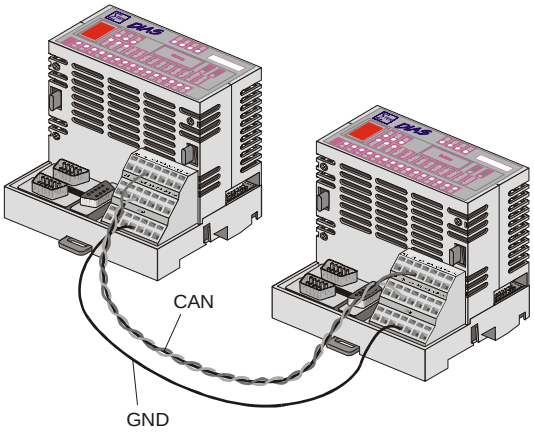
Description of the CAN bus connection

It is explained in this documentation how a CAN bus connection is properly cabled, configured and controlled.

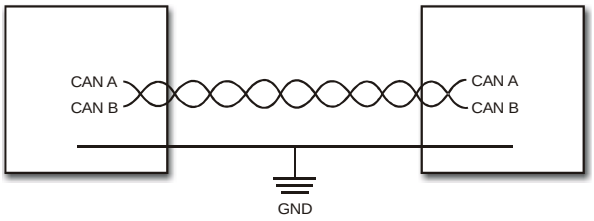


CAN bus performance data

Maximum transfer speed	1Mbaud (max. 30m)
Maximum length of the CAN bus connection	1200m (at 20k baud)
Maximum number of participants	31
Connection type	Electrical 2-wiree connection (differential signal)
Suitable cable	120 Ω, twisted pair (e.g: Lappkabel: UNITRONIC BUS FD P CAN)

IMPORTANT:

Absolutely all CAN bus participants must lie on the same GND potential! But a slight potential participant displacement (max. +/-7 V) can still be processed by the bus drivers.



Important:

CAN A = CAN LOW

a

CAN bus setup

In this section is explained the way in which the CAN bus is correctly configured. The following parameters must be additionally set: station number and transfer speed.

CAN bus station number

Each CAN bus station receives its own station number. Under this station number the other bus participants can receive and send data from this station. It is possible to install as many as 31 participants in a CAN bus system. It is to be observed that each station number can be assigned only once in the CAN bus system!

CAN bus transfer speed

It is possible for various transfer speeds (baud rates) to be set on the CAN bus. The longer the bus cable, the shorter the transfer speed is to be selected.

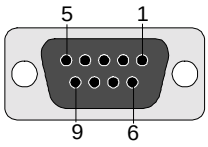
Baud rate	Maximum length
615 kBit / s	60m
500 kBit / s	80m
250 kBit / s	160m
125 kBit / s	320m
100 kBit / s	400m
50 kBit / s	800m
20 kBit / s	1200m
1 Mbit / s	30m

These values are relevant to the following cable: 120 Ω, twisted pair.

Note: valid for the CAN bus protocol: 1kBit/s = 1k baud.

Assignment of the CAN bus interface

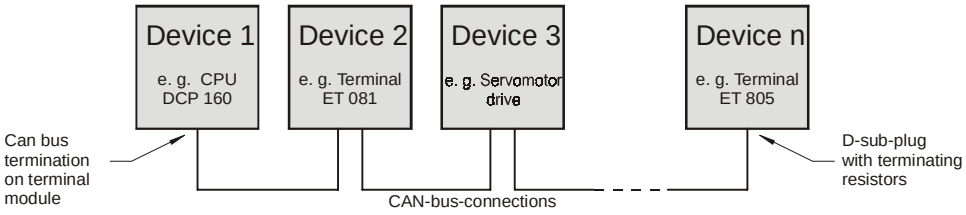
9-pole DSUB socket



Pin	Function
1	CAN A (CAN LOW)
2	Not assigned
3	Not assigned
4	Not assigned
5	GND
6	CAN B (CAN HIGH)
7	Not assigned
8	Not assigned
9	+5 V

CAN bus terminal

A line termination must take place on the two terminals in a CAN bus system. This is necessary to hinder transfer errors caused by reflections on the cable.



If a DIAS CPU is one of these terminals, the termination can take place by setting a jumper on the module.

