Transportation Solutions

# **LCON** Series Signal Converters

Open FDT Technology

LUTZE TRANSPORTATION

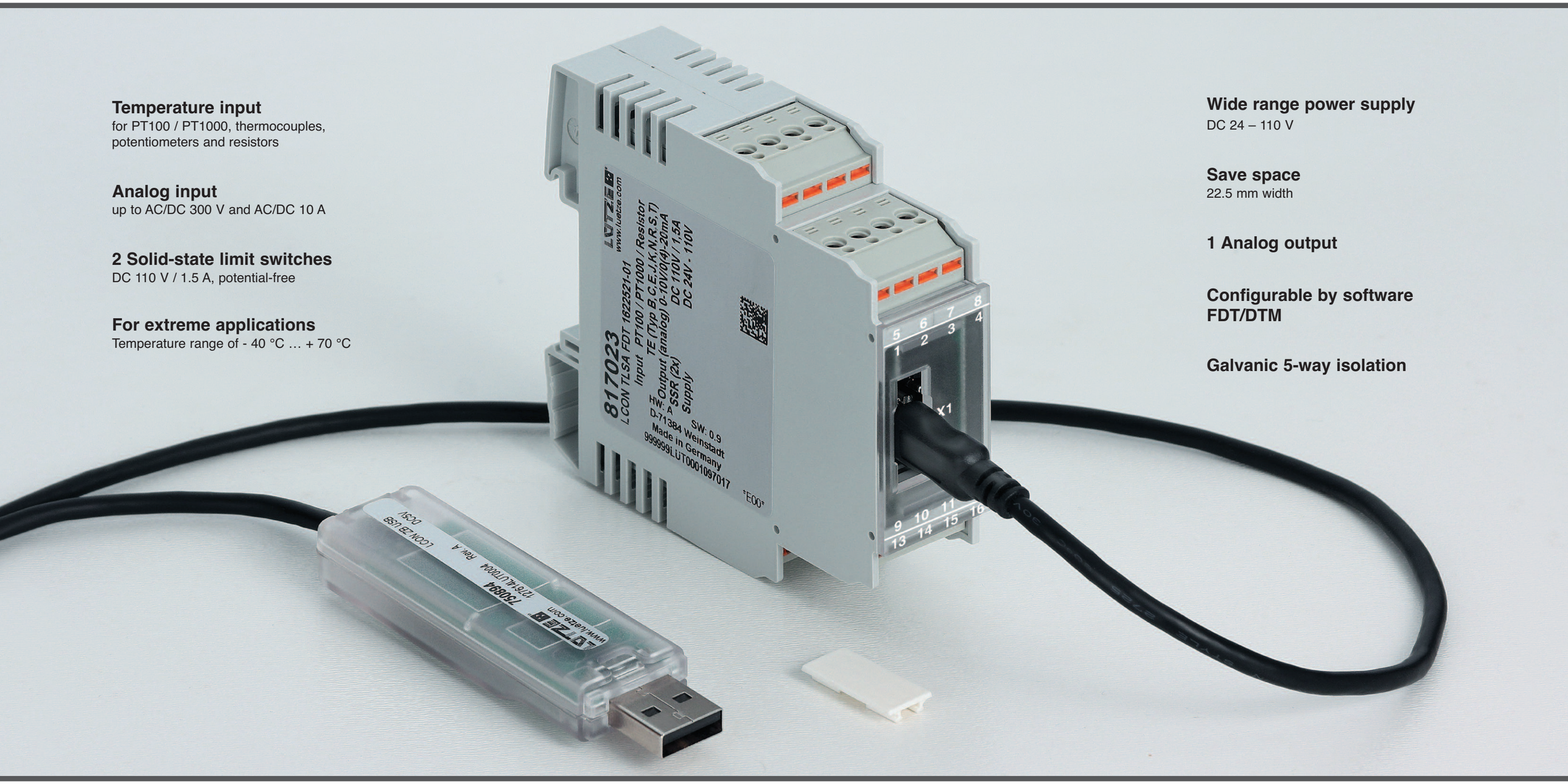
# **Jack of all trades:** The new LCON Rail Infinity

**Temperature input**
for PT100 / PT1000, thermocouples, potentiometers and resistors

**Analog input**
up to AC/DC 300 V and AC/DC 10 A

**2 Solid-state limit switches**
DC 110 V / 1.5 A, potential-free

**For extreme applications**
Temperature range of - 40 °C … + 70 °C




**Wide range power supply**
DC 24 – 110 V

**Save space**
22.5 mm width

**1 Analog output**

**Configurable by software FDT/DTM**

**Galvanic 5-way isolation**

Transportation Solutions

# Open FDT Technology

## FDT technology, what is it?

FDT standardizes the communication and configuration interface between all field devices and host systems. FDT provides a common environment for accessing the devices' most sophisticated features. Any device can be configured, operated, and maintained through the standardized user interface – regardless of supplier, type or communication protocol.

## The FDT interface – Integration standard

The FDT interface is the specification describing the standardized data exchange between devices and control system or engineering or asset management tools.

## DTM – Device driver

DTMs are classified into two categories:

- Device DTMs which connect to the field device configuration components
- CommDTMs which connect to the software communication components.

The DTM provides a unified structure for accessing device parameters, configuring and operating the devices, and diagnosing problems. DTMs can range from a simple Graphical User Interface for setting device parameters to a highly sophisticated application capable of performing complex real-time calculations for diagnosis and maintenance purposes.

## DeviceDTM

Provided by the device manufacturer
- Represents the whole logic and parameters of a device
- Standardized interface to the FDT Frame Application
- Can be used in any FDT Frame Application
- DTM Style Guide

## CommDTM

Represents communication components like PC communication cards, couplers, gateways, remote I/Os, and linking devices.

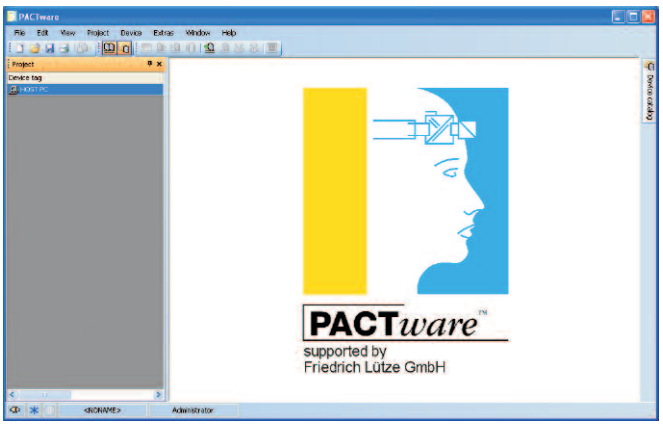
## FDT Frame Application – Host system

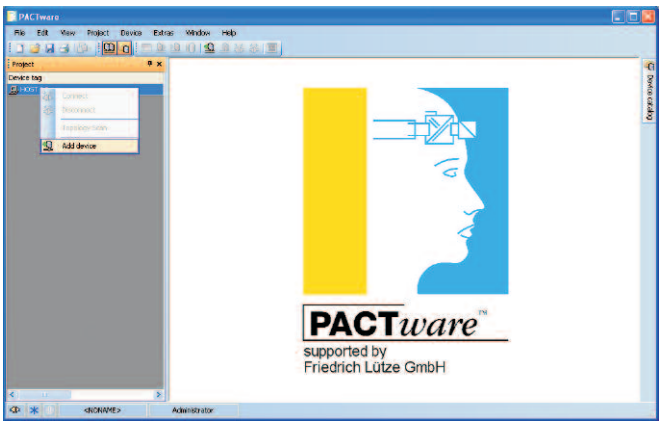
The Frame Application is a software program that implements Device DTMs and CommDTMs. The Frame Application provides:

