EN



ITP11

Process indicator 4-20 mA

User guide

ITP11_2017.11_0247_EN
© All rights reserved
Subject to technical changes and misprints

CE

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Contents

1 Safety guidelines 2

2 Intended use 3

3 Specifications 4

3.1 Environmental conditions 4

4 Functional description 5

5 Installation and operation 6

5.1 Installation 6

5.2 Operating mode 6

5.3 Programming mode 7

6 Maintenance 10

7 Transportation and storage 11

8 Scope of delivery 12

Appendix A Dimensions 13

Appendix B Electrical connection 14

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1 Safety guidelines

Please read through the user guide carefully before commissioning the device. Damages that arise from non-observance of the guidelines in the user guide shall be devoid of any liability.

- The device may only be used in the manner described in this user guide.
- No technical modifications may be made to the device.
- The device may not be used if the environmental conditions (temperature, humidity etc.) are not within the limits indicated in the specification.
- The device may not be used in explosive areas and there may be no chemically active substances in the air.
- The device should only be cleaned with a damp cloth. No abrasives or solvent-based cleaners should be used.

Non-observance of the safety guidelines may result in damage to the device and injury to users.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2 Intended use

The ITP11 is a universally applicable, digital display unit. It is designed to be connected to any transmitter with a 4-20 mA output. The device requires no auxiliary power and is supplied directly from the measured current.

The field of application of the device includes the control and monitoring of industrial processes. The display can be used in automated systems as a primary or secondary display.

The device may only be operated

- properly installed and
- in accordance with the specification.

Improper use

- The ITP11 may not be used for medical devices that sustain, monitor or otherwise affect human life or health.
- The device may not be used in potentially explosive environment.
- The device may not be used in an atmosphere with chemically active substances.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3 Specifications

ITP11 can be ordered in different versions. They differ in the display color.
Ordering key:

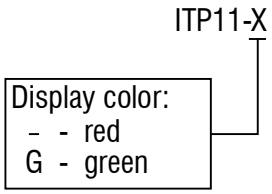


Table 3.1 Technical data

Supply current	from current loop
Input signal	4-20 mA (2-wire)
Inputs	1
Measuring range	3.8…22.5 mA
Normal operation	3.2…25 mA
Voltage drop, max.	10 V
Accuracy	0.2% + 1 digit
Display	LED, 7-segment display
Character height	14 mm
Display colour	red or green
Number of digits in display	4
Sampling rate (without damping)	1 reading / s
Dimensions	48 x 26 x 65 mm
Weight	approx. 30 g
Protection class	III

▶ **NOTICE**

Before connecting an active output of another device to the ITP11 input, ensure that the output voltage is sufficient for correct operation of the ITP11 (≥10 V).

3.1 Environmental conditions

The device is designed for natural convection cooling. It should be taken into account when choosing the installation site.

The following environment conditions must be met:

– clean, dry and controlled environment, low dust level
– closed non-hazardous areas, free of corrosive or flammable gases

Table 3.2

Conditions	Permissible range
Ambient temperature	-30…+70 °C
Storage temperature	-40…+80 °C
Relative humidity	up to 80% (at +25°C, non-condensing)
IP Code	front IP65, rear IP20
Altitude	up to 2000 m above sea level

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4 Functional description

A 4-digit, 7-segment LED display with 14 mm character height is located on the front of the device for displaying the measured values, error messages, functions and values during programming. The programming buttons are positioned on the cylindrical surface of the device.

The PROG button is used to set the programming mode and to apply the changes. The parameters can be selected and changed using buttons ⩓ and ⩔. Pressing and holding the buttons increases the speed of parameter changing in three steps.

The operating modes are described in Section 5.

