

Operating Instructions

PipeAlarm2

PipeAlarm2 short

*two channel measuring device
for district heating routes*



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Important!

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

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Technical Data

	<i>PipeAlarm2 short</i>		<i>PipeAlarm2</i>
Supply voltage	90 .. 250 V AC, 50 .. 60 Hz		
Power consumption	max. 5 W		
Measurement channels	2 (e. g. for flow and return line of a district heat pipe)		
Measurement range insulation	0 .. 5.0 M Ω fault: 3% of measured value \pm 10 k Ω absolute		0 .. 10 M Ω fault: 3% of measured value \pm 10 k Ω absolute
Measurement range loop	0 .. 5.0 k Ω fault: 3% of measured value \pm 0.02 k Ω absolute		0 .. 9.99 k Ω fault: 3% of measured value \pm 0.02 k Ω absolute
Measuring distance	NiCr \leq 750 m, nordic system \leq 3.000 m NiCr \leq 1.500 m, nordic system \leq 3.000 m		
Length calculation	no		yes, for NiCr
Measuring voltage	typ. 24 V DC		
Display	per measurement channel 1 LED bar graph for „Iso measurement” per measurement channel 1 signal LED for „Loop error” and „Iso error” each		
Operation	1 acknowledgement button each for „Iso alarm” and „Loop error” 1 Ethernet interface for device configuration threshold settings and measurement reading		
Signal outputs	1 dry change-over contact per: insulation resistance, loop resistance Max. switchable voltage: / current 250 V AC / 1 A AC		
Interface	Ethernet 10/100 Mbit/s, temporary for configuration purposes		
Operating temperature	-5 °C .. +40 °C		
Admissible humidity	0 .. 50 % at 40 °C, 0 .. 100 % at 25 °C short-time		
Degree of protection by enclosure	IP 54		
Field of application	Indoor and sheltered installation according to DIN VDE 0100 part 737 residential and business area as well as small enterprises		
Dimensions (h x w x d)	238 x 146 x 111 mm		

Ordering Data

two channel measuring device for district heating routes with pipe connection surveillance, indication panel and alarm output by dry contacts

PipeAlarm2 short (maximum length of measured section NiCr 750 m)

Order-no. 074840.100

PipeAlarm2 (maximum length of measured section NiCr 1.500 m)

Order-no. 074840.200

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 PipeAlarm2 district heating monitoring device is intended for the measurement of insulation and loop resistance for the detection of leaks in piping systems.

The device can be connected with a PC (laptop) via the Ethernet interface for the configuration. **The connection to a network is not permissible.**

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.



ATTENTION!

Never apply external voltages to the measurement lines.

Installation

Mounting

The PipeAlarm2 is located in a wall housing and is mounted to the wall with 3 screws. After assembly, the screw heads must be sealed with the enclosed rubber seals.

Detailed assembly and installation information can be found in the separately enclosed installation manual of the housing manufacturer.

Electrical connection



Accident prevention!

All circuit lines must be dead before the opening of its housing!

The PipeAlarm2 is pre-assembled with power cable and Euro plug ready for connection.



ATTENTION!

Both pipe connection terminals X3.3 and X4.3 must be connected to a pipe at two mutually separated points, or a terminal connected to the flow pipe and a terminal connected to the return pipe respectively.

Terminal assignment

X1.1 to X1.3

Signal output Iso

X2.1 to X2.3

Signal output Loop

X3.1 to X3.3

Measurement loop channel 1
(a, b, pipe connection 1)

X4.1 to X4.3

Measurement loop channel 2
(a, b, pipe connection 2)

X5.1

N (neutral wire)

