TX-ICE Series

DVB-T / DVB-T2

TECHNICAL MANUAL

itelsis group

If upon consulting this manual, you have any doubts regarding the operation of the equipment, please get in contact with our technical support department.

‘Sistemas Audiovisuales Itelsis, S.L., declares, under its responsibility, that this device complies with the provisions of Directive 99/05/CE, European Parliament and Council on March 9, 1999, transposed into Spanish law by Royal Decree 1890/2000 of 20 November ‘.

Technical Support Itelsis

Tel.: +34 981935570 Fax: +34 981936799

support@itelsis.com

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1. GENERAL DESCRIPTION

The Agile Transmitter ICE series is a Digital Terrestrial Television Transmitter designed to meet the EN 300744 (DVB-T/H), EN302755 (DVB-T2).

It uses an internal RF modulator with two ASI and two IP inputs and generates at its output a COFDM digitally modulated TV signal at RF frequency. This RF signal is sent to a power amplifier stage that increases its level to the required power.

The high stability and frequency accuracy are based on the use of a 10 MHz OCXO which can be disciplined from an external reference. Optionally the OCXO can be replaced by GPS/GLONASS receiver able to synchronize to the system of GPS/GLONASS satellites or an external reference of 1PPS.

The ICE COMPACT series consists of several references depending on the maximum output power they can reach:

Reference	*Maximum power in RF OUT connector*
ICE 600	600W
ICE 1000	1200W
ICE 1500	1800W
ICE 2000	2400W

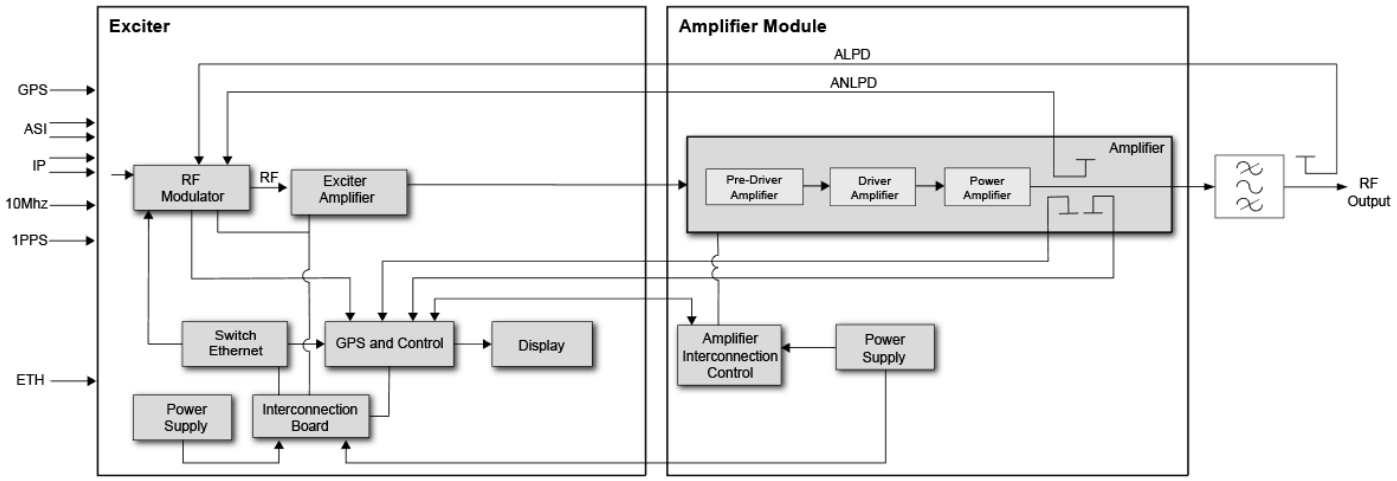
The Transmitter consists of the following components:

- RF modulator.
- Power Supplies.
- Interconnection and measurement Board.
- Control Board.
- Display.
- Switch Ethernet.
- Amplifier Stages.

