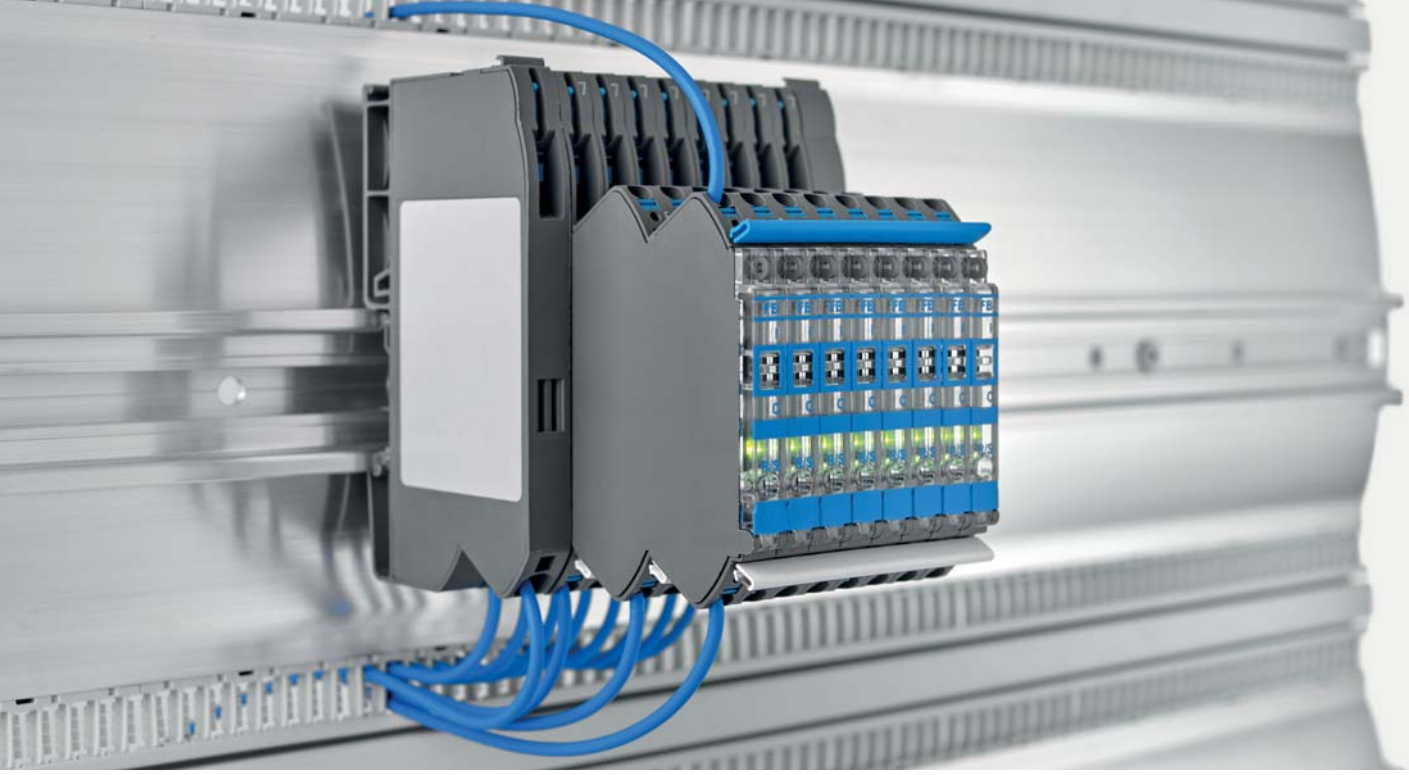


Control Solutions

LOCC-Box
Electronic Circuit Breakers

LUTZE Overload Current Control

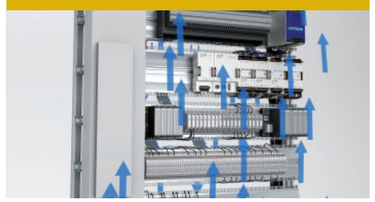
LUTZE
SYSTEMATIC TECHNOLOGY

Welcome to LUTZE

Cable Solutions

Connectivity Solutions

Cabinet Solutions



Control Solutions

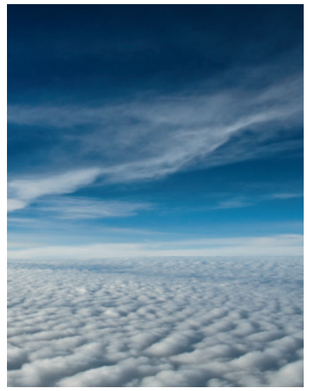
WELCOME TO LUTZE
Electronic Circuit Breakers (ECBs)

A tradition in automation for over 60 years! With countless pioneering achievements and patents, LUTZE INTERNATIONAL Group is one of the leading companies in the automation industry today. LUTZE provides components and solutions to enhance the safety and efficiency of various automation applications. LUTZE manufactures leading technology for electronic overload and short circuit protection with the LUTZE LOCC-Box electronic circuit breakers offering intelligent and reliable current monitoring with field bus communication capabilities.

LOCC-Box ECBs provide reliable load monitoring and protection in 12/24/48V DC control circuits. Innovative features include adjustable trip current range (1-10A) and patented adjustable characteristics (fast, med, slow 1, slow 2 and slow 3), and remote on/off/reset functions. Narrow construction ensures compact design even with multi-channel configurations. These are just some of the intelligent features of the LUTZE LOCC-Box electronic circuit breakers.

The LUTZE INTERNATIONAL Group has multiple locations throughout Europe, Asia and North America and numerous distribution partners across the world to provide global product availability and service to our customers in all markets.
For more information, please visit www.lutze.com.

LUTZE
SYSTEMATIC TECHNOLOGY



Business Management:
Sustainable and forw ard-looking

„The competitiveness of our industry and of its suppliers depends quite substantially on how we succeed in developing practical results. The results that we produce together today, are our competitive advantages in the future.“
Udo Lütze,
Member of the Executive Committee of the Green Carbody Innovation Alliance

The future is blue

Sustainable enterprise means thinking and planning ahead, understanding and embedding the belief that long lasting success is more important than short-term profit maximisation.

This is an attitude that has existed within LÜTZE for quite some time. Economic and environmental responsibilities complement each other well and are reflected in the sustainable management and product policy - and from now in the *Sky***BLUE** campaign.

We manufacture our products in a resourceful and energy-conscious manner. We use long lasting, environmentally-friendly materials. And our products, in turn, help our customers save energy and resources.
Good for everyone: for us, for the environment, for our customers a win-win-win situation.

Goods with real value

The value of a product or a solution from LÜTZE is determined by its sustainable qualities as well. Every innovation is only as successful in the future if it has a long-term positive effect. Therefore, we provide long lasting as well as highly efficient components.
We are incorporating the necessary knowledge and manufacturing competence in numerous joint projects with the objective of improving energy efficiency and sustainable technologies and industries. Thus, LÜTZE provides answers and demonstrates how to handle resources responsibly, with our environment and our future in mind.

Innovations-Allianz Green Carbody Technologies

ISO 14001

RoHS

Modular, flexible and safe: LOCC-Box / LOCC-Box-Net

The intelligent LUTZE Overload Current Control System

Adjustable rated current
(1 A...10 A in 1 A Steps)

Adjustable characteristic
(fast- … slow acting)

“Power-ON”-effect
to switch on capacitive loads

Single or centralized fault indication

Last status memorization

Push-in terminals

Compact housing width of 8.1 mm

Response time independent of temperature

Contact slots on each port for the potential use of jumper combs

Solid state relay with current control switching frequency up to 1 kHz

*Sky***BLUE**

Remote ON / OFF

Manual ON / OFF

LED status indication for "operation ON/OFF", "fault", "90% load", "100% load" and for difference between the target and actual values on current and characteristic curve rotary switches

Front cover accommodates label markers and lock out tags

Flammability class
UL-94-V0; NFF I2,F2

Power distribution via direct supply or supply terminal set

Optional Gateway interface

CE, UKCA conformity
cULus, URus and DNV certified

UL 508 Listed
UL 2367

The picture shows 5 x LOCC-Box incl. supply set

LOCC-BOX · Product Overview


LOCC-Box-FB


LOCC-Box-FB48


LOCC-Box-EC


LOCC-Box-SC


LOCC-Box-Net

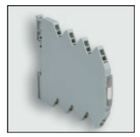

LOCC-Box-M

Electronic Circuit Breakers

Part Number	Operation Voltage Range	Current Range	Signal Output			Characteristics		Current		NEC Class 2		Type	Page
		Range (Increments)	Manual "OFF" signal alarm	Internal 6A fuse	Networkable	Fixed	Adjustable	Fixed	Adjustable	Current Limitation	Adjustable via software		
716400	DC 10V - 30V	1 - 10A (1A)					•		•			LOCC-Box-FB	14
716401	DC 10V - 30V	1 - 10A (1A)	•				•		•			LOCC-Box-FB	15
716403	DC 10V - 32V	1 - 10A (1A)	•		•		•		•			LOCC-Box-Net	16
716404	DC 10V - 32V	1 - 10A (1A)	•		•		•		•			LOCC-Box-Net	17
716406	DC 39V - 58V	1 - 6A (1A)	•				•		•			LOCC-Box-FB48	18
716407.xxx	DC 10V - 30V	1 - 10A (1A)	•			•		•				LOCC-Box-EC	19
716408	DC 10V - 30V	1 - 5A (1A)	•	•			•		•			LOCC-Box-SC	20
716409	DC 10V - 32V	0.2 - 2A (.2A)	•				•		•			LOCC-Box-FB2A	21
716410	DC 10V - 30V	1 - 10A (1A)	•		•		•		•			LOCC-Box-NET	22
716411	DC 10V - 32V	1 - 10A (1A)	•		•		•		•		•	LOCC-Box-NET	23
716412.xxx	DC 10V - 30V	1 - 10A (1A)	•			•			•			LOCC-Box-EC-I-C	24
716413	DC 11V - 30V	0.5 - 4A (.5A)	•				•		•	•		LOCC-Box-C2	25
716414	DC 10V - 30V	0.5 - 4A (.5A)	•		•		•		•	•		LOCC-Box-C2 NET	26
716415.0300	DC 10V - 30V	1 - 6A (1A)	•			•			•			LOCC-Box-ED I-C3	27
716418	DC 10V - 30V	1 - 5A (1A)	•	•	•		•		•			LOCC-Box-NET-SC	28
716419.0300	DC 10V - 30V	1 - 6A (1A)	•		•	•			•			LOCC-Box-ED NET I-C3	29
716480	DC 10V - 30V	1 8A (1A)	•				•		•			LOCC-Box-M	30
716481	DC 10V - 30V	1 8A (1A)	•		•		•		•			LOCC-Box-M-I	31

Gateway · Product Overview


LOCC-Box-FB


LOCC-Box-GW


LCOS-BC-PN


LCOS-BC-EC


LCOS-BC-ETIP

Fieldbus Gateways

Part Number	Operation Voltage Range	Max. nodes	Field bus Protocol					Function carrier required	Web Interface	Type	Page
			I/O Link	CANopen	EtherCAT	Profinet	EthernetIP				
716455	DC 10V - 30V	15	•							LOCC-Box-FB	46
716459	DC 10V - 26.4V	84		•						LOCC-Box-GW	47
778000.1301	DC 18V - 31.2V	64			•			•	•	LCOS-BC-PN	48
778000.1401	DC 18V - 31.2V	64				•		•	•	LCOS-BC-EC	49
778000.1701	DC 18V - 31.2V	64					•	•	•	LCOS-BC-ETIP	50
780714.575.1	DC 18V - 31.2V	Function carrier								LCOS-FTE-PE	51

Reliable protection of DC 24V circuits

Intelligent safeguarding of selectivity

Primary switching controllers and automatic power units nowadays form the basis of the DC 24V supply level. Due to the operating behaviour of those devices, the specified selective protection of individual circuits, especially in case of overcurrent, is virtually unfeasible. A complete system shutdown is inevitable.

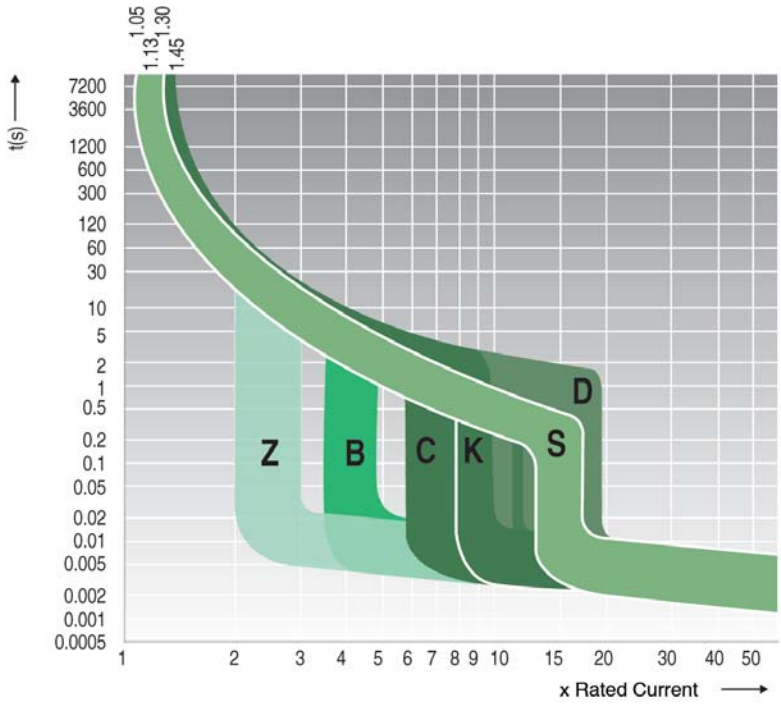
Operating behaviour of primary switching controllers

Switched-mode power supplies and their components are rated for a specific nominal value and run hot under higher load. To protect against self-destructing, they shut down at between 1.1 and 2.5 times the nominal current, according to type. Many devices feature Hiccup mode, which switches off in case of overload and automatically switches back on after a short time. If the overload persists, the process repeats until the fault is manually rectified. This means a fuse is never tripped. Using devices with a forward characteristic does not deliver success either. The power supply does not switch off, but supplies only a 1.1 to 1.2 times higher output current when the output voltage is reduced. This characteristic likewise does not trip an automatic circuit-breaker, or if it does, then only in the hours range. Furthermore, both output modes have the disadvantage that loads such as DC motors or capacitive consumers cannot be started. At additional cost, operation of heavy loads can be achieved in the simplest case by using a device with a higher output power or a device with integrated power boost.

