8 Definitions

- **QUALIFIED PERSONNEL**

  For the purpose of these Operating Instructions and product labels, a „Qualified person“ is someone who is familiar with the installation, mounting, start-up and operation of the equipment and the hazards involved. He or she must have the following qualifications:

  1. Trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety procedures.

  2. Trained in the proper care and use of protective equipment in accordance with established safety procedures.

  3. Trained in rendering first aid.

- **DANGER**

  For the purpose of these Operating Instructions and product labels, „Danger“ indicates death, severe personal injury and/or substantial property damage will result if proper precautions are not taken.

- **WARNING**

  For the purpose of these Operating Instructions and product labels, „Warning“ indicates death, severe personal injury or property damage can result if proper precautions are not taken.

- **CAUTION**

  For the purpose of these Operating Instructions and product labels, „Caution“ indicates that minor personal injury or material damage can result if proper precautions are not taken.

- **NOTE**

  For the purpose of these Operating Instructions, „Note“ indicates information about the product or the respective part of these Operating Instructions which is essential to highlight.

NOTE
The information in these Operating Instructions does not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser’s purposes, please contact your local Siemens office. Further, the contents of these Operating Instructions shall not become a part of or modify any prior or existing agreement, committment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties nor modify the existing warranty.

CAUTION

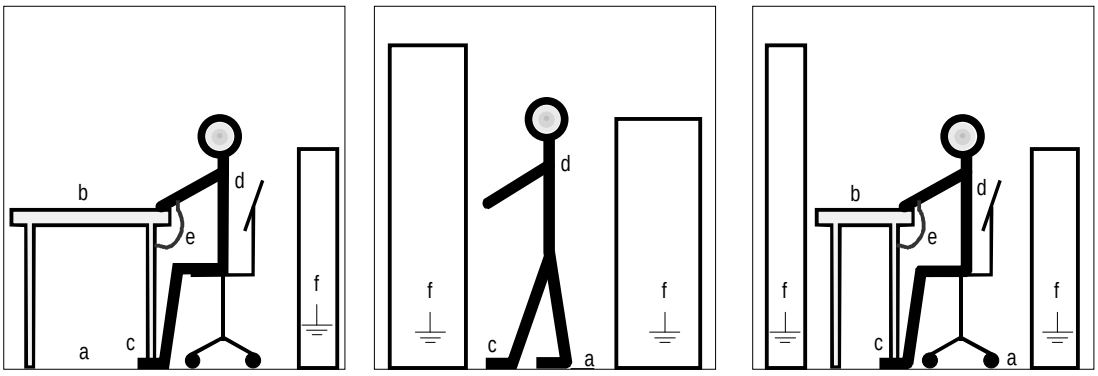
Components which can be destroyed by electrostatic discharge (ESD)

The drive converter contains components/devices which can be destroyed by electrostatic discharge. These components/devices can be easily destroyed if incorrectly handled. If it is absolutely necessary to work on/handle electronic boards, please observe the following:

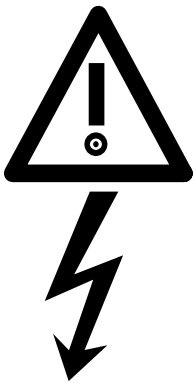
- Generally, electronic boards should only be touched when absolutely necessary.
- The human body must be electrically discharged before touching an electronics board
- Boards must not come into contact with highly-insulating materials – e.g. plastic foils, insulated desktops, articles of clothing manufactured from man-made fibers.
- Boards must only be placed on conductive surfaces.
- When soldering, the soldering iron tip must be grounded.
- Boards and components should only be stored and transported in conductive packaging (e.g. metalized plastic boxes, metal containers)
- If the packing material is not conductive, the boards must be wrapped with a conductive packing material, e.g. conductive foam rubber or household aluminum foil.

The necessary ESD protective measures are clearly shown in the following diagram:

a	=	Conductive floor surface	d	=	ESD overall
b	=	ESD table	e	=	ESD chain
c	=	ESD shoes	f	=	Cabinet ground connection



Seated **Standing** **Standing / sitting**



WARNING

Electrical equipment has components which are at dangerous voltage levels.

If these instructions are not strictly adhered to, this can result in severe bodily injury and material damage.

Only appropriately qualified personnel may work on this equipment or in its vicinity.

This personnel must be completely knowledgeable about all the warnings and service measures according to these Operating Instructions

The successful and safe operation of this equipment is dependent on proper handling, installation, operation and maintenance.

9 Product description

9.1 Application

The T300 technology board is used in SIMOVERT Master Drives and is used to implement supplementary technological functions.

Applications are, for example, higher-level closed-loop controls for:

- tension
- position
- winders, coilers
- (angular) closed-loop synchronous control
- positioning
- drive-related open-loop control functions

Refere also to Sec. 4

9.2 Function description

The T300 board can be freely-configured using the STRUC configuring language. However, for standard applications, complete, standard software packages are available on pre-programmed memory modules (MS300).

The board consists of a 16-bit microprocessor and powerful periphery. The computation performance obtained permits sampling times down to 1 ms. By using a specially developed real time operating system, response times, required for sophisticated open- and closed-loop control tasks, can be achieved.

Data transfer between the basic electronics and a possibly available communications board is realized through an almost delay-free parallel interface (dual port RAM).

The monitor program (HEX monitor, diagnostics monitor), can be used, e.g. via a terminal with RS232 connection (V.24) for fault diagnostics (hardware- or software errors/faults). In addition, up to 3 cyclically flashing LEDs indicate that the board is functioning perfectly.

The T300 has several binary and analog inputs and outputs, 2 speed sensing inputs, as well as 2 serial interfaces, which can be used e.g. for a fast digital setpoint cascade (peer-to-peer) and to connect a parameterizing- and service program (SIMOVIS).

Data save via NVRAM (Non-Volatile-RAM):

A maximum of twelve 16-bit values can be stored simultaneously in a non-volatile manner by means of a NVRAM device (Non-Volatile RAM). The STRUC standard configured package can acess the NVRAM and use it for storing N2 variables, e.g. setpoint and actual values, and recall them after power shutdown or power loss.

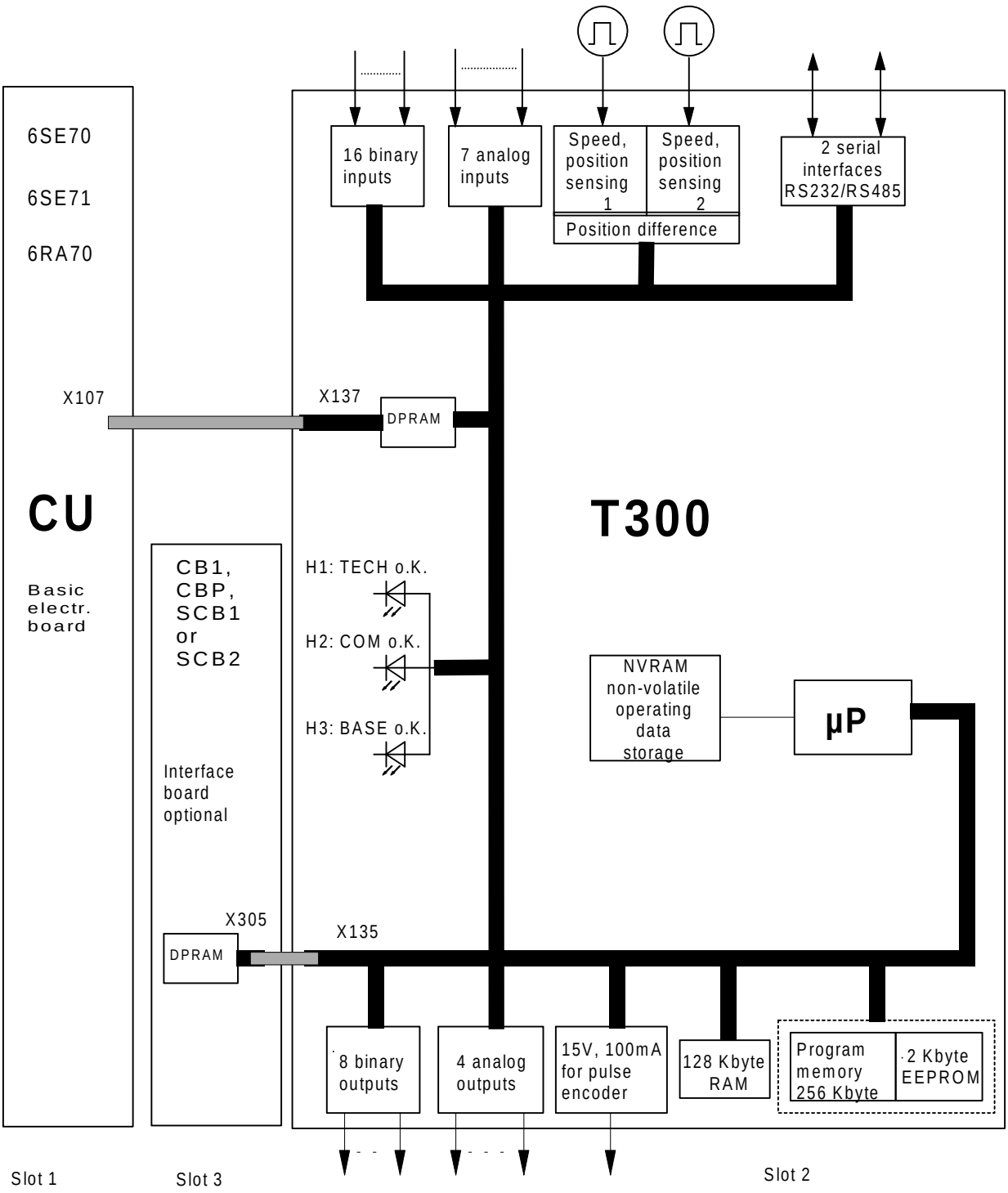


Fig. 1.2 Hardware and function block diagram of the T300

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9.3 Hardware/Software requirement

9.3.1 MASTERDRIVES basic units

MASTERDRIVES basic units (new Series, introduced from 1998)
The T300 has been approved for operation in the following MASTER DRIVES basic units:

- ❑ SIMOVERT VC with electronic board CUVC: Software release ≥ 3.11
- ❑ SIMOVERT MC with electronic board CUMC: Software release ≥ 1.2.

The T300 can only be used with Compact-, Chassis- and Cubicle-type units. The use with "Compact Plus" type units is not possible.

MASTERDRIVES basic units (older series, introduced from 1995)
The T300 has been approved for operation in the following MASTER DRIVES basic units:

- ❑ SIMOVERT VC with electronic board CU2: Software release ≥ 1.2
- ❑ SIMOVERT SC with electronic board CU3: Software release ≥ 1.1

CAUTION
When a T300 board is installed in a SIMOVERT SC unit, the pulse frequency of the converter must not be increased above the factory setting value of P761 = 5 kHz to avoid overloading the converter processor.

SIMOREG basic units
The T300 has been approved for operation in the following SIMOREG basic units:

- ❑ SIMOREG DC_MASTER 6RA70: Software release ≥ 1.7

9.3.2 Communication boards

The T300 can be combined with the following communications boards

- ❑ PROFIBUS-DP interface CBP , Software release ≥ 1.0 or CBP2, Software release ≥ 2.1
  Only one fieldbus communication board can be used. It must be mounted in mounting location 3 (middle location). Communication boards which are designed as Mini-Slot-Boards (e.g. CBP, CBP2) must additionally be mounted in Slot "G" of an ADB Adaption Bord before inserted in mounting location 3.
  The T300 can not communicate with a communication board mounted on the CU (slot A or C).

- ❑ PROFIBUS interface module CB1, software release ≥ 1.3

- ❑ SCB2 Board software release ≥ 1.3
  The SCB2 has an opto-isolated serial interface which is capable of operating with either a USS protocol or a peer-to-peer protocol.

- ❑ SCB1 board
  The SCB1 is equipped with a fibre-optic interface for peer-to-peer communication or terminal extension modules SCI1 and/or SCI2.

- ❑ SLB SIMOLINK interface board for CUVC or CUMC.
  If a Peer-to-Peer communication in not possible (for example for „Compact Plus“ type units) the SLB board can be installed instead of the T300 Peer-to-Peer interface.

- ❑ CAN-BUS interface CBC , Software release ≥ 2.0
  Only one fieldbus communication board can be used. It must be mounted in mounting location 3 (middle location). Communication boards which are designed as Mini-Slot-Boards (e.g. CBC) must additionally be mounted in Slot "G" of an ADB Adaption Bord before inserted in mounting location 3.
  The T300 can not communicate with a communication board mounted on the CU (in slot A or C).

CAUTION
- An optinal SLB SIMOLINK Interface Board must be mounted in a slot on the CUVC or CUMC base electronics board, most preferably in Slot A. -The combination T300 and SLB SIMOLINK Interface mounted in location 3 is not possible! - The SLB borad communicates directly with the base unit. Signal interconnections to the T300 board must be softwired via Binectors-/ Connectors. - A T300 board with Hardware release ≥ B, or newer, is needed for use with an SLB SIMOLINK interface board. The correct hardware release code can be detected on the component side of the T300 in the neighbourhood of the lower backplane connector.

9.3.3 T300 parameter settings

The following devices can be used to set the parameters of the T300 board:

- ❑ Standard parameterizing unit (PMU) for basic converters
- ❑ A PC or programmer with the SIMOVIS service program
- ❑ Optional OP1S plaintext operator device, Software release ≥ 2.3
- ❑ Optional OP1 plaintext operator device version 1.1 or higher

Note: MASTERDRIVES basic drive parameter and T300 Parameter can be read and write thrue all the serial Interfaces (with the exception of Peer-to-Peer interface and SIMOLINK interface board).

10 Installation, connecting-up

10.1 Inserting the memory module

The memory module must be placed on the board before it is inserted into the electronics box.

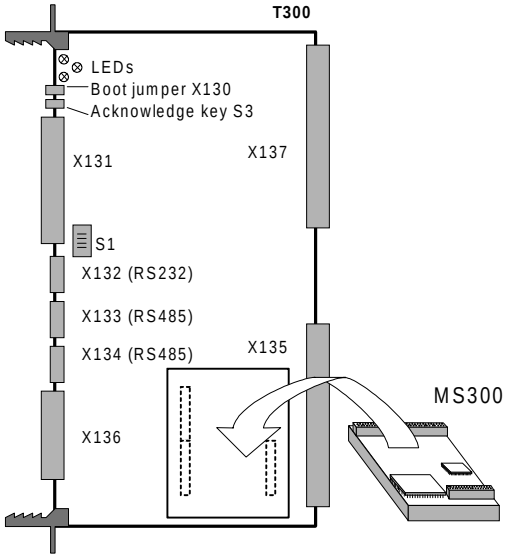

Fig 10.1 Inserting a memory module

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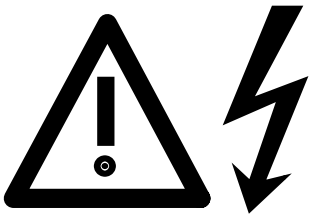
	**DANGER**
	It must be ensured that the memory module is inserted correctly into the T300 connector, as otherwise the memory module could be damaged.

10.2 Installing the board

Slots in the electronics box		Boards
Left	Slot 1 (CU)	CU
Center	Slot 3 (options)	CB1 / CBx with ADB / SCB1 / SCB2 / (TSY, not for T300)
Right	Slots 2 (options)	CB1 / CBx with ADB / SCB1 / SCB2 / TSY / **T300**

NOTE

Only one of each option board type may inserted in the electronics box.

TB (technology boards, e.g. T300) must always be inserted at slot 2.

When a TB board is used, a TSY board may not be inserted.

If only one option board is used it must always be inserted at slot 2.

Option board Order Nos. and their descriptions are found in the Instruction Manual of the Master Drive converter.