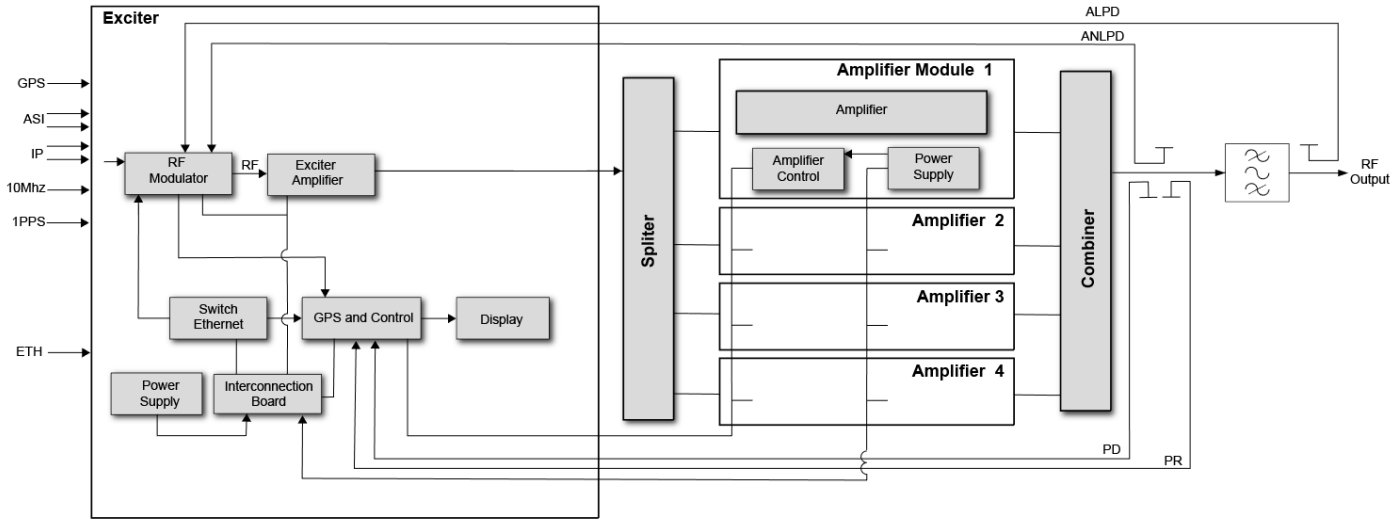
In the ICE 600 reference, the high power amplifier stages and main power supplies are grouped in a 19’ 3U height subrack with 4 pallets. The other modules are grouped in a 19’ 1U exciter.

In references ICE 1000 and ICE 2000, there are 2 and 4 amplifier modules to achieve the x2 and x4 output power capability. In this case the modules are hot swappable and exciter can control external elements of a cabinet (extractors, doors opening detection, temperature…)

