



CAN Repeater

CRep S8C-.../S24/RMD

User Manual

User manual for CAN Repeater CRep S8C-.../S24/RMD

Document version: 1.6

Documentation date: August 11th, 2023

No part of this document or the software described herein may be reproduced in any form without prior written agreement from EMS Dr. Thomas Wünsche.

For technical assistance please contact:

EMS Dr. Thomas Wünsche
Sonnenhang 3

D-85304 Ilmmünster

Tel. +49-8441-490260

Fax +49-8441-81860

Email: support@ems-wuensche.com

Our products are continuously improved. Due to this fact specifications may be changed at any time and without announcement.

FCC: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING: CRep S8C hardware and software may not be used in applications where damage to life, health or private property may result from failures in or caused by these components.

Content

1	Overview	1
1.1	Attributes	1
1.2	General Description	1
1.3	Ordering Information	2
2	Electrical Characteristics	3
2.1	Absolute Limiting Values	3
2.2	Nominal Values	3
3	Operating Instructions	5
3.1	Pin Assignment	5
3.2	Cascade	6
3.3	Block Diagram	7
3.4	Dimensions	8
4	Appendix	9
4.1	Instruction for Disposal	9
4.2	FCC Statement	9
4.3	CE Conformity	10

THIS PAGE INTENTIONALLY LEFT BLANK

1 Overview

1.1 Attributes

- Protocol transparent CAN repeater
- 8 CAN channels
- Low propagation delay
- Links for cascading up to 3 devices with one supply
- ISO 11898 compatible bus interface
- Detach of dominant locked bus segments
- Rail mountable
- 120 ohm termination included

1.2 General Description

The compact CAN repeater CRep S8C transmits and amplifies signals transparent to the CAN protocol. Each of the eight CAN connections has the physical behaviour of a single bus node. CRep S8C permits a flexible design of the network topology and offers special support for star structured networks. Furthermore tree structures and long stub lines are supported. Through the possibility to use the network structure that fits the application best a reduction of installation costs can be reached.

The maximum data rate in CAN networks, depending on signal propagation delays, can be increased, if CRep S8C is used to improve the network structure. An increase of the maximum node count in a CAN network can be reached by splitting the network in subnets that are connected by CRep S8C. Each subnet makes the number of CAN nodes possible permitted by the drivers output current. Where CAN signals have to be transmitted over long distances, CRep S8C can be used for signal conditioning. The capability to detach erroneous segments from the rest of the CAN system reduces the impact on the intact bus segments for the most commonly occurring errors.

The presence of power is indicated by a LED. Furthermore each CAN channel is provided with a LED indicating that this channel has originated a CAN message when the LED is on.

1.3 Ordering Information

12-04-102-xx	CRep S8C-5/S24/RMD Multiport CAN repeater for rail mounting 500ns inhibit time
12-04-103-xx	CRep S8C-10/S24/RMD Multiport CAN repeater for rail mounting 1 μ s inhibit time
12-04-104-xx	CRep S8C-20/S24/RMD Multiport CAN repeater for rail mounting 2 μ s inhibit time
12-04-105-xx	CRep S8C-50/S24/RMD Multiport CAN repeater for rail mounting 5 μ s inhibit time
12-04-106-xx	CRep S8C-100/S24/RMD Multiport CAN repeater for rail mounting 10 μ s inhibit time

Note: xx denotes language of delivery:

- 10 German
- 20 English

2 Electrical Characteristics

2.1 Absolute Limiting Values

Any (also temporary) stress in excess of the limiting values may cause permanent damage on CRep S8C and connected devices.

Parameter	Min.	Max.	Unit
Storage temperature	-40	+80	°C
Operating temperature	0	+60	°C
Power supply voltage	-100	+35	V
Voltage on signal lines	-30	+30	V
Maximum power dissipation (at 60°C)	-	tbd	mW

2.2 Nominal Values

All values, unless otherwise specified, refer to a supply voltage of 24V and an environmental temperature of 20°C.

Parameter	Min.	Typ.	Max.	Unit
Current consumption (no load)	-	70	-	mA
Current consumption (250kBit/s, 100% busload)	-	tbd	-	mA
Power supply voltage	19	24	30	V
Propagation delay between 2 arbitrary CAN channels	-	130	200	ns
Propagation delay cascade	-	8	10	ns

THIS PAGE INTENTIONALLY LEFT BLANK

3 Operating Instructions

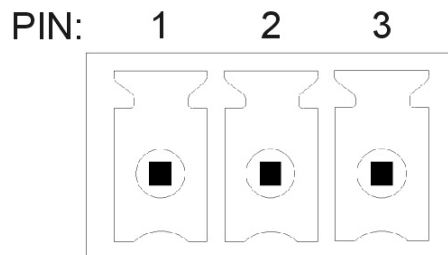
3.1 Pin Assignment

A CRep S8C device includes 8 CAN segments, wired by terminal blocks with 3 clamps. The power supply of CRep S8C is separately wired by a terminal block with 2 clamps.

