



■ Transportation Solutions

# LUNA – LÜTZE Universal Network Adapter

**Intelligent control system for switching, monitoring  
and protecting of 24 V actuators on trains**

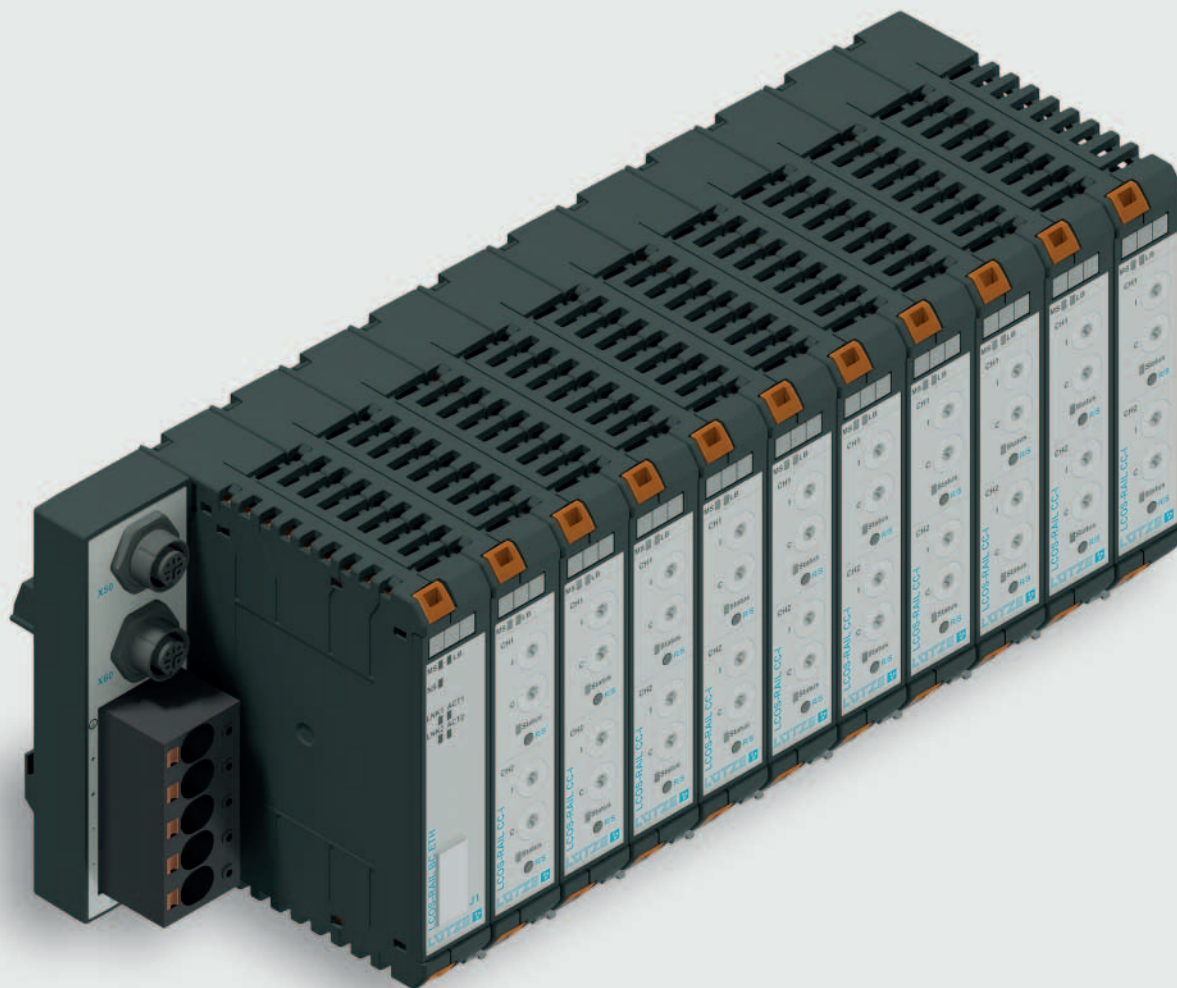
# LUNA – System for data collection for predictive maintenance on trains



The new intelligent control system LUNA enables intelligent switching, monitoring, and protecting of 24 V actuators on trains. By connecting to Ethernet TRDP, the connected actuators can be remotely switched on and off. This allows installation even in inaccessible locations. Through continuous current monitoring, upcoming failures of the consumers can be detected early based on the collected data and replaced as part of preventive maintenance.

The LUNA system consists of a TRDP bus coupler, current monitoring modules, compact supply modules Ethernet and compact extension modules. The current monitoring modules feature a 2-pole disconnection with galvanic isolation, adjustable current ranges up to 10 A, and 5 different characteristics. The compact power supply- and extension modules are available with 6 or 11 slots, and allow supply currents up to 100 A.