1.1 Transmitter ICE 600 Block Diagram

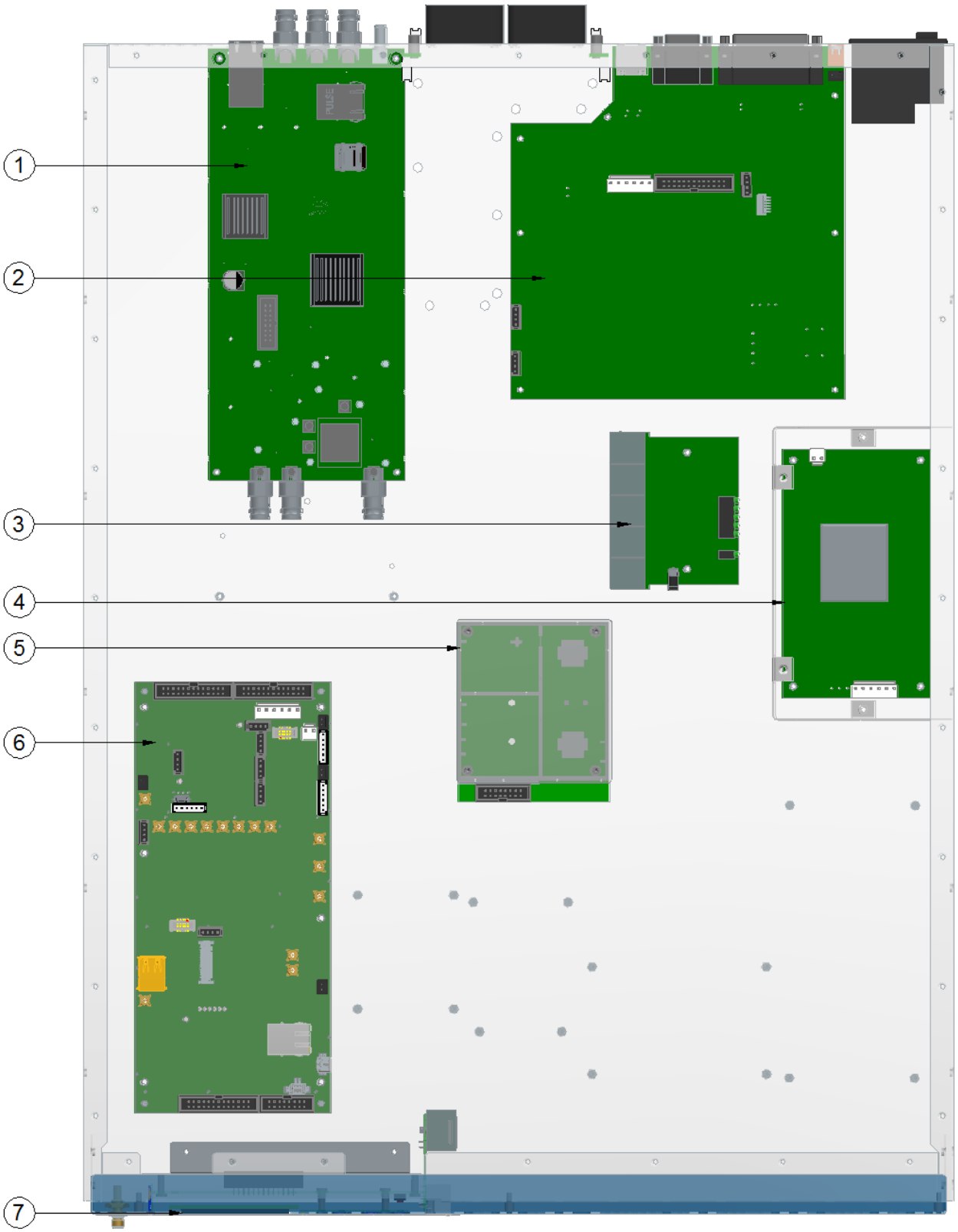


1.2 Transmitter ICE 1000 / ICE 1500 / ICE 2000 Block Diagram