- Common environment
- User Management
- DTM Management
- Data Management
- Network Configuration
- Navigation

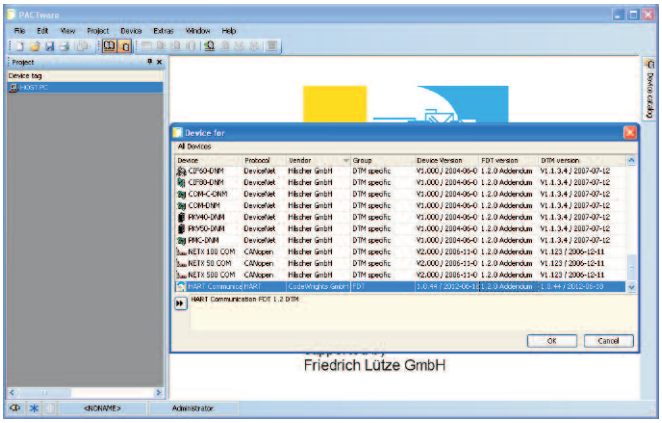
# Open FDT Technology

## Example to implement LÜTZE DTM´s into PACTware™



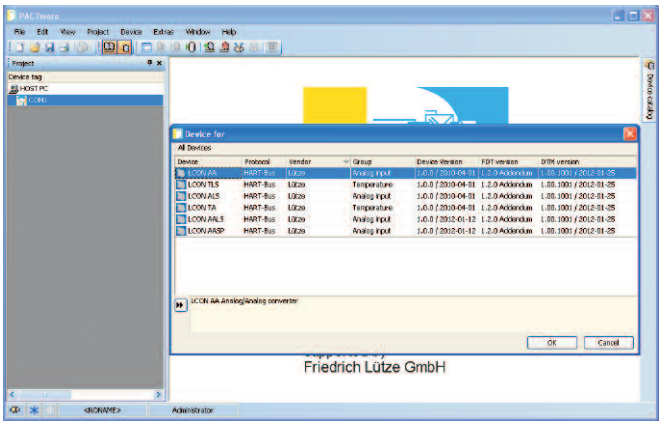




Add device.

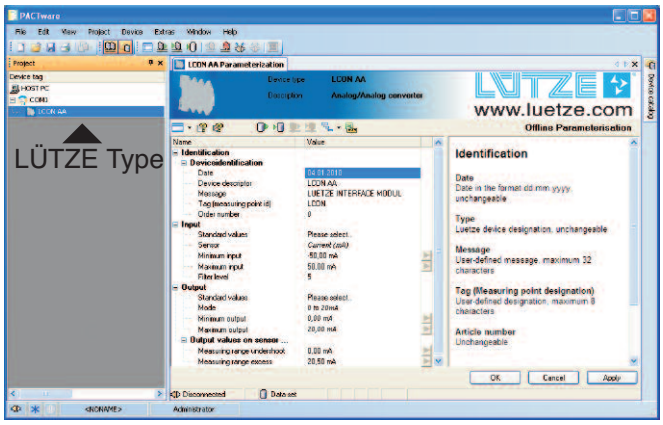



Select the communication channel start communication.

Again, add device.




Select needed LÜTZE DTM.




The LÜTZE type device is displayed.
Double click on the device, the parameter list opens.

# Analog converter - adjustable and programmable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 817006 | Spring terminal | 6.2 mm |

| Input | | | |
|---|---|---|---|
| Measurement input | + 30 / - 30 V | + 50 / - 50 mA | + 5 / - 5 A |
| Accuracy | 0.1 % FSR @ 23 °C | | 0.5 % FSR @ 23 °C |
| Step response (10 - 90 %) | 1.5 ms – 750 ms (adjustable by means of filter stage 1 – 5, default: filter stage 4 = 200 ms) | | |
| Parameterization | adjustable via DIP-switch and software FDT/DTM, connection via Micro USB | | |
| Zero/Span | freely adjustable | | |
| Input characteristic impedance | > 800 kΩ | 30 Ω | 10 mΩ |

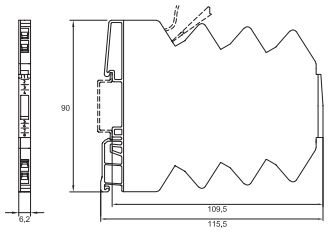
| Output | | | | |
|---|---|---|---|---|
| Output signal | 0 – 10 V | - 10 – + 10 V | 0 – 20 mA | 4 – 20 mA |
| Parameterization | adjustable via DIP-switch and software FDT/DTM, connection via USB service cable | | | |
| Max. load impedance at I-output | – | | 700 Ω | |
| Min. load impedance at U-output | > 2 kΩ | | – | |
| Limitation for exceeding measurement range | 10.25 V (default: max. output + 2,5 %) | | 20.5 mA (default: max. output + 2.5 %) | |

| General | |
|---|---|
| Operation voltage range | 16.8 – 30 V |
| Rated current | approx. 18 mA |
| Status indication | LED green, red (error) |
| Input/output protection | Overvoltage DC 30 V, short circuit-proof output |
| Potential isolation | 3-way isolation<br>Input/output potential: 2.5 kVeff, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.5 mm |
| Weight (kg/piece) | 0.050 |
| Approvals | cULus; Class I; Div. 2; Groups A, B, C, D T4 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

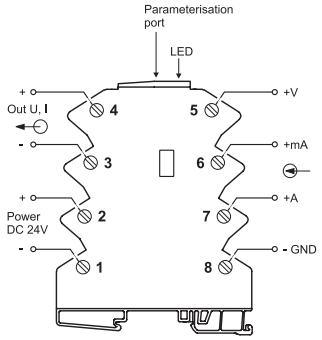
This analog converter can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the converter can be found on page 19.

Compatible jumper combs can also be found on page 19.