X5.2

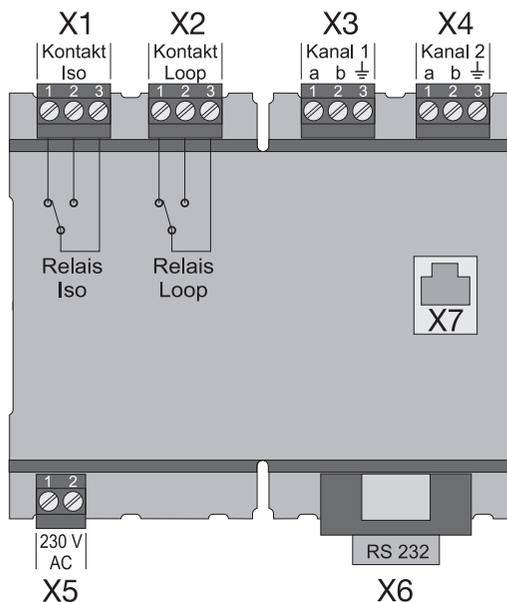
L (phase)

X6

RS232 interface (option)

X7

Ethernet interface



Function/commissioning

The PipeAlarm2 is a measurement and monitoring device for insulation and loop resistance in terms of detecting leaks in piping systems and interruptions of the measurement loop.

Each device can cyclically monitor two measurement loops, e.g. flow and return of a district heating pipe respectively. In case of exceedance or deceedance of the freely adjustable resistance limiting values, the red alarm LEDs will be enabled and the corresponding alarm relay triggered for remote alarming.

The PipeAlarm2 is equipped with a pipe connection monitor to detect an interruption of the pipe connection line (earth).

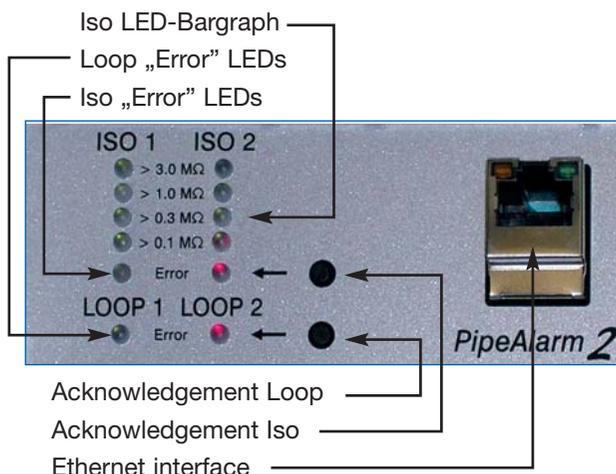
The limiting values for insulation and loop resistance are freely programmable via the Ethernet interface using a laptop or netbook. All settings are stored in an internal EEPROM memory, loss protected.

The PipeAlarm2 can be temporarily disabled on the pipe lines for certain servicing purposes.

Display and operating panel

The following can be done on the display and operating panel of the PipeAlarm2

- the values of both insulation resistance measurement channels can be read off the **Iso LED bar graphs**,
- the alarm conditions of both insulation resistance measurement channels and interruptions of the pipe connection can be read off the **Iso "Error" LEDs**,
- the alarm conditions of both loop resistance measurement channels can be read off the **Loop "Error" LEDs**,
- Alarm messages of the measurement channels can be acknowledged,
- The limiting values can be edited via the **Ethernet interface** by using a laptop or notebook.



Commissioning

After switching on the power supply, the PipeAlarm2 initializes and performs a self-test.

All LEDs light up, subsequently the LEDs of the bar graphs go off, from top to bottom.

The PipeAlarm2 starts automatically with the continuous measurements. The first measurement results are displayed after about 30 seconds.

If the PipeAlarm2 is operable with the default settings, the commissioning is now completed.

PipeAlarm2 default settings

- Insulation resistance limiting values (Iso): alarm signal when falling below 1 M Ω
- Loop resistance limiting values (Loop): alarm signal when exceeding 9 k Ω resp. alarm signal when exceeding 4.5 k Ω (PipeAlarm2 short)
- Measurement value averaging: no
- Alarm relay: close, relay operates in case of alarm
- Alarm relay tripping delay: no

PipeAlarm2 function

The PipeAlarm2 measurement device works independently and must only be operated in case of alarm.

