

ETG 2000.20
ETG 1500.15
ETG 1000.10
ETG 700.7
ETG 500.5
ETG 300.3
ETG 150

(the list of variants is in the manual)

SOLID STATE FM TRANSMITTER

Rev. 00- 11/07/2011
Cod. MAN1009UUK

ELENOS®
broadcast @xperience

USER MANUAL



Operative Office : via G. Amendola 9, 44028 Poggio Renatico (Fe) ITALY
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UNI EN ISO 9001:2008 certified company
Certificate No.102222A

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Please, give us information about the device serial number (shown on the identifying label).

Elenos s.r.l. declares that the equipment in this documentation complies with 1999/05/CE Directive.



For details see "CE Conformity" Section.

EC Declaration of Conformity

According to Directive 1999/5/EC (R&TTE)



We : ELENOS s.r.l. - via G.Amendola, 9 – 44028 Poggio Renatico (FE) - Italy

Declare under our sole responsibility that the product:

ETG 2000.3, ETG 1900.3, ETG 1800.3, ETG 1700.3, ETG 1600.3, ETG 1500.3, ETG 1400.3, ETG 1200.3, ETG 1000.3, ETG 900.3, ETG 800.3, ETG 700.3, ETG 600.3, ETG 500.3, ETG 400.3, ETG 300.3, ETG 250.3, ETG 200.3, ETG 150.3, ETG 100.3
ETG 1400.2, ETG 1200.2, ETG 1000.2, ETG 900.2, ETG 800.2, ETG 700.2, ETG 600.2, ETG 500.2, ETG 400.2, ETG 300.2, ETG 250.2, ETG 200.2, ETG 150.2, ETG 100.2, ETG 80.2
ETG 800.1, ETG 700.1, ETG 600.1, ETG 500.1, ETG 400.1, ETG 300.1, ETG 250.1, ETG 200.1, ETG 150.1, ETG 100.1, ETG 80.1, ETG 50.1,
ETG 150, ETG 100, ETG 80, ETG 50, ETG 40, ETG 30, ETG 20, ETG 10
ETG 2000.20, ETG 1900.20, ETG 1800.20, ETG 1700.20, ETG 1600.20, ETG 1500.20, ETG 1400.20, ETG 1200.20, ETG 1000.20, ETG 900.20, ETG 800.20, ETG 700.20, ETG 600.20, ETG 500.20, ETG 400.20, ETG 300.20, ETG 250.20, ETG 200.20, ETG 150.20, ETG 100.20
ETG 1500.15, ETG 1400.15, ETG 1200.15, ETG 1000.15, ETG 900.15, ETG 800.15, ETG 700.15, ETG 600.15, ETG 500.15, ETG 400.15, ETG 300.15, ETG 250.15, ETG 200.15, ETG 150.15, ETG 100.15, ETG 80.15
ETG 1000.10, ETG 900.10, ETG 800.10, ETG 700.10, ETG 600.10, ETG 500.10, ETG 400.10, ETG 300.10, ETG 250.10, ETG 200.10, ETG 150.10, ETG 100.10, ETG 80.10
ETG 700.7, ETG 600.7, ETG 500.7, ETG 400.7, ETG 300.7, ETG 250.7, ETG 200.7, ETG 150.7, ETG 100.7, ETG 80.7, ETG 50.7
ETG 500.5, ETG 400.5, ETG 300.5, ETG 250.5, ETG 200.5, ETG 150.5, ETG 100.5, ETG 80.5, ETG 50.5
ETG 300.3, ETG 250.3, ETG 200.3, ETG 150.3, ETG 100.3, ETG 80.3, ETG 50.3

With intended purpose: VHF FM broadcast transmitters

And manufactured by: ELENOS s.r.l.

To which this declaration relates is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/CE).