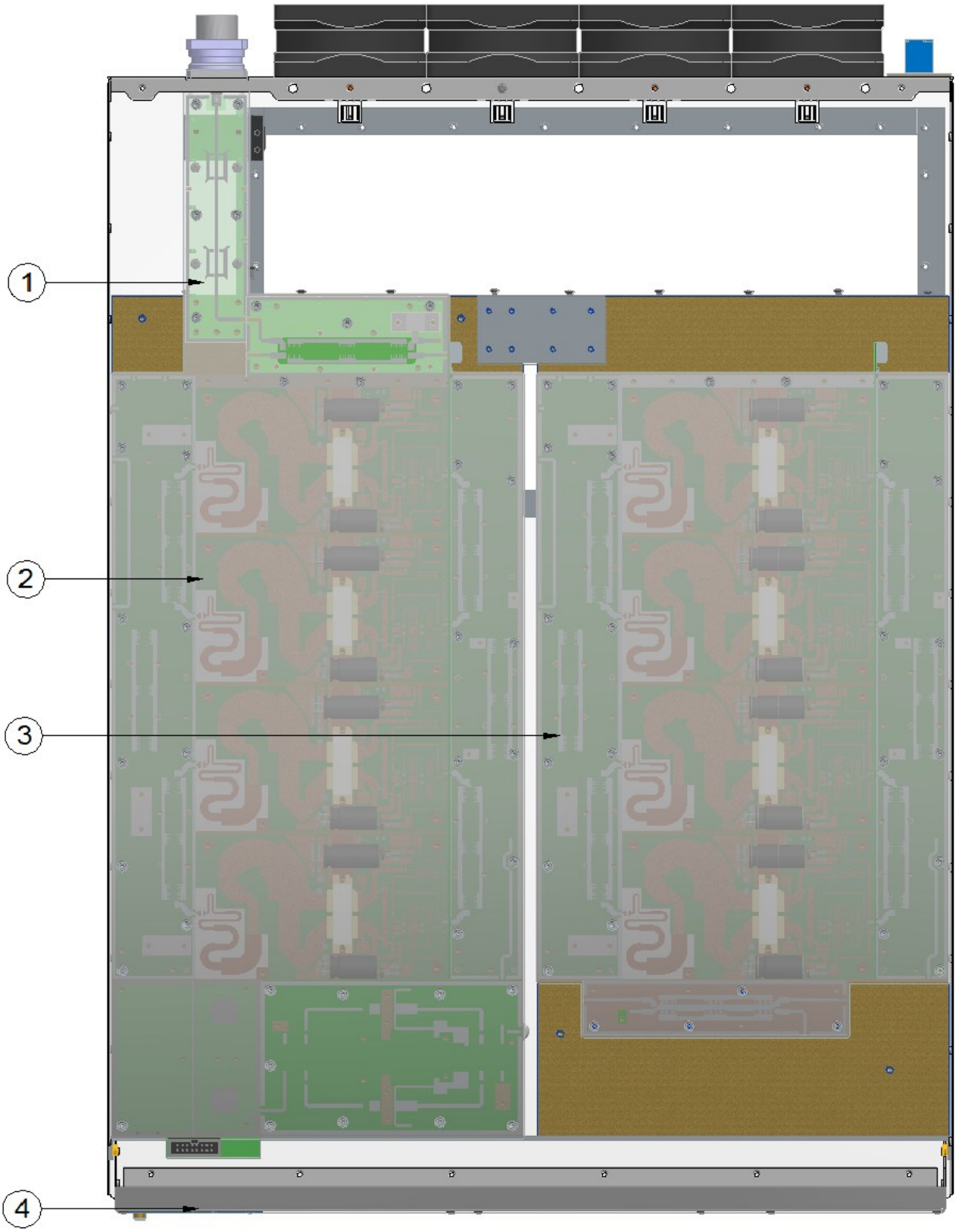
1.3 Positioning Diagram

The different modules and components that form the Exciter.