# LUNA – System



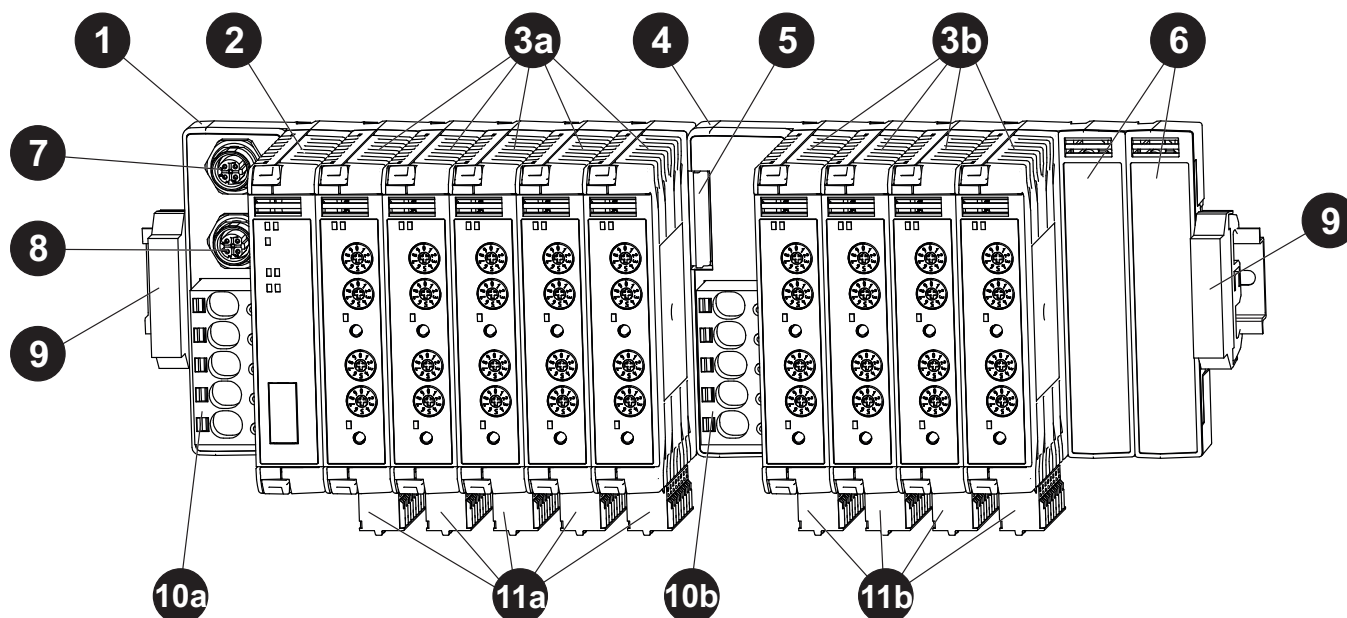
## Key Features

- Ethernet TRDP bus coupler
- 2-channels per module
- 2-pole switching with galvanic isolation
- Current ranges up to 10 A per channel
- 5 different characteristics
- Triggering behavior independent of temperature
- Parameter setting optionally via configuration data or rotary switch
- Up to 32 current control modules per bus coupler
- Supply current up to 100 A per supply- or extension module
- DIN rail mounting
- Simple commissioning and configuration using the LÜTZE LUNA Configuration Framework Tool (LUNA LCF)

## Product Overview

| Type                       | Part no.    | Description                                     |
|----------------------------|-------------|-------------------------------------------------|
| Bus Coupler                | 819600      | Bus coupler LUNA BC-TRDP                        |
| Current Monitoring Modules | 819601.0606 | Current monitoring module LUNA CC-I 6 A / 6 A   |
|                            | 819601.1006 | Current monitoring module LUNA CC-I 10 A / 6 A  |
|                            | 819601.1010 | Current monitoring module LUNA CC-I 10 A / 10 A |
| Infrastructure Components  | 819602.006  | Compact supply module Ethernet LUNA ES 6 slots  |
|                            | 819602.011  | Compact supply module Ethernet LUNA ES 11 slots |
|                            | 819603.006  | Compact extension module LUNA EW 6 slots        |
|                            | 819603.011  | Compact extension module LUNA EW 11 slots       |