It measures the pipe connection resistance, the insulation, then the loop resistance of measurement channel 1 continuously, one after the other, then the same happens for measurement channel 2. A complete measurement cycle is concluded in less than 1 minute.

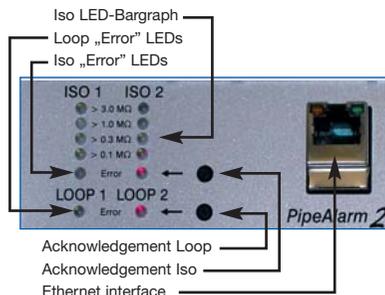
Meaning of the LEDs

1. The **"ISO 1" and "ISO 2"** LEDs indicate the range in which the current measurement values are found:
> 0,1 | > 0,3 | >1 | > 3 M Ω .
2. The **„ISO 1" and „ISO 2" Error LEDs** change from **green** to **red**, if the limiting value has fallen below that defined. They **flash alternately**, if the pipe connection is interrupted.

The **"ISO" alarm relay** changes its switching status to initiate the remote alarm.

3. The **"LOOP 1" and "LOOP 2" Error LEDs** change from **green** to **red**, if the measurement loop was interrupted and as a consequence, the defined limit was exceeded.

The **"LOOP" alarm relay** changes its switching status to initiate the remote alarm.



Alarm acknowledgement

To cancel the remote alarm, although a measurement value still falls into an alarmed status, the alarms can be acknowledged on the device.

For such a purpose, the acknowledgement button, which can be found to the right of the red luminous LED, must be pressed. The alarm relay changes its switching status back into the idle state. The **red Error LED** flashes.

The alarm acknowledgement can again be cancelled by pressing the acknowledgement button once more.

An acknowledgement button is responsible for the 2 measurement channels in each case.

The remote alarm is re-enabled,

- if the measurement value was intermittently in the permissible range and then subsequently outside of the range again,
- if the measurement values of the other measurement channel are outside of the permissible range.

A fault signal of the pipe connection monitor cannot be acknowledged since it is serious enough that it must be resolved immediately.

Disable the measurement for servicing purposes

If the measurements are disabled for servicing purposes, the acknowledgement button must be pressed for a minimum of 5 seconds.

Both **green ISO "Error" LEDs** flash.

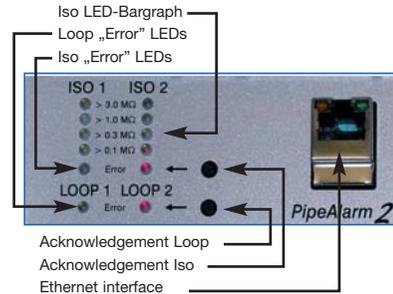
The measurement lines a and b are then internally bridged with 10 Ω. A loop or insulation measurement can be carried out from the end of the line.

A timer starts simultaneously, which automatically enables the module again after the expiration of 12 hours.

By once again pressing the same acknowledgement button for at least 5 seconds, the measurement can be re-enabled.

Note:

The measurement input is bridged with low-resistance in case of a disabled measurement channel, thus, the measurement loop can be manually measured at any point with "normal measurement voltage" (max. 100 V DC / 70 V AC).



Reset to the default settings

Resetting to the default settings is particularly necessary if the network configuration of the PipeAlarm2 has been altered so that access to the configuration via the Ethernet interface (see page 10) is no longer possible.

Simultaneously pressing both acknowledgment buttons for 20 seconds, until all LEDs light briefly (see Commissioning, page 8), implements the reset.



ATTENTION!
This process is irreversible.

PipeAlarm2 configuration

In order to change the default settings or for subsequent adjustment of the parameters, a network-enabled computer (laptop, notebook, netbook) with internet browser must be connected to the PipeAlarm2 via the Ethernet interface.

The connection to a network is not permissible.

