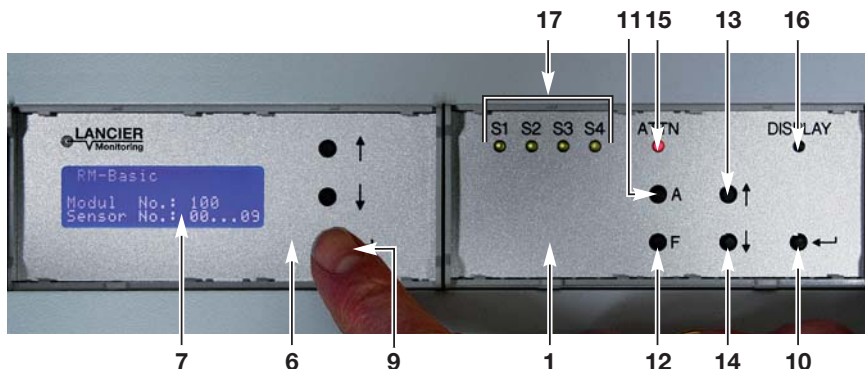
### CAN bus terminator

The last participant on the RM CAN bus (as seen from the basic module) must be equipped with a terminating resistor. Next, flip the "CAN-Bus-Terminator" switch down.

## Assigning measuring module address

Each RM-Basic module (6) can hold a maximum of 10 measuring modules (1). The measuring modules are connected to the basic module (6) on a DIN rail using a bus connecting plate.

To assign unique measurement values, the measuring modules (1) must be addressed.



### 1. Determining the basic module number

Press and hold the “Enter” button (9) on the basic module for 5 s until “Module No.” appears on the display (7).

### 2. Reading the module No.

For the

- basic module No. 100 measuring module addresses 01 to 09 are acceptable,
- basic module No. 101 measuring module addresses 10 to 19 are acceptable, etc., until
- basic module No. 109 measuring module addresses 90 to 99 are acceptable

The basic module automatically returns to the normal display mode after a preset amount of time.

### 3. Entering measuring module addresses

Using a small screwdriver, enter the module number on the address rotary switch (18) (left switch in the 10th position, right switch in the 1st position).

For technical reasons the measuring module address 00 is not allowed.



10th, 1st pos.

Example: Module address 01

**The measuring module address remains identical when connected to another CAN or module bus.**



### IMPORTANT!

After entering the measurement module addresses, the basic module should be reset by switching the power supply off and then on again.



## Function/Commissioning

The RM-Fiber 4S module is a measuring and monitoring device in the LANCIER Monitoring RM bus for attenuation measurements on fiber optic communication cables with a range of -9.9 ... 50 dB.

At the same time it makes it possible to monitor up to four optical attenuation switches connected in series on the same fiber optic cable, e.g. for monitoring manhole cover states (open/closed).

A fiber optic cable running through up to 4 attenuation switches is measured continuously by the RM-Fiber 4S module in a loop. It is also possible to monitor a fiber optic cable between two stations. Here, one RM-Fiber 4S module acts as a transmitter and another as a receiver.

The alarm values for the overall attenuation of the fiber optic cable are freely programmable via a built-in keypad and the display on the basic module. All settings are stored securely in an internal EEPROM memory.

For remote alarms the RM-Fiber 4S module has 5 potential-free output contacts, i.e. 1 switch alarm per switch and one line alarm.

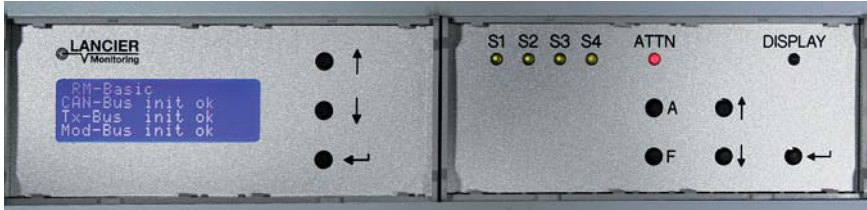
In the LANCIER Monitoring RM bus a number of different measuring modules are mounted on a top-hat rail and interlinked directly via integrated plug-in connectors. The power supply, measurement evaluation and display as well as data transmission to remote control rooms are managed via the RM-Basic basic module. Communication between the modules takes place via a CAN bus.