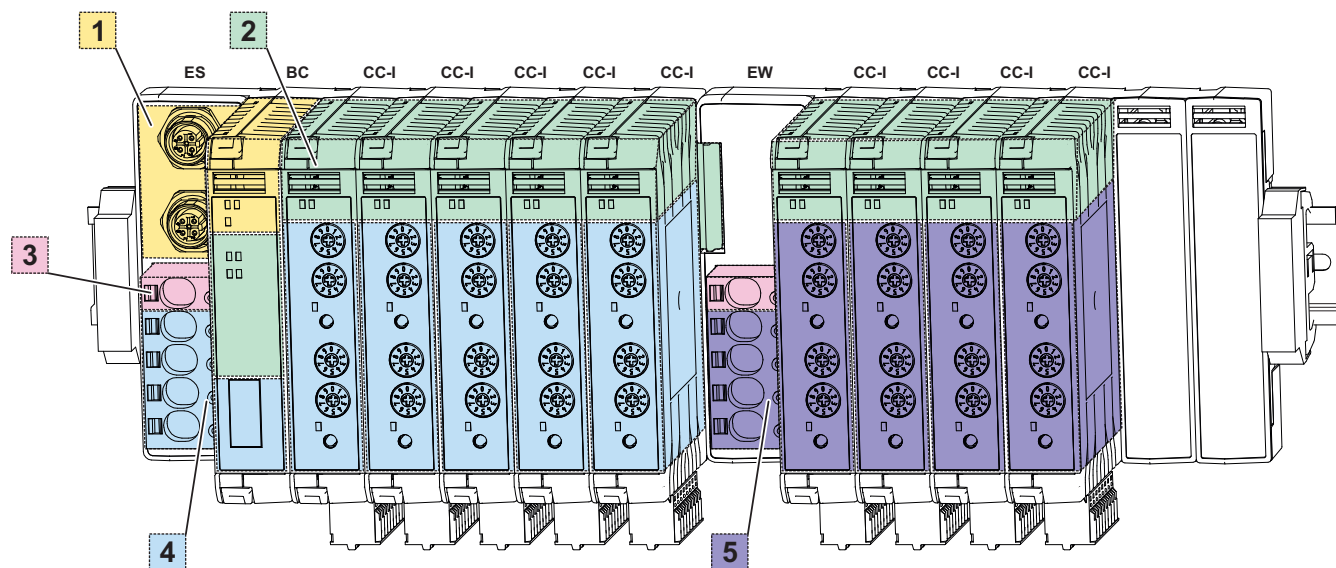
## System Structure – LUNA



| No.       | Description                                                                                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Backplane: Compact supply module Ethernet LUNA ES                                                                                                 |
| 2         | Bus coupler LUNA BC-TRDP (supply voltage area A)                                                                                                  |
| 3a / 3b   | Current monitoring modules LUNA CC-I (supply voltage area A) / Current monitoring modules LUNA CC-I (supply voltage area B)                       |
| 4         | Backplane: Compact extension module LUNA EW                                                                                                       |
| 5         | Extension connection data bridge                                                                                                                  |
| 6         | Cover for module slot                                                                                                                             |
| 7 / 8     | Ethernet connectors 100BaseT, M12 D-coded, female                                                                                                 |
| 9         | End bracket                                                                                                                                       |
| 10a / 10b | Supply Powerbus (supply voltage area A) / Supply Powerbus (supply voltage area B)                                                                 |
| 11a / 11b | Connection terminals current monitoring modules (supply voltage area A) / Connection terminals current monitoring modules (supply voltage area B) |

# LUNA – System

## Operating Bus Systems – LUNA



| No. | Description                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Fieldbus: Ethernet TRDP (Train Realtime Data Protocol) acc. to IEC 61375-2-3 and diagnostic via LUNA web server                                                                                                                                                                                                                                                                                                                              |
| 2   | Internal data bus: The backbone of LUNA is the internal L-BUS <sup>2</sup> (LÜTZE bus), via all data is exchanged between the current control modules (DEVICES) and the bus coupler (HEAD). In case of a malfunction of one or several DEVICES, the HEAD can unambiguously record this malfunction and continue to address the intact modules. The functionality and availability of the overall system is retained despite the malfunction. |
| 3   | PE / shielding                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4   | Power bus - compact supply module Ethernet (max. 100 A)                                                                                                                                                                                                                                                                                                                                                                                      |
| 5   | Power bus - compact extension module (max. 100 A)                                                                                                                                                                                                                                                                                                                                                                                            |

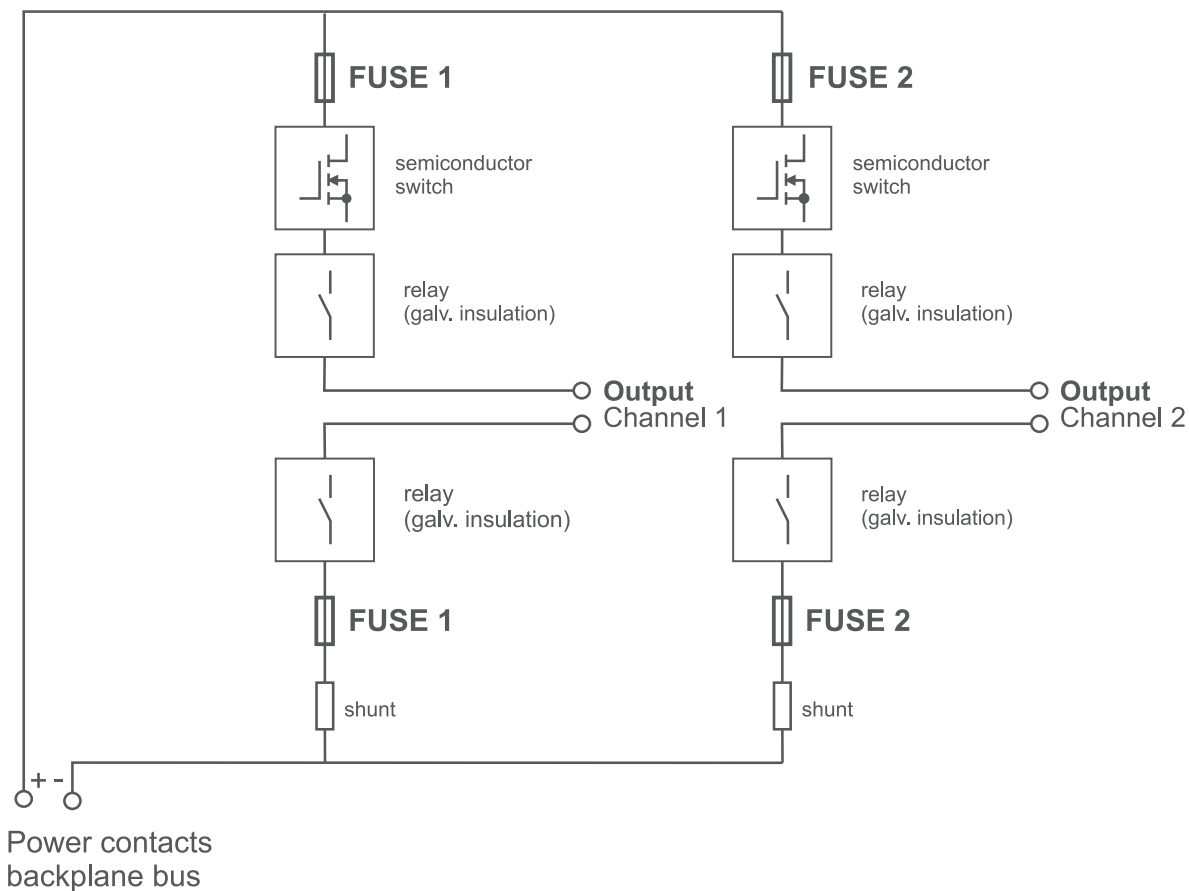
## Functionality – LUNA CC-I

In the event of a fault or overcurrent, a semiconductor switch interrupts the current flow in the positive path. Then a relay contact opens in both the positive and negative paths, ensuring a 2-pole, galvanically isolated disconnection. All LUNA CC-I modules have a fixed installed back-up fuse in both the positive and negative paths to ensure cable protection in the event of an electronics failure. The 6 A channels are protected by a 10 A fuse and the 10 A channels by a 15 A fuse. The cross-sections of the connected cables must be dimensioned according to the tripping current of these fuses.

