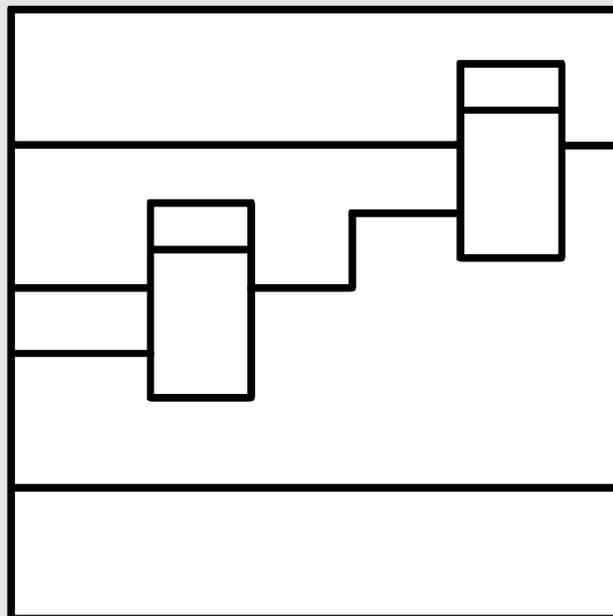# SIMADYN D
Digital Control System

User Manual

Communication board CS21

User Manual, Communication board CS21

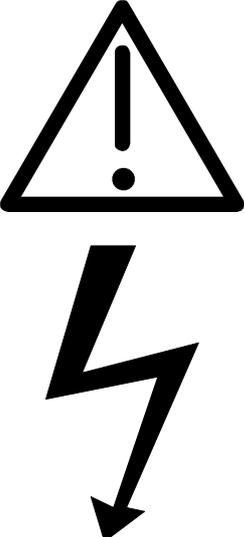| Edition		Edition status
1	Communication board CS21	03.91
2	Communication board CS21	05.95

Contents

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, severe bodily injury and material damage can result.

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. Function Description

The communication board CS21 is the new version of the CS2 board. The board is designed, in conjunction with the communication board CS11, to link from two to four board racks SR1 or SR5 of the Simadyn D system. Therefore a fast parallel link is possible via the C-bus. The data transfer can therefore only be carried out by processor boards with a C-bus connection (PM12, PM13, PM16).

The CS21 board contains the driver which switches the addresses, data and control signals on the CS11 board memory.

A daisy chain arbitration is enforced between the communication boards CS11 and CS21 in order to prevent accessing to the dual port RAM by more than one rack. A permanent request signal may be generated in order to transmit several data blocks successively. No other processor board is permitted access to the dual port RAM while this signal is set.

The rack containing the CS21 board is designated the slave in the system. The basic clock rate, the time clock interrupt and the external interrupt are received from the CS11. Therefore this rack can be synchronized by the master rack.

The memory area of the dual port RAM lies within the special peripheral area (40000H - 6FFFFH). The start address is defined by the compiler. Accessing the chip select logic and the memory is carried out via a programmable address decoder (PAD).

The connection between the boards CS11 and CS21 is made via a 50 pin cable. The control signals, addresses and data are transferred via differential bus drivers and receivers in order to improve security against signal corruption.

2. Board Design

- Connections for local bus (connector X2) and the communication bus connector X1)
  (only monitoring signals and the clock via the local bus)
- two 50 pin SUB D jack terminals (X5, X6) for the connection to the CS11 and the SE42
- board ID
- Software programmed address definition
- receive the basic clock rate, time clock interrupt, external interrupt from the CS11
- permanent request for data block consistency
- up to three CS21 boards can be connected to CS11 via a terminal block SE42
- cable length of 100m between two coupled racks. A 20m cable length is permitted between a CS21 board and the terminal block when three or four racks are coupled via terminal blocks.

3. Application notes

3.1. General

The communication board CS21 can only be installed in the large racks SR1 or SR5, since the data communication between the processor board and the dual port RAM can only be implemented via the communication bus. The corresponding function modules can only be configured on the PM12, PM13 and PM16.

3.2.Start-up Response

The rack containing the CS21 board can be switched on alone for the purpose of board commissioning. This, however will cause the initialization module to abort, since the CS11 board is not available and no memory accessing is possible. The processor with the communication modules sets the message (flashing) "C" for communication failure.

The following is required to put the board into operation:

- Power up all racks in the system simultaneously,

- or power up the rack containing the CS11 before the rack containing the CS21

3.3. Configuration Notes

As described above, the rack containing the CS21 can be synchronized by the CS11. Therefore delay times can be minimized. The basic clock rate, time clock and external interrupt can be channeled through to the C bus via the CS21 board. This is achieved by making the following configuration changes to the connectors:

- Receive basic clock rate from the CS11
     Insert "Y" at the connector "TCR"

   - Receive external interrupt from the CS11
     Insert "Y" at the connector "ICR"

   - Receive time clock from the CS11
     Insert "Y" at the connector "IUR"

 These signals are disabled as default settings.