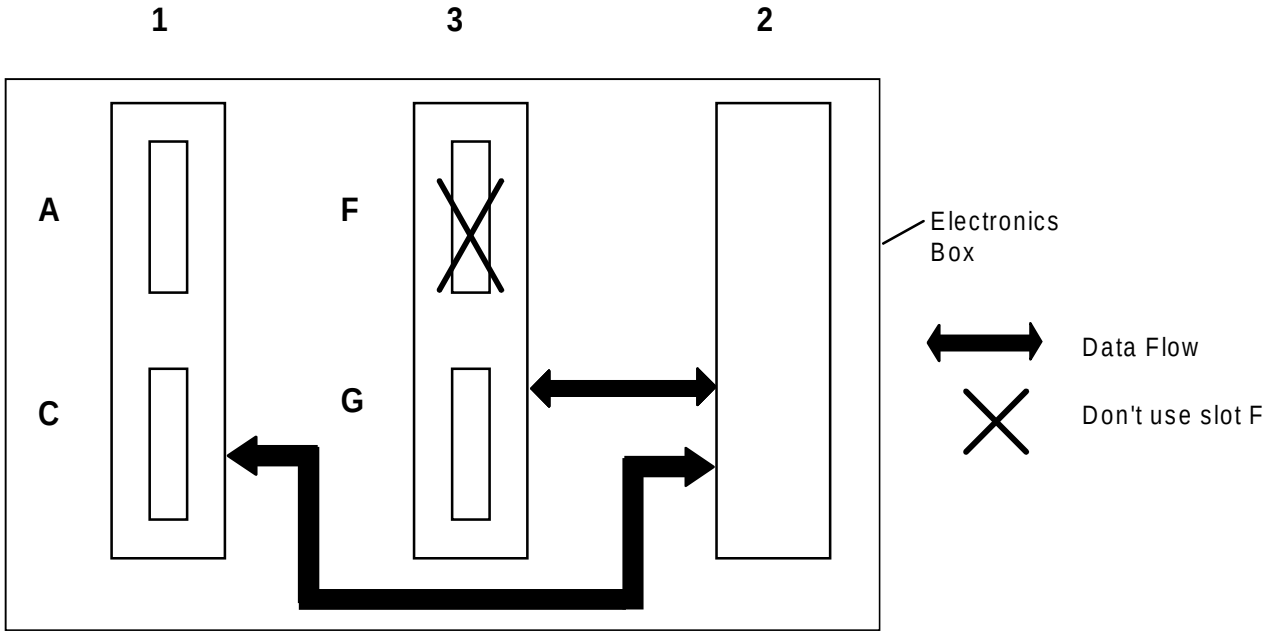
Examples of possible arrangements:

Slot 1	Slot 3	Slot 2
CU	---	SCB
CU	---	CBx
CU	---	**T300**
CU	SCB	**T300**
CU	CBx	**T300**
CU	TSY	SCB

Please adhere to the following rules for mounting the T300 and other supplementary boards into the electronics box.

Please note: Only the following combinations and mounting positions are allowed.

Mounting Positions



- CUVC - CUMC - CU2, CU3 - 6RA70	- CBx mounted on ADB Adaption Board - CB1 - SCB1 - SCB2	- T300

– The T300 must be mounted in mounting location 2 (rightmost mounting location)

– Only one fieldbus communication board can be used. It must be mounted in mounting location 3 (middle location). Communication boards which are designed as Mini-Slot-Boards (e.g. CBP, CBC) must additionally be mounted in Slot "G" of an ADB Adaption Bord before inserted in mounting location 3. The T300 can not communicate with a communication board mounted on the CU (in slot A or C).

– The Communication Board communicates directly with the T300 board.

– An optinal SLB SIMOLINK Interface Board must be mounted in a slot on the CUVC or CUMC base electronics board, most preferably in Slot A..

The combination T300 and SLB SIMOLINK Interface mounted in location 3 is not possible!

CAUTION
A T300 board with Hardware release ≥ B, or newer, is needed for use with an SLB SIMOLINK interface board. The correct hardware release code can be detected on the component side of the T300 in the neighbourhood of the lower backplane connector.

Before installing option boards in the electronics box, the LBA (local Bus Adapter) has to be inserted.

Install the LBA bus expansion:

- Remove the CU (lefthand slot in the electronics box) using the handles after first removing the connecting cable to the PMU and both retaining screws
- Insert the LBA bus expansion in the electronics box (position, refer to the diagram) so that it snaps into place
- Re-insert the CU into the lefthand slot, screw the retaining screws on the handles tight, and insert the connecting cable to the PMU

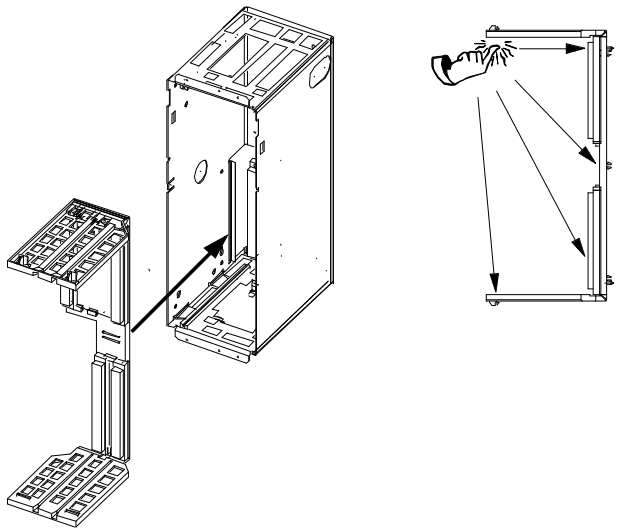


Fig. 10.2.a Installing the local bus adapter

Insert the option board in the righthand or center slot of the electronics box and screw into place. Only one of each option board type may be inserted in the electronics box. If only one option board is inserted, then it must always be at slot 2 (right).

Installing a new board

- Undo the two fixing screws on the handles above and below the board.
- Pull the board out of the electronics box using the handles
- Insert the new board. The board must be pressed tightly onto the plug connector.
- Screw the board tight at the fixing points in the front section of the board using the two screws attached.

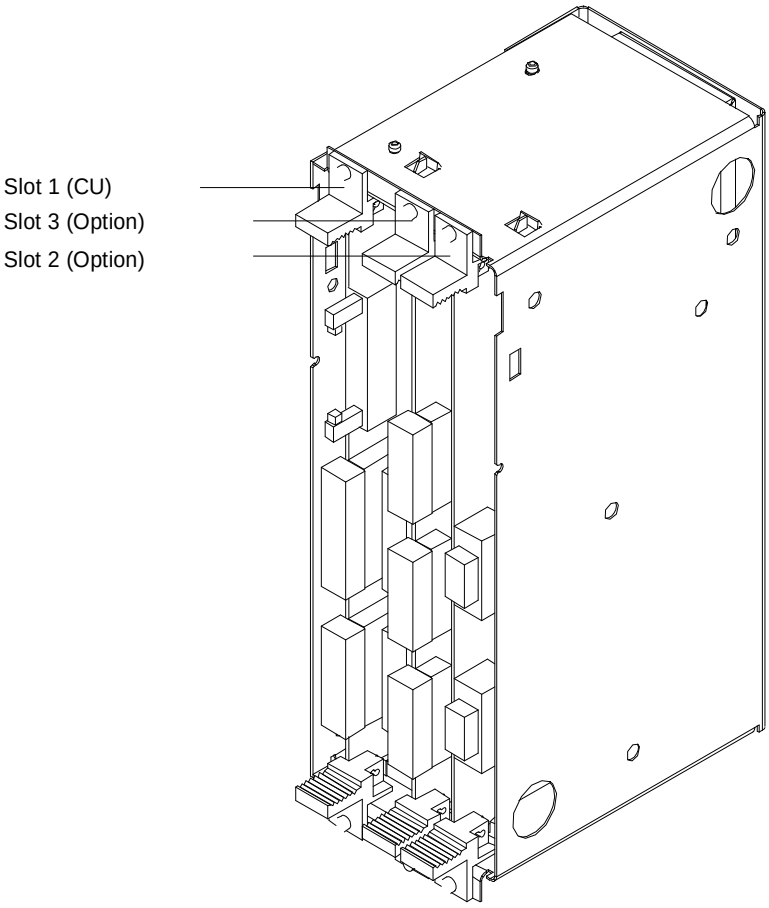


Fig. 10.2.b: Elektronics box, with CU (Slot 1) and Options (Slot 2 (left) and 3 (right))

10.3 Connections

10.3.1 T300 and SE300 terminal module connections

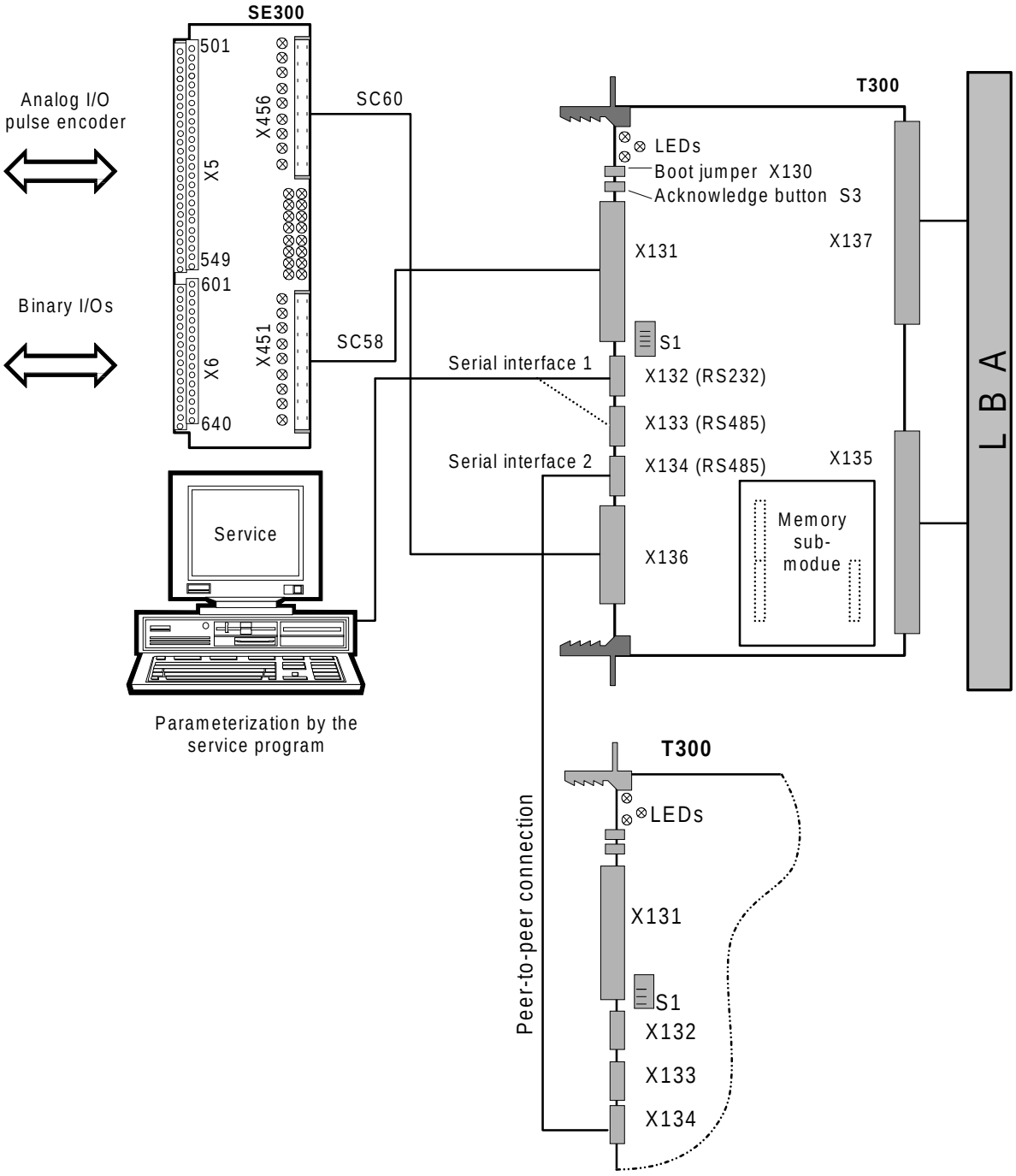


Fig. 10.3.a: T300 connections

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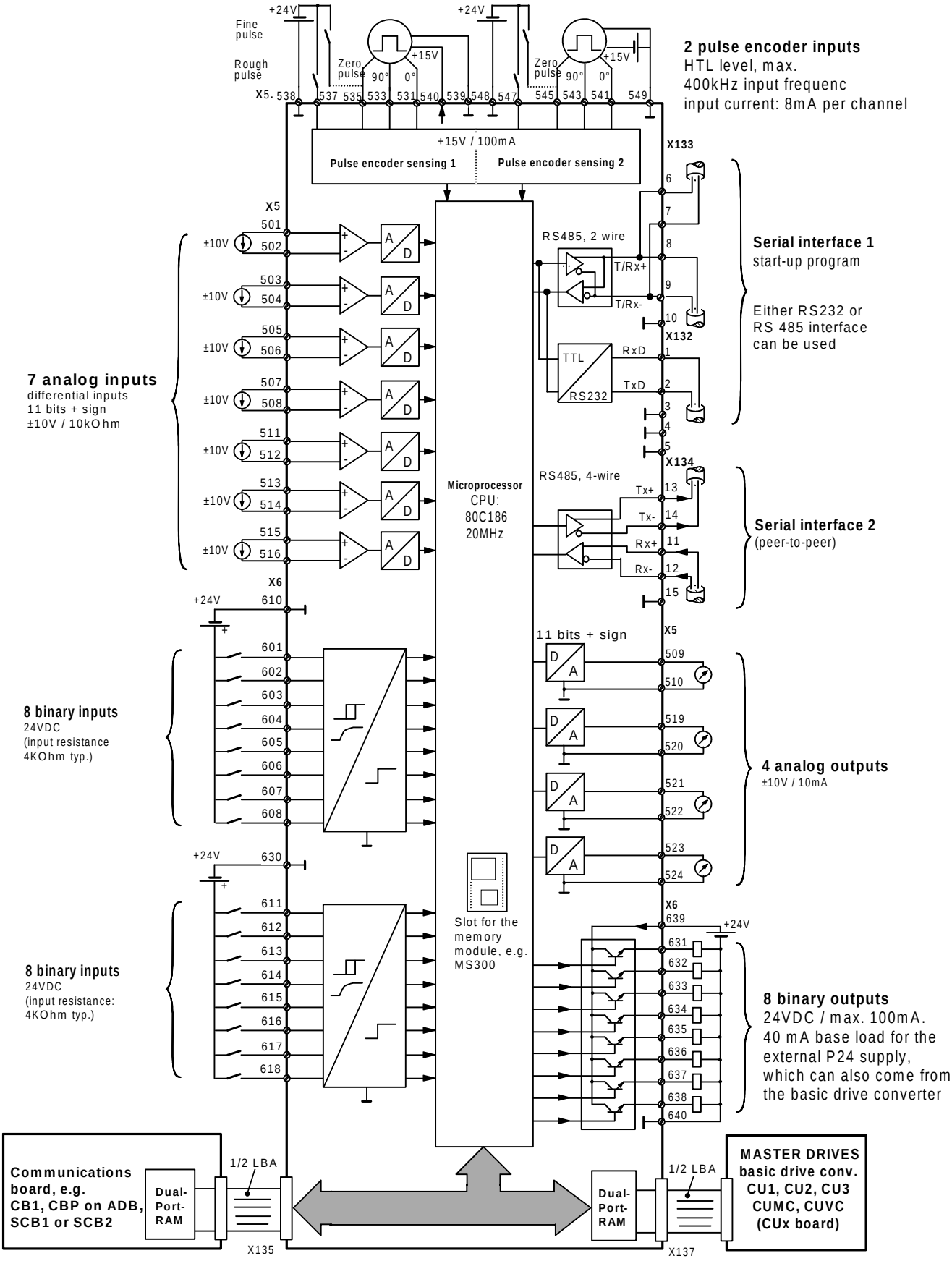

Connecting diagram, T300,SE300

Terminal series X5, X6: Connect at terminal block SE300
Terminal series X132, X133, X134: Connect at T300

File: T300_E.DRW

Note: For the first **SE58 which were supplied** (Order No.: 6DD3460-0AB0, Item No.. 465460.9001.00) terminals 630...640 are designated as 620...630!

10.3.2 SE300 terminal module

The SE300 terminal module is used to connect the plant-side input-, output- and pulse encoder signals. The terminal module is snapped onto a 35mm (DIN EN 50 022-35) mounting rail. The terminal module has LEDs which permits fast diagnostics of the binary input-, output- and pulse encoder signals.

The connection to the T300 is realized through the two, shielded ribbon cables SC58 (40-core, for analog and pulse encoder signals) and SC60 (34-core, for binary signals).

The serial interfaces are connected directly at the T300.

