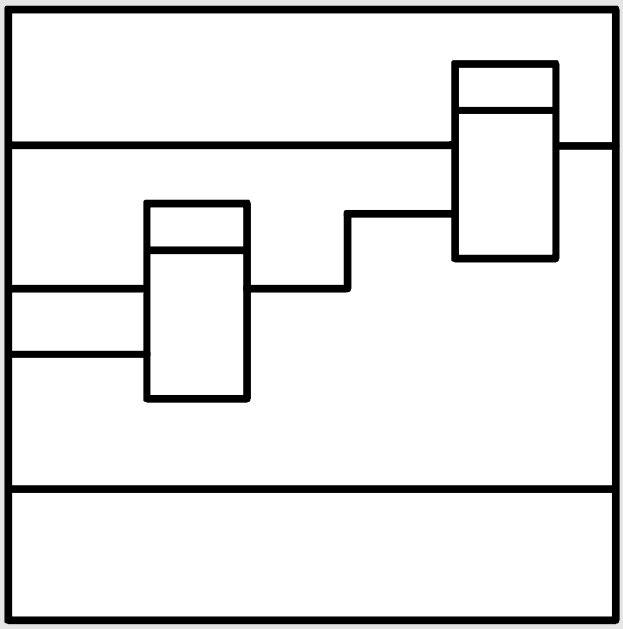
SIMADYN D
Digital Control System

User Manual

Subrack SRT



Edition 05.95

DK No. 213142

User Manual, Subrack SRT

Edition		Status
1	Subrack SRT	05.95

We have checked the contents of this Manual to ensure that they coincide with the described hardware and software. However, deviations cannot be completely ruled-out, so we cannot guarantee complete conformance. However, the information in this document is regularly checked and the necessary corrections included in subsequent editions. We are thankful for any recommendations or suggestions.

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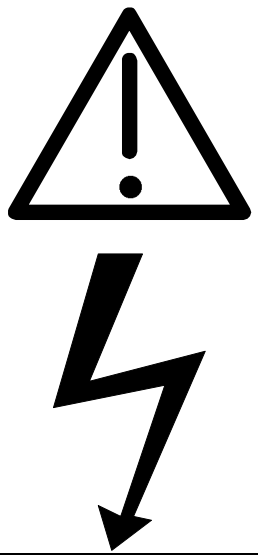
N O T E !

The information in this Manual 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 this Manual 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.

Warning information



W A R N I N G !

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 this User Manual.

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

Definitions

* **QUALIFIED PERSONNEL**

For the purpose of this User Manual 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 this User Manual 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 this User Manual 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 this User Manual 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 this User Manual, „Note“ indicates information about the product or the respective part of the User Manual which is essential to highlight.

C A U T I O N !

This board contains components which can be destroyed by electrostatic discharge. Prior to touching any electronics board, your body must be electrically discharged. This can be simply done by touching a conductive, grounded object immediately beforehand (e.g. bare metal cabinet components, socket protective conductor contact).

W A R N I N G !

Hazardous voltages are present in this electrical equipment during operation.

Non-observance of the safety instructions can result in severe personal injury or property damage.

It is especially important that the warning information in all of the relevant Operating Instructions are strictly observed.

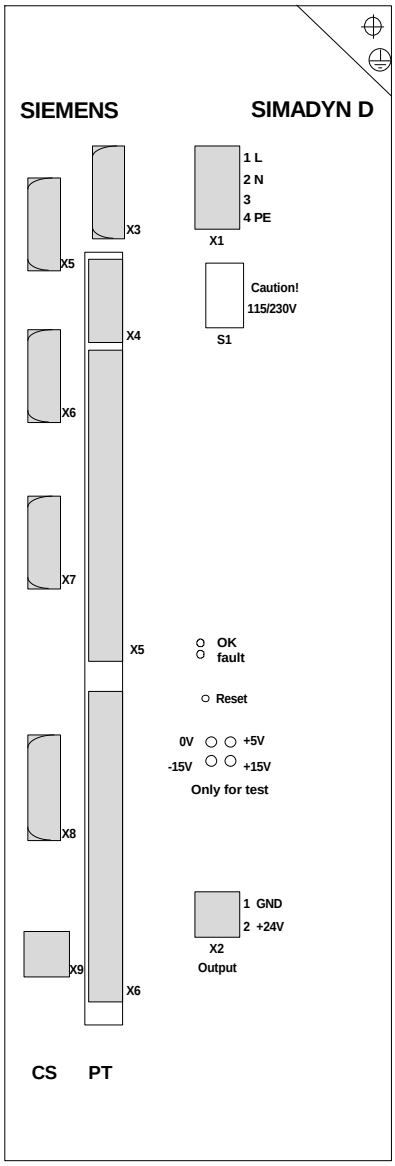
1. Ordering information and supplementary components