ATTENTION:

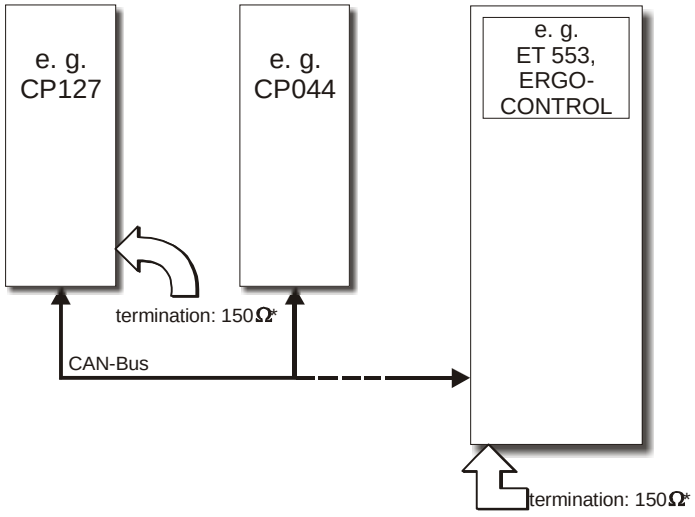
There are different bus drives!

1.) RS485 drive
2.) ISO drive

The bus termination can vary depending on which drive type is used!
These variations are explained in the following section.

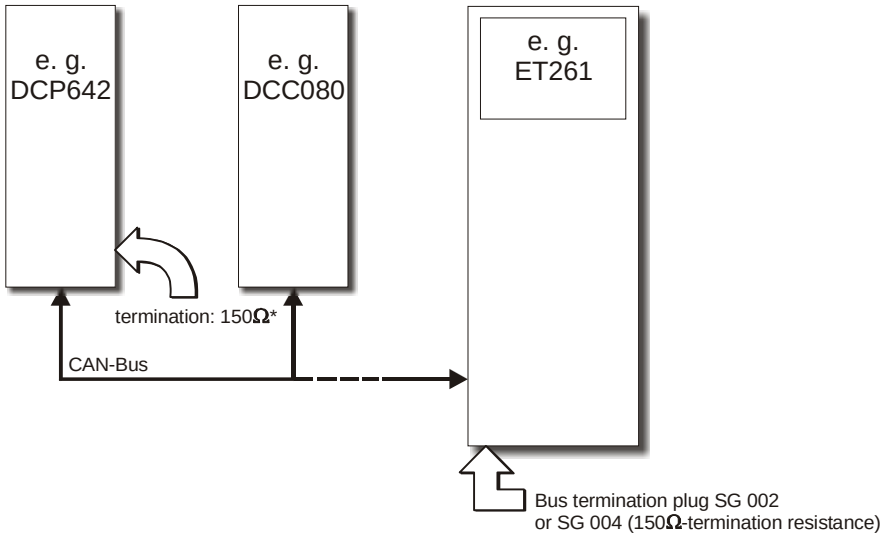
Overview of the differing variants of CAN bus connections (RS485/ISO drives)

MODAS module/CAN bus connections exclusively with an RS485 drive



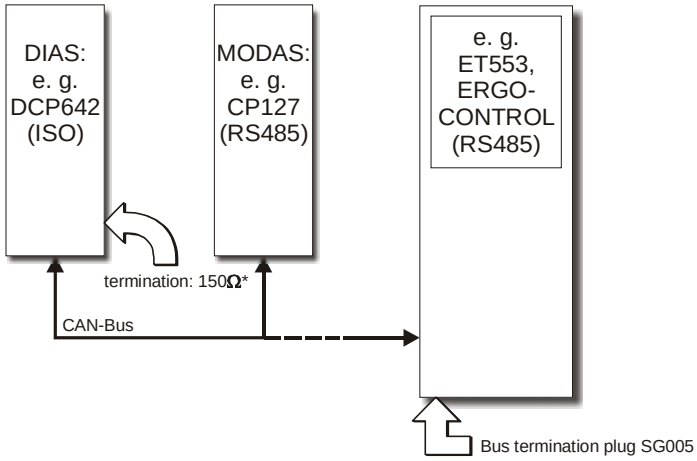
* e.g.: Bus terminator plug (SG002 or SG004), interface distributor (SV101)

