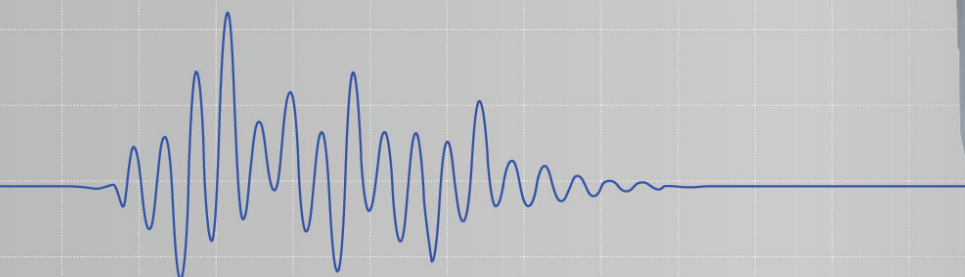


e.series

Manual

e.bloxx D3 CAN



Vers.-Nr. 09



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Contact address / manufacturer:

Gantner Instruments Test & Measurement GmbH

Montafonerstrasse 8

A - 6780 Schruns/Austria

Tel.: +43 5556 73784 - 410

Fax: +43 5556 73784 - 419

E-Mail: office@gantner-instruments.com

Web: www.gantner-instruments.com

Gantner Instruments Test & Measurement GmbH

Industriestraße 12

D-64297 Darmstadt

Tel.: +49 6151 95136 - 0

Fax: +49 6151 95136 - 26

E-Mail: testing@gantner-instruments.com

Web: www.gantner-instruments.com

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1. ABOUT THIS MANUAL

This manual describes the installation and set-up of the e.bloxx D3 CAN.

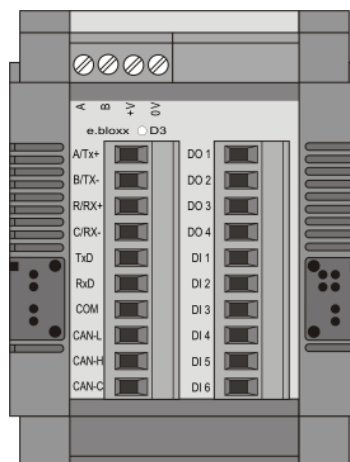
The following information can be found in this manual:

- Description of the e.bloxx system with detailed information on the hardware and module features.
- Installation description of the e.bloxx D3 CAN and how it is connected to the power supply and bus lines.
- A short introduction on how the e.bloxx D3 CAN is configured with the test.commander software. This software has an integrated help that includes detailed description on the configuration process.
- Possible errors and solutions.
- Technical specifications of the e.bloxx D3 CAN.

2. MODULE DESCRIPTION

2.1. System Overview

The e.bloxx modules have been developed for the industrial and experimental testing technology, especially for the multi-channel measurement of electrical signals of thermal or mechanical quantities at test beds and test sites.



Picture 2.1 - e.bloxx D3 CAN

The e.bloxx D3 CAN, which is described in this manual, is a modular interface module for the automation of industrial test stands as well as for monitoring of assembly and production processes. The module is part of a whole product line of different e.bloxx.

Due to the modular design, flexible definition of solutions and the standardized interface, the module provides maximum freedom, thus leaving enough space for further testing concepts.

Standardized interfaces guarantee the integration of up to 127 modules into a single network.

With the e.gate module very high data rates via Profibus-DP and Ethernet can be realized. The customer-specific signal processing supplements the standard conditioning of the single e.bloxx modules.

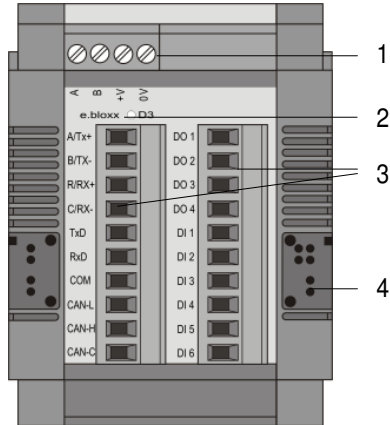
2.2. Types of Modules

There are several types of e.bloxx that differ in their number and type of analog and digital inputs and outputs.

	A1-1	A1-4	A1-8	A3-1	A3-4	A4-1	A4-4	A5-1	A5-1 CR	A6-1	A6-3	A6-2	A9-1	D1-1	D1-4	D2-1
Voltage Supply	10 - 30 VDC															
Power Consumption [W]	1,5	6	12	1,5	6	1,5	6	1,5	1,5	2	6	5	2,3	1,5	6	2
Variable / Channels	8	32	64	8	32	8	32	8	8	8	24	16	8	8	32	8
Analog Inputs	1	4	8	4	16	4	16	2/3/6	2	1	3	1	-	-	-	-
Analog Outputs	-	-	-	-	-	-	-	-	-	1	3	2	4	-	-	-
Relay Outputs	1	4	8	-	-	-	-	-	-	-	-	-	-	-	-	4
Digital Inputs	1	4	8	1	4	-	-	1	1	1	3	6	1	8	32	-
Digital Outputs	-	-	-	1	4	-	-	1	1	1	3	4	1	8	32	-
Fieldbus Interface	RS 485															
Protocols	ASCII - Modbus-RTU - Profibus-DP - LocalBus															
Quantity to measure																
Sensor Principle																
Voltage	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-
Current	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Resistance	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Pt100 / Pt1000	x	x	x	-	-	-	-	x	-	-	-	-	-	-	-	-
Cryo Sensor	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-
Thermocouple	x	x	x	-	-	x	x		-	-	-	-	-	-	-	-
Strain Gauge Full Bridge	x	x	x	-	-	-	-	-	-	x	x	x	-	-	-	-
Strain Gauge Half Bridge	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-
Strain Gauge Quarter Br.	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-
Inductive Full Bridge	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-
Inductive Half Bridge	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-
LVDT	-	-	-	-	-	-	-	-	-	x	x	x	-	-	-	-
Potentiom. Transducer	x	x	x	-	-	-	-	-	-	-	-	x	-	-	-	-
Piezoresist. Transducer	-	-	-	-	-	-	-	-	-	-	-	x	-	-	-	-
Status	x	x	x	x	x	-	-	x	x	x	x	x	x	x	x	-
Frequency	-	-	-	-	-	-	-	-	-	-	-	x	-	x	x	-
Counter	-	-	-	-	-	-	-	-	-	-	-	x	-	x	x	-

Table 2.1. - Characteristics of the e.bloxx modules

2.3. Module Parts



- 1 ... Pluggable Screw-Type Terminal Strip for Connection of RS 485 Bus, Power Supply
- 2 ... Power/Error-LED (red/green)
- 3 ... Pluggable Screw-Type Terminal Strips for Sensor Connection and In-/Outputs
- 4 ... Rapid Bus Link Plugs

Picture 2.2. - Parts of the e-bloxx D3 CAN

Terminal Strip for RS 485, Power Supply, Synchronization and Grounding

Terminal	Description
A	RS 485 Bus Interface A
B	RS 485 Bus Interface B
+V	Power Supply +
0V	Power Supply -

Table 2.2. - Description of Terminal Strip for RS 485 Bus and Power Supply

Terminal Strip for Sensor Connection

Terminal	Description
A/Tx+	RS422
B/Tx-	RS422
R/Rx+	RS422
C/Rx-	RS422
TXD	RS232
RXD	RS232
COM	RS232
CAN-L	CAN low
CAN-H	CAN high
CAN-C	CAN GND
DO 1 .. 4	Digital Output 1 up to 4
DI 1 .. 6	Digital Input 1 up to 6

Table 2.3. - Description of Terminal Strips for Sensors and In-/Outputs

2.4. Functional Overview

This manual describes the e.bloxx module D3 CAN, which is an interface module CAN \leftrightarrow LocalBus and requires an e.gate for communication.

