Technical data sheet

Load monitoring LOCC-Box Rail

Identification

Type	LOCC-Box-FB Rail 7-9501
Part No.	819501

Product version

Hardware revision	2.0
Software version	2.6
Datasheet version	03

Use/Application/Properties

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

Safety integrity

Standards	EN 50155:2007-07 EN 50121-3-2:2006-07 EN 50124-1:2001-03 EN 61373:2010-09

Input

Type of function	1-channel 1 pin switching
Rated voltage U_N	DC 24 V
Reverse voltage protection	internal electronics
Connection type input	screwless contact slide

Inputs

Rated voltage U_N	DC 24 V
Connection type input	screwless contact slide

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Control input (Set / Reset)

Signal level	DC 24 V
OFF	Pulse with falling edge >100 ms, <800 ms
ON	Pulse with falling edge > 1 s

Output

Switching element	MOSFET
Output current	Single operation: max. DC 10 A @ 70 °C Side by side operation (Derating): max. DC 10 A @ ≤55 °C -0.2 A/C @ ≥56 °C max. DC 7 A @ 70 °C
Supply current	DC 40 A over Cu-rails 10 × 3 mm
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'
Type of function	1-channel 1 pin switching

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

Technical data

Storage temperature range	-40 °C … +85 °C
Connection type	Push-In 0,25 – 2,5 mm² AWG 24 – AWG 14
Strip length	10 mm
Screwdriver	3,0 × 0,5 mm
Current Consumption	25 mA @ 24 V
Measurement accuracy	approx. ±10 %

General

Dimensions (w × h × d)	8.1 mm × 107.4 mm × 116.0 mm
Weight/unit	0.105 kg
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 postition	As desired

Environmental service conditions

Altitude	2000 m
Operating temperature class	OT4: -40 °C … +70 °C
Switch-on extended Operating temperature class	ST1: OTx + 15 °C
Temperature variation class	H1:no requirements
Shock/Vibration	Category 1, class B
Class of supply voltage interruption	S1
Supply change-over class	C1: 100 ms
Useful life class	L4 (Restrictions, see Operating Instructions("MA"))
Degree of pollution	PD2
Over voltage category	OV2
Socket and edge connector	K2: Sockets for ICs and/or edge connectors are not used
Protective coating class	PC2: lacquered on both sides
Degree of protection	IP20

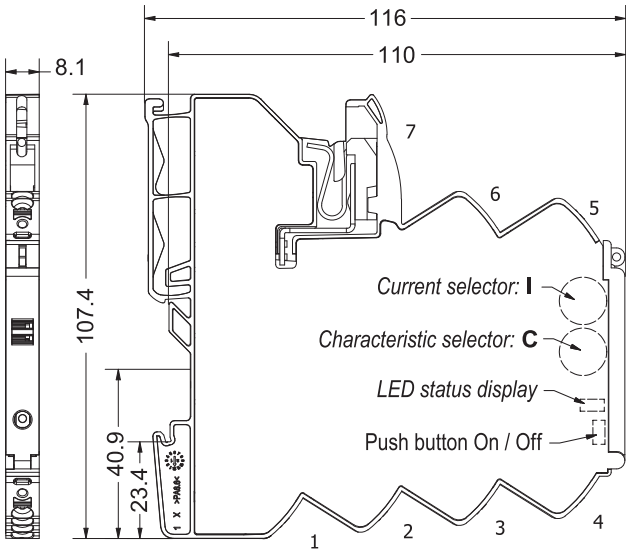
Failure Rate Prediction (MTBF)

Standards	Electronic components – Reliability – Reference conditions for failure rates and stress models for conversion: EN/IEC 61709 Failure Rates of Components – Expected values: SN 29500
Failure rate at +45 °C	598 fit
Failure rate at +45 °C	1672207 h
	1 fit equals one failure per 10^9 component hours
	The indicated temperature is the mean component ambient temperature.
Comments	The results are valid under following conditions: Automotive environment or industrial areas without extreme dust levels and harmful substances Continuous operation 8760 h per year

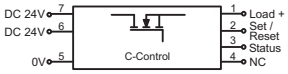
Standards/Certifications

Standards	**EN 50155:2007:** Railway applications – Rolling stock – Electronic equipment **EN 50155:2017:** Railway applications – Rolling stock – Electronic equipment – only testing according to chapter 13.3 Withstand voltage test: routine test with 1 s test duration **EN 50121-3-2:2016:** Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus **EN 50124-1:2017:** Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment **EN 61373:1999:** Railway applications – Rolling stock equipment – Shock and vibration tests **EN 61373:2010:** Railway applications – Rolling stock equipment – Shock and vibration tests **EN 45545-2:2013+A1:2015:** Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behaviour of materials and components