The product is in conformity with the following standards and/or other normative documents:

Health and safety requirements pursuant to Article 3.1.a

Standards applied: EN60215: 1989/A1:1992/A2:1994

Protection requirements concerning electromagnetic compatibility pursuant to article 3.1.b

Standards applied: EN301 489-1 V 1.8.1 ; EN301 489-11 V 1.3.1;

Measures for the efficient use of the radio frequency spectrum pursuant to article 3.2

Standards applied: EN302 018-2 V1.2.1

Supplementary information :

Notified body involved: Nemko AS

Technical file held by : Elenos s.r.l and Nemko AS

Place and Date: Ferrara My 16, 2011

Responsible person: Leonardo Busi (Amministratore unico)
Tel. 439 0532 829965
e.mail : leonardobusi@elenos.com

Signature

Revision

N°	Date	Description
00	11/07/2011	First release

Family variants

Transmitter	N° RF modules	N° driver	Max output power
ETG 2000.20 ETG 1900.20 ETG 1800.20 ETG 1700.20 ETG 1600.20 ETG 1500.20 ETG 1400.20 ETG 1200.20 ETG 1000.20 ETG 900.20 ETG 800.20 ETG 700.20 ETG 600.20 ETG 500.20 ETG 400.20 ETG 300.20 ETG 250.20 ETG 200.20 ETG 150.20 ETG 100.20	3 FREESCALE MRF6VP11KH	1	From 2000W to 100W depending of variants
ETG 1500.15 ETG 1400.15 ETG 1200.15 ETG 1000.15 ETG 900.15 ETG 800.15 ETG 700.15 ETG 600.15 ETG 500.15 ETG 400.15 ETG 300.15 ETG 250.15 ETG 200.15 ETG 150.15 ETG 100.15 ETG 80.15	2 FREESCALE MRF6VP11KH	1	From 1500W to 80W depending of variants

Transmitter	N° RF modules	N° driver	Max output power
ETG 1000.10 ETG 900.10 ETG 800.10 ETG 700.10 ETG 600.10 ETG 500.10 ETG 400.10 ETG 300.10 ETG 250.10 ETG 200.10 ETG 150.10 ETG 100.10 ETG 80.10	2 FREESCALE MRF6VP2006H	1	From 1000W to 80W depending of variants
ETG 700.7 ETG 600.7 ETG 500.7 ETG 400.7 ETG 300.7 ETG 250.7 ETG 200.7 ETG 150.7 ETG 100.7 ETG 80.7 ETG 50.7	1 PHILIPS BLF578	0	From 700W to 50W depending of variants
ETG 500.5 ETG 400.5 ETG 300.5 ETG 250.5 ETG 200.5 ETG 150.5 ETG 100.5 ETG 80.5 ETG 50.5	1 PHILIPS BLF578	0	From 500W to 50W depending of variants

Transmitter	N° RF modules	N° driver	Max output power
ETG 300.3 ETG 250.3 ETG 200.3 ETG 150.3 ETG 100.3 ETG 80.3 ETG 50.3	1 FREESCALE MRF6V4300NR1	0	From 300W to 50W depending of variants
ETG 150 ETG 100 ETG 80 ETG 50 ETG 40 ETG 30 ETG 20 ETG 10	1 FREESCALE MRF6V2150NR1	0	From 150W to 10W depending of variants