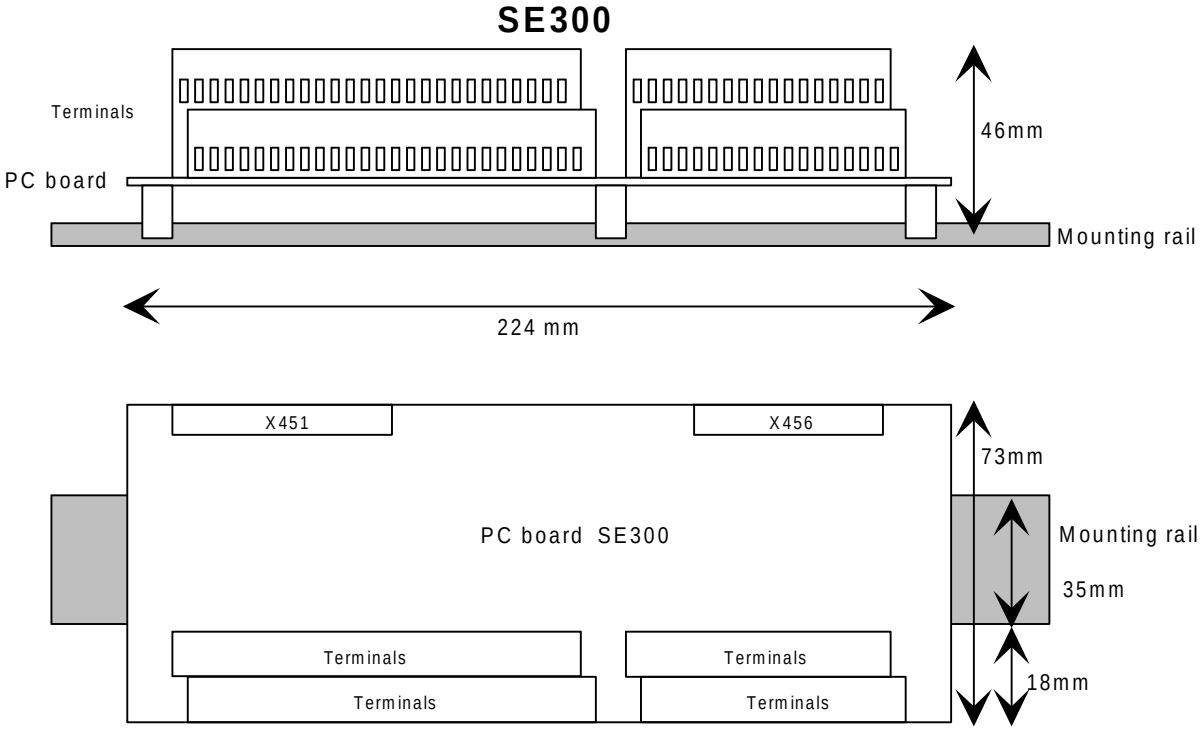

Fig. 10.3.2: SE300 dimensions

File: SE300M_E.DRW

10.3.3 Connecting-up pulse encoders (digital tachometers) at SE300

10.3.3.1 Connection possibilities

The T300 provides a 15 V voltage via the SE300 for **one** pulse encoder, so that either pulse encoder 1 **or** pulse encoder 2 can be supplied without having to use an external power supply.

24 V pulse encoders can also be used, whereby it should be observed, that the pulse encoder could be overloaded if long cable are used in conjunction with high frequencies (e.g. 150m, 40kHz), which could result in speed actual value sensing errors.

The speed actual value can also be lost, if the cable capacitance prevents the input voltage decreasing to less than 5 V for a pulse encoder LOW signal.

Only unipolar encoder signals can be evaluated.

The encoder reference potentials must be connected with the speed input reference points of the SE300:
Terminal 531, 533, 535 or 539 for encoder 1
Terminal 541, 543, 545 or 549 for encoder 2

When using an external power unit, its ground must also be connected to SE300 (e.g. terminal 539).

An external power supply unit can also supply both pulse encoders, whereby in this case, terminals 539 and 549 must be connected to the power supply ground.

The zero pulses are only required for certain applications (e.g. synchronizing drives).

Using a rough signal, a window can be defined, in which a zero pulse can be identified and evaluated. Such a rough signal can be generated, for example, from a contact switch or proximity switch. The zero pulse is evaluated when the rough signal = 1.

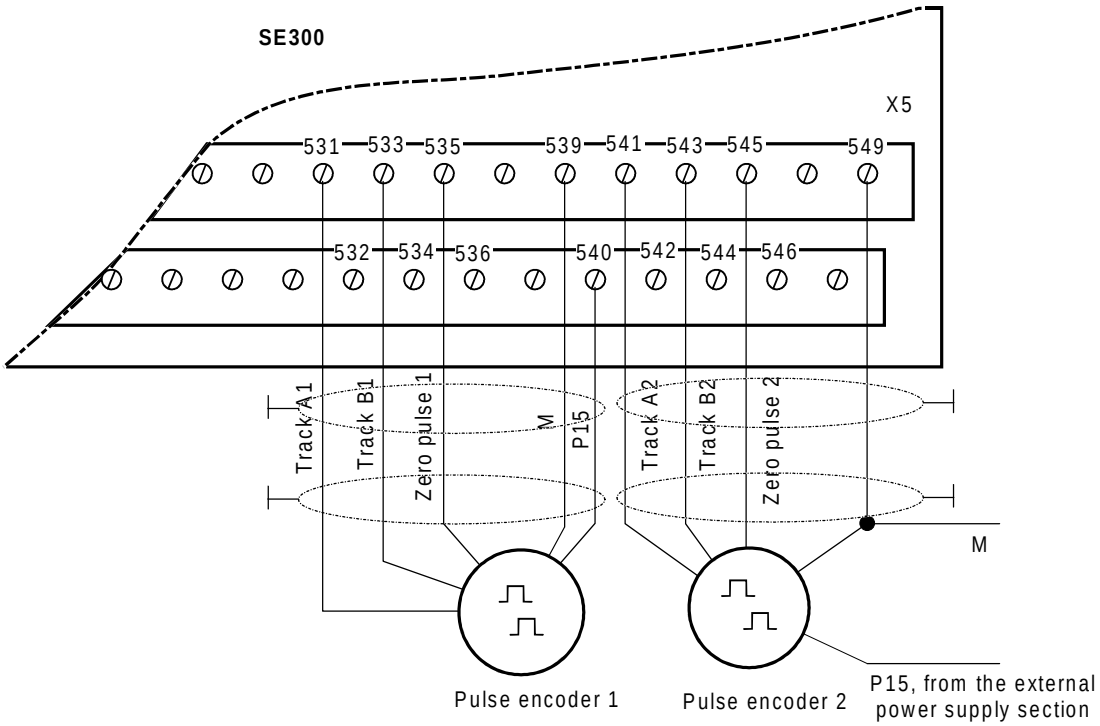

Fig. 10.3.3.1.a: Connecting pulse encoders with zero pulse

File: SEIMP_E.DRW

Using a **single-track pulse encoder**:

- the pulse encoder pulse track is connected at track A1 or A2 (terminals 531 or 541)
- the track inputs B1 or B2 of the pulse encoder sensing (terminals 533 or 543) are connected to ground.

As the **SIMOVERT VC** includes closed-loop speed control, then typically, an encoder („encoder input 1“) is directly connected to control board CU2 (**terminals X103.35 to X103.40**) or CUVC (**terminals X103.35 to X103.40**) . The pulses, fed to CU2, are supplied to the T300 via the LBA.
This does not load the pulse encoder connected at the CU.

For servo converters SIMOVERT SC (CU3 control board) or MASTERDRIVE Motion Control (CUMC control board), the **resolver signals** are transformed into pulse encoder signals (tracks A1, B1, N) and are also fed to T300 via the LBA.

For SIMOREG DC_MASTER (6RA70) typically, an encoder is directly connected to control board (**terminals X173.26 to X173.33**).
The pulses, fed to CU, are supplied to the T300 via the LBA.
This does not load the pulse encoder connected at the CU.

In this case, these pulses are not just available on the control board for speed sensing, but also on the T300 via the LBA.

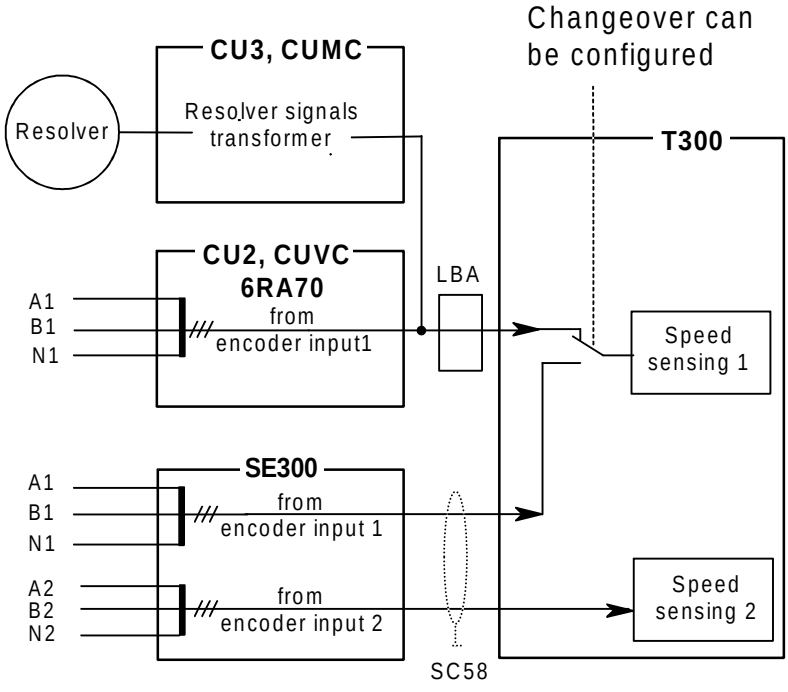

Fig. 2.3.3.1.b: Connecting the pulse encoder

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10.3.3.2 Information regarding the pulse encoder cable

Capacitance per unit length of the pulse encoder cable:

Core - shield: approx. 265 pF/m
Core - core: approx. 120 pF/m

1. For long cables, it must be ensured, that there is still enough voltage at the pulse encoder to ensure correct operation.

2. Max. pulse encoder output frequency:

Max. Pulse Encoder Frequency as a Function of the Cable Length with the HTL Encoder Inputs of MASTERDRIVES and T300.

Below you can find a pulse frequency vs. cable length characteristic curve. The following assumptions have been made for this curve:

1. Encoder types: Heidenhain 1XP8001-1 and Hübner ROD9 / HOG9

2. Stabilized +15 VDC encoder power supply . Both, the CU board and the T300 board provide output terminals each supplying one encoder with the appropriate power-supply voltage. (i.e. two encoders can be supplied in total).

3. With pulse frequencies above 50 kHz or cable lengths above 50 m, two parallel-connected conductors have to be used for the 15VDC and GND encoder supply leads in order to make the voltage drops as low as posible.
   Four parallel-connected conductors have to be used with cable lengths above 100m. As an alternative, you can use 15VDC and GND conductors with a minimum cross-section of 1 mm^2 each.

4. Appropriate encoder cables:
   - Siemens 6SX7002... according to Motor-Catalog DA65.3
   - other shielded twisted -pair cables with the following features:
     - min. cross-section of the conductors: 0,25 mm^2
     - max. capacitance per unit length: 120 pF/m

5 For cable lengths above 150m, the use of an encoder with additional complementary HTL signals is highly recommended (differential pulse signals A/A_inverted, B/B_inverted, N/N_inverted).
   A Siemens DTI "Digital-Tacho Interface" module has to be employed in this case, refer to MASTER-DRIVES-Catalog DA65.10.
   The 1XP8001-1 encoder type is equipped with the complementary outputs as a standard. The ROD9 / HOG9 types can be ordered, as a special version, from Hübner with complementary outputs. Use the Hübner-Order No suffix " ...I" for ordering.

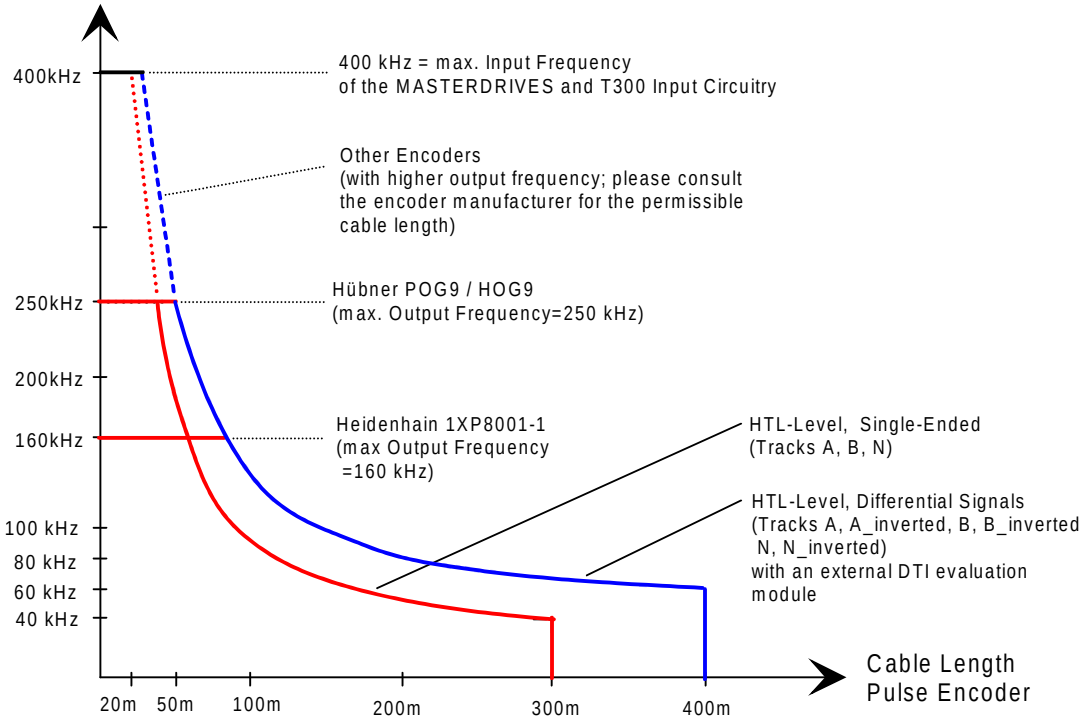

Fig. 10.3.3.2: Permissible pulse encoder output frequency

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10.3.3.3 Connecting a TTL encoder to the T300 via a DTI converter module

A downstream-connected DTI module can be employed for converting the pulse levels from HTL (15 to 24V) to TTL. In this case, the T300 cannot evaluate encoder frequencies above 25 kHz without additional measures.

This restriction is due to the passive pull-up output of the DTI (output transistor switches to GND, no push-pull stage) and the RC-type T300 input filter circuit resulting in slow rising edges and fast falling edges.

Higher pulse frequencies can be achieved by removing the filter elements on the T300 board according to the following table. These filters are no longer needed in connection with the DTI. Each filter consits of an R (resistor) and a C (capacitor) which are series-connected. An **R or a C component must be removed** for each encoder track.

Encoder 1:	Track A Track B Index Pulse	C43 C44 C45	or R195 or R197 or R198
Encoder 2:	Track A Track B Index Pulse	C46 C47 C48	or R205 or R207 or R208

10.3.3.4 Rough signal processing

The T300 allows the zero pulse only to be evaluated if the „rough signal“ is present. If such a AND logic operation is to be made (in the sense of a filter function), then the speed sensing (function function block NAV015) must be appropriately parameterized.

