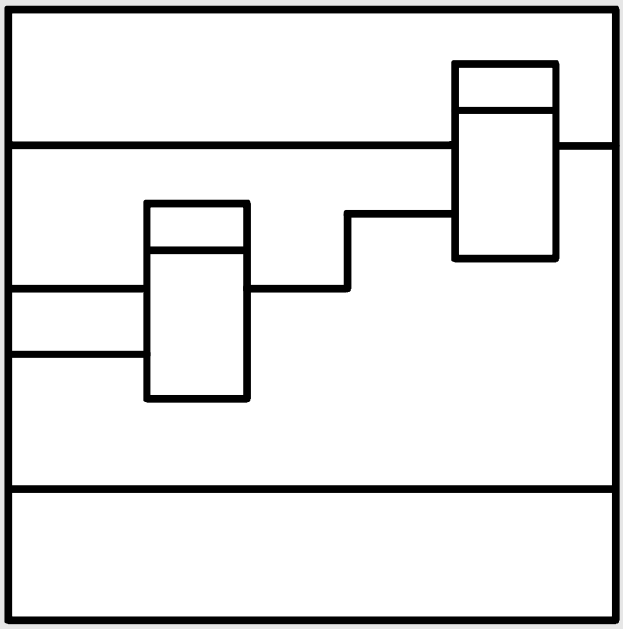
SIMADYN D
Digital Control System

User Manual

Communication module CS41



Edition 05.95

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User Manual, Communication module CS41

Edition		Edition status
1	Communication module CS41	05.90
2	Communication module CS41	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.

Contents

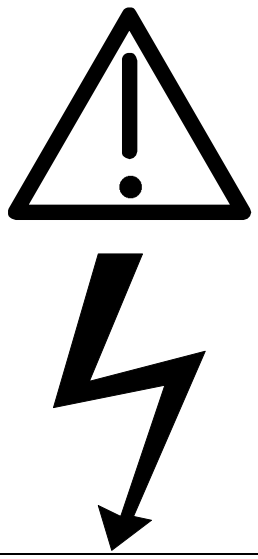
N O T E !

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. Order designation

6DD 1660-0AK0 CS41 communikation module

Serial interface:

-	4 × RS485	Full duplex	(X5, 6, 7, 8)
-	or 2 × RS485	Full duplex	(X5, 6)
	and 1 × RS485	Half duplex	(X8)
	and 1 × TTY		(X7)
-	or 2 × RS485	Half duplex	(X6, 8)
	and 2 × TTY		(X5, 7)

Memory expansion:

2 × 32 kB RAM	120 ns
2 × 2 kB DP-RAM	70 ns
2 × 64 kB EPROM	100 ns

for software from release 3.0 onwards

2. Function description

The CS41 communication module is used in the SIMADYN D system for fast data transfer between SIMADYN D and digital AC and DC converters, e.g. SIMOREG K and SIMOVERT or ET 100 (refer to Appendix 8.1).

The module is addressed by SIMADYN D (processor module PM12/16) via the local bus (L bus) of the system using a programmable address decoder (PAD).

It has two 16-bit processor V25 (70320) with external de-multiplexed 20-bit address and 8-bit data bus. The system clock is 8 Mhz.

Data transfer to the L bus is realized using 2 dual port RAMs (DP-RAM), each with 2 kbyte memory. The read and write cycles to the L bus are organized wordwise, and the internal accesses from the V25 processor to the dual port RAMs, bytewise.

Access control on booth sides is realized using a hardware arbitration logic.

Each of the two processor has a 64-kbyte EPROM as program memory and 32 kbyte buffered SRAM as working memory.

The processor have 2, independent serial interfaces, which are fed to the 15-pin sub-D plug connectors X5-X8 via the corresponding transmit and receiver module, and which establish the connection to the digital AC and DC drive converters from the SIMOREG K and SIMOVERT series, or to the distributed ET100 I/Os.

The RS 485 interfaces at the plug connectors are electrically isolated from the electronics (but not between each other!)