Type:	Order No. (MLFB)	Designation	Internal item No.
SRT:	6DD 1682-0CF0	Technology box SRT	465 682 9025.00
PT10:	6DD 3440-0AB0	Processor board PT10	465 440 9001.00
SE58:	6DD 3460-0AB0	Terminal block for PT10	465 460 9001.00
SC58:	6DD 3461-0AB0	Shielded round cable, 40 core for PT10	465 461 9001.00
SC60:	6DD 3461-0AE0	Shielded round cable, 34 core for PT10	465 461 9004.00
PT10P1:	6DD 3440-0AB3	Package consisting of PT10, SE58, SC58, SC60	465 440 9001.30
MS47:	6DD 3440-0AB2	Memory sub-module for PT10	465 440 9001.20
SE59:	6DD 3440-0AB1	Incremental encoder board for PT10	456 440 9001.10
PP1I:	6DD 1670-0AE0	Parallel programmer (desk-top unit)	465 670 9004.00
PP1X:	6DD 1670-0AD0	Parallel programmer (integrated unit)	465 670 9005.00
UP3:	6DD 3462-0AB0	Programming adapter for MS47	465 462 9001.00
SW20:	6DD 3470-0AC0	Angular synchronism on the memory sub-module MS47	465 470 9002.00
SW20:	6DD 3470-0AC2	" on floppy disk	465 470 9002.20
SW20:	6DD 3481-0BA0	Description, angular synchronism	465 481 9010.00
SW30:	6DD 3470-0AD0	Axial winder on the memory sub-module MS47	465 470 9003.00
SW30:	6DD 3470-0AD2	" on floppy disk	465 470 9003.20
SW30:	6DD 3481-0CA0	Description, axial winder	465 481 9020.00
CS51:	6DD 1660-0AH1	Interface board CS51	465 660 9007.10

2. Function description

2.1. Overview

The SRT technology box is used for mounting SIMADYN D PC boards **PT10, CS51**. It also additionally includes the power supply for both PC boards.



Each board has its specific slot which is identified on the front panel. The technology box can be operated with or without the CS51 communications board.

Various standard software packages are offered for the PT10 technology board. User-specific open- and closed-loop control and arithmetic functions can be implemented using the STRUC configuring language.

The technology box power supply requires a 230V AC 50-60 Hz supply which can be switched-over for 115V AC 50-60 Hz supplies.