**819601.1010: FUSE 1: 15A / FUSE 2: 15A**

**819601.1006: FUSE 1: 15A / FUSE 2: 10A**

**819601.0606: FUSE 1: 10A / FUSE 2: 10A**



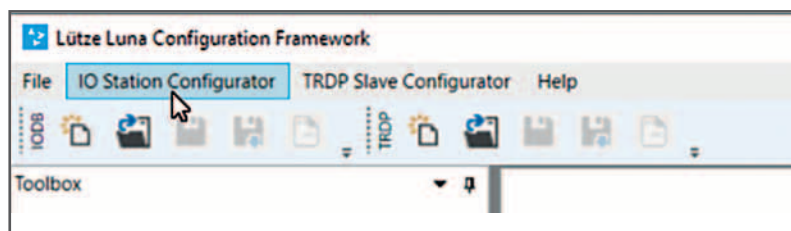
# LÜTZE LUNA Configuration Framework Tool

The LÜTZE LUNA Configuration Framework Tool is used to generate configuration files for the HEAD (bus coupler) and to configure a LUNA system.

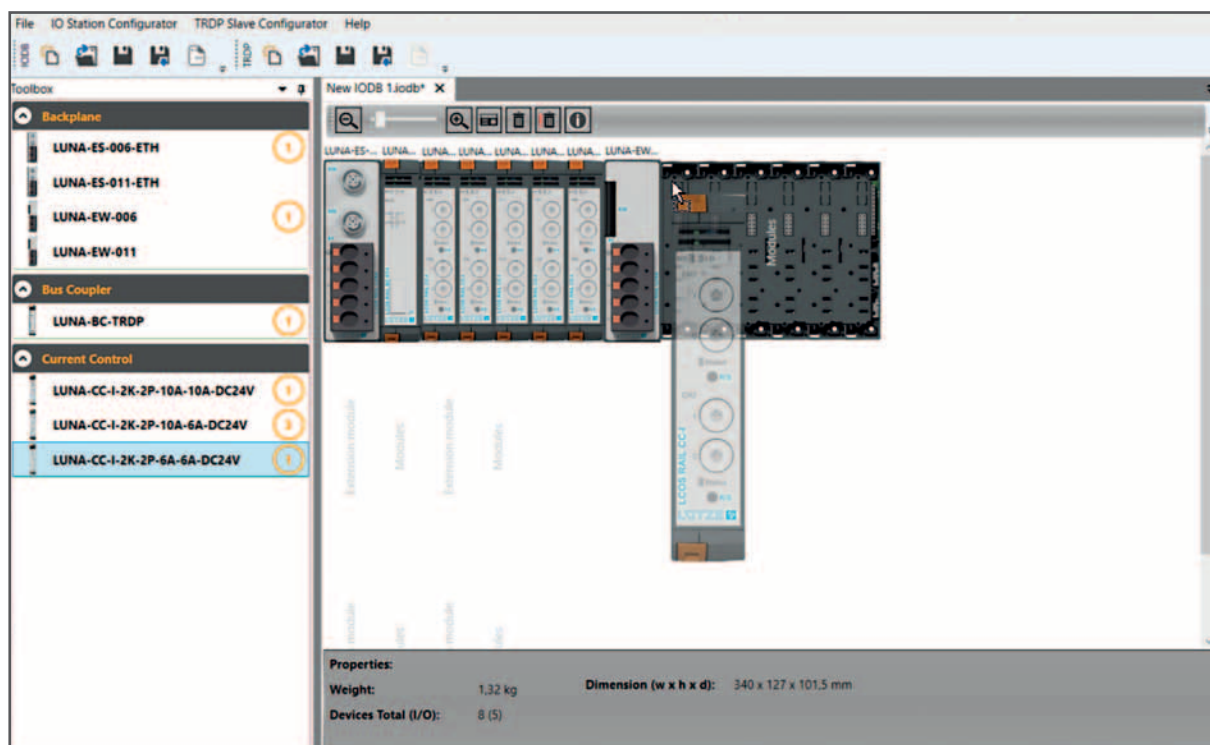
The LCF is an innovative software platform of the LUNA system. It supports the user during all project phases, starting with the planning of the LUNA stations, through the fieldbus configuration to the configuration of the LUNA CC-I modules.

