Janitza 800CT24 Current Measuring Module Instruction Manual

Contents

Janitza®

Janitza 800CT24 Current Measuring Module

General

Disclaimer

Compliance with the usage information for the devices, modules and components is a prerequisite for safe operation and attaining the stated performance characteristics and product features. Janitza electronics GmbH assumes no liability for bodily injury, material damage or financial losses which result from disregard of the usage information. Make sure that your usage information is readily available and legible. Further usage information, such as the installation manual or the user manual for the basic device, can be found on our website, www.janitza.de under Downloads.

Subject to technical alterations.

- Make sure that your device, module or component matches the installation manual.
- First make sure you have read and understood the usage information accompanying the product.
- Keep the usage information associated with the product available for the entire service life and pass it on to any possible subsequent users.
- Please find out about device revisions and the associated modifications of the usage information associated with your product at **www.janitza.com**.

Disposal
Please abide by national regulations! Dispose of individual parts, as applicable, depending on their composition and existing country-specific regulations, e.g. as:

- Electronic waste
- Batteries and rechargeable batteries
- Plastics.
- Metals or engage a certified disposal company to handle scrapping.

Safety

Safety information
The installation manual does not represent a complete set of all safety measures required for the operation of the device (module). Special operating conditions can require additional measures. The installation manual contains information which must be observed to ensure your personal safety and avoid material damage. Safety information in the installation manual is marked by a warning triangle and, in dependence on the degree of hazard, is displayed as follows:

- **DANGER**
  Warns of an imminent danger which, if not avoided, results in serious or fatal injury.
- **WARNING**
  Warns of a potentially hazardous situation which, if not avoided, could result in serious injury or death.
- **CAUTION**
  Warns of an immediately hazardous situation which, if not avoided, can result in minor or moderate injury.
- **ATTENTION**
  Warns of an immediately hazardous situation which, if not avoided, can result in material or environmental

damage.

- **INFORMATION**

  Indicates procedures in which there is no hazard of personal injury or material damage.

Safety measures
When operating electric devices, it is unavoidable for certain parts of these devices and their components to conduct hazardous voltage. Consequently, severe bodily injury or material damage can occur if they are not handled properly.

- Before making connections to the device and its components, ground the device by means of the ground wire connection, if present.
- Hazardous voltages can be present in all circuitry parts that are connected to the power supply.
- There can still be hazardous voltages present in the device or the components even after disconnection from the supply voltage (capacitor storage).
- Do not operate equipment with current trans- former circuits (with secondary-side current output) open.
- Do not exceed the limit values specified in the user manual and on the rating plate. This must also be observed during testing and commissioning!
- Observe the safety information and warning notices in the usage information associated with the devices, modules and components!

WARNING
Hazard due to disregard of warning notices and safety information! Disregard of warning notices and safety information on the device itself and in the usage information for the device and its components can lead to injuries or even death! Observe the safety information and warning notices on the device itself and in the usage information associated with the devices, modules and compo- nents, such as:

- Installation manual.
- Installation supplement.
- User manual.
- Supplement Safety Information.

Qualified personnel
To prevent personal injury and damage to property, only qualified personnel with Electrotechnical training may work on the basic device and its modules and components who have knowledge of:

- The national accident prevention regulations.
- Safety technology standards.
- Installation, commissioning and operation of the device, modules and components.
- **WARNING** Risk of injury due to electric voltage or electric current!

When handling electric currents or voltages, serious bodily injury or death can result from:

- Touching bare or stripped leads that are energized
- Device inputs that pose a hazard when touched.

Before starting work on your system:

- Disconnect the supply of power to the system!
- Secure it against being switched on!
- Check to be sure it is de-energized!
- Ground and short circuit!
- Cover or block off adjacent live parts!

Intended use

The modules/components

- Are intended only for use in the field of industrial controls.
- Are intended as expansion or transfer modules for a basic device (for suitable basic devices, see the user manual for the module in switchboard cabinets and small distribution boards. Please observe the usage information associated with the basic device.
- Only mount with the basic device disconnected from the power supply (see “Mounting” step).
- Not intended for installation in vehicles! Use of the basic device with modules in non-stationary equipment is considered an exceptional environmental condition and is only permissible by special agreement.
- Not intended for installation in environments with harmful oils, acids, gases, vapors, dusts, radiation, etc.

