Siemens 6DD1642-0BC0

Analog Output Module / Control signal to plant terminals

Siemens 6DD1642-0BC0 is the EA12 analog output module for the SIMADYN D L-bus system. Its bipolar voltage outputs connect to plant signals through the SC12 cable and SU11 terminal interface, with front-panel test sockets for commissioning.

CONFIGURED SIGNAL

The SIMADYN D software drives the EA12 channels.

EA12 / X5

The output signal and its ground form an assigned pair.

SC12 / SU11

The cable and direct terminal interface connect the plant wiring.

Module designation	EA12
System bus	SIMADYN D L bus
Analog output channels	8
Output voltage	-10 to +10 V
Maximum output current per channel	+/-10 mA
Recommended current at +/-10 V	+/-5 mA for noise suppression

SIGNAL-PAIR BOUNDARY

EA12 connects X5 to SU11 through SC12; the output pins alternate with their associated grounds, while test sockets X11 to X18 correspond to channels 1 to 8. The screened plant wiring terminates at the cabinet screen rail rather than relying on the front panel alone.

Important Notice: EA12 outputs are not defined while system supply voltages rise. Keep the machine in a safe state during energization, and do not remove or insert the module under voltage.

Siemens 6DD1642-0BC0

Analog Output Module / Output limits and supply domains

Simultaneous channel load	8 outputs, each 10 mA
Output resolution	13 bits plus sign; approximately 1 mV
Output accuracy	14 bits; approximately 1 mV
Absolute linearity error	+/-0.6 mV
Differential linearity error	+/-1 mV
Monotonicity	14 bits; approximately 1 mV
Temperature dependency	Maximum 240 microV/C
Short-circuit protection to ground	56 ohm resistor
Permitted short-circuit duration	120 s
Output connector	X5, 20-pin

LOAD AND NOISE

All eight outputs may be loaded simultaneously at 10 mA each. At +/-10 V, +/-5 mA is recommended for noise suppression.

FAULT DURATION

The ground-fault protection is time-limited:120 s. It is not a continuous short-circuit operating mode.

+5 V supply range	+4.75 to +5.25 V
+5 V typical current drain	600 mA
+15 V supply range	+14.4 to +15.6 V
+15 V typical current drain	200 mA
-15 V supply range	-15.6 to -14.4 V
-15 V typical current drain	200 mA

Siemens 6DD1642-0BC0

Analog Output Module / Channel map and wiring discipline

Channel 1	X5 pins 1 / 2; SU11 1 / 2; test X11
Channel 2	X5 pins 3 / 4; SU11 3 / 4; test X12
Channel 3	X5 pins 5 / 6; SU11 5 / 6; test X13
Channel 4	X5 pins 7 / 8; SU11 7 / 8; test X14
Channel 5	X5 pins 9 / 10; SU11 9 / 10; test X15
Channel 6	X5 pins 11 / 12; SU11 11 / 12; test X16
Channel 7	X5 pins 13 / 14; SU11 13 / 14; test X17
Channel 8	X5 pins 15 / 16; SU11 15 / 16; test X18

X5 pins 17 /18	Electronics ground through zero-ohm resistors
X5 pins 19 /20	Ground
Configured output names	X5A through X5H

SCREEN RAIL

Screen plant-side I/O wiring. Bond it over a broad area between the interface and cabinet cable entry.

GROUND TOPOLOGY

The output grounds are connected through zero-ohm resistors and an associated inductance to electronics ground.

Secure the module to the subrack. EA12 can operate without a fan, but free air circulation and the system air-intake limit remain separate installation checks.

Siemens 6DD1642-0BC0

Analog Output Module / Warm-up and calibration decisions

Stabilize	Operate approximately 2 min before adjustment.
Offset first	Configured output 0.0; measure 0 V at the channel.
Gain second	Configured output 2.0; check 10 V using the separate gain adjustment.
Direction	Clockwise offset adjustment increases the output voltage.

CHANNEL / TEST SOCKET -> OFFSET / GAIN POTENTIOMETERS

1 / X11	R49 / R46
2 / X12	R55 / R52
3 / X13	R61 / R58
4 / X14	R67 / R64
5 / X15	R73 / R70
6 / X16	R79 / R76
7 / X17	R85 / R82
8 / X18	R91 / R88

TEMPERATURE AND GROUND NOISE

The output temperature dependency is specified at up to approximately 240 microV/C. Ground-cable spikes from the switch-mode supply can reach 100 mV; smoothing at the load input and low-ohmic loading are the stated suppression measures.

System environment: air intake 0 to +55 C; storage -25 to +70 C. Operation without a fan is possible for EA12, subject to the installed system cooling arrangement.

Siemens 6DD1642-0BC0

Analog Output Module / Engineering questions and safe service

Why can an EA12 output be noisy even when its load is below 10 mA?

The maximum channel load is not the preferred noise-suppression operating point. At +/-10 V, the recommended output current is +/-5 mA; switch-mode supply spikes on the ground cable can also require smoothing at the load input and a low-ohmic load.

Does the EA12 ground-fault protection permit a permanent short circuit?

No. The output-to-ground protection uses a 56 ohm resistor and the permitted short-circuit duration is 120 seconds. Remove the fault rather than leaving the output shorted indefinitely.

When should offset be checked relative to gain?

Allow approximately two minutes for the board to reach operating temperature. Check offset first with the configured output at 0.0 and measure 0 V; the subsequent gain check uses a configured value of 2.0 and a 10 V measurement. Use the channel's separate offset and gain potentiometers.

Which measurements belong to channel 8 at X5?

Channel 8 uses X5 pin 15 for its output and pin 16 for ground. The matching front-panel test socket is X18 and the configuration designation is X5H; SU11 terminals 15 and 16 carry the same pair.

Does SU11 convert the EA12 voltage signals?

SU11 provides direct terminal access without signal conversion. Connect it through SC12; this interface arrangement is distinct from terminal modules that adapt or convert other signal types.

Why is tightening the subrack mounting important for analog signal quality?

Noise-immune EA12 operation requires the module to be tightly screwed into the subrack. Screen the plant-side signals and connect the screen over the largest practical surface area to the cabinet screen rail; front-panel contact alone does not replace that arrangement.

Can output drift be ignored after a large cabinet-temperature change?

Offset and gain are adjusted near 20 C, and the output temperature dependency is specified as a maximum of approximately 240 microV per C. Check the channel at its actual operating temperature before deciding whether readjustment is needed.

Are configured output values guaranteed during supply ramp-up?

No. SIMADYN D output states are undefined while the supply voltages rise. The machine design and commissioning sequence must prevent those start-up states from creating a hazardous condition.

SYSTEM ENERGIZATION

Keep the connected machine safe while supply voltages rise. Do not insert or remove the EA12 with the subrack energized; separate calibration measurements from removal work.

Siemens 6DD1642-0BC0

Analog Output Module / Evidence and related portfolio

SOURCE LEDGER

SIMADYN D Hardware

A5E01114837-02, cover edition 04.2011; general data chapter 08.2005; EA12 chapter 12.2004, original pages 94-98.

UNCHANGED MANUFACTURER PAGES

The technical reference covers EA12 output limits, channel wiring and calibration decisions. The manufacturer excerpt retains 28 unchanged original pages covering source identity, installation/EMC guidelines, system conditions and the complete EA12 section; it is not the full manual.

SIMADYN D SERIES CATALOG

Related family browsing; these links do not establish substitution or a complete compatible assembly.

View Siemens 6DD1641-0AC0 page

View Siemens 6DD1600-0AK0 page

View Siemens 6DD1670-0AF0 page

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Siemens 6DD1642-0BC0