



User manual

CX3-DG Compact amplifier

0048402A, Rev003

TELESTE

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Introduction

The CX3-DG is a compact dual output amplifier. Output performance meets the requirements of forward and return path DOCSIS 3.1 signals.

Adjustments are using electrical circuits that are controlled with push buttons. A high gain return amplifier is fixed built on the mother board.

Key features include: 1.2 GHz forward path, GaN technology, 65/85/204 MHz return channel, interstage gain and sloped adjustment, 7-segment display for adjustments, cable simulator option, BYPASS at input and 2 output ports. All ports with remote powering (CX3L-DG only). Optional: RIS and PowerSave.

Installation

Plan the installation with enough clearance to install the cable and cable connectors. The amplifier should be installed vertically so that the external cables are facing downwards. When installing the amplifier in its final location, make certain that it has adequate ventilation on all sides. In particular, it is necessary to provide at least 150 mm of room above and below the amplifier for air circulation.

Wall mounting

Drill two mounting holes 233 mm apart in the mounting surface. Figure 2 depicts the locations of the wall mount brackets (Pos. B). Select appropriate length 5 mm mounting bolts (not supplied) and washers. Tighten the mounting bolts. The amount of torque required depends on the mounting surface.

The lid retaining socket head screws are fasten with a H5 hex nut driver. Use no more than 3 Nm torque. Before closing the lid it should be checked that:

- nothing is trapped between the lid and the case
- all case gaskets are intact and in their correct positions
- lid seats evenly on the rubber gasket

The CX3-DG housing should be grounded from an approved earth point to the housing ground lug (Fig. 2, Pos. A).

Coaxial connections

The CX3-DG amplifier requires pin-type connectors for all RF connections. The amplifier has spring loaded seizure assemblies on coaxial ports that provide a tight connection with precise alignment between contact points. All coaxial output ports have a standard 5/8" thread.

Suitable length for the center conductor pin is approximately 26...29 mm (Fig. 1). Any longer pins must be trimmed before inserting them into the housing. After cutting the pin, trim the sharp edges. Using connectors with center conductors pins exceeding 1.8 mm in diameter will permanently damage spring loaded seizure assemblies. Ensure that the center conductor pin is not deformed, causing destruction of the spring loaded seizure assembly.

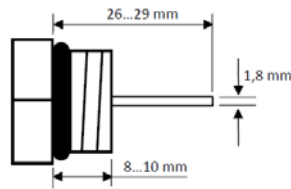


Figure 1. Centre conductor length

Powering



NOTICE: To reduce the risk of electric shock, do not remove the shielding cover of the power supply unit if it is connected. All electrical installations must be carried out by authorized and competent technicians in accordance with the national or regional electrical regulations. There are no user serviceable parts inside. Unauthorized repairs or modifications result in permanent damage to the equipment, and will void the warranty.

Common precautions:

- The CX3-DG amplifier is intended for installation in restricted access locations (dedicated equipment rooms, equipment closet, or the like)
- Operate the device only on the specified supply voltage.
- The CX3-DG must never be operated without its shielding covers.
- The CX3-DG has no separate power switch thus the coaxial cables and external AMP connector (CX3R-DG) or power cord (CX3L-DG) must be easily accessible to be able to disconnect it from the power source.
- Disconnect the power cord by the connector only (CX3L-DG). Never pull on the cable portion of the power cord.
- Do not place or drop heavy or sharp-edged objects on the power cord.
- The power must be disconnected when installing or removing the CX3-DG.

Additional safety requirements for Norway and Sweden:

- Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system must be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11).

The CX3-DG is available either with remote or local powering options. The power supply is integrated and cannot be replaced. The following subsections describe the different models.

CX3R-DG with remote powering: (28...90 V AC)

The CX3R-DG is either powered via one of the coaxial cables or via de AMP connection at the side. The maximum allowed port to port current feed is 7 A. In case the BYPASS port is used, the amplifier connected to the BYPASS port can be remotely fed as well. Also the 2 output ports can be remotely fed. On delivery, only RF INPUT and both OUTPUT ports are provided with a fuse. BYPASS port is disabled for both RF (CXM1 in use) and remote power (no fuse).

Remote power from INPUT port is also available at the AMP port at the right (Fig. 1, Pos. C).