### Dimensions




### PIN assignment




### Range adjustment

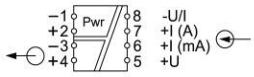
| Range* | S1 1 | 2 | 3 | 4 | 5 | Range* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 – 50mV | ● | | | | | 0 – 10mA | | | | | ● |
| 0 – 100mV | | ● | | | | 0 – 20mA | ● | | | | ● |
| 0 – 200mV | ● | ● | | | | 0 – 50mA | | ● | | | ● |
| 0 – 500mV | | | ● | | | 4 – 20mA | ● | ● | | | ● |
| 0 – 1V | ● | | ● | | | 0 – 0.5A | | | ● | | ● |
| 0 – 2V | | ● | ● | | | 0 – 1A | ● | | ● | | ● |
| 0 – 5V | ● | ● | ● | | | 0 – 2A | | ● | ● | | ● |
| 0 – 10V | | | | ● | | 0 – 5A | ● | ● | ● | | ● |
| 0 – 20V | ● | | | ● | | ±1V | | | | ● | ● |
| 0 – 30V | | ● | | ● | | ±5V | ● | | | ● | ● |
| 1 – 5V | ● | ● | | ● | | ±10V | | ● | | ● | ● |
| 2 – 10V | | | ● | ● | | ±5mA | ● | ● | | ● | ● |
| 0 – 1mA | ● | | ● | ● | | ±20mA | | | ● | ● | ● |
| 0 – 2mA | | ● | ● | ● | | ±2A | ● | | ● | ● | ● |
| 0 – 5mA | ● | ● | ● | ● | | ±5A | | ● | ● | ● | ● |

S1 1-8 off: FDT/DTM

*See instruction leaflet

| Output | 6 | 7 | 8 |
|---|---|---|---|
| 0 – 20mA | ● | | |
| 4 – 20mA | | ● | |
| 0 – 10V | ● | ● | |
| ±10V | | | ● |
| 2 – 10V | ● | | ● |
| 0 – 5V | | ● | ● |
| 1 – 5V | ● | ● | ● |

### Circuit



# Analog/Analog splitter - adjustable and programmable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 817019 | Spring terminal | 6.2 mm |

| Input | | | |
|---|---|---|---|
| Measurement input | 0 – 10 V | 0 – 20 mA | 4 – 20 mA |
| Accuracy | 0.1 % FSR @ 23°C | | |
| Limit frequency | 30 Hz (Filter off), 5 Hz (Filter on) | | |
| Parameterization | adjustable via DIP-switch and software FDT/DTM, connection via Micro USB | | |
| Zero/Span | freely adjustable | | |
| Input characteristic impedance | 500 kΩ | 100 Ω | |

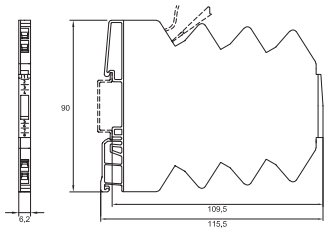
| Output 1 / Output 2 | | | |
|---|---|---|---|
| Output signal | 0 – 10 V | 0 – 20 mA | 4 – 20 mA |
| Parameterization | adjustable via DIP-switch and software FDT/DTM, connection via USB service cable | | |
| Max. load impedance at I-output | – | 400 Ω | |
| Min. load impedance at U-output | > 2 kΩ | – | |
| Limitation for exceeding measurement range | 10.25 V (default: max. output + 2,5 %) | 20.5 mA (default: max. output + 2.5 %) | |

| General | |
|---|---|
| Operation voltage range | 16.8 – 30 V |
| Rated current | approx. 20 mA |
| Status indication | LED green |
| Input/output protection | Overvoltage DC 30 V, short circuit-proof output |
| Potential isolation | 4-way isolation<br>Input/output potential: 2.5 kVeff, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.5 mm |
| Weight (kg/piece) | 0.050 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

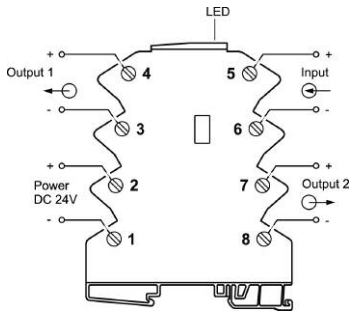
This analog converter can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the converter can be found on page 19.

Compatible jumper combs can also be found on page 19.

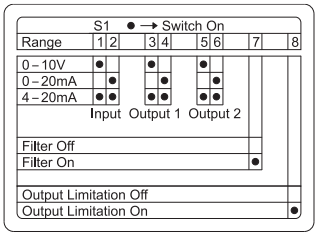
**Dimensions**




**PIN assignment**

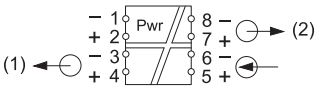



**Range adjustment**




See instruction leaflet for details

**Circuit**



# Analog limit switch - programmable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 751922 | Spring terminal | 6.2 mm |

| Input | | | |
|---|---|---|---|
| Measurement input | + 30 / - 30 V | + 50 / - 50 mA | + 5 / - 5 A |
| Accuracy | 0.1 % FSR @ 23°C | | 0.5 % FSR @ 23°C |
| Parameterization | adjustable via software FDT/DTM, connection via Micro USB | | |
| Zero/Span | freely adjustable | | |
| Input characteristic impedance | > 800 kΩ | 30 Ω | 10 mΩ |

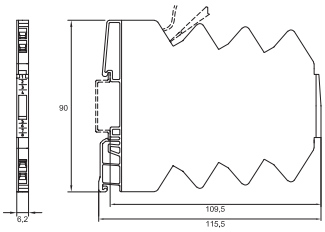
| Output | |
|---|---|
| Contact type | K1, K2 semiconductor NO contact |
| Max. switching voltage | DC 30 V |
| Max. switching current | DC 100 mA |

| General | |
|---|---|
| Operation voltage range | 16.8 – 30 V |
| Rated current | approx. 12 mA |
| Status indication | LED green, yellow (K1, K2), red (error) |
| Input/output protection | Overvoltage DC 30 V |
| Potential isolation | 2-way isolation<br>Input/output potential: 2.5 kVeff, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.5 mm |
| Weight (kg/piece) | 0.050 |
| Approvals | cULus; Class I; Div. 2; Groups A, B, C, D T4 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

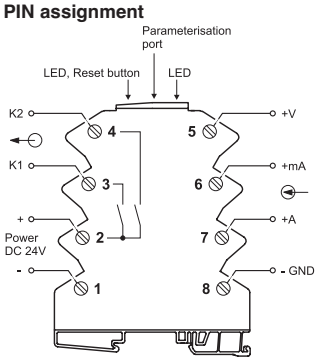
This analog limit switch can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the analog limit switch can be found on page 19.

Compatible jumper combs can also be found on page 19.