1 General information.....	9
1.1 Intended use.....	9
1.2 Shipment.....	9
1.3 Unpacking.....	9
1.4 Storage.....	9
1.5 Off line and disposal.....	10
1.6 Purchased product verification.....	10
2 Product description.....	11
2.1 External connectors description.....	13
2.1.1 EIA485/Telemetry connector.....	13
2.1.2 LEFT/RIGHT connectors.....	13
2.1.3 AES/EBU connector.....	13
2.1.4 AUX connectors.....	14
2.1.5 MPX connector.....	14
2.1.6 Monitor/19kHz connector.....	14
2.1.7 TC/TS connector (option).....	15
2.1.7.1 Analog output scale value.....	16
2.1.8 Profiles connector (option).....	17
2.1.9 TCP/IP - Reserved connectors (option).....	18
2.1.10 EIA485 connector (option).....	18
2.2 Technical brochure.....	19
2.3 Protections.....	33
2.3.1 Software protections.....	33
2.3.1.1 IPF (Intelligent Proportional Foldback).....	33
2.3.1.2 IPC (Intelligent Power Control).....	33
2.3.1.3 Safety Management (option Lifextender ®).....	33
2.3.2 Hardware protections.....	34
2.4 Options.....	35
3 Use instructions.....	37
3.1 User interface.....	37
3.1.1 Status & Settings.....	40
3.1.2 Audio Setting.....	41
3.1.3 Audio Levels.....	41
3.1.4 View & Setting.....	41
3.1.5 Temperatures.....	42
3.1.6 Alarms List.....	42
3.1.7 Events History.....	42
3.1.8 RF Data.....	43
3.1.9 PSUs Data.....	43
3.1.10 Password.....	43
3.1.11 Lifextender.....	44
3.1.12 Inputs Level.....	44
3.1.13 Aux Inputs Level.....	44
3.1.14 Pilot Level & Phase.....	45
3.1.15 Exciter Clipping.....	45

3.1.16 Alarms Audio Settings.....	45
3.1.17 AES/EBU Settings.....	46
3.1.18 Time Base	46
3.1.19 Profile Summary.....	46
3.1.20 Pre Amplifier	47
3.1.21 Voltages.....	47
3.1.22 System Info.....	47
3.1.23 System Time	48
3.1.24 Clock Pwr Target.....	48
3.1.25 Max Reflected Power	49
3.1.26 Comm.ID LC/RT Disp.Mode.....	49
3.1.27 Password Setting.....	49
3.1.28 Password Recovery.....	50
3.1.29 Foldback Setting.....	50
3.1.30 Com1 Speed Set.....	50
3.1.31 Enable Alarms SMS	51
3.1.32 Enable Alarms Bit	51
3.1.33 User Alarms Data.....	51
3.1.34 User Alarms Timers	52
3.1.35 UPS Settings.....	52
3.1.36 Uart Info.....	53
3.1.37 SMS Enable/-3dB Alarm	53
3.1.38 GSM Field.....	54
3.1.39 Phone N°	54
3.1.40 SMS Diagnostic	54
3.2 Alarms/events list.....	55
3.3 SMS list.....	57
3.3.1 SMS command (send)	57
3.3.2 SMS status/alarm (reception).....	57
3.4 Optional equipment can be connected	59
3.4.1 PC connection	59
3.4.1.1 Hyperterminal screen	60
3.4.2 Telemetry connection.....	67
3.4.3 Exchange unit and/or audio matrix connection.....	68
3.4.4 Amplifier connection.....	70
3.4.5 E.BOX module connection	71
4 Maintenance	73
4.1 Maintenance (cleaning, replacement, control).....	73
4.2 Malfunction (effects, causes and solutions)	74

1 General information

1.1 Intended use

The products described in this document are solid state transmitters with an output power adjustable from 0W up to the maximum rating (see “Family variants” section), using in FM band between 87.5 and 108MHz at 10kHz steps.

The Indium series, this is its name, that already stands for new lines, new colors, an innovative look, and especially new technology designed to outstanding performance, has been further improved.

More compact size, weight not exceeding 10kg, with an extension of output power maximum range (up to 2000W).

The RF performance, obtained with a number of modules from 3 to 1 depending on the model purchased, are close to the finish line that is not superable in terms of efficiency, with devices and technologies of today.

Thanks to these features, ETG series allows a drastic electricity costs reduction.

The product distinguishing features remain : ECOSAVING, ICEFET, VSWR PEAK HOLD, monitoring capability, protection against corrosion.

The options would satisfy all needs : MPX, STEREO or AES/EBU versions; TC/TS, TC/TS+ETHERNET+PROFILES options; LIFEXTENDER.

1.2 Shipment

The shipment may only be performed in its original packaging.

