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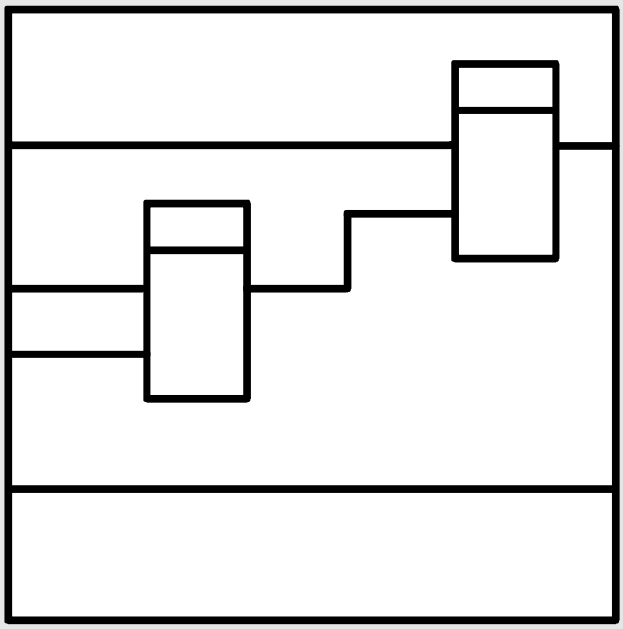
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Find the *Siemens 6DD1642-0BC0 EA12* at our website: *Click HERE*

SIMADYN D
Digital Control System

User Manual

I/O module EA12



Edition 05.95

DK-Nr. 232241

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User Manual, I/O module EA12

Edition		Edition status
1	I/O module EA12	06.93
2	I/O module EA12	05.95

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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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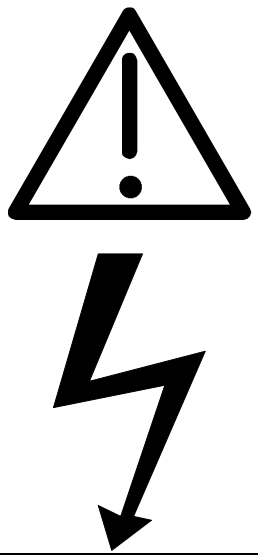
N O T E !

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, 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.

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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.

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1. Description

The external EA12 module is used in the SIMADYN D system for outputting analog voltage signals (-10 to +10V, accuracy: 14 bits or 1mV).

The addresses of these analog outputs are assigned by a programmable address decoder dependent on the slot.

The EA12 module has 8 channels. The signal outputs are routed to the 20-way ribbon cable connector X5. In addition to the 8 signals there is one ground terminal for each and, in addition, two ground and two shield pins.

The signals can also be tapped at the double test sockets (dia. = 2.3 mm, one socket each for signal and ground) e.g. on system startup.

The outputs can be loaded with up to 10 mA and are proof against short circuit up to a period of 120 sec.

Caution: the total signal load at connector X5 and the associated double test socket must not exceed 10 mA.

The output format for the individual channels can be configured. This is done by specifying a multiplication factor in powers of 2 (extra for each channel).

The 50-pin ribbon cable connector X6 can be ignored, if at all available on the frontplate.

2. Module construction

- 1 plug-in station (corresponds to 1 1/3 SPS)

- SIMADYN D local bus connection

- Programmable address decoder (PAD) with module identification

- 8 analog output channels with D/A converters, -10 to +10 V, 10 mA, 14-bit accuracy (corresponding to 1 mV)

- Connection option for KO via 2.3 mm test sockets

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3. Notes for the user

The external EA12 module can be used both in all SIMADYN D subracks, in each connected to the local bus. Each module takes up one plug-in station in the subrack.

The module can only function properly when it is screwed down in position
in the subrack (also during commissioning).

If the module is plugged onto an adapter, the frontplate (or even better, one of the two metallized frontplate end pieces) must be connected to chassis via a short lead in order to have the shield potential at X5/17/18.

Because of the type of power supply module used (switched-mode power supply), noise with voltage spikes of up to 100 mV can be measured at the analog outputs. This is caused by surges/dips on the M (0V reference potentials) bus and can be eliminated by installing an input filter at the signal destination and keeping the given min. load (see technical data).

The eight output voltages of the module are adjusted for minimum offset and correct gain at an ambient temperature of about 20°C. The offset determines how high the output voltage is for a software value corresponding to 0 V. The gain adjustment however determines how high the output voltage is for a software valu&e corresponding to ±10 V.

The two potentiometers required per output for this purpose have not been locked so that any necessary adjustments can be made later in operation (ambient temperature, accuracy specifications). The guide value for temperature sensitivity is ± 240 uV at a temperature change of ± 1 deg.