In this, the device with power boost continuously supplies 1.2 to 1.3 times the nominal current in the temperature range up to +45°C. On reducing the output voltage, a maximum of 2.5 times the nominal current is reached which - dependent on the device itself and the characteristic of the automatic circuit-breaker - may be just enough to effect a shutdown.

Characteristics of automatic circuit-breakers

The trip curve of an automatic circuit-breaker with characteristic B (Figure 1) is considered by way of example. To record smaller overcurrents, a thermal trip in the minutes to hours range is used (hold >1h at I = 1.13 x I_{nom} and trip <1h at I = 1.45 x I_{nom}). Switch-off in case of high overcurrents is effected by immediate magnetic tripping within 0.01 to 0.1 seconds. If such a device is used in conjunction with a 10A switched-mode power supply, the switch-off occurs at 1.2 times the nominal current only after 20 to 60 minutes. Even at 2.5 times nominal current (power boost) between 25 seconds and two minutes elapse until switch-off in the thermal range. In short: essential protection - in particular selective protection of connected devices - is not provided. The fuse essentially performs a dummy function. In the event of a short-circuit or faulty wire supply would be maintained at 2.5 times nominal current. System failure or even a cable fire may be the consequence.



Selective switch-off

Selective load protection means that in case of overload or short-circuit only the faulty current path is switched off, with no reactive effect on the supply. The standards EN60204-1 (line protection and fire prevention) and EN 61131-1 and -2 (operating states and storage) are also applicable to the rating of the overcurrent protection device in DC 24V circuits. In concrete terms, this means withstanding a mains power failure lasting 10ms without functional impairment, which demands the deployment of large input capacities. Furthermore, hazardous overcurrents must be reduced to a safe level within 5s. Rating is made more difficult by the fact that nowadays many parallel consumers are supplied by way of one protection element.

LUTZE LOCC-Box – the intelligent current monitoring system

Figure 2: LOCC-Box single module

The ideal solution would be one which is capable of optimally operating capacitive loads to start heavy loads and quickly detecting an overcurrent in operation and switching off only the affected path. Such a system should of course store the fault so as to prevent danger from switching back on and permit diagnosis. The Lütze LOCC-Box system meets those requirements in a modular design with additional intelligent functions. To meet the widely varying demands on switch-off response, the LOCC-Box system features the facility to program 10 different characteristics by way of a switch. Both standard automatic unit characteristics and in particular custom characteristics can be implemented. The nominal current range can additionally be selected with locking settings from 1A to 10A. The adjustable current range and characteristic is very important when retrofitting, as in such cases the device protection often has to be modified and adapted. As additional information, the capacity utilisation of the path is indicated by an LED. When 90% of the programmed current value is reached the status LED starts to flash. In the event of a switch-off due to overcurrent or short-circuit, in addition to the visual indication by a red LED.

Current Control System · Basics

A 24V signal is set as a collective fault warning. This eliminates the need to install and wire additional auxiliary contacts. A restart after clearing the fault is then effected either using the mechanical switch on the device or from the main system by remote control. This channel-based switching facility is of great importance in particular in the commissioning phase of a system, as it enables individual system components to be activated and checked specifically.

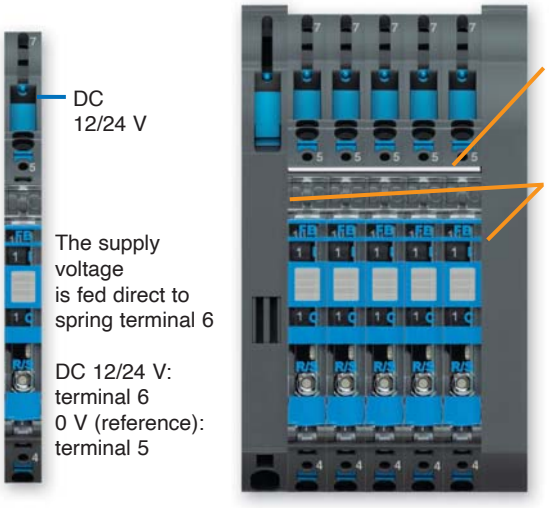
LOCC-Box
Practical and efficient

The monitoring function itself is one side of the coin. The other in many other systems is the associated mechanism. Frequently multi-channel solutions are offered on the market which only make sense if exactly the available channels are required. If that is not the case, or if only one channel has to be additionally implemented subsequently, money and space will be wasted. Another disadvantage of this solution is the looping of up to 40A via a printed circuit board. This entails an enormous load on the carrier material and interruption of the entire supply when a device is replaced. What in other areas of automation has been state of the art for over 10 years is also ideal here as the solution in a highly modular configuration!

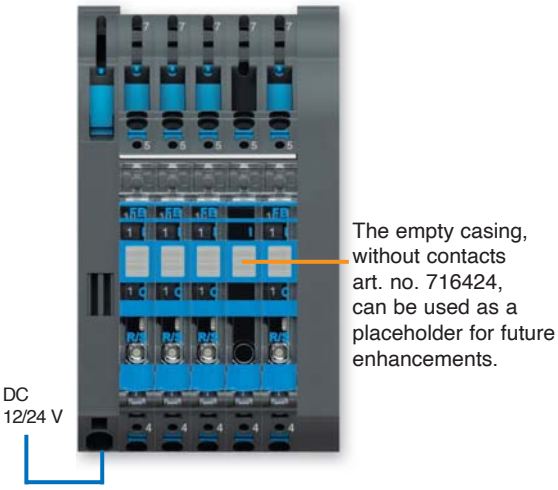
Here, too, the LOCC-Box system is setting new standards. The single-channel design with all the functionality described offers the highest possible flexibility. As shown below, customers can decide whether the supply is provided by each module individually or via the system supply (infeed terminal, copper rail, end terminal). The particular advantage of this method of infeed is the screwless contact carriage, which permits exchanging of individual channels in operation without interrupting the entire supply. This additional provides functionality to switch off individual paths to perform essential work safely. The maximum supply current is dictated by the 6mm² terminal, and is DC 40A. The slim width of just 8.1mm results in an installed width of just 340mm even with a 40-channel configuration. The system housing is complemented by name plate labels, seals and a jumper system to loop signals.

Standard Application

without supply set, art. no. 716425 with supply set, art. no. 716425



Empty housing as placeholder

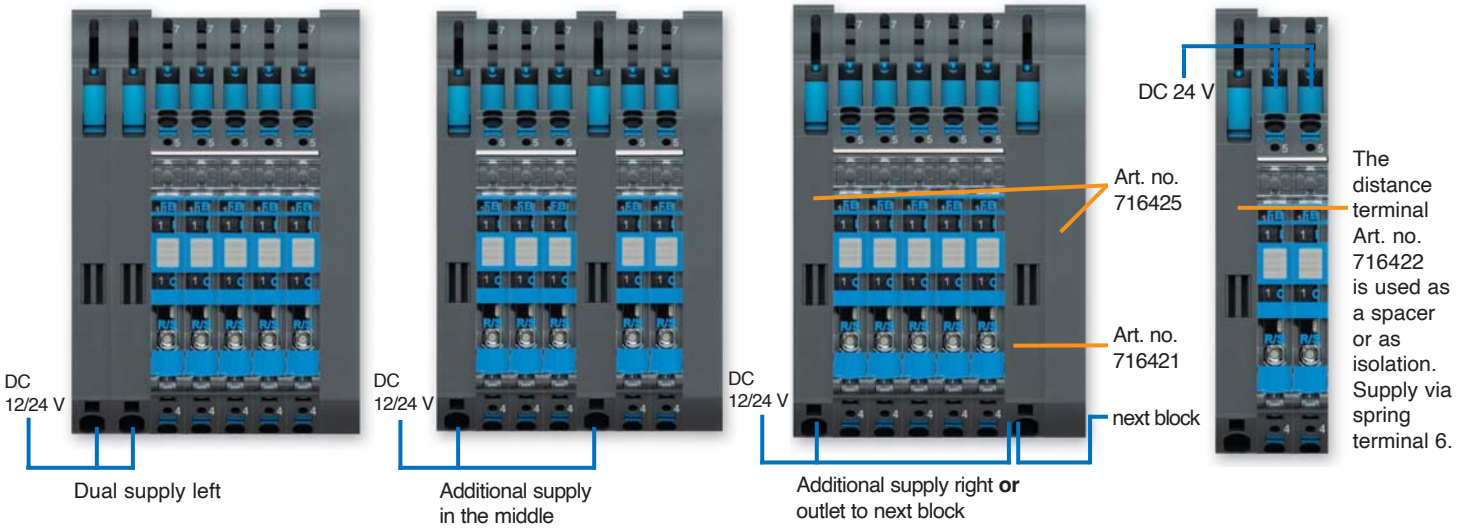


Use with additional supply terminals

Supply set, art. no. 716425 and supply terminal, art. no. 716421

The supply terminal is accessed via a terminal in the lower left hand side. This enables a variable positioning in the system construction. The maximum total current can thus be increased. Max. 160 A / 4 feeds.

Individual construction with distance terminal



LOCC-Box / LOCC-Box-Net · Application examples

e.g. Switching power supply: 722814 DC 24 V, 40 V

DC 24 V, 100 A.

Standard Application

with supply set, art. no. 716425

-

+

PIN-Nr.

1 1 1 1 1 1 1 1 1 1 1 1

PIN-Nr. 5, 6

Load

Consumer

5, 6

Construction of the 0 V Collective terminal

with supply set
Art. no. 716425

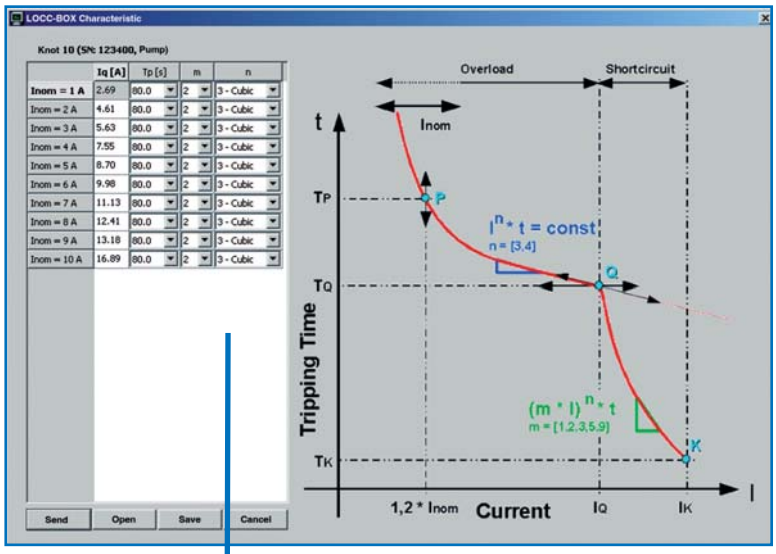
1-4

1-4

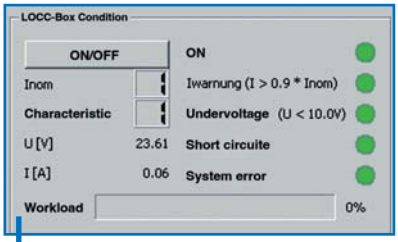
LOCC-Pads · Monitoring software

LOCC-Pads*

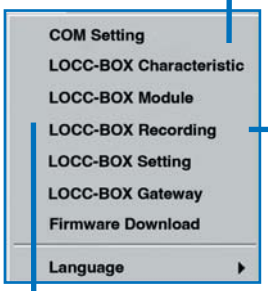
Software for the parameterisation of the LOCC-Box-Net, as well as the analysis and diagnosis of DC 12 / 24 V circuits



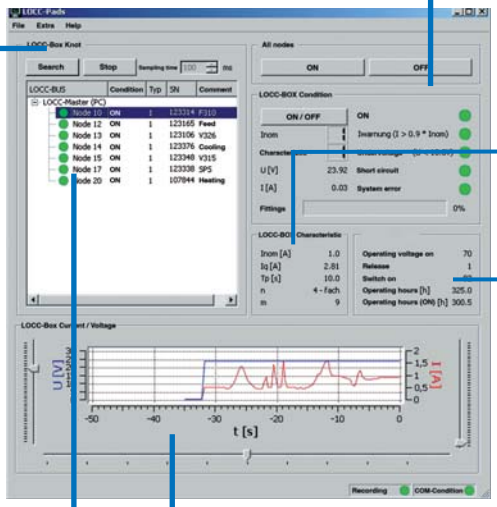
Adjustment parameters for the parameterisable characteristic No. 10



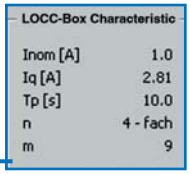
Displays the operating status, current range / characteristic, the load capacity of the characteristic, as well as the updated current and voltage values.



