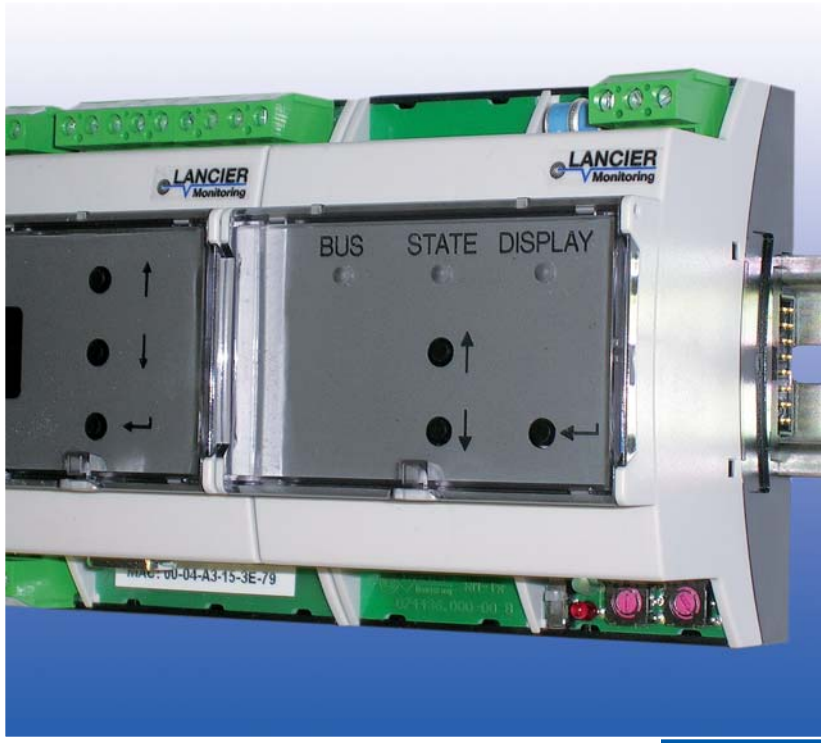
LANCIER Monitoring

Operating Instructions

RM-Tx

Interface Module for addressable Sensors for the Rail-Module-Bus



BA 074478.020/04.12

Contents

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

Technical Data

Number of measuring channels	1 for 127 Tx bus sensors
Bus voltage U_{ATX}	60 V
Current limiting typ.	30 mA
Measurement range	700 .. 2400 Hz
Input sensitivity	≥ 35 dB typ. (600 Ω)
Supply voltage	12 V / 5 V DC by RM-Basic module
Power consumption	max. 4 W
Measurement input Impulse stability 1,2/50 µs	 1000 V
Operating temperature	-20 °C .. +65 °C
Storing temperature	-40 °C .. +70 °C
Admissible ambient humidity	0 .. 95 % rel. humidity, non-condensing
Display	Monochrome LC-Display by RM-Basic module
Signal LEDs per measuring channel BUS green / red: STATE green / red: DISPLAY blue:	 *red*: signal is present *green*: measuring channel *red*: measurement interval *green*: operation active this module's values are displayed at the RM basic module
Dimensions RM-Tx (W x D x H)	72 x 90 x 65 mm

A maximum of only 4 RM-Tx modules may be connected to a single basic module!

Ordering Data

Interface module RM-Tx	**Order-No. 074005.000**
Accessories	
Basic module RM-Basic Power supply and display module for the RM-Bus	**Order-No. 074001.100**
Bus expansion RM-Bus-Extender with connection cable	**Order-No. 074002.000**

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.

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 interface module RM-Tx is designed to integrate Tx-bus sensors into the RM bus system. A maximum of 127 sensors can be connected to each module.

The interface module RM-Tx is destined for the use in residential and small business areas

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 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!
- 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 RM module should have a complete lightning protection plan that covers power supply cables as well as data and telecommunications cables.