The LCF contains two configuration components:

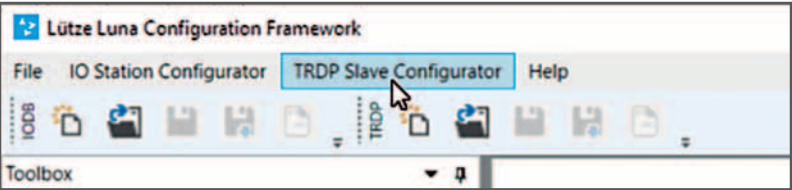
## I/O Station Configurator



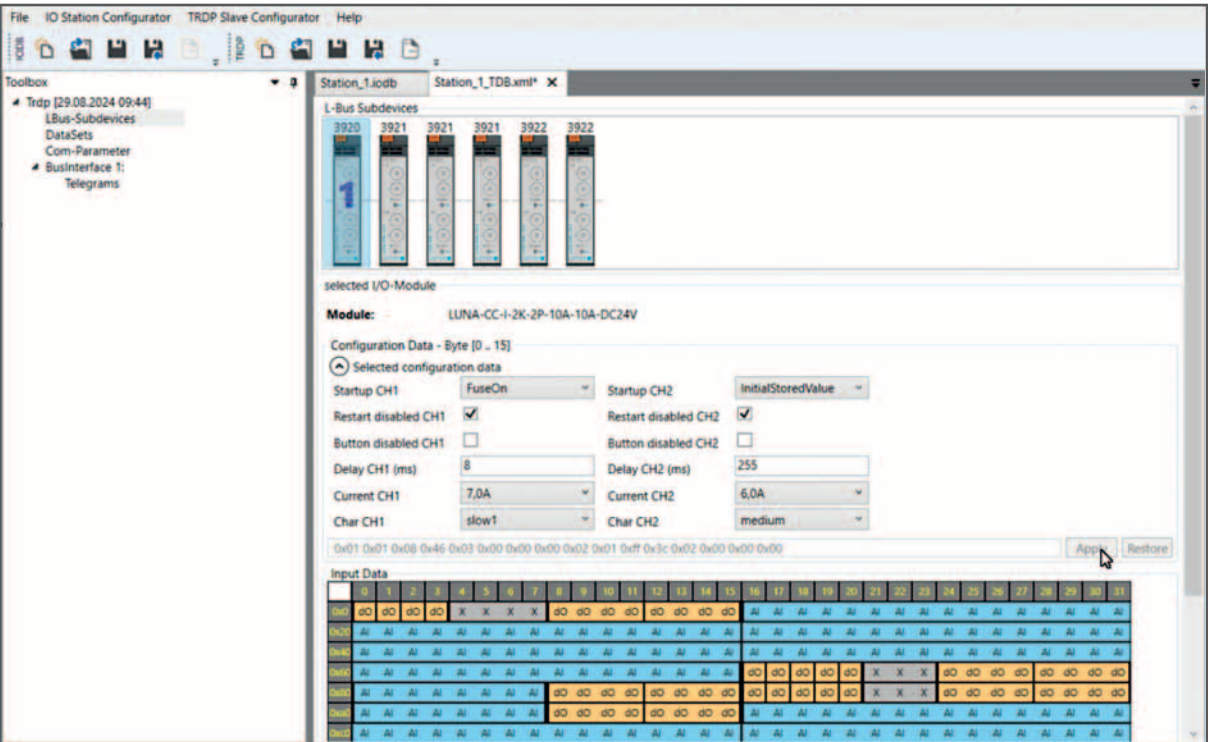
The composition of the LUNA station is configured in the I/O Station Configurator. This includes all components of the LUNA system.



## TRDP Slave Configurator



With the TRDP Slave Configurator a TRDP XML (TDP) file can be generated to setup the TRDP communication parameters of the LUNA TRDP bus coupler as well as the configuration and data mapping of the LUNA CC-I modules.

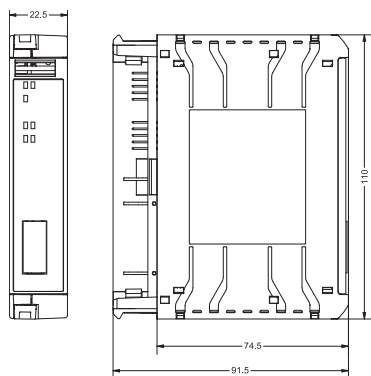


# Technical Data – LUNA

## Bus Coupler Ethernet TRDP



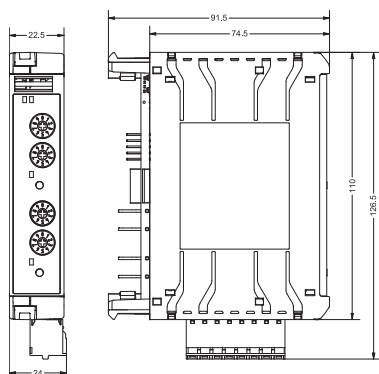
|                               |                                                                               |
|-------------------------------|-------------------------------------------------------------------------------|
| Part no.                      | 819600                                                                        |
| Type                          | LUNA BC-TRDP                                                                  |
| Safety integrity              | Basic integrity according to EN 50657                                         |
| Fieldbus                      | Ethernet 802.3, 100 Base TX 2 with TRDP (TCNOpen V1.4.1.0)                    |
| Local bus                     | L-Bus <sup>2</sup> Interface for local I/O modules                            |
| Module type                   | HEAD (Master)                                                                 |
|                               | Max. number of connectable slaves: 32                                         |
| Diagnostics and configuration | Via Webserver: Default IP 10.0.1.29 (Bridge Mode)                             |
| Operating voltage             | DC 24 V                                                                       |
| Operating temperature         | -40 °C to +70 °C                                                              |
| Dimensions (w x h x d)        | 22.5 mm x 110.0 mm x 91.5 mm                                                  |
| Standards                     | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2 |