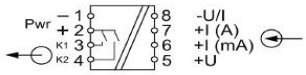
**Dimensions**




**PIN assignment**




**Circuit**

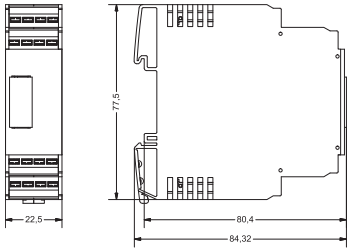


# Analog/Analog-Limit switch - programmable

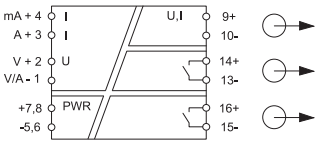
| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 – 110 V | 817022 | Spring terminal | 22.5 mm |

| Input | | | | | |
|---|---|---|---|---|---|
| Measurement input | DC 0 – 10 V<br>DC 0 – 50 V<br>DC 0 – 100 V<br>DC 0 – 300 V | DC 0 – 50 mA | AC 0 – 10 V<br>AC 0 – 50 V<br>AC 0 – 100 V<br>AC 0 – 300 V | AC 0 – 50 mA | AC/DC 0 – 2 A<br>AC/DC 0 – 5 A<br>AC/DC 0 – 10 A |
| Accuracy | 0.1 % + 100ppm FSR | | 0.3 % +100ppm FSR | | 0.5 %<br>+100ppm FSR |
| Delay ON / OFF | Parameterizable | | | | |
| Limit frequency | 5 – 100 Hz (adjustable by means of filter stage 1 – 6) | | | | |
| Parameterization | Measuring range, measuring method (AC/DC) and filter adjustable via software FDT/DTM | | | | |
| Zero / Span | freely adjustable | | | | |
| Input characteristic impedance | 1 MΩ (voltage input), 30 Ω (0 – 50 mA Input), 6 mΩ (0 – 10 A Input) | | | | |

**Dimensions**




**Circuit**




| Output | |
|---|---|
| Output signal | 0 – 10 V, 0 – 5 V, 1 – 5 V, 2 – 10 V, 0 – 20 mA, 4 – 20 mA, 2 – 10 mA |
| Parameterization | adjustable via software FDT/DTM |
| Max. load impedance at I-output | 500 Ω |
| Min. load impedance at U-output | 2 kΩ |
| Limitation for exceeding measurement range | adjustable (default: max. output + 2.5 %) |

| Limit switches | |
|---|---|
| Contact type | N-channel Mosfet, not short-circuit proof |
| Number of switches | 2 (potential-free) |
| Max. switching voltage | DC 154 V |
| Max. switching current | DC 1.5 A |
| Status indication output | LED yellow (2x) |
| Operation modes | Limit value, window, tendency+, tendency-, tendency+/- |
| Ripple | < 2 $mV_{eff}$ / < 4 $mA_{eff}$ |
| Parameterization | adjustable via software FDT/DTM |

| General | |
|---|---|
| Operation voltage range | DC 16.8 – 137.5 V |
| Rated current | max. 60 mA @ DC 24 V / max. 15 mA @ DC 110 V |
| Status indication | LED green: operating mode<br>LED red: Error (flashing codes for different errors) |
| Potential isolation | 5-way isolation<br>Input potential: 2.5 $kV_{eff}$, 50 Hz, 1 min<br>Remaining isolating gaps: 1.5 $kV_{eff}$, 50 Hz, 1 min |
| Housing material | PC-ABS |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 22.5 x 79.0 x 84.0 mm |
| Weight (kg/piece) | 0.076 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

This analog/analog-limit switch can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the limit switch can be found on page 19.

# Temperature converter - adjustable and programmable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 817002 | Spring terminal | 6.2 mm |

| Input | | |
|---|---|---|
| Measurement input | PT100, PT1000, Potentiometer 0 - 100 kΩ<br>Resistors 400 Ω – 600 kΩ | Thermocouples<br>Type B, C, E, J, K, N, R, S, T |
| Measuring range | - 220 °C … + 850 °C<br>depending on type | - 210 °C … + 2310 °C<br>depending on type |
| Accuracy | (10 K: set measurement range<br>(K)) + 0.2 % FSR @ 23°C | (10 K: set measurement range<br>(K)) + 0.4 % FSR @ 23°C |
| Step response (10 - 90 %) | TE: 10 – 750 ms, PT: 5 – 750 ms<br>(adjustable by means of filter stage 1 – 5, default: 200 ms – filter stage 4) | |
| Parameterization | customer specific via contact points, polynomial | |
| Input characteristic impedance | – | 1 MΩ |
| Sensor current | 0.2 / 0.6 mA type-dependent | – |
| Circuit | PT – 2/3/4-wire, for 2-wire with offset adjustment,<br>no external bridges necessary, autom. detection | |

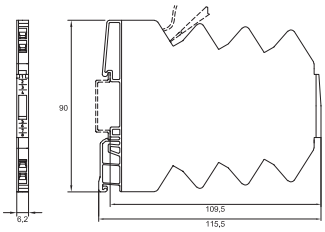
| Output | | | | |
|---|---|---|---|---|
| Output signal | 0 – 10 V | - 10 – + 10 V | 0 – 20 mA | 4 – 20 mA |
| Parameterization | adjustable via DIP-switch and software FDT/DTM,<br>connection via USB service cable | | | |
| Max. load impedance at I-output | – | | 700 Ω | |
| Min. load impedance at U-output | > 2 kΩ | | – | |
| Limitation for exceeding measurement range | 10.25 V<br>(default: max. output + 2,5 %) | | 20.5 mA<br>(default: max. output + 2.5 %) | |

| General | |
|---|---|
| Operation voltage range | 16.8 – 30 V |
| Rated current | approx. 18 mA |
| Status indication | LED green, red (error) |
| Input/output protection | Overvoltage DC 30 V, short circuit-proof output |
| Potential isolation | 3-way isolation<br>Input/output potential: 2.5 $kV_{eff}$, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.5 mm |
| Weight (kg/piece) | 0.050 |
| Approvals | cULus; Class I; Div. 2; Groups A, B, C, D T4 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

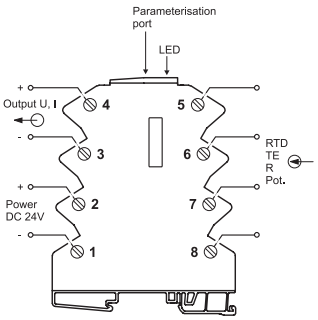
This temperature converter can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the converter can be found on page 19.

Compatible jumper combs can also be found on page 19.