However, although this is designed to avoid product damages, even in mishandling case, it is recommended to respect the “UP/DOWN” side and to not give shocks.

To make sure that the type of transport and lifting equipment type are capable to support the weight.

1.3 Unpacking

The staff, handling the product, should operate with gloves and shoes against injury.

Before lifting or handling equipment to verify that you have done to clear the area of operation, considering a safety area large enough to avoid damage to persons or objects that may be in the range of maneuver.

1.4 Storage

If you wish, for whatever reason, store the product it is necessary that:

- the temperatures, in the storage, are not exceeded -20° - $+55^{\circ}$ C, with humidity not exceeding 90% at 55° C;
- the equipment must be disconnected from the sources of energy;
- the equipment is clean and there are any dust;
- the equipment is covered with a waterproof sheet.

1.5 Off line and disposal

For all aspects concerning the product disposal, reference should be made the specifications required by European Directives.

However, please note that **the equipment DOES NOT CONTAIN OILS POLLUTION.**

1.6 Purchased product verification

Please note, before installing the equipment, to verify that it has not been damaged during transportation or storage conditions.

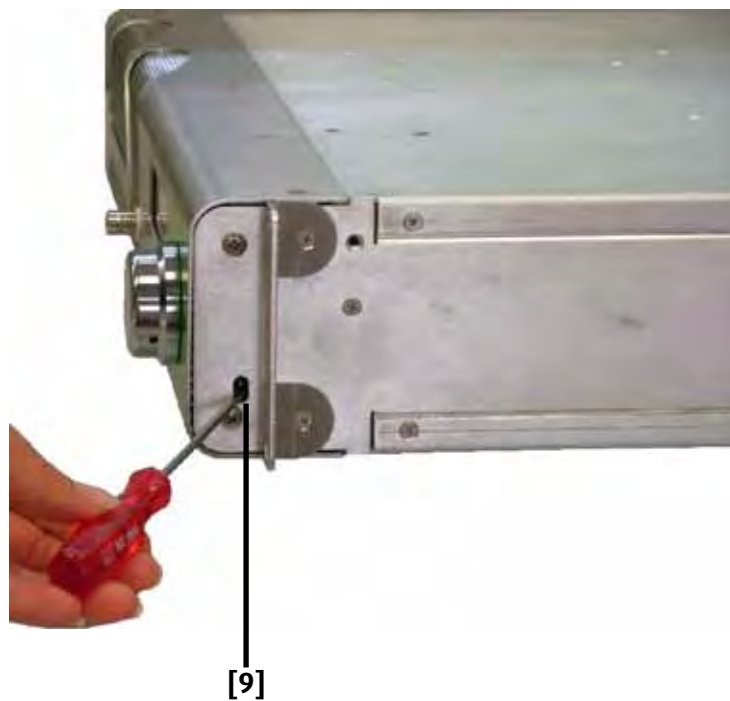
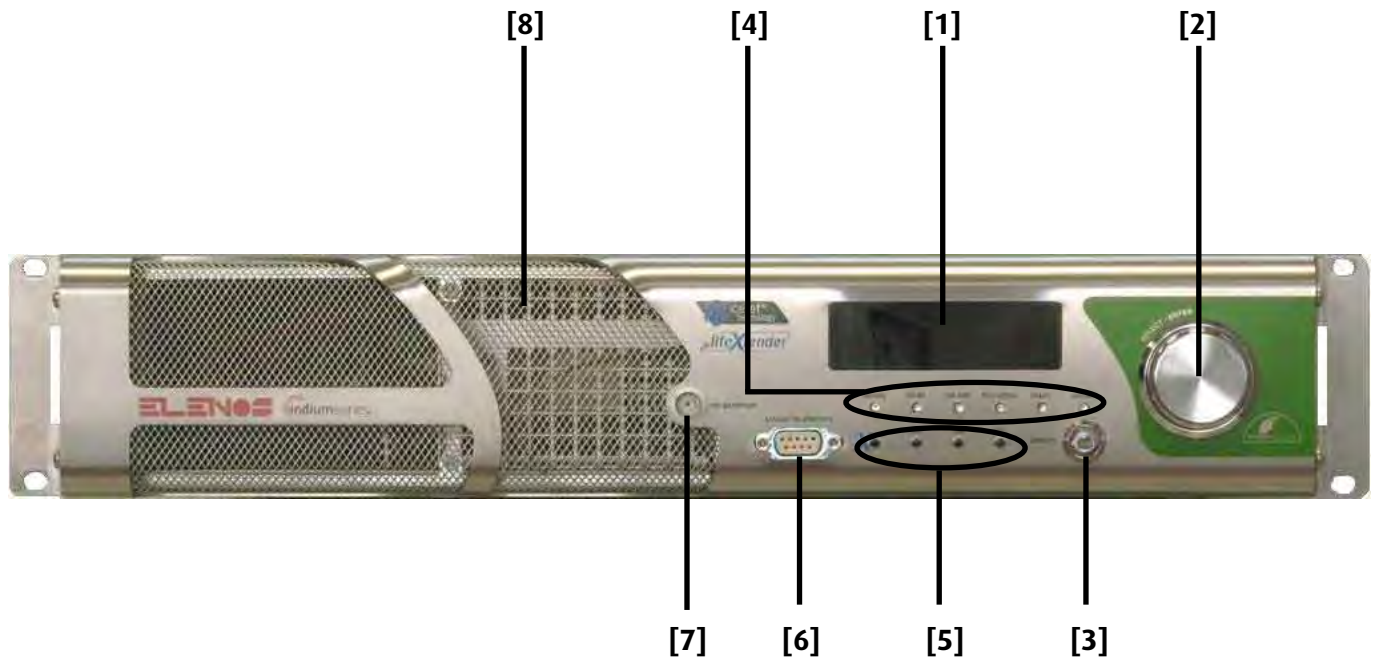
Check that all standard components and accessories ordered have been delivered correctly, and if not please contact Elenos for material adjustment.