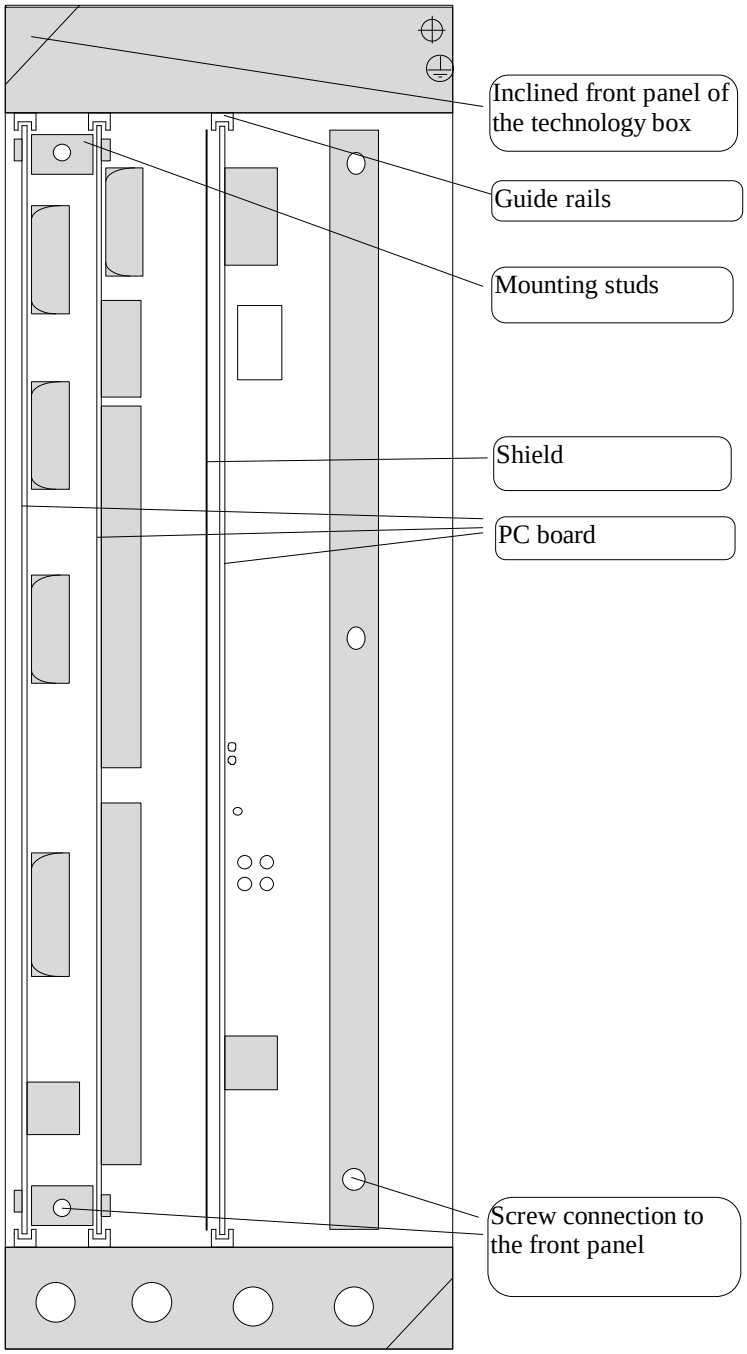
The PC boards and the power supply are designed for operation without fans.

2.2. Power supply and data transfer of the PC boards

The PC boards are connected together and with the power supply through a 64-core ribbon cable connector. Each board has an 8 cm long ribbon cable. The ribbon cable with the 64-pin plug connector is inserted into the power supply, the CS51 ribbon cable connector, into the PT10. This ribbon cable connector establishes the connection between the power supply of the boards and data transfer between PT10 and CS51.

Data transfer between PT10 and TS51 is realized through a 16-bit databus. A dual port RAM, 2K*8 is provided on the CS51 for this purpose.

3. Mechanical design



To mount the PC boards in the technology box, the front panel with 4 screws is removed from the technology box. The front panel can be removed from the technology box together with the power supply. The upper left and lower right of the front panel can be used to withdraw it.

The boards are screwed to the studs provided. The studs are screwed to the front panel. The ribbon cable connectors are inserted on the boards before they are inserted.

4. Power supply

4.1. Front panel

The power supply is part of the technology box. It is screwed to the subrack front panel. The boards are also screwed to the front panel. The technology box is supplied with mounted power supply.

The technology box power supply is established through the 4-pole terminal X1. The supply voltage is 230V AC 50-60 Hz. The unit can be switched-over to 115 V AC, 50-60 Hz supplies using switch **S1**. **The factory setting is for 230V AC.**

X1 pin 1	phase conductor L
X1 pin 2	neutral conductor N
X1 pin 3	not connected
X1 pin 4	protective conductor PE

The protective conductor must be connected to Pin 4. **It is not sufficient to just connect a protective conductor to the subrack.**

A fuse should be provided with the following operating data.

In	**=**	**0.5A max** (for Vn =230V DC)
In	**=**	**1.0A max** (for Vn =115V DC)

The power supply switch-on and switch-off routine is activated when the supply voltage is connected. This involves establishing the 5V, +15V, -15V, +24V output voltages, a POWER FAIL control line, and a RESET control line.