### Dimensions




### PIN assignment




### Range adjustment

| Range* | S1 | | | | S2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start | 7 | 8 | 1 | 2 | End | 3 | 4 | 5 | 6 | 7 | 8 |
| -200°C | ● | | | | 0°C | ● | | | | | |
| -150°C | ● | ● | | | 50°C | | ● | ● | | | |
| -100°C | ● | | ● | | 100°C | ● | ● | | ● | | |
| -50°C | | ● | | ● | 150°C | ● | | ● | ● | | |
| 0°C | ● | ● | ● | ● | 200°C | ● | ● | ● | ● | | |
| | | | | | 250°C | ● | | | | ● | |
| | | | | | 300°C | ● | ● | | | ● | |
| | | | | | 350°C | ● | | ● | | ● | |
| | | | | | 400°C | ● | ● | ● | | ● | |
| | | | | | 450°C | ● | | | ● | ● | |
| | | | | | 500°C | ● | ● | | ● | ● | |
| | | | | | 550°C | ● | | ● | ● | ● | |
| | | | | | 600°C | ● | ● | ● | ● | ● | |
| | | | | | 650°C | ● | | | | | ● |
| | | | | | 700°C | ● | ● | | | | ● |
| | | | | | 750°C | ● | | ● | | | ● |
| | | | | | 800°C | ● | ● | ● | | | ● |
| | | | | | 850°C | ● | | | ● | | ● |
| | | | | | 900°C | ● | ● | | ● | | ● |
| | | | | | 950°C | ● | | ● | ● | | ● |
| | | | | | 1000°C | ● | ● | ● | ● | | ● |
| | | | | | 1050°C | ● | | | | ● | ● |
| | | | | | 1100°C | ● | ● | | | ● | ● |
| | | | | | 1150°C | ● | | ● | | ● | ● |
| | | | | | 1200°C | ● | ● | ● | | ● | ● |
| | | | | | 1250°C | ● | | | ● | ● | ● |
| | | | | | 1300°C | ● | ● | | ● | ● | ● |
| | | | | | 1350°C | ● | | ● | ● | ● | ● |
| | | | | | 1400°C | ● | ● | ● | ● | ● | ● |

| Sensor* | S1 | 1 | 2 | 3 |
|---|---|---|---|---|
| Pt100 | | ● | | |
| Pt1000 | | | ● | |
| TE J | | ● | ● | |
| TE K | | | | ● |
| Pot. % | | ● | ● | ● |

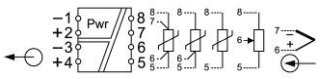
| Output* | S1 | 4 | 5 | 6 |
|---|---|---|---|---|
| 0 – 20mA | | ● | | |
| 4 – 20mA | | | ● | |
| 0 – 10V | | ● | ● | |
| ±10V | | | | ● |

S1-S2 1-8 off: FDT/DTM

*See instruction leaflet

● → Switch On

### Circuit



# Temperature limit switch - programmable

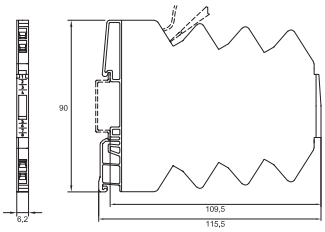
| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 817000 | Spring terminal | 6.2 mm |

| Input | | |
|---|---|---|
| Measurement input | PT100, PT1000, Potentiometer 0 – 100 kΩ<br>Resistors 400 Ω – 600 kΩ | Thermocouples<br>Type B, C, E, J, K, N, R, S, T |
| Measuring range | - 220 °C … + 850 °C depending on type | - 210 °C … + 2310 °C depending on type |
| Accuracy | (10 K: set measurement range(K))<br>+ 0.2 % FSR @ 23°C | (10 K: set measurement range(K))<br>+ 0.4 % FSR @ 23°C |
| Step response (10 - 90 %) | TE: 10 – 750 ms, PT: 5 – 750 ms<br>(adjustable by means of filter stage 1 – 5, default: 200 ms – filter stage 4) | |
| Parameterization | customer specific via contact points, polynomial | |
| Input characteristic impedance | – | 1 MΩ |
| Sensor current | 0.2 / 0.6 mA type-dependent | – |
| Circuit | PT – 2/3/4-wire, for 2-wire with offset<br>adjustment, no external bridges necessary,<br>autom. detection | – |

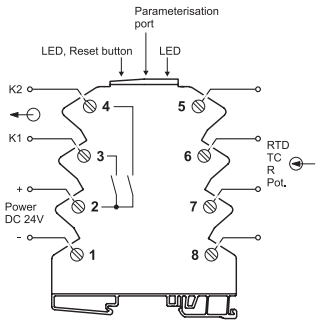
| Output | |
|---|---|
| Contact type | K1, K2 semiconductor NO contact |
| Max. switching voltage | DC 30 V |
| Max. switching current | DC 100 mA |

| General | |
|---|---|
| Operation voltage range | 16.8 – 30 V |
| Rated current | approx. 12 mA |
| Status indication | LED green, yellow (K1, K2), red (error) |
| Input/output protection | Overvoltage DC 30 V |
| Potential isolation | 2-way isolation<br>Input/output potential: 2.5 $kV_{eff}$, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.5 mm |
| Weight (kg/piece) | 0.050 |
| Approvals | cULus; Class I; Div. 2; Groups A, B, C, D T4 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

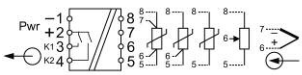
**Dimensions**




**PIN assignment**




**Circuit**




This temperature limit switch can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the limit switch can be found on page 19.

Compatible jumper combs can also be found on page 19.

# Temperature/Analog-Limit switch - programmable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 – 110 V | 817023 | Spring terminal | 22.5 mm |

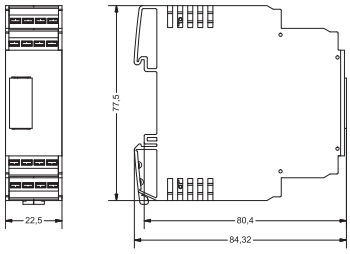
| Input | | | |
|---|---|---|---|
| Measurement input | PT100, PT1000<br>2-, 3- and 4-wire | Resistor / Potentiometer<br>Bases, polynomial | Thermocouples<br>Type B, C, E, J, K, N, R, S, T |
| Measuring range | - 220 °C… + 850 °C | 0 – 0.5 kΩ<br>0.5 kΩ – 4.5 kΩ<br>4.5 kΩ – 49 kΩ<br>49 kΩ – 600 kΩ<br>automatic measuring range switchover | - 210 °C … + 2310 °C*<br>*depends on the type |
| Accuracy | +/-(1K + 0.1K/$K_{ambient}$) | +/-(0.3% + 100ppm) of measuring range | +/-(10K + 0.25K/$K_{ambient}$) |
| Delay ON / OFF | Parameterizable | | |
| Limit frequency | 5 – 100 Hz (adjustable by means of filter stage 1 - 6) | | |
| Parameterization | Measuring range, measuring method (AC/DC) and filter adjustable via software FDT/DTMerizable | | |
| Zero / Span | freely adjustable | | |

| Output | |
|---|---|
| Output signal | 0 – 10 V, 0 – 5 V, 1 – 5 V, 2 – 10 V, 0 – 20 mA, 4 – 20 mA, 2 – 10 mA |
| Parameterization | adjustable via software FDT/DTM |
| Max. load impedance at I-output | 500 Ω |
| Min. load impedance at U-output | 2 kΩ |
| Limitation for exceeding measurement range | adjustable (default: max. output + 2.5 %) |