Incoming goods inspection
The prerequisites for trouble-free and safe operation of the devices, modules and components include proper transport, storage, setup and assembly, as well as proper operation and main- tenance. Exercise due caution when unpacking and packing the device, do not use force and only use suitable tools.

Check:

- Visually inspect the devices, modules and components for flawless mechanical condition.
- Check the scope of delivery (see user manual) for completeness before you begin installing your devices and components.
- If it must be assumed that safe operation is no longer possible, immediately put your device with module and components out of service and secure against unintentional startup.

It can be assumed that safe operation is impossible if the basic device with the modules and components, for example:

- has visible damage.
- No longer functions despite an intact power supply.
- Was subjected to extended periods of unfavorable conditions (e.g. storage outside of the permissible climate thresholds without adjustment to the room climate, condensation, etc.) or transport stress (e.g. falling from an elevated position, even without visible external damage, etc.).

Brief device description

The current measuring module

- Extends the functional range of a basic device by 24 additional current measuring channels.

- Is suitable for low-power current transformers with a secondary voltage of 0 to 333 mV.
- Has an input and output for integration into a Jan- Bus topology with a basic device. The 800-CT24 module requires at least one 800-CON-RJ45 module for this purpose! (The interfaces of the transfer module are proprietary RJ45 JanBus interfaces! Do not connect to RJ45 Ethernet interfaces!)

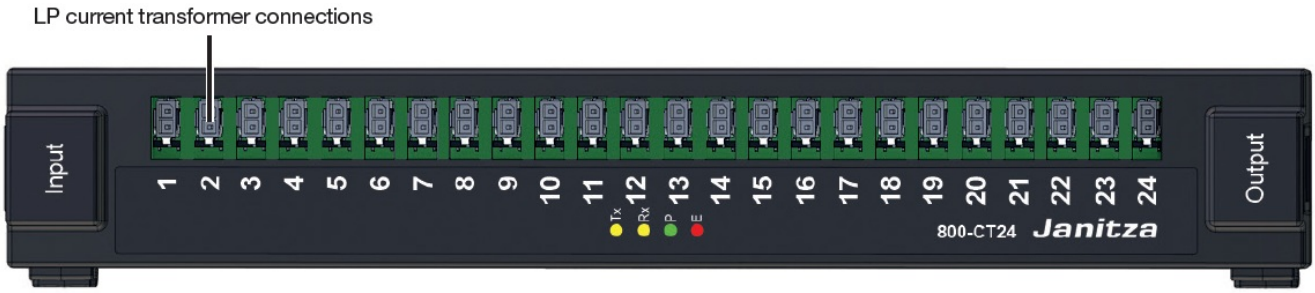


Fig.: 800-CT24 module

A basic device

- With the 800-CT24 module measures current ex- clusively via low-power current transformers. The LP current transformer and the primary measuring line each require basic insulation in accordance with IEC 61010-1 – alternatively, use a double-in- sulated LP current transformer.
- Allows integration of the 800-CT24 module into a combined JanBus topology. Please refer to the usage information for the 800-CON-RJ45 transfer module for information on this.
- The number of permissible 800-CT24 modules on a on a base unit can be found in the “Tab. suitable Basic devices” in the user manual for the module.

INFORMATION

- The 800-CON-RJ45 module and the RJ45 cables are not included in the scope of delivery of the 800-C124 module!
- In addition to the usage information for the 800-CT24 module, also observe all usage information for the modules and components integrated in the JanBus topology, especially that of your basic device!

Mounting

CAUTION
Disregard of the installation instructions may cause property damage or personal injury! Disregard of the installation instructions may cause damage to your basic device with modules and components or destroy it and/or may also result in personal injury.

- Observe the assembly instructions of your basic device.
- Before installing modules and components:
- Disconnect the supply of power to the system!
- Secure it against being switched on!
- Check to be sure it is de-energized!
- Ground and short circuit!
- Cover or block off adjacent live parts!
- Provide adequate air circulation in your installation environment, and cooling as needed.

- Send defective modules back to the manufacturer.