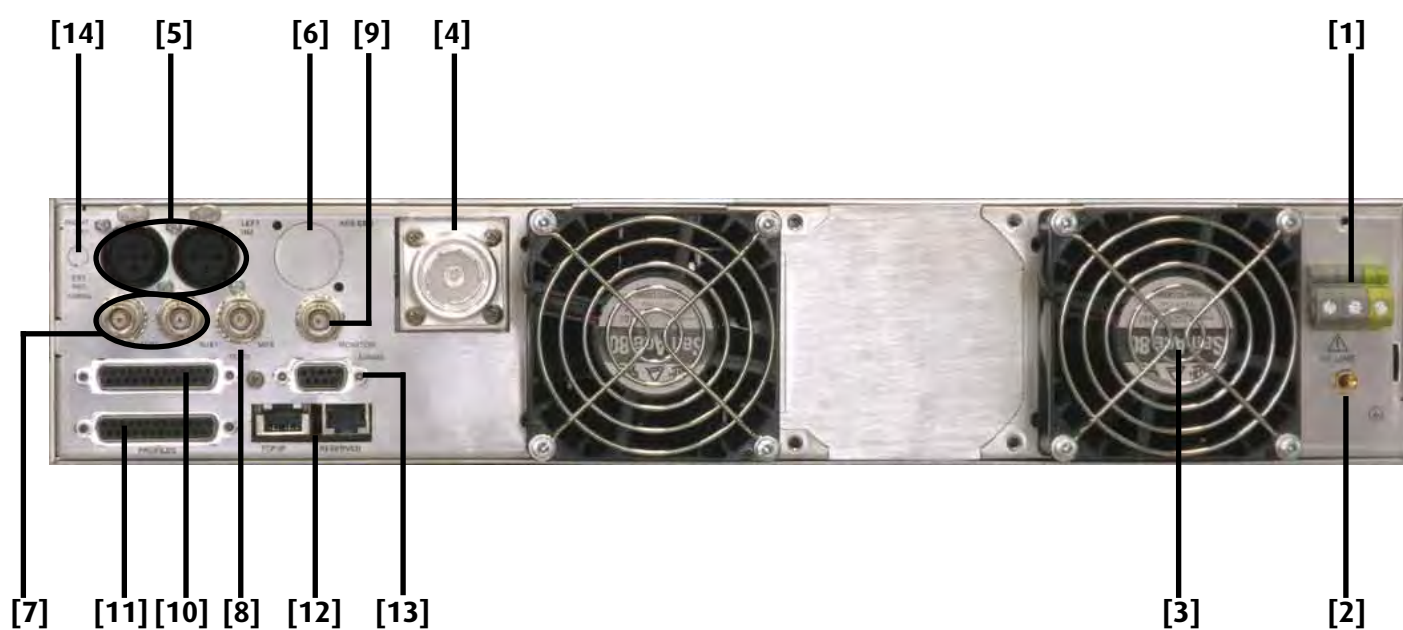
In this case the package must contain at least :