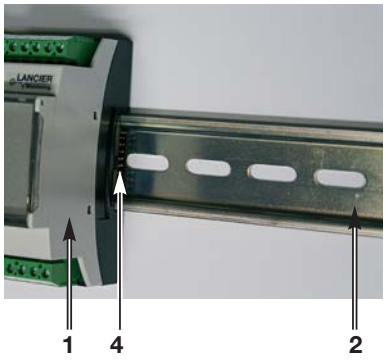
Installation

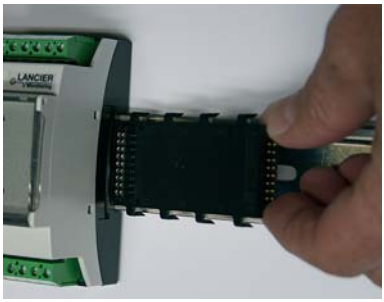
Mounting

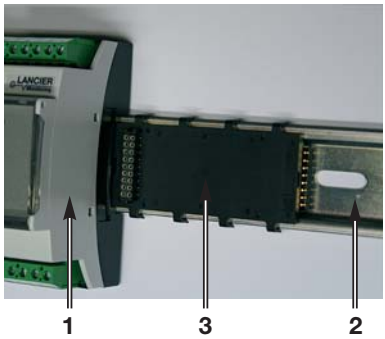
The Rail-Module-Bus-System is composed of a basic module and various interface modules (**1**), which are clipped on a DIN rail (**2**). When mounting the DIN rail (**2**) make sure that the spacing of the mounting screws matches the spacing of the ports on the back of the connecting plates (**3**).

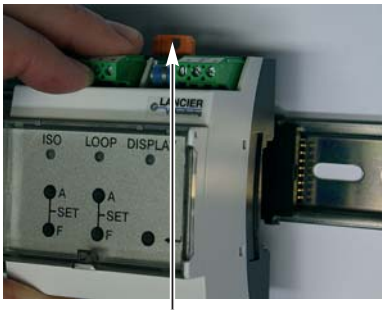
Each interface module (**1**) has a bus connecting plate (**3**) that plugs into the interfaces (**4**) of the existing neighbouring module and subsequently clips into the DIN rail (**2**).

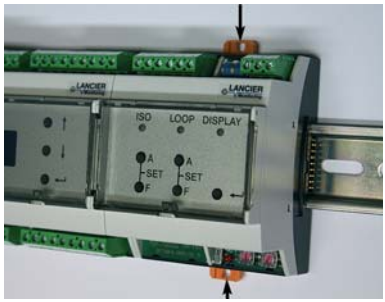
The interface module can now be attached to the Bus connecting plate (**3**) using opened connecting clips (**5**). The connecting clips (**5**) must be pushed in until they lock into place to secure them. **A maximum of only 4 RM-Tx modules may be connected to a single basic module!**











Electrical connection

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

WARNING,
Adhere to EMC directives!

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

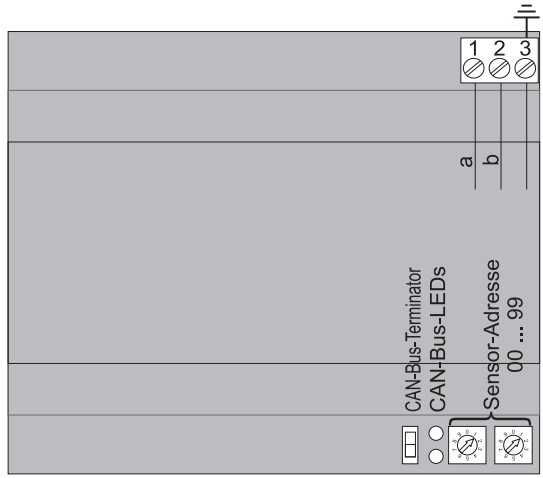
The leads of the measurement pair (sensor Tx-bus) are connected to clamps a and b.