Observing the installation manual for the 800-CON- RJ45 module, mount the 800-CT24 module with the system disconnected from the power supply as follows:

1. Press your 800-CT24 module onto the DIN rail until the bottom bolts engage.
2. Connect the 800-CON-RJ45 module to the input side of the 800-C124 module. Use a commercially available Ethernet cable (RJ45 cable forJanBus communication) for this purpose.
3. Connect the output side of the 800-CT24 module to
    - the input side of the next 800-CT24 module.
    - another 800-CON-RJ45 transfer module to extend the JanBus topology (see step 5 “JanBus topologies – examples with 800-CT24 modules”).

      The basic device automatically recognizes the module during the start-up process! The number of permitted 800-CT24 modules on a basic device can be found in the “Tab. suitable basic devices” in the user manual for the module. Please note the number of available module slots on the basic device (see usage information for the 800-CON-RJ4 transfer module)!

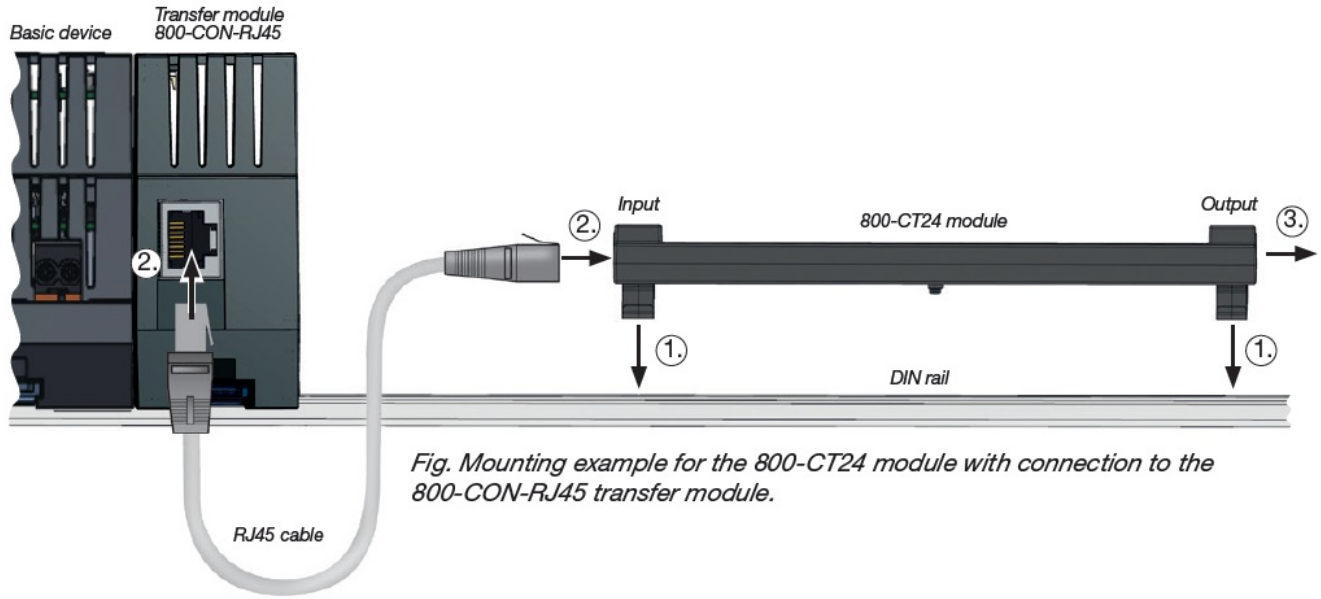


Fig. Mounting example for the 800-CT24 module with connection to the 800-CON-RJ45 transfer module.

ATTENTION
The basic device does not recognize the module during the power-up procedure! If there is no communication to the module, the module functions are not supported (e.g. current measurements).

- Disconnect your system from the power supply and check the RJ45 cable and the connection of the module to the basic device (seating of the contacts of the RJ45 module).
- The interfaces of the module are proprietary RJ45 JanBus interfaces! Do not connect to RJ45 Ethernet interfaces!
- If necessary, restart the basic device. If these measures do not lead to the desired result, please contact Janitza Support – www.janitza.com

JanBus topologies – examples with the 800-CT24 module
Topology example: JanBus communication between the basic device and 3 modules of the type 800-C124 via module 800-CON-RJ45 and RJ45 cables.

