

E-Compact

Less energy. More power.

MP Series - EX8001

High Efficiency VHF-BIII Transmitters

ISDB-T TV Digital: 300 Watts RMS



MP Series

E-Compact Family of Medium Power VHF-BIII Digital TV Transmitters features fully solid-state drivers, air-cooled and is structured on standard 19" cabinets.

Its compact design combines high power density per amplifier module and efficient energy consumption, embedded with Real Time A-DPD pre-correction technology that allows to recover MER values in an imperceptible way if there are changes in the equipment output power.

It features the option of Dual Exciter drivers, providing automatic redundancy to the equipment without the need for management by a separate control module.

Based upon Doherty topology Broadband Power Drawer delivers High performance with efficiency up to 38%.

High reliability against power failures.

Highlights



- Full Equipment control, including Power Drawers, performed by the Exciter Driver, dispensing the need for external control units.
- Power Drawers with high efficiency Doherty topology, operating up to 380 W RMS @ ISDB-T.
- Real Time A-DPD function automatic non-linear pre-correction and linear pre-correction.
- Built-in parameterizable BTS decompressor, compatible with other brands.
- Embedded remux, allows the signal adjustment according to the need for transmission.
- Onboard satellite receiver, with Free to Air, IRDETO³, CONAX³, BISS, VERIMATRIX³ and NAGRAVISION³ license options.
- Automatic fan speed control, resulting in low noise levels, energy savings and longer device life.
- "Easy Maintenance" concept offering, among others, Plug-In connection for Power Supplies and Power Drawers.
- Up to two power supplies per transmitter, operating in "Share" mode, allows for different levels of power redundancy.

Available resources

<p>Easy Maintenance concept Power Supplies and Power Drawers with plug-in connection, does not require the use of cables and wiring, allowing quick and safe replacement.</p>	AVAILABLE
<p>Embedded WEB Server Remote access¹ of the settings and management of the transmitter through the Ethernet² port is possible, using a PC or Smartphone browser, without the need to install drivers or applications.</p>	AVAILABLE
<p>Real Time A-DPD Linear and Nonlinear Pre-Correction Imperceptible Automatic pre-correction applied due to changes in transmitter output power to recover MER values and intermodulation.</p>	AVAILABLE
<p>BTS Decompression Parameterizable BTS decompressor, embedded in the Transmitter, eliminating the use of auxiliary devices in the system, thus permitting interoperability with other brands.</p>	AVAILABLE
<p>Embedded Remux PID filtering, insertion of PSI/SI static tables, Virtual Channel configuration and TMCC parameterization.</p>	AVAILABLE
<p>Exciters Inputs / Outputs <i>Inputs:</i> BTS/TS over IP, 2x ASI/310M, 1PPS, 10MHz e ANTENA GPS. <i>Outputs:</i> 2x ASI/310M, 1PPS, 10MHz, 2x USB 2.0 Type B, USB 2.0 Type A and Ethernet² RJ45. <i>The BTS/TS over IP input can be converted to ASI and made available on the ASI/310M outputs without interfering with the modulating signal.</i></p>	AVAILABLE
<p>Passive Elements Critical Mask Filter (50dB), RF probe after mask filter.</p>	AVAILABLE
<p>1200 W Power Supply Power Supplies with plug-in type connection ("Easy Maintenance" concept), eliminates the use of cables and wiring, for quick and safe replacement. EC602MP: 01 power supply present in the Power Module.</p>	AVAILABLE
<p>Digital manuals in English.</p>	AVAILABLE
<p>Dual Exciter Backup driver, which allows automatic redundancy, without the need for management by a separate control module.</p>	OPTIONAL
<p>Ethernet² Switch standard cabinet 19" Standard with the Double Excitement option.</p>	OPTIONAL
<p>Instrumental through Software Pre-correction tool, MER reading, constellation and spectral density (GUI8001).</p>	OPTIONAL
<p>GPS time base High precision time base sync via GPS. High performance running on SFN (Single Frequency Network). Features an external GPS antenna and surge protector.</p>	OPTIONAL
<p>UHF Tuner (Terrestrial Reception) ISDB-T UHF receiver and demodulator for terrestrial signal retransmission. It comes with a 5 or 7 pole mechanical tuning filter, depending on the conditions of the adjacent channels.</p>	OPTIONAL
<p>SAT Tuner (Satellite Reception) L-Band DVB-S/S2 receiver compatible with C-band and Ku-band LNBs. Electric surge protector included.</p>	OPTIONAL
<p>CAS Tuner (Satellite Reception with Conditional Access) L-Band DVB-S/S2 receiver compatible with C-band and Ku-band LNB. It performs the decryption of up to 04 services simultaneously and visualization of up to 08 services on the display. Electric surge protector included.</p>	OPTIONAL
<p>Decryption Licenses for CAS Tuner: IRDETO³, CONAX³, BISS-1, NAGRAVISION³ and VERIMATRIX³ Decryption licenses can be purchased individually or together, for new transmitters or for transmitters that are already in field operation. In some cases it is possible to enable licenses remotely.</p>	OPTIONAL
<p>Remote telemetry over GPRS Transmitter remote monitoring using the GPRS cell phone network.</p>	OPTIONAL
<p>Redundant Power Supply It has a compartment to accommodate up to 02 Power Supplies of 1,200W each, operates in "Share" mode when the 02 Supplies are present. 100% redundancy for power supplies.</p>	OPTIONAL
<p>Manuals printed in English.</p>	OPTIONAL