1. Interface µP X channel 0 at front connector X5

   RS485 full duplex interface with 117 kbaud
   Telegram: DUST 6 (point-to-point or point-to-multipoint)

   20mA TTY-interface with connector identification
   Diagnostics using PG 675/685 (1200 baud)

2. Interface µP X channel 1 at front connector X6

   RS485 full duplex interface with 117 kbaud
   Telegram: DUST 6 (point-to-point or point-to-multipoint)

   RS485 half duplex interface with connector identification
   Telegram: for ET 100

3. Interface µP Y channel 0 at front connector X7

   RS485 full duplex interface with 117 kbaud
   Telegram: DUST 6 (point-to-point or point-to-multipoint)

   20mA TTY-interface with connector identification
   Diagnostics using PG 675/685 (1200 baud)

4. Interface µP Y channel 1 at front connector X8

   RS485 full duplex interface with 117 kbaud
   Telegram: DUST 6 (point-to-point or point-to-multipoint)

   RS485 half duplex interface with connector identification
   Telegram: for ET 100

The diagnostic interfaces at plug connectors X5 and X7 are only available in conjunction with DUST 6.

Telegram cycle time

The CS41 module has a timer device, which monitors the SIMADYN D parametrized cycle time, and generates ist own clock signal, asynchronous to SIMADYN D, when the L bus clock signal, fails. This timer device is only initialized during the starting phase of SIMADYN D and is then free running.

The following modes are possible:

1. Synchronous mode with clock „LT" (X2 a28)

   All CS41 modules in the SIMADYN D subrack are supplied with the „LT“ clock and issue their DUST 6 telegrams synchronized.

2. Synchronous mode with interrupt "IRO" (X2 a20)

   All CS41 modules in the SIMADYN D subracks are supplied with the "IR0" interrupt, and issue their DUST 6 telegrams synchronized.

3. Asynchronous mode when the synchronous clock is faulted.

   If the LT or IRO clocks from SIMADYN D fail in synchronous operation, then the parametrized clock monitoring time is exceeded, and a module-internal clock is generated. The DUST 6 telegrams are transmitted asynchronously with reference to SIMADYN D. The interfaces of a module always operate synchronously with respect to each other.

   The module is re-synchronized if a SIMADYN D clock is re-established.

4. Asynchronous mode, parametrized.

   The DUST 6 telegrams are transmitted asynchronously with reference to SIMADYN D. The interfaces of the modules always operate synchronously with respect to each other.

Synchronous mode is still not possible with SIMADYN D software release 3.0, but will however be available in a later release.

3. Setting elements on the PC board

The jumpers X10 and X11 must not be mounted (only aids for factory board test).

The jumpers X12 and X13 must be inserted in operation (cyclic time monitoring of the software, watchdog).

Refer to Appendix 8.2 for setting element arrangement.

4. Assignment and meaning of the LEDs

Two LEDs (H10-H17) are assigned to each physical interface, which indicate the status of the applicable interface as follows:

Continuous light	Interface operational	
Flashing light	Interface faulted	*1)
LED off	Interface not operational	

H10	RS485, DUST 6	Front connector X5	
H11	TTY 20mA diagnostic	Front connector X5	*2)
H12	RS485, DUST 6	Front connector X6	
H13	RS485, ET100	Front connector X6	
H14	RS485, DUST 6	Front connector X7	
H15	TTY 20mA diagnostic	Front connector X7	*2)
H16	RS485, DUST 6	Front connector X8	
H17	RS485, ET100	Front connector X8	

*1) Not valid for H11 and H15 (diagnostics)
*2) Only with DUST 6

5. Pin assignment X2 (96pin) to the L bus

PIN	a	b	c
1	Vcc	Vcc	Vcc
2			
3			
4	P15	P15	P15
5			
6	LOCK~		CSINI~
7			
8	UBATT	AD12	AD0
9		GND	AD1
10	DSAD~	AD13	AD2
11	DSAVE~	PCL0	AD3
12	AD19	AD14	AD4
13		PCL1	AD5
14	RESET~	AD15	AD6
15	BHE~	PCL2	AD7
16		AD16	AD8
17	DAISY	PCL3	AD9
18	DAISY	AD17	AD10
19		PCL4	AD11
20	IR0	AD18	DB0
21		GND	DB1
22		DB11	DB2
23		GND	DB3
24	RDYIN~	DB12	DB4
25	RDY~		DB5
26		DB13	DB6
27		GND	DB7
28	LT	DB14	DB8
29	CLK8M	GND	DB9
30	DEN~	DB15	DB10
31			
32	DT_R~	GND	