For the CAN communication just the terminals CAN-L, CAN-H and CAN-C are being used. The other channels can be used for digital I/O's, to process the digital input which can be used for example as a trigger, to make arithmetical calculations.

2.5. Front-LED

The LEDs at the front of the e.bloxx module provides the following information:

Right LED	
LED green	Module works well, no signal overflow, no communication error...
LED red	
LED red + short off period	
LED green + short red flash	Signal ok + communication timeout
LED red fast flashing	

2.6. DC-Isolation

The following groups are galvanic isolated from each other:

- power supply, digital inputs and digital outputs
- bus interface
- interface circuit

3. MOUNTING e.bloxx D3 CAN AND CONNECTING WIRES

3.1. Environmental Conditions

The e.bloxx D3 CAN is protected against water and dirt according IP 20. If required by the conditions of the operating site the modules have to be installed accordingly, e.g. in a water-resistant or waterproof case, compliant with the regulations of electrical engineering.

For the allowed ambient temperatures for the e.bloxx D3 CAN please see the technical specifications at the end of this manual.

3.2. Connection Technique

The wires are connected to the modules via screw-type terminals. The captive terminal screws are part of the terminal strips. All terminal strips are of plug-in type and can be detached from the modules.

Not more than 2 leads should be connected with one clamp. In this case both leads should have the same conductor cross section. For the precise clamping of stranded wire we recommend the use of wire-end ferrules.

Notice: Connecting wires respectively the plugging-in and –out of the terminal strip is only allowed with modules in power-off status.

In order to prevent interference with sensors, signals and modules, shielded cables have to be used for the power supply, bus connection and signal lines.

We strongly recommend using a single screened cable each input signal. To use more signals in one cable could generate interacting influences.

Notice: For optimal performance the e.bloxx modules must be grounded properly. This is achieved by utilizing the Ground/Earth screw on the back of each e.bloxx module. The screen of the sensor cable has to be grounded at the same potential.

3.3. Power Supply

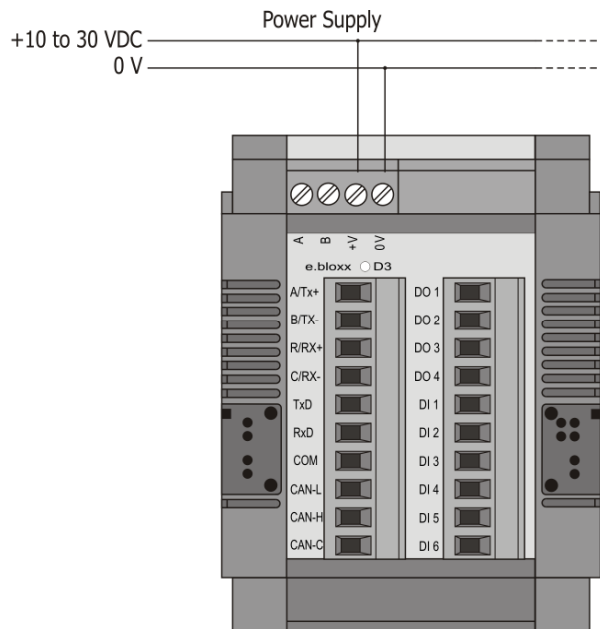
Non-regulated DC voltage between +10 and +30 VDC is sufficient for the power supply of the modules. The input is protected against excess voltage and polarity connecting error. The power consumption remains approximately constant over the total voltage range, due to the integrated switching regulator.

Due to their low current consumption (max. 180 mA at 24 VDC) the modules can also be remotely supplied via longer lines. Several modules can be supplied in parallel within the permissible voltage range and drop in the lines. If required, the supply lines together with the bus line may be incorporated in one cable.

In order not to overload the module power supply needlessly and to avoid unnecessary line troubles, a separate power supply is recommended for sensors with a large current drain.

The distribution voltage for the e.bloxx D3 CAN has to be protected by a fuse with maximum 1 A (inert). The modules have an internal fuse (reversible) for protection against excess voltage, excess current and wrong polarity.

Notice: It depends on the power supply unit and its noise and internal grounding issues whether it is helpful to connect earth of the power supply unit with ground/earth of the e.bloxx module.



Picture 3.1. - Power Supply of the e.bloxx D3 CAN

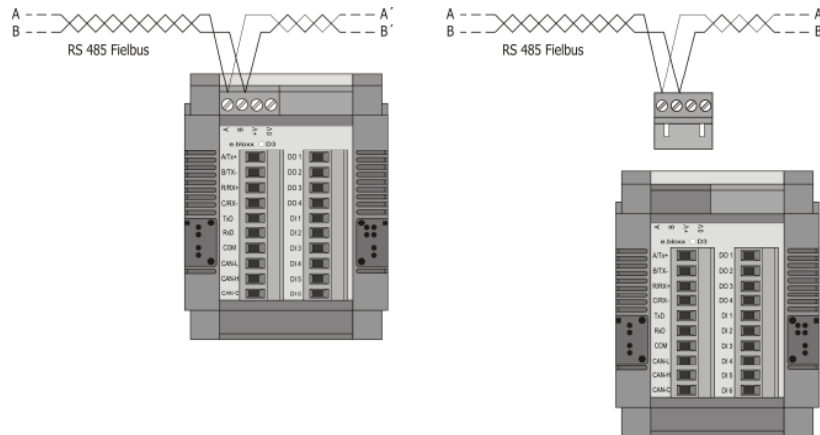
3.4. Bus Connection

Only the connection of the e.bloxx D3 CAN to the bus is described in here. A detailed description of the bus and the communication of the modules can be found in the Communication Guide of the e.bloxx modules.

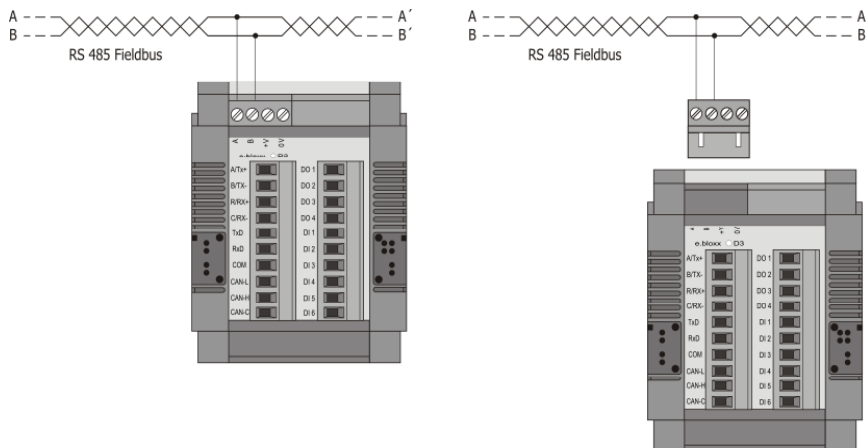
The e.bloxx D3 CAN have an RS 485 bus interface for connection to the serial fieldbus. The bus has to be terminated on both sides with characteristic impedance. The maximum line length depends on the transmission speed (refer to the Communication Guide for details) and can never be higher than 1.2 km per bus segment or 4.8 km via a physical bus string by using 3 repeaters. A maximum of 32 devices are possible at each bus segment and up to 127 devices via a physical bus string.