The device has the following functions:

- Display process values, received from process control devices with 4-20 mA output (current loop).
- The measured values are displayed on the 4-digit LED display with a maximum range of -999…+9999 in accordance with the set limit values and the decimal point position.
- When exceeding the measuring limit, the device displays an error message.
- Switching between linear and square root function (for special transmitters)
- Filter for damping the signal fluctuations with an adjustable time constant
- Protection against unauthorized access

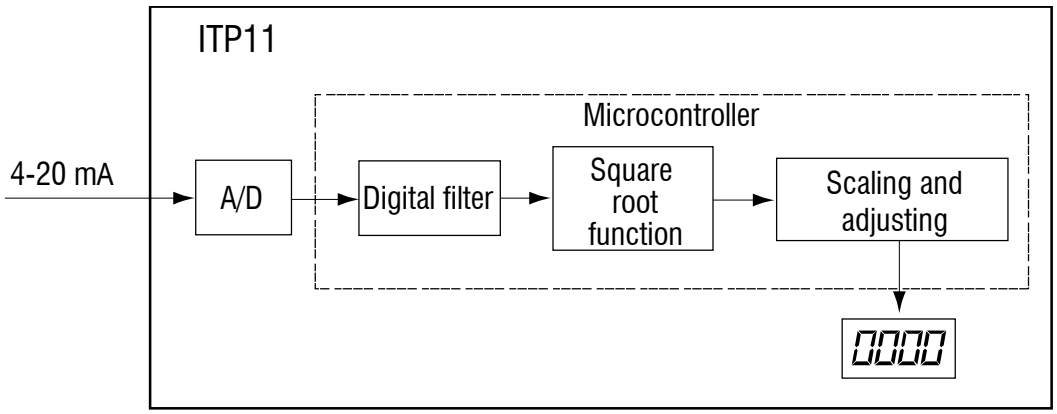


Fig. 4.1 Block diagram

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5 Installation and operation

5.1 Installation

The device is designed for switch panel mounting in a borehole of Ø22.5 mm (see Appendix A for dimensional drawings).

Carefully position the supplied gasket on the display rear surface. Insert the cylindrical part of the device into the borehole and tighten the nut from the rear side of the switch panel. Connect the device to the signal cable in accordance with Appendix B.

The device factory settings can be changed before assembly if necessary. For this purpose the display must be connected to a standard signal 4-20 mA.

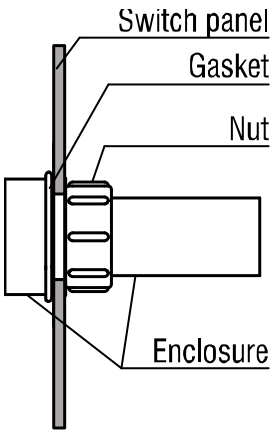


Fig. 5.1 Mounting

5.2 Operating mode

The operating mode is automatically switched on if the standard signal 4-20 mA is connected to the terminals.

The input signal is digitalised, the square root calculated (if the function is enabled) and the signal accordingly to the set parameters calibrated and displayed. The scale factor is calculated based on the parameter **di.Lo** “lower limit” (according to input signal 4 mA) and **di.Hi** “upper limit” (according to input signal 20 mA).

If the input signal is lower than 3.8 mA, the error message **Lo** is displayed.

If the input signal is higher than 22.5 mA, the error message **Hi** is displayed.

Square root function

This function is intended for transmitters with square characteristic curve. To enable the function, the parameter **Sqrt** must be set to **ON**.

Damping function

Undesirable signal fluctuations can be suppressed through the adjustable filter constant.

The most important feature of the exponential filters is τ_d – the filter time constant (parameter **td**) (see Fig. 5.2 and Table 5.1).

If the constant increases, the display reacts to changes of the input signal more slowly and the susceptibility to interference is lower.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