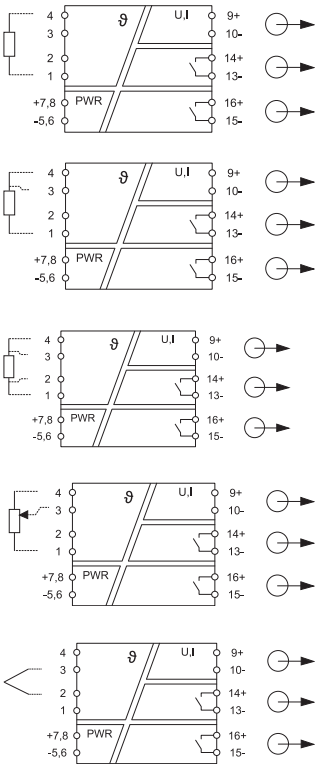
| Limit switches | |
|---|---|
| Contact type | N-channel Mosfet, not short-circuit proof |
| Number of switches | 2 (potential-free) |
| Max. switching voltage | DC 154 V |
| Max. switching current | DC 1.5 A |
| Status indication output | LED yellow (2x) |
| Operation modes | Limit value, window, tendency+, tendency-, tendency+/- |
| Ripple | < 2 $mV_{eff}$ / < 4 $mA_{eff}$ |
| Parameterization | adjustable via software FDT/DTM |

| General | |
|---|---|
| Operation voltage range | DC 16.8 – 137.5 V |
| Rated current | max. 60 mA @ DC 24 V / max. 15 mA @ DC 110 V |
| Status indication | LED green: operating mode<br>LED red: Error (flashing codes for different errors) |
| Potential isolation | 5-way isolation<br>Input potential: 2.5 $kV_{eff}$, 50 Hz, 1 min<br>Remaining isolating gaps: 1.5 $kV_{eff}$, 50 Hz, 1 min |
| Housing material | PC-ABS |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C … + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C … + 85 °C |
| Dimensions (w x h x d) | 22.5 x 79.0 x 84.0 mm |
| Weight (kg/piece) | 0.076 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

**Dimensions**




**Circuit**




This analog/analog-limit switch can be programmed with a free software (FDT/DTM). On request it can be delivered parameterized according to customer specifications ex works. USB service cable for downloading the parameter set on the limit switch can be found on page 19.

# Even frequencies:

## The new adjustable frequency converter

**Nominal voltage**
AC/DC 24 V

**For converting a frequency to a standard signal**

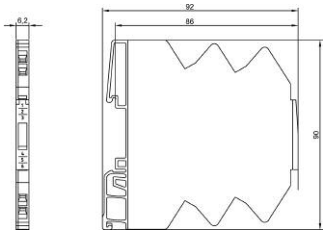
**Input signal**
up to 28.8 kHz

**For extreme applications**
Temperature range
of - 40 °C … + 70 °C

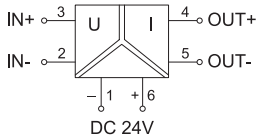
**Operation voltage range**
DC 16.8 – 30 V

# Single-range analog converter - width 6,2 mm

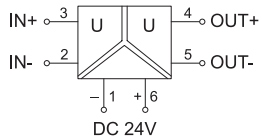
**Dimensions**



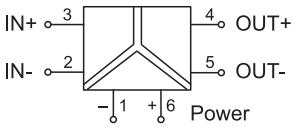

**Circuit (751920)**




**Circuit (751930)**




**Circuit (817021)**




| **Identification** | | | |
|---|---|---|---|
| Part.-No. | 751920 | 751930 | 817021 |
| Nominal voltage | | DC 24 V | |

| **Input** | | | |
|---|---|---|---|
| Measurement input | | 0 – 10 V | 0 – 20 mA |
| Accuracy | | 0.1% FSR @ 23°C | |
| Rise time (10 - 90 %) | | < 10 ms | |
| Input characteristic impedance | | 330 kΩ | < 100 Ω |

| **Output** | | | |
|---|---|---|---|
| Output signal | 0 – 20 mA | 0 – 10 V | DC 0 – 10 V |
| Working resistance | 400 Ω | max. 1 kΩ / 55 Ω | |
| Ripple | | < 5 $mV_{eff}$ | |
| Protection device output | | Varistor, PTC fuse | |

| **General** | |
|---|---|
| Operation voltage range | DC 16.8 – 30 V |
| Rated current | |
| Current consumption per LED | at 24 V: ca. 13 mA (station supply) |
| Input/output protection | Overvoltage DC 30 V, short-circuit-proof |
| Potential isolation | 3-way isolation<br>Input/output potential: 1500 $V_{eff}$, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C… + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C… + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 92.5 mm |
| Weight (kg/piece) | 0.042 |
| Termination | Spring terminal |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

Compatible jumper combs can be found on page 19.

# Single-range analog converter - width 17,5 mm

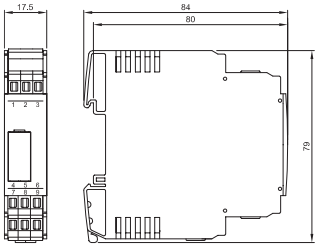
| Identification | | | | |
|---|---|---|---|---|
| Part.-No. | 750854 | 817018 | 751921 | 751919 |
| Nominal voltage | DC 24 – 110 V | | | |

| Input | | | | |
|---|---|---|---|---|
| Measurement input | DC 0 – 200 V | 0 – 20 mA | AC/DC 0 – 1.5 A (True RMS) | AC/DC 0 – 10 A (True RMS) |
| Accuracy | 0.3 % FSR @ 23°C | 0.1 % FSR @ 23°C | 0.5 % FSR @ 23°C | |
| Rise time (10 - 90 %) | < 10 ms | | - | - |
| Input characteristic impedance | 330 kΩ | < 100 Ω | approx. 0.1 Ω | approx. 0.03 Ω |
| Protection device | Varistor | Varistor, PTC fuse | Varistor, external fuse | |

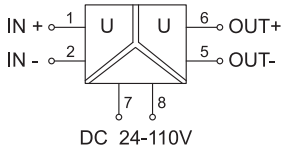
| Output | | | | |
|---|---|---|---|---|
| Output signal | 0 – 10 V | 0 – 20 mA | 0 – 10 V | |
| Working resistance | max. 400 Ω, @ 85 °C | | | |
| | 350 Ω | | | |
| Output impedance | 55 Ω | – | 55 Ω | 55 Ω |
| Ripple | < 5 $mV_{eff}$ | | | |
| Protection device output | Varistor, PTC fuse | | | |

| General | |
|---|---|
| Operation voltage range | DC 16.8 - 137.5 V |
| Rated current | |
| Current consumption per LED | at 110 V: ca. 2 mA (station supply) |
| Input/output protection | Overvoltage DC 30 V, short-circuit-proof |
| Potential isolation | 3-way isolation<br>Input/output potential: 4000 $V_{eff}$, 50 Hz, 1 min |
| Housing material | PC-ABS |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C… + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C… + 85 °C |
| Dimensions (w x h x d) | 17.5 x 80.0 x 84.0 mm |
| Weight (kg/piece) | 0.075 |
| Termination | Spring terminal |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