Wiring

In general, the e.bloxx D3 CAN is connected to the bus by connecting both signal leads A and B of the incoming bus cable and A' and B' of the outgoing bus cable together to one terminal on the module (Picture 3.2). Alternatively, the bus can also be connected by a "stub cable" (Picture 3.3). This guarantees that the bus connection to other modules remains in place, even if one module has to be exchanged, due to the removable terminal strip.



Picture 3.2. - Bus Connection of an e.bloxx D3 CAN to the RS 485 Fieldbus with Derivation



Picture 3.3. - Bus Connection of an e.bloxx D3 CAN to the RS 485 fieldbus via Stub Cable

The stub-cable should be as short as possible, not longer than 30 cm.

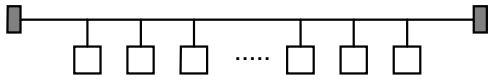
Notice: The terminal designations A and B of all modules of the e.bloxx series are exchanged compared with the PROFIBUS-definitions. Consequently, in multi-vendor systems the bus lines A and B have to be exchanged when connecting them to the e.bloxx modules.

Bus Structure

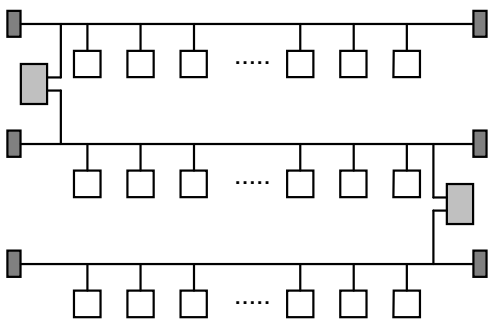
The bus structure is a line structure where each bus segment will be terminated with characteristic impedance on both ends. Branches can be set up by means of a bi-directional signal amplifier, so-called repeaters. Other types of branches are not permitted (no tree topology). The max. stub-length to a user must not exceed 30 cm.

The following pictures show a few examples of possible bus topology structures. The meanings of the symbols are as follows:

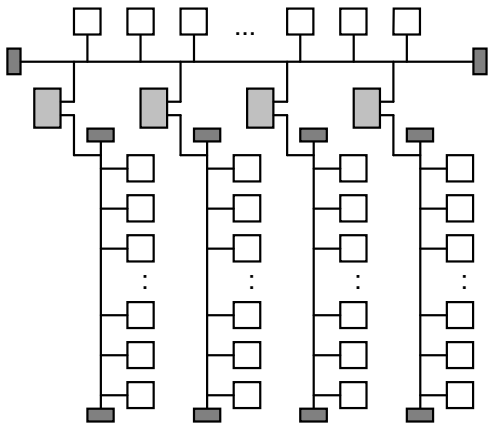
- ... Bus User
- ... Repeater
- ... Bus Termination



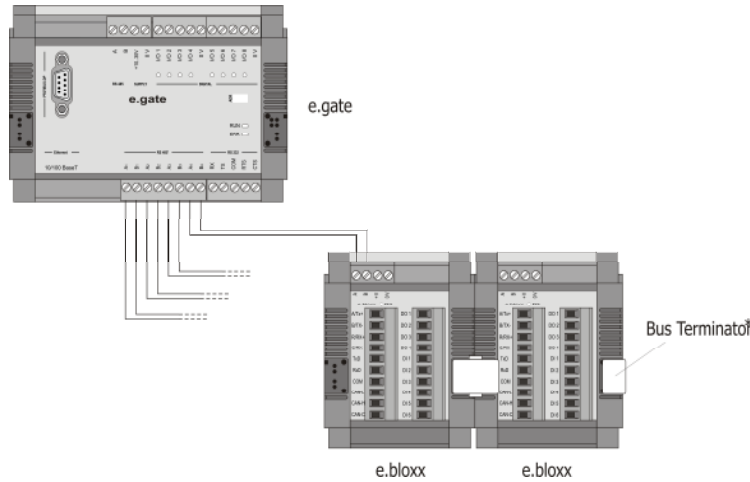
Picture 3.4. - Simple Line Structure



Picture 3.5. - Extended Line Structure



Picture 3.6. - Line Structure with Branches



Picture 3.7. - e.bloxx D3 CAN connected to e.gate

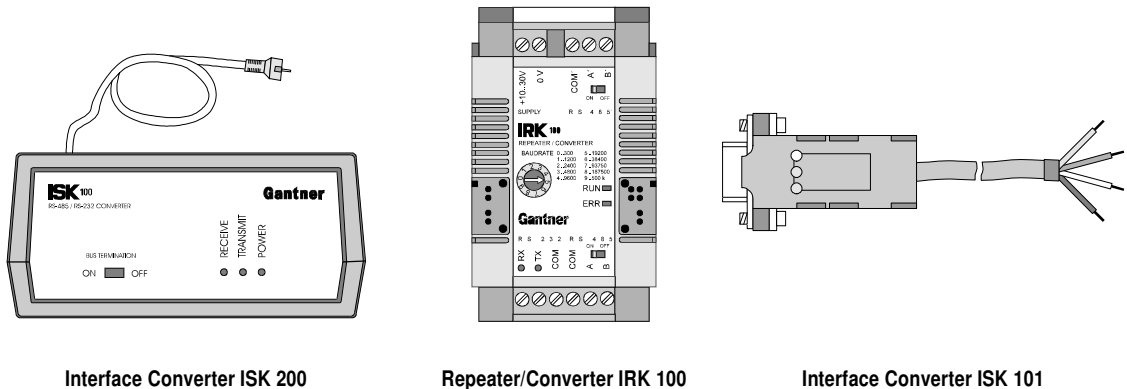
*...Using an e.bloxx D3 CAN together with an e.gate, which is used to collect data of all connected e.bloxx modules and processes them for fast transmission via the further network, a bus termination must be connected to the last e.bloxx in each bus line.

Bus Connection to PC – (in preparation, communication via e.gate only!)

The bus interface of the e.bloxx D3 CAN is based on the RS 485 standard. Since most hosts are "only" equipped with RS 232 interfaces, an interface converter or a plug-in board with RS 485 drivers is required for conversion purposes.

Gantner Instruments Test & Measurement GMBH offers a compact interface converter, called ISK 200, with an integrated power supply and automatic baud rate detection. The power supply, bus connection and a separate 24 VDC-output are DC-isolated. Therefore, the interface converter ISK 200 is also applicable as a power supply for remote applications. Additionally, the interface converter ISK 200 features the option of connecting the required bus termination via a switch. The converter is designed to be used as a desk device.

Another module IRK 100 from Gantner Instruments Test & Measurement GMBH is available which may be used as an RS 485 repeater or RS 485/RS 232 converter. The baud rate can be adjusted at the IRK 100. Also, for this module the required bus termination may be connected with a switch. The Repeater/ Converter IRK 100 has a snap-on mounting mechanism for the installation on standard profile rails (DIN rail) 35 mm according to DIN EN 50022.



Interface Converter ISK 200

Repeater/Converter IRK 100

Interface Converter ISK 101

Picture 3.8. - Interface Converters ISK 200, IRK 100 and ISK 101

Bus Connection to Profibus-DP

For the connection of the bus cable and bus interface to a PC 9-channel D-subminiature plugs and sockets can be used. The pin assignment for the RS 485 connection according to PROFIBUS is given in Table 3.1.