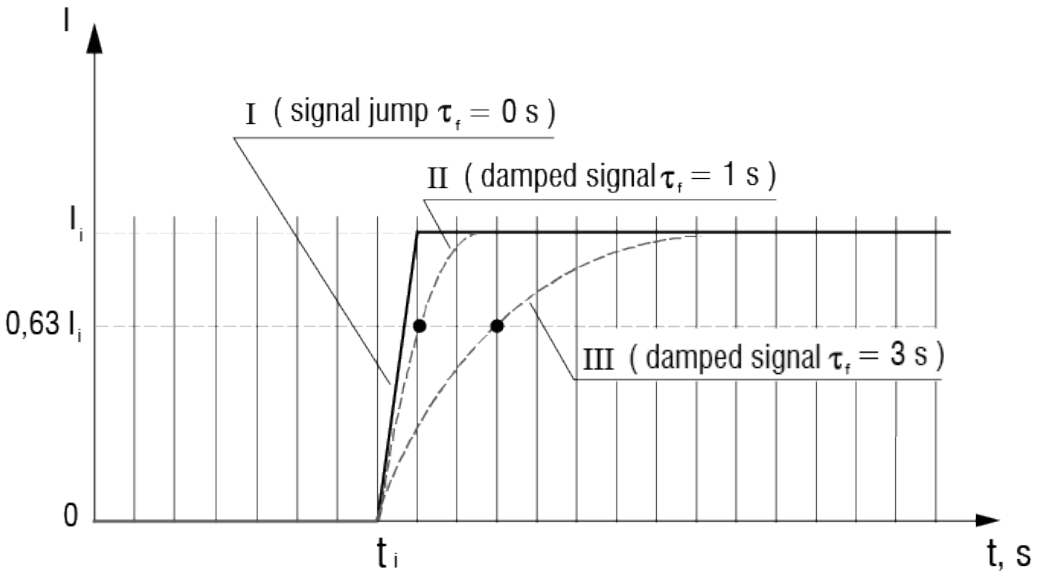


Fig. 5.2

5.3 Programming mode

In programming mode the necessary parameters can be changed (see Table 5.1).

To return to the operating mode, the PROG button must be pressed for longer than 5 s. If no button is pressed within 20 s, the device reverts to operating mode automatically.
The flowchart is presented in Fig. 5.3.

Table 5.1

Parameter	Comments	Valid values
PS	Access protection	**on** [1]
		oFF
di.P	Decimal point position (from the right)	**– -- -- --.**
		-- -- --.--
		-- --.-- --
		--.-- -- --
di.Lo	Lower limit (with 4 mA)	**-999…4.00…9999** [2]
di.Hi	Upper limit (with 20 mA)	**-999…20.00…9999** [3]
td	Filter time constant in seconds	**0…1…10**
Sqrt	Square root ON / OFF	**on**
		oFF

Comments:

1. Factory settings are highlighted.
2. With particular setting parameters the device cannot display the necessary minus sign due to the restriction to four segments. The parameters are configured as follows:

   di.Lo: -999 ➔ 4 mA

   di.Hi: 9999 ➔ 20 mA

   With an input measured current of 3.8 mA the correct display should be “-1068”. Due to the restriction to four segments, the minus sign is removed and the display is “1068”.
3. With particular setting parameters the device cannot actually display the necessary 5 figures due to the restriction to four segments. The parameters are configured as follows:

   di.Lo: -999 ➔ 4 mA

   di.Hi: 9999 ➔ 20 mA

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

With an input measured current of 20.8 mA the correct display should be “10548”. Due to the restriction to four segments, the first character is removed and the display is “0548”.