The clamp ‘ground’ has to be connected to protective earth by a low resistive cable as it is used for overload protection.

Terminal assignment

Measuring channel 1

X1.1 and 1.2 Tx sensor bus (measuring pair)
X1.3 Ground for overload protection

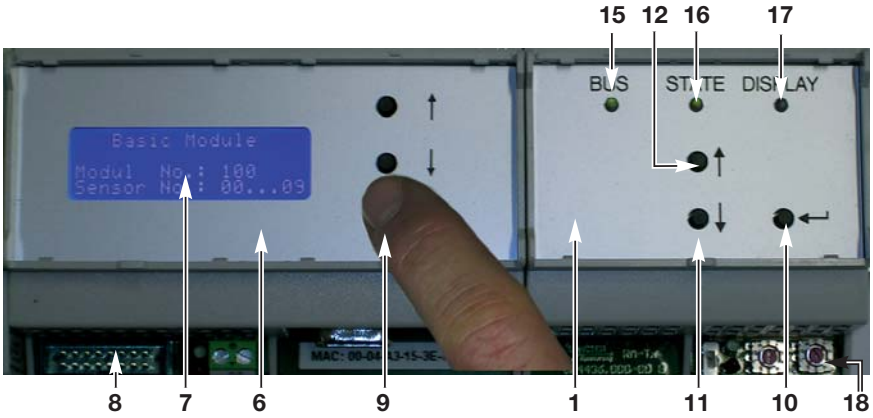


CAN bus terminator
The last participant on the RM CAN bus (as seen from the basic module) must be equipped with a terminating resistor.
Next, flip the “CAN-Bus-Terminator” switch down.

Entering the interface module address

Each RM basic module (**6**) can hold a maximum of 4 interface modules (**1**) plus 6 other measuring modules. The interface modules are connected to the basic module (**6**) on a DIN rail using a bus connecting plate or using an interface cable with the connecting plug (**8**).

To assign unique measurement values, the interface 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 interface module addresses 01 to 09 are acceptable,
   - basic module No. 101 interface module addresses 10 to 19 are acceptable,

   etc., until
   - basic module No. 109 interface 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 interface 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 interface module address 00 is not allowed.

10th, 1st pos.
Example: Module address 01

The interface 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/Start-up

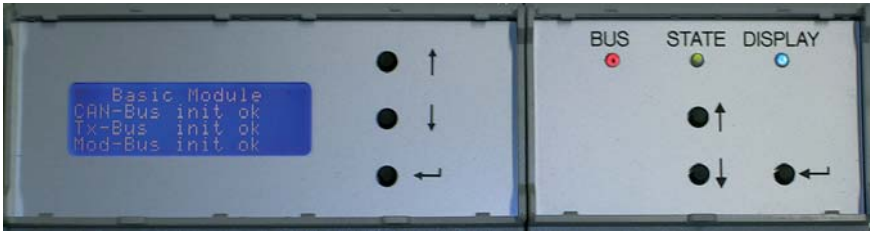
The interface module RM-Tx is a device for the integration of Tx-bus sensors into the RM bus system. It is part of the LANCIER RM bus. Several interface modules are mounted to a DIN rail and, by means of integrated plug-in contacts, are directly connected to one another. The power supply, measurement value reporting and display, as well as their transmission to remote measuring stations, are carried out through the RM basic module.

Threshold settings for each sensor are carried out by means of the connected LANCIER monitoring system.

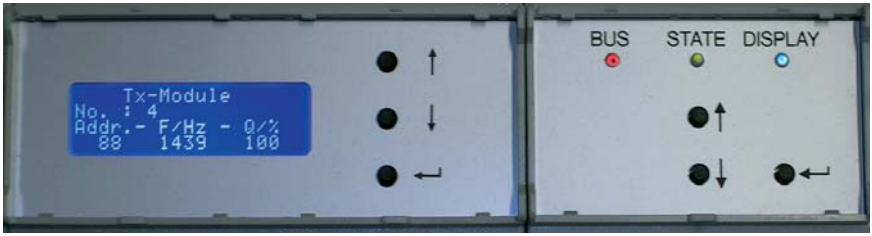
A real time measurement can be activated for fault location.