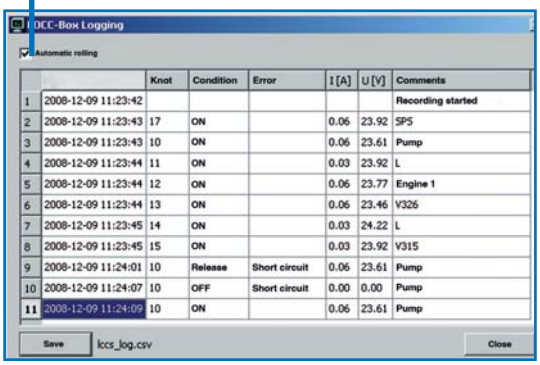
Menu "Extra"



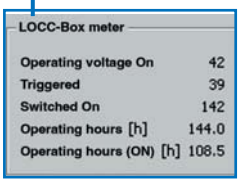
Overall view



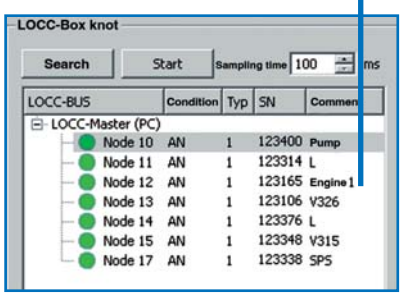
Displays the parameters of the selected characteristic curve.



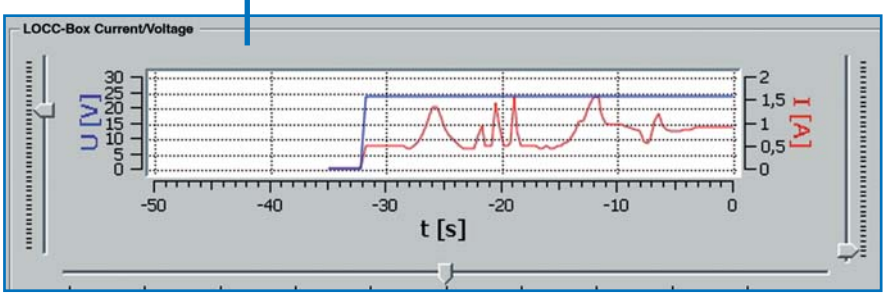
Recording of all results such as "ON", "OFF" or "SHORT CIRCUIT" with date and time



Indicates the current meter readings of the selected module



Overview of all connected modules



Plotter function for the selected module – current/voltage progression (analysis)

* in connection with a gateway (CANopen,EtherCAT, Profinet-IO, EtherNet/IP, IO-Link)

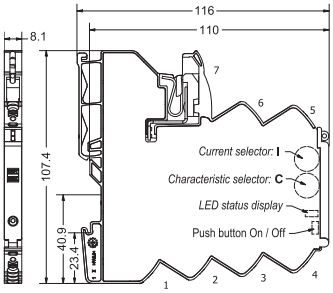
Load monitoring · LOCC-Box-FB

Electronic circuit breaker rated up to DC 10 A
Single-channel design, adjustable current range: DC 1 A – 10 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

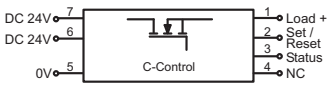
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) see 'characteristic curves'
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716400	LOCC-Box-FB 7-6400	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

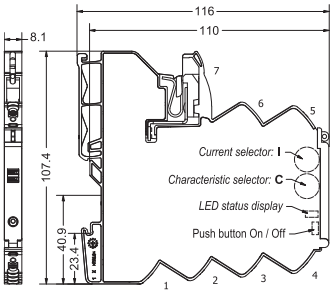
Load monitoring · LOCC-Box-FB

Electronic circuit breaker rated up to DC 10 A
Single-channel design, adjustable current range: DC 1 A – 10 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

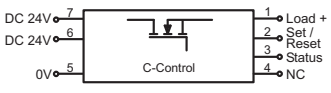
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) see 'characteristic curves'
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off or manual „OFF"
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716401	LOCC-Box-FB 7-6401	0.07	1

Dimensions



PIN assignment



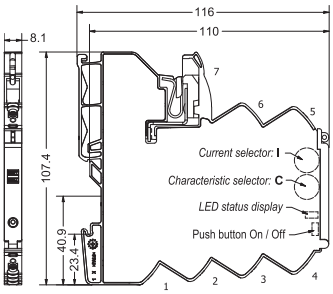
1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 10 A, with communication, parameterized
Single-channel design, adjustable current range: DC 1 A – 10 A
Adjustable characteristic: fast, medium, slow 1, -2, -3

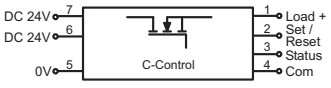
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to IEC 61131-2
OFF	Low level
ON	High level (automatic reset)
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5), can be configured (19) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off, and manual „OFF“ (parameterized)
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716403	LOCC-Box-Net 7-6403	0.07	1

Dimensions



PIN assignment



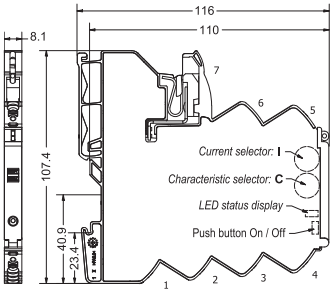
1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 10 A, with communication, parameterized
Single-channel design, adjustable current range: DC 1 A – 10 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

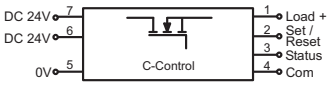
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to IEC 61131-2
OFF	Low level
ON	High level (manual reset)
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5), can be configured (19) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off, and manual „OFF“ (parameterized)
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367
Comments	The triggered output can only be acknowledged via the device switch.

Part No.	Type	Weight/unit kg	PU (units)
716404	LOCC-Box-Net 7-6404	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

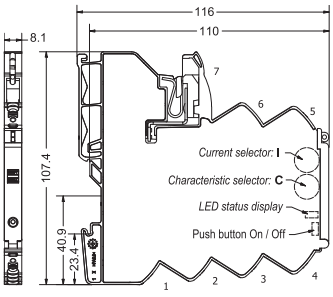
Load monitoring · LOCC-Box-FB48

Electronic circuit breaker rated up to DC 48 V to 6 A
Single-channel design, adjustable current range: DC 1 A – 6 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

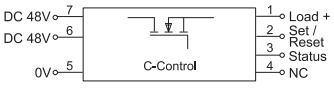
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 48 V
Operation voltage range	DC 39–58 V
Rated current I_N	DC 6 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 48 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 6 A
Voltage drop	Max. 310 mV (6 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	1000 µF
Current range	1 A – 6 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) see 'characteristic curves'
Current limitation	13.75 A
Signal output	
Signal level	DC 48 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF"
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716406	LOCC-Box-FB48 7-6406	0.07	1

Dimensions



PIN assignment



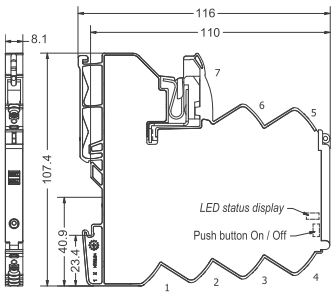
1: + Output
2: Control input (Set/Reset)
3: Status output
4: not used
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 10 A
Single channel version, fixed current range: DC 1 A - 10 A (see order code)
Fixed characteristic: fast, medium, slow 1, -2, -3 (see order code)

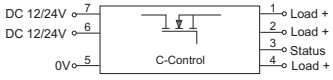
Input		Switching element	Transistor, collector with pull-up resistance
Rated voltage U_N	DC 12/24 V		
Operation voltage range	DC 10–30 V		
Rated current I_N	DC 10 A	**General**	
Supply current	DC 40 A over Cu-rails 10 × 3 mm	Operation temperature range	-25 °C … +50 °C
Reverse voltage protection	Internal electronics	Storage temperature range	-40 °C … +85 °C
Connection type input	Screwless contact slide	Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
		Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Output		Mounting	DIN rail mountable TS35 (EN 60715)
Switching element	MOSFET		
Output current	Max. DC 10 A	Installation position	Any
Voltage drop	Max. 215 mV (10 A)	MTBF	690000 h
Status display output	LED green: operating voltage present, no error LED red: error in load circuit	Degree of protection	IP20 (only as complete system with supply terminal and end block)
		Vibration resistance	4 g acc. to EN 60068-2-6
Switch-on capacity	10000 µF	Connection type	Push-In
Current range	1 A – 10 A (see order code)		0.25 mm² – 2.5 mm²
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) (see order code), see ‘characteristic curves‘		AWG 24 – AWG 14
		Relative air humidity	10 % – 95 %, without condensation
		Shock resistance	15 g acc. EN 60068-2-27
Signal output		Approvals	cULus (E135145) URus (E490188)
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“	Standards	EN 61000-2 EN 61000-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716407.xxxx	LOCC-Box-EC-I-C	0.07	1

Dimensions



PIN assignment



1: + Output
2: + Output
3: Status output
4: + Output
5: 0V
6: + Supply (alternative)
7: + Supply

Order code

716407. 2 3 50

Type	Current range	Characteristic	PU
	1 1A	1 fast	00 1 pc.
	2 2A	2 medium	**50** 50 pcs.
	3 3A	**3** slow-1	
	⋮	4 slow-2	
	0 10A	5 slow-3	

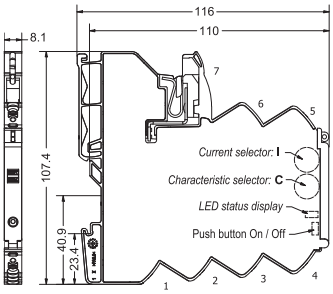
Load monitoring · LOCC-Box-SC

Electronic circuit breaker rated up to DC 5 A
Single-channel design, adjustable current range: DC 1 A – 5 A
Adjustable characteristics, fast, medium-speed, slow 1

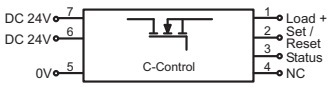
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 5 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 5 A
Voltage drop	Max. 90 mV (5 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 5 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716408	LOCC-Box-SC 7-6408	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

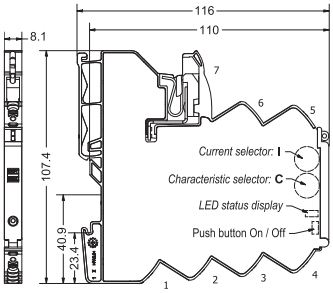
Load monitoring · LOCC-Box-FB2A

Electronic circuit breaker rated up to DC 2 A
Single-channel design, adjustable current range: DC 0.2 A – 2 A
Adjustable characteristics, fast, medium, slow

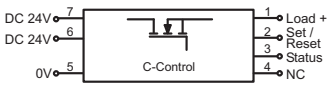
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–32 V
Rated current I_N	DC 2 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 2 A
Voltage drop	Max. 145 mV (2 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	0.2 A – 2 A (adjustable via switch in 0.2 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3) see ‘characteristic curves‘
Current limitation	13.75 A
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1

Part No.	Type	Weight/unit kg	PU (units)
716409	LOCC-Box-FB2A 7-6409	0.07	1

Dimensions



PIN assignment



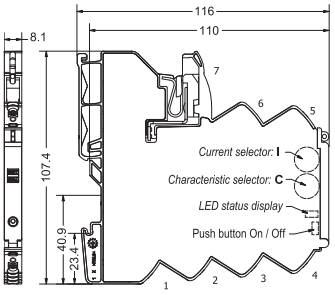
1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 10 A, with communication
Single-channel design, programmable, adjustable current range: DC 1 A – 10 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

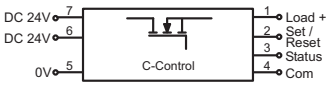
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to IEC 61131-2
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5), can be configured (19) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off or manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716410	LOCC-Box-Net 7-6410	0.07	1

Dimensions



PIN assignment



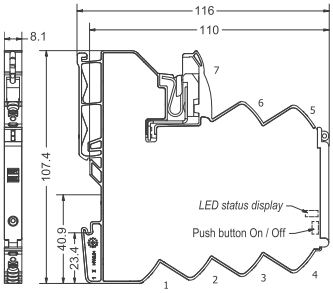
1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 10 A, with communication, without rotary switch
Single-channel design, adjustable current range: DC 1 A – 10 A
Adjustable characteristic: fast, medium, slow 1, -2, -3

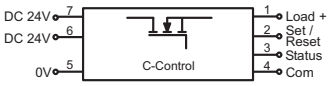
Input			DC 0 V: error, output switched off, and manual „OFF“ (parameterized)
Type of function	1-channel 1 pin switching	Switching element	Transistor, collector with pull-up resistance
Rated voltage U_N	DC 12/24 V		
Operation voltage range	DC 10–32 V		
Rated current I_N	DC 10 A		
Supply current	DC 40 A over Cu-rails 10 × 3 mm	**General**	
Reverse voltage protection	Internal electronics	Operation temperature range	-25 °C … +50 °C
Connection type input	Screwless contact slide	Storage temperature range	-40 °C … +85 °C
		Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Control input (Set / Reset)		Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Signal level	DC 12/24 V acc. to IEC 61131-2	Color of the housing	Basalt grey
OFF	Pulse with falling edge >100 ms, <800 ms	Mounting	DIN rail mountable TS35 (EN 60715)
ON	Pulse with falling edge > 1 s	Installation position	Any
		MTBF	690000 h
Output		Degree of protection	IP20 (only as complete system with supply terminal and end block)
Switching element	MOSFET	Vibration resistance	4 g acc. to EN 60068-2-6
Output current	Max. DC 10 A	Connection type	Push-In
Voltage drop	Max. 215 mV (10 A)		0.25 mm² – 2.5 mm²
Status display output	LED green: operating voltage present, no error		AWG 24 – AWG 14
	LED red: error in load circuit	Relative air humidity	10 % – 95 %, without condensation
Switch-on capacity	10000 µF	Shock resistance	15 g acc. EN 60068-2-27
Current range	1 A – 10 A (adjustable via software, EtherCAT, Profibus, CANopen)	Approvals	cULus (E135145) URus (E490188)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5), (adjustable via software, EtherCAT, Profibus, CANopen), see ‘characteristic curves‘	Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367
Signal output			
Signal level	DC 12/24 V: operating voltage on standby, no error,		

Part No.	Type	Weight/unit kg	PU (units)
716411	LOCC-Box-Net 7-6411	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

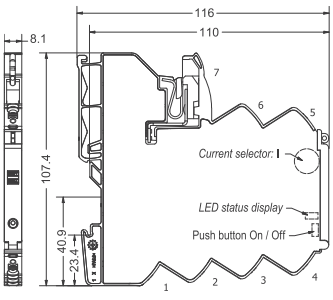
Load monitoring · LOCC-Box-EC

Electronic circuit breaker rated up to DC 10 A
Single-channel design, adjustable current range: DC 1 A – 10 A
Fixed characteristic: fast, medium, slow 1, -2, -3 (see order code)

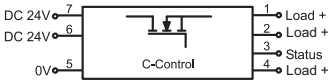
Input	
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 10 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Output	
Switching element	MOSFET
Output current	Max. DC 10 A
Voltage drop	Max. 215 mV (10 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 10 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) (see order code), see 'characteristic curves'
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF"
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716412.xxxx	LOCC-Box-EC-I-C	0.07	1

Dimensions



PIN assignment



1: Load +
2: Load +
3: Status output
4: Load +
5: 0V
6: + Supply (alternative)
7: + Supply

Order code

716412. 03 50

Type

PU
- 00 1 pc.
- **50** 50 pcs.

