LANCIER Monitoring

Operating Instructions

IsoTxA-Mk2

Addressable Insulation and Loop Resistance Sensor

Contents

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

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Technical Data

Measurement range insulation	0 .. 200 MΩ
Resolution	0.1 MΩ at 0 .. 99.9 MΩ 1.0 MΩ at 100 .. 200 MΩ
Measurement range loop	0 .. 9.99 KΩ
Resolution	10 Ω
Supply voltage	36 .. 72 VDC
Power consumption	50 mA typ.
Operating temperature	0 .. 50 °C
Storing temperature	-10 .. 60 °C
Admissible ambient humidity	0 .. 95 % rel. humidity, non-condensing
Display	3-digit, LCD

Signal LEDs	2 x red, Alarm insulation and loop
	2 x yellow, Acknowledged alarm
	   insulation and loop
	2 x green, Display insulation and
	   loop resistance
	1 x red, Remote operation

Signal outputs	2 dry change-over contacts for: insulation resistance, loop resistance
Max. switchable voltage	100 V DC
Max. switchable current	0.1 A DC
Dimensions IsoTxA-Mk2 (W x H x D)	40.3 x 129.0 x 167.0 mm

Ordering Data

Sensor IsoTxA-Mk2	**Order-No. 071676.000**
Options **LANCIER Tx-Bus Interface**	**Order-No. 071700.000**
CAN-Interface	**Order-No. 072050.000**
Other interfaces (RS232, RS485) upon request	
Accessories **Drawer 19" 1HU** complete	**Order-No. 071863.000**
Power supply unit 115-230 VAC / 48 VDC	**Order-No. 070257.000**
Wall housing with power supply unit 48/60 VDC	**Order-No. 072723.000**
Wall housing with power supply unit 115-230 VAC	**Order-No. 072723.008**
Ethernet/CAN-Interface Type Mk2	**Order-No. 072240.000**

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 insulation and loop resistance sensor IsoTxA-Mk2 is designed to measure the insulation and loop resistance in telecommunications cables.

Any non-compliant use excludes the manufacturer from liability for any damages. The operator carries 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 replacement parts!

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

IMPORTANT!
Observe the EMC directives!
When the sensor is mounted into a drawer:
Ground the drawer with a conductor of 0.75 mm^2 on its backside.

Function

The IsoTxA-Mk2 is a stand-alone measurement and monitoring device for insulation and loop resistance. A dedicated copper pair is used as a measurement loop in the monitored cable. This loop is being measured continuously by the IsoTxA-Mk2. The thresholds for the insulation and loop resistance values are easily programmable with the built-in keys. The integrated display shows the measurement values and settings. All settings are stored in an internal non-volatile EEPROM.
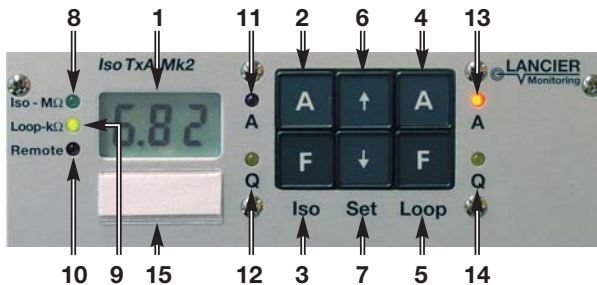
1   Digital LC display, 3 digits
- Shows the actual measured insulation value (green LED „Iso-MΩ" [8] glows) resp. loop resistance value (green LED „Loop-kΩ" [9] glows).
- Shows the stored alarm limit when button **A** (Iso) [2] resp. **A** (Loop) [4] is held.

2   Button A (Iso)
- Pressing shortly displays the insulation resistance value (green LED „Iso-MΩ" [8] glows).
- Holding the button displays the stored **alarm limit** of the insulation resistance (green LED „Iso-MΩ" [8] glows).
- Holding the button and simultaneously pressing the button ↑ [6] raises or button ↓ [7] lowers the stored insulation resistance alarm value gradually (green LED „Iso-MΩ" [8] glows).

3   Button F (Iso)
- Pressing shortly acknowledges the signal contact „Iso" when an alarm is pending (yellow LED „Q" (Iso) [12] glows).