The subrack is powered-up when the supply voltage is connected. All of the interface boards used must be supplied with power 100 ms before the system boards in order to prevent faults when powering-up. This condition is guaranteed by simultaneously switching-in the power supply voltage for the subrack and the interface boards.

The power supply also provides a 24 V DC output at terminal X2. It is used to supply terminal X9 on the CS51 interface board. The CS51 requires a 24 V power supply for electrical isolation via its RS484 interface, which cannot be realized via the 64 core ribbon cable.

Further, there is a RESET button, which can be used to activate the power-up/power-down routine. It is recessed, to prevent erroneous actuation. The output voltages are not shutdown or established when the power-down/power-up routine is activated via the RESET button.

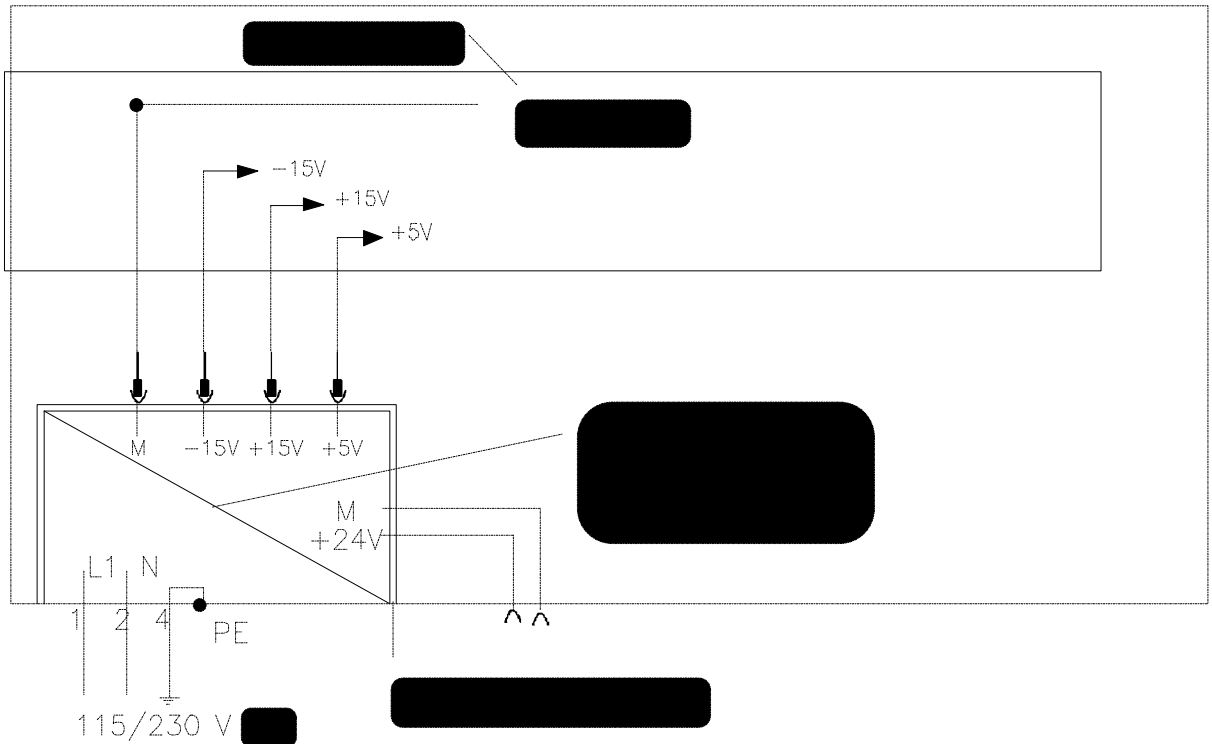
The 5V, +15V, -15V and ground, supplied from the power supply are available at 4 test points (2 mm sockets), for test purposes. They are short-circuit protected using series resistors.

Both LEDs indicate fault-free operation (green LED) and faulted operation (red LED) of the power supply.

4.2. Line filter

The power supply has a line filter, which limits the radio interference voltage according to VDE 0871 to limit value class A.