CX3L-DG with local powering: (230 VAC)

This special version of the DG model comes without remote powering. The locally powered CX3L-DG is connected to the mains voltage of 230 VAC via its own power cord and has no fuses nor AC feed-through at its RF ports. The power supply unit is double shielded and does not require separate grounding. However, ensure that the housing of the CX3L-DG is properly connected to the earth in order to meet safety requirements. Proper grounding will also improve protection from the effects of interference and thus increase the overall reliability of the system.

Interfaces

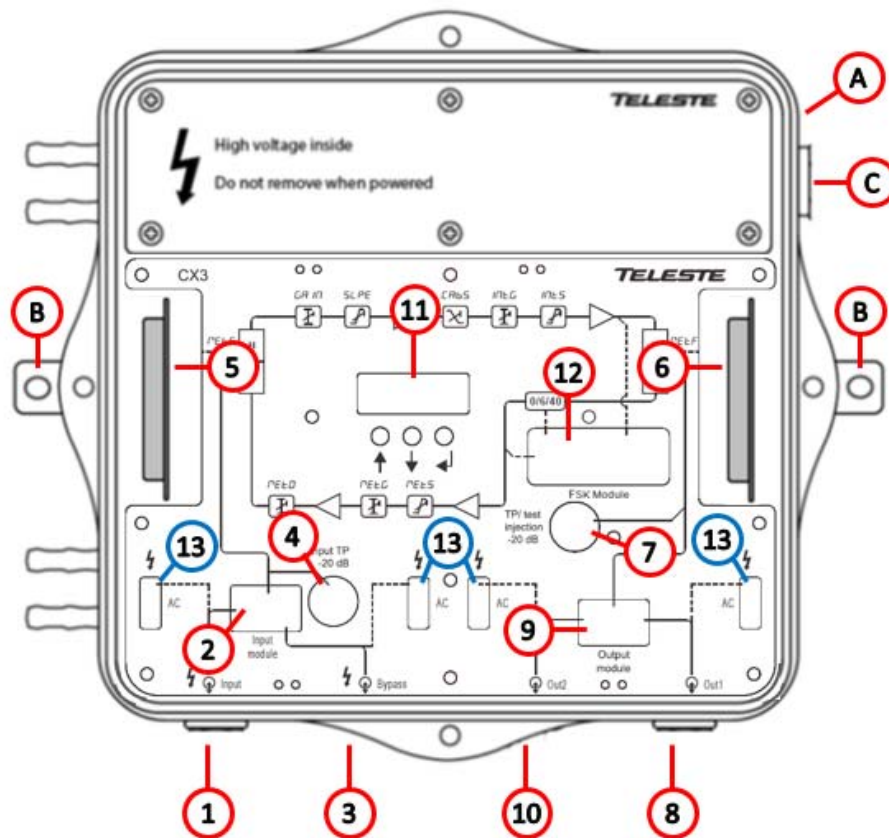


Figure 2 CX3R-DG housing details

- | | |
|---------------------------------------|---|
| 1) INPUT port 5/8" | 10) OUTPUT port 2 5/8" |
| 2) BYPASS module | 11) Local user interface |
| 3) BYPASS port 5/8" | 12) FSK module slot |
| 4) INPUT test point -20 dB | 13) Fuses (<i>not available at CX3L-DG</i>) |
| 5) INPUT diplex filter module | A) Ground |
| 6) OUTPUT diplex filter module | B) Brackets |
| 7) OUTPUT test/injection point -20 dB | C) AMP remote power port (CX3R-DG) or 230VAC power cord (CX3L-DG) |
| 8) OUTPUT port 1 5/8" | |
| 9) OUTPUT module | |

Menu and block diagram

The internal cover plate shows the block diagram and corresponding parameters in the menu structure. Use the “Up” and “Down” buttons to scroll through the menu and settings, and the “Enter” button to make the selection.