---

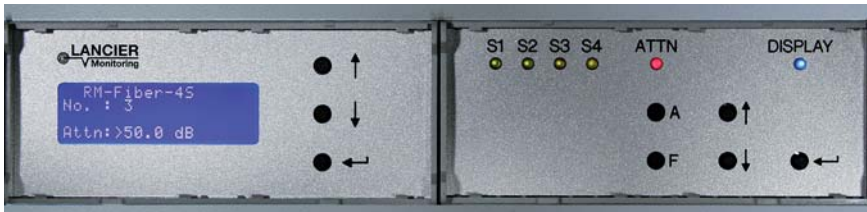
## Basic functions of the measuring module RM-Fiber 4S

### 1. System start/Self test

- When the power supply is switched on, the system carries out a self test, which is indicated by the display (7) on the basic module (6).

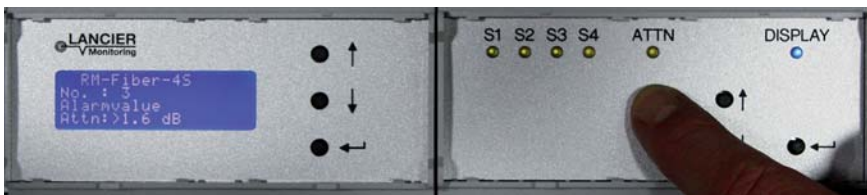


### 2. Measured value display



- When the "Enter" key (10) is pressed on the measuring module (1), the attenuation values are shown on the display (7)
- The **blue** "Display" LED (16) on the active measuring module will light up.

### 3. To set alarm value



- When the "A" key (11) on the measuring module (1) is pressed, the programmed attenuation alarm value will appear on the display (7) of the basic module (6).

#### To change the alarm value

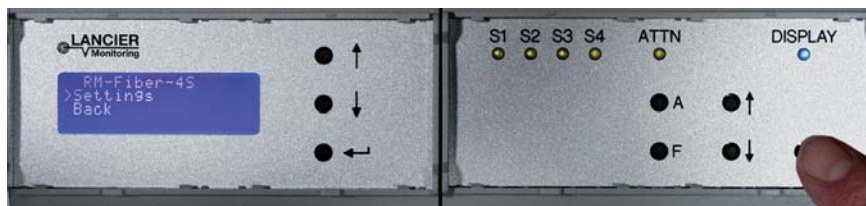
- Keep the „A" key (11) of the measuring module (1) pressed and also press the „↑" key (13) of the measuring module (1) to increase the value press the „↓" key (14) of the measuring module (1) to decrease the value, until the desired value (-9.9 bis +50 dB) has been reached.

The longer the „↑" key (13) or „↓" key (14) s pressed, the faster the alarm value will change.

**The new, reset value is saved automatically.**

## RM-Fiber 4S measuring module settings

### 1. How to enter the service mode



- Press the "Enter" key (10) on the measuring module (1) for 5 seconds to call up the service mode on the display (7) of the basic module (6).
- Every time the "Enter" key (10) on the measuring module (1) is pressed again quickly, the cursor will alter between the menu items „Settings" and „Back".
- The **blue** "Display" LED on the active measuring module will light up.

### 2. Displaying and changing the settings of the measuring module

- The cursor must be in front of the "Settings" menu item.
- Press and hold the "Enter" button (10) on the measuring module (1) for 2 s to call up the settings display on the display (7) of the basic module (6).  
*The "No." item always shows the number of the active measuring module.*
- Every short press of the "Enter" button (10) on the measuring module (1) calls up the following settings in succession:

#### 1. „Average Factor"

Strongly fluctuating measurement values, which occur on the line due to interferences, can be steadied by forming an average of 1 to 16 measurements for display.

The screenshot shows a blue background with white text. It reads: "Average Factor", "No. : 1", and "Attn: 0".

#### To change the number of measurements for the mean value formation

- Keep the "Iso A" key (11) pressed, while
- Pressing the "↑" (13) or "↓" (14) repeatedly until the desired value (1 to 16) at „Attn:" has been reached.

**The new, reset value is saved automatically.**

## 2. „AlarmType”

0 = measured value > set alarm value,

In the event of an alarm,  
the relay is energised

1 = measured value < set alarm value,

In the event of an alarm,  
the relay is energised

2 = measured value > set alarm value,

In the event of an alarm, the relay is de-energised

3 = measured value < set alarm value,

In the event of an alarm, the relay is de-energised

### To change the Alarm type

- Keep the "A" key (11) pressed, while
- Pressing the „↑” (13) oder „↓” (14) repeatedly until the desired value (0 to 3) at „Attn:” has been reached.

**The new, reset value is saved automatically.**

```
Alarm Type
No. : 1
Attn: 0
```

## 3. „Tx-Address”

Set Tx-bus address of the measuring module.

### To change the Tx-Bus-Address

- Keep the "A" key (11) pressed, while
- Pressing the „↑” (13) or „↓” (14) repeatedly until the desired value (0 to 127) at „Attn:” has been reached.

