



**Optical Fiber Transceiver**  
**CTrans OL-.../P/RMD**  
**CTrans OL-.../ST/RMD**  
**CTrans OL-.../SMA/RMD**  
**User Manual**

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User manual for Optical Fiber Transceiver CTrans OL

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

**WARNING:** CTrans OL 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.

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# 1 Overview

## 1.1 Attributes

- Coupling of CAN systems by optical fiber
- Available for PMMA- and glass fiber, connection by connector or by clamping
- Protocol transparent; CAN error handling mechanisms are preserved
- Extended error suppression

## 1.2 General Description

CTrans OL acts as a transceiver for protocol transparent transmission of CAN signals between copper based sections via an optical fiber.

Several technical improvements can be obtained by optical transmission of CAN signals, such as secure separation of high voltages and insensitivity to electromagnetic perturbation. Furthermore the transparent transmission of CAN signals with CTrans OL preserves the main benefits of CAN, such as error correction and priority driven bus access.

Like repeaters CTrans OL can be used to build flexible wiring topologies. Star and tree structures as well as stub lines can be realized. The integrated error suppression reduces the influence of faulty segments onto intact sections.

For the optical connection cost effective PMMA fibers with clamped connection and 62,5µm multimode glass fibers with SMA and ST connectors are used. Depending on the type of fiber a wiring distance up to 3000m can be achieved.

### 1.3 Ordering Information

12-03-0xx-20	<b>CTrans OL-.../P/RMD</b> Optical fiber transceiver for rail mount application, clamping connection for PMMA fiber, range up to 40m (... inhibit time)
12-03-1xx-20	<b>CTrans OL-.../ST/RMD</b> Optical fiber transceiver for rail mount application, ST connector for optical fiber, range up to 1000m (... inhibit time)
12-03-2xx-20	<b>CTrans OL-.../ST-3000/RMD</b> Optical fiber transceiver for rail mount application, ST connector for optical fiber, range up to 3000m (... inhibit time)
12-03-3xx-20	<b>CTrans OL-.../SMA/RMD</b> Optical fiber transceiver for rail mount application, SMA connector for optical fiber, range up to 1000m (... inhibit time)

## 2 Electrical Characteristics

### 2.1 Absolute Limiting Values

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

Parameter	Min	Max	Unit
Storage temperature	-20	+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)	-	2000	mW

### 2.2 Nominal values

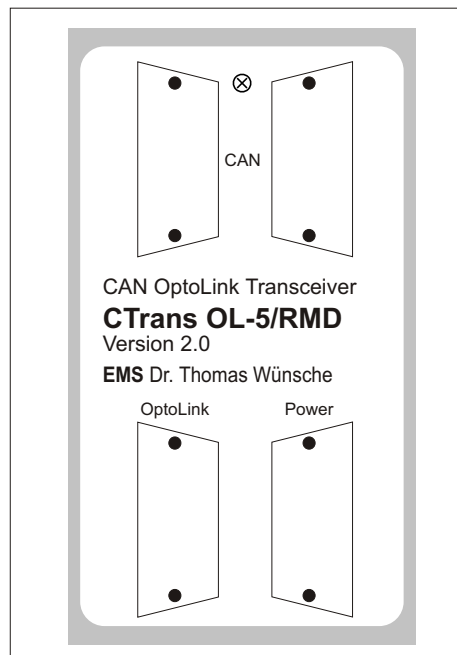
All values, unless otherwise specified, refer to a supply voltage of 24V and an environmental temperature of 20°C.

Parameter	Min	Typ	Max	Unit
Current consumption (running idle)	–	30	–	mA
Current consumption (250kBit/s, 100% load)	–	40	–	mA
Power supply voltage	10	24	30	V
Propagation delay (per pair of devices)	–	125	300	ns

## 3 Operating Instructions

### 3.1 Layout and Pin Assignment

CTrans OL devices include one CAN segment (marked 'CAN') fed to a male and female plug of type D-Sub 9. The plugs carry the CAN signals and the supply voltage, the latter can optionally be fed into a separate connector (marked 'Power'). The optical connection is provided by a type dependent optical fiber adapter mounted on an additional connector (marked 'Opto Link').