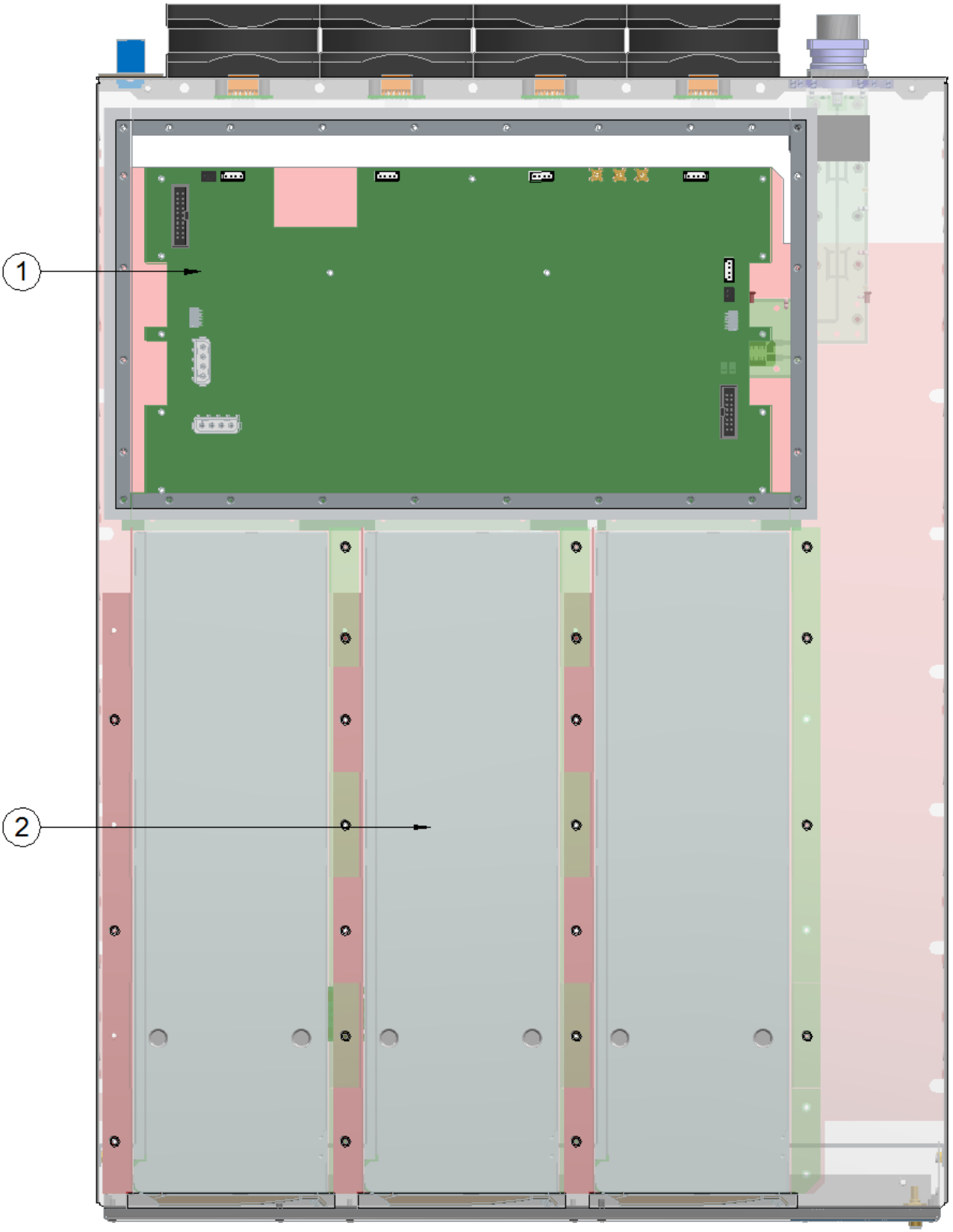
1- RF modulator.
2- Interconnection and measurement Board.
3- Switch Ethernet.
4- Auxiliarly Power Supply.
5- Amplifier Stages.
6- Control Board.
7- Display.

The different modules and components that form the 3U height modular Amplifier Unit (Top view)



1- Coupler
2- Amplifier Stages 1.
3- Amplifier Stages 2. (4 pallets in total)
4- Display

The different modules and components that form the 3U height modular Amplifier Unit (Bottom view)



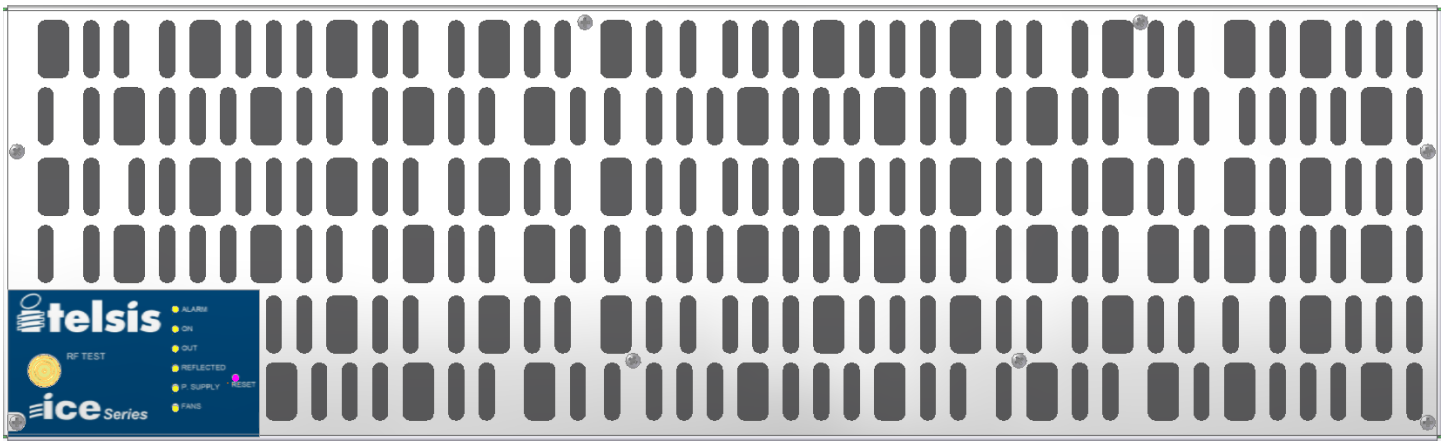
1- Power Supply (x3).