The DHCP should be enabled in the network settings of the laptop in use in order to allow for unrestricted access. Otherwise, the IP address of the laptop must begin with 192.168.

Input of the „**192.168.0.2**” URL invoke the PipeAlarm2 home page in the address bar of the browser window.

If this address cannot be invoked, resetting of the PipeAlarm2 may remedy the situation (see page 10).



The '**Overview**' homepage appears.

Menu

The following menu appears in the left menu bar:

- **Overview:** General information about PipeAlarm2.
- **Measurements:** Display of the measurement values for both measurement channels.
Display of the relay status.
Manual measurement value storage.
Circuit diagram for the connection configuration.
- **History:** Table of the daily and manually saved measurement values.
Graphical measurement value trend curve.
- **Settings:** Configuration of the limiting values and relay states.
Deactivation of a measurement channel.
- **Network Configuration:** Configuration of the network settings, the access is password protected.

Overview

Measurements

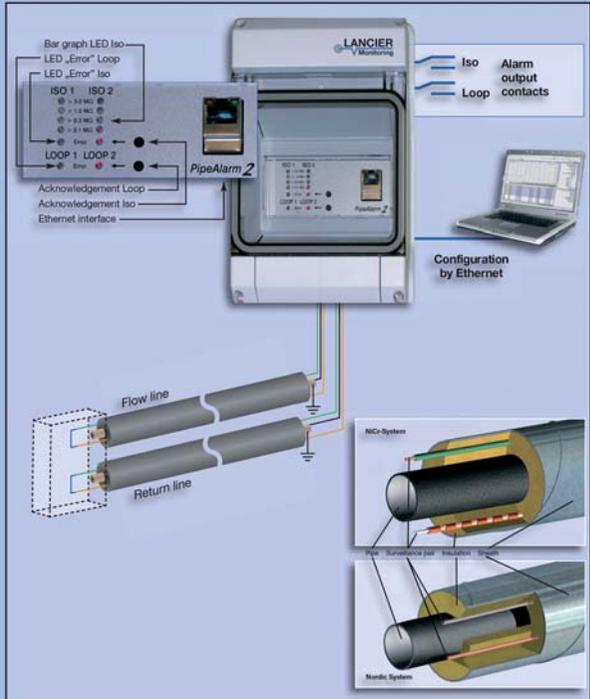
History

Settings

Network Configuration

PipeAlarm

PipeAlarm of LANCIER Monitoring is the compact and cost-effective monitoring device for district heating pipes as well as cooling pipes with surveillance pair inside their insulation layer.



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Measurements menu point

1. Display of the precise **measured values** for the insulation and loop resistance of both measurement channels.
Measurement values within the limiting values have a **green** background.
Measurement values outside the limiting values have a **red** background.
 2. Display of the **switching statuses of the alarm relays**.
Relays not in alarm have a **green** background.
Relays in alarm have a **red** background.
 3. **Length display** of the measurement section in meters
- **only with NiCr-System** and
- only with PipeAlarm2, **not** with PipeAlarm2 **short**
 4. **„Save to history“** button.
By clicking on this button, the momentarily displayed measurement value-data record is added to the "History" table.
Adding this measurement value-data record does NOT interrupt the normal 24-hour measurement rhythm! The measurement value-data record is additionally included to the automatically measured values. It is indicated in the measurement value table ("History" menu point) in the last column "Status" with "Manual".
 5. **Circuit diagram** for the connection configuration.
-

Overview

Measurements

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Network Configuration

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PipeAlarm

Measurement Values

	Channel 1	Channel 2	Alarm Relay
Iso	3.03 MOhm	0.81 MOhm	close
Loop	4.69 kOhm	9.42 kOhm	close
Length NiCr	809 m	>1500 m	

Electrical connection

The last line of the "Length NiCr" measurement value table appears only with the "PipeAlarm2" device.

The length measurement function is not present with "PipeAlarm2 short".

History menu point

The PipeAlarm2 saves the latest measurement values once a day, respectively 24 hours after the last measurement.