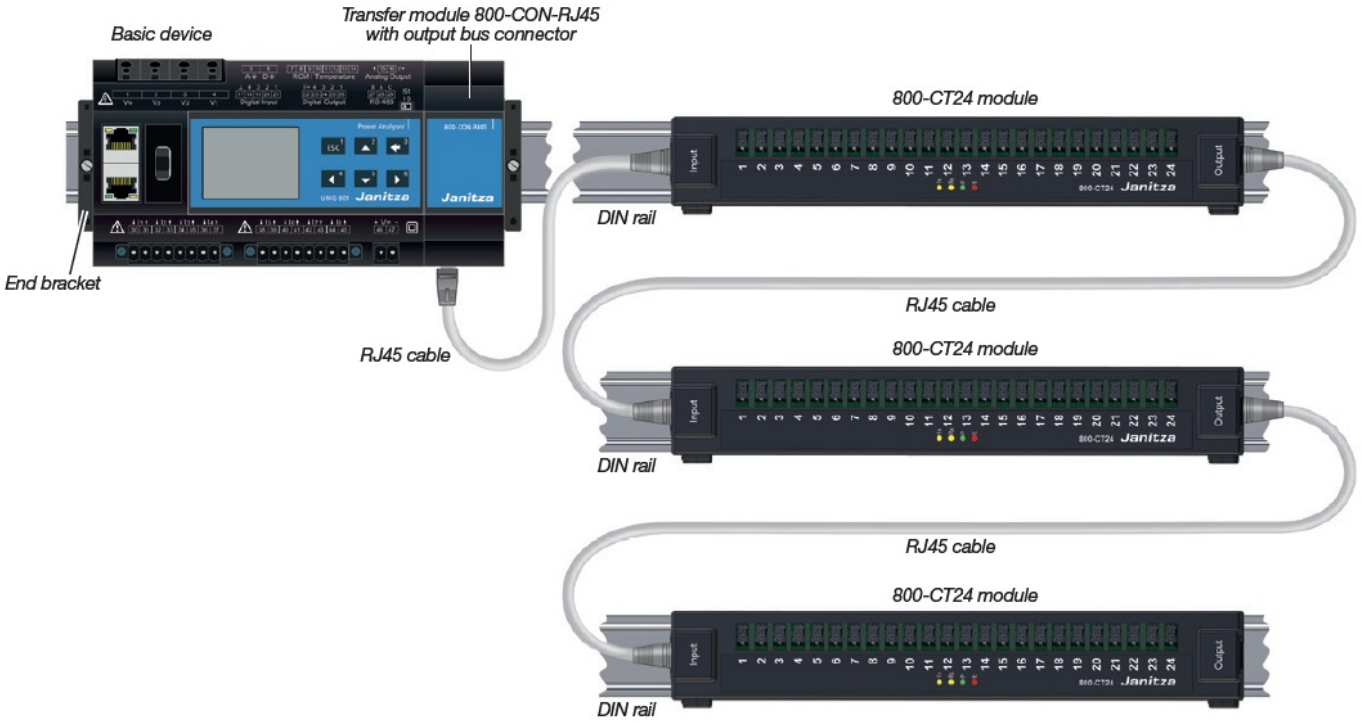


Fig. Topology example: Basic device with 800-CON-RJ45 module and 3x 800-CT24 modules.

Topology example: JanBus communication in a combined module topology with module 800-CT24 and various other modules via RJ45 cables.