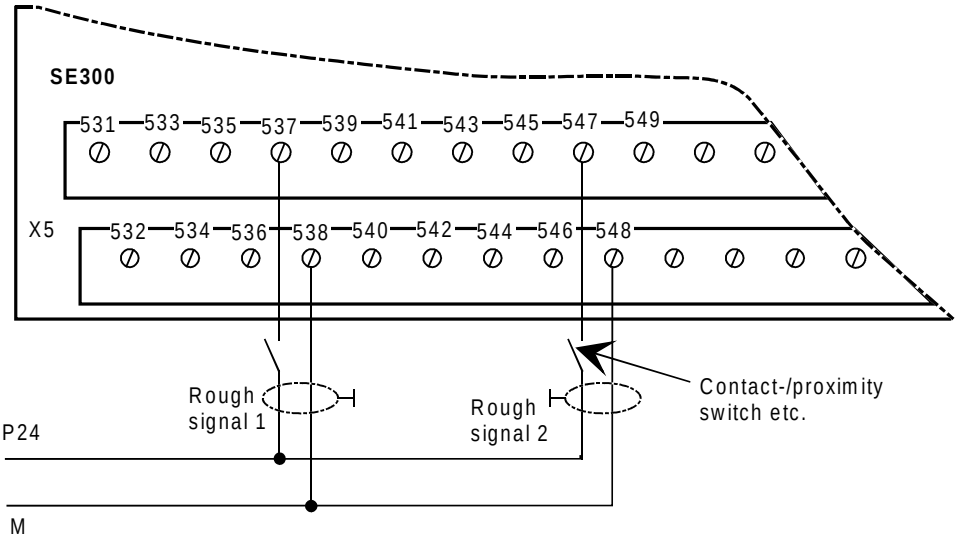

Fig. 10.3.3.4.a: Rough signal speed sensing 1 and 2

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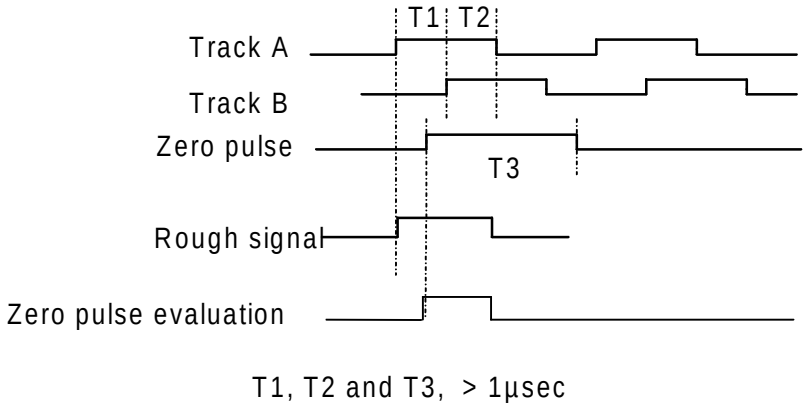

Fig. 10.3.3.4.b: Zero pulse evaluation with rough signal

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10.3.4 Connecting-up the analog inputs

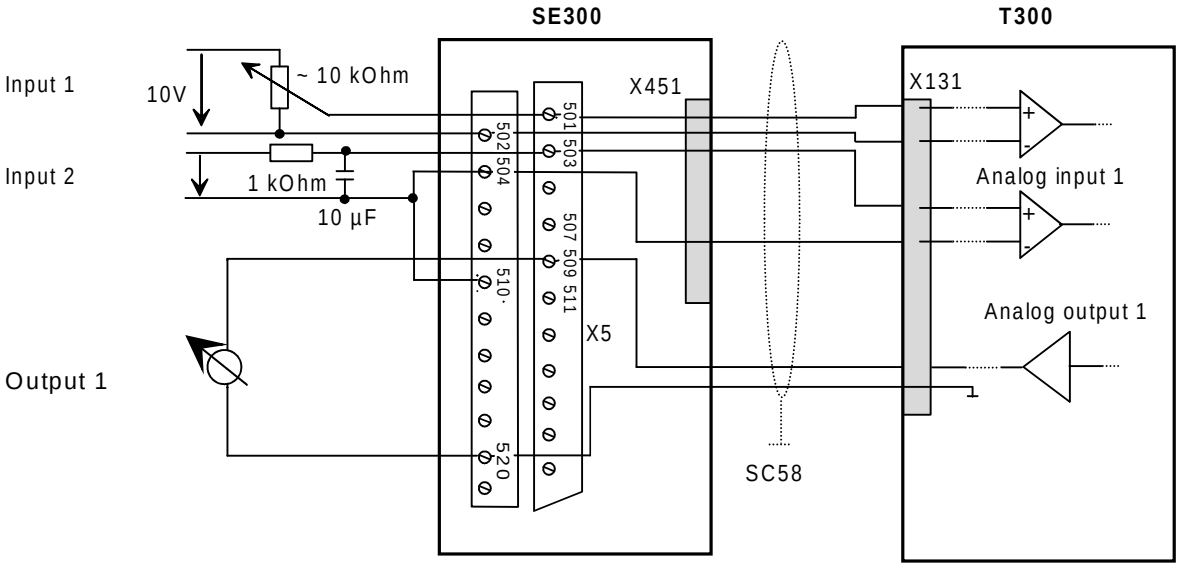


Fig. 10.3.4: Connecting the analog inputs and analog outputs

File: ANALIN_E.DRW

- The analog inputs are **differential inputs**, in order to suppress common-mode noise and disturbances. The „reference potential“ (e.g. terminal 502 for input 1) must therefore also be connected!
  Further, it should be noted that the inputs are **non-floating** via the A/D converter!

- For unipolar signals, the inverting inputs must be connected at the analog signal reference points.
- Noisy signals must be smoothed using a low-pass filter, which is externally mounted. The recommended circuit, illustrated in fig. above refers to analog input sampling times of ≥ 8ms.

10.3.5 Connecting-up the binary inputs

Binary signals have a 24 V DC signal level referred to M24 (SE300 terminals 610, 630 or 640).

Low signal level (logical zero) is identified for
- an open-circuit input
- signals below +6V.

A **high signal level** is defined for voltages between 13 V and 33 V.

The input current at 24 V is typically approx. 5 mA and the delay time, approx. 1 ms.

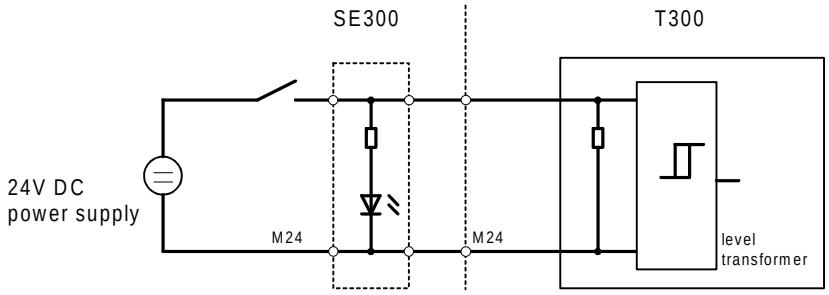


Fig. 10.3.5.a: Circuit diagram of a binary input

File: BINEIN_E.DRW

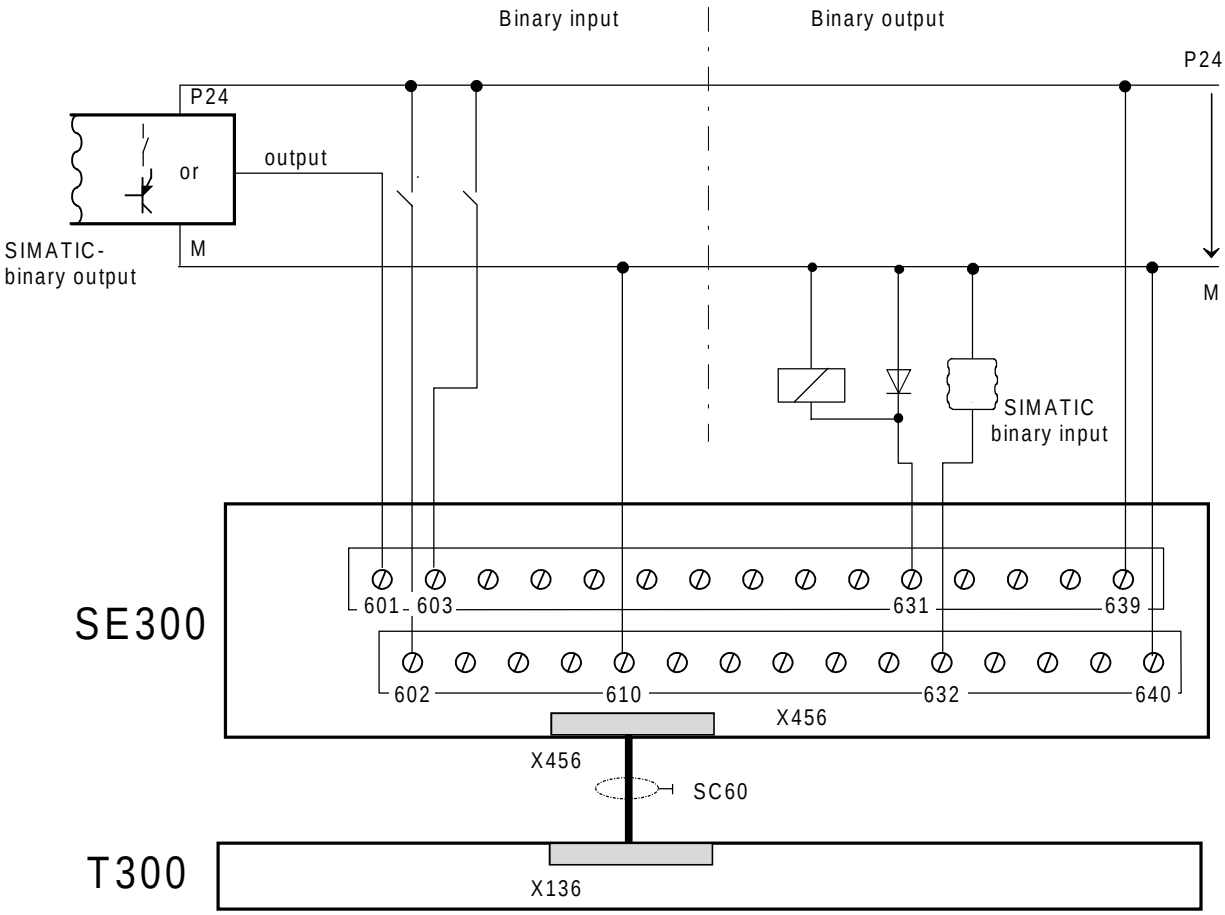


Fig. 10.3.5.b: Connecting-up the binary inputs and outputs

File: BINARI_E.DRW

10.3.6 Connecting-up the binary outputs

The binary outputs are also 24V DC signals, which are referred to M24 (terminal 610, 630 or 640 of the SE300). They are supplied from the P24 terminals (609, 619 or 639).

Each of the 8 outputs (terminals 631 to 638) can drive 0.2 mA to 100 mA, which is sufficient to control small signaling lamps or interface relays. A free-wheeling diode is provided on the T300, however, for inductive loads, it is recommended that a **free-wheeling diode** is directly connected at the load.

The outputs have electronic short-circuit protection to ground and P24.

The total of all outputs may not exceed 400 mA; the operating voltage range is +20 V to +30 V.

The switching delay is approx. 300 µs.

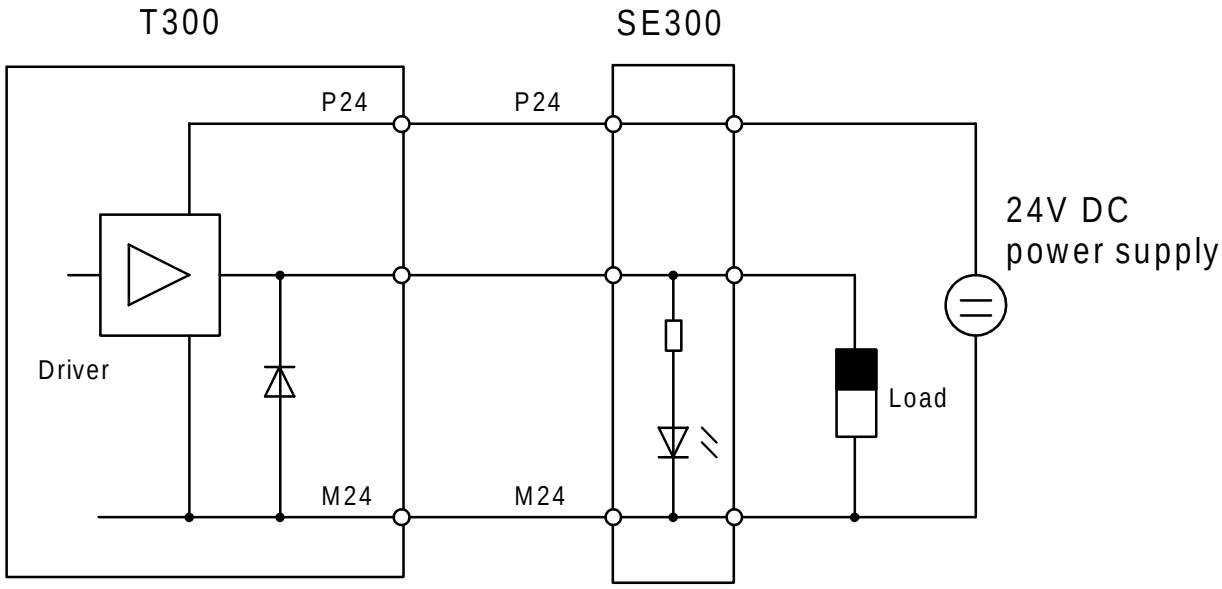


Fig. 10.3.6: Circuit diagram of a binary output

File: BINAUS_E.DRW

P24 power supply voltage:

Binary inputs:

- The power supply voltage can either be taken from the drive converter (connector X101, terminals 13 and 23) or from an external power supply source.

Binary outputs:

- The power supply voltage can be taken from the converter or an external power supply.
  It should be noted, that a maximum of 150 mA can only be taken from the converter P24 supply (also refer to Section 10.4)

10.3.7 Connecting-up the serial interfaces

10.3.7.1 Serial connections, X132

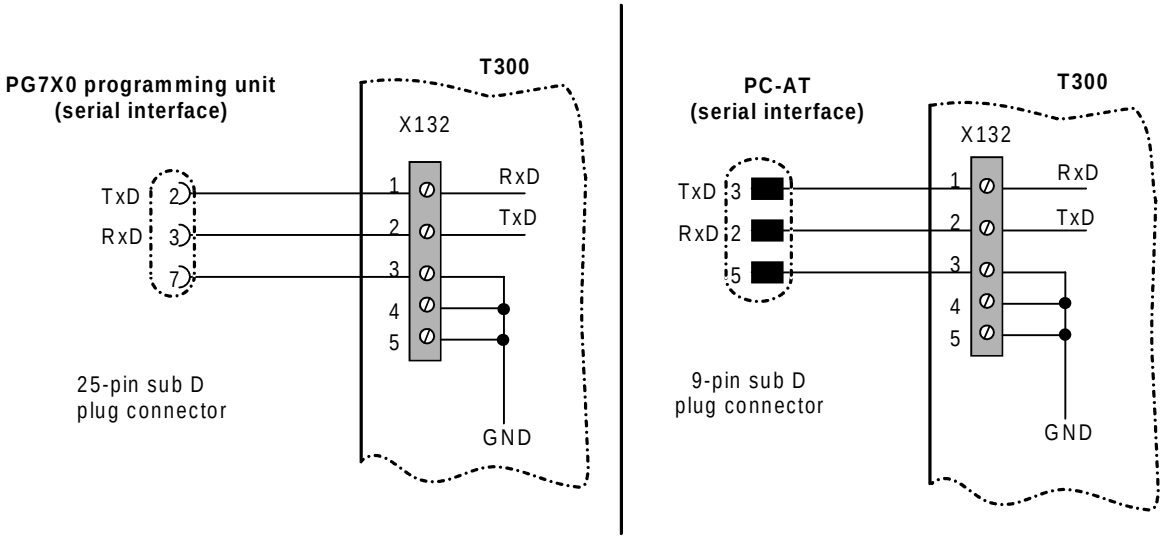


Fig. 10.3.7.1: T300 serial connections

File: X132_E.DRW

10.3.7.2 Peer-to-peer connection, X134

The peer-to-peer connection is used to cascade the setpoint between the drives .

- A transmitter only supplies **one** receiver:
  ⇒ For the receiver, the terminating resistors must be switched-in.
- A transmitter can supply up to 31 receivers:
  ⇒ All receivers must be connected as for a serial bus due the cable characteristic impedance. This means, that an incoming and an outgoing bus cable connector must be connected at each receiver.
  The terminating resistors must be effective for the last receiver in the chain. It is <u>not</u> permissible to connect-up the receivers in a star configuration!

Refer to Section 10.6 for further details regarding the terminating resistors.

Every cable section must be shielded!

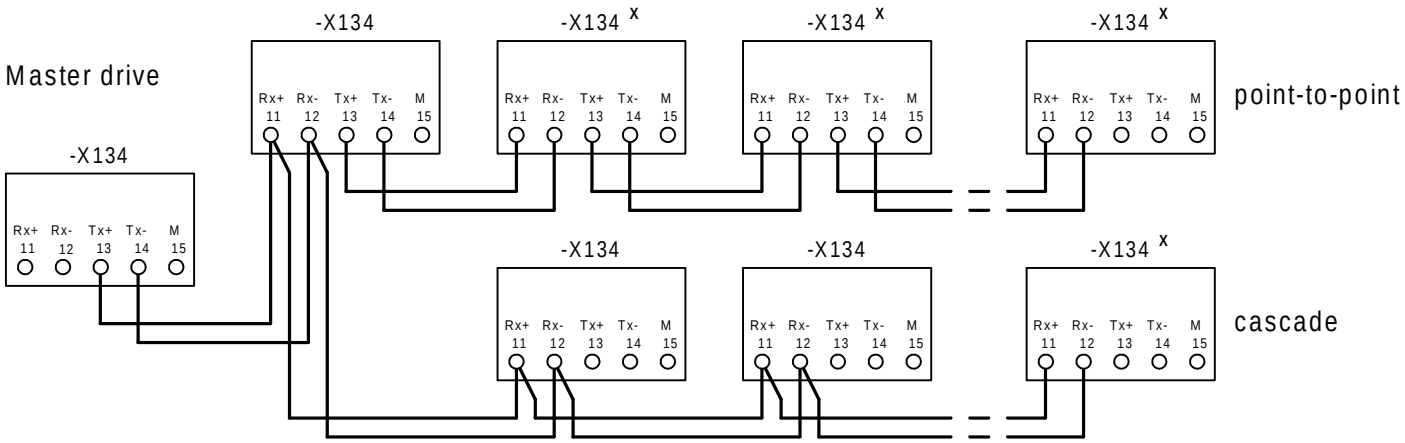


Fig.10.3.7.2: Peer-to-peer connection

File: PEER_E.DRW

x: For this T300, the **bus terminating resistors** must be switched-in, i.e. at bus terminating switch S1, coding switches S1.3 and S1.4 must be set to ON!