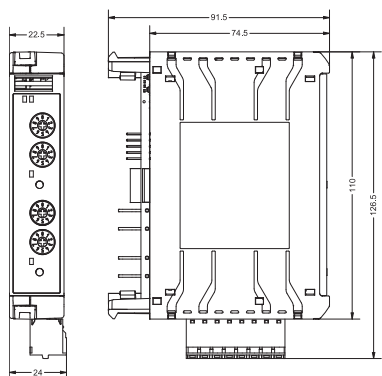
## Current Monitoring Modules



|                                |                                                                                                                                                                             |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part no.                       | 819601.0606                                                                                                                                                                 |
| Type                           | LUNA CC-I 2K-2P 6A / 6A DC 24V                                                                                                                                              |
| Local bus                      | L-Bus <sup>2</sup>                                                                                                                                                          |
| Module type                    | DEVICE (Slave)                                                                                                                                                              |
| Data capacity in process image | 2 Byte outputs / 30 Byte inputs / Configuration data (see operating manual)                                                                                                 |
| Operating voltage              | DC 24 V                                                                                                                                                                     |
| Output current                 | Channel 1: DC 1 A - 6 A<br>Channel 2: DC 1 A - 6 A<br>(adjustable via switch or configuration data in 1 A steps)<br>Total output current of the module (permanent): DC 12 A |
| Back-up fuse                   | Per channel: 10 A                                                                                                                                                           |
| Characteristic                 | Per channel: fast, medium, slow 1, slow 2, slow 3 (adjustable via switch or configuration data)                                                                             |
| Switching element              | MOSFET transistor + 2 relays                                                                                                                                                |
| Connection type                | Push-In terminals, pluggable                                                                                                                                                |
| Operating temperature          | -40 °C to +70 °C                                                                                                                                                            |
| Dimensions (w x h x d)         | 22.5 mm x 110.0 mm x 91.5 mm                                                                                                                                                |
| Standards                      | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2                                                                                               |

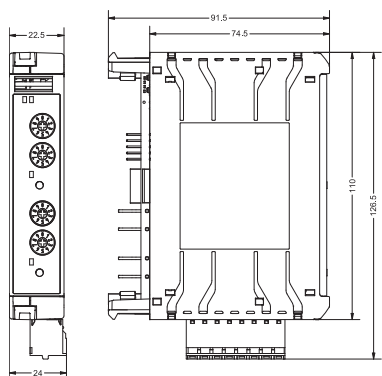


## Current Monitoring Modules



|                                |                                                                                                                                                                        |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part no.                       | 819601.1006                                                                                                                                                            |
| Type                           | LUNA CC-I 2K-2P 10A / 6A DC 24V                                                                                                                                        |
| Local bus                      | L-Bus <sup>2</sup>                                                                                                                                                     |
| Module type                    | DEVICE (Slave)                                                                                                                                                         |
| Data capacity in process image | 2 Byte outputs / 30 Byte inputs / Configuration data (see operating manual)                                                                                            |
| Operating voltage              | DC 24 V                                                                                                                                                                |
| Max. output current            | Channel 1: 1 A - 10 A<br>Channel 2: 1 A - 6 A<br>(adjustable via switch or configuration data in 1 A steps)<br>Total output current of the module (permanent): DC 14 A |
| Back-up fuse:                  | Channel 1: 15 A / Channel 2: 10 A                                                                                                                                      |
| Characteristic                 | Per channel: fast, medium, slow 1, slow 2, slow 3 (adjustable via switch or configuration data)                                                                        |
| Switching element              | MOSFET transistor + 2 relays                                                                                                                                           |
| Connection type                | Push-In terminals, pluggable                                                                                                                                           |
| Operating temperature          | -40 °C to +70 °C                                                                                                                                                       |
| Dimensions (w x h x d)         | 22.5 mm x 110.0 mm x 91.5 mm                                                                                                                                           |
| Standards                      | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2                                                                                          |

## Current Monitoring Modules



|                                |                                                                                                                                                                               |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part no.                       | 819601.1010                                                                                                                                                                   |
| Type                           | LUNA CC-I 2K-2P 10A / 10A DC 24V                                                                                                                                              |
| Local bus                      | L-Bus <sup>2</sup>                                                                                                                                                            |
| Module type                    | DEVICE (Slave)                                                                                                                                                                |
| Data capacity in process image | 2 Byte outputs / 30 Byte inputs / Configuration data (see operating manual)                                                                                                   |
| Operating voltage              | DC 24 V                                                                                                                                                                       |
| Max. output current            | Channel 1: DC 1 A - 10 A<br>Channel 2: DC 1 A - 10 A<br>(adjustable via switch or configuration data in 1 A steps)<br>Total output current of the module (permanent): DC 14 A |
| Bak-up fuse                    | Per Channel: 15 A                                                                                                                                                             |
| Characteristic                 | Per channel: fast, medium, slow 1, slow 2, slow 3 (adjustable via switch or configuration data)                                                                               |
| Switching element              | MOSFET transistor + 2 relays                                                                                                                                                  |
| Connection type                | Push-In terminals, pluggable                                                                                                                                                  |
| Operating temperature          | -40 °C to +70 °C                                                                                                                                                              |
| Dimensions (w x h x d)         | 22.5 mm x 110.0 mm x 91.5 mm                                                                                                                                                  |
| Standards                      | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2                                                                                                 |

# Technical Data – LUNA

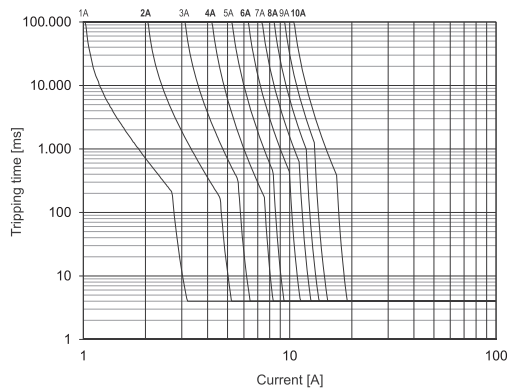
## Current Monitoring Modules - Characteristics

The LUNA CC-I modules feature 5 triggering characteristics per channel, which can be set via switch or configuration data.