Each CAN segment is terminated with 120 ohm.

The following table shows the terminal assignment of the CAN connector:

Pin	-	Function
1	CAN_H	CAN high bus line
2	CAN_L	CAN low bus line
3	GND	CAN ground



The following table shows the terminal assignment of the power connector:

Pin	Name	Function
1	POWER +	Positive supply +24V
2	POWER -	Ground

The power supply is galvanically decoupled from the CAN system.

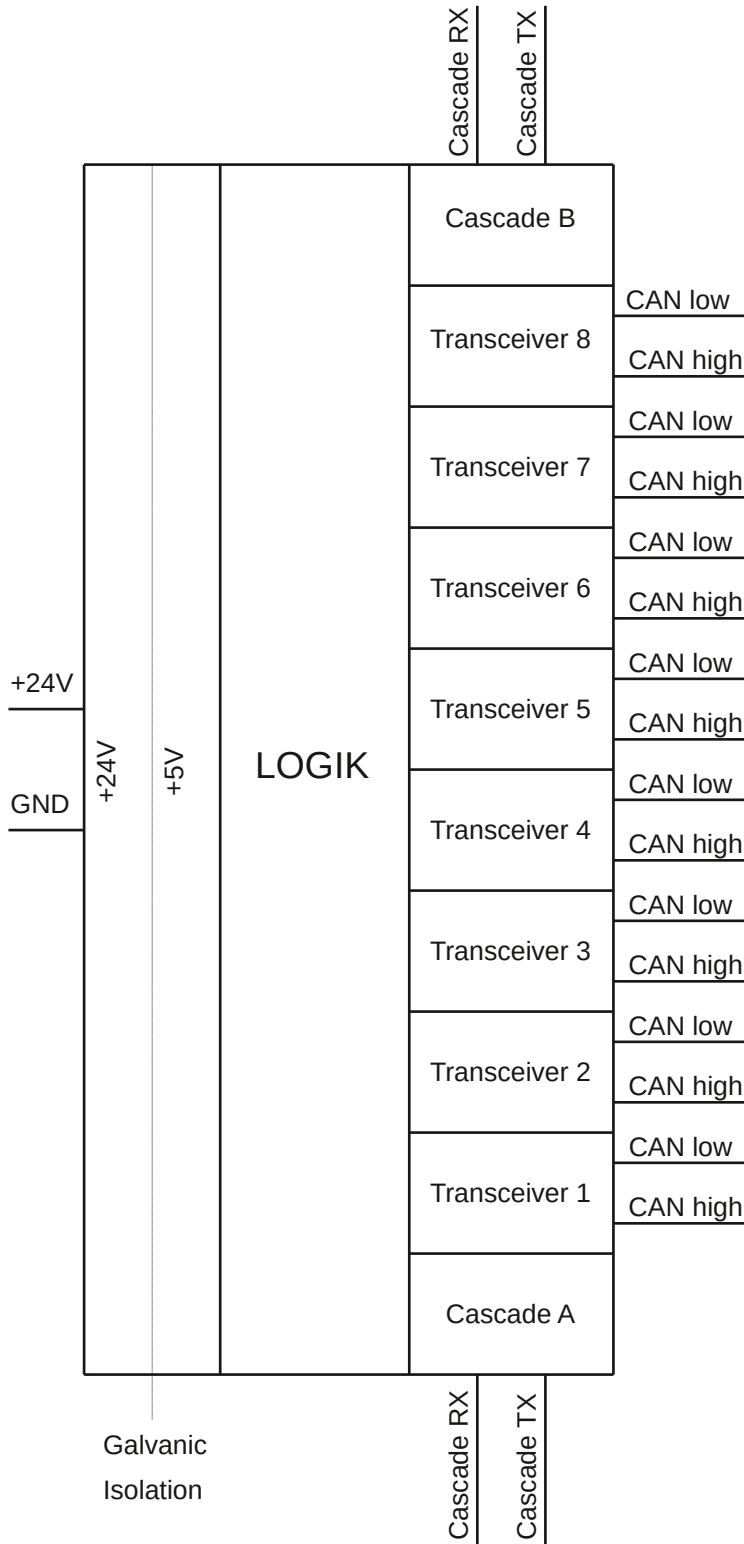
3.2 Cascade

It is possible to connect up to three CRep S8C into a cascade configuration to extend the CAN channel count up to 24. The cascade connectors are the SUB-D9 plugs on the left and right side of the device. When a cascade is used only one power supply needs to be connected.