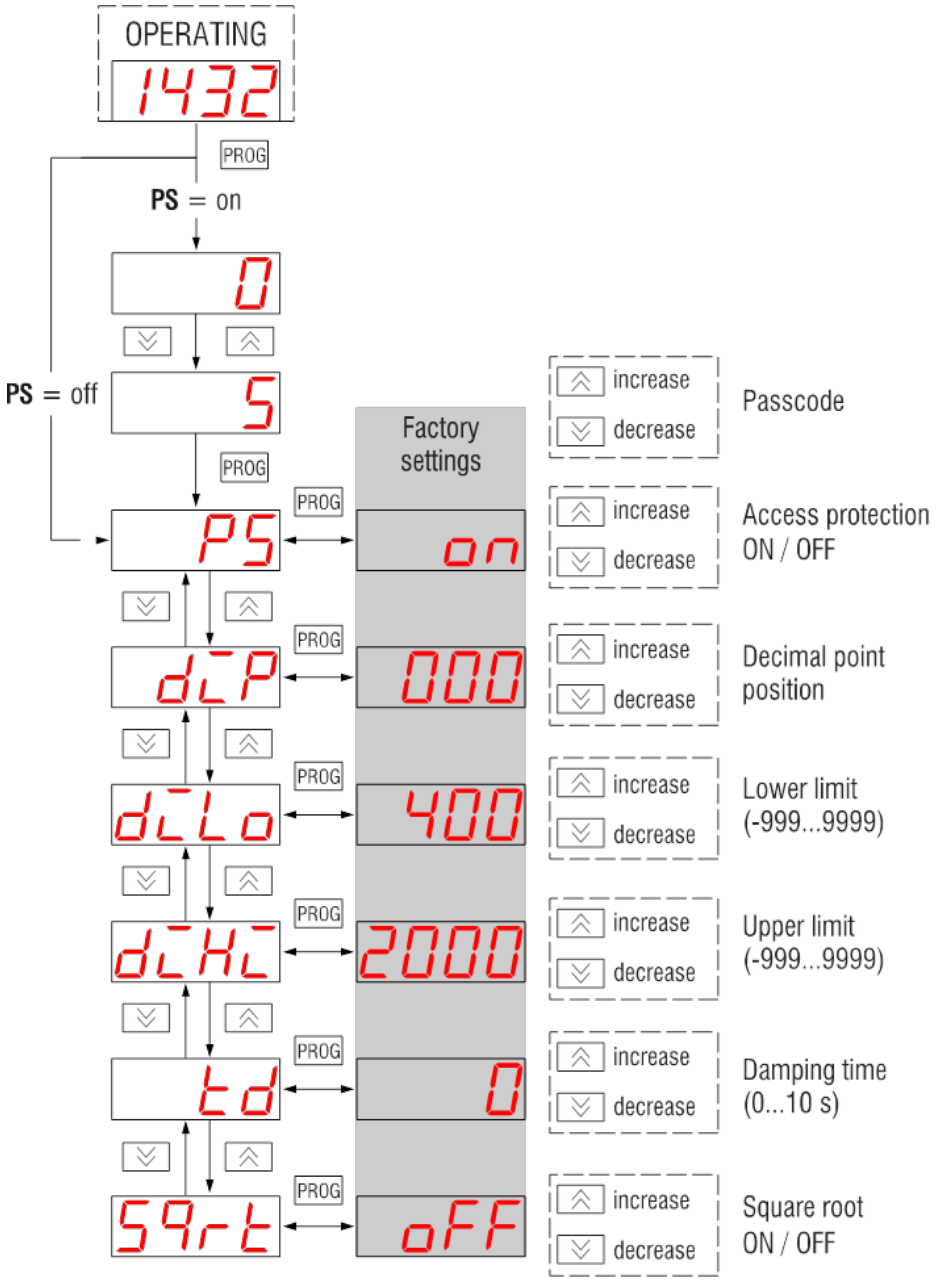


Fig. 5.3

To enter the programming mode use the button PROG.

To scroll the parameters use the buttons ⩓ and ⩔, to change the parameter use the button PROG.

When the device is switched on for the first time or the access protection is activated, **0** is displayed.

Use the buttons ⩓ and ⩔ to enter the correct passcode (factory setting – **5**), then press the PROG button to confirm.

If an incorrect passcode is entered, the device reverts to operating mode.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

If the passcode protection is disabled (the parameter **PS** is **oFF**), the passcode is not requested.

If the ⩓ button is pressed while the parameter **PS** is being displayed, the following characters appear on the display: **I- - - -** . This means that the upper end of the menu has been reached.

If the ⩔ button is pressed while the parameter **Sqrt** is being displayed, the following characters appear on the display: **- - - -I**. This means that the lower end of the menu has been reached.

Briefly push the PROG button (< 1 s) to change the selected parameter. The display indicates the actual parameter value. The factory settings are shown in Fig. 5.3 and Table 2.

The value can be changed using buttons ⩓ and ⩔ . After confirming by pressing the PROG button, you return to the parameter list.

Potential errors and troubleshooting measures are listed in Table 5.2.