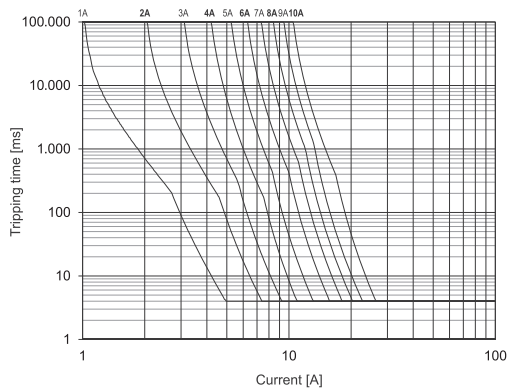
These five characteristic curves were reproduced electronically and have significantly less tolerances than typical characteristic curves based on magnetic or thermal principles.

The electronically simulated characteristic curves offer a much more reliable and consistent performance.

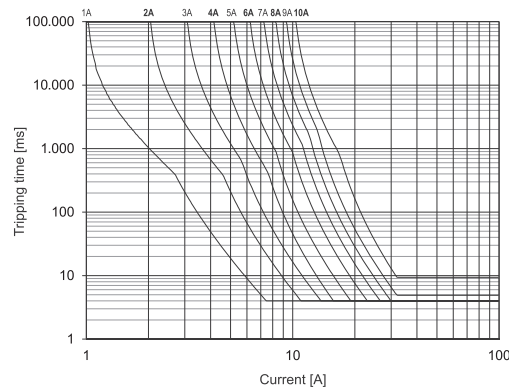
### 1. Characteristic fast



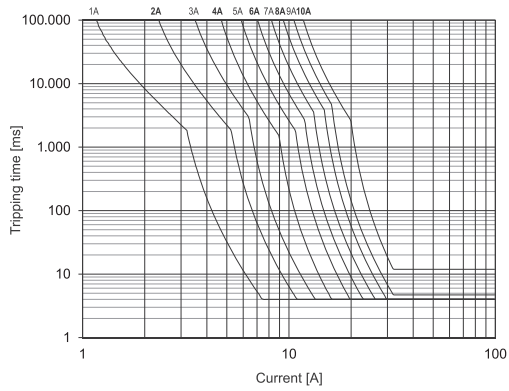
### 2. Characteristic medium



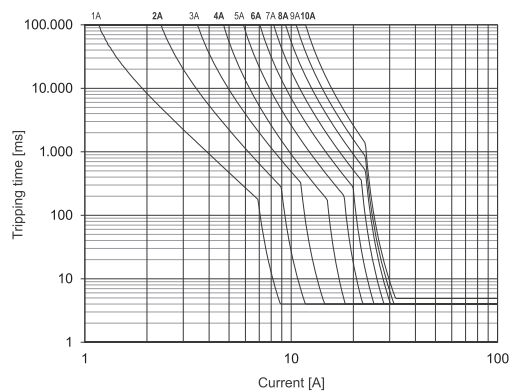
### 3. Characteristic slow-1



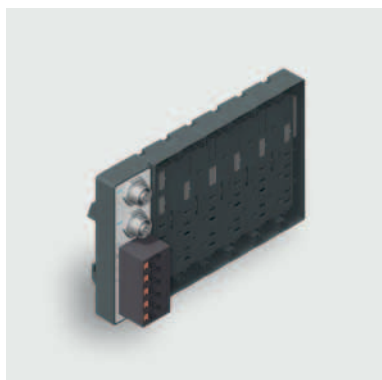
### 4. Characteristic slow-2



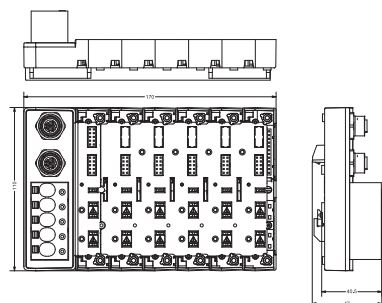
### 5. Characteristic slow-3



## Compact Supply Module Ethernet 6 slots



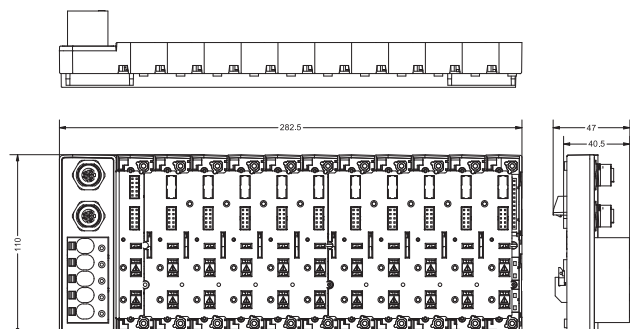
|                          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| Part no.                 | 819602.006                                                                    |
| Type                     | LUNA ES-006 ETH                                                               |
| Number of slots          | 6                                                                             |
| Fieldbus                 | Ethernet 802.3, 100 Base TX                                                   |
| Local bus                | L-Bus <sup>2</sup> Interface for local I/O modules                            |
| Module type              | Generic                                                                       |
| Connection type fieldbus | M12 female connector, 4-Pin, D-coded                                          |
| Supply voltage           | DC 24 V                                                                       |
| Supply current           | Max. 100 A (max. 50 A per pin)                                                |
| Connection type supply   | Push-In, 5-pole, max. 16 mm <sup>2</sup>                                      |
| Operating temperature    | -40 °C to +70 °C                                                              |
| Dimensions (w x h x d)   | 170.0 mm x 110.0 mm x 47.0 mm                                                 |
| Standards                | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2 |