Dimensions

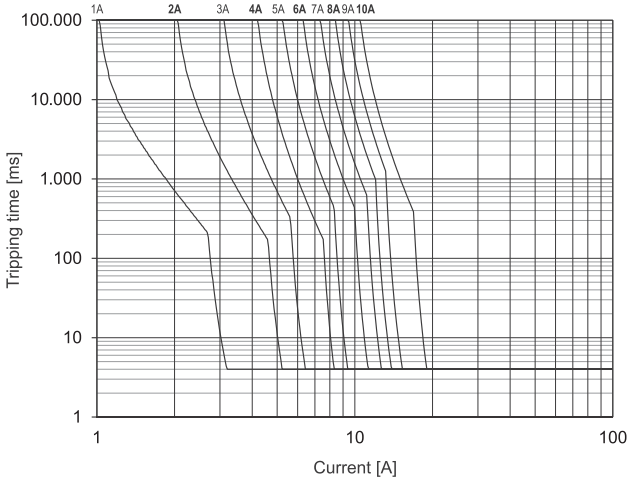


PIN assignment

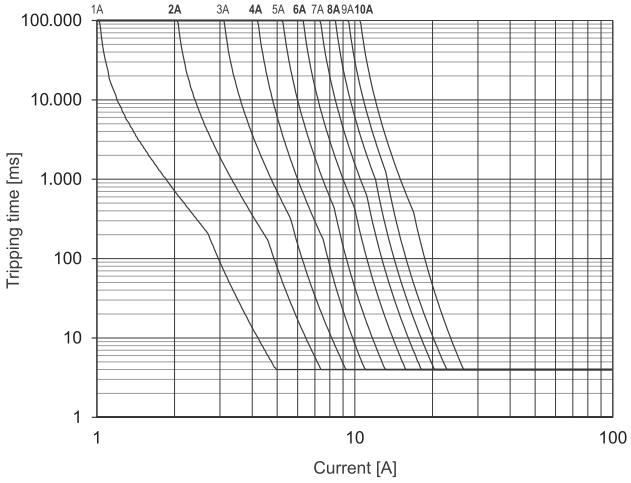


1: + Output
2: Control input (Set/Reset)
3: Status output
4: NC
5: 0V
6: + Supply (alternative)
7: + Supply