Table 5.2 Error display

Display	Possible cause of error	Remedy
Lo	Input current lower than 3.8 mA	Check input signal
HI	Input current higher than 22.5 mA	Check input signal
None	No input signal	Check input signal
	Reverse polarity on input	Check polarity

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6 Maintenance

The maintenance includes:

- cleaning the housing and the terminals from dust, dirt and debris
- checking the fastening of the device
- checking the wiring (connecting leads, fastenings, mechanical damage)

The device should be cleaned with a damp cloth only. No abrasives or solvent-containing cleaners may be used.

The safety guidelines in Section 1 must be observed when carrying out maintenance.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7 Transportation and storage

Pack the device in such a way as to protect it reliably against impact for storage and transportation. The original packaging provides optimum protection.

If the device is not taken immediately after delivery into operation, it must be carefully stored at a protected location. The device should not be stored in an atmosphere with chemically active substances.

Storage temperature range: -40…+80 °C

▶ **NOTICE**

The device may have been damaged during transportation.
Check the device for transport damage and completeness!
Report the transport damage immediately to the shipper and akYtec GmbH!

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8 Scope of delivery

–	ITP11	1
–	Gasket	1
–	Mounting nut	1
–	User guide	1

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Appendix A Dimensions

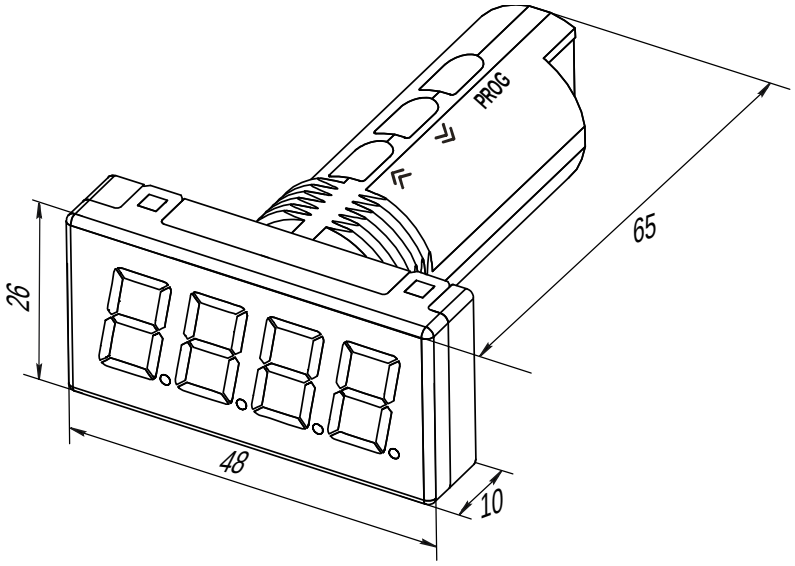


Fig. A.1

To prevent the device spinning, the borehole in the front panel must correspond to the dimensions in Fig. A.2.

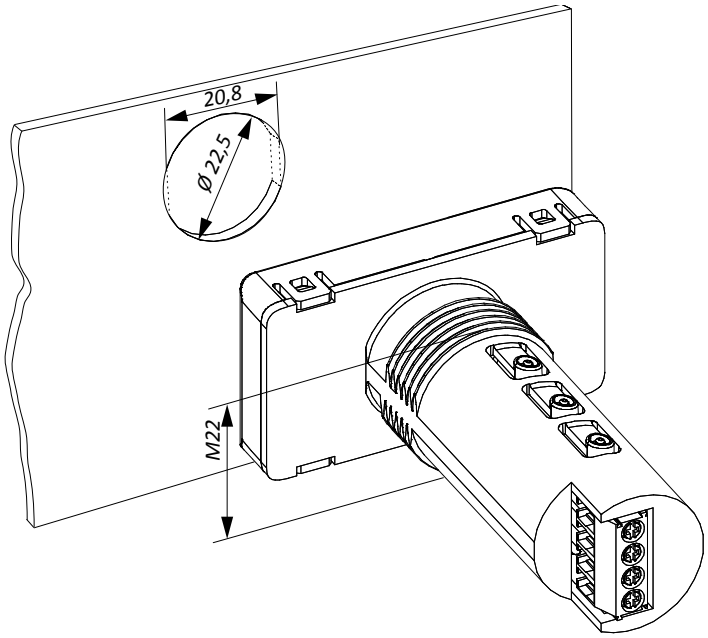


Fig. A.2.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Appendix B Electrical connection