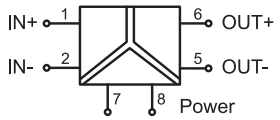
**Dimensions**



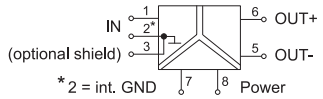

**Circuit (750854)**



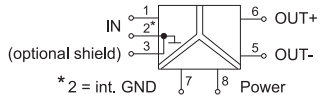

**Circuit (817018)**




**Circuit (751921)**




**Circuit (751919)**



# Frequency converter - adjustable

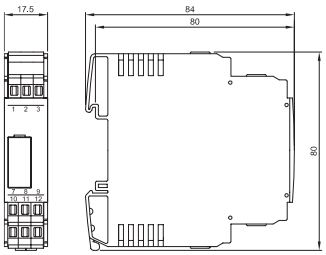
| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| AC/DC 24 V | 817020 | Spring terminal | 17.5 mm |

| Input | |
|---|---|
| Input signal | 0 – 28.8 kHz, 6 – 30 $V_{pp}$ |
| Accuracy | 0.1 % FSR, Offset < 20 µA (23 °C). At the start of the range (4 mA), an offset of up to 20 µA can occur. |
| Input characteristic impedance | 50 kΩ |
| Hysteresis | 0.5 $V_{pp}$ / 5 $V_{pp}$ |
| Ripple in | < 200 Hz: approx. 0.1 % |

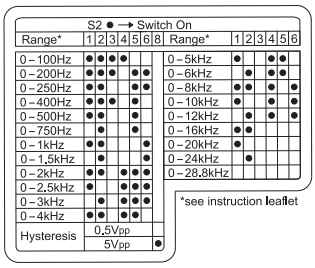
| Output | | | |
|---|---|---|---|
| Output signal | 0 – 10 V | 0 – 20 mA | 4 – 20 mA |
| Load resistance | | 400 Ω | |
| Output impedance | 55 Ω | | |
| Ripple out | | < 5 $mV_{eff}$ + Ripple in | |

| General | |
|---|---|
| Operation voltage range | DC 16.8 - 30 V |
| Rated current | 12 mA |
| Status indication | LED yellow |
| Input/output protection | |
| Potential isolation | 3-way isolation<br>Input/output potential: 2500 $V_{eff}$, 50 Hz, 1 min |
| Housing material | PC-ABS |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C… + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C… + 85 °C |
| Dimensions (w x h x d) | 17.5 x 80.0 x 84.0 mm |
| Weight (kg/piece) | 0.070 |
| Termination | Spring terminal |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

**Dimensions**




**Range adjustment**



S2 ● → Switch On

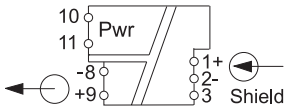
| Range* | 1 | 2 | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|
| 0 – 100Hz | ● | ● | ● | ● | | | |
| 0 – 200Hz | ● | ● | ● | | ● | ● | |
| 0 – 250Hz | ● | ● | | | ● | ● | |
| 0 – 400Hz | ● | ● | ● | | ● | | |
| 0 – 500Hz | ● | ● | | | ● | | |
| 0 – 750Hz | | ● | | | ● | | |
| 0 – 1kHz | ● | ● | | | | | ● |
| 0 – 1.5kHz | | ● | | | | | ● |
| 0 – 2kHz | ● | ● | | ● | ● | ● | ● |
| 0 – 2.5kHz | ● | | | ● | ● | ● | ● |
| 0 – 3kHz | | ● | | ● | ● | ● | ● |
| 0 – 4kHz | ● | ● | | ● | ● | | |
| Hysteresis | 0.5Vpp | | | | | | |
| | 5Vpp | | | | | | ● |

| Range* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 0 – 5kHz | ● | | | ● | ● | |
| 0 – 6kHz | | ● | | ● | ● | |
| 0 – 8kHz | ● | ● | | ● | | ● |
| 0 – 10kHz | ● | | | ● | | ● |
| 0 – 12kHz | | ● | | ● | | ● |
| 0 – 16kHz | ● | ● | | | | |
| 0 – 20kHz | ● | | | | | |
| 0 – 24kHz | | ● | | | | |
| 0 – 28.8kHz | | | | | | |

*see instruction leaflet

| ● → Switch On | S1 | | |
|---|---|---|---|
| Output | 1 | 2 | 3 |
| 0-10V | ● | | |
| 0-20mA | | ● | |
| 4-20mA | | | ● |

**Circuit**

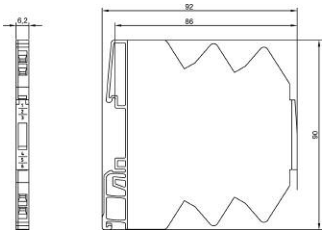


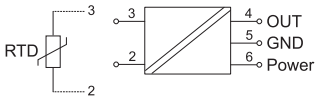
# Single-range temperature converter

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 751400 | Spring terminal | 6.2 mm |

| Input | |
|---|---|
| Measurement input | PT100, 2-wire |
| Accuracy | 0.3% FSR @ 23°C |
| Rise time (10 - 90 %) | < 30 ms |
| Sensor current | 0.5 mA |
| Input characteristic impedance | 1 MΩ |
| Temperature range | Adjustment according to customer's specification - 200 °C… 800 °C<br>Please indicate the temperature range when placing an order.<br>Please note:<br>minimum temperature span 100 °C<br>maximum temperature span 500 °C |

**Dimensions**




| Output | |
|---|---|
| Output signal | 0 – 10 V |
| Output impedance | 55 Ω |
| Ripple | < 5 $mV_{eff}$ |
| Protection device output | Varistor; PTC fuse |

| General | |
|---|---|
| Operation voltage range | DC 16.8 – 30 V |
| Rated current | approx. 13 mA |
| Input/output protection | Overvoltage DC 30 V, short-circuit-proof |
| Potential isolation | 2-way isolation<br>Input/output potential: 1500 Veff, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C… + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C… + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 92.5 mm |
| Weight (kg/piece) | 0.042 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

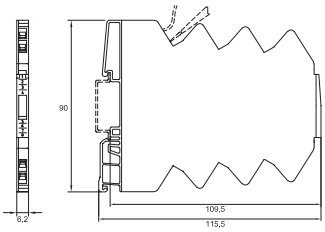
Compatible jumper combs can be found on page 19.