The list contains a maximum of 30 entries, with the most recent entry occupying first place. If the number of entries exceeds the maximum amount of the 30, then the oldest entry is overwritten.

Measurement values **shown in red** indicate an alarm status.

The status of the measurement is displayed in the last column of the table:

Clear = No measured value present. The "Clear History" below the table has been clicked.

Reset = This is the first measurement value after a restart, power failure or any other technical fault. The length of a fault is not documented.

Auto = Automatically acquired measurement value in the 24h rhythm.

Manual = This measurement was triggered manually in the "Measurements" menu point. The measurement value is outside the 24h rhythm.

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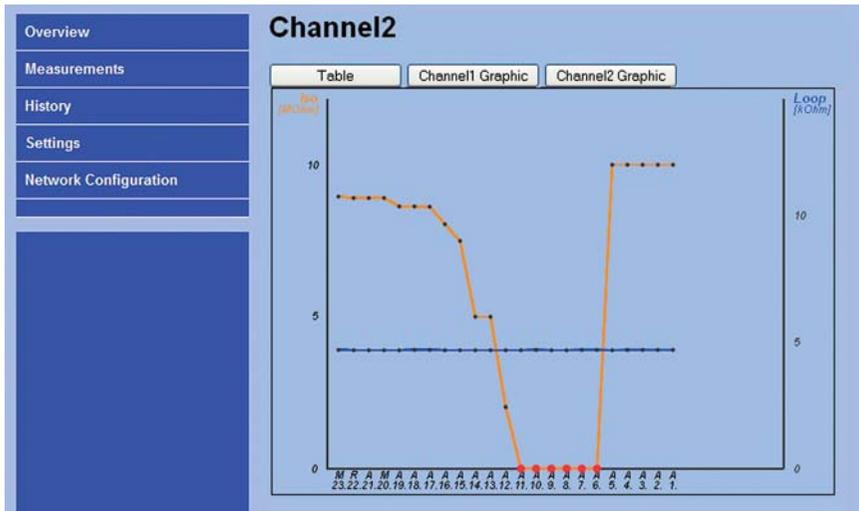
PipeAlarm History

Table
Channel1 Graphic
Channel2 Graphic

	Iso Ch1	Loop Ch1	Iso Ch2	Loop Ch2	Status
1.	10.00 MOhm	0.76 kOhm	10.00 MOhm	4.69 kOhm	Auto
2.	10.00 MOhm	0.82 kOhm	10.00 MOhm	4.69 kOhm	Auto
3.	10.00 MOhm	0.79 kOhm	10.00 MOhm	4.69 kOhm	Auto
4.	10.00 MOhm	0.71 kOhm	10.00 MOhm	4.69 kOhm	Auto
5.	10.00 MOhm	0.71 kOhm	10.00 MOhm	4.68 kOhm	Auto
6.	10.00 MOhm	0.73 kOhm	0.01 MOhm	4.69 kOhm	Auto
7.	10.00 MOhm	0.74 kOhm	0.01 MOhm	4.69 kOhm	Auto
8.	10.00 MOhm	0.69 kOhm	0.01 MOhm	4.68 kOhm	Auto
9.	10.00 MOhm	2.24 kOhm	0.01 MOhm	4.68 kOhm	Auto
10.	10.00 MOhm	0.75 kOhm	0.01 MOhm	4.69 kOhm	Auto
11.	10.00 MOhm	0.77 kOhm	0.01 MOhm	4.68 kOhm	Auto
12.	10.00 MOhm	0.75 kOhm	2.03 MOhm	4.68 kOhm	Auto
13.	10.00 MOhm	0.76 kOhm	5.00 MOhm	4.69 kOhm	Auto
14.	10.00 MOhm	0.72 kOhm	5.00 MOhm	4.68 kOhm	Auto
15.	10.00 MOhm	0.72 kOhm	7.50 MOhm	4.69 kOhm	Auto
16.	10.00 MOhm	0.71 kOhm	8.05 MOhm	4.69 kOhm	Auto
17.	10.00 MOhm	0.72 kOhm	8.6 MOhm	4.68 kOhm	Auto
18.	10.00 MOhm	0.69 kOhm	8.6 MOhm	4.69 kOhm	Auto
19.	10.00 MOhm	0.70 kOhm	8.6 MOhm	4.68 kOhm	Auto
20.	10.00 MOhm	0.73 kOhm	8.9 MOhm	4.68 kOhm	Manual
21.	10.00 MOhm	0.73 kOhm	8.9 MOhm	4.68 kOhm	Auto
22.	10.00 MOhm	0.72 kOhm	8.9 MOhm	4.68 kOhm	Reset
23.	10.00 MOhm	0.76 kOhm	9.0 MOhm	4.69 kOhm	Manual
24.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
25.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
26.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
27.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
28.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
29.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear
30.	-- MOhm	-- kOhm	-- MOhm	-- kOhm	Clear