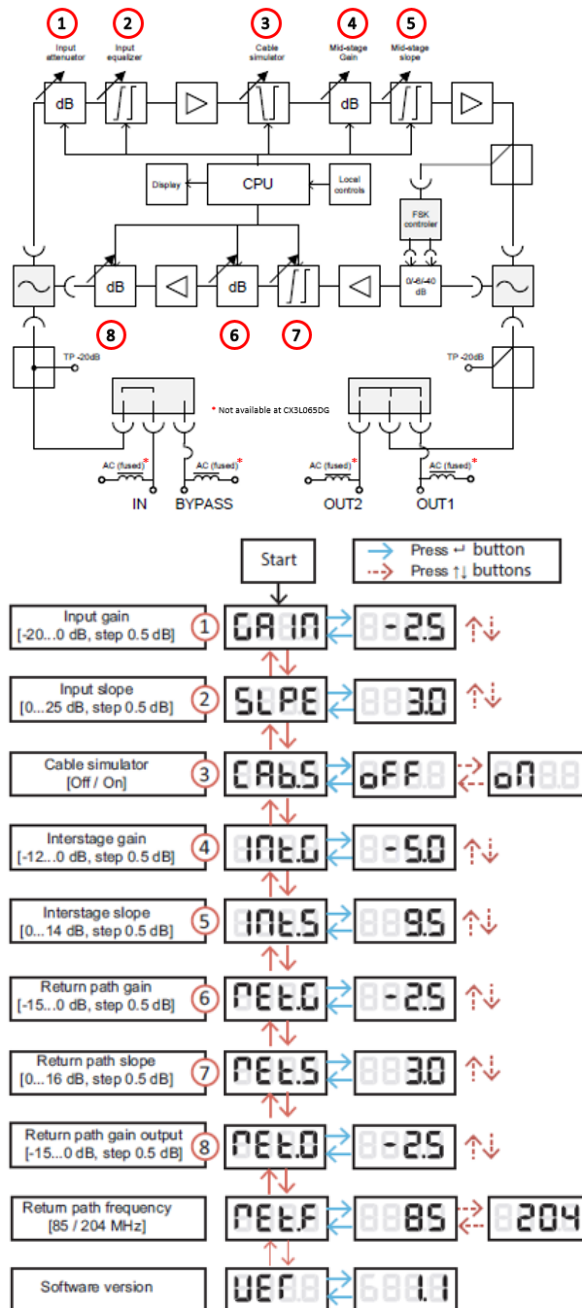


Figure 3 OX3 menu

Local user interface

The CX3-DG has a local user interface consisting of a 4*7-segments display and 3 buttons. This local UI is used for basic configuration. During the power-up the display indicates "00:00" till "99:99". Pressing "Enter" button wakes up the display and activates the first menu item. If there is no button activity during ~4 minutes, the display will go into stand-by mode.

Control of the upstream ingress switches

The CX3-DG has ingress switches in the upstream path of -6 and -40 dB. They can be used to identify the ingress source in a network. There are 2 ways of controlling the upstream switches. Both ways require a CXT-plugin in the FSK module slot (see Fig. 2, 12).

CXT002, manual on-site control

The CXT002 is a service module for on-site field operations for local control of the ingress switches. It is used in the FSK module slot.

A lanyard is attached to the CXT002 as visible sign that ingress switches are in use. However, the cord can also be wrapped inside the amplifier in case fault finding requires a temporary visit to another site and lid needs to be closed in the meanwhile. Note that while inserting CXT002, the ingress switches are either 6 or 40 dB, but never 0 dB.

(picture shows similar application for the OX3 compact node).



	Ingress switch (dB) (see CX3-DG spec)	LED colour
Inserting the CXT002 for the first time	-6	Yellow
Pushing the button for 3 seconds disables the upstream path	-40	Red
Pushing the button again for 3 seconds returns to default state	-6	Yellow

CXT001, remote control

The CXT001 supports Remote Ingress Switching (RIS), allowing return path ingress switch control via forward path data link. The CXT001 uses a narrowband one-way FSK communication channel and automatically searches for and locks to a carrier of an HDM155 within the tuning range. The carrier frequency is typically 253 MHz. The carrier frequency should not be chosen in between 2 adjacent QAM carriers.



Remote ingress switch control via an HDM155 RIS link

Each CXT001 has a unique MAC address, which is printed at the side and also encapsulated in a QR-code. The MAC addresses need to be added to the HDM155 database to allow remote ingress switching. See the HDM155 documentation for more details.

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WEEE Notice

This product complies with the relevant clauses of the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE). The unit must be recycled or discarded according to applicable local and national regulations.



European Conformity

This equipment conforms to all applicable regulations and directives of European Union and has gone through relevant conformity assessment procedures.



UK Conformity

This equipment conforms to all applicable regulations and directives of the United Kingdom and has gone through relevant conformity assessment procedures.



Teleste Corporation
P.O. Box 323
FI-20101 Turku
Street address: Telestenkatu 1, 20660 Littoinen
FINLAND

www.teleste.com

TELESTE

www.teleste.com
