AI523: Connection of resistance thermometers in 3-wire configuration

When resistance thermometers (Pt100, Pt1000, Ni1000) are used, a constant current must flow through them to build the necessary voltage drop for the evaluation. For this, the module AI523 provides a constant current source which is multiplexed over the max. 8 (depending on the configuration) analog channels.

The following figure shows the connection of resistance thermometers in **3-wire configuration.**

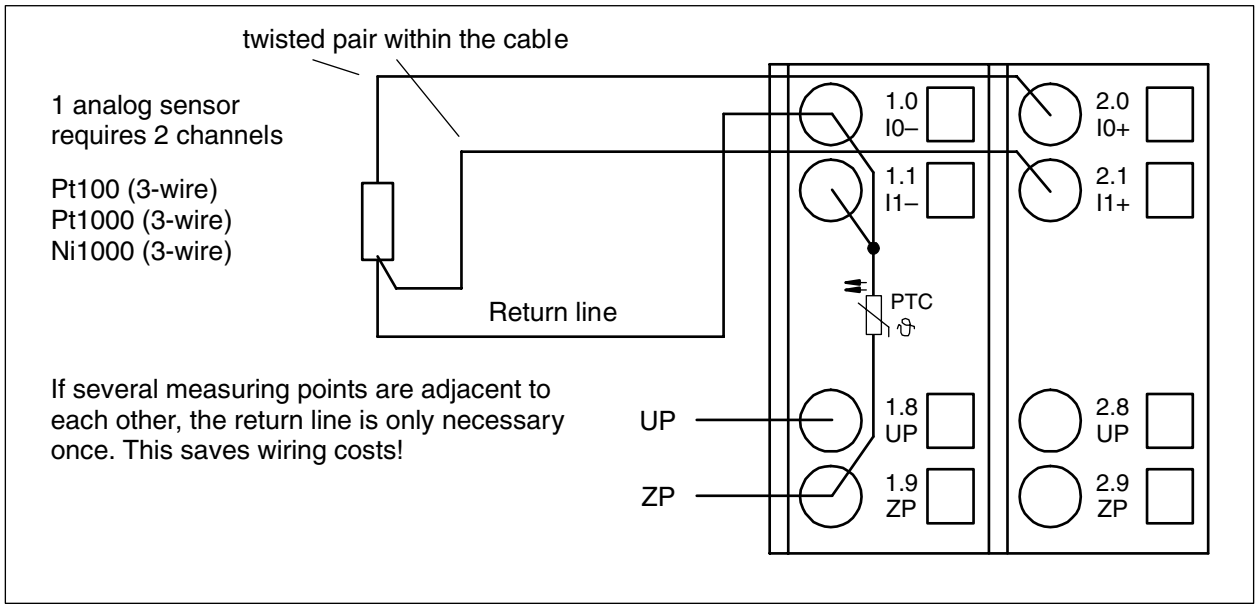

Figure: Connection of resistance thermometers in 3-wire configuration

With 3-wire configuration, two adjacent analog channels belong together (e.g. the channels 0 and 1). In this case, both channels are configured according to the desired operating mode. The lower address must be the even address (channel 0), the next higher address must be the odd address (channel 1).

The constant current of one channel flows through the resistance thermometer. The constant current of the other channel flows through one of the cores. The module calculates the measured value from the two voltage drops and stores it under the input with the higher channel number (e.g. I1).

In order to keep measuring errors as small as possible, it is necessary, to have all the involved conductors in the same cable. All the conductors must have the same cross section.

The following measuring ranges can be configured (see also "Parameterization / Channel configuration" and "Measuring ranges / Input ranges of resistances"):

Pt100	-50 °C...+70 °C	3-wire configuration, two channels used
Pt100	-50 °C...+400 °C	3-wire configuration, two channels used
Pt1000	-50 °C...+400 °C	3-wire configuration, two channels used
Ni1000	-50 °C...+150 °C	3-wire configuration, two channels used

The function of the LEDs is described under "Diagnosis and displays / Displays".

The module AI523 performs a linearization of the resistance characteristic.

In order to avoid error messages from unused analog input channels, it is useful to configure them as "unused".

AI523: Connection of active-type analog sensors (voltage) with electrically isolated power supply

The following figure shows the connection of active-type analog sensors (voltage) with electrically isolated power supply.

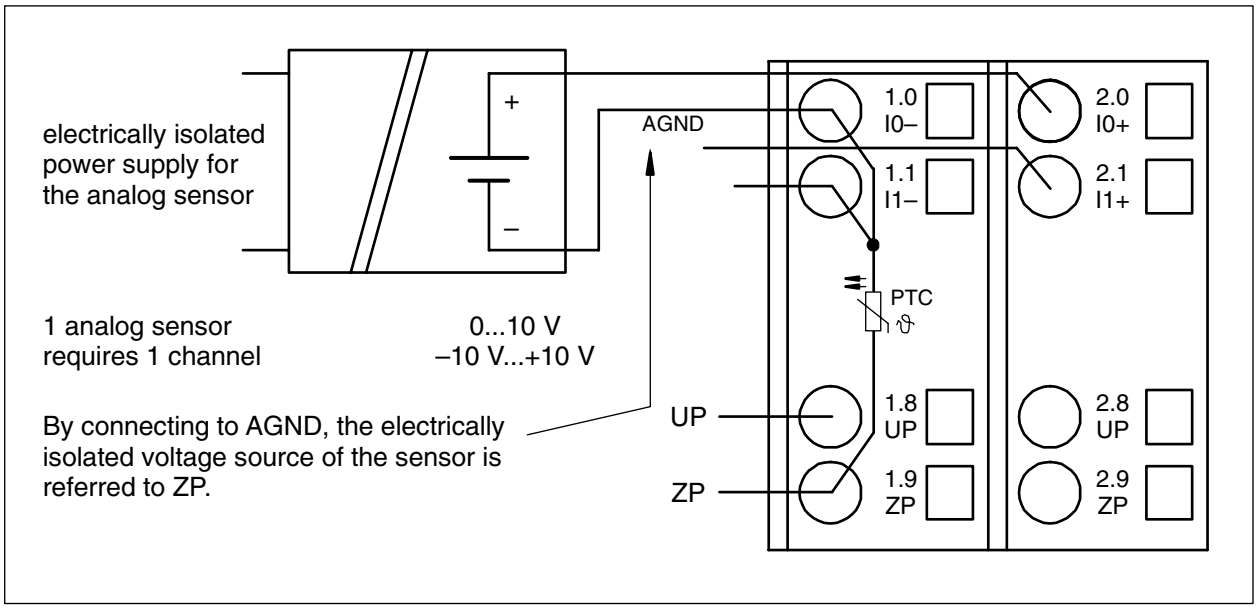

Figure: Connection of active-type analog sensors (voltage) with electrically isolated power supply

The following measuring ranges can be configured (see also "Parameterization / Channel configuration" and "Measuring ranges / Input ranges of voltage, current and digital input"):

Voltage	0...10 V	1 channel used
Voltage	-10 V...+10 V	1 channel used

The function of the LEDs is described under "Diagnosis and displays / Displays".

In order to avoid error messages or long processing times, it is useful to configure unused analog input channels as "unused".