DIAS module/CAN bus connections exclusively with an ISO drive



* e.g.: set the jumper on the DKL on CLOSE

Module groups mixed with RS485 and ISO drives

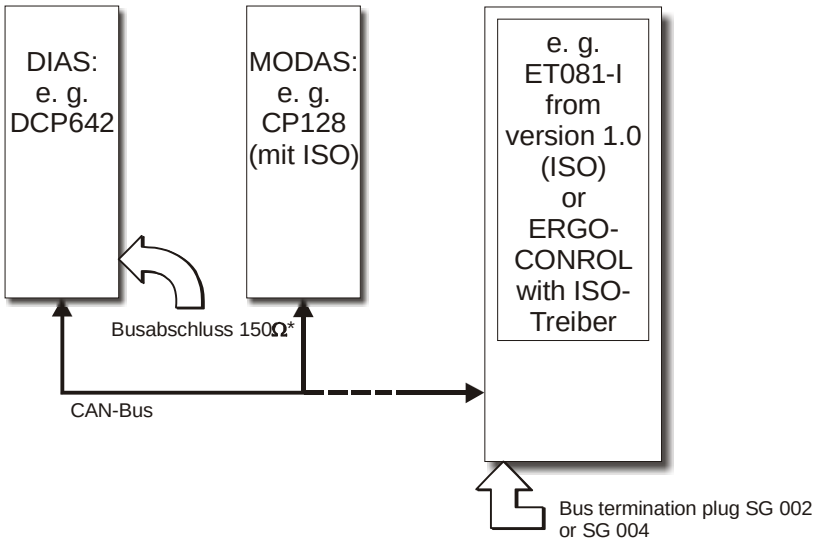


* e.g.: set jumper on the DKL on CLOSE

Disadvantages of this form of connection

Only a limited number of bus participants can be served.
A system comprising only ISO drives would be preferable for long CAN bus connections.

Modas and DIAS module groups mixed, but only with ISO drives

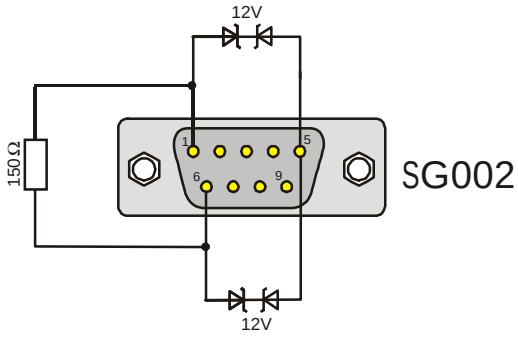


* e.g.: set jumper on the DKL on CLOSE

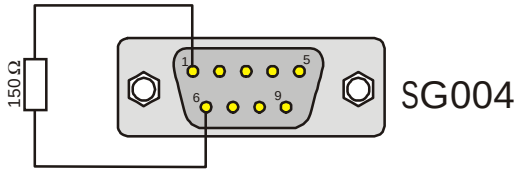
The advantages of this form of connection

Many participants can be served.
Long CAN bus connections are possible.

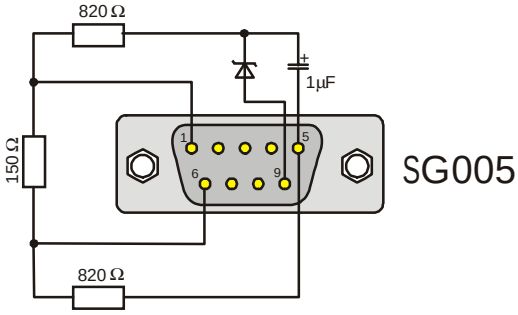
Termination circuit of the bus termination plugs