The following rules are mandatory:

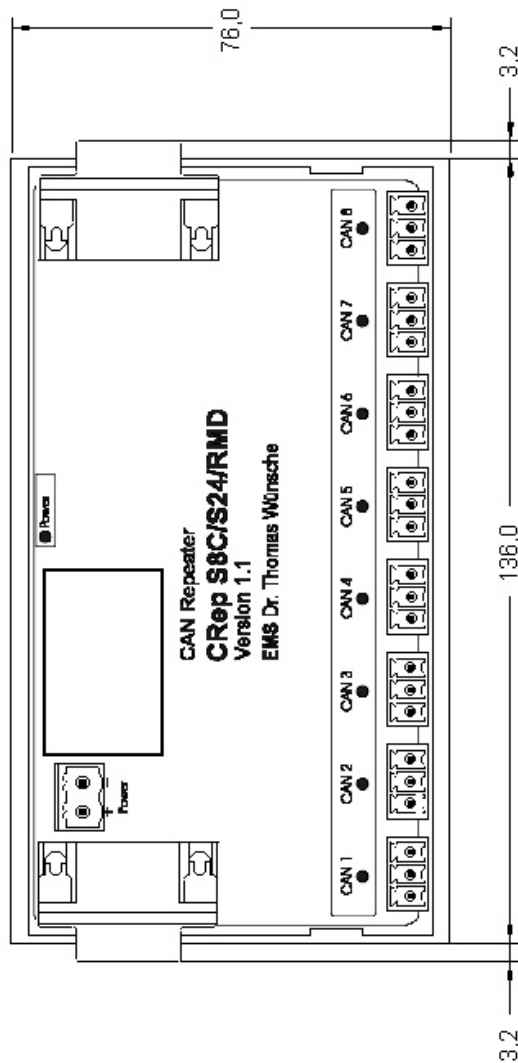
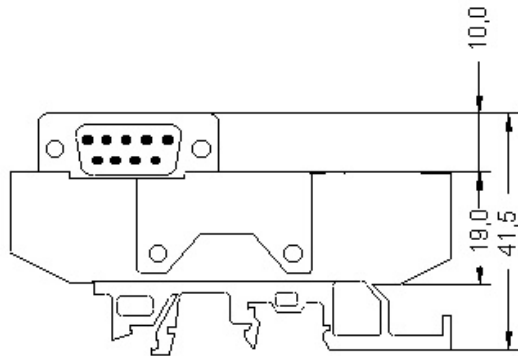
- The cascade connectors must not be used to any other purpose than to form a cascade with another CRep S8C.
- The cascade connection may only be done when no power is supplied to CRep S8C.

3.3 Block Diagram



3.4 Dimensions

All values in [mm].



Representation not full-scaled.

All dimensions without explicit tolerance have a tolerance of +/- 0,5 mm

Subject to change without notice.

COMPANY EMS Dr. Thomas Wünsche Sonnenhang 3 D-85304 Ilmmünster		
TITLE CRep S8C-.../S24/RMD		
SIZE A4	DATE 06/2020	NO. 12-04-1xx-20
SCALE	PAGE 1 of 1	

4 Appendix

4.1 Instruction for Disposal

Electronic Equipment Act (WEEE)

EMS is selling its products exclusively to commercial customers. This is the reason why all devices are designed for commercial use and have to be disposed appropriately. In accordance to § 10 para. 2 clause 3 Electronic Equipment Act (WEEE) the disposal of EMS products is regulated the following way.

The equipment must not be disposed at the public collection points. In accordance with the applicable law the disposal has to be done by the customer for own account. The same applies to products, which have been sold to third parties, if those parties do not take care of a disposal in accordance to the applicable law. As an alternative the products can be returned to EMS free of charge.

4.2 FCC Statement

CRep S8C has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

4.3 CE Conformity

Declaration of Conformity

The manufacturer

EMS Dr. Thomas Wünsche e.K.
Sonnenhang 3
85304 IImmünster

hereby declares, that the following product:

Name	Article Number	Serial Number
CRep-S8C-xx/S24/RMD	12-04-10x-yy	> 0001349

meets the requirements of the following standards:

Electromagnetic Immunity

EN 55035:2018-04; VDE 0878-35:2018-04 – Electromagnetic compatibility of multimedia equipment – Immunity requirements (CISPR 35:2016, modified); German version EN 55035:2017

Electromagnetic Emission

EN 55032:2016-02; VDE 0878-32:2016-02 – Electromagnetic compatibility of multimedia equipment – Emission Requirements (CISPR 32:2015); German version EN 55032:2015

and therefore conform with the EU requirements on:

Electromagnetic compatibility (2014/30/EU)

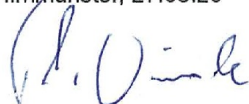
In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities.

RoHS 3

The RoHS 3 (EU 2015/863) commits manufacturers of „Electrical and Electronic Equipment“ (EEE) to secure compliance with the RoHS Directive before placing a CE mark.

Based on technical documentation and to the best of our knowledge, we hereby confirm that the above mentioned products do not contain any of the restricted substances according to Article 4 of the RoHS Directive in excess of the maximum concentration values tolerated by weight in any of their homogeneous materials.

IImmünster, 27.08.20



Dr. Thomas Wünsche