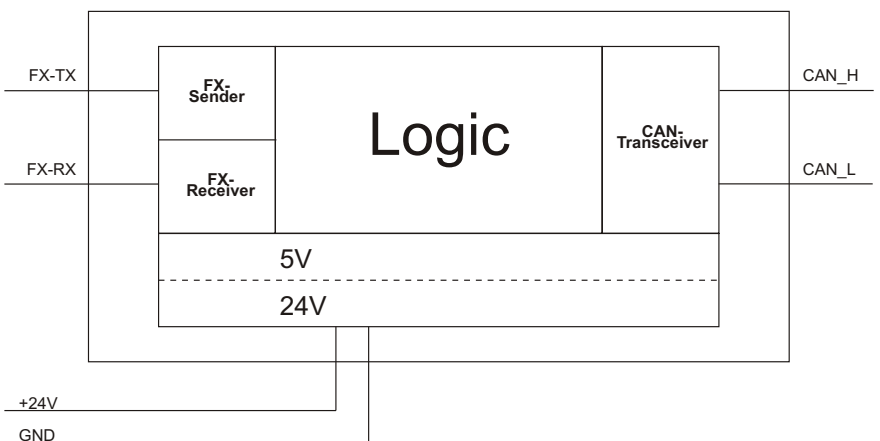


The following table shows the pin assignment of the CAN D-Sub 9 plugs (male and female plugs are connected internally):

Pin	Name	Function
2	CAN_L	CAN_Low bus line
3	GND	Ground
7	CAN_H	CAN_High bus line
9	V+CAN	Power supply 24V

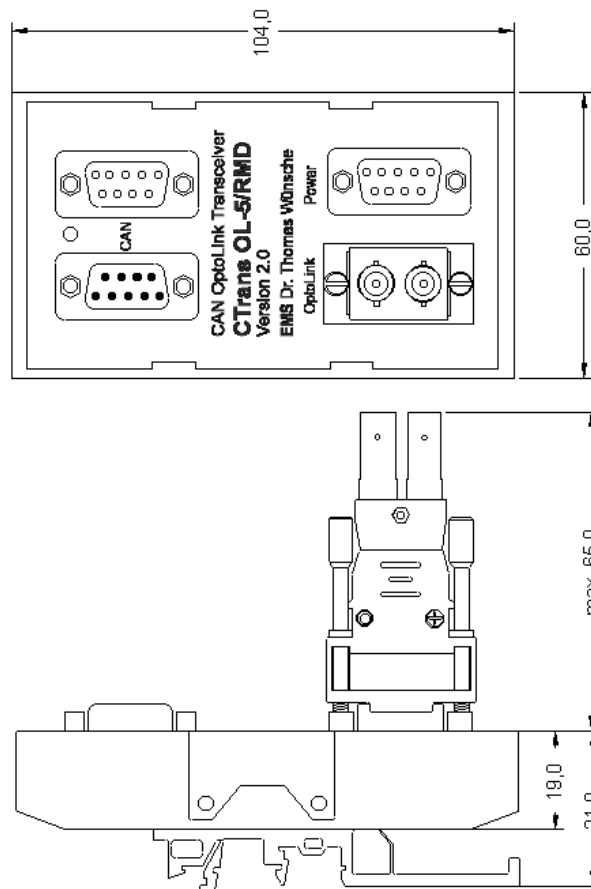
**Please notice that on the Power plug only the pins 3 (ground) and 9 (+24V) are connected.**

### 3.2 Block Diagram



## 4 Measurements

All values in [mm].



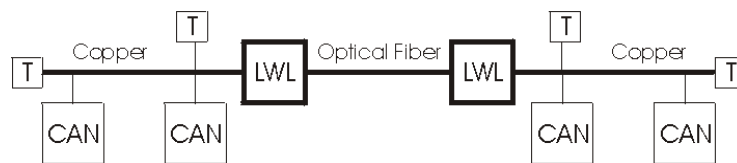
## 5 Appendix A: Topology examples

One should always make sure to terminate a CAN bus on both ends, typically using a 120Ohm termination resistor between CAN-High and CAN-Low signal lines.

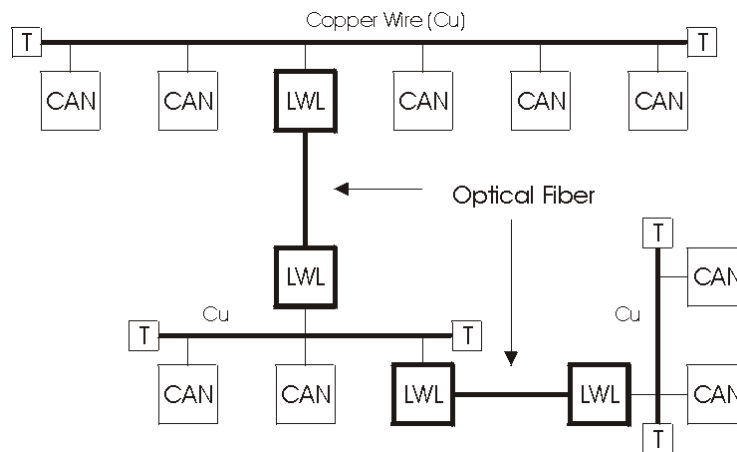
### Legend



### Line topology with Optical Fiber Transceivers



### Tree topology with Optical Fiber Transceivers



**Star topology with Optical Fiber Transceivers**