11 Technical data

11.1 Hardware configuration

- 233mm x 100mm PC board format
- CPU 80C186, 20 MHz
- RAM 128Kbyte
- NVRAM 256*4 bit
- Possibility of connecting to the base drive electronics board (e.g. CU2) via a 1Kx16 bit dual port RAM
- Possibility of connecting to a communications board for data transfer (e.g. CB1)
- 7 differential analog inputs
- 4 analog outputs
- 16 binary inputs
- 8 binary outputs
- 2 pulse encoder inputs
- 2 serial interfaces: a) serial interface 1: Connector X132 with RS232 (e.g. PC connection)
  or
  connector X133 with a 2-wire RS485
- b) serial interface 2: Connector X134 with RS485, 2- or 4-wire
- Pushbutton, freely configurable or to start the diagnostics monitor
- 3 diagnostic LEDs
- Boot bridge for future expansions

11.2 Watchdogs

Several watchdogs are provided to monitor the functioning of the board (both the hardware and software); the following is checked.

- Ready signal delay for hardware accesses
- Double address coding errors
- Cyclic board operation
- Interrupt-control of the serial interface, timers and inputs

If a watchdog identifies an error/fault condition, the processor generates a „non-maskable interrupt“ (NMI), and attempts to create a normal operating status. If the processor itself is faulted, the board switches itself into an inactive condition, i.e. the analog and binary outputs are set to 0 V.

11.3 General technical data

Dimensioning the creepage distances and clearances	Pollution level 2 according to DIN VDE 0110
Degree of protection	IP00
Ambient temperature	0 to +50°C for self-cooling
Storage temperature	– 40 to + 70°C
Humidity class	F acc. to DIN 40040 (IEC 721 Part 3-3 Class 3K3), moisture condensation not permissible
Mechanical strength	According to DIN IEC 68-2-6 / 06.90
Dimensions	233.4 * 100mm
Weight	Approx. 1.5kg including 2 x round cables, SE300 and memory module
Current drain	P5: 1000mA typical P15: 130 mA typical + encoder load N15: 93 mA typical
Current drain for a 24 V external supply (Part of T300)	1A Referred to a minimum voltage of 20 V (incl. encoder power supply, terminals, SE300 LEDs

11.4 Inputs/outputs

All analog and binary inputs and outputs are **non-floating**! If the permissible signal level is exceeded, in addition to the input- or output stages, the complete board could be damaged!

Analog inputs

Number	7, multiplexed
Minimum input voltage	–10V
Maximum input voltage	+10V
Input resistance	10kΩ
Resolution	12 bits (corresponding to 4.88 mV)
Accuracy, absolute	+/– 3 LSB
Linearity error	≤ 1 LSB
Low pass filter	1.5kHz (-3dB transition frequency)

Analog outputs

Number	4, multiplexed
Minimum output voltage	– 10V
Maximum output voltage	+ 10 V
Output current, max.	10mA, short-circuit proof to ground
Internal resistance	56Ω
Resolution	12 bits (corresponding to 4.88 mV)
Accuracy, absolute	+/– 3 LSB
Linearity error	≤ 1 LSB
Voltage rise time (slew rate) of the outputs	3 V/µs

Binary inputs

Number	16, interrupt-capable
Input voltage	+24V nominal value
Input voltage for 0 signal	–1V to +6V or open binary inputs
Input voltage for 1 signal	+13V to +33V
Input current for a 1 signal	8mA typical
Input smoothing	< 700µs

Binary outputs

Number	8,
Power supply voltage	Must be fed-in externally
Nominal value	24V DC
Ripple	3.6V peak-to-peak (smoothing not required)
Permissible range	+ 15 to + 40V, including ripple
Short-time loading	+ 40V < 0.5s
Basic loading (all outputs open)	< 40mA
Output current for a 1 signal Nominal value Permissible range Only loaded by the LED	 100mA (92mA at SE300 terminal) 0.2mA to 100mA 8mA
Short-circuit protection	Continually short-circuit proof with respect to ground and P24
Total loading	Summed current of all outputs < 400mA
Signal level for 0 signal	Max. 2 V for load < 5kΩ
For a 1 signal	External supply voltage –2.5V
Switching delay	Max. 300µsec.

Pulse encoder connection (speed actual value sensing):

Number of pulse encoders which may be connected	2
Max. pulse frequency	**400kHz**
Min. duration for the signals A, B, N:	> 1µsec
Nominal displacement between tracks A and B	> 1µsec at every speed
Pulse level	0 – 30V
Signal level with input hysteresis: 1 signal 0 signal (optimized for pulse encoders with 15 V power supply voltage)	 > 8V < 5V
Input currents	8mA typical
Rough signal	Values as for binary inputs

Voltage at the external terminals (SE300) for the pulse encoder supply:

Output voltage	Nominal value: 15V, typically 14V
Output current, max.	0.1A, electronically limited to 0.15A under short-circuit conditions

11.5 Serial interfaces

The T300 has 2 serial interfaces:

1. Serial interface 1 terminals X132 or X133 on T300

Serial interface 1 is a 2-wire cable according to RS485 (X133) and RS232 (X132).

In the STRUC master program, this interface corresponds to connector **X01.**

NOTE
Serial interface 1 can **either** be used as RS485 **or** as RS232; this means, it is **not** permissible to **simultaneously** use the physical interfaces at terminal series X132 and X133!

2. Serial interface 2, terminals X134 on T300

Serial interface 2 is a 2- or 4-wire cable according to RS485 (X134). Changeover to 2- or 4-wire cable is realized automatically corresponding to the protocol set at the interface.

In the STRUC master program, this interface corresponds to connector **X02.**

The subsequent two diagrams show a schematic of serial interfaces 1 and 2, in conjunction with the bus terminating switch S1.

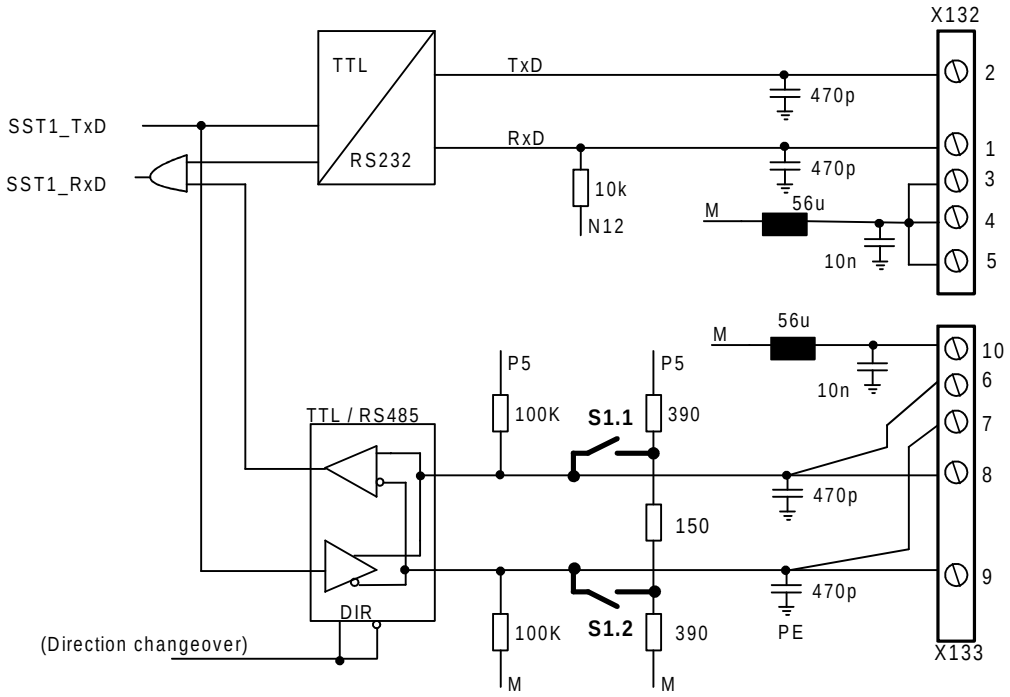


Fig. 11.5.a: Connecting serial interface 1 (RS485/RS232)

File: SST1_E.DRW

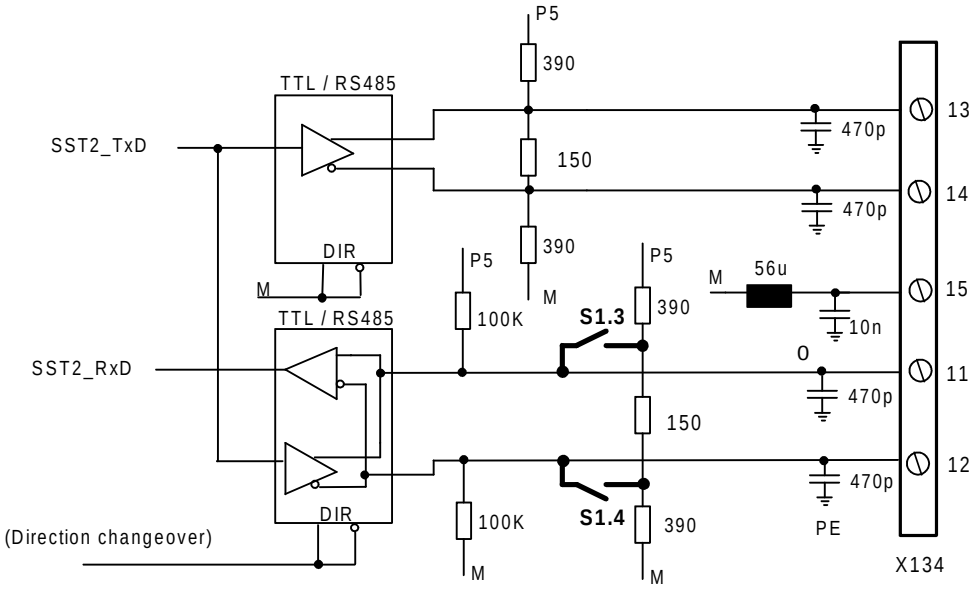


Fig. 11.5.b: Connecting serial interface 2 (RS485)

File: SST2_E.DRW

11.6 Bus terminating switch S1

The bus terminations are switched-in when switch S1 is in the ON position (coding switches 1-4).
The bus terminating resistance is approx. 120 Ohm.

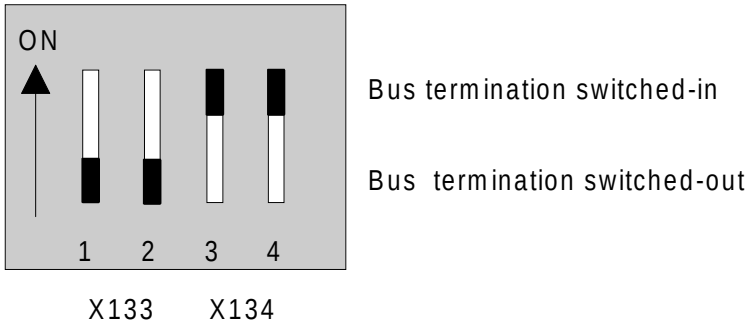


Fig. 11.6: Bus terminating switch S1

File: BUSABS_E.DRW

NOTE
Coding switches 1 and 2 or 3 and 4 must always be in the same setting so that the bus terminations are either switched-in or -out.

11.7 Pushbutton S3

A) Using the pushbutton, the SIMADYN D diagnostics monitor (9.6 kbaud, no parity bit) can be started when the voltage runs-up. It is only effective at interface 1 (connector X132/X133), which is then no longer available for other applications once the monitor has started!
Generally, the user does not use this monitor.

a) If a fatal T300 error/fault is identified during operation, which prevents the T300 operating correctly, then the diagnostics monitor can be started by actuating the pushbutton.

b) Independent of a possibly occuring error/fault, the monitor can be started at voltage run-up. The pushbutton must be depressed until the system goes into a READY status **(°008** or **°009)**!

B) The pushbutton can also be implemented (configured) with a switch function within the software. The diagnostic monitor can still be started (as described under A).

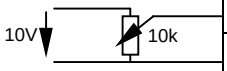
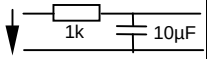
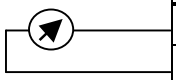
11.8 Diagnostic LEDs

Flashing of the LED indicates that the unit is in a perfect operating status. The associated LED is either lit or dark if a fault condition is present.

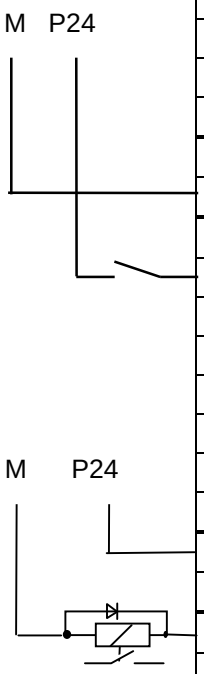
H1	**Red** LED	Dependent on the particular configuring: The flashing frequency is the sampling time of the function package @SIMD (TY-connector of T300 Board mask) In case of error it is 4 times lower!
H2	**Green** LED	Data transfer to the communications board O.K.; The flashing frequency is the sampling time of the DCCZ function function block
H3	**Yellow** LED	Data transfer to the basic drive converter O.K.; The flashing frequency is the sampling time of the DCCZ function function block

11.9 Connector assignments

Analog inputs/outputs and pulse encoder

Connection example	SE300 X5	Function	T300 X131	AD connector (FB)	Explanation
	501	Input 1 +	1	X5 A	Analog **in**puts 1 - 4
	502	Input 1 -	2		
	503	Input 2 +	3	X5 B	
	504	Input 2 -	4		
	505	Input 3 +	5	X5 C	
	506	Input 3 -	6		
	507	Input 4 +	7	X5 D	
	508	Input 4 -	8		
	509	Analog output 1	9	X5 H	Analog **out**put 1
	510	Ground analog (=520)	**10**		
	511	Input 5+	11	X5 E	Analog **in**puts 5 - 7
	512	Input 5-	12		
	513	Input 6+	13	X5 F	
	514	Input 6-	14		
	515	Input 7+	15	X5 G	
	516	Input 7-	16		
	519	Analog output 2	17	X5 J	Analog **out**puts 2-4
	520	Ground analog (=510)	**10**		
	521	Analog output 3	19	X5 K	
	522	Ground analog (=524)	**18**		
	523	Analog output 4	20	X5 L	
	524	Ground analog (=522)	**18**		
	531	Track 1A+	21	X5 M	Speed sensing 1
	532	Ground track 1A	22		
	533	Track 1B+	23		
	534	Ground track 1B	24		
	535	Zero pulse 1+	25		
	536	Ground zero pulse 1	26		
	537	Rough pulse 1	27		
	538, 539	Ground, encoder supply 1, Ground rough pulse 1	28, 29		
	540	15V encoder supply	30,39		
	541	Track 2A+	31	X5 N	Speed sensing 2
	542	Ground track 2A	32		
	543	Track 2B+	33		
	544	Ground track 2B	34		
	545	Zero pulse 2+	35		
	546	Ground zero pulse 2	36		
	547	Rough pulse 2	37		
	548, 549	Ground, encoder supply. 2, Ground rough pulse 2	38, 40		

Binary inputs/outputs

Connection example	SE300 X6	Function	T300 X136	AD connector (FB)	Explanation
	601	Input 1	1	X6 A	Binary inputs 1 - 8
	602	Input 2	2		
	603	Input 3	3		
	604	Input 4	4		
	605	Input 5	5		
	606	Input 6	6		
	607	Input 7	7		
	608	Input 8	8		
	609	P external	9		External supply for inputs and outputs
	610	M external	10		
	611	Input 9	11	X6 B	Binary inputs 9 - 16
	612	Input 10	12		
	613	Input 11	13		
	614	Input 12	14		
	615	Input 13	15		
	616	Input 14	16		
	617	Input 15	17		
	618	Input 16	18		
	619	P external	19		External supply for inputs and outputs
	630	M external	20		
	631	Output 1	21	X6 C	Binary outputs 1 - 8 (NO contacts)
	632	Output 2	22		
	633	Output 3	23		
	634	Output 4	24		
	635	Output 5	25		
	636	Output 6	26		
	637	Output 7	27		
	638	Output 8	28		
	639	P external	29		External supply for inputs and outputs
	640	M external	30		

Note: For the first **SE58** (Order No.: 6DD3460-0AB0, Item No. 465460.9001.00) which were supplied, terminals 630...640 are designated as 620...630!