4   Button A (Loop)
- Pressing shortly displays the loop resistance value (green LED „Loop-kΩ" [9] glows).
- Holding the button displays the stored **alarm limit** of the loop resistance (green LED „Loop-kΩ" [9] glows).
- Holding the button and simultaneously pressing the button ↑ [6] raises or button ↓ [7] lowers the stored loop resistance alarm value gradually (green LED „Loop-kΩ" [9] glows).

5 **Button 🇫 (Loop)**
- Pressing shortly acknowledges the signal contact „Loop" when an alarm is pending (yellow LED „Q" (Loop) [14] glows).

6 **Button ⬆**
- Pressing simultaneously with the button 🅰 (Iso [2] or Loop [4]) raises the respective alarm value gradually.

7 **Button ⬇**
- Pressing simultaneously with the button 🅰 (Iso [2] or Loop [4]) lowers the respective alarm value gradually.

8 **Green LED „Iso-MΩ"**
- glows when insulation resistance values are displayed.

9 **Green LED „Loop-kΩ"**
- glows when loop resistance values are displayed.

10 **Red LED „Remote"**
- glows when the sensor is remote read (when equipped with Tx or CAN module only).

11 **Red LED „A" (Iso)**
- glows when insulation resistance **falls below** the alarm limit.

12 **Yellow LED „Q" (Iso)**
- glows when signal contact „Iso" is acknowledged by pressing the button 🇫 (Iso) [3], and the measured value is still in alarm condition.
- goes out when the measured value exceeds alarm limit after signal contact „Iso" was acknowledged.

13 **Red LED „A" (Loop)**
- glows when loop resistance **exceeds** the alarm limit.
  (Factory settings can be inverted by removing jumper [J4] from the printed circuit board. Then LED glows when loop resistance **falls below** the alarm limit.)

14 **Yellow LED „Q" (Loop)**
- glows when signal contact „Loop" is acknowledged by pressing the button 🇫 (Loop) [5], and the measured value is still in alarm condition.
- goes out when the measured value falls below alarm limit after signal contact „Loop" was acknowledged.
  (Factory settings can be inverted by removing jumper [J4] from the printed circuit board. Then LED glows when loop resistance **exceeds** the alarm limit.)

15 **Label**
- Mark name of sensor, cable or other notes for the identification of the measuring point.

The IsoTxA-Mk2 has integrated dry contacts for remote alarming. It can be equipped additionally with interfaces for the LANCIER Tx-Bus or a CAN-Bus (see pages 9 and 10).

Connection

## Electrical connection in a 19" drawer

Accident prevention!
All circuit lines must be dead before opening on the instrument!

IMPORTANT!
Observe the EMC directives! Ground the drawer with a conductor of 0.75 mm² on its backside connector.

IsoTxA-sensors are connected to the bus PCB of the drawer by a 20-pin ribbon cable. A maximum of 3 sensors can be mounted into one drawer.
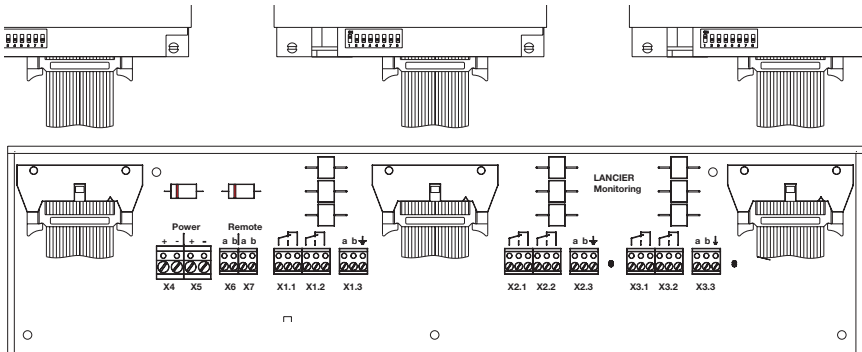
Terminal assignment

of the bus PCB:

Supply voltage
X4   Power supply
X5   Power supply for an additional drawer

Remote reading
X6   Interface for remote reading (for CAN: X6a - CAN_L, X6b - CAN_H)
X7   Interface for remote reading for an additional drawer