General features

Mounting in standard 19" Rack cabinet;

Fully solid state;

360 Watts RMS Doherty Power Drawers with LDMOS Transistors;

Air cooled;

Automatic restart in case of power failure;

Operates on SFN (Single Frequency Network) and MFN (Multiple Frequency Network);

All equipment controlled and managed by firmware;

Access to settings and management of parameters via display interface on the front panel of the Exciter or remote¹ via Ethernet² (WEB server or SNMP);

Alarm signaling LEDs present on the front panel of the Exciter and Power Drawer;

Access the list of current or occurred alarms via display interface on the front panel of the Exciter or remotely¹ via WEB interface;

VSWR and Overpower protection via hardware and software, with automatic power reduction;

Software protection against module temperature increase, with alarm signaling and power reduction;

Automatic fan rotation speed control;

Automatic quiescent bias current compensation of power transistors as a function of temperature;

Transistor AGING compensation adjustment via Exciter front panel display;

USB communication drivers;

Automatic and programmable input switching in hold on and hold off modes;

Power supply with PFC (Power Factor Correction) and soft starter with In-Rush limitation.

Models and their specific characteristics (ISDB-t)

	EC602MP
Output power after filter	300 W
Output power before filter	360 W
AC consumption ⁴	1118 W (Typical)
Thermal dissipation ⁴	2791 BTU/h (Typical)
Efficiency after filter ⁴	26,8 % (Typical)
Efficiency before filter ⁴	34,0 % (Typical)
Exciter Dimensions height x width x length; Weight	1 RU x 19 in x 505 mm (19 7/8 in) 7,0 Kg (15,4 lb)
Power Drawer Dimensions height x width x length; Weight	2 RU x 19" x 635 mm (25 in) 16,2 Kg (35,7 lb)
19" Rack Units	8 RU

Transmission Spectrum Mask (Intermodulation)

Critical mask	
±3,15MHz @ BW = 6MHz	≥50 dB
±4,50MHz @ BW = 6MHz	≥67 dB
±9,00MHz @ BW = 6MHz	≥97 dB
±15,00MHz @ BW = 6MHz	≥97 dB

Technical Characteristics

RF	
Standard	ISDB-T
Operation frequency	174 MHz to 216 MHz (Chanel 7 to Chanel 13)
Bandwidth	6 MHz / 8 MHz
Minimum operating power	10 % of rated power ¹⁰
Pré-correction	A-DPD – Non linear Pré-correction Linear
Typical MER	≥35 dB
Out-of-channel spurs and harmonic distortions	Better than -60 dBc
Transmission Mask (Intermodulation) ⁶	Critical Non-critical (Multichannel)
Power stability	±2 %
RF output impedance	50 Ω
Output Connections	N-Female DIN 7/16" Female EIA 7/8" EIA 1 5/8"

ASI Inputs / Outputs	
Quantity	02 inputs, 02 Outputs
Standard	DVB-ASI 188 /204 BYTES
Connectors	BNC Female
Impedance	75 Ω

Input TSoIP	
Standard	IEEE802,3u 10 Base-T /100Base TX
Connector	RJ45
Encapsulation	UDP/RTP
IP assignment	Static
Multicast	IGMP v2