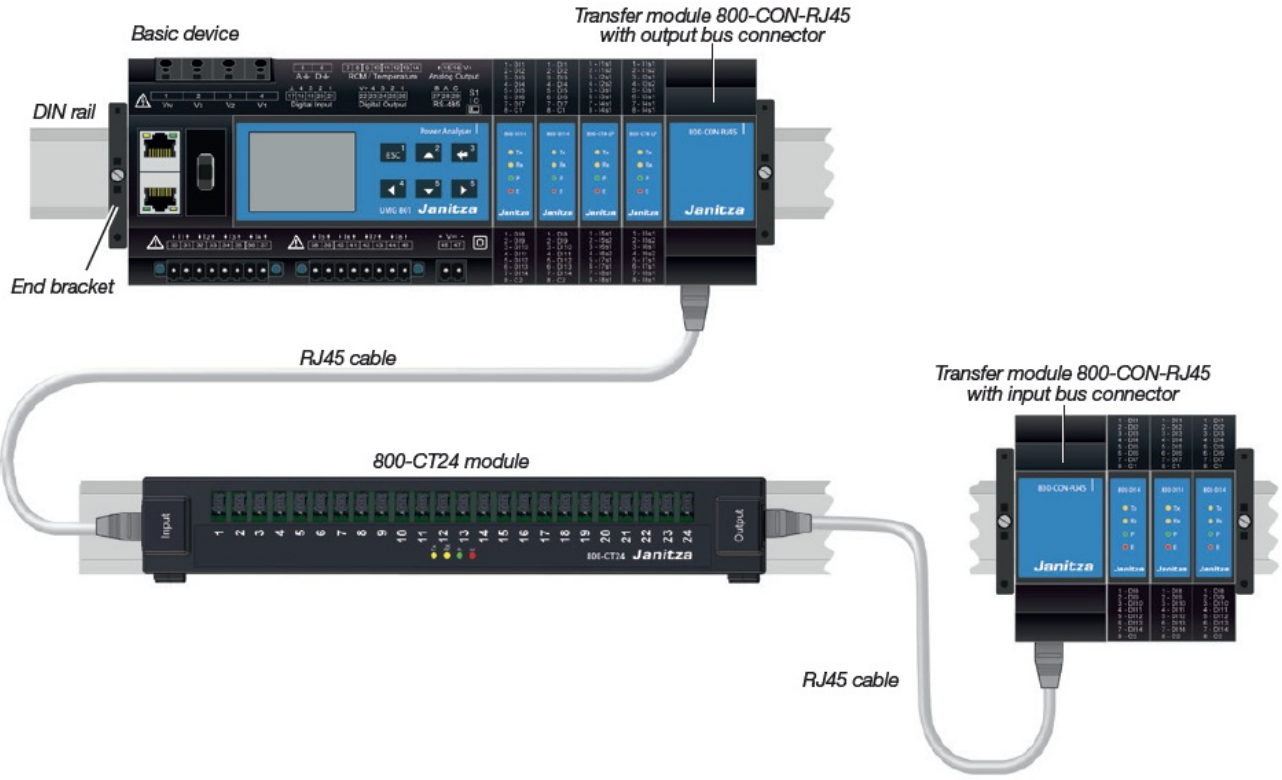


Fig. Topology example: Basic device with various modules

INFORMATION
Please note the following for the setup and dimensioning of your measurement device and module topology with an 800-CT24 module:

- 1 module of type 800-C124 has 24 current measurement channels.
- The usage information of measurement devices, modules and components of your topology, in particular the

usage information of the 800-CON- RJ45 transter module!

- The interfaces of the 800-CT24 module are propri- etary Ru45 JanBus interfaces! Do not connect to RJ45 Ethernet interfaces!
- Use a commercially available RJ45 cable (RJ45 patch cable) for trouble-free JanBus communication in your measurement device and module topology.
- Use end brackets to set up your rows of measuring devices and modules on the DIN rails.

System limits:
Before mounting, please check the number of suitable modules (slot requirements) for your mea- surement device and module topology based on the respective usage information (see user manuals for the modules). The 800-CON-RJ45 transfer module does not occupy a slot! The maximum bus length of the JanBus (proprietary) for setting up measuring device and module topologies can be found in the “Technical data”.

Current measurement

The 800-CT24 module:

- Measures current exclusively via low-power current transformers.
- Allows the connection of LP current transformers with a secondary voltage of 0 … 333 mV.
- Does not measure DC currents.

INFORMATION
You can configure the (LP) current transformer ratios via the user interface of the basic device.
Recommendation: Configure the (LP) current trans- former ratios simply and in a self-explanatory way in the “Device configuration” function of the GridVis software.

WARNING
Risk of injury due to high currents and high electrical voltages!

Severe bodily injury or death can result from:

- Touching bare or stripped leads that are energized.
- Inputs of devices, components and modules are dangerous to touch.

Therefore, please note for your system:

- Disconnect the supply of power before starting work!
- Secure it against being switched on!
- Check to be sure it is de-energized!
- Ground and short circuit! Use the ground connection points with the ground symbol for grounding! Cover or block off adjacent live parts!