2- Interconnection and measurement Board.

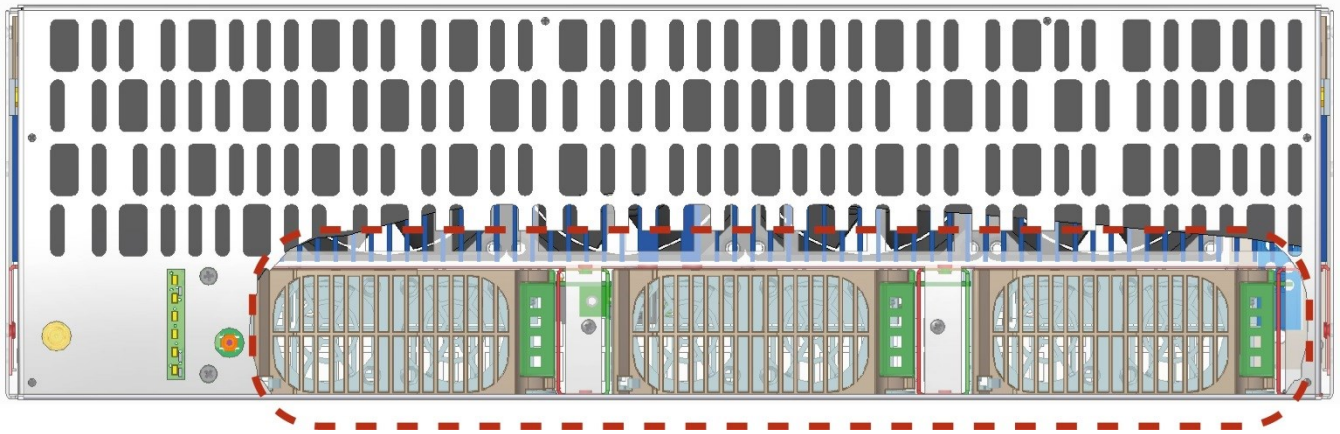
1.4 Front Panel

Different connectors, push-buttons and indicators are located on the front panel of the Exciter, 3U height equipment.
In case of 3U equipment, the hot swappable power supplies are accessible removing the front cover.

3U Front Panel



3U power supply access



Elements in the Front Panel:

RF TEST: Test connector for the RF output signal.

There are several LEDs to indicate operation:

STATE LED: Unit state depending of the colour light:

- Green: OK.
- Yellow: Warning.
- Red: Alarm.

OUT LED: Equipment delivers output power when it lights.

IN LED: Presence of input signal to the modulator when it lights.

ALARM LED: General alarm when it lights.

REFLECTED LED: Amplifier unit led to indicate is a Reflected power alarm occurred.

P. SUPPLY LED: Amplifier unit led to indicate the state of the Power Supplies.

FANS LED: Amplifier unit led to indicate the state of the fans.

LCD screen and 6 push-buttons: Local user interface for displaying and configuring equipment parameters.

USB: Mini USB Type-B connector. Interface used for local maintenance.