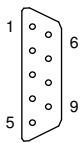
Plug	Pin	RS 485 Notation	Signal	Identification
 DB 9	1	-	Shield	Shield, Protective Ground
	2	-	RP	Reserved for Power
	3	B / B'	RxD/TxD-P	Receive/Transmit-Data-P
	4	-	CNTR-P	Control-P
	5	C / C'	DGND	Data Ground
	6	-	VP	Voltage Plus
	7	-	RP	Reserved for Power
	8	A / A'	RxD/TxD-N	Receive/Transmit-Data-N
	9	-	CNTR-N	Control-N

Table 3.1. - Pin Assignment D-Subminiature Plug According to PROFIBUS

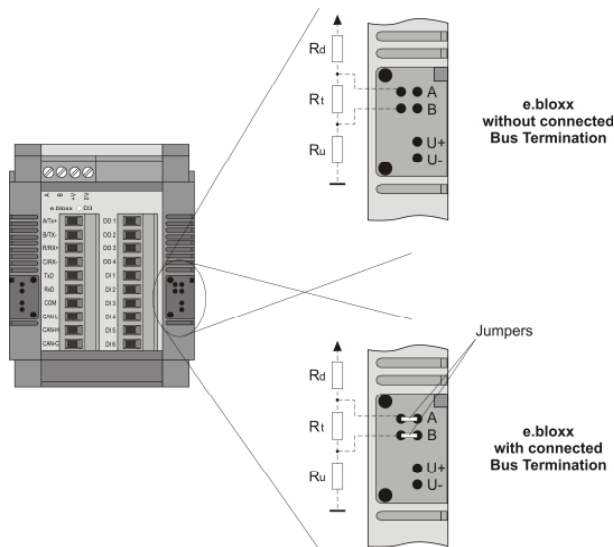
The signal leads A and B (and Shield) are mandatory for a (shielded) connection. Additional signal leads may be installed if required.

Notice: Due to the fact that the RS 485 interface is used for different protocols, in case of using Profibus-DP the leads A and B has to be crossed.

Bus Termination at the e.bloxx D3 CAN

In order to avoid signal reflections on the bus, each bus segment has to be terminated at its physical beginning and at its end with the characteristic impedance. A terminating resistor is installed between the bus leads A and B for this purpose. In addition, the bus lead A is connected via a pull-up resistor to potential (VP) and the bus lead B is connected via a pull-down resistor to ground (DataGround). These resistors provide a defined quiescent potential in case there is no data transmission on the bus. This quiescent potential is level high.

The e.bloxx D3 CAN has these bus termination resistors built in. They can be connect to the bus by plugging the Bus Termination Plug IBT 100, which is available as accessory, into the rapid bus link plug on the front side of the module. Instead of the bus termination plug *IBT 100*, also separate jumpers may be used for the bus termination. In this case, it is mandatory that the jumper clips are installed as indicated below, and that the bus leads or the bus termination are not short-circuited by mistake.



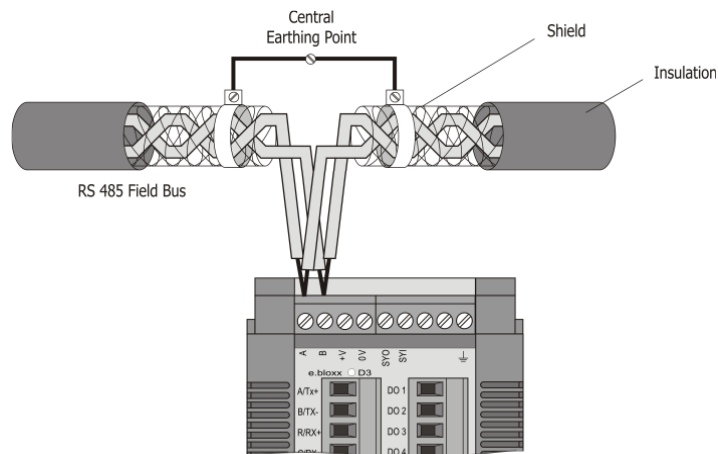
Picture 3.9. - Bus Termination at the e.bloxx D3 CAN

3.5. Shielding

In case of increased interference, such as in industrial areas, we recommend shielding of bus and signal cables. In general, the shield should be connected to the protective grounding (not DataGround!) at each bus connection. If necessary, the shield should also be applied along the course of the cable several times. For shorter distances, e.g. with stub cables, the interference response is often improved if the shielding is only applied to the stub cable exit.

Bus users such as controllers (PLCs), computers (PCs), repeaters and interface converters (ISK), etc., generally feature the possibility of applying the shield directly to the appliance or to separate shield rails. Shield rails offer the advantage of preventing possible interfering signals from reaching the appliance. The shields, which are connected to protective grounding, conduct interference signals off before reaching the module.

The e.bloxx D3 CAN do not have a direct shield connection at the module. Here the shield of the bus cable can be connected to earth e.g. by so-called shield clamps.



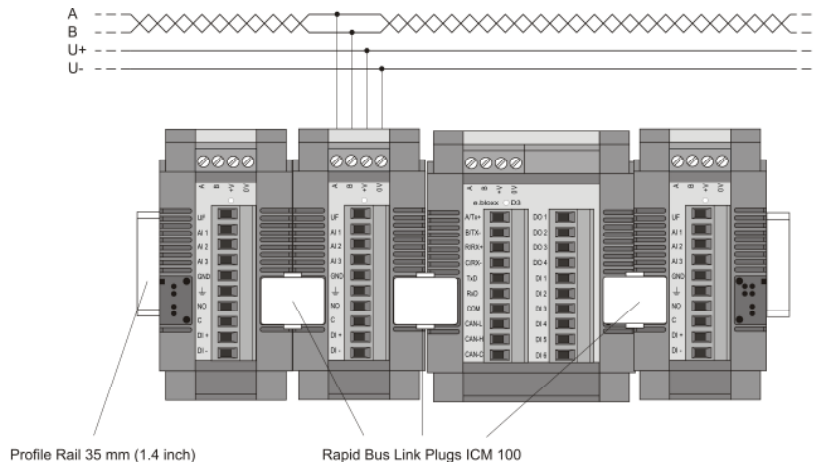
Picture 3.10. - Grounding of the Bus Line Shield at an e.bloxx D3 CAN

Notice: The shielding screen must not be connected to the ground (GND, 0V) of the power supply and it should always be connected to earth with a large surface and low-inductance.

3.6. Rapid Bus Link Plug

The e.bloxx D3 CAN have plugs on the left and right side which allow to connect the bus and power supply from one module to the next with a Rapid Bus Link Plug (type designation: *ICM 100*). This kind of connecting bus and power supply is particularly advantageous if several modules are mounted on one common profile rail side by side. In this case, only the terminal of one module has to be connected. Furthermore, various modules of the e.bloxx series may be connected with the Rapid Bus Link Plug.