WARNING

- Of electrical currents and voltages! Current transformers operated while open on the secondary side (with current output on the secondary side) can result in severe bodily injury or death (high voltage peaks).
- Avoid exposed operation of the current trans- formers and short circuit unloaded transformers!

ATTENTION

- Incorrectly dimensioned or connected current transformers (LP current transformers) can lead to material damage! Reversed (LP) current transformer terminals (*k" and "l") or incorrectly dimensioned (LP) current transformers can lead to incorrect measurement results and/or incorrect control performance!
- When connecting a (LP) current transformer, it is essential to observe the designations on the transformer!
- The polarity of the (LP-) current transformers and thus the "energy flow direction" runs from "k" to "l"! The polarity of the (LP) current transformers may differ depending on the model!
- Also observe the technical connection requirements and the markings on the rating plate of your (LP) current transformers.

Connection diagram "Current measurement" for 1st 800-CT24 module
The example in the figure shows the connection diagram, for example, for current measurement via LP current transformers on the first 6 current measuring channels of the 800-C124 module (measurements on two L1-L3 systems).

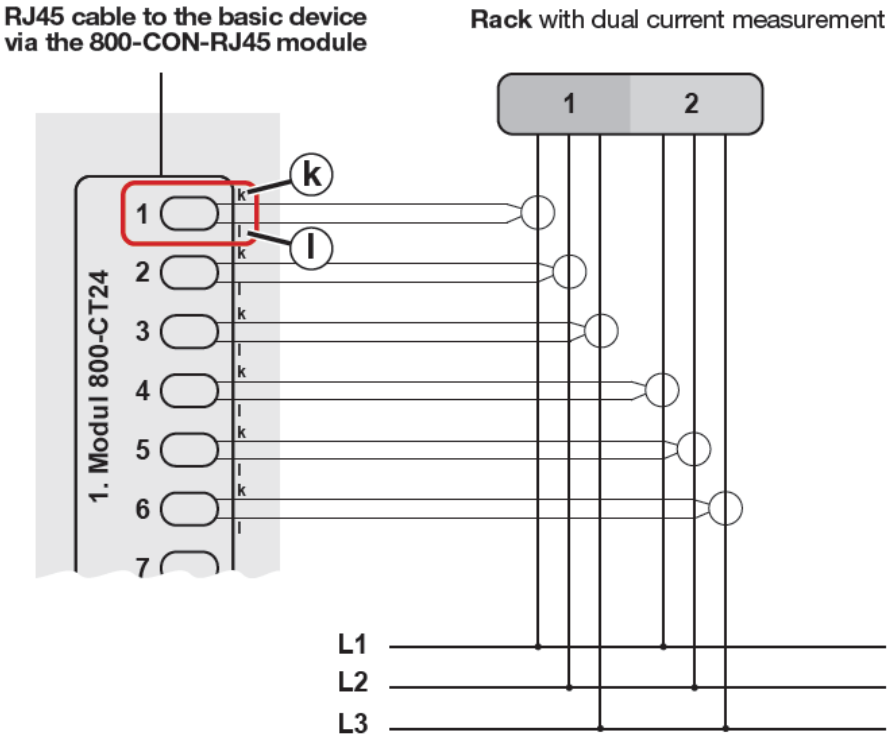


Fig.: Connection diagram – current measurement via LP current transformer.