The following table shows the assignment of potentiometers (-Rxx) to outputs:

EA12 outputs	Connector	Offset	Gain
Output 1	X5 A	-R49	-R46
Output 2	X5 B	-R55	-R52
Output 3	X5 C	-R61	-R58
Output 4	X5 D	-R67	-R64
Output 5	X5 E	-R73	-R70
Output 6	X5 F	-R79	-R76
Output 7	X5 G	-R85	-R82
Output 8	X5 H	-R91	-R88

Before adjustment the module must have reached operation temperature (min. 2 minutes with operation voltage).
When making adjustments, always start with the offset. To do this, the respective output should be set to zero volts (software). The deviation of the output voltage from the desired zero volts is corrected by turning the setting screw of the appropriate offset potentiometer. Rotation in the clockwise direction changes the output voltage in the direction of +10 V.

When the offset adjustment has been made, the gain is adjusted with a software value of +10V at the respective output. Deviation of the output voltage from the desired 10 V is corrected by turning the adjusting screw of the respective gain potentiometer. Rotation against the clockwise direction changes the output voltage in the direction of -10 V.

The analog outputs are connected via the SE7.1 interface module, which is snapped onto the mounting rack. Another connection can be made by the SE40 interface module (one-to-one connection of the ribbon cable connector pins to screw-type terminals).

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Connector X5 on the output module and connector X1 on the interface module are interconnected by a 20-way ribbon cable (Recommended: SC12 ribbon cable with twisted pairs).

The appropriate circuit diagram is shown in figure 1, appendix.

The SE7.1 interface module has a screw-type terminal for signal, ground and shield for each channel; the shield is not connected to the SIMADYN D chassis potential.

Additional components that can be used:

Ribbon cable

* 20-way, twisted pairs,	1.5 m	SC12	6DD 1684-0BC0
* 20-way,	2.0 m	SC11	6DD 1684-0BB0

Interface modules

* SE7.1 I/O block, analog, 8/10 channel	6DD 1681-0AH1
* SE40 Terminal block, 20-way, one-to-one	6DD 1681-0EA0

4. Technical specification

GENERAL

INSULATION GROUP	B to VDE 0110 paragraph 13, group 2 at 15V, 15 V DC
AMBIENT TEMPERATURE	0 to 55 deg. C, with self ventilation
STORAGE TEMPERATURE	-40 to +70 deg. C
PROTECTION CLASS	IP00 to DIN 40050
HUMIDITY CLASS	F to DIN 40040
ALTITUDE RATING	S to DIN 40040
MECHANICAL STRESS	Installation in stationary equipment, sensitive to vibrations
PACKAGING SYSTEM	ES 902 C
DIMENSIONS	233.4 x 220 mm
MODULE WIDTH	1 1/3 SPS = 1 plug-in station = 20.14 mm
WEIGHT	0.5 kg
CURRENT CONSUMPTION	P5 0.6 A P15 0.2 A N15 O.2 A

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ANALOG OUTPUTS	
NUMBER	8
MIN. OUTPUT VOLTAGE	-10 V
MAX. OUTPUT VOLTAGE	+10 V
MAX. CURRENT	±10 mA
MIN. CURRENT (REC	±5 mA (at ± 10 V)
ACCURACY	14 bits (corr. to 1 mV)
LINEARITY ERROR	
ABSOLUT	±0.6 mV
DIFFERENTIAL	±1 mV
MONOTONY	14 bits (corr. to 1 mV)
DRIFT	
OFFSET	240 uV/deg
GAIN	240 uV/deg (deviation of max. output value)
SHORT-CIRCUIT PROTECTION	Ohmic resistance 56 ohm
MAX. SHORT-CIRCUIT DURATION	120 sec.
TOTAL LOAD	All outputs simultaneously, 10 mA

5. Connector pin assignments of X5

Pin	EA12	Connector	Relevant test socket
1	Output 1	X5 A	X11 SIG
2	Ground	X5 A	X11 COM
3	Output 2	X5 B	X12 SIG
4	Ground	X5 B	X12 COM
5	Output 3	X5 C	X13 SIG
6	Ground	X5 C	X13 COM
7	Output 4	X5 D	X14 SIG
8	Ground	X5 D	X14 COM
9	Output 5	X5 E	X15 SIG
10	Ground	X5 E	X15 COM
11	Output 6	X5 F	X16 SIG
12	Ground	X5 F	X16 COM
13	Output 7	X5 G	X17 SIG
14	Ground	X5 G	X17 COM
15	Output 8	X5 H	X18 SIG
16	Ground	X5 H	X18 COM
17	Shield	X5	---
18	Shield	X5	---
19	Shield	X5	---
20	Shield	X5	---

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6. STRUC-L menu of the EA12 module in the master program