3.4. Rack Link Design

See HW documentation 23.71.41 (CS11 Description)

3.5. Connection Cables

See HW documentation 23.71.41 (CS11 Description)

4. Technical Specification

INSULATION GROUP	A to VDE 0110 paragraph 13, group 2 at 5 VDC
AMBIENT TEMPERATURE	0 to 50 deg. C with forced ventilation
STORAGE TEMPERATURE	-40 to +70 deg. C
HUMIDITY CLASS	F to DIN 40040
ELEVATION STRESS	S to DIN 40040
MECHANICAL STRESS	Installation in fixed non vibration resistant devices
PACKAGING SYSTEM	ES 902 C
DIMENSIONS	233.4 x 220 mm
BOARD WIDTH	1 1/3 SEP = 1 Slot = 20.14 mm
WEIGHT	0.45 kg
CURRENT CONSUMPTION	5 VDC 1.12 A

5. Pin Allocation of the CS21

	X6 (female)	X5 (female)
	X6 (female)	X5 (female)
1	GRANT11	----
2	----	----
3	REQ11	----
4	----	DATWRH2
5	2RDY1	ENAS1
6	DBD41	DATRD2
7	DBD52	ABD131
8	DBD61	DT/*RD2
9	DBD32	ABD112
10	DBD12	ABD92
11	DBD121	ABD82
12	DBD152	ABD72
13	DBD141	ABD62
14	DBD81	ABD42
15	DBD92	ABD12
16	DBD101	ABD22
17	CIR11	CIR31
18	----	----
19	----	----
20	----	DATWRH1
21	----	DATWRL2
22	DBD42	DATRD1
23	DBD72	DENB2
24	DBD62	DT/*RD1
25	DBD01	ABD112
26	DBD11	ABD91
27	DBD21	ABD102
28	DBD151	ABD71
29	DBD132	ABD52
30	DBD82	ABD41
31	DBD112	ABD32
32	DBD102	ABD21
33	CLKCY1	CIR02
34	GRANT12	----
35	----	----
36	REQ12	----
37	----	DATWRL1
38	2RDY2	ENAS2
39	DBD71	DENB1

	X6	X5
40	DBD51	ABD131
41	DBD02	ABD121
42	DBD31	ABD111
43	DBD22	ABD101
44	DBD122	ABD81
45	DBD131	ABD51
46	DBD142	ABD61
47	DBD111	ABD31
48	DBD9	ABD11
49	CLKCY2	CIR01
50	CIR12	CIR32

6. STRUC L-Mask for the CS21 board in the Master Program

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101 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
102
103      :CS21          "driver module CS21, C-bus"
104  TCR 1C = N          "basic sampling time by CS11 (Y/N)"
105  ICR 1C = N          "alarm interrupt by CS11 (Y/N)"
106  IUR 1C = N          "clock int., not yet implemented"
107  X5  1M = 0          "connector X5,X6"
108 +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
109
```

7. Appendices

7.1. Block Diagram
Block Diagram   3GE 465 660 9004.00 SU

7.2. Scale Drawing and Plug Connector Table
Scale Drawing with front panel view   3GE 465 660 9004.00 MB

7.3. Layout Plan
Layout plan   3GE 465 660 9004.00 AO

8. Miscellaneous

9. ECB instructions

Components which can be destroyed by electrostatic discharge (ECB)

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

The human body must be electrically discharged before touching an electronic 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 ECB protective measures are clearly shown in the following diagram.
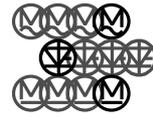
a = Conductive floor surface   d = ECB overall
b = ECB table   e = ECB chain
c = ECB shoes   f = Cubicle ground connection

| Seated | Standing | Standing/sitting |
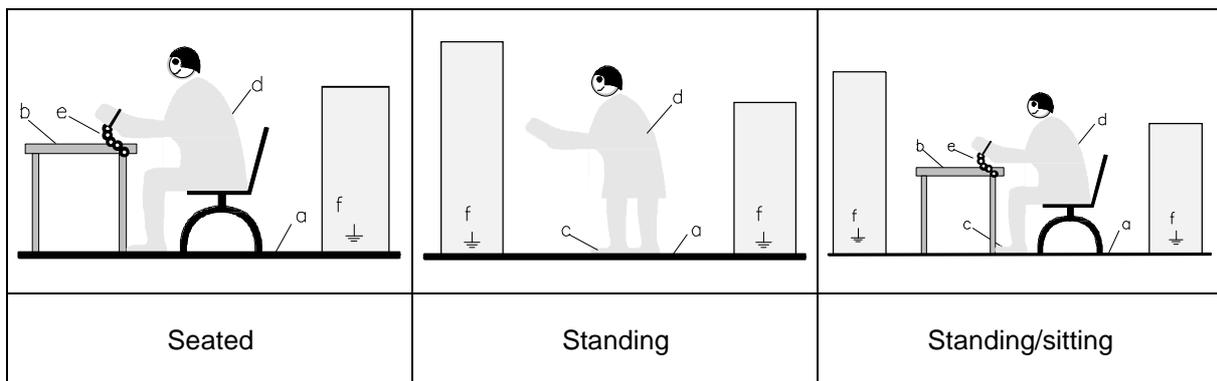
Drives and Standard Products
Motors and Drives Systems Group
Postfach 3269, D-91050 Erlangen

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