Notice: The current flowing through the Rapid Bus Link Plug Jack and the e.bloxx must not exceed 1 A. Thus, the power supply should preferably be connected to the middle of several modules and no more than 5 pieces of e.bloxx may be connected via the Rapid Bus Link Plug *ICM 100* in one line. So the supply should be connected to the module in the middle and 2 further modules could be connected on the left and 2 modules on the right side



Picture 3.11. - Connection of four e.bloxx Modules with Rapid Bus Link Plugs ICM 100

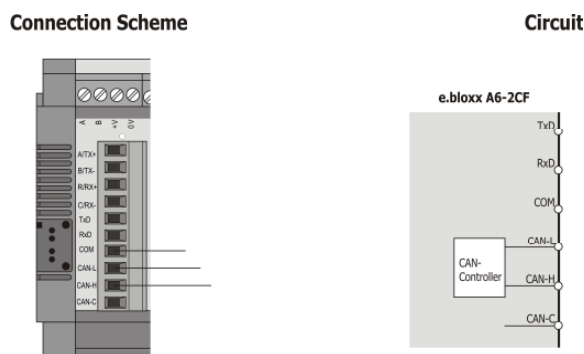
4. MEASUREMENTS

4.1. General

The e.bloxx D3 CAN is an interface module for CAN signals to be connected to an e.bloxx/e.gate system. Beside this CAN interface several digital I/O's are available.

4.2. CAN - Interface

4.2.1. CAN signal



Picture 4.1. – Connection Diagram

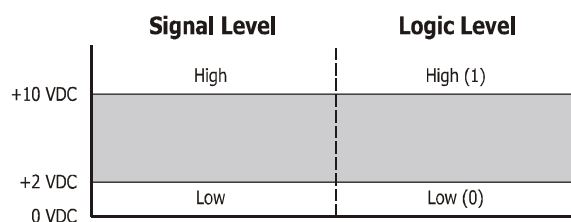
4.3. Digital Input/Output

Digital Input

The digital inputs are offering the functionality of

- Digital status input (host controlled)

The maximum permissible input voltage amounts to 30 VDC. The digital inputs have a so-called "Active-High-Logic". Input voltages between 10 VDC and 30 VDC are interpreted as logic High ("1"), input voltages lower than 2 VDC as logic Low ("0"). The maximum fan-in current amounts to 6 mA at 30V.



Picture 4.2. - Definition of Signal Levels and Logic Levels

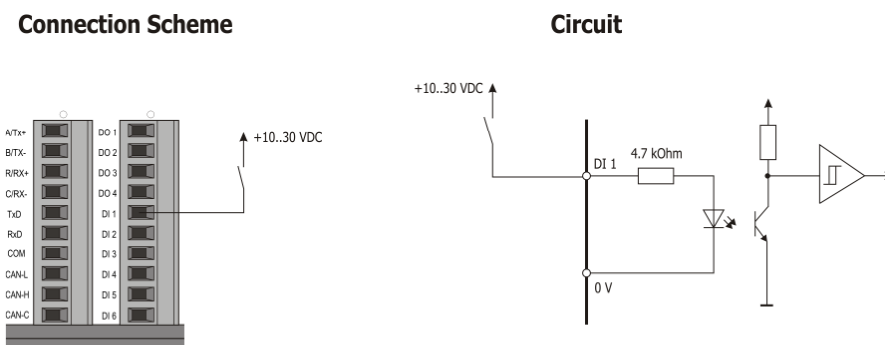
Digital Output

The Digital Output Variables support:

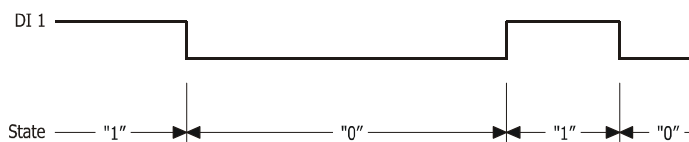
- Digital status output, host-controlled
- Digital status output, process-controlled

Via the digital outputs digital status information or measured quantities and sensor variables respectively can be output in digital form, according to the configuration. Digital status information can be withdrawn from the process (Process Out). A typical case of application would be e.g. the local output of an acoustic or optical signal in case a limiting value is exceeded or undershot by a measured value. Or the digital outputs may be set from the host computer by bus (Host Out).

4.3.1. Digital Input - Status



Picture 4.3. - Connection Diagram



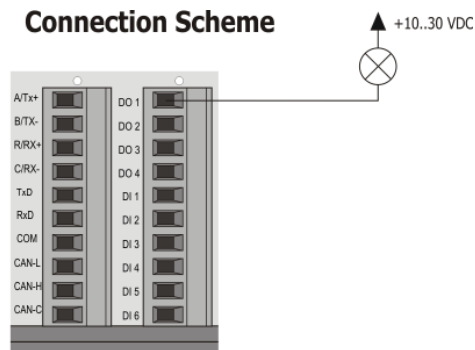
Picture 4.4. - Signal Diagram of Status Recording

For the acquisition of digital status information (on/off, closed/open, left/right, etc.) the signal applied to the digital input is collected and is held ready for further processing in the e.bloxx D3 CAN or for transmission via bus.

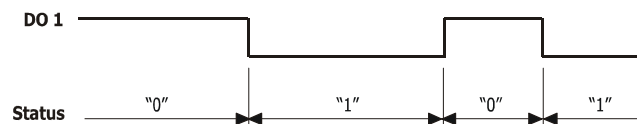
The digital input is set (switch closed) as long as the applied signal voltage remains over the threshold value of 10 VDC.

The digital information can be scanned as 1/0 information via bus.

4.3.2. Digital Status Output - Host-Controlled



Picture 4.5. – Digital Output as Host-Controlled Output



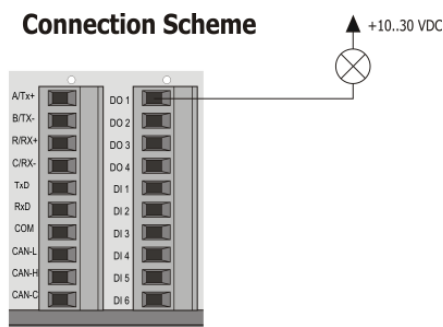
Picture 4.6. - Signal Diagram of Host-Controlled Digital Output

With the host-controlled digital status output, the digital output is set according to the status information received by the e.bloxx D3 CAN via bus.

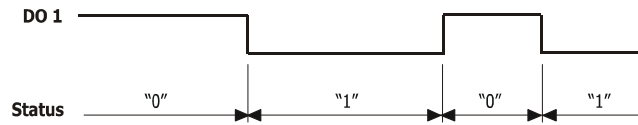
The distribution voltage can range from 10 to 30 VDC. It has to be either supplied externally or be picked up by the power supply of the sensor modules.

The status of the digital output can be scanned as 1/0 information via bus.

4.3.3. Digital Status Output - Process-Controlled (in preparation)



Picture 4.7. – Digital Output as Process-Controlled Output



Picture 4.8. - Signal Diagram of Process-Controlled Digital Output

With the process-controlled output of status information the e.bloxx D3 CAN monitors measured values, resp. sensor variables as to constraints (threshold values). The digital output is set if one or several threshold conditions are fulfilled.

The user can freely define the constraints. The user can also preset the logical signal level (see also the Configuration Software ICP 100).

The distribution voltage can amount from 10 up to 30 VDC. It has to be supplied externally or picked up by the power supply of the sensor module.

The status of the digital output can be scanned as 1/0 information via bus.

5. CONFIGURATION

5.1. General Information about Configuration Software test.commander

The e.bloxx D3 CAN can be configured with the Configuration Software test.commander. This software includes all functions to set the module parameters like baud rate, measurement rate, etc. and to define the input and output functions like the type of measurements and the processing of the measured values.

The Configuration Software test.commander also includes a function to display measured values in real-time. In the module settings (available via the test.commander, right mouse button onto the e.bloxx D3 CAN module) all the module settings can be defined being required for the CAN communication.