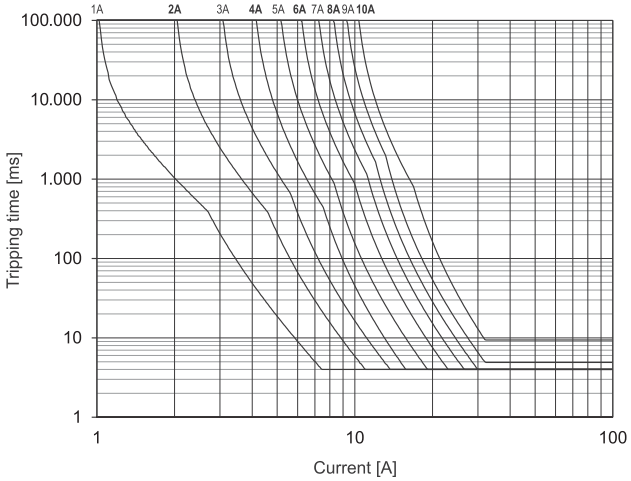
1: Characteristic fast



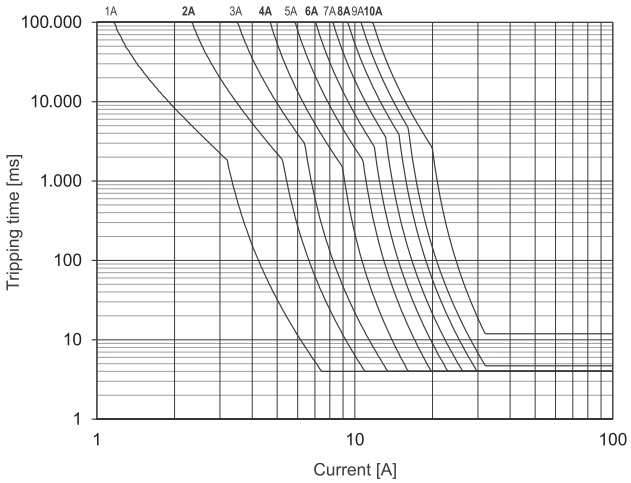
2: Characteristic medium



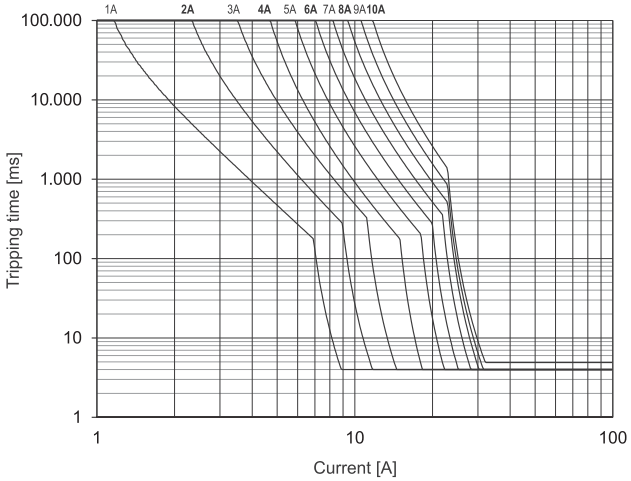
3: Characteristic slow-1



4: Characteristic slow-2



5: Characteristic slow-3



LED status

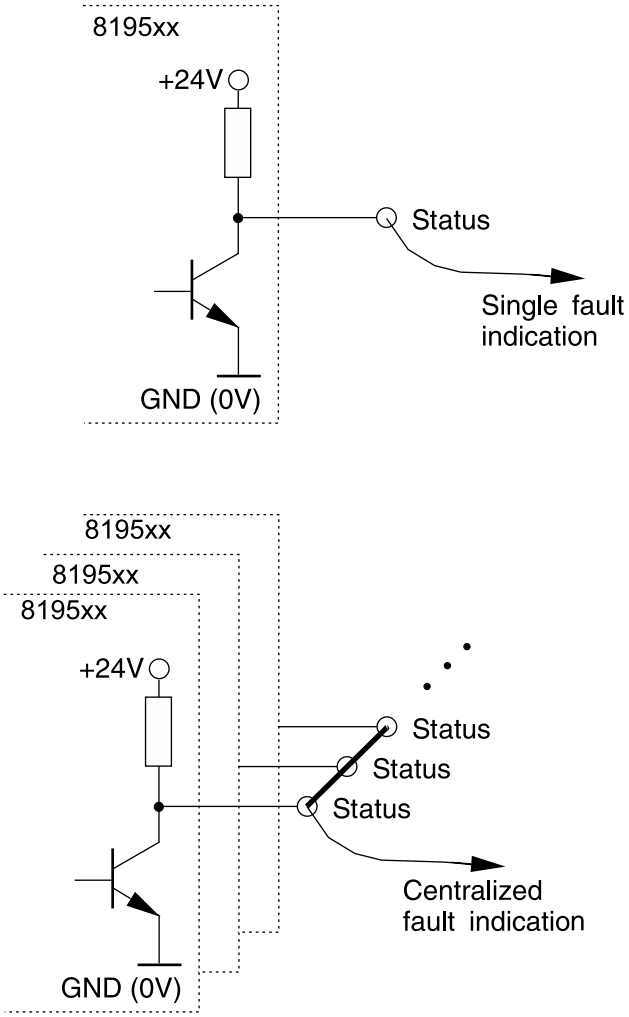
LED Status, Button, Rotary Switch

LED green	*ON*	*Function is OK**
LED green, flashing 1 Hz	*Overload*	*Load above 90 % of I nominal*
LED green, flashing 5 Hz	*Overload*	*Load above 100 % of I nominal*
LED red	*OFF*	*Module switched off or acknowledged**
LED red, flashing 1 Hz	*Overload*	*Output off due to overload/short circuit**
LED red, flashing 5 Hz	*Error*	*Wiring error – feedback (internal error)*
LED red, flashing shortly	*OFF*	*Output off via remote set/reset*
LED red/green, flashing 1 Hz	*ON*	*Target settings via rotary switch deviate from actual settings.* ***NOTICE: Switching off and on via pushbutton required.***
*Button ****	*ON/OFF*	*Nominal operation: ON/OFF* *Load monitoring tripped: 1st push: acknowledge* *2nd push: ON*
*Rotary Switch (I) – Switch Position***		*Rated current, see page 4.*
*Rotary Switch (C) – Switch Position***		*Characteristic: 1: fast 2: middle* *3: slow-1 4: slow-2 5: slow-3*

** If the operating voltage is switched off, the last status is saved (Default).*
*** Accept the setting - after switching on again via the button, not by Remote Set/Reset*
**** Master function - switch off via push button, can only be switched on again via push button*

For further information see also the operating instructions

Signal output



Mounting diagram