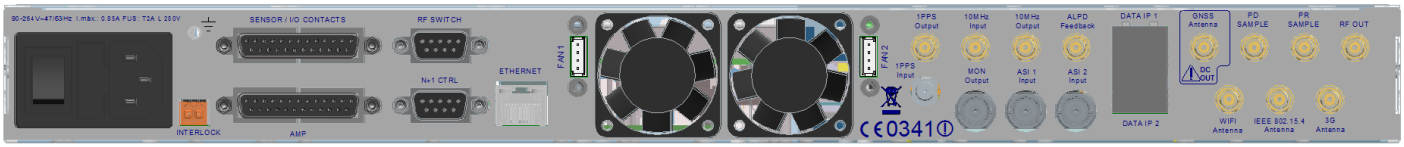
ETHERNET: RJ45 Ethernet connector (10/100 Mbps).

RESET: Push-button to reset the Unit.

1.5 Rear Panel

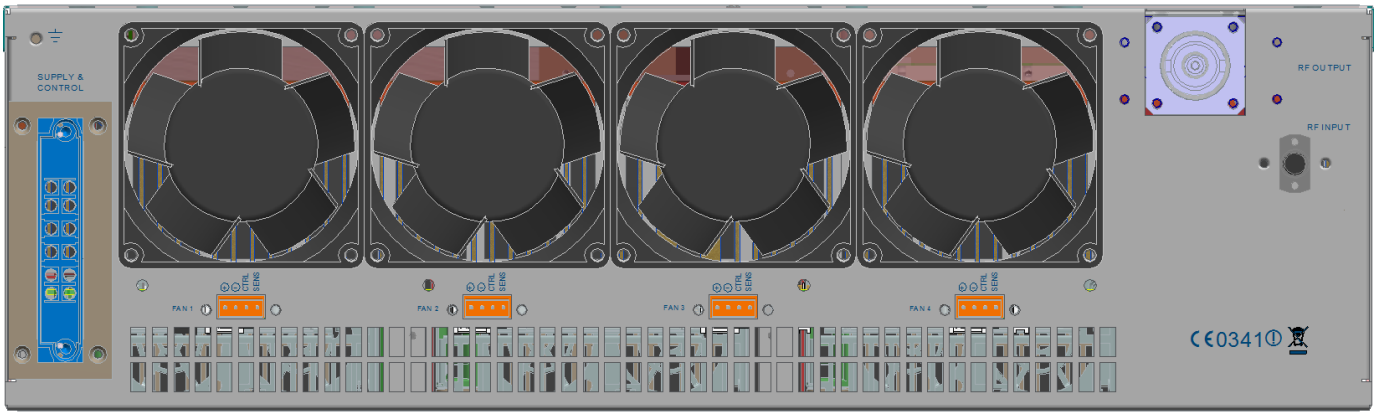
Different connectors and fans are located on the back panel of the 3U and Exciter height equipment's.