„Associated“ ground- and P24 terminals:
On the T300 the following terminals are connected directly:

X131	10=18 28=29=38=40	(Ground Analog outputs) (Ground Speed sensing)
X136	10=20=30	(Ground external for binary inputs/outputs)
X136	9=19=29	(P24 external for binary inputs/outputs)

These 3 different grounds are connected via reactors with the T300 grounding.
However, it is recommended that the „associated“ grounds are used in order to prevent possible overload conditions and to achieve a structure which is, as far as possible, in line with the EMC regulations.
The T300 ground is connected to PE through 0 Ohm resistors.

Serial interfaces

Connector X132 (serial interface 1)	
Terminal No.	**RS232**
1	RxD
2	TxD
3	Ground
4	Ground
5	Ground

Connector X133 (serial interface 1)	
Terminal No.	**RS485 2-wire operation**
6	+ RxD / +TxD
7	- RxD / - TxD
8	+ RxD / +TxD
9	- RxD / - TxD
10	Ground

Connector X134 (serial interface 2)		
Terminal No.	**RS485 for 2-wire operation**	**RS485 for 4-wire operation**
11	+RxD / +TxD	+RxD
12	- RxD / -TxD	- RxD
13	No function (+TxD)	+TxD
14	No function (-TxD)	-TxD
15	Ground	Ground

12 Application software

The T300 control software can either be generated, user-specific using STRUC (refer to the next section), or pre-configured standard software packages may purchased from Siemens.

12.1 Standard software packages

Four different standard software packages are available in the form of pre-programmed memory modules:

- MS320 Axial winder
- MS340 Angular synchronous control
- MS360 Multi-motor drive
- MS 380 Positioning

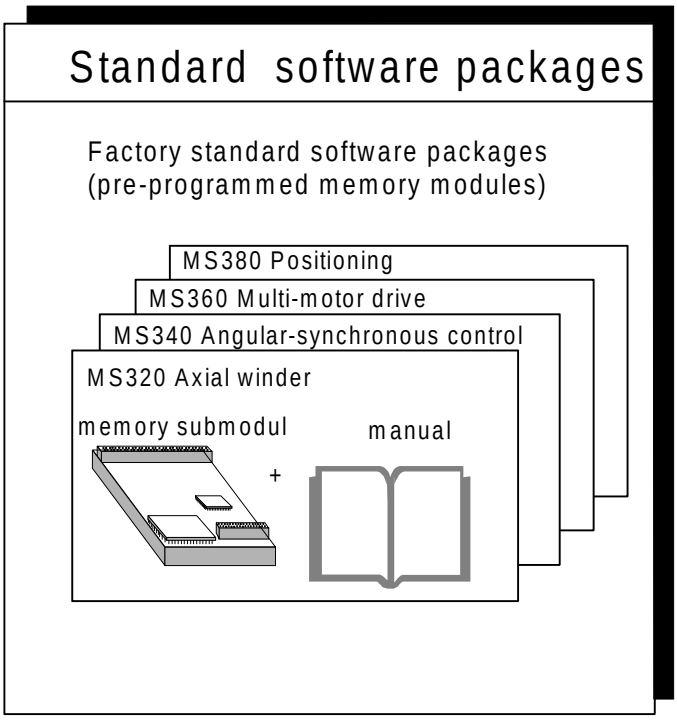


Fig. 12.1: Standard software packages

File: STANDPR_E.DRW

RELEASE Standard software packages
The T300 standard software packages MS320, MS340, MS360, MS380 are released for operation in the **MASTER DRIVES** basic units (CU2, CU3, CUVC, CUMC). The T300 standard software packages MS320, MS340, MS360, MS380 are **not released** for operation in the **SIMOREG DC_MASTER** 6RA70. In this case the T300 control software can be generated, user-specific using STRUC.

12.2 User-specific software configuring

If other solutions are required in addition to the standard software packages, then the user can simply generate his own open- and closed-loop control solutions.
To start off with, the required closed-loop control structure is configured using STRUC, and from this, a binary code program generated which is then executed on the T300.

The MS300 memory module, which is inserted on the T300 board, is used as memory medium both for the user program (binary code) of the board as well as for the system software (operating system, function function block code etc).
A parallel programmer (PP1X) and UP3 adapter are used to program the memory module, whereby the parallel programmer is connected at the parallel interface of a PG/PC.

As the memory module can be erased using an UV lamp, a new application software package can be programmed on the module after the previous contents have been erased.

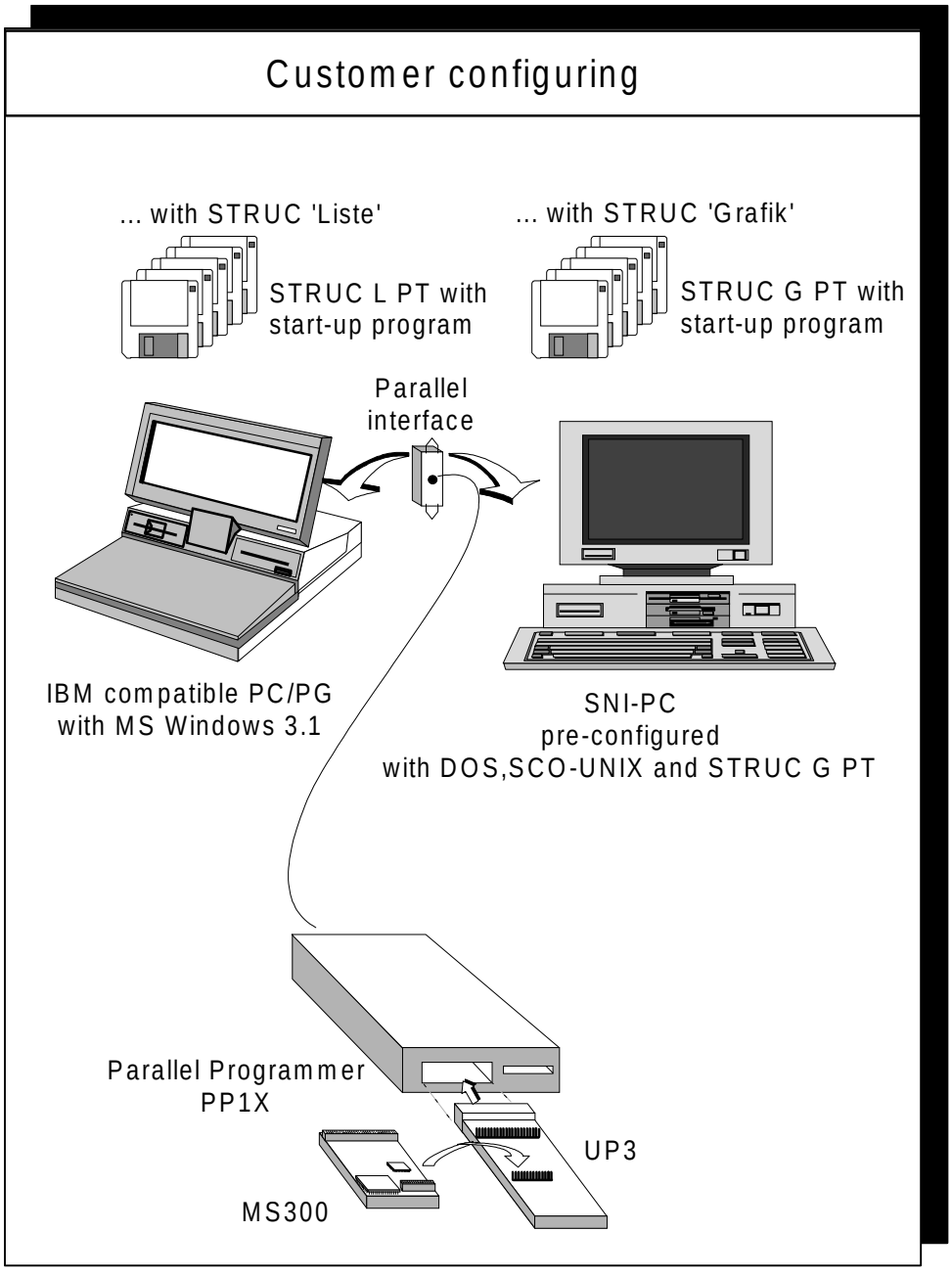


Fig. 12.2: Customer configuring

File: STRUC1_E.DRW

13 Configuring the T300 for SIMOVERT 6SE70 and DC_MASTER 6RA70

The following instructions assume that you have prior knowledge of SIMADYN D configuring!.

When using the T300 in the drive converter, the function blocks, described in this section, must be configured. The configuring rules and regulations and possibilities of SIMADYN D are valid. Only the T300-specific configuring measures are presented in this Section.
The function blocks, presented here, are available **from software version 4.2.0 (March 95)**.

The function blocks required for the „fast“ peer-to-peer protocol, are available from STRUC-software release 4.2.3!

Information regarding the notation:
For the examples shown in STRUC L, the (function block) names to be assigned by the configuring engineer are shown in *italics*, if they are also required elsewhere in the software.
Important (function block) types are printed in **bold**.

13.1 Master program

13.1.1 SR6 subrack

An SR6 subrack must be selected (a dedicated type was not created for the converter electronics box). T300 is configured at the 1st slot of the SR6 subrack mask (connector S01). If a communications board is used, then a slot must be specified **before** the basic drive converter control board (CU1, CU2, CU3).

Configuring example:

```
30 EBOX      : SR6                  "Subrack with 6 slots, L bus"
 31 L01 6S = '.       .       .       .       .       .       '"Descr.-"
 32 S01 8N = D01_P1,SW23V0           "Slot.1:T300 board- + mem.module name
 33 S02 8N = 0
 34 S03 8N = CS                      "User name of the comm. board."
 35 S04 8N = GG                      "User name of the CU control board."
 36 S05 8N = 0
 37 S06 8N = 0
```

13.1.2 Board mask T300

Contrary to other SIMADYN D board masks, the following points must be observed:

As the binary- and analog signals as well as the pulse tachometer must **always** be fed, for the T300, via the SE300 terminal module, no information is required for the appropriate connectors in the processor mask (X5A to X6B).

13.1.3 T300 synchronization to the base drive cycle time

The T300 synchronization to the base drive cycle time is only approved for the MASTER DRIVES basic. A T300 synchronization to the base drive Simoreg DC_MASTER 6RA70 is not applicable.

The MASTERDRIVES base drive control board generates at the start of its 4 times basic cycle time, i.e. **4*P308** (CU2), **4*P357** (CUVC) a pulse via the backplane bus LBA to T300.
The T300 can synchronize its basic cycle time to this base drive cycle time.

If the clock cycle, generated by the base drive control board is to be used on the T300, an appropriate (equivalent time) **constant**, with the value TG = **4 * P308** or **4*P357** must be specified in the T300 board mask at the connector for the basic cycle time T0.

T0 **TG = xxx[ms]**

Further, the **basic clock cycle source** must be configured. The backplane bus LBA, which transfers the base drive cycle time from CUx to T300, establishes a so-called „L bus“ for the STRUC configuring language.
Thus, the following must be specified when synchronizing to the base drive:

T0 TG = xxx[ms] **,SRC=TL**

In order to optimally harmonize data processing on the control board and T300, it is recommended that an additional **start delay** is specified for the T300 cycle time. This can either be realized at the connector, base cycle time T0 using an additional attribute

T0 TG = xxx[ms] ,SRC=TL ,**TDL=yyy[ms]**

or using the **DTS function block**. The function block has the advantage, that the delay can be changed without making any master program changes and can therefore be made online (in this case, it is only necessary to reset the T300.)

13.1.4 MS300 memory module

MS300 memory modules are configured for the T300.

13.1.5 Converter log-on using the DPZ initialization block

13.1.5.1 Block description

The initialization block (IB) DPZ („Device Processor module Z“) signals to the T300 that there is a control board CU at its dual port RAM.

The block name (in the example „GG“), which is assigned by the configuring engineer, is specified at the CTS- and DTS connectors of other function blocks (refer below).

Configuring example:

```
87 GG        : DPZ             "IB for the control board (basic drive conv.)"
88 T0  TG = 4.8[MS],SEND=TL    "Cycle time, CU provides the basic clock"
```

13.1.5.2 CU as source for the basic clock cycle

The DPZ initialization function block has a connector T0, where a **transmitter for the basic clock (T0)** of the T300 can be specified (as was shown in the previous section, the T300 can be configured so that it receives the basic clock from the LBA backplane bus („L bus“ in STRUC).
In the drive converter, this basic clock is generated by the CU control boards, via the backplane bus LBA and sent to T300, so that the following connector attribute must be specified (refer to the example below)

,SEND=TL

To calculate the cycle time dependent time constants, an (equivalent time) **constant** = **4 * P308** (drive converter cycle time) must also be specified at the T0 connector. This constant corresponds to the clock supplied from the CU.

13.1.6 Logging-on a communications board with CSZ

The initialization function block (IB) CSZ („Communication Submodule Z“) signals to the T300 that there is a communications board connected at its X135 connector (e.g. CB1, SCB1, SCB2).
In order to permit configuring standards, this function block can also be configured, even if there is no communications board.

The function block name, to be assigned by the configuring engineer (under „CS“ in the example below), is specified at the CTS- and DTS connectors of other function blocks (refer below).

Configuring example:

```
85 CS        : CSZ                    "IB for the interface board"
```

13.1.7 Example of a master program (as excerpt)

```
.........
  30 EBOX      : SR6                  "Subrack 6 slots, L bus"
  31 L01 6S = '.       .       .       .       .       .       '"Description"
  32 S01 8N = D01_P1,SW23V0           "Slot 1:T300 board- + mem. module name
  33 S02 8N = 0
  34 S03 8N = CS                      "User name of the comm. board"
  35 S04 8N = GG                      "User name of the CU control board"
  36 S05 8N = 0
  37 S06 8N = 0
.........
  40 D01_P1    : T300                 "Processor board type T300"
  41 PIJ 1N = 0                       "Interrupt processing FP"
  42 SFJ 1N = 0                       "System error FP"
  43 PRX 1N = @RXD                    "Special communications FP - transmit"
  44 PJ1 1N = CONF                    "1. permanent processing-FP"
  45 PJ2 1N = SYNCON                  "2. permanent processing-FP"
  46 PJ3 1N = CONTRL                  "3. permanent processing-FP"
  47 PJ4 1N = PARA                    "4. permanent processing-FP"
.........
  52 PTX 1N = @TXD                    "Special communications FP - transmit"
  53 T0  TG = 4[MS]                   "Basic cycle time"
  54 T1  TS = 1                       "1.sample. time *T0, gen. LB- and CB conn."
  55 T2  TS = 4                       "2.sample time.           ''                "
  56 T3  TS = 0                       "3.sample time.           ''                "
  57 T4  TS = 32                      "4.sample time.           ''                "
  58 T5  TS = 64                      "5.sample time.           ''                "
  59 TY  TX = T5                      "System FP sample. time"
  60 CCT 8R = 0                       "Transmit telegram names Tx"
  61 CCR 8R = 0                       "Receive telegram names Tx, e.g. PKW.T4"
  62 COP 8R = 0                       "Op. control telegram names Tx"
  63 X01 1N = 0                       "1. serial interface"
  64 X02 1N = PEER                    "2. serial interface"
  65 X5A 1K <                         "Analog input 1"
  66 X5B 1K <                         "Analog input 2"
  67 X5C 1K <                         "Analog input 3"
  68 X5D 1K <                         "Analog input 4"
  69 X5E 1K <                         "Analog input 5"
  70 X5F 1K <                         "Analog input 6"
  71 X5G 1K <                         "Analog input 7"
  72 X5M 4K <                         "Speed sensing 1"
  73 X5N 4K <                         "Speed sensing 2"
  74 X6A 8K <                         "Binary inputs 1, interrupt-capable"
  75 X6B 8K <                         "Binary inputs 2, interrupt-capable"
  76 X5H 1K >                         "Analog output 1"
  77 X5J 1K >                         "Analog output 2"
  78 X5K 1K >                         "Analog output 3"
  79 X5L 1K >                         "Analog output 4"
  80 X6C 8K >                         "Binary outputs"
.........
  82 SW23V0    : MS300                "Memory submod.:512K,2K EEPROM,0WS"
.........
  85 CS        : CSZ                  "IB for interface board"
.........
  87 GG        : DPZ                  "IB for control board (basic drive conv.)"
  88 T0  TG = 4.8[MS],SEND=TL         "Cycle time, CU provided basic clock"
.........
```

13.2 Function blocks in function packages for initialization

The function blocks described in this section

@GRZ
DCCZ

must be configured so that the T300 can run in the drive converter.