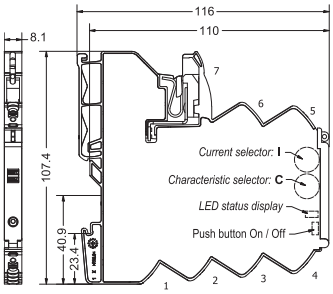
Characteristic
- 01 fast
- 02 medium
- **03** slow-1
- 04 slow-2
- 05 slow-3

Electronic circuit breaker rated up to DC 4 A
Single channel version, adjustable current range, adjustable characteristic with current limitation acc. to NEC class 2

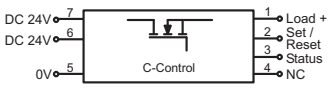
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 11–30 V
Rated current I_N	DC 5 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 4 A
Power output	Limited to <100 W
Voltage drop	Max. 275 mV (4 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	4700 µF
Current range	0.5 A – 4 A (can be set via switch in 0.5 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3) see ‘characteristic curves‘
Current limitation	<5 A
Signal output	
Signal level	DC 24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 – 95 % RH, brief condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E170585) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 EN 61131-2 UL 61010-1 UL 61010-2-201 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716413	LOCC-Box-C2 7-6413	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

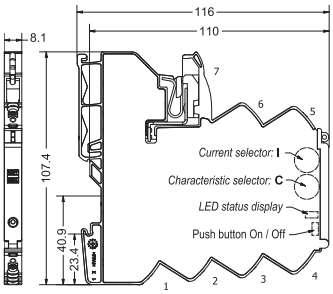
Load monitoring · LOCC-Box-C2 NET

Electronic circuit breaker rated up to DC 4 A, with communication
Single channel version, adjustable current range, adjustable characteristic with current limitation acc. to NEC class 2

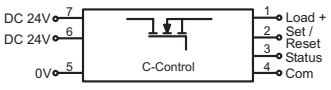
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 11–30 V
Rated current I_N	DC 5 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to IEC 61131-2
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 4 A
Power output	Limited to <100 W
Voltage drop	Max. 275 mV (4 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	4700 µF
Current range	0.5 A – 4 A (can be set via switch in 0.5 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3) see ‘characteristic curves‘
Current limitation	<5 A
Signal output	
Signal level	DC 24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 – 95 % RH, brief condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E170585) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 EN 61131-2 UL 61010-1 UL 61010-2-201 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716414	LOCC-Box-C2 NET 7-6414	0.07	1

Dimensions



PIN assignment



1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

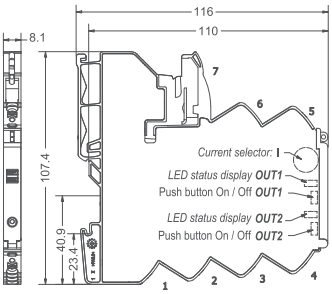
Electronic circuit breaker rated up to DC 6 A
Two-channel version, adjustable current range: DC 1 A - 6 A
Fixed characteristic: slow-1

Input	
Type of function	2-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 2 × 6 A
Supply current	DC 40 A
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Output	
Ampacity	DC 2 × 6 A Total current
Switching element	MOSFET
Output current	Max. DC 6 A per channel
Voltage drop	Max. 115 mV (6 A, per channel)
Status display output	LED green: no error, LED green flashing: 90 % utilisation LED red flashing: triggered, LED red: unit off
Switch-on capacity	10000 µF
Current range	1 A – 6 A (adjustable via switch in 1 A steps)
Characteristic	Slow 1 (3), fixed setting
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off and manual „OFF“
Switching element	Transistor, collector with pull-up resistance

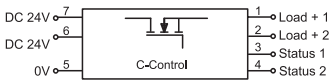
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	RAL 7012 Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h @ 40 °C, 100 operations button, 30 revolutions coding switch
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716415.0300	LOCC-Box-ED I-C3	0.07	1

Dimensions



PIN assignment



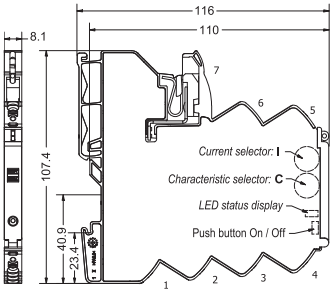
Load monitoring · LOCC-Box-NET-SC

Electronic circuit breaker rated up to DC 5 A, with communication
Single-channel design, adjustable current range: DC 1 A – 5 A
Adjustable characteristics, fast, medium-speed, slow 1

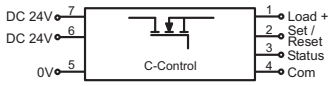
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 5 A
Supply current	DC 40 A over Cu-rails 10 × 3 mm
Reverse voltage protection	Internal electronics
Connection type input	Screwless contact slide
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 5 A
Voltage drop	Max. 90 mV (5 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	Optional
Current range	1 A – 5 A (adjustable via switch in 1 A steps)
Characteristic	Fast (1), medium (2), slow 1 (3) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off, and manual „OFF“ (parameterized)
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20 (only as complete system with supply terminal and end block)
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716418	LOCC-Box-Net-SC 7-6418	0.07	1

Dimensions



PIN assignment



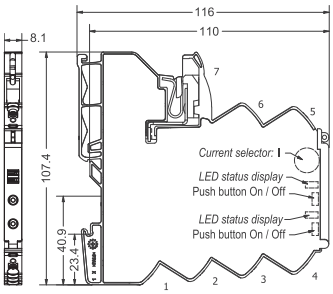
1: + Output
2: Control input (Set/Reset)
3: Status output
4: 1 Wire bus (Communication)
5: 0V
6: + Supply (alternative)
7: + Supply

Electronic circuit breaker rated up to DC 6 A, with communication
Two-channel version, adjustable current range: DC 1 A - 6 A
Fixed characteristic

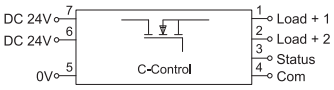
Input		Storage temperature range	-40 °C … +85 °C
Type of function	2-channel 1 pin switching	Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Rated voltage U_N	DC 12/24 V	Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Operation voltage range	DC 10–30 V	Color of the housing	RAL 7012
Rated current I_N	DC 2 × 6 A		Basalt grey
Supply current	DC 40 A	Mounting	DIN rail mountable TS35 (EN 60715)
Reverse voltage protection	Internal electronics	Installation position	Any
Connection type input	Screwless contact slide	MTBF	690000 h @ 40 °C, 100 operations button, 30 revolutions coding switch
Output		Degree of protection	IP20 (only as complete system with supply terminal and end block)
Ampacity	DC 2 × 6 A Total current	Vibration resistance	4 g acc. to EN 60068-2-6
Switching element	MOSFET	Connection type	Push-In
Output current	Max. DC 6 A per channel		0.25 mm² – 2.5 mm²
Voltage drop	Max. 125 mV (6 A, per channel)		AWG 24 – AWG 14
Status display output	LED green: no error, LED green flashing: 90 % utilisation LED red flashing: triggered, LED red: unit off	Relative air humidity	10 % – 95 %, without condensation
		Shock resistance	15 g 11 ms acc. to EN 60068-2-27:2009
Switch-on capacity	10000 µF	Approvals	cULus (E135145) URus (E490188)
Current range	1 A – 6 A (adjustable via switch in 1 A steps)	Standards	EN 61000-6-2 EN 61000-6-3 UL 60947-5-1 UL 2367
Characteristic	Slow 1 (3), fixed setting		
Signal output			
Signal level	High level: no error Low level: unit has triggered or is switched off		
Switching element	Transistor, collector with pull-up resistance		
General			
Operation temperature range	-25 °C … +50 °C		

Part No.	Type	Weight/unit kg	PU (units)
716419.0300	LOCC-Box-EDNet I-C3	0.07	1

Dimensions



PIN assignment



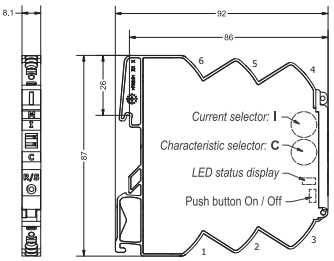
Load monitoring · LOCC-Box-M

Electronic circuit breaker rated up to DC 8 A
Single-channel design, adjustable current range: DC 1 A – 8 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

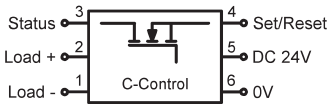
Input	
Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 12/24 V
Operation voltage range	DC 10–30 V
Rated current I_N	DC 8 A
Reverse voltage protection	Internal electronics
Control input (Set / Reset)	
Signal level	DC 12/24 V acc. to EN 61131
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s
Output	
Switching element	MOSFET
Output current	Max. DC 8 A
Voltage drop	Max. 180 mV (8 A)
Status display output	LED green: operating voltage present, no error LED red: error in load circuit
Switch-on capacity	10000 µF
Current range	1 A – 8 A (adjustable via switch)
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5) see ‘characteristic curves‘
Signal output	
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off or manual „OFF“
Switching element	Transistor, collector with pull-up resistance
General	
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	8.1 mm × 87.0 mm × 92.0 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	Basalt grey
Mounting	DIN rail mountable TS35 (EN 60715)
Installation position	Any
MTBF	690000 h
Degree of protection	IP20
Vibration resistance	4 g acc. to EN 60068-2-6
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Relative air humidity	10 % – 95 %, without condensation
Shock resistance	15 g acc. EN 60068-2-27
Approvals	FCC Part 15 Class B cULus (E135145) URus (E490188)
Standards	EN 61000-6-2 EN 61000-6-4 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716480	LOCC-Box-M	0.06	1

Dimensions



PIN assignment



1: Load -
2: Load +
3: Status output
4: Set/Reset
5: DC +24V
6: 0V

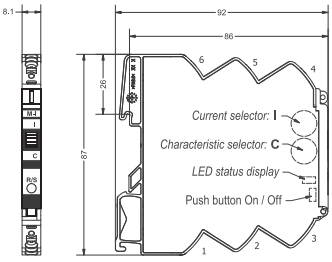
Load monitoring · LOCC-Box-M-I

Electronic circuit breaker rated up to DC 8 A, with communication
Single-channel design, parameterizable, adjustable current range: DC 1 A – 8 A
Adjustable characteristics, fast, medium, slow 1, -2, -3

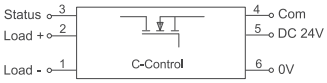
Input		Switching element	Transistor, collector with pull-up resistance
Type of function	1-channel 1 pin switching		
Rated voltage U_N	DC 12/24 V	**General**	
Operation voltage range	DC 10–30 V	Operation temperature range	-25 °C … +50 °C
Rated current I_N	DC 8 A	Storage temperature range	-40 °C … +85 °C
Reverse voltage protection	Internal electronics	Dimensions (w × h × d)	8.1 mm × 87.0 mm × 92.0 mm
		Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Output		Color of the housing	Basalt grey
Switching element	MOSFET	Mounting	DIN rail mountable TS35 (EN 60715)
Output current	Max. DC 8 A		
Voltage drop	Max. 180 mV (8 A)	Installation position	Any
		MTBF	1742151 h
Status display output	LED green: operating voltage present, no error LED red: error in load circuit	Degree of protection	IP20
		Vibration resistance	4 g acc. to EN 60068-2-6
		Connection type load side	Direct connection with plus and minus
Switch-on capacity	10000 µF	Connection type	Push-In
Current range	1 A – 8 A (adjustable via switch)		0.25 mm² – 2.5 mm²
Characteristic	Fast (1), medium (2), slow 1 (3), slow 2 (4), slow 3 (5), can be configured (19) see ‘characteristic curves‘		AWG 24 – AWG 14
		Relative air humidity	10 % – 95 %, without condensation
		Shock resistance	15 g acc. EN 60068-2-27
Signal output		Approvals	FCC Part 15 Class B
Signal level	DC 12/24 V: operating voltage on standby, no error, DC 0 V: error, output switched off or manual „OFF“		cULus (E135145) URus (E490188)
		Standards	EN 61000-6-2 EN 61000-6-4 UL 60947-5-1 UL 2367