GPS antenna input (optional)	
Connectors	SMA Female
Impedance	50 Ω
Accessories	External antenna, cable and surge protector

UHF tuner input (optional)	
Reception band	UHF
Standard	ISDB-t
Connectors	SMA Female (Exciter) N Female (input UHF filter)
Impedance	50 Ω

Satellite tuner input (optional)	
Reception band	L band
Polarization	Vertical / Horizontal
LNB voltage	+13 V, +18 V
Standard	DVB-S / DVB-S2
Connectors	SMA Female (Exciter) F Female (connection w/ LNB)
Impedance	75 Ω
Accessories	surge protector

CAS tuner input (optional)	
Reception band	L band
Polarization	Vertical / Horizontal
LNB voltage	+13 V, +18 V
Standard	DVB-S / DVB-S2
Connectors	SMA Female (Exciter) F Female (connection w/ LNB)
Impedance	75 Ω
Optional decryption licenses³	IRDETO CONAX NAGRAVISION VERIMATRIX BISS-1
Accessories	surge protector

10MHz external references - Input / output	
Quantity	01 input, 01 output
Connector	BNC Female
Impedance	50 Ω
Input level	0 a +10dBm
Output Level	+10 dBm

1PPS external references - Input / output	
Quantity	01 input, 01 output
Connector	BNC Female
Impedance	1 kΩ
Input level	3V3 LVTTTL
Output Level	3V3 LVTTTL

Linearization inputs. After Filter / Before Filter.	
After Filter Input	Linear pre-correction
Before Filter Input	Nonlinear pre-correction
Connector	SMA Female
Impedance	50 Ω
Input level	-5 to +5 dBm

Local oscillator	
Oscillator	Synthesized by PLL
Frequency stability	±1 Hz (with Internal GPS) ±35 Hz (without Internal GPS)
Phase noise	≤-95 dBc/Hz @ 1 kHz

ISDB-t Modulation	
Mode OFDM	Mode 1: 2K (2048/3,96 KHz) Mode 2: 4K (4096/1,98 KHz) Mode 3: 8K (8192/0,99 KHz)
Guard interval	1/4, 1/8, 1/16, 1/32
Partial reception	Single segment for mobile devices (1-Sec)
Hierarchical Transmission	Support for 3 layers (A, B and C)
Segments	1 to 13
Modulation	QPSK, DQPSK, 16QAM, 64QAM
FEC	1/2, 2/3, 3/4, 5/6, 7/8
Time Interleaving	0, 1, 2, 4

Electrical Characteristics	
Mains (Factory Configured)	Single-phase 220VAC (M220) Biphasic 220 VAC (B220)
AC input voltage	180~254 VAC
AC frequency	43~63 Hz
Quantity of sources per Power Drawer	01 (default) 02 (optional)
PFC	0.95 (typical), 0.9 (minimum)

Interfaces	
Equipment local control interface	Display LCD 2x40 An keyboard
Signaling leds	Alarm LEDs on the exciter and power drawers
USB	USB 2.0 type B (rear panel) USB 2.0 type A (front panel) USB 2.0 type B (front panel)
Remote access	Connector RJ45 (front panel) Format IEEE802,3u 10 Base-T /100Base TX
Communication interfaces	Ethernet ² WEB server SNMP Interface GUI8001

Environment Features	
Operating altitude	Up to 2500 meters ⁵ (8200 ft) ⁵ above sea level
Environment temperature range	0°C (32°F) to + 45°C (113°F) +25°C (77°F) recommended
Environment humidity range	0 to 95 % non-condensing
Power amplifier cooling	Forced ambient air, front-to-rear flow through high-volume integral fans

Additional Information

MER ≥ 40dB for output power (after filter) of 100 Watts RMS.

Notes:

¹ Consult factory to use transmitter Web Interface access on the same network with multicast stream.

² Ethernet is a trademark of Xerox Corporation.

³ Module with PCMCIA CAM slot (Irdeto, Conax, Nagravision and Verimatrix systems), SMARTCARD and CAM not included.

⁴ Measurements in channel and optimized environment, may vary according to operating frequency and MER.

⁵ Rated power up to 2500 meters (8200 ft). Above 2500 meters (8200 ft), consult factory.

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REV09 – OCT/2024