This manual only gives a brief description on how to set up and configure an e.bloxx D3 CAN. A detailed description of all the functions of the Configuration Software test.commander is included in the help function of the software.

Note: To activate all changes of settings in an e.bloxx D3 CAN they first have to be loaded into the e.bloxx D3 CAN.

5.2. Setting Address and Baud Rate of an e.bloxx D3 CAN

Before a control (PLC) or a computer (PC) can interchange data with an e.bloxx D3 CAN via the bus, address and baud rate of the e.bloxx D3 CAN have to be defined. The following points have to be taken into consideration in this connection:

- All devices have to be adjusted to the same baud rate.
- The same address may not appear twice in the bus topology.

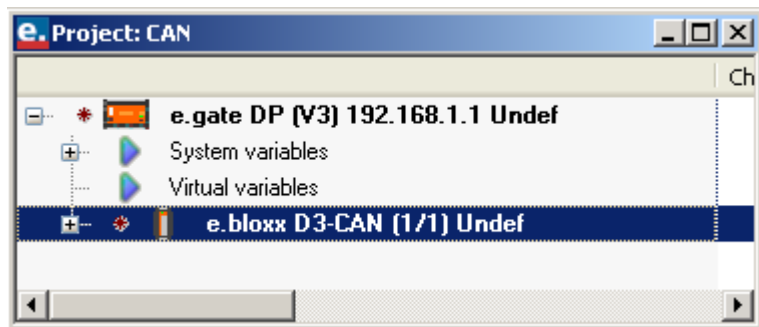
The setting variants for the bus parameters for e.bloxx D3 CAN are:

Bus Parameter	LOCAL-BUS Protocol
Address	1 127
Baud Rate	19,200 bps
	38,400 bps
	57,500 bps
	93,750 bps
	115,200 bps
	187,500 bps
	500 kbps
1500 kbps	

Table 5.1 - Setting variants for address and baud rate for the e.bloxx D3 CAN

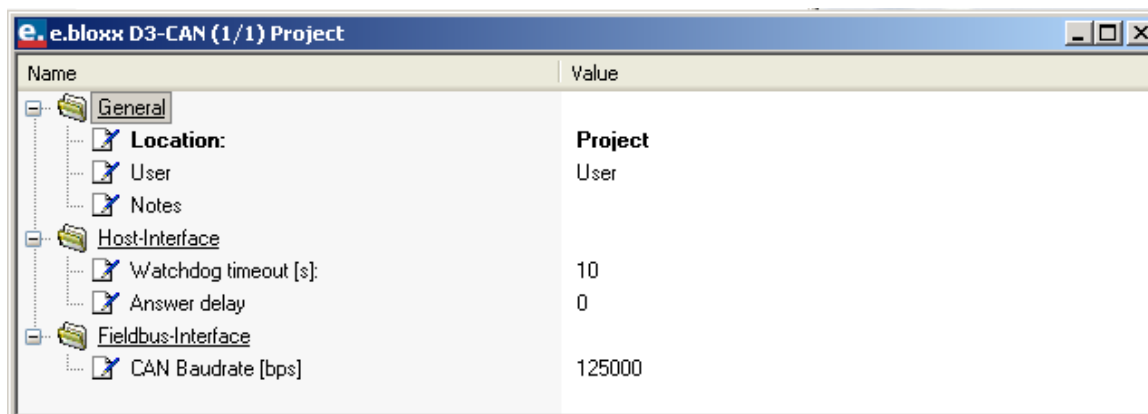
5.3. Module Settings

To define the module settings of the e.bloxx D3 CAN the module has to be selected in the system tree as shown below.



Picture 5.1. – System Tree

To change the settings of the module the right mouse button has to be clicked onto the marked module:

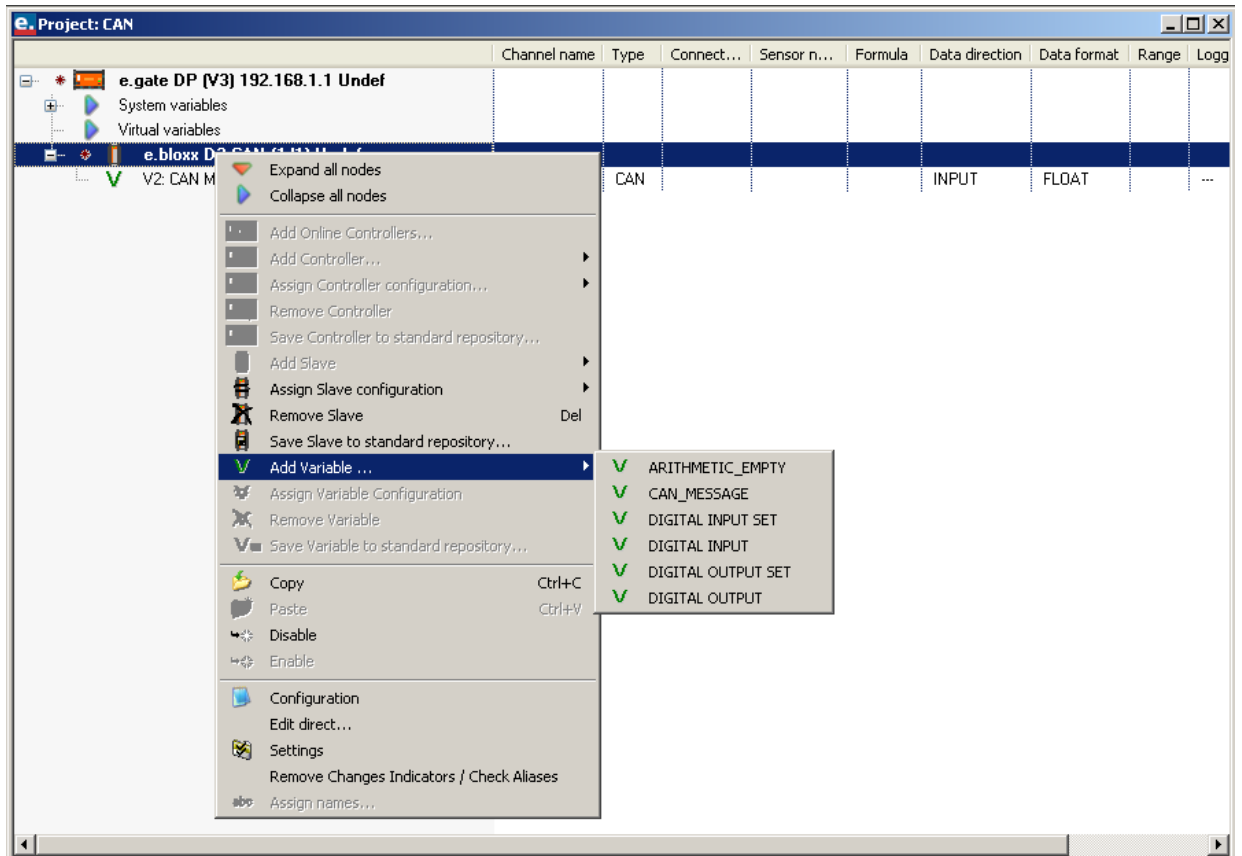


Picture 5.2. – Module Settings

- **Location:** Description of each e.bloxx D3 CAN, project name,...
- **User Name:** Possibility to enter the name of the person that has configured the module.
- **Notes:** Additional information to be added if required.
- **Watchdog Timeout:** A timeout means that there is no communication with the module during the time period that is set here. All host-controlled functions (output via the Digital and Setpoint Variable) can be defined to pass into a safe, definable status. As soon as the communication recommences, the values are assumed again, depending on the configuration.
- **Answer Delay:** Determines how long an e.bloxx D3 CAN will wait before it sends an answer to a host request.
- **CAN Baudrate:** The default Baudrate of the test.commander is 125kBaud and has to be equal to the CAN Baudrate of the "sensor" to be connected to the module.