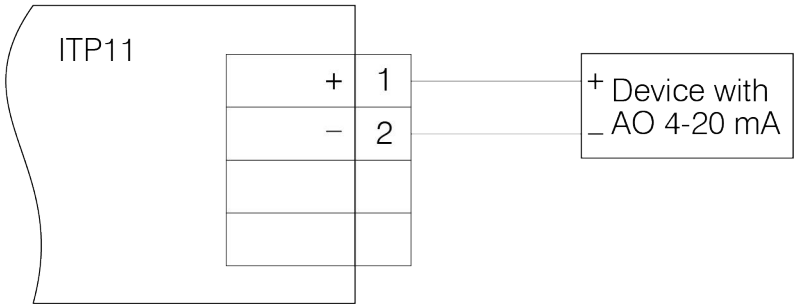


Fig. B.1 Connection to the device with active output 4-20mA

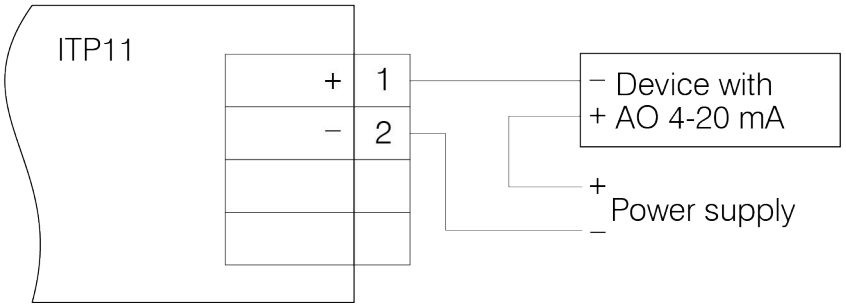


Fig. B.2 Connection to the device with passive output 4-20mA

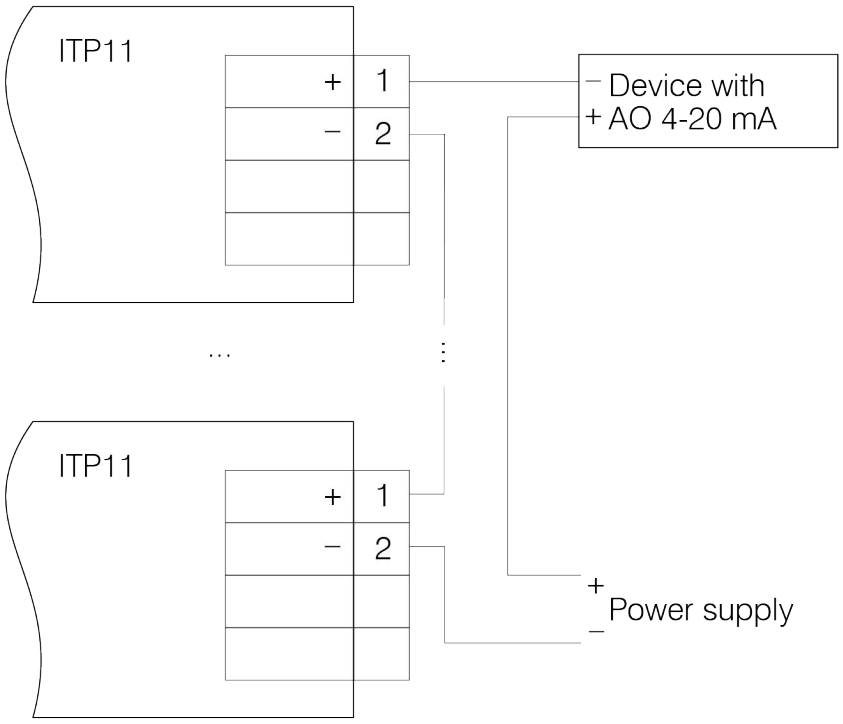


Fig. B.3 Connection of 2 or more ITP11 to a 4-20 mA source

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000