Part No.	Type	Weight/unit kg	PU (units)
716481	LOCC-Box-M-I	0.06	1

Dimensions



PIN assignment



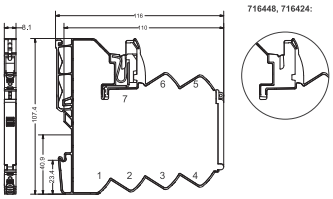
1: Load -
2: Load +
3: Status output
4: Communication
5: DC +24V
6: 0V

24 V - Distribution terminal
Single-channel design
Maximum total current 10 A

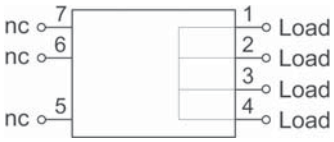
Input			
Rated voltage U_N	DC 12/24/48 V	Mounting	DIN rail mountable TS35 (EN 60715)
Rated current I_N	Max. DC 10 A	Degree of protection	IP20 (only as complete system with supply terminal and end block)
Reverse voltage protection	No		
Connection type input	Push-In 0.25 mm² – 2.5 mm² AWG 23 – AWG 14	Installation position	Any
		Operation temperature range	-25 °C … +50 °C
		Storage temperature range	-40 °C … +85 °C
Connection	1 – 4	Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Conductor connection cross section		Approvals	cULus (E135145)
		Standards	EN 60947-1 EN 60947-5-1 UL 60947-5-1
General			
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14		
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)		

Part No.	Type	Weight/unit kg	PU (units)
716448	LOCC-Box-VKL 7-6448	0.102	2

Dimensions



PIN assignment

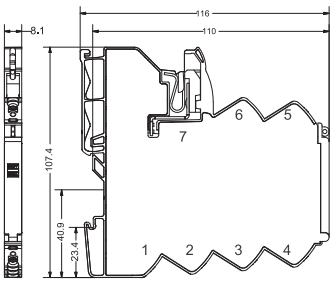


LOCC-Box 0V Collective Terminal
Maximum total current 40 A

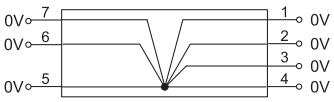
Input		Mounting	DIN rail mountable TS35 (EN 60715)
Rated voltage U_N	DC 12/24 V		
Rated current I_N	6 × max. DC 10 A	Degree of protection	IP20 (only as complete system with supply terminal and end block)
Reverse voltage protection	No		
Connection type input	Screwless contact slide	Installation position	Any
Conductor connection cross section		Operation temperature range	-25 °C … +50 °C
		Storage temperature range	-40 °C … +85 °C
Output		Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Output current	Max. DC 40 A	Approvals	cULus (E135145)
Connection type output		Standards	EN 60947-1 EN 60947-5-1 UL 60947-5-1
General			
Connection type	Push-In 0.25 mm² – 2.5 mm² AWG 24 – AWG 14		
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)		

Part No.	Type	Weight/unit kg	PU (units)
716420	LOCC-Box-SK 7-6420	0.102	2

Dimensions



PIN assignment

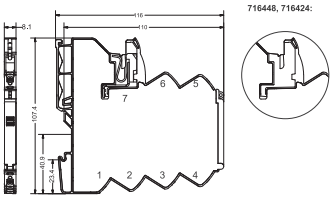


LOCC-Box empty housing without terminals

General		Approvals	cULus (E135145)
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)	Standards	EN 60947-1
Color of the housing	Basalt grey		EN 60947-5-1
Mounting	DIN rail mountable TS35 (EN 60715)		UL 60947-5-1
Installation position	Any		
Operation temperature range	-25 °C … +50 °C		
Storage temperature range	-40 °C … +85 °C		
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm		

Part No.	Type	Weight/unit kg	PU (units)
716424	LOCC-Box-DY 7-6424	0.102	2

Dimensions

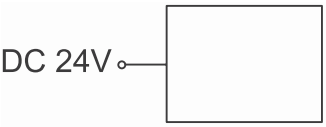


LOCC-Box supply set
consisting of supply terminal and end block
Maximum total current 40 A (UL: 35 A)

Input			Fine stranded wire with ferrule
Rated voltage U_N	DC 12/24/48 V		Finely stranded, ferrule with plastic collar
Rated current I_N	Max. DC 40 A		0.5 mm² – 6 mm²
Reverse voltage protection	No		AWG 22 – AWG 9
Connection type input	Push-In		UL Values
	0.5 mm² – 10 mm²		AWG 14 – AWG 8
	UL Values/stranded	Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
	AWG 14 – AWG 8	Mounting	DIN rail mountable TS35
Conductor connection cross section	Single-wire: max. 10 mm²	Degree of protection	IP20 (only as complete system with supply terminal, end block and copper rail cover)
	Finely stranded: max 10 mm²		
	Finely stranded with AEH: max 6 mm²		
Strip length	13 mm	Installation position	Any
Output		Operation temperature range	-25 °C … +50 °C
Rated voltage U_N	DC 12/24/48 V	Storage temperature range	-40 °C … +85 °C
Output current	Max. DC 40 A	Dimensions (w × h × d)	10.0 mm × 110.0 mm × 62.0 mm
Connection type output	Screwless contact slide	Approvals	cULus (E135145)
Copper bus bar	3 × 10mm	Standards	UL 60947-5-1
General			
Connection type	Push-In		
	Single wire/fine wire		
	0.50 mm² – 10.0 mm²		
	AWG 22 – AWG 7		

Part No.	Type	Weight/unit kg	PU (units)
716425	LOCC-Box-ES 7-6425	0.07	1

PIN assignment

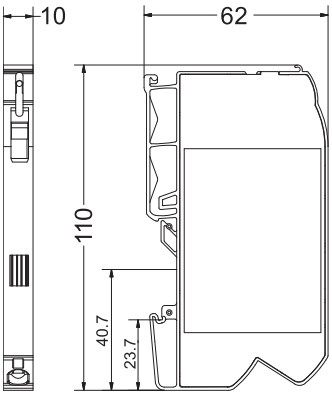


LOCC-Box supply terminal
Maximum total current 40 A (UL: 35 A)

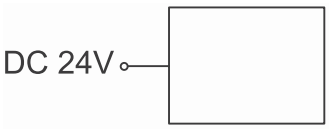
Input			Fine stranded wire with ferrule
Rated voltage U_N	DC 12/24/48 V		Finely stranded, ferrule with plastic collar
Rated current I_N	Max. DC 40 A		0.5 mm² – 6 mm²
Reverse voltage protection	No		AWG 22 – AWG 9
Connection type input	Push-In		UL Values
	0.5 mm² – 10 mm²		AWG 14 – AWG 8
	UL Values/stranded	Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
	AWG 14 – AWG 8	Mounting	DIN rail mountable TS35 (EN 60715)
Conductor connection cross section	Single-wire: max. 10 mm²	Degree of protection	IP20 (only as complete system with supply terminal, end block and copper rail cover)
	Finely stranded: max 10 mm²	Installation position	Any
	Finely stranded with AEH: max 6 mm²	Operation temperature range	-25 °C … +50 °C
Strip length	13 mm	Storage temperature range	-40 °C … +85 °C
Output		Dimensions (w × h × d)	10.0 mm × 110.0 mm × 62.0 mm
Rated voltage U_N	DC 12/24/48 V	Approvals	cULus (E135145)
Output current	Max. DC 40 A	Standards	UL 60947-5-1
Connection type output	Screwless contact slide		
Copper bus bar	3 × 10mm		
General			
Connection type	Push-In		
	Single wire/fine wire		
	0.50 mm² – 10.0 mm²		
	AWG 22 – AWG 7		

Part No.	Type	Weight/unit kg	PU (units)
716435	LOCC-Box-EKL 7-6435	0.035	2

Dimensions



PIN assignment

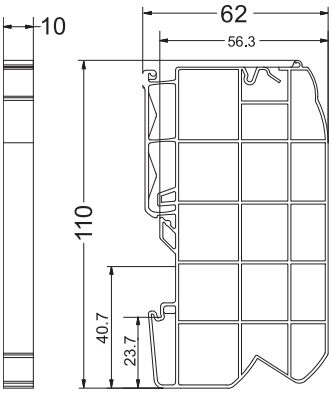


LOCC-Box end block

General			
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)	Storage temperature range	-40 °C … +85 °C
Mounting	DIN rail mountable TS35 (EN 60715)	Dimensions (w × h × d)	10.0 mm × 110.0 mm × 62.0 mm
Degree of protection	IP20 (only as complete system with supply terminal, end block and copper rail cover)	Approvals	cULus (E135145)
		Standards	UL 60947-5-1
Installation position	Any		
Operation temperature range	-25 °C … +50 °C		

Part No.	Type	Weight/unit kg	PU (units)
716436	LOCC-Box-EB 7-6436	0.01	2

Dimensions

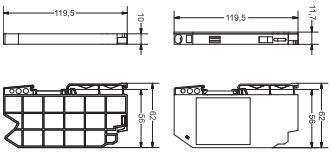


LOCC-Box supply set 16 mm²
Consisting of supply terminal and end block
Maximum total current 40 A (UL: 35 A)

Input			Finely stranded, ferrule with plastic collar
Rated voltage U_N	DC 12/24/48 V		1.5 mm² – 10 mm²
Rated current I_N	Max. DC 40 A		AWG 16 – AWG 7
Reverse voltage protection	No		UL Values
Connection type input	Spring terminal		AWG 14 – AWG 6
	0.33 mm² – 16 mm²	Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
	AWG 22 – AWG 6	Mounting	DIN rail mountable TS35
Conductor connection cross section	Single-wire: max. 16 mm²		(EN 60715)
	Finely stranded: max 10 mm²		
	Finely stranded with AEH: max 10 mm²	Degree of protection	IP20 (only as complete system with supply terminal, end block and copper rail cover)
Strip length	18 mm		
		Installation position	Any
Output		Operation temperature range	-25 °C … +50 °C
Rated voltage U_N	DC 12/24/48 V	Storage temperature range	-40 °C … +85 °C
Output current	Max. DC 40 A	Dimensions (w × h × d)	11.7 mm × 119.5 mm × 62.0 mm
Connection type output	Screwless contact slide		10.0 × 119.5 × 62.0 mm
Copper bus bar	3 × 10mm	Approvals	cULus (E135145)
		Standards	UL 60947-5-1
General			
Connection type	Spring terminal		
	Single wire/fine wire		
	1.50 mm² – 16 mm²		
	AWG 16 – AWG 5		
	Fine stranded wire with ferrule		

Part No.	Type	Weight/unit kg	PU (units)
716447	LOCC-Box-ES16 7-6447	0.045	1

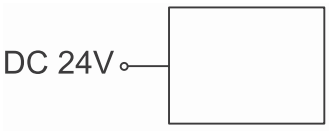
Dimensions



DE Endblock
EN *End block*
FR *Bloc d'extrémité*

DE EinspeiseKlemme
EN *Supply terminal*
FR *Borne d'alimentation*

PIN assignment

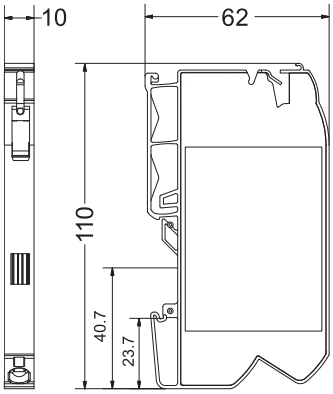


LOCC-Box supply terminal
Additional supply terminal for increased current
Maximum total current 40 A (UL: 35 A)

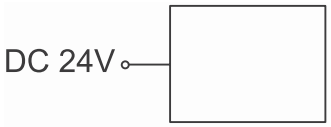
Input			Finely stranded, ferrule with plastic collar
Rated current I_N	Max. DC 40 A		0.5 mm² – 6 mm²
Reverse voltage protection	No		AWG 22 – AWG 9
Connection type input	Push-In 0.5 mm² – 10 mm² UL Values/stranded AWG 14 – AWG 8		UL Values AWG 14 – AWG 8
		Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Conductor connection cross section	Single-wire: max. 10 mm² Finely stranded: max 10 mm² Finely stranded with AEH: max 6 mm²	Mounting	DIN rail mountable TS35 (EN 60715)
		Degree of protection	IP20 (only as complete system with supply terminal, end block and copper rail cover)
Strip length	13 mm		
Output		Installation position	Any
Rated voltage U_N	DC 12/24 V	Operation temperature range	-25 °C … +50 °C
Output current	Max. DC 40 A	Storage temperature range	-40 °C … +85 °C
Connection type output	Screwless contact slide	Dimensions (w × h × d)	10.0 mm × 110.0 mm × 62.0 mm
Copper bus bar	3 × 10mm	Approvals	cULus (E135145)
		Standards	UL 60947-5-1
General			
Connection type	Push-In Single wire/fine wire 0.50 mm² – 10.0 mm² AWG 22 – AWG 7 Fine stranded wire with ferrule		

Part No.	Type	Weight/unit kg	PU (units)
716421	LOCC-Box-EKL 7-6421	0.035	2

Dimensions



PIN assignment



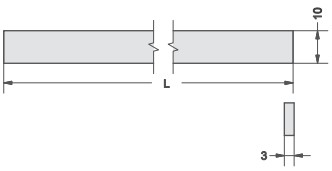
Copper bus bar, tin-plated
Various lengths
10 × 3 mm

General

Material	Cu, tin-plated surface
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +80 °C