Basic functions of the interface module RM-Tx

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**).



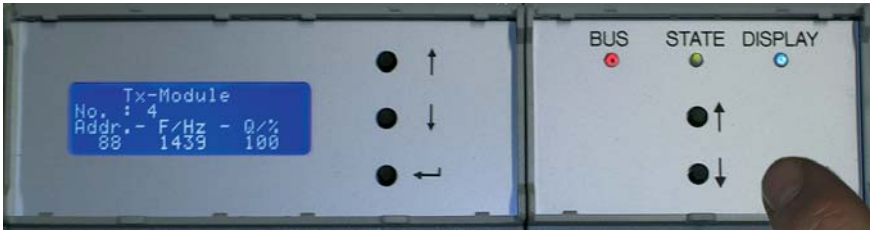
2. **Measured value display**



   - Press the “Enter” button (**10**) on the interface module (**1**) to show the current frequency values of the connected Tx-bus sensors in the display (**7**) on the basic module (**6**).
     The display shows: sensor address, frequency (Hz) and signal quality (%).
   - *The blue “DISPLAY” LED (**17**) glows on the interface module.*

Interface module RM-Tx settings

1. Opening the service menu

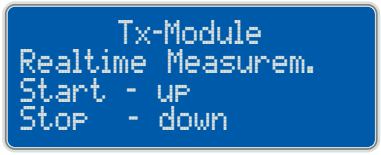


- Press and hold the “Enter” button (**10**) on the interface module (**1**) for 5 s to call up the interface module’s service menu on the display (**7**) of the basic module (**6**).
- Every short press of the ”Enter” button (**10**) on the interface module (**1**) moves the selection cursor down one menu item.
  - **A** Realtime Measurem. (realtime measurement of the connected Tx-bus)
  - **B** Settings Last-Sensor (shows the highest determined sensor address)
  - **C** Waittime (shows the determined measuring break between two complete measuring cycles)
  - **D** Software (shows the implemented firmware version)
- *The blue “DISPLAY” LED glows on the active interface module.*

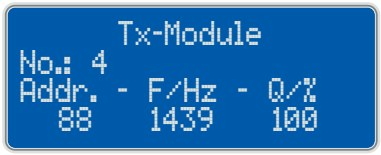
The module automatically returns to normal operation when no button has been pressed for 10 seconds.

A. Realtime measurement

- Menu item „Realtime Measurem.” must be shown on the display.
- Pressing the button „Up” (**12**) of the interface module (**1**) starts the realtime measurement.



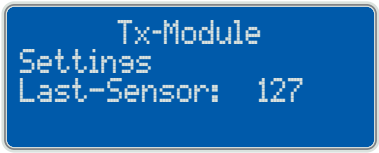
The sensors of the connected Tx-bus are polled in sequence.
*The display (**7**) of the basic module (**6**) shows the module number and consecutively the sensor addresses with their related measured frequencies and the signal quality (frequency = 0: no sensor found at this address).*

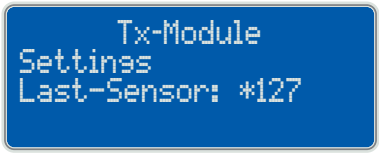


- Pressing the button „Down” (**11**) of the interface module (**1**) stops the realtime measurement.

B. Settings Last-Sensor (register highest sensor address)
It is reasonable to assign all sensor addresses consecutively and to register the highest address in order to optimise the measuring cycles. The polling of the Tx-bus stops at the highest registered sensor address. A possible unnecessary idle running until address 127 is avoided.