Sensor 1
X1.1   Signal contact Iso
X1.2   Signal contact Loop
X1.3   Measuring loop (a,b - pair loop, reference ground)

Sensor 2
X2.1   Signal contact Iso
X2.2   Signal contact Loop
X2.3   Measuring loop (a,b - pair loop, reference ground)

Sensor 3
X3.1   Signal contact Iso
X3.2   Signal contact Loop
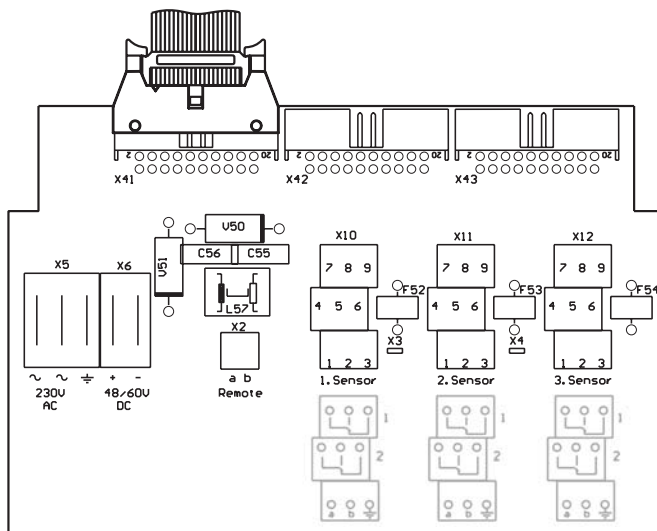**X3.3**   Measuring loop (a,b - pair loop, reference ground)

Electrical connection in a wall housing

Accident prevention!
All circuit lines must be dead before opening on the instrument!

IsoTxA-sensors are connected to the bus PCB of the wall housing by a 20-pin ribbon cable. A maximum of 3 sensors can be mounted into one wall housing.

Terminal assignment
of the bus PCB:

Supply voltage
X5   Power supply 230V AC (wall housing 072723.008 only)
X6   Power supply 48/60V DC

Remote reading
X2   Interface for remote reading (for CAN: X2a - CAN_L, X2b - CAN_H)

Sensor 1
X10.1 Signal contact Iso
X10.2 Signal contact Loop
X10.3 Measuring loop (a,b - pair loop, reference ground)

Sensor 2
X11.1 Signal contact Iso
X11.2 Signal contact Loop
X11.3 Measuring loop (a,b - pair loop, reference ground)

Sensor 3
X12.1 Signal contact Iso
X12.2 Signal contact Loop
X12.3 Measuring loop (a,b - pair loop, reference ground)

Setting up the loop resistance signal

The alarm condition of the loop resistance signal can be inverted by removing the jumper [J4] from the sensor's PCB.

Jumper [J4] is set (factory setting)

Alarm is released when measured value **exceeds** stored alarm limit of loop resistance.

Jumper [J4] is removed

Alarm is released when measured value **falls below** stored alarm limit of loop resistance.

Setting up alarm relays

Jumper [J5] is set (factory setting)

Relay makes contact when alarm is pending.

Jumper [J5] is removed

Relay breaks contact when alarm is pending.

Option with CAN interface

Before starting up

The last participant on the CAN bus must be equipped with a terminating resistor (considered from the RTU)

Last participant

(120 Ω resistor is activated).
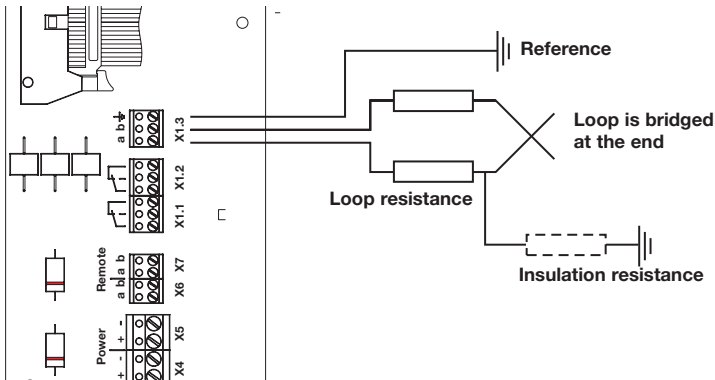The jumper at the sensor's back connects the contacts J1 and J2.