The function blocks presented in the subsequent sections

TFAW
PRP
TXT
PTR
@PTP
@PTP01

are only configured, if the specified functions are actually required.

13.2.1 Central block @GRZ in the transmit communications FP

The „GRZ“ (drive response Z)“ function block initializes (connects) the T300 to one board, connected via a dual port RAM. A @GRZ must be configured, both for the CU as well as for a communications board!

To be configured **in the transmit communications FP**!

Input conn.	Type	**Explanation, @GRZ**
CTS	CR-	Depending on the CPT conn., either the board name of the drive converter (refer to IB DPZ in the MP) or the board name of the comm. board (refer to IB CSZ in the MP) must be specified.
CPT	B1-	=0: Basic drive converter and =1: Comm. board should be initialized

Output conn.	Type	**Explanation, @GRZ**
QTS	B1	Transfer status to the basic drive converter or communications board : 0: Data transmission faulted 1: O.K.
YTS	O2	Error code (refer to the Manual /1/ Sect. 6)

Configuring example:

```
52 CU_DPR    : @GRZ
53 CTS CR - GG
54 CPT B1 - 0                    "=0: comm. with the drive conv. (GG)"
55 QTS B1 >
56 YTS O2 >
57 +
58 CS_DPR    : @GRZ
59 CTS CR - CS
60 CPT B1 - 1                    "=1: comm. with the comm. board"
61 QTS B1 >
62 YTS O2 >
```

13.2.2 Dual port RAM administration using DCCZ in the standard FP

The „Device Configuration Control Z“ function block initializes and administers the communication channels (process data, parameters) to the base drive (CU), **and** a possibly available communications board. It processes the heartbeat counter monitoring, and controls monitoring LEDs H2 and H3 on the T300.

It may only be configured in the standard FP and in cycle times 100ms <= Ta <= 256ms
If this is not the case, initialization is not correctly executed.

Information regarding the address connectors AR, AT:
A specification must be made at the AR/AT connectors of the telegram blocks or the direct transmitter/receiver, for the coupling to the basic drive converter (CU) or communications board (SCB1/2, CB1), e.g.

AR NS - ‘0’
AT NS - ‘0’

Input conn.	Type	**Explanation, DCCZ**
DTS	CR-	The FB name of the IB DPZ in the MP is specified (board name of the basic drive converter)
CTS		The FB name of the IB CSZ in the MP is specified (board name of the communications board): A 0 must be entered if a communications boad is not used.

Output conn.	Type	**Explanation, DCCZ**
QTS	B1	Data transmission status to the basic drive converter or communications board : 0: Data transmission faulted 1: O.K.

Configuring example:

```
279 KOPINI    : DCCZ
280 DTS CR - GG
281 CTS CR - CS
282 QTS B1 >
```

13.3 Error- and alarm function block TFAW

The „Technology Faults and Warnings“ function block transfers the binary signals (V2 type) available at its input connectors, to the base drive as converter faults (the drive is then shutdown) or alarms.
A set bit generates a fault or alarm.

When the fault/alarm cause has disappeared, the software must reset the appropriate bit. Faults are only acknowledged on the base drive control board.
The signals present at the TFAW are not influenced by an acknowledgement. The binary values of all connectors are transferred to the base drive at every cycle time.

Can be configured in the standard FP; multiple configuring not possible!

Input conn.	Type	**Explanation, TFAW**
DTS	CR-	Board name of the base drive (DPZ in the MP)
F01	V2	Faults F116 - F131 (e.g. bit 0 generates F116)
F02		Faults F132 - F147
A01		Alarms A097 - A113
A02		Alarms A114 - A129

Output conn.	Type	**Explanation, TFAW**
QTF	B1	Data transmission status, fault channel 0: Faulted 1: Operational
YTF	O2	Error code, fault channel 0: Error-free
QTA	B1	Data transmission status, alarm channel
YTA	O2	Error code, alarm channel
QTS	B1	Data transmission status (central administration)
YTS	O2	Error code (central administration)

Error codes, refer to the Manual /1/ Sect. 6!

13.4 Parameter processing

Restrictions:

1.) Parameters defined on the T300 can be read and changed for

- SIMOVERT MASTER DRIVES **FC/VC** (CU1,CU2) only from **software release V1.2** (supplied since 7.95).
- SIMOVERT MASTER DRIVES **SC** (CU3) with **software release V1.1** (supplied since 9.95).
- SIMOVERT MASTER DRIVES **VC** (CUVC) only from **software release V3.11** (supplied since 97).
- SIMOVERT MASTER DRIVES **MC** (CUMC) only from **software release V1.2** (supplied since 97).
- SIMOREG DC_MASTER **6RA70** only from **software release V1.7**

The software release can be read using drive converter parameter **r720.1** (CU1, CU2, CU3), **r69.1** and **r828.1** (CUVC, CUMC), **r60** (6RA70).

2.) Parameters, which represent a time, can presently only be configured with in „ms“ units!

3.) Time-reciprocal connector types, which refer to another cycle time than their own (e.g. R2:T2“ of a function function block in cycle time T1), presently cannot be defined as parameter.
Remedy: Configure a DUMY function block in the associated reference cycle time (in the example, T2) and
feed the signal via a $ connection into the required cycle time (in the example T1).

13.4.1 Defining parameters using signal designators

A connector can also be read and changed as parameter. In this case, a signal designator as connector attribute must be configured in the following form at the input- or output connectors involved:

,’TP_xxx’ with 0<= xxx <= 999 as parameter number

Technology board parameters are displayed as follows, depending on where they are defined on the base drive operating control panels (PMU, OP1):

at the output connector: **„dxxx“** (display, cannot be changed),

at the input connector: **„Hxxx“**

A parameter at an input connector can only be practically (effectively) changed, if this connector is not connected-up, i.e., if a **constant** is configured at the input connector.
A connected input connector can be changed via the parameter, however the value is effective for the maximum of one cycle time (depending on the execution sequence of the function blocks).

It is not permissible to assign parameter numbers twice!

It is recommended that a parameter is configured with the number „TP_000“ in order to be able to easily use the OP1.

13.4.2 Reading and changing parameters using PRP

The connectors, defined on the T300 as parameters, can be read and changed using the „Parameter Reply“ function block. This is simultaneously possible from several sources, for example, from the base drive:

PMU operator control panel or via the
serial interfaces SST1 (e.g. OP1), SST2 or from
communication boards (CB1, SCB2).

The PRP function block can be configured **once** in a standard FP and only in a **samping time ≥ 100 ms**! The parameter read and change tasks from all of the interfaces are responded to in this cycle time.

Connector types correspond generally directly to the parameter types. Several **type conversions** are realized on the T300 due to the resolution and the value range required:

Connector type	**Parameter type**
N2, E2	I4
D2, T2, R2	I4 (O4 is **not** defined in the base drive (CU))

Input conn.	Type	**Explanation, PRP**
DTS	CR-	Board name of the base drive (refer to DPZ in the MP)
CTS		Board name of the comm. board (refer to CSZ in the MP)
NP	O2	Number of the existing parameters (<1000); Conn, reserves the appropriate space in the administration tables. More parameters than are actually available can be specified.
LID		Selecting 2 different parameter names at the string connectors of the TXT-FBs configured tests; is also used to select the language: **0:** Selecting texts from the connectors designated with the ‘TP**T**xxx’ attribute (xxx: Parameter number); **<>0:** Selecting the connectors with the Tp**t**xxx attribute
MEN		Defined access rights of all parameters: **0:** Parameters can be read and **changed**, 1: Can only be be read

Output conn.	Type	**Explanation, PRP**
NPF	O2	Number of configured parameters
NTF		Number of available parameter names
NPD		Number of parameter numbers which have been assigned twice
NTD		Number of parameter names which have been assigned twice
NPE		Number of the parameters which have not found space in the administration list as the NP conn. is too small
NTE		Number of unavailable parameter names, because not configured with TXT function block
YTB		Error code, basic converter channel
QTB	B1	Operating status, basic converter channel: 0:Faulted 1:Ready
YTC	O2	Error code, comm. board channel
QTC	B1	Operating status, comm. board channel
YTK	O2	Error code, operator panel channel
QTK	B1	Operating status, operating panel channel
YTS	O2	Error code (central administration)
QTS	B1	Operating status (central administration)

Error code, refer to the Manual (Section 6 /1/)

13.4.3 Parameter names defined using TXT

Using the TXT text function block, parameters, defined using the signal designator, can be assigned **up to 2 parameter** names.
The assignment of the parameter names specified here to the parameter numbers is realized via the attributes attached to the parameter names in the following form:

T1 NS - **'Drehzahlistwert' ,'TPT001'**

or

T2 NS - **'speed actual val' ,'TPt001'**

The two different parameter names, assigned to a parameter number are selected via the LID connector of the PRP function block (refer there).

Input conn.	Type	**Explanation, TXT**
T1	NS-	Parameter name 1
T2		Parameter name 2
...		...
T16		Parameter name 16

Output conn.	Type	**Explanation, TXT**
		None!

13.4.4 Configuring example, parameters

```
  22 PARAMS    : PRP                "Parameter function block"
  23 DTS CR - GG
  24 CTS CR - CS
  25 NP  O2 - 200                   "No. of parameters"
  26 LID O2 - 0
  27 MEN B1 < 0                     "Inhibit par. changes"
  28 NPF O2 >                       "Number of found par."
  29 NTF O2 >                       "Number of texts found"
  30 NPD O2 >
  31 NTD O2 >
  32 NPE O2 >                       "Number n. of par. entered"
  33 NTE O2 >                       "Number n. of texts entered"
  34 YTB O2 >
  35 QTB B1 >
  36 YTC O2 >
  37 QTC B1 >
  38 YTK O2 >
  39 QTK B1 >
  40 YTS O2 >
  41 QTS B1 >
.................
  55 P001      : DUMY
  56 X   N2 < 1.1,SCAL=163.84       "Software release"
  57 Y   N2 > ,SCAL=163.84,FORM=1 ,'TP_001'
.................
  64 TEX000    : TXT
  65 T1  NS - 'Synch. contr. SW21','TPT001'
  66 T2  NS - 'Language D/E=1/2' ,'TPT002'
  67 T3  NS - 'Spec handle. V2/B1','TPT003'
  68 T4  NS - ''
  69 T5  NS - 'Encoder par. SLAVE','TPT018'
  70 T6  NS - 'Encoder par. MASTE','TPT019'
  71 T7  NS - ''
  72 T8  NS - ''
  73 T9  NS - 'Enc. pulse No. SLAVE','TPT010'
  74 T10 NS - 'Enc. pulse No. MASTE','TPT011'
.................
  80 T16 NS - 'Pos. act. val. MASTER' ,'TPT017'
```

13.5 Base drive parameters via the comm. board with PTR

If parameters of a base drive (CUx) are to be read or changed via a communications board, the „Parameter Transport“ PTR function block must be configured. It transfers the parameter orders and parameter replies via the T300, located between the communications board and the base drive.

The PTR function block is configurable **once** in a standard FP.

Input conn.	Type	**Explanation, PTR**
DTS	CR-	Board name of the basic converter (refer to IB DPZ in the MP)
CTS		Board name of the comm. board (refer to IB CSZ in the MP)

Output conn.	Type	**Explanation, PTR**
YTS	O2	Error code
QTS	B1	Operating status: 0: Faulted 1: Ready

Error code, refer to the Manual /1/ section 6!

Configuring example:

```
269 TRANS     : PTR          "Param.transport CU <-> CBx"
270 DTS CR - GG
271 CTS CR - CS
272 QTS B1 >
273 YTS O2 >
```

13.6 Peer-to-peer coupling

A fast serial coupling to partners, for example, T300 and SCB2 boards for SIMOVERT Master Drives as well as to SIMOVERT P 6SE12 and SIMOREG K 6RA24 drives can be established using the „Peer-to-peer“ coupling.

For baud rates up to 115.2 kbaud, a maximum of 5 data words can be transferred in full duplex.

Only 1 telegram can be defined in the transmit direction and receive direction, i.e., only one transmit- and receive function block may be configured.

The net data length of the transmit- and receive function blocks can be different. However, a receiver only accepts data from a received telegram, if the configured length corresponds with the received telegram length (LTW- or LT connector).

Different versions are available depending on the particular STRUC version:

STRUC V4.2.3: Configuring with function blocks @PTP01, CTPP, CRPP
(max. baud rate: 115.2kbaud; requires little computation time)

for V4.2.1 to be asked (special libaries KFSLIB, FBSLT1 required)!

STRUC V4.2, V4.2.1 and V4.2.2: Configuring with function block @PTP
(max. baud rate: 38.4kbaud)

13.6.1 Configuring a peer-to-peer telegram with @PTP01, CTPP, CRPP

A peer-to-peer protocol is avaialble with STRUC release V4.2.3, which

- has a high baud rate,
- has minimum telegram delay times and
- only loads the T300 with low computation time.

Initialization:

The **@PTP01 function block must be configured in the special FP transmit**.
The cycle time can be freely selected, as it only takes over the initialization of the serial interface..

As a result of the 4-wire RS485 interface, the peer-to-peer protocol can only run at **connector X134**, i.e. serial interface 2 (**connector X02** of the board mask).This „connector“ X02 must be configured, together with the T300 board names at the **CTS connectors** of @PTP01, CTPP and CRPP.

Input- conn.	Type	**Explanation @PTP01**
CTS	CR-	T300 board name (refer to MP) and, separated by a point, connector „**.X02**“
BDR	O2	Baud rate (coding as for the SCB board): 0: 150 bit/s 1: 300 bit/s 2: 600 bit/s 3: 1200 bit/s 4: 2400 bit/s 5: 4800 bit/s 6: 9600 bit/s 7: 19200 bit/s 8: 38400 bit/s 9: 57600 bit/s 10: 76800 bit/s 11: not permitted (=93750 of the SCB) 12: 115200 bit/s

Outp.- conn.	Type	**Explanation @PTP01**
QTS	B1	Operating status: 0: Faulted 1: O.K.
YTS	O2	Error/status display: 7B90H/31632dec: Init still running (wait for KSIPP0) 7B91H/31633dec: Init error: KML is full 7B92H/31634dec: Connector is not X02 7B93H/31635dec: Excessive baud rate ID (>12) 7B94H/31636dec: Baud rate ID 11 (93750Bd) not permitted 7B95H/31637dec: other KSIPP0- errors (e.g. DUST init)

Transmit:

Up to 5 data words can be sent using function block **CTPP**. It has to be configured in a standard FP.

A send telegram operation is started immediately within the function block processing. The telegram of the previous cycle time must have been completely transmitted. Thus, it is recommended to adapt the baud rate as well as the telegram length (both together specify the telegram transmission time) to the cycle time (refer below, telegram transmission time table).

Computation time required for a 5-word telegram (including the time to transmit all characters): **230µsec** (this includes a processing time of 28µsec /data word.)

Input conn.	Type	**Explanation CTPP**
CTS	CR-	T300 board name (refer to MP) and, separated by a point, connector „**.X02**“
LEM	O2-	Error message limit: If the telegram cannot be sent within the specified number of cycle times (e.g.: Due to a low baud rate with respect to the cycle time), this is signaled in QTS (=0) and YTS
LTW	O2-	The net data **word** quantity to be transmitted (1 word = 2 bytes); maximum number:0 to 5 (from 1.96 A change is only effective after the system has been powered-down and powered-up again!
EN	B1	1 enables transmit, 0 inhibits transmit
X1	N2	1st data word
X2	N2	2nd data word
X3	N2	3rd data word
X4	N2	4th data word
X5	N2	5th data word

Outp. conn.	Type	**Explanation CTPP**
QTS	B1	Operating status: 0: Faulted 1: O.K.
YTS	O2	Error/status display: 7D04H/32004dec: Telegram length configured too long 7D08H/32008dec: Transmitter inhibited (EN conn.) 7D09 H/32009dec: Transmitter still full 7D10H/32016dec: Init still running (wait for KSIPP0) 7D11H/32017dec: KM name double (configuring) 7D12H/32018dec: Init error: Refer to KML 7D13H/32019dec: Init ready, wait for 1st telelgram, as long as LEM>0 7D14H/32020dec: LTW=0

Receive:

Telegrams with up to 5 data words can be received with the **CRPP** function block. It has to be configured in a standard FP.