4.3. Block diagram of the power supply voltages within the technology box



5. Installation guidelines

5.1. Installation information

The SRT SIMADYN D subrack is self-ventilated. In order to guarantee adequate ventilation, there must be sufficient air circulation in the subrack and the cabinet for the discharged subrack air.

This means that the subrack may not be operated in an enclosed cabinet, and the subrack discharged air may not be restricted by equipment or other components. The same is true for the subrack air intake. It is not permissible to locate a filter in front of the cabinet air slots.

If the subrack is used in an enclosed cabinet, then the cabinet must be force-ventilated.

A minimum clearance of 60 mm must be maintained above and below the subrack when mounting other equipment or components. When locating two subracks one above the other, this means that a 120 mm clearance must be maintained between the two subracks, whereby the upper subrack must be separated from the lower subrack by an air deflection plate.

5.2. Noise immunity

All SIMADYN D housings must be connected to the cabinet ground through the shortest possible cable - at least 6 mm^2 cross-section.

Potential equalization via the „PE“ power supply connection is not adequate.

Shielded cables should be connected with the shield to the grounding- or shield rails and routed to the terminal module, shielded.

All of the cabinets, networked for SIMADYN D drives should be connected using a potential equalization cable, at least 16 mm^2 cross-section.

The front panel must be connected when operated with the technology box housing.

It is not permissible to use undamped contactors together with SIMADYN D in a cabinet.

If undamped contactors (i.e. no RC elements) are used in cabinets next to SIMADYN D, a panel must be mounted between the cabinets.

The protective conductor is connected at the subrack and power supply.

6. Technical data

6.1. General data

INSULATION GROUP	A ACC. TO VDE 011 PARA. 13 GROUP 2 AT 24V DC, 15V, 5VDC
AMBIENT TEMPERATURE	0 TO 55 DEGREES C WITH FORCED VENTILATION
STORAGE TEMPERATURE	-40 TO +70 DEGREES C.
HUMIDITY RATING	F ACC. TO DIN 40050
ALTITUDE RATING	S ACC. TO DIN 40040
MECHANICAL STRESSING	MOUNTED IN STATIONARY EQUIPMENT WHICH IS NOT NECESSARILY VIBRATION-FREE
PACKAGING SYSTEM	ES 902 C
WEIGHT	2.5 kg

Output voltage/current	Va1: +5.1V ± 0.1V Ia1: 0 to 3 A
Baseload, min.:	(5% of Ia1)
	Va2: +15V ± 0.300V Ia2: 0 to 0.6 A
Baseload, min.:	(5% of Ia2)
	Va3: -15V ± 0.300V Ia3: 0 to 0.6 A
Baseload, min.:	(5% of Ia3)
	Va4: +24V ± 2.0V Ia3: 0 to 0.5 A

Residual ripple (above 10% of the base load)	(measurement bandwidth, 30 MHz) < 50 mVpp Va1 (probe 1:1) < 150 mVpp Va2,Ua3
Commutating spikes (% of VaN)	± 5%
Current limiting	Ia1max = approx. 1.2 x Ia1 Ia2max = approx. 1.2 x Ia2 Ia3max = approx. 1.2 x Ia3
Shock/vibration stressing	acc. to SN29010
Stationary application:	severity 12
Transport:	severity 22
Degree of protection:	IP00
VDE 0110	Pollution level 2
VDE 0110	Air-creepage distances
Radio interference suppression	VDE0871 limit value class "A"

1. Input voltages: at Ve = 230V
DC power supply acc. to SN 26555 Part 8, DIN IEC 38 Draft

Static upper limit	Ve * 1.1 (=253V)
Static lower limit:	Ve * 0.85 (=195.5V)
Frequency:	50/60 Hz ±2.5 Hz

Non-periodic overvoltages acc. to DIN VDE160, A5.3.1.1.2

V referred to the peak value:	Ve * 1.3 (460V)
Duration:	0.3 ms
Recovery time, min.:	0.1 s
Events per hour:	10 max.

Brief voltage dips according to DIN VDE 0160, A5.3.1.1.3

V	0
Duration:	5 ms
Recovery time, min.:	0.1 s
Events per hour:	10 max.