Part No.	Type	Design	Dimensions (L×H×T)	Weight/unit kg	PU (units)
716426	LOCC-Box-CU 7-6426	Rod 1000 mm	1000.0 × 10.0 × 3.0 mm	0.265	1
716426.004.2	LOCC-Box-CU 7-6426.004.2	Rod 50.4 mm	50.4 × 10.0 × 3.0 mm	0.013	10
716426.008.2	LOCC-Box-CU 7-6426.008.2	Rod 82,8 mm	82.8 × 10.0 × 3.0 mm	0.022	10
716426.016.2	LOCC-Box-CU 7-6426.016.2	Rod 147.6 mm	147.6 × 10.0 × 3.0 mm	0.039	10
716426.032.1	LOCC-Box-CU 7-6426.004.2	Rod 277.2 mm	277.2 × 10.0 × 3.0 mm	0.074	1
716426.064.1	LOCC-Box-CU 7-6426.064.1	Rod 536.4 mm	536.4 × 10.0 × 3.0 mm	0.142	1

Dimensions



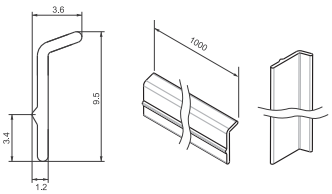
	L [mm]	Modules	VE / PU
716426.004.2	50.4	4	10
716426.008.2	82.8	8	10
716426.016.2	147.6	16	10
716426.032.1	277.2	32	1
716426.064.1	536.4	64	1
716426	1000.0	-	1

Cover, copper rail
Length 1 m

General			
Design	Rod 1000 mm	Operation temperature range	-25 °C … +50 °C
Material	ABS halogen-free	Storage temperature range	-40 °C … +80 °C
Color	grey	Dimensions (L×H×T)	1000.0 × 10.0 × 3.0 mm

Part No.	Type	Weight/unit kg	PU (units)
716427	LOCC-Box-AD 7-6427	0.1	1

Dimensions



Insulated jumper combs, 8-pin

Insulated jumper combs, 8-pin

General

Connection type	Plug-in
Contact design	Flat contact 0.5 mm
Pin spacing	8.2 mm
Contact material	FeZn
Material	PVC hard
Flamability according to UL 94	V0
Operation temperature range	-40 °C … +80 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	63.0 mm × 3.3 mm × 12.0 mm

Part No.	Type	Color	Weight/unit kg	PU (units)
716428	LOCC-Box-BKW 7-6428	white	0.003	5
716429	LOCC-Box-BKR 7-6429	red	0.003	5
716430	LOCC-Box-BKB 7-6430	blue	0.003	5

Insulated jumper combs, 16-pin

General

Connection type	Plug-in
Contact design	Flat contact 0.5 mm
Pin spacing	8.2 mm
Contact material	FeZn
Material	PVC hard
Flamability according to UL 94	V0
Operation temperature range	-40 °C … +80 °C
Storage temperature range	-40 °C … +85 °C
Dimensions (w × h × d)	130.0 mm × 3.3 mm × 12.0 mm

Part No.	Type	Color	Weight/unit kg	PU (units)
716438	LOCC-Box-BKW 7-6438	white	0.006	5
716439	LOCC-Box-BKR 7-6439	red	0.006	5
716440	LOCC-Box-BKB 7-6440	blue	0.006	5

Labelling system

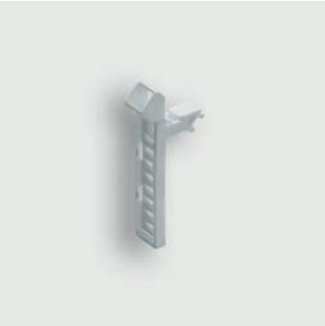
Labelling system

General

Pin spacing	6 mm
Material	PA6.6 (UL 94 V2)
Installation position	Vertical
Flamability according to UL 94	V2
Operation temperature range	-40 °C … +100 °C
Storage temperature range	-40 °C … +100 °C
Dimensions	6 × 12 mm
MTBF	690000 h
Approvals	UL 94
Standards	EN 60947-1

Part No.	Type	Color	Design	Weight/unit kg	PU (units)
716441	LOCC-Box-BZW 7-6441	white	Frame with 12 strips à 10 tabs	0.1	1

Labelling system, Tag holder 39.3×5 mm, Single signs



General

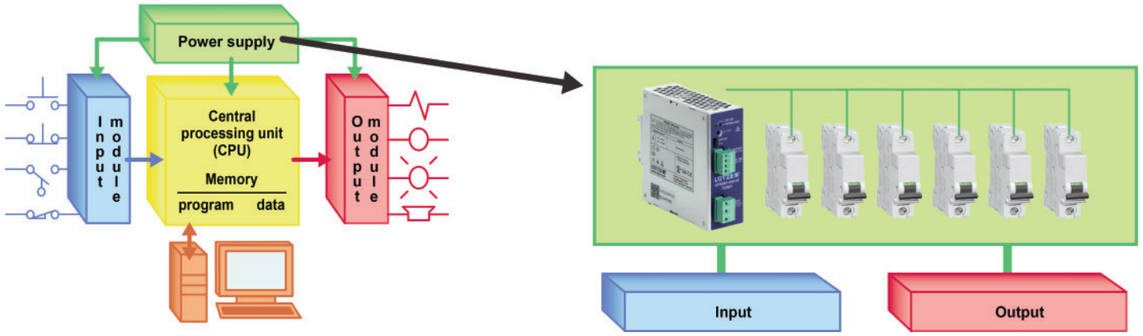
Pin spacing	7 mm
Material	PA6.6 (UL 94 V2)
Flamability according to UL 94	V2
Operation temperature range	-25 °C … +50 °C
Storage temperature range	-40 °C … +85 °C
Dimensions	38.2 × 8.0 × 14.7 mm
MTBF	690000 h
Standards	EN 60947-1

Part No.	Type	Color	Design	Weight/unit kg	PU (units)
716443	LOCC-Box-BZT 7-6443	white	Tag holder	0.00045	20
716444	LOCC-Box-BAD 7-6444	transparent	Cover for tag holder	0.00015	20

Intelligent LOCC-Box Net + Gateway Solution

The Problem

The benefits of IIoT are widely known and today's smart devices are increasingly used in new equipment throughout the manufacturing industries. But what about IIoT for thousands of older machines and deployed equipment? To update the machines, the initial thought is to add sensors or replace antiquated sensors with smarter ones. However, the decentralized control architecture on older machines makes this solution questionable due to the large number of physical locations and the time it would take to replace each unit. This would result in an extensive retrofit program, costing unnecessary downtime and thus most manufacturing organizations would forgo the undertaking and continue to operate in the outdated way.



The Solution

Instead of looking at the sensor actuator level as described above, manufacturers should take a look at the power supply level. Power supplies represent the heartbeat of the control systems, and if we were able to measure voltage and amperage, we would gain a deeper understanding of the system's condition. Furthermore, the power supply system contains multiple circuit branches allowing us to look deeper into detailed functions like a set of actuators or sensors.

In the picture above such a control circuit branch management system is shown using standard MCBs for the purpose of short circuit protection. This control system without intelligence does not provide any remote access to understand what happens on the input/output level. Additionally, such systems are known for frequent nuisance trips and a lack of overload protection.

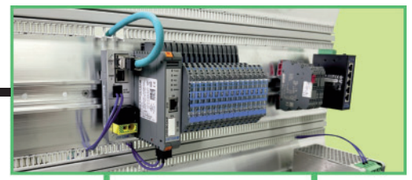
Hence, we need a "smart" MCB: A device which
- differentiates between a short circuit and an in-rush current, thus avoiding nuisance trips
- measures an overload triggering the proper trip curve, thus avoiding overheating
- measures current and voltage
- communicates with the plant floor level

The innovative solution is:
LOCC-BOX Net + Gateway
(Ethernet/IP, EtherCat, Profinet)

Now an IIoT retrofit becomes easy: all that is needed is to exchange the old MCBs with the LOCC-Box. Retrofitting is performed only in one location; inside the cabinet and not in the field. Existing wiring is often reusable. With minimal effort you develop a higher understanding of your equipment through remote diagnostics. And that is what IIoT is all about.

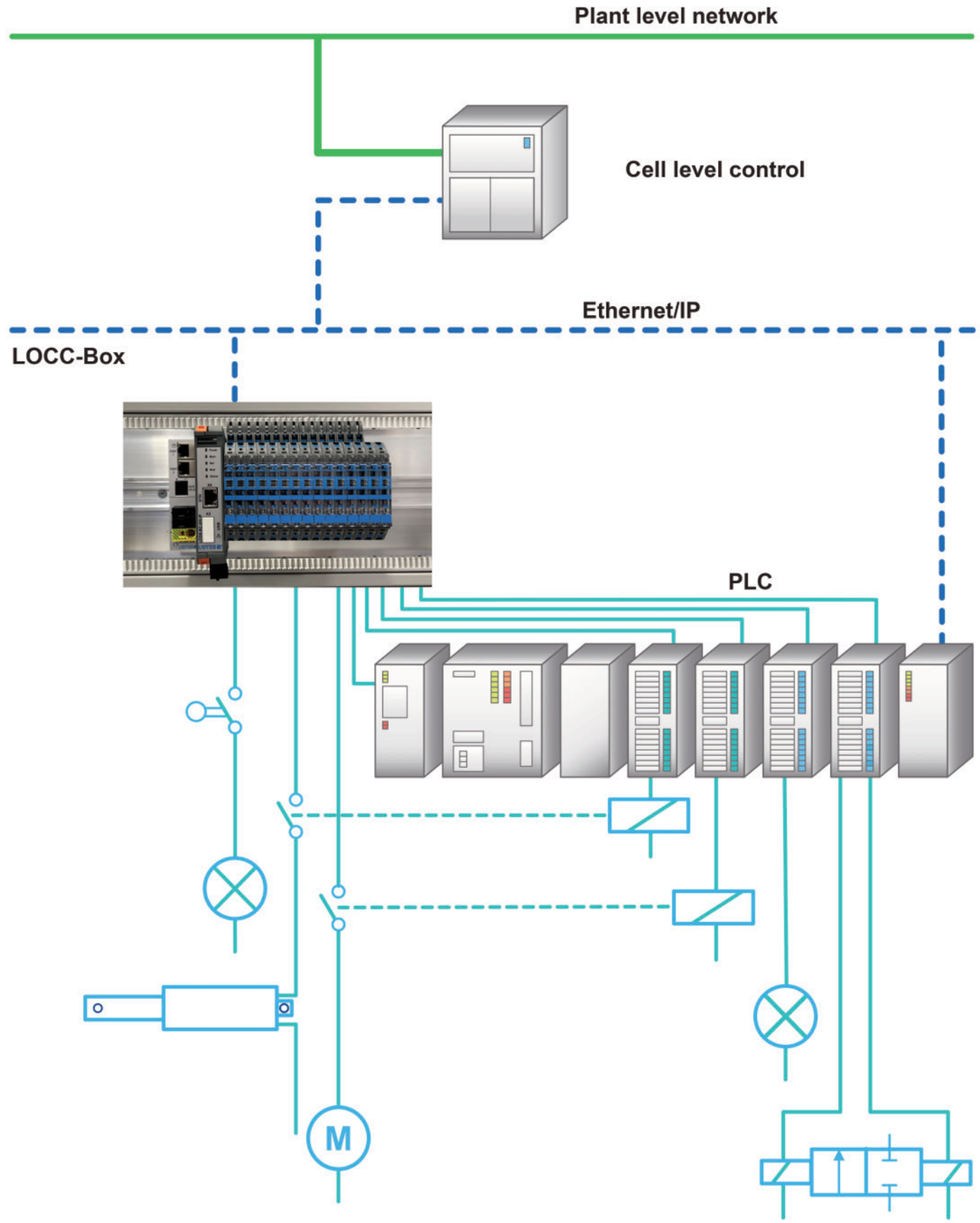
Intelligent Power Supply Solution

- **Factory Field Bus Gateway, Integrated Power Supply**
- **Intelligent Power Monitoring and Circuit Protection**



Factory Network

Ethernet/IP Gateway Application Example



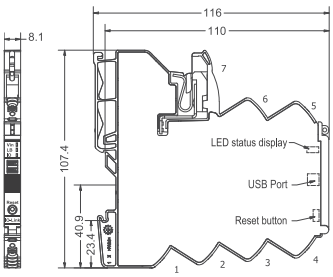
IO-Link Gateway for LOCC-Box-Net · LOCC-Box-GWIO 7-6455

Gateway for LOCC-Box-Net versions
Input: LOCCbus (LIN)
Output: I/O-Link

Input		Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Bus system	LOCCbus, base LIN	Mounting	DIN rail mountable TS35 (EN 60715)
Access method	Single-Master – Multiple Slave max. 15 functional assemblies	Installation position	Any
Bus technology	Line	Degree of protection	IP20 (only as complete system with supply terminal and end block)
Physical level	1-wire	Vibration resistance	1 g acc. to EN 60068-2-6
Data rate	8 Bit + fixed parity (Bit 9)	Connection type	Push-In spring connection 0.25 mm² – 2.5 mm² AWG 24 – AWG 14
Transfer protocol	Modified multi-drop	Relative air humidity	max. 90 % not condensing
Reverse voltage protection	Yes	Shock resistance	15 g acc. EN 60068-2-27
Output		Approvals	cULus (E170585)
Bus system	IO-Link	Standards	EN 61000-6-2 EN 61000-6-4 EN 61010-1 EN IEC 61010-2-201 UL 61010-1 UL 61010-2-201 CFR 47 Part 15 Subpart B
Transfer rate	38.4 kBaud		
Interface	IO-Link Device		
General			
Rated voltage U_N	DC 12/24 V		
Rated current	80 mA @ 24 V		
Operation temperature range	-25 °C … +50 °C		
Storage temperature range	-40 °C … +85 °C		
Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm		