Participant X

(120 Ω resistor is deactivated).
The jumper at the sensor's back connects the contacts J2 and J3.

Connection of the sensing loop

19" drawer

Wall housing
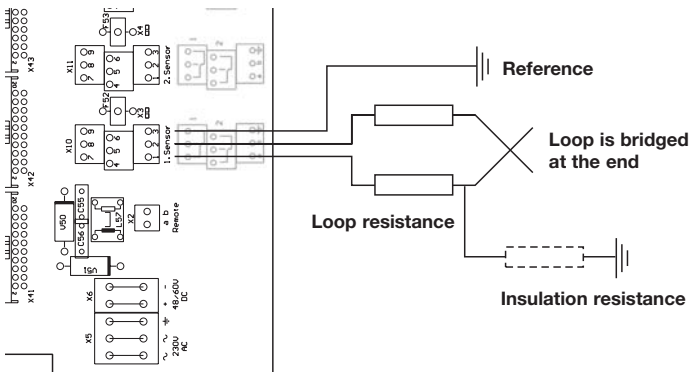
The LANCIER Tx-Bus

A maximum of 127 addressable sensors can be connected to one Tx-bus pair.

Please consider that the IsoTxA-Mk2 monitors two parameters which are read after each other in two time windows, i. e. the IsoTxA-Mk2 counts for two sensors in the LANCIER Tx-bus.

The measured values of all sensors connected to the LANCIER monitoring system are transmitted in time intervals. Therefore all sensors must be coded before installation.

Coding

Accident prevention!
All circuit lines must be dead before opening on the instrument!

- The 8-pin DIP switch [16] is located at the back of the IsoTxA-Mk2 housing.
- Set the sensor's address at the DIP switch [16] by means of a small screw driver according to the coding table.
  Switch at left side = 0 = „off" , switch at right side = 1 = „on"

The switches' values are as follows:

Switch 1:   value 1
Switch 2:   value 2
Switch 3:   value 4
Switch 4:   value 8
Switch 5:   value 16
Switch 6:   value 32
Switch 7:   value 64
Switch 8:   sensitivity switch

DIP switch [16]
set to address „27"
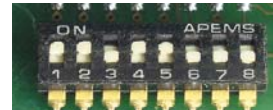
Coding table

Code	64	32	16	8	4	2	1
1							■
2						■	
3						■	■
4					■		
5					■		■
6					■	■	
7					■	■	■
8				■			
9				■			■
10				■		■	
11				■		■	■
12				■	■		
13				■	■		■
14				■	■	■	
15				■	■	■	■
16			■				
17			■				■
18			■			■	
19			■			■	■
20			■		■		
21			■		■		■
22			■		■	■	
23			■		■	■	■
24			■	■			
25			■	■			■
26			■	■		■	
27			■	■		■	■
28			■	■	■		
29			■	■	■		■
30			■	■	■	■	
31			■	■	■	■	■
32		■					
33		■					■
34		■				■	
35		■				■	■
36		■			■		
37		■			■		■
38		■			■	■	
39		■			■	■	■
40		■		■			
41		■		■			■
42		■		■		■	
43		■		■		■	■
44		■		■	■		
45		■		■	■		■
46		■		■	■	■	
47		■		■	■	■	■
48		■	■				
49		■	■				■
50		■	■			■	
51		■	■			■	■
52		■	■		■		
53		■	■		■		■
54		■	■		■	■	
55		■	■		■	■	■
56		■	■	■			
57		■	■	■			■
58		■	■	■		■	
59		■	■	■		■	■
60		■	■	■	■		
61		■	■	■	■		■
62		■	■	■	■	■	
63		■	■	■	■	■	■
64	■						
65	■						■
66	■					■	
67	■					■	■
68	■				■		
69	■				■		■
70	■				■	■	
71	■				■	■	■
72	■			■			
73	■			■			■
74	■			■		■	
75	■			■		■	■
76	■			■	■		
77	■			■	■		■
78	■			■	■	■	
79	■			■	■	■	■
80	■		■				
81	■		■				■
82	■		■			■	
83	■		■			■	■
84	■		■		■		
85	■		■		■		■
86	■		■		■	■	
87	■		■		■	■	■
88	■		■	■			
89	■		■	■			■
90	■		■	■		■	
91	■		■	■		■	■
92	■		■	■	■		
93	■		■	■	■		■
94	■		■	■	■	■	
95	■		■	■	■	■	■
96	■	■					
97	■	■					■
98	■	■				■	
99	■	■				■	■
100	■	■			■		
101	■	■			■		■
102	■	■			■	■	
103	■	■			■	■	■
104	■	■		■			
105	■	■		■			■
106	■	■		■		■	
107	■	■		■		■	■
108	■	■		■	■		
109	■	■		■	■		■
110	■	■		■	■	■	
111	■	■		■	■	■	■
112	■	■	■				
113	■	■	■				■
114	■	■	■			■	
115	■	■	■			■	■
116	■	■	■		■		
117	■	■	■		■		■
118	■	■	■		■	■	
119	■	■	■		■	■	■
120	■	■	■	■			
121	■	■	■	■			■
122	■	■	■	■		■	
123	■	■	■	■		■	■
124	■	■	■	■	■		
125	■	■	■	■	■		■
126	■	■	■	■	■	■	
127	■	■	■	■	■	■	■