6. Pin assignment X5 - X8

PIN	Plug connector X5		PIN	Plug connector X6	
1			1	U ET100	(ET100)
2	+ I A51	(TTY)	2		
3	+ I A52	(TTY)	3		
4	U D1	(TTY)	4		
5	GND	(TTY)	5		
6	GND 1	(DUST / TTY)	6	GND 1	(DUST)
7	/TxD0X	(DUST)	7	/TxD1X	(DUST)
8	TxD0X	(DUST)	8	TxD1X	(DUST)
9	GND	(TTY)	9		
10	TxD E	(TTY)	10		
11	TxD A	(TTY)	11		
12	RxD E	(TTY)	12		
13	RxD A	(TTY)	13		
14	/RxD0X	(DUST)	14	/RxD1X	(DUST / ET100) **
15	RxD0X	(DUST)	15	RxD1X	(DUST / ET100) **

PIN	Plug connector X7		PIN	Plug connector X8	
1			1	U ET100	(ET100)
2	+ I A71	(TTY)	2		
3	+ I A72	(TTY)	3		
4	U D2	(TTY)	4		
5	GND	(TTY)	5		
6	GND 1	(DUST / TTY)	6	GND 1	(DUST / ET100)
7	/TxD0Y	(DUST)	7	/TxD1Y	(DUST)
8	TxD0Y	(DUST)	8	TxD1Y	(DUST)
9	GND	(TTY)	9		
10	TxD E	(TTY)	10		
11	TxD A	(TTY)	11		
12	RxD E	(TTY)	12		
13	RxD A	(TTY)	13		
14	/RxD0Y	(DUST)	14	/RxD1Y	(DUST / ET100) **
15	RxD0Y	(DUST)	15	RxD1Y	(DUST / ET100) **

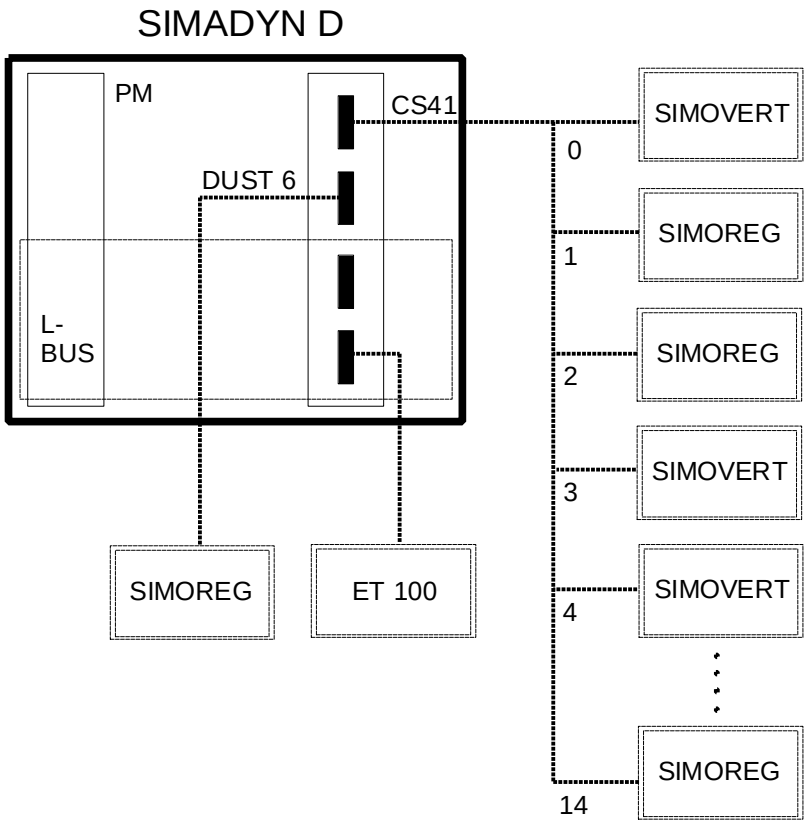
** Pin 14 /RxD1Y and /TxD1Y for ET100
** Pin 15 RxD1Y and TxD1Y for ET100