Vcc: Va1 - voltage drop across the switching element

2 overvoltage protection for Va1	via suppressor diode
3 input voltage protection	fuse
4 safety regulations	(Standard, VDE 0160 December 1990; IEC)
5 rated insulation voltage:	3750 V AC
Test voltage:	acc. to VDE 0160
Protective separation:	Safety extra-low voltage according to VDE 0805 / EN 60950 with protective separation

7. STRUC mask in the master program

The technology box does not have its own STRUC mask. Any subrack can be configured in the master program.

```
        : SRT                          "2-slot subrack, L bus"
L01 4S = '.     .       .       .      ´"lettering"
L05 4S = '.     .       .- - - - - - SP - - - - ´"strip "
S01 8N = ?                             "Slot 1: Subrack“
S02 8N = 0
S03 8N = 0
S04 8N = 0
S05 8N = 0
S06 8N = 0
++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

8. Connector assignments

8.1. Parallel interface X2 to PT10 or CS51

X2 (64-core ribbon cable to PT10 or CS51)

Pin	Function	Pin	Function
1	AD0	2	M
3	AD1	4	M
5	AD2	6	M
7	AD3	8	M
9	AD4	10	M
11	AD5	12	M
13	AD6	14	M
15	AD7	16	M
17	AD8	18	M
19	AD9	20	M
21	AD10	22	M
23	AD11	24	M
25	AD12	26	M
27	AD13	28	M
29	AD14	30	M
31	AD15	32	M
33	ALE	34	ME
35	L_WR	36	ME
37	L_RESET	38	ME
39	L_RD	40	ME
41	L_READY	42	ME
43	L_BHE	44	ME
45	---	46	ME
47	SYNC	48	ME
49	ME	50	---
51	PWR_FAIL	52	L_CSPER1
53	---	54	L_INT
55	ME	56	L_STAT1E
57	---	58	---
59	P5	60	---
61	P5	62	P15
63	P5	64	N15

9. Others

9.1. Attachments

Dimension drawing 3SE.465 682 9025.00 MB

9.2. Terminology/abbreviations

SV power supply
BGT subrack

10. ESD instructions

Components which can be destroyed by electrostatic discharge (ESD)

Generally, electronic boards should only be touched when absolutely necessary.

The human body must be electrically discharged before touching an electronics board. This can be simply done by touching a conductive, grounded object directly beforehand (e.g. bare metal cubicle components, socket outlet protective conductor contact).

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.

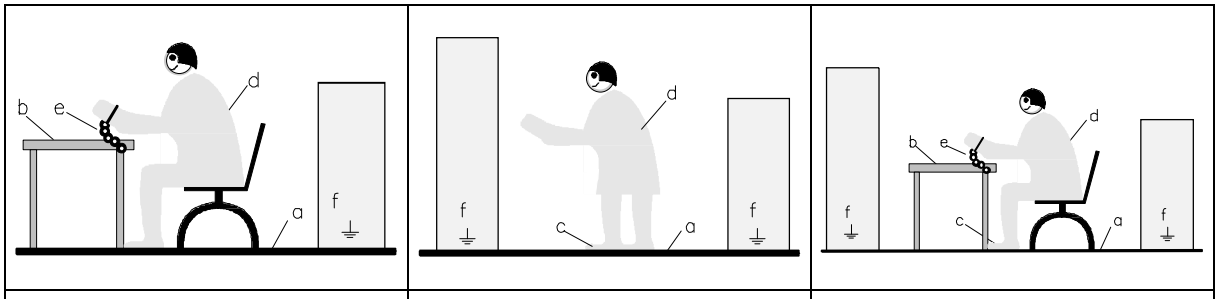
When soldering, the soldering iron tip must be grounded.

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.

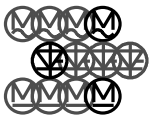
The necessary ESD protective measures are clearly shown in the following diagram.

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



Seated	Standing	Standing / sitting

Drives and Standard Products
Motors and Drive Systems Group
Postfach 3269, D-91050 Erlangen



System-Based
Drive
Technology