The telegram is received in the background, asynchronously to the cycle time of the receive function block. The cycle time of the receive function block is therefore the maximum **delay time** between the telegram being received and the received data being processed.

Computation time required for a 5-word telegram (including all characters being received): **267 µsec** (this includes a processing time of 34 µsec/data word).

Input conn.	Type	**Explanation CRPP**
CTS	CR-	T300 board name (refer to MP) and, separated by a point, connector „**.X02**“
LEM	O2-	Error message limit: If a correct telegram has not been received within the specified number of cycle times (e.g.: incorrect length), this is signaled in QTS (=0)
LTW	O2-	The net data word quantity to be transmitted (1 word = 2 bytes); maximum number: 5 A change is only effective after the system has been powered-down and powered-up again!

Output conn.	Type	**Explanation CRPP**
Y1	N2	1st data word
Y2	N2	2nd data word
Y3	N2	3rd data word
Y4	N2	4th data word
Y5	N2	5th data word
QTS	B1	Operating status: 0: Faulted 1: O.K.
YTS	O2	Error/status display: 7D00H/32000dec: no telegram received after LEM expired 7D01H/32001dec: BCC error, as generally the telegram length of the transmitter is greater than that of the receiver 7D02H/32002dec: Telegram length of the receiver is greater than that of the transmitter 7D03H/32003dec: Baud rate possibly incorrect 7D04H/32004dec: Excessive telegram length configured. 7D10H/32016dec: Init still running (wait for KSIPP0) 7D11H/32017dec: KM name double (configuring) 7D12H/32018dec: Init error: refer to KML 7D13H/32019dec: Init ready, wait for first telegram, as long as LEM>0

Telegram transmission times

(examples)

General formula:

for LTW <=3:
t = 1/Baud rate *11 *(2*LTW +3)

for LTW >=4:
t = 1/Baud rate *11 *(2*LTW +4)

Baud rate	Number of net data words (LTW conn.)	Telegram transmission time (**in ms**)
9600	1 2 5	5.7 8 16
19200	1 2 5	2.8 4 8
38400	1 2 5	1.43 2 4
115200	1 2 5	0.47 0.67 1.34

13.6.2 Peer-to-Peer Communication in Version V4.2 / V4.2.1 / V4.2.2 with @PTP

In STRUC-Version V4.2, V4.2.1 and V4.2.2, the Peer-to-Peer communication has to be realized by means of the @PTP function block. The data interchange can be configured according to the normal SIMADYN D mechanism, i.e. using the Telegram Function Blocks @CTD/@CRD oder direct Transmit/Receive blocks.

In **V4.2.3**, this configuring method for the Peer-configuring (FB @PTP) **is no longer supported!**

13.6.2.1 Configuring a Peer-to-Peer Telegram in Version V4.2 / V4.2.1 / V4.2.2

Due to the 4-wire RS485-interface, the Peer-to-Peer-Protocol is only available on the T300 **Connector X134**, i.e. on Com Port 2 (**Connector X02** of the Hardware-Module Mask). This „Connector“ X02 and the T300 Board Name have to be hooked up to the **CTS-Connectors** of @PTP, @CTT/@CRT or the direct Transmit/Receive Blocks respectively.

Only one telegram in transmit direction and one telegram in receive direction can be defined. This is the reason why only one Send and one Receive Block can be configured at maximum. At the Address Connectors AT/AR, differring (Telegram-) Names have to be noted as arbitrary strings.

Up to **5 Net-Data Words** can be transferred. The net-data length of Transmit and Receive Blocks can differ. But a reciever only accepts data from a received telegram if the configured receive-telegram length (LT-Connector, e.g. of the @CRT Block) equals the length of the actually received telegram..

The @PTP block must be configured within the **„Send“ Communications FB** and in **sampling times between 32 ms and 255 ms**. The configured sampling time does not influence the transfer speed.

Input- Conn.	Type	**Explanation @PTP**
CTS	CR-	T300-Board Name (refer to. MP) and – separated by a dot - „**.X02**“ connector
BDR	O2	Baud Rate with the follwing code: 0: 300 Bit/s 1: 600 Bit/s 2: 1200 Bit/s 3: 2400 Bit/s 4: 4800 Bit/s 5: 9600 Bit/s 6: 19200 Bit/s 7: 38400 Bit/s (differs from @PTP01!)
TBM		Telegram Timeout Time („Tlg.-Breakdown-Monitoring“); In case of expiration, the transceiver will be disabled. This makes a monitoring and a „Breakdown Control“ of a closed multi-drop Peer-Ring possible. Setting range: 0 to 32000**ms** The timeout monitoring is started with power-on!
TWU		Alarm Cycle Time („Time Wake Up“) Setting rage: 1 to 32000**ms**

Outp.- Conn.	Type	**Explanation @PTP**
ECL	O2	Error Class; Evaluation in combination with the ECO-Connector; ECL>0: Hardware/Software Error
ECO		Error Code: ECO=ECL=0: no error; ECO>0 and ECL=0: Configuring Error
CDM	B1	State of the Communication: 0: Initialization is running 1: Telegram Interchange is running
QTS		Operating Status: 0: Error pending 1: no Error

Error Codes: Refer to Manual (Chapter 6 /1/) !

13.6.2.2 Principle of Operation and Time Response in Version V4.2 , V4.2.1 and V4.2.2

After the „Alarm Time“ specified at Connector **TWU** has been expired, the function block processes an evetually received telegram and makes the telegram’s net data available for the Receive Function Block(s) in the „Normal“ FPs. If the Send Funktion Blocks have provided net data in the meantime, this data will be „packed“ now into a Peer-to-Peer telegram and transmitted.
This Alarm Cycle runs asynchronously to the sample times!

Set the alarm time as short as possible for minimizing the dead times caused by the alarm processing. This maximizes the time which can be used for the effective data transfer. The minimum allowable value of the alarm time is 2 ms due to the processing time of approx. 1 ms for the transmit and the receive routine. So enough processing time will be available for the normal tasks.

Only transmit data actually generated by the Transmit Function Blocks is transmitted. If long alarm and sampling times and high baud rates (i.e. short telegram transfer times) are configured, telegramm pause intervals can occur on the transfer line.

13.6.2.3 Peer-to-Peer Configuring example for Version V4.2 / V4.2.1 / V4.2.2

1. In the „Send“ Communication FP:

```
  39 PEER      : @PTP
  40 CTS CR - D01_P1.X02
  41 BDR O2 - 7                        "38400 Baud"
  42 TBM O2 - 50                       "Report a Telegr Loss after 50ms"
  43 TWU O2 - 5                        "Telegram Processing every 5ms"
  44 ECL O2 >
  45 ECO O2 >
  46 CDM B1 >
  47 QTS B1 >
```

2. In a „normal“ FP:

```
 184 PEERRX   : CRD401                "4 Words Receive Data"
 185 CTS CR - D01_P1.X02
 186 AR  NS - 'ADRPEER'
 187 MOD B1 - 1
 188 LEM O2 - 3
 189 Y1  N2 > @TYP=V2, $STWT3P ,INIT=0H6  "1st word received"
 190 Y2  N2 > $LSWT3P                 "2nd word received "
 191 Y3  N2 >                         "3rd word received, not used in this case"
 192 Y4  N2 > @TYP=V2, $ZW1T3P        "4th word received "
 193 QTS B1 >
 194 YTS O2 >
.................
 133 PEERTX    : CTD501               "501: Telegr.Length can be changed after RESET"
 134 CTS CR - D01_P1.X02
 135 AT  NS - 'A_PEER'
 136 MOD B1 - 1
 137 LEM O2 - 3
 138 LT  O2 - 4                       "Telegr. Length = 4 Words
 139 EN  B1 < 1                       "Transmitter Enable
 140 X11 N2 < $TB_CW                  "Control Word for Master generated by TB"
 141 X12 N2 < 50%
 142 X13 N2 < BAUST1.Y1
 143 X14 N2 < BAUST2.Y
.................
 179 X58 N2 < 0%
 180 QTS B1 >
 181 YTS O2 >
```

13.7 Erasing the EEPROM

The T300 parameters („H-Parameters“) are reset to their factory values by erasing the nonvolatile EEPROM parameter memory chip loctated on the MS300 board..

Also in non-standard situations, it can become necessary to erase the EEPROM, e.g. if

- all modifications made should be made „undone“,
  (This can also be performed with an EPE funktion block if such a block has been configured and the board is still functionable)

- if the T300 doesn’t longer start-up correctly after unauthorized modifications of connectors or parameters had been made.

- if an EEPROM overflow has been occurred.

The T300 stores **all** technology parameters (H- or 1xxx-parameters) received from a PC download file into the T300 EEPROM regardless of whether the parameter value is differring from the factory setting or not. This is due to the SIMADYN D operating system. According to our experience, approx. 250 to 290 parameters can be stored in the EEPROM until an overflow occurs. An EEPROM overflow is signalled by the SIMOVIS message "Write Error" or, during download, by the message "Not Written".

Please Note: In the EEPROM, binary quantities occupy 6 Bytes, word quantities 7 Bytes and double-word quantities 9 Bytes. The hardware EEPROM chip mounted on the MS300 memory module has a parameter capacity of 2000 Bytes.

- If your T300 configured software package has more than 250 to 280 H-Parameters, it is an imperative procedure to generate a „File of Changed Parameters“ (containing only those parameters which are differring from the factory settings) which can be used for an error-free parameter download without EEPROM overflow.

13.7.1 Erasing the EEPROMs if an overflow has been occurred

- SIMOVIS signals a "KON: Writing Error" message if an EEPROM overflow occurs when editing the SIMOVIS parameter.

- SIMOVIS signals a „Not Written xxx“ message if an EEPROM overflow occurs during a download procedure.

- The EEPROM can only be erased when the storage mode „Storing in EEPROM“ is changed to „Storing in RAM“ by clicking on the small RAM symbol.

- Afterwords use the respective H-Parameter for erasing the EEPROM. The number of this „Erase EEPROM“ parameter depends on the T300 software Configured Package. Refer to the appropriate manual of your Standard Configured Package (e.g. MS320...380) or the SIMADYN D Function-Block Catalog to get information on the correct parameter settings for the EEPROM erasing procedure. Subsequently please switch the electronics power supply off and on again.

13.7.1.1 Erasing the EEPROM in case of memory overflow by means of the Hex-Monitor

The EEPROM also can be erased by means of the SIMADYN D Hex-Monitor .

In this case two EEPROM Bytes have to be modified via the Hex-Monitor according to the following procedure:

1. Connect a COM port of your PC to terminal X132 of the T300. Configure your COM port to 9,6kBd and No Parity Bit by one of the following two alternatives:

   a) Use the SIMADYN D SERVICE-Programm: Select the „Hex/Debug-Monitor“ option in the „Activities“ menue.

   b) Launch a terminal emulation program on your PC, e.g. the „Terminal“ programm with DEC VT100 emulation if you are using WINDOWS.

2. Start the Hex-Monitor:
   Push the small pushbutton on the T300 board during Power-On and keep it pressed until operating state °003 is displayed. A Hex-Monitor start-up message should now be displayed on the screen.

3. Use the „S“ command („Subsitute“) to change the following memory locations in the EEPROM memory:

```
7C00:0=AA
7C00:2=0        (End Specifier)
```

Type in the following Hex-Monitor command sequence (strictly adhere to the noted command syntax; <CR> designates the Enter key. XX designates any two arbitrary hexadecimal digits):

```
S7C00:0        <CR>
```

Now you will be prompted on the screen. Subsequently type in the following commands:

7C00:0	XX	**AA,**	input AA, proceed
7C00:1	XX	**,**	go to the next location
7C00:2	XX	**0,**	input 0 and proceed
7C00:3	XX	**.**	termination

4. Switch the the electronics power supply OFF and ON again.

13.7.2 Erasing the EEPROM for restoring the factory settings:

- Erase the EEPROM according to chapter 13.7.1. Switching over the storage mode from EEPROM to RAM is not necessary.

After the EEPROM is erased and power has beeen switched on again, it is highly recommended to reset those parameters back to „0“ which have been used to accomplish the erasing procedure.

14 Literature

/1/ SIMADYN D „General diagnostics“
Item No.: 465 983.9010.00

15 Order numbers

Type:	Order No. (MLFB)	Designation
T300- HW package	6SE7090-0XX87-4AH0	Hardware package (complete, without software (MSxxx)!)
T300	6SE7090-0XX84-0AH2	T300 processor board
SE300	6SE7090-0XX84-3EH0	Terminal function block for T300
SC58	6DD 3461-0AB0	Round cable to transfer analog- and pulse encoder signals between SE300 and T300, shielded, 40 core
SC60	6DD 3461-0AE0	Round cable to transfer binary signals between SE300 and T300, shielded, 34-core
MS300	6SE7098-**0**XX84-0AH0	MS300 memory module, empty
MS320	6SE7098-2XX84-0AH0	MS300 memory module with standard software package „Axial winder“ AW
MS340	6SE7098-4XX84-0AH0	MS300 memory module with standard software package „Angular synch.“ WGL
MS360	6SE7098-6XX84-0AH0	S300 memory module with standard software package „Multi-motor drive“ MMA
MS380	6SE7098-8XX84-0AH0	S300 memory module with standard software package „Positioning“ POS
Doc. T300	6SE70**87**-**6**CX84-0AH1	Description of the T300 board and general software **(dt.,engl.)**
Doc. T300	6SE70**87**-**7**CX84-0AH1	Description of the T300 board and general software **(fr.)**
Dok. AW	6SE70**80**-**0**CX84-**2**AH1	Description, standard app. software. axial winder **(dt.)**
Dok. WGL	6SE7080-0CX84-**4**AH1	Description, standard app. software. ang. synch. **(dt.)**
Dok. MMA	6SE7080-0CX84-**6**AH1	Description, standard app. software.multi-motor drive **(dt.)**
Dok. POS	6SE7080-0CX84-**8**AH1	Description, standard app. software. positioning **(dt.)**
Doc. AW	6SE70**87**-**6**CX84-**2**AH1	Description, standard app. software. axial winder **(engl.)**
Doc. WGL	6SE7087-6CX84-**4**AH1	Description, standard app. software. ang. synch. **(engl.)**
Doc. MMA	6SE7087-6CX84-**6**AH1	Description, standard app. software.multi-motor drive **(engl.)**
Doc. POS	6SE7087-6CX84-**8**AH1	Description, standard app. software. positioning **(engl.)**
Doc. WGL	6SE70**87**-**7**CX84-**4**AH1	Description, standard app. software. ang. synch. **(fr.)**

MD320	6S**W17**98-**2**XX84-0AH0	MS320 standard app. software axial winder on a $3^1/_2$ inch floppy disk (without documentation)
MD340	6SW1798-**4**XX84-0AH0	MS340 standard app. software angular synchronous control on a $3^1/_2$ inch floppy disk (without documentation)
MD360	6SW1798-**6**XX84-0AH0	MS360 standard app. software multi-motor drive on a $3^1/_2$ inch floppy disk (without documentation)
MD380	6SW1798-**8**XX84-0AH0	MS380 standard app. software positioning on a $3^1/_2$ inch floppy disk (without documentation)

Bisher sind folgende Ausgaben erschienen:

Ausgabe	Sachnummer/ Materialnummer
02.96	Sach.Nr. 477 407.4000.76
12.99	Mat.Nr. A5E00101653

Ausgabe 12.99 besteht aus folgenden Kapiteln:

Kapitel		Änderungen	Seitenzahl	Ausgabedatum
0	Definitionen	überarbeitete Ausgabe	2	12.99
1	Produktbeschreibung	überarbeitete Ausgabe	4	12.99
2	Montieren, Anschließen	überarbeitete Ausgabe	18	12.99
3	Technische Daten	überarbeitete Ausgabe	10	12.99
4	Projektierung	überarbeitete Ausgabe	2	12.99
5	Projektierung der T300 für SIMOVERT 6SE70 und DC_MASTER 6RA70	überarbeitete Ausgabe	20	12.99
6	Literatur	überarbeitete Ausgabe	2	12.99
7	Bestellnummern	überarbeitete Ausgabe	2	12.99

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Edition	Internal Item Number
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Version 12.99 consists of the following chapters:

Chapter		Changes	Pages	Version date
8	Definitions	reviewed edition	2	12.99
9	Product description	reviewed edition	4	12.99
10	Installation, connecting-up	reviewed edition	18	12.99
11	Technical data	reviewed edition	10	12.99
12	Application software	reviewed edition	2	12.99
13	Configuring the T300 for SIMOVERT 6SE70 and DC_MASTER 6RA70	reviewed edition	20	12.99
14	Literature	reviewed edition	2	12.99
15	Order numbers	reviewed edition	2	12.99

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