## Compact Supply Module Ethernet 11 slots

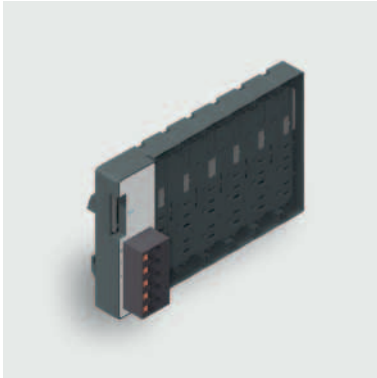


|                          |                                                                               |
|--------------------------|-------------------------------------------------------------------------------|
| Part no.                 | 819602.011                                                                    |
| Type                     | LUNA ES-011 ETH                                                               |
| Number of slots          | 11                                                                            |
| Fieldbus                 | Ethernet 802.3, 100 Base TX                                                   |
| Local bus                | L-Bus <sup>2</sup> Interface for local I/O modules                            |
| Module type              | Generic                                                                       |
| Connection type fieldbus | M12 female connector, 4-Pin, D-coded                                          |
| Supply voltage           | DC 24 V                                                                       |
| Supply current           | Max. 100 A (max. 50 A per pin)                                                |
| Connection type supply   | Push-In, 5-pole, max. 16 mm <sup>2</sup>                                      |
| Operating temperature    | -40 °C to +70 °C                                                              |
| Dimensions (w x h x d)   | 282.5 mm x 110.0 mm x 47.0 mm                                                 |
| Standards                | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2 |

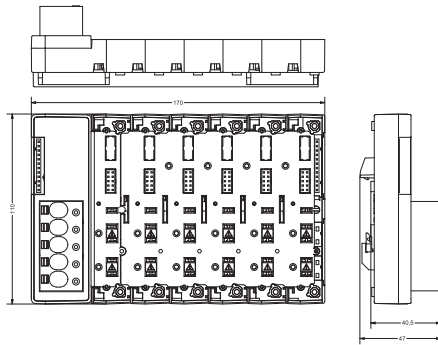


# Technical Data – LUNA

## Compact Extension Module 6 slots



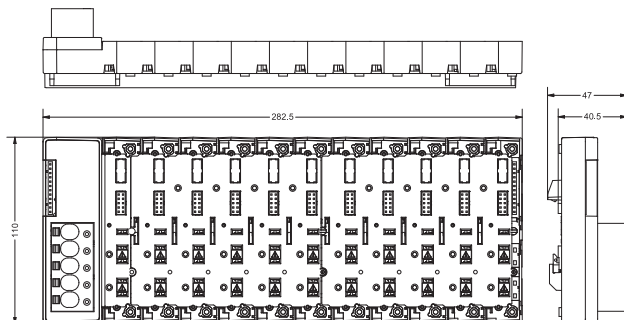
|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| Part no.               | 819603.006                                                                    |
| Type                   | LUNA EW-006                                                                   |
| Number of slots        | 6                                                                             |
| Local bus              | L-Bus <sup>2</sup> Interface for local I/O modules                            |
| Supply voltage         | DC 24 V                                                                       |
| Supply current         | Max. 100 A (max. 50 A per pin)                                                |
| Connection type supply | Push-In, 5-pole, max. 16 mm <sup>2</sup>                                      |
| Operating temperature  | -40 °C to +70 °C                                                              |
| Dimensions (w x h x d) | 170.0 mm x 110.0 mm x 47.0 mm                                                 |
| Standards              | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2 |



## Compact Extension Module 11 slots

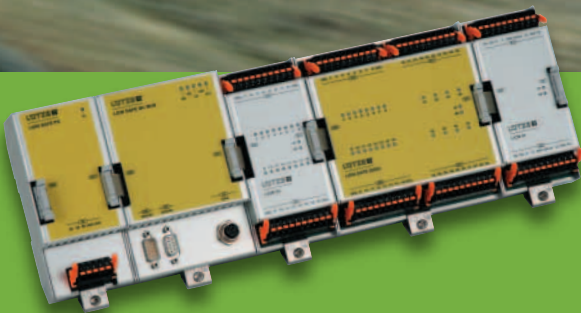


|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| Part no.               | 819603.011                                                                    |
| Type                   | LUNA EW-011                                                                   |
| Number of slots        | 11                                                                            |
| Local bus              | L-Bus <sup>2</sup> Interface for local I/O modules                            |
| Supply voltage         | DC 24 V                                                                       |
| Supply current         | Max. 100 A (max. 50 A per pin)                                                |
| Connection type supply | Push-In, 5-pole, max. 16 mm <sup>2</sup>                                      |
| Operating temperature  | -40 °C to +70 °C                                                              |
| Dimensions (w x h x d) | 282.5 mm x 110.0 mm x 47.0 mm                                                 |
| Standards              | EN 50155, EN 50121-3-2, EN 50124-1, EN 61373, Regelung Nr. EMV 06, EN 45545-2 |



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## Electronic control for rail vehicles



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**Interface**



**Indication**



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