5.4. Definition of Channels

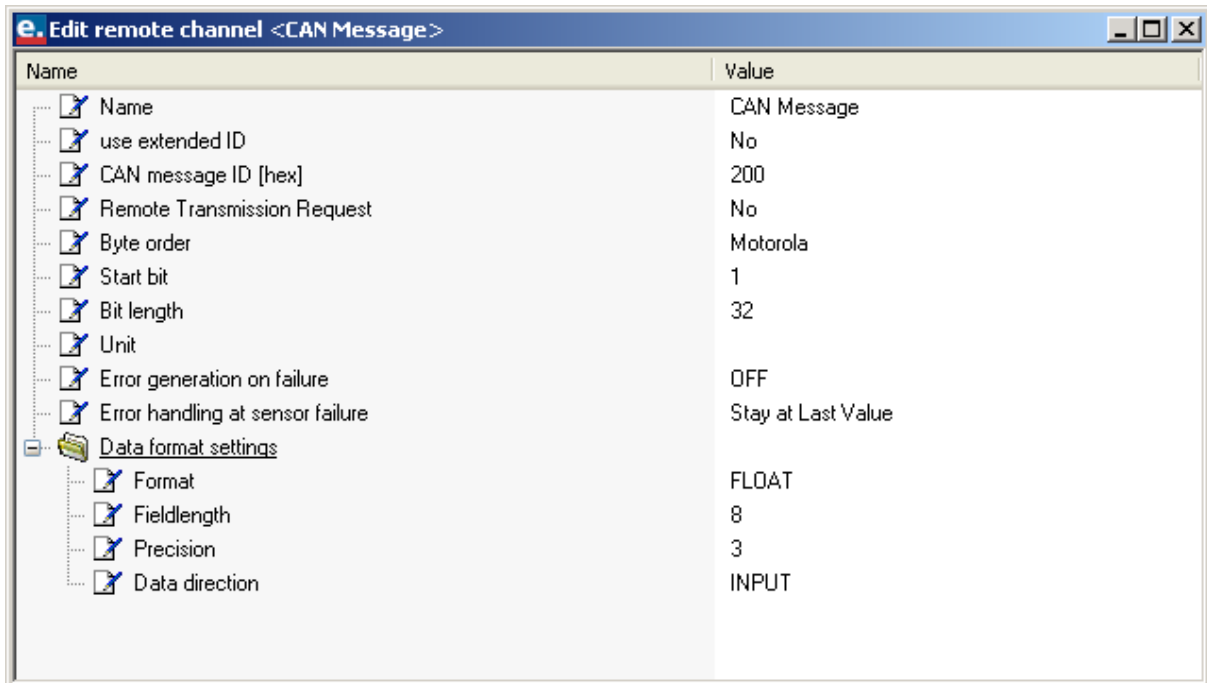
Up to 8 channels (real plus virtual) can be defined for an e.bloxx D3 CAN. They define how the signals at the in- and outputs of the e.bloxx D3 CAN will be processed. The value of every channel can be read out via the fieldbus. The channels are defined in the configuration software test.commander. To add a variable to the e.bloxx D3 CAN module click the right mouse button onto the e.bloxx D3 module and select “Add Variable”. Some variables are predefined and can be selected directly.



Picture 5.3. – Adding Channels

Beside the digital inputs and outputs some reduced arithmetic functions (max, min value) the CAN-Message will be described in more detail in the following part.

Settings of the CAN – Message in the test.commander software.



Picture 5.4. - Example for CAN-Variable Settings

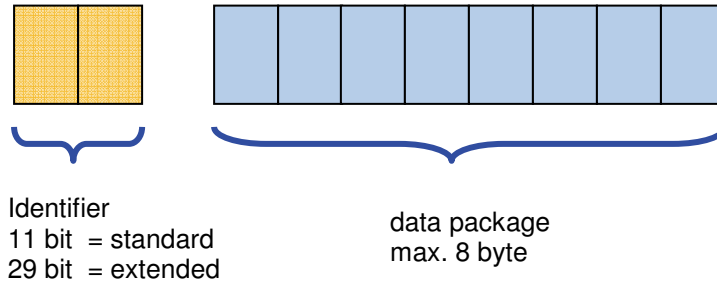
- Name: Here the name of the variable can be specified. Attention: Using an e.pac module all variable names within a system have to be unique!
- use extended ID: With CAN the “standard”-ID (11 bit) can be used – for several application the extended ID (29 bit) will be required and can be defined in here.
- CAN message ID: The CAN message requires the hex-format and it is required to read data.
- Remote Transmission Request: This is an active request of a control unit and probably will not be used in an e.gate application. The default setting is “No”.
- Byte order: Depending on the processor being used either “Motorola” or “Intel” has to be selected.
- Start bit: The start bit defines the bit within the CAN-frame the required information is available.
- Bit length: A CAN message has a certain length. The maximum bit length is 32 bits. Here the length of the messages will be defined.
- Unit: Here the unit of the remote module can be defined (txt-format).
- Error generation on failure: not available right now.
- Error handling at sensor failure: not available right now.
- Format: Here the format of the CAN message can be defined (e.g. integer, real, Boolean,...)
- Fieldlength: The fieldlength will be defined in here.
- Precision: Her the precision (values next to the comma) are being defined.
- Data direction: Depending on the requirement data direction can be INPUT, OUTPUT or EMPTY (no data transfer). Selecting “OUTPUT” it is possible to define rules for the write access.
- Use rules for write access: as the CAN protocol is quite slow traffic on the bus has to be reduced (if possible). The following settings are available:
 - write only when the value changes (no data transmission in between)
 - always (a continues writing – so be used very seldom)
 - cyclically (at a predefined time the latest value will be written)

After all the settings are done they have to be written to the module via an e.gate – for further information please refer to the test.commander.

The following diagram shows a typical setup of a CAN data frame and its possible data types. This is important to know as data have to be read out from this data frame. More details are available in chapter 5 "Configuration".

CAN – Data Frame

- Typical CAN message

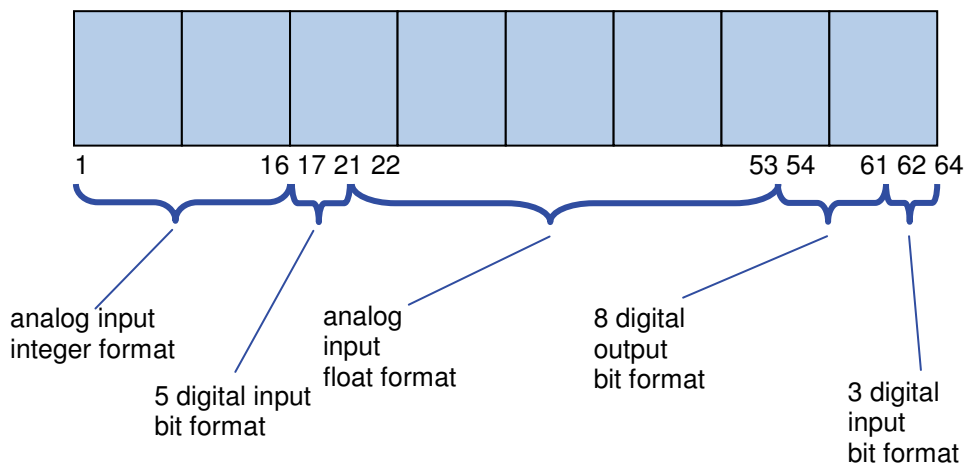


- data types:
- Boolean, byte, integer, float, long integer, double

The following diagram shows an example of a CAN data frame:

CAN – Data Frame

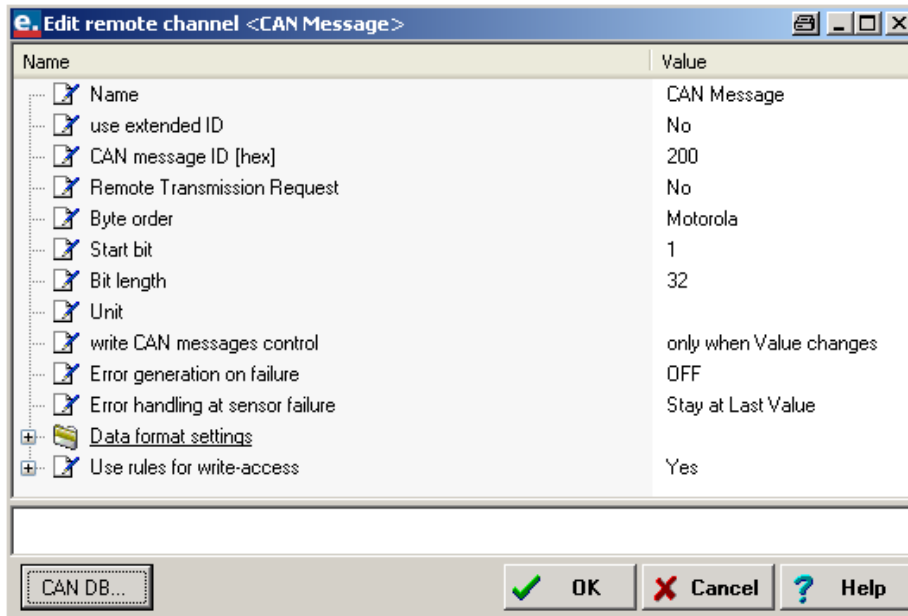
- data frame (example)



DBC-File:

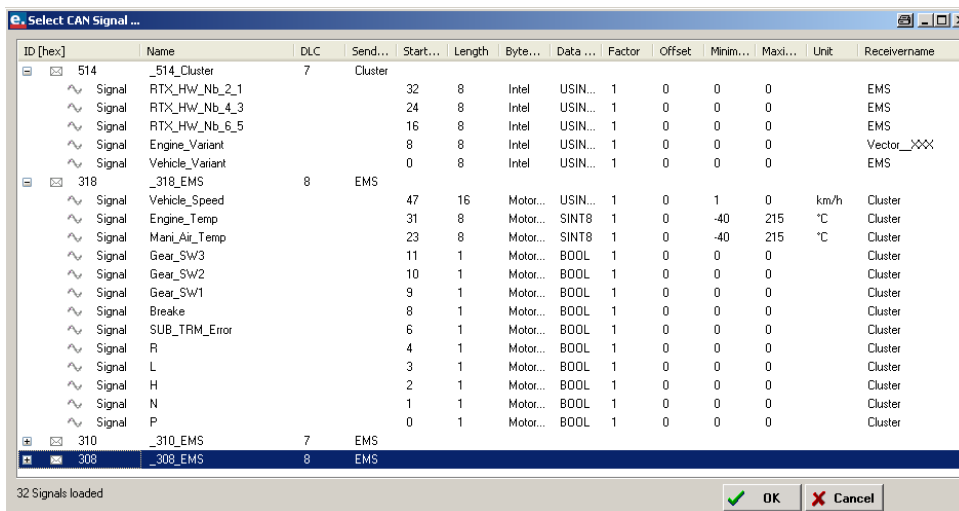
Based on the information before the user can imagine that there are several possibilities to describe a CAN-data frame. Therefore a “standard” had been defined on how to read such information from a CAN network.

The structure of this data frame is being defined in a DBC-file which makes it easy to provide this information to anyone using a CAN network and who wants to integrate a new CAN-product with a certain data structure into it. All these files will be stored in a database and the test.commander software provides a tool to read such information.



Picture 5.5 – CAN - DBC

In the variable type “CAN MESSAGE” an additional button “CAN DB...” is available. Clicking this button the user will select the required DBC-file from his data base and the information of this description file will be added to the module configuration as shown in the picture above. The following picture shows an example of a CAN network:



Picture 5.6 – DBC File

6. SPECIFICATIONS

All following data are valid after a warm-up time of approx. 45 minutes.

6.1. CAN Interface

Specification	CAN node 2.0A/2.0B
Reference	ISO 11898
Function	- Send and receive of data and remote frames - Recognition and generation of error frames - Synchronization
Transfer	1 MbpX – CAN high speed
Bitset	11/29 bit
Channels	8 independent input or output variables

6.2. Digital Inputs

Number	6, active circuit (high/low)
Function	6 x state
Input voltage	max. 30 V
Input current	max. 6 mA
High switching threshold	>10 V (high)
Low switching threshold	<2.0 V (low)

6.3. Digital Outputs

Number	4
Function	Process-, host controlled
Reaction time	1 ms per channel
Type of output	Open Collector
Output current	max. 100 mA
Output voltage	max. 30 V

6.4. Slave Communication Interface

Standard	RS 485, 2-wire
Data format	8E1
Protocols	ASCII, MODBUS, PROFIBUS-DP, LOCAL-BUS

Baud rates

ASCII and MODBUS-RTU	19.2, 38.4, 57.6, 93.75, 115.2 kbit/s
PROFIBUS-DP	19.2, 93.75, 187.5, 500, 1500 kbit/s
LOCAL-BUS	19.2, 38.4, 57.6, 93.75, 115.2, 187.5, 500, 1500 kbit/s
Connectable devices	up to 32 without repeater up to 127 with repeater
Isolation voltage	500 V

6.5. Power Supply

Power supply	10 VDC to 30 VDC overvoltage and overload protection
Power consumption	approx. 5 W
Influence of voltage	0.001 % / V

6.6. Mechanical

Case	Aluminium and ABS
Dimensions (W x H x D)	69.7 x 90 x 83 mm (2.7 x 3.5 x 3.3 inch)
Protective system	IP 20
Weight	250 g
Mounting	DIN EN-Rail

6.7. Connection

Plug-in screw terminals	wire cross-section up to 1.5 mm ²
Rapid bus connector	4-pin plug in ABS-housing

6.8. Environmental Conditions

Operating temperature	-20 °C to + 60 °C (-4 °F to +140 °F)
Storage temperature	-30 °C to +85 °C (-22 °F to +185 °F)
Relative humidity	0% to 95% at +50 °C(+122 °F), non-condensing

7. DECLARATION OF CONFORMITY (IN PREPARATION)

Notice:

Information in this manual are valid from March 2006 until revocation.
Further changes and completion of the manual are reserved and possible without notice.

e.bloxx D3 CAN

— www.gantner-instruments.com —

Gantner Instruments Test & Measurement GmbH
Montafonerstraße 8 • A-6780 Schruns/Austria
Tel.: +43 (0)5556-73784-410 • Fax: +43 (0)5556-73784-419
E-Mail: office@gantner-instruments.com

Gantner
instruments