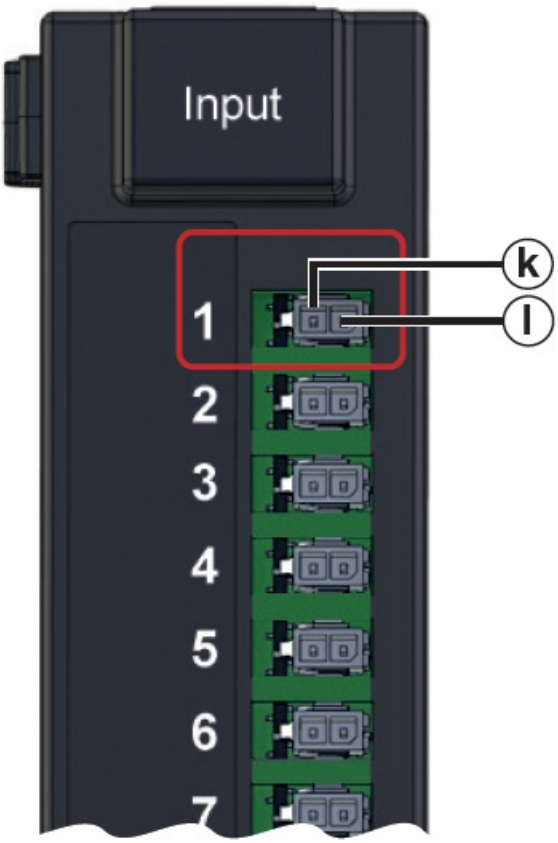


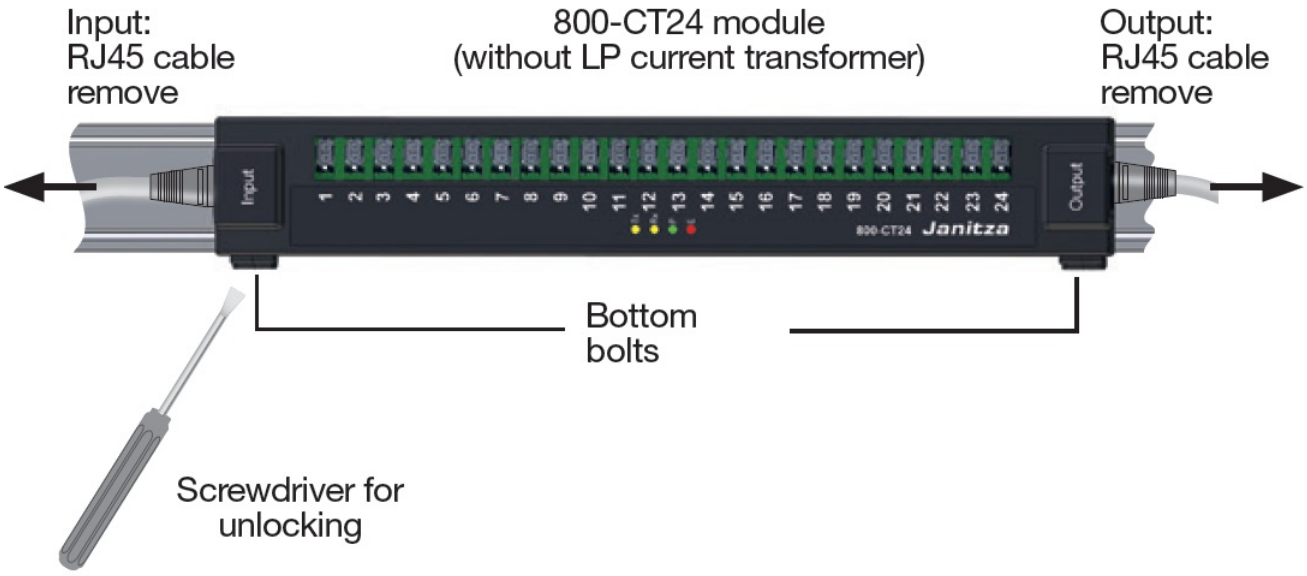
Fig.: Module 800-CT24 – LP current transformer connection "k" and "l".

3 modules of the 800-CT24 in the JanBus topology allow the measurement of 72 additional current measuring channels.

Dismounting

Dismounting the module:

1. Disconnect the supply of power to the system Secure it against being switched on! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!
2. Disconnect the 800-CT24 module from the JanBus topology by removing the RJ45 cable.
3. Disconnect the wiring of your module (remove LP current transformer).
4. Unlock all bottom bolts of your module
   Recommendation: Use a screwdriver (be careful!).
5. Remove your module from the DIN rail.



ATTENTION
Handling your module too roughly may cause damage to the module and result in material damage! The bottom bolts can be damaged or broken off when dismounting your module.

- Never pull the module out of the DIN rail forcefully.
- First remove the RJ45 cable, the wiring of the LP current transformers and then carefully unlock the bottom bolts of the module with a screwdriver!

ATTENTION
Material damage due to disassembly or decoupling of the module during operation! is mounting or decoupling the module during comunication with the basic device can cause damage to your devices!