- n°1 Indium series product;
- n°1 "Identification and Quick Start" manual, which should be kept at station, always attached to the product;
- n°1 "User" manual.

Cables, spare parts and other accessories can be obtained by Elenos or Elenos dealers.

2 Product description



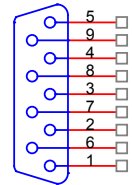


2.1 External connectors description

2.1.1 EIA485/Telemetry connector

N°[6] Front panel (DB9 Female)

Connector	Pin No.	Signal	Remark
CN3 Panel board			
	1	TX_1	485 filtered output Differential signal (+)
	2	/TX_1	485 filtered output Differential signal (-)
	3	RX_1	485 filtered input Differential signal (+)
	4	/RX_1	485 filtered input Differential signal (-)
	5	GND / Common	
	6	GND / Common	
	7	GND / Common	
	8	GND / Common	
	9	GND / Common	



2.1.2 LEFT/RIGHT connectors

N°[5] Rear panel (XLR Female)

Connector	Pin No.	Signal	Remark
J1 or 101 Stereo or AES/ EBU board			
	1	GND / Common	
	2	Differential audio input "positive"	Right channel
	3	Differential audio input "negative"	Right channel
	4	Frame to ground	



Connector	Pin No.	Signal	Remark
J2 or 102 Stereo or AES/ EBU board			
	1	GND / Common	
	2	Differential audio input "positive"	Left channel
	3	Differential audio input "negative"	Left channel
	4	Frame to ground	



2.1.3 AES/EBU connector

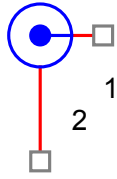
N°[6] Rear panel (XLR Female)

Connector	Pin No.	Signal	Remark
J3 AES/ EBU board			
	1	GND / Common	
	2	Differential audio input "positive"	Left channel
	3	Differential audio input "negative"	Left channel
	4	Frame to ground	



2.1.4 AUX connectors

N°[7] Rear panel (BNC Female)

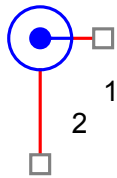


Connector	Pin No.	Signal	Remark
J2 or CN2 Coder Stereo or MPX board	1	RDS/SCA/AUX1	Input (RDS/SCA only with Coder Stereo board)
	2	GND / Common	

Connector	Pin No.	Signal	Remark
J3 Coder Stereo board	1	AUX2	Input
	2	GND / Common	

2.1.5 MPX connector

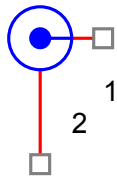
N°[8] Rear panel (BNC Female)



Connector	Pin No.	Signal	Remark
J1 or CN1 Coder Stereo or MPX board	1	External MPX	Input
	2	GND / Common	

2.1.6 Monitor/19kHz connector

N°[9] Rear panel (BNC Female)

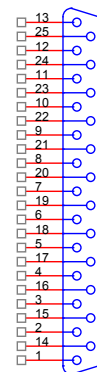


Connector	Pin No.	Signal	Remark
J4 or CN3 Coder Stereo or MPX board	1	Monitor MPX-19KHz	Input (10KHz only with Coder Stereo board)
	2	GND / Common	

2.1.7 TC/TS connector (option)

N°[10] Rear panel (DB25 Female). Signals compatible with IEC 60864-1 standard).