■ switch in position „ON"   ☐ switch in position „OFF"

Function Test

Each transducer has to be checked with the Lancier Testbox (Order no. 050833.000) for accurate function and coding. The necessary steps are described in the manual of the Testbox.

> ⚠ **Important!**
> **Check all transducers before use, in order to avoid later malfunction!**

Parameter settings

Averaging of measurements

If the measurements are oscillating because of interference voltages on the line this effect can be attenuated by averaging over up to 16 measured values. Averaging is set separately for insulation and loop resistance measurement .
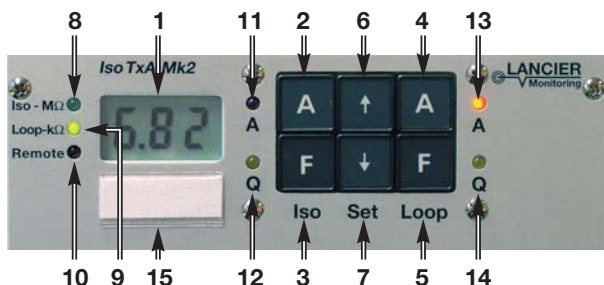

1 Switch-off sensor
 • Cut power supply according to local conditions.

2 Hold button ⬆ and

3 Switch-on sensor
  • Re-establish power supply according to local conditions.
 • Hold button ⬆ until red LED „Remote" [10] flashes.

4 Release button ⬆
  • The value „00" appears on the display [1].
  • If there is no button pressed for 10 seconds, the IsoTxA stores the displayed value and returns to operating mode.

5a Setting averaging for „Insulation resistance"
  • Holding button A [2] shows the number of measurements used for averaging on the display [1] (001 to 016, 001 = no averaging).
  • Holding button A [2] and simultaneously pressing the button ⬆ [6] raises or button ⬇ [7] lowers the numbers of measurements used for averaging gradually.

5b Setting averaging for Loop resistance"
  • Holding button A [4] shows the number of measurements used for averaging on the display [1] (001 to 016, 001 = no averaging).
  • Holding button A [4] and simultaneously pressing the button ⬆ [6] raises or button ⬇ [7] lowers the numbers of measurements used for averaging gradually.

6   Storing the values for averaging

- Wait for 10 seconds.
- If there is no button pressed for 10 seconds, the IsoTxA stores the set value and returns to operating mode.

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LANCIER Monitoring

CE

EC Declaration of Conformity
in accordance with EC directives 98/37/EC

We declare under our sole responsibility that the product

Make:	**LANCIER Monitoring**
Type:	**IsoTxA Mk2**

to which this declaration refers, meets the relevant health and safety requirements of the EC directive 98/37/EC,as well as the requirements of other relevant EC directives.

73/23/EWG	**Low voltage directive**
89/336/EWG	**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:

GSG	**German product safety law**
EN 61000-6-3/4	**Emitted interference**
EN 61000-6-1/2	**Interference resistance (fault-free operation)**

Münster, 28 October 2003

Research and Development   Managing Director

Rev. 00a