- Disconnect your system from the power supply prior to dismounting or disconnecting the module. Secure it against being switched back on! Check to be sure it is de-energized! Ground and short circuit! Cover or block off adjacent live parts!

Technical data

General	
Net weight	120 g (0.26 lb)
Device dimensions	W = 248 mm (9.76 in), H = 42 mm (1.65 in) , D = 37 mm (1.46 in)
Mounting orientation	As desired
Fastening/mounting – Suitable DIN rails (35 mm / 1.38 in)	· TS 35/7.5 according to EN 60715 · TS 35/10 · TS 35/15 x 1.5
Protection against for- eign matter and wat er	IP20 according to EN60529
Impact resistance	IK07 according to IEC 62262

Transport and storage The following specifications apply for devices transported and stored in the original packaging	
Free fall	1 m (39.37 in)
Temperature	K55 – -25 °C (-13 °F) to +70 °C (158 °F)
Relative humidity	0 to 95% at 25 °C (77 °F), no condensation

Environmental conditions during operation

The module:

· Must only be operated with suitable basic devices (see user manual for the module).

· Is for weather-protected and stationary use.

· Fulfills the operating conditions according to DIN IEC 60721-3-3.

· Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!

Working temperature	-10 °C (14 °F) .. +55 °C (131 °F)
Relative humidity in operation	5 to 95% at 25 °C (77 °F), no condensation
Pollution degree	2
Ventilation	No forced ventilation required.

Current measurement	
Rated voltage for the low-power current trans- forme rs	333 mV
Channels	24 (6×4) · 6 systems – L1, L2, L3, N (optional) · 24 single channels
Measuring range	0 … 400 mV
Crest factor	1.8
Overload for 1 s	1 V
Resolution	16 bit
Sampling frequency	6.8 kHz
Frequency of the fundamental oscillation	40 Hz .. 70 Hz
Harmonics	1 .. 15 (odd only)

Interfaces	
RJ45 interface (In/Out)	JanBus (proprietary) via RJ45 cable (RJ45 patch cable).
JanBus (proprietary) – The maximum bus length of the JanBus/RJ45 cable length	Cat 7/7a = 100 m (109.36 yd) (AWG 22: Ø = 0.64 mm, Cross-sectional area = 0.33 mm²)
	Cat 6/6a = 75 m (82.02 yd) (AWG 23: Ø = 0.57 mm, Cross-sectional area = 0.26 mm²)
	Cat 5/5e = 60 m (65.62 yd) (AWG 24: Ø = 0.51 mm, Cross-sectional area = 0.21 mm²)
LP current transformer interface	Micro Mate-N-Lok connector, reverse polarity protected

Compatible low-power current transformers with TE connectors

Available for purchase at Janitza electronics GmbH!

Primary current/line length	Designation
50 A / 2 m	CT24-SC-010-200-50/333mV, Kl. 0.5
75 A / 2 m	CT24-SC-010-200-75/333mV, Kl. 0.5
100 A / 2 m	CT24-SC-012-200-100/333mV, Kl. 0.5
50 A / 0.25 m	CT24-SC-010-025-50/333mV, Kl. 0.5
75 A / 0.25 m	CT24-SC-010-025-75/333mV, Kl. 0.5
100 A / 0.25 m	CT24-SC-012-025-100/333mV, Kl. 0.5

Module 800-CT24 LEDs	
Tx (send data)	Blink “orange” during operation and indicate cyclic data exchange.
Rx (receive data)	
P (power – power supply)	Lights “green” if the supply of power via the JanBus interface is correct.
E (error – initialization and malfunction)	Lights “red” when initializing/starting the device and in the event of a fault.

INFORMATION

- Detailed technical data on the module can be found in the user manual at **www.janitza.de** (download area).
- Technical data on the basic device and information on how to proceed in the event of a fault can be found in the usage information of your basic device.

UK Represented by:
Authorised Rep Compliance Ltd., ARC House, Thurnham, Lancaster, LA2 ODT, UK.

Documents / Resources

	Janitza 800CT24 Current Measuring Module [pdf] Instruction Manual 800CT24 Current Measuring Module, 800CT24, Current Measuring Module, Measuring Module

References

- User Manual