SG002



SG004



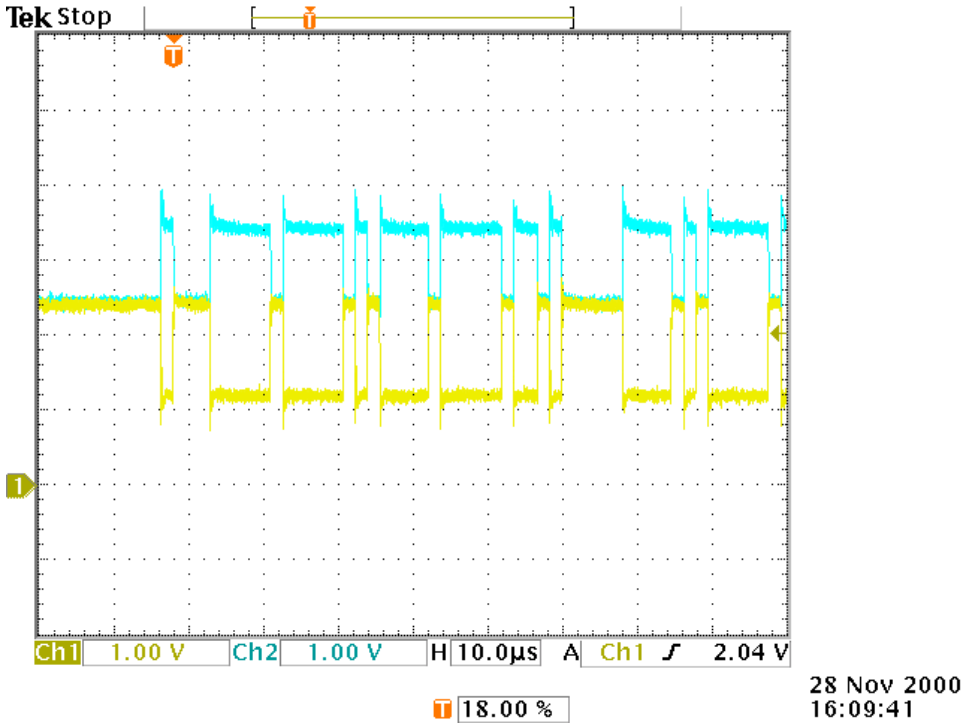
SG005

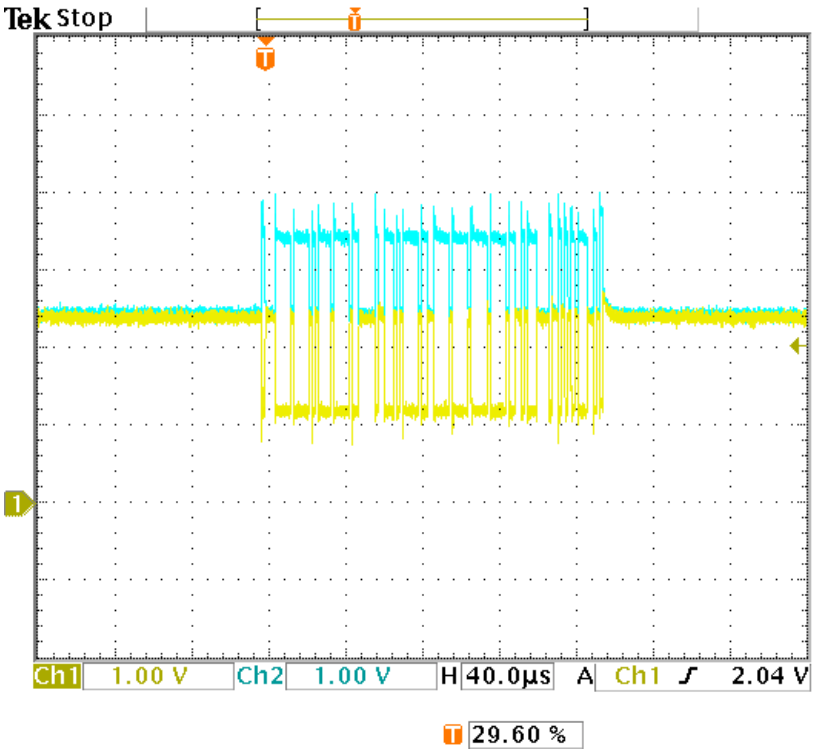
These module groups are converted from an RS485 drive to an ISO drive

RS485		**ISO**	
Module group	**Version**	**Module group**	**Version**
BU102	to V1.1	BU103	from V1.0
ET551	to V2.1	ET551-I	from V1.0
ET553	to V1.1	ET554	from V1.0
ET322	to V2.2	ET322-I	from V1.0
ET243	to V2.0	ET243-I	from V1.0
ET081	to V2.0	ET081-I	from V1.0
ET244	to V1.0	ET244-I	from V1.0
CP127	to V2.2	CP128	from V1.0