- Menu item „Settings Last-Sensor" must be shown on the display. *The currently registered value will be indicated.*
- Pressing the button „Enter" (**10**) of the interface module (**1**) for 5 seconds opens the editing mode. *The editable value is asterisked „*"*
- Pressing the button „Up" (**12**) of the interface module (**1**) rises the value.
- Pressing the button „Down" (**11**) of the interface module (**1**) lowers the value.

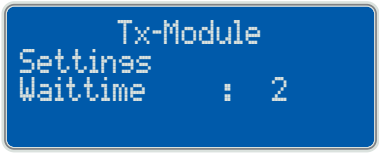


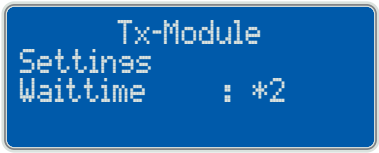


Changes must be acknowledged by pressing the button „Enter" (10) of the interface module (1) in order to store them.
Otherwise the changes are discarded!

C. Waittime (set measuring break between two measuring cycles)
Set the measuring break between two complete measuring cycles.
Factory setting = 2 s

- Menu item „Settings Waittime" must be shown on the display. *The currently registered value will be indicated.*
- Pressing the button „Enter" (**10**) of the interface module (**1**) for 5 seconds opens the editing mode. *The editable value is asterisked „*"*
- Pressing the button „Up" (**12**) of the interface module (**1**) rises the value.
- Pressing the button „Down" (**11**) of the interface module (**1**) lowers the value.

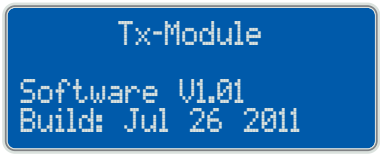




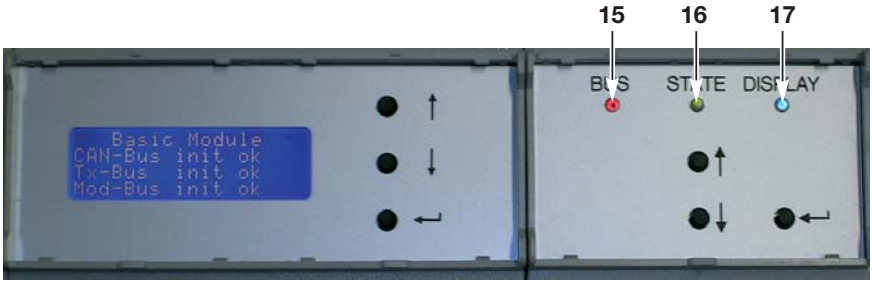
Changes must be acknowledged by pressing the button „Enter" (10) of the interface module (1) in order to store them.
Otherwise the changes are discarded!

D. Software

- Version and production date of the internal software (firmware).
  These values cannot be changed.



Signification of the LEDs



15 LED „BUS“

- glows **green** if a Tx-bus is connected and measuring voltage is pending.
- flashes **red** during the reception of measuring frequencies.

16 LED „STATE“

- glows **green** if a Tx-bus is connected and measuring voltage is pending.
- glows **red** during sensor polling.

17 LED „DISPLAY“

- glows **blue** if the “Enter” button (**10**) on the interface module (**1**) was pressed in order to display the measurement value on the display (**7**) of the basic module (**6**) or while module settings are changed (see pages 10 - 12).

Examples

1. **Measurement break between measurement cycles:**
   Both LEDs „BUS” and „STATE” glow **green.**
2. **Interface module polls measuring bus, sensor address is not allocated:**
   LED „BUS” glows **green,**
   LED „STATE” glows **red**.
3. **Interface module polls measuring bus, sensor address transmits frequency:**
   LED „BUS” flashes **red,**
   LED „STATE” glows **red**.

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CE

EC Declaration of Conformity

We declare under our sole responsibility, that the product

Make:	**LANCIER Monitoring**
Type:	**Interface Module RM-Tx**

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

2004/108/EG	**Electromagnetic compatibility**

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)**

Münster, 11.08.2011

Research and Development

Managing Director