Connector	Pin No.	Signal	Remark
CN1 TC/TS board			
	1	F_TC_INTRLCK	Interlock (Enable) Pin connected to ground = command active
	2	F_TC_TX_ON	TX ON Pin connected to ground = command active
	3	F_TC_TX_OFF	TX OFF Pin connected to ground = command active
	4	F_DTM_REFL_PWR	Analog voltage output reflected power (see 2.1.7.1 paragraph user manual)
	5	GND / Common	
	6	F_RX-	EIA485
	7	-	Not connected
	8	F_TX-	EIA485
	9	GND / Common	
	10	F_DTM_I_PA	Analog voltage output current Power Amplifier (see 2.1.7.1 paragraph user manual)
	11	F_TS_/FLT_MAIN	FAULT status mains Pin must be externally powered. "Open" status → Fault active
	12	F_TS_TX_ON	TX ON status Pin must be externally powered. "Closed to ground" status → TX ON
	13	F_TS_WARNING	Warning Pin must be externally powered. "Closed to ground" status → Warning active
	14	F_TC_ALRM_RST	Reset allarms Pin connected to ground = command active
	15	-	Spare pin
	16	-	Reserved Elenos
	17	F_DTM_FWD_PWR	Analog voltage output direct power (see 2.1.7.1 paragraph user manual)
	18	GND / Common	
	19	F_RX+	EIA485
	20	F_TX+	EIA485
	21	GND / Common	
	22	F_DTM_V_PA	Analog voltage output voltage Power Amplifier (see 2.1.7.1 paragraph user manual)
	23	F_TS_FLT_AUDIO	Allarm FAULT audio Pin must be externally powered. "Closed to ground" status → Alarm active
	24	F_TS_/FLT	Allarm FAULT Pin must be externally powered. "Open" status → Alarm active
	25	F_TS_REMOTE	Remote status Pin must be externally powered. "Closed to ground" status → Remote signal active



2.1.7.1 Analog output scale value

The TC/TS analog output scale are normalized at 4V. The resolution is equal to 1/204.

Device	Parameters	Scale output	fs factor
ETG 150	FWD pwr	150W	1V/37.5W
	REFL pwr	15W	1V/3.75W
	PA current	10A	1V/2.5A
	PA voltage	50V	1V/12.5V

Device	Parameters	Scale output	fs factor
ETG 300.3	FWD pwr	300W	1V/75W
	REFL pwr	30W	1V/7.5W
	PA current	10A	1V/2.5A
	PA voltage	50V	1V/12.5V

Device	Parameters	Scale output	fs factor
ETG 500.5	FWD pwr	500W	1V/125W
	REFL pwr	50W	1V/12.5W
	PA current	25A	1V/6.25A
	PA voltage	50V	1V/12.5V

Device	Parameters	Scale output	fs factor
ETG 700.7	FWD pwr	700W	1V/175W
	REFL pwr	70W	1V/17.5W
	PA current	25A	1V/6.25A
	PA voltage	50V	1V/12.5V

Device	Parameters	Scale output	fs factor
ETG 1000.10	FWD pwr	1000W	1V/250W
	REFL pwr	100W	1V/25W
	PA current	50A	1V/12.5A
	PA voltage	50V	1V/12.5V