Exciter Rear Panel



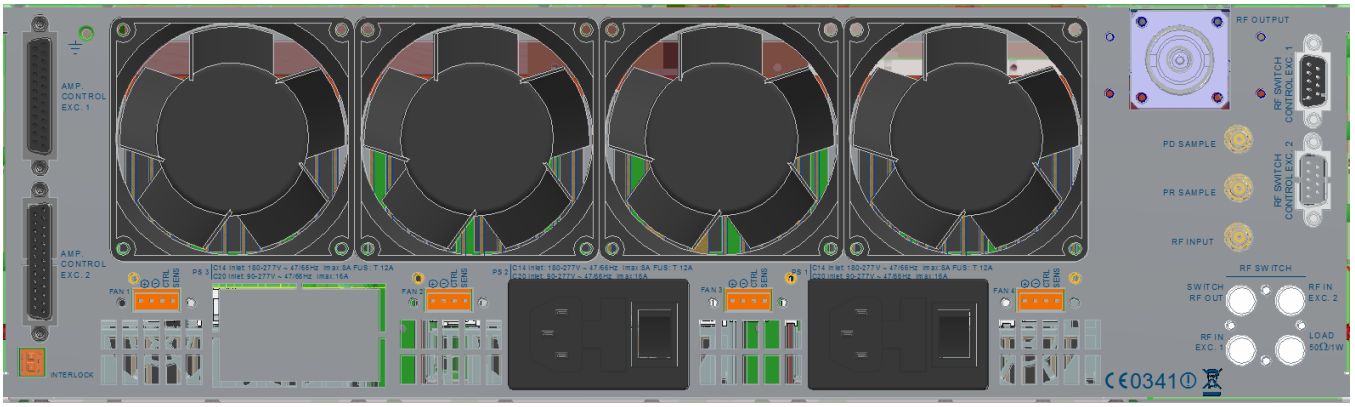
FAN1 / 2 / 3: Fans power connectors.
RF OUT: RF Output signal connector.
WIFI Antenna: WIFI antenna input connector.
IEEE 802.15.4 Antenna: Zigbee antenna input connector**.**
3G Antenna: 3G antenna input connector.
I/O CONTACTS: Contacts interface for use by a relay based remote management.
1PPS Output: 1PPS output connector.
10MHz Input: External 10MHz reference input connector.
10MHz Output: Transmitter 10MHz reference output connector.
ALPD Feedback: Feedback input for the adaptative predistorter-Lineal predistortion.
PD SAMPLE (Exciter): Feedback input from the amplifier output for direct power measure and non-linear predistorter.
PR SAMPLE (Exciter): Feedback input from the amplifier output for reflected power measure.
AMP (Exciter): Control interface for connection to the Amplifier unit.
1PPS Input: 1PPS input connector.
MON Output: Auxiliar output connector for monitoring internal ASI or RF signals.
ASI 1 Input: ASI 1 input connector.
ASI 2 Input: ASI 2 input connector.
DATA IP 1: Data IP 1 input connector.
DATA IP 2: Data IP 2 input connector.
GNSS Antenna: GPS/GLONASS antenna input connect *(**Warning: Powered connector**).*
INTERLOCK: Contacts for an external protection system. It cuts power if contacts are open.
RF SWITCH: Control interface for connecting to the coaxial switch.
N+1 CTRL: Control interface for use in N+ 1 system.
ETHERNET: RJ45 Ethernet connector (10/100 Mbps).
C14/C20 inlet: Power Entry Module to connect the equipment to the AC.
Grounding Connection: Screw to optionally connect the equipment to an ground cable.

3U Amplifier Unit Rear Panel (Hot swap version)



FAN1 / 2 / 3 / 4: Fans power connectors.
RF OUTPUT: RF Output signal hot-swap connector.
RF INPUT: RF Input signal hot swap connector
SUPPLY AND CONTROL Hybrid hot-swap connector containing Vac input contacts and control lines from the exciter.
Grounding Connection: Screw to optionally connect the equipment to an ground cable.

3U Amplifier Unit Rear Panel (Stand alone version)



FAN1 / 2 / 3 / 4: Fans power connectors.
RF OUTPUT: RF Output signal connector.
RF INPUT: RF Input signal connector
PD SAMPLE: Output power sample for direct power measure and non-linear predistorter in the exciter.
PR SAMPLE: Reflected power sample for reflected power measure in the exciter.
AMP CONTROL EXC 1: Connection for controlling the unit from the exciter
INTERLOCK: Contacts for an external protection system. It cuts power if contacts are open.
C14/C20 inlet: Power Entry Module to connect the equipment to the AC.
Grounding Connection: Screw to optionally connect the equipment to an ground cable.

In case of Dual Drive option is installed: With this option a low power RF switch is installed inside the equipment presenting 4 external SMA connectors

RF IN EXC 1 / 2: RF Input signal from exciter 1 / exciter 2
AMP CONTROL EXC 1 / 2: Connection for controlling the unit from the exciter 1 / exciter 2
RF SWITCH EXC 1 / 2: Connection for controlling the internal RF SWITCH from the exciter 1 / exciter 2
SWITCH RF OUT: Output signal of the internal RF SWITCH to be connected to the RF INPUT connector.
LOAD 50Ω/1W: Connection for dummy load of internal RF SWITCH. This SMA load must be connected externally to this point.

Sistemas Audiovisuales Itelsis, S.L.
Polg.Ind. Boisaca, Xosé Villar Granjel,28 15890 Santiago de Compostela, Spain
Tel. +34 981935570, www.itelsis.com e-mail:itelsis@itelsis.com