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

      :EA12              "analog output module 2, L-bus"
ISE 1C = N                "ignore failed message (RDYINT) (Y/N) ?"
X5A 1K >                  "D/A converter 1, X11"
X5B 1K >                  "D/A converter 2, X12"
X5C 1K >                  "D/A converter 3, X13"
X5D 1K >                  "D/A converter 4, X14"
X5E 1K >                  "D/A converter 5, X15"
X5F 1K >                  "D/A converter 6, X16"
X5G 1K >                  "D/A converter 7, X17"
X5H 1K >                  "D/A converter 8, X18"

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

See also description of master program

7. Miscellaneous

7.1. Appendices

7.1.1. Figures

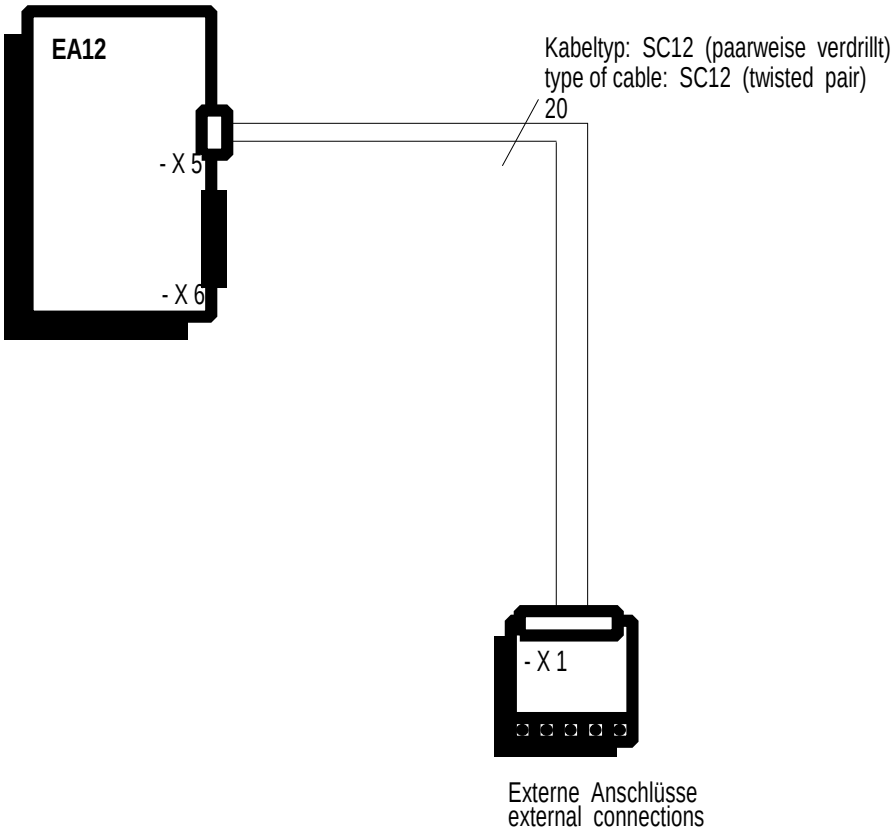


Figure 1

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7.1.2. Drawings

7.1.2.1. Block diagram

Block diagram:	3GE 465 642 9012.00 SU

7.1.2.2. Dimension drawing and table of connectors

Dimension drawing, front plate and table of connectors used	3GE 465 642 9012.00 MB

7.1.2.3. Location diagram

Location diagram	3GE 465 642.9012.00 A0

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8. 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.

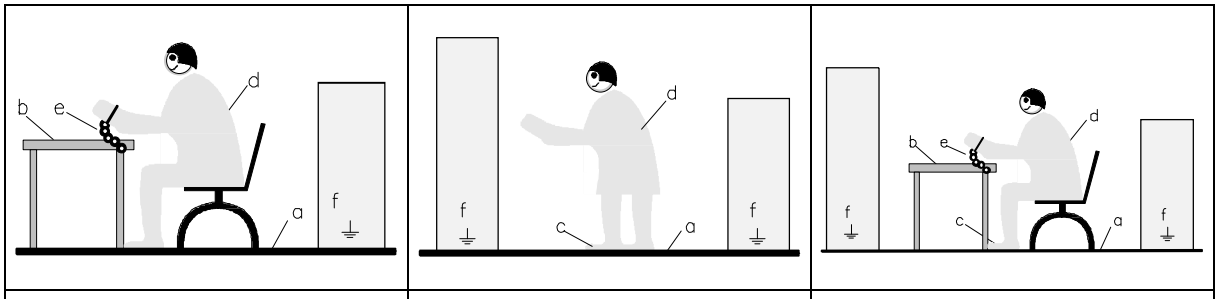
When soldering, the soldering iron tip must be grounded.

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

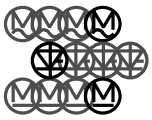


Seated	Standing	Standing/sitting

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