# Temperature converter - adjustable

| Nominal voltage | Part-No. | Termination | Width |
|---|---|---|---|
| DC 24 V | 751929 | Spring terminal | 6.2 mm |

| Input | |
|---|---|
| Measurement input | PT100, 2-, 3- and 4-wire |
| Measuring range | - 50 – 150 °C / 0 – 100 °C / 0 – 200 °C |
| Accuracy | 0.3 % FSR |
| Rise time (10 – 90 %) | 30 ms |
| Parameterization | adjustable via DIP-switch |
| Build-up time (Accuracy 1 %) | 60 ms |
| Sensor current | 0.5 mA |
| Zero / Span | Production calibration |
| Input characteristic impedance | 2-wire: 1 MΩ, 3-/4-wire: 240 kΩ |

**Dimensions**




| Output | | | |
|---|---|---|---|
| Output signal | 0 - 10 V | 0 - 20 mA | 4 - 20 mA |
| Load resistance | | 400 Ω | 400 Ω |
| Parameterization | | adjustable via DIP-switch | |
| Ripple | | < 5 $mV_{eff}$ | |

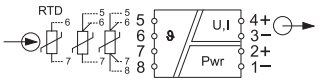
**Range adjustment**

| ● → Switch On | | S1 | | | | | |
|---|---|---|---|---|---|---|---|
| Range | Output | 1 | 2 | 3 | 4 | 5 | 6 |
| -50 – 150°C | 0-10V | | | | | | |
| -50 – 150°C | 0-20mA | ● | | | | | |
| -50 – 150°C | 4-20mA | | ● | | | | |
| 0 – 100°C | 0-10V | ● | ● | | | | |
| 0 – 100°C | 0-20mA | | | ● | | | |
| 0 – 100°C | 4-20mA | ● | | ● | | | |
| 0 – 200°C | 0-10V | | ● | ● | | | |
| 0 – 200°C | 0-20mA | ● | ● | ● | | | |
| 0 – 200°C | 4-20mA | | | | ● | | |

| ● → Switch On | S2 | | | |
|---|---|---|---|---|
| Input configuration | 1 | 2 | 3 | 4 |
| 2-wire | ● | | ● | ● |
| 3-wire | | ● | | |
| 4-wire | ● | | | |

| General | |
|---|---|
| Operation voltage range | DC 16.8 – 30 V |
| Rated current | 13.0 mA |
| Status indication | LED yellow, blinks for wire break and output goes to a saturated state |
| Input/output protection | Overvoltage AC/DC 30 V, short circuit-proof output |
| Potential isolation | 3-way isolation<br>Input/output potential: 2.5 $kV_{eff}$, 50 Hz, 1 min |
| Housing material | PA 66 |
| Mounting | DIN rail mountable TS35 (EN 60715) |
| Protection class | IP 20 |
| Installation position | Optional |
| Operation temperature range | - 40 °C… + 70 °C (+ 85 °C for 10 min) |
| Storage temperature range | - 40 °C… + 85 °C |
| Dimensions (w x h x d) | 6.2 x 90.0 x 115.6 mm |
| Weight (kg/piece) | 0.050 |
| Standards | EN 50155; EN 50121-3-2; EN 50124-1; EN 61373; EN 45545-2 |

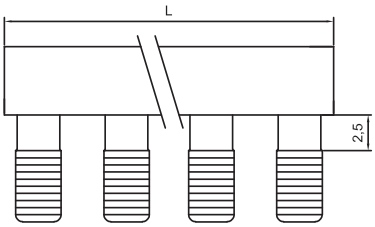
**Circuit**

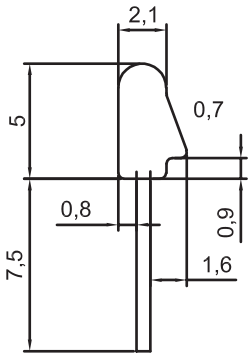



Compatible jumper combs can be found on page 19.

## Jumper combs

| Description | Colour | Part-No. | Rated current | Length | Weight |
|---|---|---|---|---|---|
| 2 pole | red | 762802 | DC 6 A | 12.4 mm | 1.0 g / piece |
| | white | 762803 | DC 6 A | 12.4 mm | 1.0 g / piece |
| | blue | 762804 | DC 6 A | 12.4 mm | 1.0 g / piece |
| 3 pole | red | 762805 | DC 6 A | 18.6 mm | 1.5 g / piece |
| | white | 762806 | DC 6 A | 18.6 mm | 1.5 g / piece |
| | blue | 762807 | DC 6 A | 18.6 mm | 1.5 g / piece |
| 4 pole | red | 762812 | DC 6 A | 24.8 mm | 2.0 g / piece |
| | white | 762813 | DC 6 A | 24.8 mm | 2.0 g / piece |
| | blue | 762814 | DC 6 A | 24.8 mm | 2.0 g / piece |
| 8 pole | red | 762822 | DC 6 A | 49.6 mm | 3.0 g / piece |
| | white | 762823 | DC 6 A | 49.6 mm | 3.0 g / piece |
| | blue | 762824 | DC 6 A | 49.6 mm | 3.0 g / piece |
| 16 pole | red | 762832 | DC 6 A | 99.2 mm | 4.0 g / piece |
| | white | 762833 | DC 6 A | 99.2 mm | 4.0 g / piece |
| | blue | 762834 | DC 6 A | 99.2 mm | 4.0 g / piece |



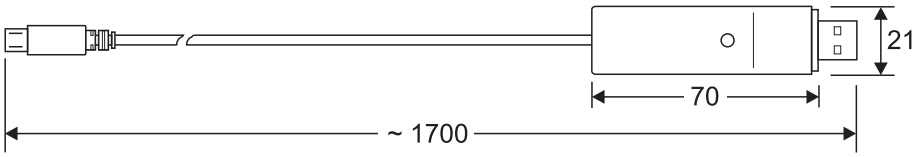




| General Information | 2 pole | 3 pole | 4 pole | 8 pole | 16 pole |
|---|---|---|---|---|---|
| Contact material | tin-plated copper | | | | |
| Contact design | Flat contact 0,5 mm<br>Ribbing on both sides | | | | |
| Pin spacing | 6.2 mm | | | | |
| Material of housing | Vectra C130 | | | | |
| Colour | red / white / blue | | | | |
| Flammability according to UL 94 | V0 | | | | |
| Mounting | pluggable | | | | |
| Storage temperature range | - 40 °C … + 80 °C | | | | |
| Operation temperature range | - 40 °C … + 80 °C | | | | |

## USB service cable

| Input voltage | Part-No. | Weight | Operation temperature range |
|---|---|---|---|
| USB A - Micro USB | 815900 | 0.035 kg / piece | 0 °C … 40 °C |

The USB service cable can be used for the parameterization of Time Relays. For this case there is the driver software "LCON ZB USB Driver" available. The cable includes an galvanic isolated RS232 to USB interface.



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