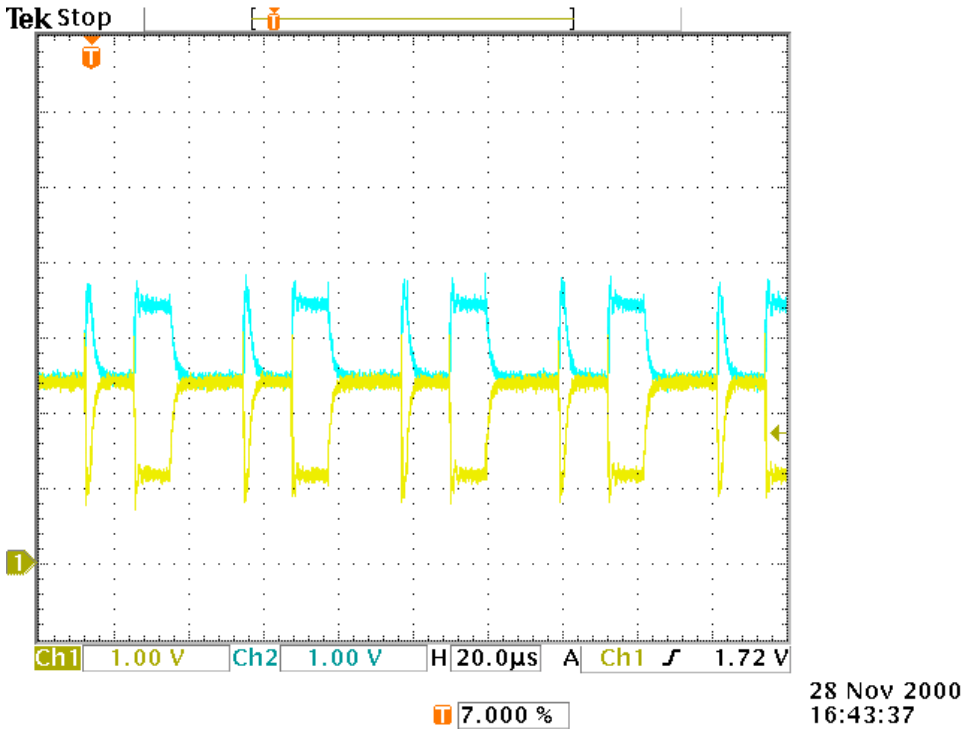
CAN bus signals

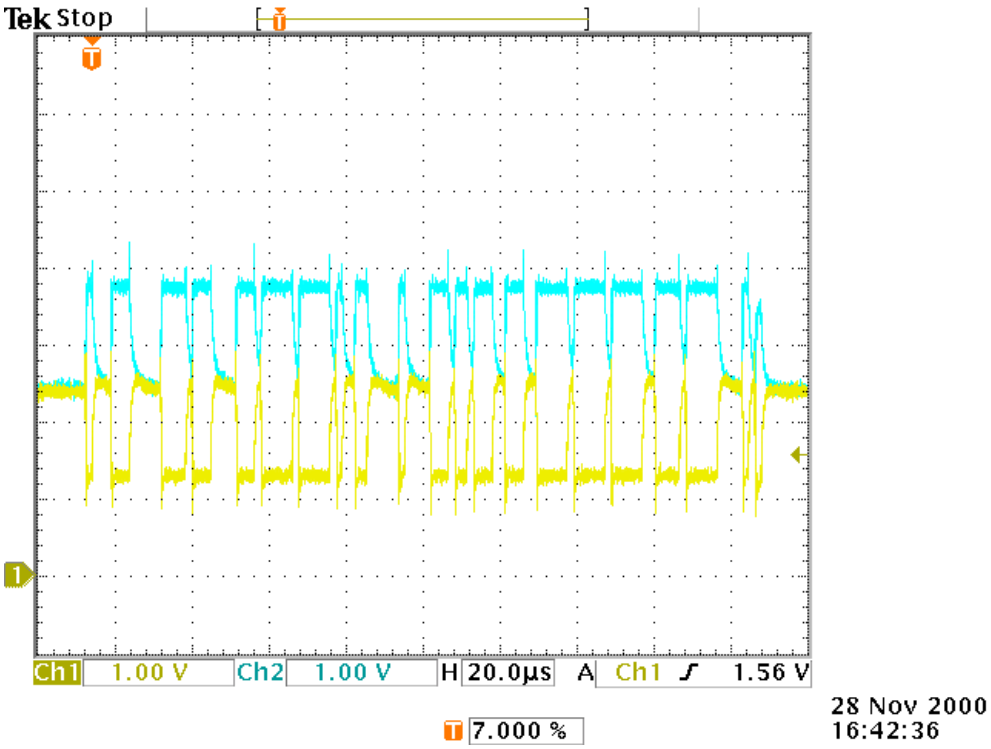
Signal is OK




Tek Stop
Ch1 1.00 V
Ch2 1.00 V
H 40.0µs
A Ch1 2.04 V
29.60 %
28 Nov 2000
16:08:43

Signal not OK (e.g. no bus termination)




Tek Stop
Ch1 1.00 V
Ch2 1.00 V
H 20.0µs
A Ch1 1.56 V
7.000 %
28 Nov 2000
16:42:36