Part No.	Type	Weight/unit kg	PU (units)
716455	LOCC-Box-GWIO 7-6455	0.105	1

Dimensions



PIN assignment

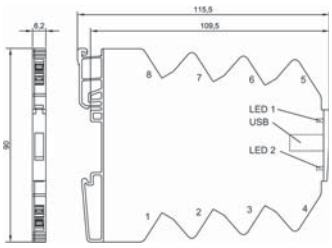
PIN	Signal
1	IO Link (L-)
2	IO Link (C/Q)
3	IO Link (L+)
4	Communication (LIN)
5	0V GND
6	DC + 24V
7	DC + 24V

Gateway for LOCC-Box-Net versions
Input: LOCCbus (LIN)
Output: USB, RS 232, CANopen

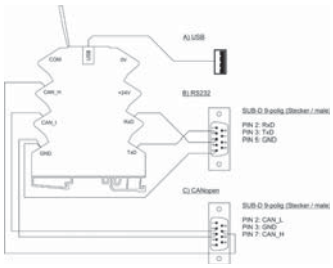
Input			
Bus system	LOCCbus, base LIN	Rated current	Max. 50 mA
Access method	Single-Master - Multiple Slave	Status indication	LED 1 green/red: USB, RS232, Firmware
Bus technology	Line		LED 2 green/red: CANopen
Physical level	1-wire	Operation temperature range	-25 °C … +50 °C
Transfer rate	9600 Baud	Storage temperature range	-40 °C … +85 °C
Data rate	8 Bit + fixed parity	Dimensions (w × h × d)	6.2 mm × 90.0 mm × 115.0 mm
Transfer protocol	Modified multi-drop	Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Operation voltage range	DC 10–26.4 V	Mounting	DIN rail mountable TS35 (EN 60715)
Reverse voltage protection	Yes	Installation position	Any
Output		Degree of protection	IP20
Bus system	USB 2.0 Full-Speed, RS232, CANopen	Connection type	Spring terminal
Transfer rate	USB: 12 Mbit/s RS232: 600–11500 bit/s CANopen: 10–1000 kbit/s		0.14 mm² – 2.5 mm² (with ferrule 1.5 mm²)
		Relative air humidity	max. 90 % not condensing
		Shock resistance	15 g acc. EN 60068-2-27
General		Standards	EN 61000-6-2 EN 61000-6-4
Rated voltage U_N	DC 12/24 V		

Part No.	Type	Weight/unit kg	PU (units)
716459	LOCC-Box-GW 7-6459	0.06	1

Dimensions



PIN assignment

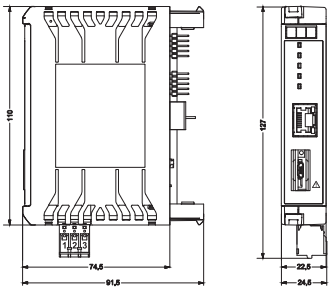


PROFINET Gateway for LOCC-Box-Net

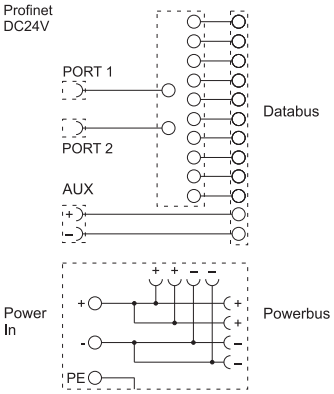
Field bus connection	
Fieldbus/Network systems	PROFINET RT acc. to IEC 61158-5-10
BUS physics	Ethernet
Interface mechanical	2 × Square connector 10-pin
Transfer rate	100 Mbit/s
Transmission standard	IEEE 802.3, 100 Base-Tx
Communication assemblies	
BUS physics	CANopen acc. to ISO 11898-1
Bus termination	120 Ω internal
BUS participants	Max. 64 functional assemblies
BUS topology	Line
Communication external LOCC-boxes	
BUS physics	LIN
Bus termination	1 K internal
BUS participants	Max. 64 functional assemblies
BUS topology	Line
Interface mechanical	Plug-in spring terminal 3-pin, 0.2 – 2.5 mm² (AWG 24 – AWG 12)
Interface electrical	Galvanically separated
Communication web server	
BUS physics	Ethernet acc. to IEEE 802.3 100 Base-Tx
Transfer rate	100 Mbit/s
Interface mechanical	RJ45 bush with galvanic isolation 1.5 kV
communication LOCC-PADS	
BUS physics	USB specification 2.0
Transfer rate	480 Mbit/s (USB High Speed)
Interface mechanical	Micro USB
General	
Rated voltage	24 V
Nominal voltage range	DC 18 V – 31.2 V
Rated current	Max. 240 mA via function carrier with feed (FTE)
Power consumption	< 5 W
Protection device	Reverse diode
Vibration resistance	0.7 g acc. to EN 60068-2-6
Shock resistance	15 g acc. EN 60068-2-27
Insulation voltage input / output	AC 1.5 kV_{eff}
Installation position	Any
Operation temperature range	-25 °C … +55 °C
Storage temperature range	-25 °C … +85 °C
MTBF	2196952 h
Relative air humidity	5 – 95 %, without condensation
Cooling	Air convection
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	RAL 7012
	Basalt grey
Mounting	Pluggable
	On function carrier with feed (FTE)
	780714.575.1
	57.5 mm (Accessories)
LOCC-Bus (transfer rate)	9600 kbit/s
LCOS-Bus (transfer rate)	1 Mbit/s
Max. altitude operation	2000 m
Degree of protection	IP20 (EN 60529)
Dimensions (w × h × d)	22.5 mm × 102.0 mm × 120.0 mm
Approvals	cULus (E170585)
	DNV (TAA00002SY)
Standards	EN 61000-6-2
	EN 61000-6-4
	UL 61010-1
	UL 61010-2-201
	DNV-CG-0339

Part No.	Type	Weight/unit kg	PU (units)
778000.1301	LCOS-BC-PN	0.25	1

Dimensions



PIN assignment

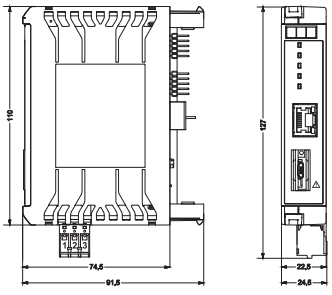


EtherCAT Gateway for LOCC-Box-Net

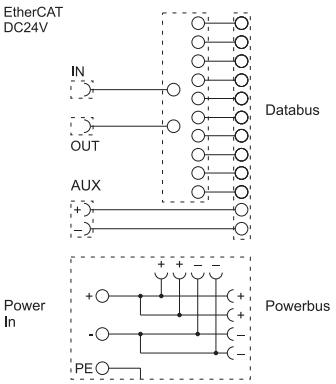
Field bus connection	
Fieldbus/Network systems	EtherCAT Slave acc. to ETG.1300
BUS physics	Ethernet
Interface mechanical	2 × Square connector 10-pin
Transfer rate	100 Mbit/s
Transmission standard	IEEE 802.3, 100 Base-Tx
Communication assemblies	
BUS physics	CANopen acc. to ISO 11898-1
Bus termination	120 Ω internal
BUS participants	Max. 64 functional assemblies
BUS topology	Line
Communication external LOCC-boxes	
BUS physics	LIN
Bus termination	1 K internal
BUS participants	Max. 64 functional assemblies
BUS topology	Line
Interface mechanical	Plug-in spring terminal 3-pin, 0.2 – 2.5 mm² (AWG 24 – AWG 12)
Interface electrical	Galvanically separated
Communication web server	
BUS physics	Ethernet acc. to IEEE 802.3 100 Base-Tx
Transfer rate	100 Mbit/s
Interface mechanical	RJ45 bush with galvanic isolation 1.5 kV
communication LOCC-PADS	
BUS physics	USB specification 2.0
Transfer rate	480 Mbit/s (USB High Speed)
Interface mechanical	Micro USB
General	
Rated voltage	24 V
Nominal voltage range	DC 18 V – 31.2 V
Rated current	Max. 240 mA via function carrier with feed (FTE)
Power consumption	< 5 W
Protection device	Reverse diode
Vibration resistance	0.7 g acc. to EN 60068-2-6
Shock resistance	15 g acc. EN 60068-2-27
Insulation voltage input / output	AC 1.5 kV_{eff}
Installation position	Any
Operation temperature range	-25 °C … +55 °C
Storage temperature range	-25 °C … +85 °C
MTBF	2196952 h
Relative air humidity	5 – 95 %, without condensation
Cooling	Air convection
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	RAL 7012
	Basalt grey
Mounting	Pluggable
	On function carrier with feed (FTE)
	780714.575.1
	57.5 mm (Accessories)
LOCC-Bus (transfer rate)	9600 kbit/s
LCOS-Bus (transfer rate)	1 Mbit/s
Max. altitude operation	2000 m
Degree of protection	IP20 (EN 60529)
Dimensions (w × h × d)	22.5 mm × 102.0 mm × 120.0 mm
Approvals	cULus (E170585)
	DNV (TAA00002SY)
Standards	EN 61000-6-2
	EN 61000-6-4
	UL 61010-1
	UL 61010-2-201
	DNV-CG-0339

Part No.	Type	Weight/unit kg	PU (units)
778000.1401	LCOS-BC-EC	0.25	1

Dimensions



PIN assignment



Ethernet-IP Gateway

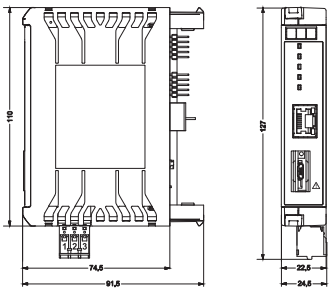
Ethernet-IP Gateway for LOCC-Box-Net

Field bus connection	
Fieldbus/Network systems	Ethernet Industrial Protocol (EtherNet/IP) acc. to IEC 61158
BUS physics	Ethernet
Interface mechanical	2 × Square connector 10-pin
Transfer rate	100 Mbit/s
Transmission standard	IEEE 802.3, 100 Base-Tx
Communication assemblies	
BUS physics	CANopen acc. to ISO 11898-1
Bus termination	120 Ω internal
BUS participants	Max. 120 channels or 64 functional assemblies
BUS topology	Line
Communication external LOCC-boxes	
BUS physics	LIN
Bus termination	1 K internal
BUS participants	Max. 64 functional assemblies
BUS topology	Line
Interface mechanical	Plug-in spring terminal 3-pin, 0.2 – 2.5 mm² (AWG 24 – AWG 12)
Interface electrical	Galvanically separated
Communication web server	
BUS physics	Ethernet acc. to IEEE 802.3 100 Base-Tx
Transfer rate	100 Mbit/s
Interface mechanical	RJ45 bush with galvanic isolation 1.5 kV
communication LOCC-PADS	
BUS physics	USB specification 2.0
Transfer rate	480 Mbit/s (USB High Speed)
Interface mechanical	Micro USB

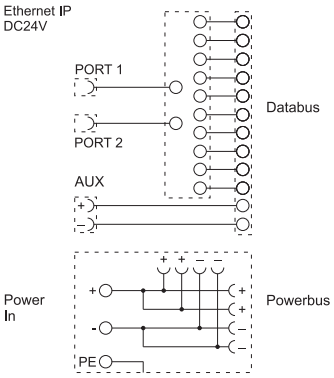
General	
Rated voltage	24 V
Nominal voltage range	DC 18 V – 31.2 V
Rated current	Max. 240 mA via function carrier with feed (FTE)
Power consumption	< 5 W
Protection device	Reverse diode
Vibration resistance	0.7 g acc. to EN 60068-2-6
Shock resistance	15 g acc. EN 60068-2-27
Insulation voltage input / output	AC 1.5 kV_{eff}
Installation position	Any
Operation temperature range	-25 °C … +55 °C
Storage temperature range	-25 °C … +85 °C
MTBF	2196952 h
Relative air humidity	5 – 95 %, without condensation
Cooling	Air convection
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Color of the housing	RAL 7012 Basalt grey
Mounting	Pluggable On function carrier with feed (FTE) 780714.575.1 57.5 mm (Accessories)
LOCC-Bus (transfer rate)	9600 kbit/s
LCOS-Bus (transfer rate)	1 Mbit/s
Max. altitude operation	2000 m
Degree of protection	IP20 (EN 60529)
Dimensions (w × h × d)	22.5 mm × 102.0 mm × 120.0 mm
Approvals	cULus (E170585) ODVA Certification DNV (TAA00002SY)
Standards	EN 61000-6-2 EN 61000-6-4 UL 61010-1 UL 61010-2-201 DNV-CG-0339

Part No.	Type	Weight/unit kg	PU (units)
778000.1701	LCOS-BC-ETIP	0.25	1

Dimensions



PIN assignment

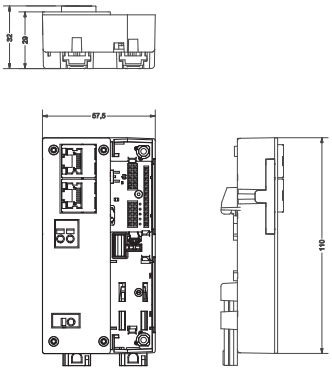


LCOS function carrier
Supply module for Profinet, EtherCAT and Ethernet IP Gateways
Control voltage connection DC 24 V