### Address value „00”:

- Setting the address value „00” deactivates communication by the measuring module through the Tx-bus.

**The new, reset value is saved automatically.**

```
Tx-Address
No. : 1
Attn: 22
```



## IMPORTANT!

**Make sure that the measuring module is coded with a unique address on the assigned Tx-bus to avoid data collision.**

## 4. „Alarm Delay”

Under certain circumstances it may not be desirable to receive alarms for short-term events (fiber has been bent unintentionally). In this case a preset "alarm delay" value can be created.

If the alarm state is shorter than the preset delay period, no alarm will be triggered.

### To change the Alarm Delay

- Keep the "A" key (11) pressed, while
- Pressing the „↑” (13) oder „↓” (14) repeatedly until the desired value (0 to X sec.) at „Attn:” has been reached.

**The new, reset value is saved automatically.**

```
Alarm Delay
No. : 1
Attn: 2 sec.
```

### 5. „Alarm Turn On Time”

At times it may be desirable that alarms are still displayed even if the alarm mode is no longer active, e.g. when a manhole door with an optical switch is briefly opened.

```
Alarm Turn On Time
No. : 1
Attn: 10 sec.
```

For this, an „Alarm Turn On Time”, i.e. an alarm display period can be set.

#### To change the Alarm Turn On Time

- Keep the "A" key (11) pressed, while
- Pressing the „↑” (13) oder „↓” (14) repeatedly until the desired value (0 to X sec.) at „Attn:” has been reached.

**The new, reset value is saved automatically.**

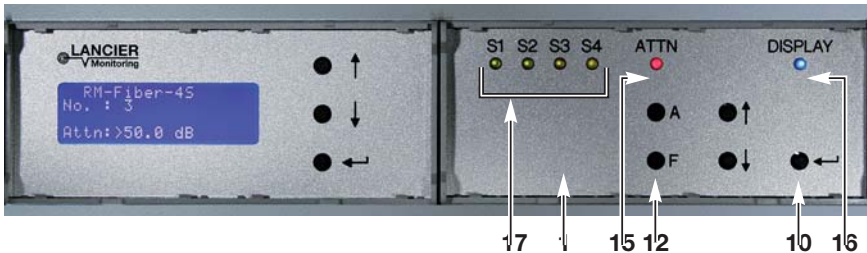
### 6. „Software”

Information about the version and build date of the internal software (firmware) will be displayed.

```
Fiber-Module
Software: V1.01
Build: Apr. 15 2016
```

**These values cannot be changed.**

## Signification of the LEDs



### 15 LED „ATTN“

- glows **green** if the attenuation value is within the rated range.
- glows **red** if the attenuation value is in alarm condition.
- flashes shortly **red** when glowing **green** if the attenuation value is acknowledged by pressing the “F” button (12) but the attenuation value is still in alarm condition.
- Briefly flashes **red** twice when a **green** light is on, if the attenuation value is in the alarm range but the alarm delay period (see “Alarm Delay” on page 12) has not yet elapsed.  
The RM-Fiber 4S is **not in an alarm state**.
- Briefly flashes **green** twice when a **red** light is on, if the attenuation value is no longer in the alarm area but the alarm display period (see “Alarm Turn On Time” on page 13) has not yet elapsed.  
The RM-Fiber 4S is **in an alarm state**.

### 16 LED „Display“

- glows **blue** if the “Enter” button (10) on the measuring module (1) is pressed in order to display the measurement value on the display (7) of the basic module (6).

### 17 LEDs S1“ bis „S4“

- They light up **green** when the associated switch, e.g. a manhole cover, is closed.
- They light up **red** when the associated switch, e.g. a manhole cover, is open.



**LANCIER Monitoring GmbH**

Gustav-Stresemann-Weg 11  
48155 Münster, Germany

Tel. +49 (0) 251 674 999-0  
Fax+49 (0) 251 674 999-99  
mail@lancier-monitoring.de  
www.lancier-monitoring.de



## EC Declaration of Conformity

We declare under our sole responsibility, that the product

**Make:** LANCIER Monitoring  
**Type:** Measuring module RM-Fiber 4S

to which this declaration refers, meets the relevant health and safety requirements of the following EC directives:

**2014/30/EU** Electromagnetic compatibility  
**2011/65/EU** RoHS-II

For proper implementation of the health and safety requirements named in the EC directives the following standard(s) and/or technical specification(s) have been consulted:

**EN 61326-1** Electrical equipment for measurement, control and laboratory use - EMC requirements (class B)  
**EN 60825-1** Laser safety class

Münster, 08.01.2019

  
Research and Development

  
Managing Director