In addition to the tabular display of the saved measurement values, a graphical display is also possible, separated by measurement channels.

For such a purpose, the corresponding button "Channel 1 Graphic" or "Channel 2 Graphic", above the table, must be clicked. By clicking the "Table" button, the display returns to the tabular depiction.



Orange line = Iso measurement value curve in $M\Omega$

Blue line = Loop measurement value in $k\Omega$

The oldest measurement value is found on the left, the most recent (1.) on the right.

Red measurement value point • is in the alarm status!

Status indicator below the ordinal number of the measurement value:

A = Auto

M = Manual

R = Reset

Cleared entries (clear) are not displayed.

Settings menu point

1. Display of the **software version** with revision status.
2. Determination of the **limiting values** and the **measurement channel activation**.

The permissible values are indicated after the entry fields.

Measurement channel 1 and 2 (Channel 1 / Channel 2) values

- **Disable:** Checkbox to disable a measurement channel.
Empty checkbox = the measurement channel is **enabled**.
If, for example, only 1 measurement section is connected or a measurement section is to be disabled due to maintenance reasons, this can be implemented by placing a tick in the checkbox.
Only 1 measurement channel can be disabled.
- **Alarm Value Iso:** Entry of the insulation resistance limiting value, from below which the alarm is triggered.
(A decimal comma must be entered as a point!
Example: 3.00 MΩ)
- **Filter Value Iso:** Entry of the number of insulation resistance measurements from which an average value is to be formed.
The formation of an average value prevents the alarm being triggered by sporadic erroneous measurements.
Permissible: 1 .. 16
- **Alarm Value Loop:** Entry of the loop resistance limiting value, from above which the alarm is triggered.
(A decimal comma must be entered as a point!
Example: 5.00 kΩ)
- **Filter Value Loop:** Entry of the number of loop resistance measurements, from which an average value is to be formed.
The formation of an average value prevents the alarm being triggered by sporadic erroneous measurements.
Permissible: 1 .. 16

Alarm relay settings (Alarm Relay)

- **Relay Mode Iso:** Entry of the alarm status of the insulation alarm relay.
Permissible: 0 = close (Relay operates in case of alarm),
1 = open (Relay drops off in case of alarm)
- **Relay Mode Loop:** Entry of the alarm status of the loop resistance alarm relay.
Permissible: 0 = close (Relay operates in case of alarm),
1 = open (Relay drops off in case of alarm)

- **Alarm Delay Iso:** Entry of the time delay, which the loop resistance alarm relay waits until it triggers.
The setting of a time delay prevents the alarm being triggered by brief erroneous measurements.
Permissible: 0...999 min.
- **Alarm Delay Loop:** Entry of the time delay, which the insulation alarm relay waits until it triggers.
The setting of a time delay prevents the alarm being triggered by brief erroneous measurements.
Permissible: 0...999 min.

The modified values must be saved by clicking on the "Save Settings" button.

Overview

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PipeAlarm

Software Version: V1.03

Settings

This page allows the configuration of the module's system settings.