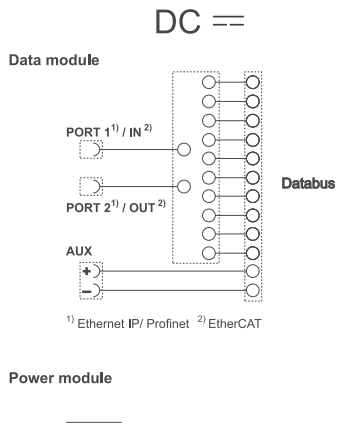
Electrical data supplementary supply		Mounting	DIN rail mountable TS35 (EN 60715)
Operating voltage	DC 18 V – DC 31.2 V	Max. altitude operation	2000 m max.
Rated voltage	DC 24 V	Installation position	Vertical
Operating current	Max. DC 2 A	MTBF	on request
Protection device	Polarity reversal protection	Over voltage category	II
Connection type input	Spring terminal 2 × 2.5 mm² (AWG 26 – AWG 14)	Degree of pollution	2
		Dimensions (w × h × d)	57.5 mm × 110.0 mm × 32.0 mm
		Approvals	DNV (TAA00002SY)
Field bus connection		Standards	EN 61000-6-2 EN 61000-6-4 DNV-CG-0339
Interface mechanical	2xRJ45 bush with galvanic isolation 1.5 kV		
Status indication	Link, activity	**General ambient conditions**	
		Operation temperature range	-25 °C … +55 °C
Slots		Storage temperature range	-40 °C … +85 °C
Slots	1 × LCOS function housing 22.5 mm	Relative air humidity	10 % – 95 %, without condensation
		Degree of protection	IP20 (EN 60529)
General		Shock resistance	15 g 11 ms acc. to IEC 60068-2-27
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)	Vibration resistance	0.7 g acc. to EN 60068-2-6
Color of the housing	Pebble grey		

Part No.	Type	Weight/unit kg	PU (units)
780714.575.1	LCOS-FTE-PE-575-UN-04-1-L	0.25	1

Dimensions



PIN assignment

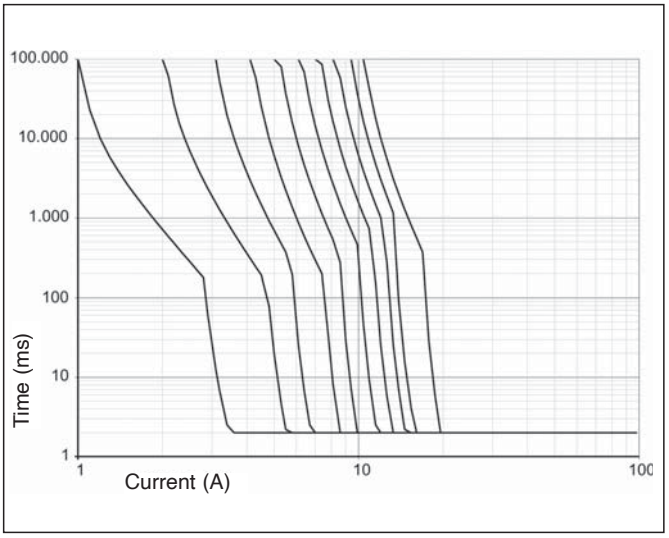


LOCC-Box · Characteristic Curves

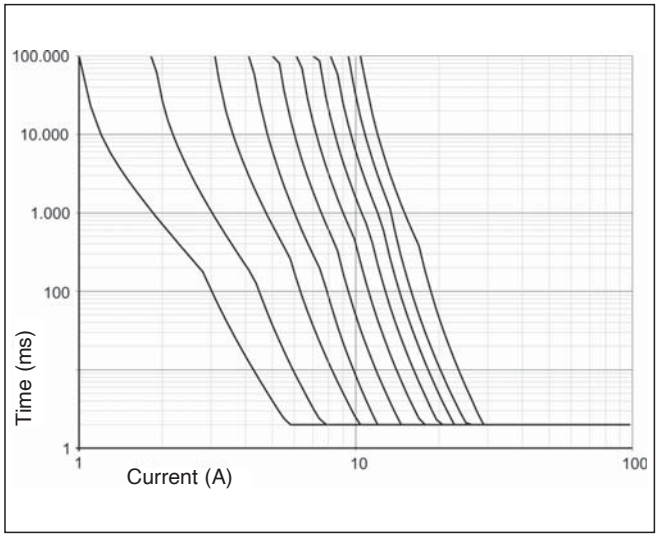
All LOCC-Box devices have the same characteristic curves

1-10 A (6A)

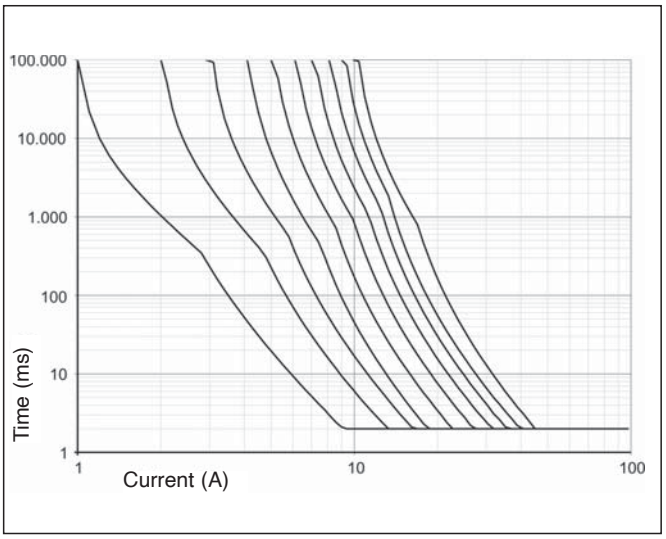
Switch position 1: Characteristic fast



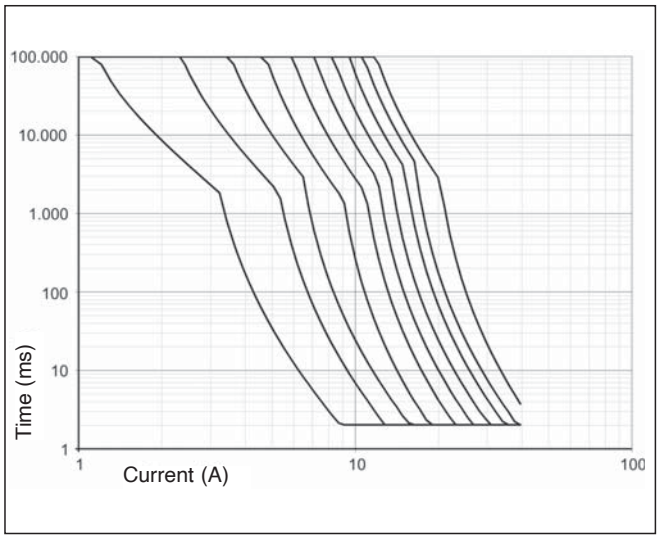
Switch position 2: Characteristic medium



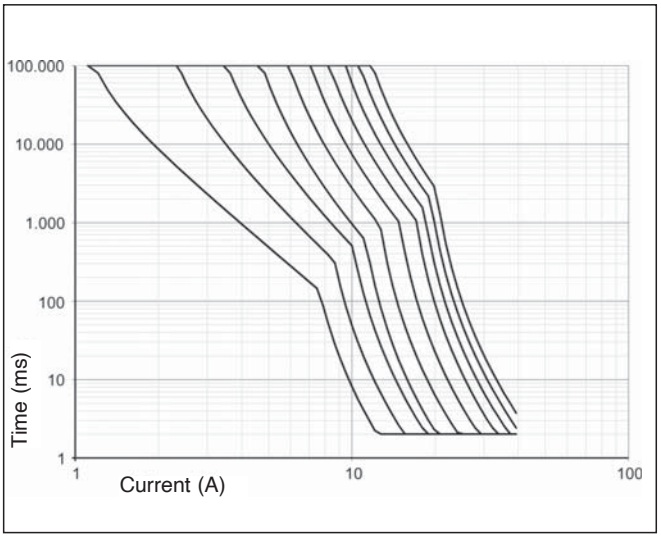
Switch position 3: Characteristic slow-1



Switch position 4: Characteristic slow-2



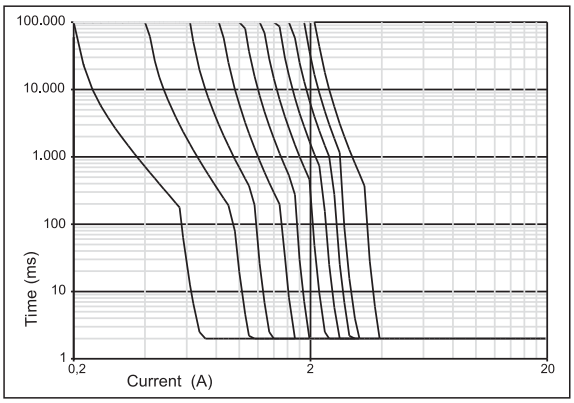
Switch position 5: Characteristic slow-3



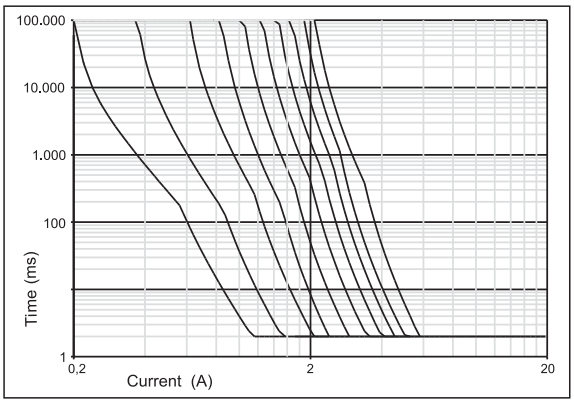
LOCC-Box · Characteristic Curves

Characteristic Curves 0-2 A

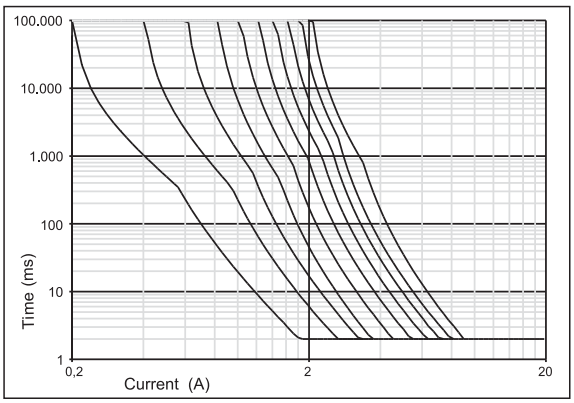
Switch position 1: Characteristic fast



Switch position 2: Characteristic medium

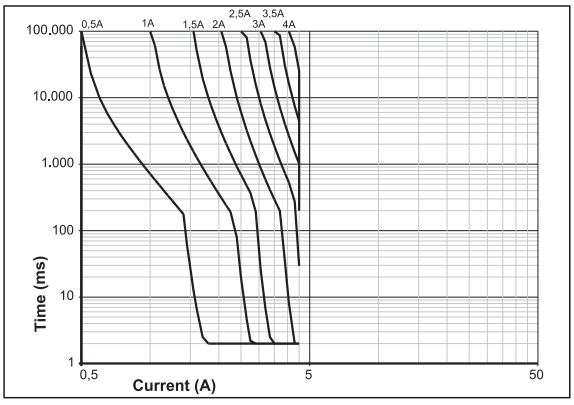


Switch position 3: Characteristic slow

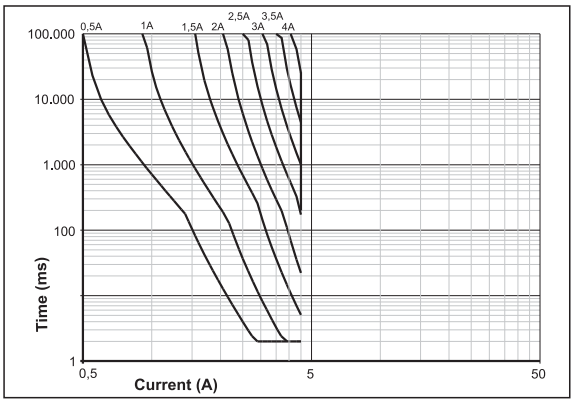


Characteristic Curves for the NEC Class 2 device

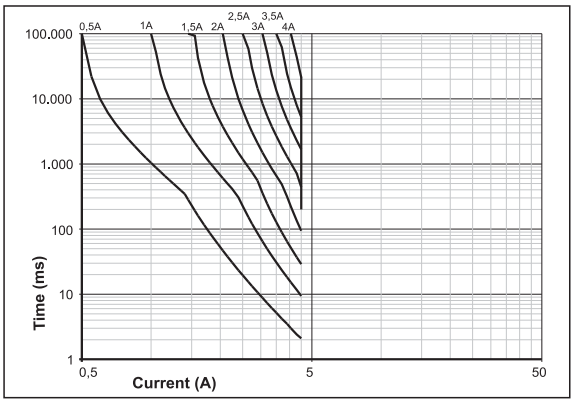
Switch position 1: Characteristic fast



Switch position 2: Characteristic medium



Switch position 3: Characteristic slow



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USA
LUTZE INC.
13330 South Ridge Drive
Charlotte, NC 28273
Tel.: +1 704 504-0222
info@lutze.com

Germany
Friedrich Lütze GmbH
Postfach 12 24 (PLZ 71366)
Bruckwiesenstraße 17-19
D-71384 Weinstadt
Tel.: +49 71 51 60 53-0
info@luetze.de

United Kingdom
LÜTZE Ltd.
Unit 3 Sandy Hill Park
Sandy Way, Amington
Tamworth, Staffs, B77 4DU
Tel.: +44 1827 313330
sales.gb@lutze.co.uk

Austria
LÜTZE Elektrotechnische Erzeugnisse Ges.m.b.H.
office@luetze.at

Switzerland
LÜTZE AG
info@luetze.ch

France
LUTZE SASU
lutze@lutze.fr

Spain
LUTZE, S.L.
info@lutze.es

China
Luetze Trading (Shanghai) Co.Ltd.
info@luetze.cn

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