7. Technical data

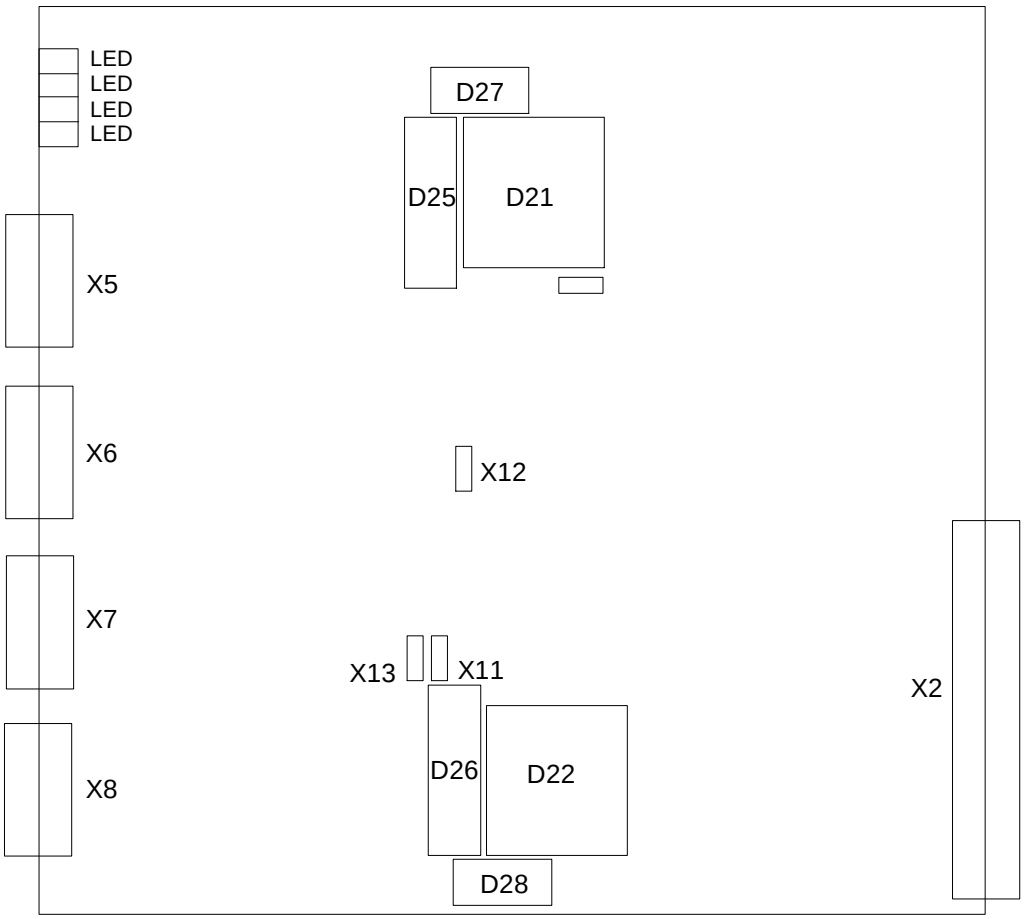
Board format:	Extended double Europa format 233,4 × 220 mm	
Width:	1 slot (20,32)	
Front panel:	SIMADYN D front panel design	
Auxiliary voltage:	5V, 15V from the L-Bus	
Current drain:	5V approx. 1A 15V approx. 20mA per each TTY-current source	
Isolating voltage:	Ground with respect to the electronics Ground with respect to RS 485 interface Electronics with respect to RS 485 interface	500V AC 500V AC 500V AC