Enter the new settings for the module below:

Channel 1 :

Disable :

Alarm Value Iso : 0 ... 3.00 MOhm

Filter Value Iso : 1...16

Alarm Value Loop : 0 ... 9.99 kOhm

Filter Value Loop : 1...16

Channel 2 :

Disable :

Alarm Value Iso : 0 ... 3.00 MOhm

Filter Value Iso : 1...16

Alarm Value Loop : 0 ... 9.99 kOhm

Filter Value Loop : 1...16

Alarm Relay :

Relay Mode Iso : 0=close,1=open

Relay Mode Loop : 0=close,1=open

Alarm Delay Iso : 0...999 min.

Alarm Delay Loop : 0...999 min.

Input mask for "PipeAlarm2", with "PipeAlarm2 short", different limiting values are displayed.

Network Configuration menu point

The network settings can be modified here.



Important!

The network configuration should only be performed in close cooperation with the network administrator in order to avoid network errors.

Access to the network configuration is password protected

User: http

Password: http



Description

- MAC Address: The **MAC address** (unique product identification) of the PipeAlarm is not editable.
- Host Name: Freely editable name **for the PipeAlarm2** in the network.
- Enable DHCP Server: The **Dynamic Host Configuration Protocol** (DHCP) allows for the assignment of the network configuration to clients through the integrated server. This setting is enabled by default in order to allow for trouble-free initial registration for configuration purposes. In such a case, the laptop that is being used should have the DHCP enabled in the network settings.
 - IP Address: Freely editable **IP address for the PipeAlarm2** in the network.
The IP address must not coincide with the IP addresses that already exist in the network.
Default setting: 192.168.0.2
 - Gateway: The **IP address of the gateway** (access device to the network) is freely editable.
 - Subnet Mask: Freely editable **subnet mask** address for the PipeAlarm2 in the network.
Subnet Mask (net mask) specifies to which Bit the address has to be shared with. The Bits (network part) masked by the net mask or indicated by the prefix length are identical to all hosts (computers) of a subnetwork.

Overview	<h2>PipeAlarm</h2> <h3>Network Configuration</h3> <p>This page allows the configuration of the module's network settings.</p> <div style="border: 1px solid red; padding: 5px; background-color: #ffe6e6;"> <p>CAUTION: Incorrect settings may cause the module to lose network connectivity.</p> </div> <p>Enter the new settings for the module below.</p> <div style="border: 1px solid gray; padding: 10px; background-color: #f0f0f0;"> <p>MAC Address: <input type="text" value="00:04:A3:76:25:AA"/></p> <p>Host Name: <input type="text" value="PIPEALARM"/></p> <p><input type="checkbox"/> Enable DHCP Server</p> <p>IP Address: <input type="text" value="192.168.0.2"/></p> <p>Gateway: <input type="text" value="192.168.0.1"/></p> <p>Subnet Mask: <input type="text" value="255.255.255.0"/></p> <p><input type="button" value="Save Config"/></p> </div>
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The modified values must be saved by clicking on the "Save Config" button.

The configuration is concluded, the PipeAlarm2 reboots, all LEDs light up. Subsequently the LEDs of the bar graph go off, from top to bottom, and the PipeAlarm2 is ready for operation.

Reset to default setting

Resetting to the default settings is particularly necessary if the network configuration of the PipeAlarm2 has been altered so that access to the configuration via the Ethernet interface (see page 10) is no longer possible.

Simultaneously pressing both acknowledgment buttons for 20 seconds, until all LEDs light briefly (see Commissioning, page 8), implements the reset.



ATTENTION!
This process is irreversible.



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EC Declaration of Conformity

We declare under our sole responsibility, that the product

Make: LANCIER Monitoring
Type: PipeAlarm2
PipeAlarm2 short

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

2014/35/EU	Low voltage directive
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 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements (class B)

Münster, 27.11.2019


Research and Development


Managing Director