8. Appendix

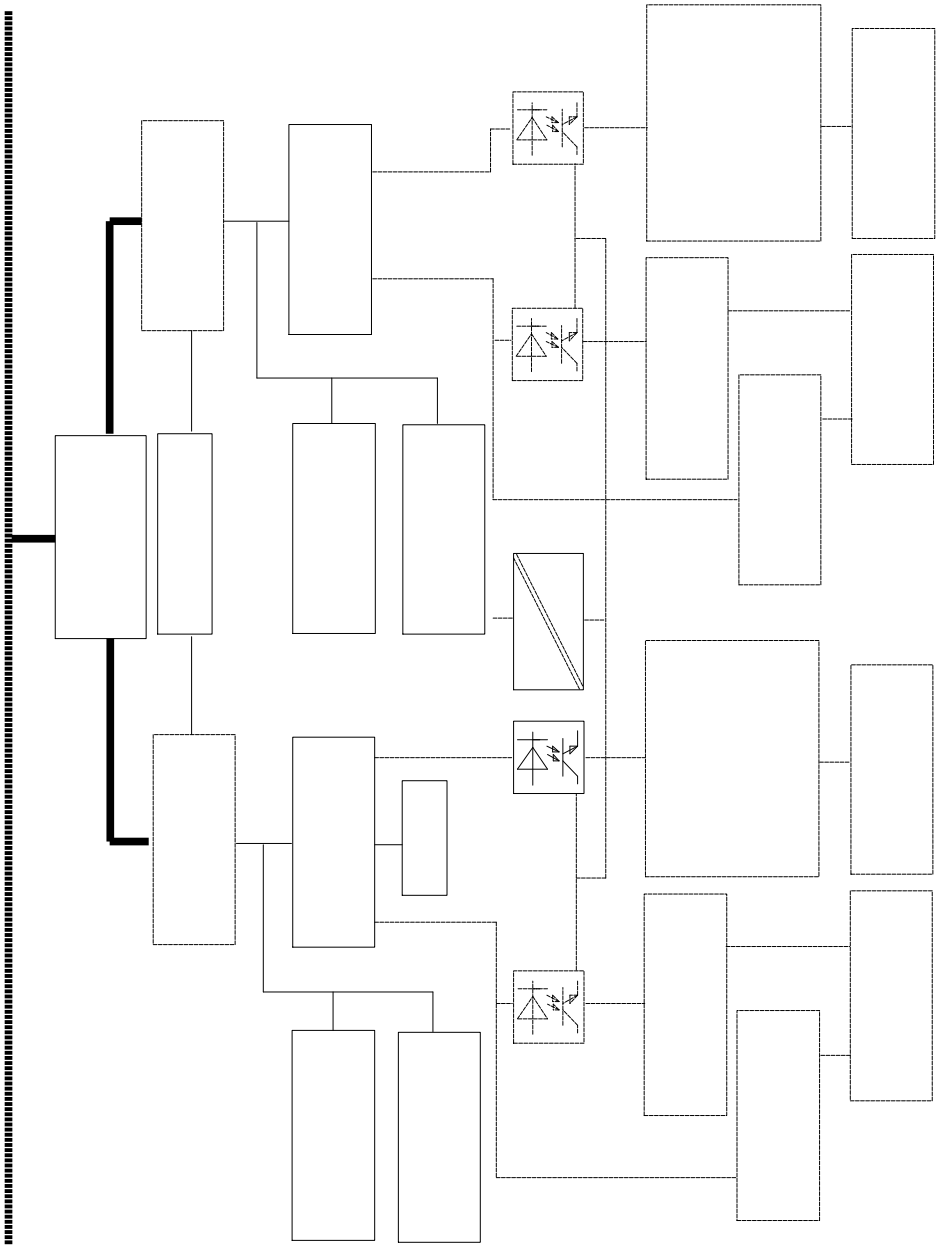
8.1. Application example



8.2. Component arrangement



8.3. Block diagram



8.4. Circuit diagram

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.

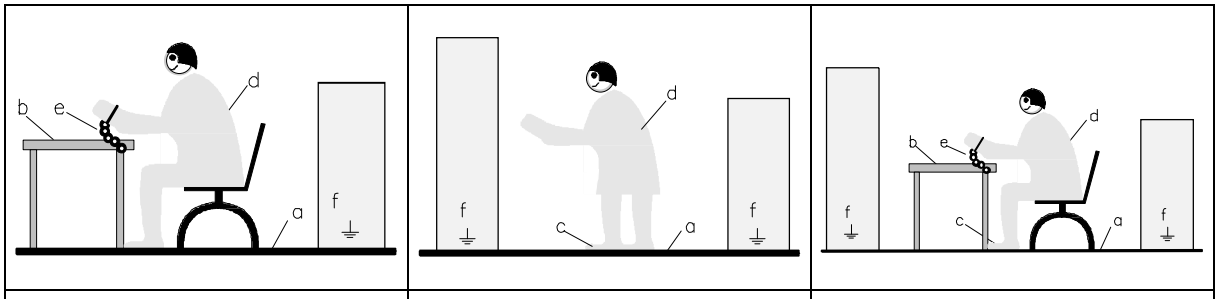
When soldering, the soldering iron tip must be grounded.

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.

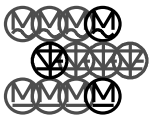
The necessary ECB protective measures are clearly shown in the following diagram.

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



Seated	Standing	Standing/sitting

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



System-Based
Technology