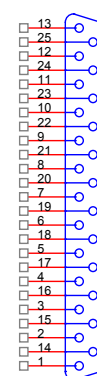
Device	Parameters	Scale output	fs factor
ETG 1500.15	FWD pwr	1500W	1V/375W
	REFL pwr	150W	1V/37.5W
	PA current	50A	1V/12.5A
	PA voltage	50V	1V/12.5V

Device	Parameters	Scale output	fs factor
ETG 2000.20	FWD pwr	2000W	1V/500W
	REFL pwr	200W	1V/50W
	PA current	75A	1V/18.75A
	PA voltage	50V	1V/12.5V

2.1.8 Profiles connector (option)

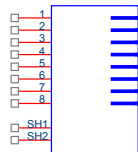
N°[11] Rear panel (DB25 Female)

Connector	Pin No.	Signal	Remark
CN1 Channel board			
	1	Telecontrol input channel 1 (0V..12V)	0V..24V
	2	Telecontrol input channel 3 (0V..12V)	0V..24V
	3	Telecontrol input channel 5 (0V..12V)	0V..24V
	4	Telecontrol input channel reserve (0V..12V)	0V..24V
	5	GND / Common	
	6	GND / Common	
	7	-	Not connected
	8	GND / Common	
	9	GND / Common	
	10	GND / Common	
	11	Telesignal output channel 5 (0V..24V)	Max current 50mA
	12	Telesignal output channel 3 (0V..24V)	Max current 50mA
	13	Telesignal output channel 1 (0V..24V)	Max current 50mA
	14	Telecontrol input channel 2 (0V..12V)	0V..24V
	15	Telecontrol input channel 4 (0V..12V)	0V..24V
	16	Telecontrol input channel 6 (0V..12V)	0V..24V
	17	-	Not connected
	18	GND / Common	
	19	GND / Common	
	20	GND / Common	
	21	GND / Common	
	22	GND / Common	
	23	Telesignal output channel 6 (0V..24V)	Max current 50mA
	24	Telesignal output channel 4 (0V..24V)	Max current 50mA
	25	Telesignal output channel 2 (0V..24V)	Max current 50mA



2.1.9 TCP/IP - Reserved connectors (option)

N°[12] Rear panel (RJ48)

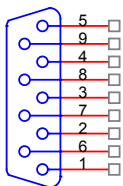


Connector	Pin No.	Signal	Remark
CN2 Channel board			
	1	GND / Common	Standard EIA485 (0..5V)
	2	Signal TX-	Standard EIA485 (0..5V)
	3	Signal TX+	Standard EIA485 (0..5V)
	4	Signal RX+	Standard EIA485 (0..5V)
	5	Signal RX-	
	6	GND / Common	
	7	Interlock	Open Collector signal without protection diode
	8	GND / Common	

Connector	Pin No.	Signal	Remark
CN3 Channel board			
	1	ETHERNET connector	
	2	ETHERNET connector	
	3	ETHERNET connector	
	4	ETHERNET connector	
	5	ETHERNET connector	
	6	ETHERNET connector	
	7	ETHERNET connector	
	8	ETHERNET connector	

2.1.10 EIA485 connector (option)

N°[13] Rear panel (DB9 Female)



Connector	Pin No.	Signal	Remark
CN2 TC/TS board			
	1	TX_1	EIA485
	2	/TX_1	EIA485
	3	RX_1	EIA485
	4	/RX_1	EIA485
	5	GND / Common	
	6	GND / Common	
	7	GND / Common	
	8	GND / Common	
	9	GND / Common	

2.2 Technical brochure

Indium Series ETG 150

indiumseries®

GENERAL DATA	
Output Nominal Power	150W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED from PC
Number of MOSFETs in power amplifier stage	1 MRF6V2150NR1
RF power stage technology	ICEFET & ECOSAVING
Protection	The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 8.5 - 58.5 cm
Weight	9.4 Kg
Number of cooling fans	2
PERFORMANCE RF	
Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	< -75 dBc
Out of band emission (spurious)	< -80dBc
PERFORMANCE AUDIO/STEREO CODER	
AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω, balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX Input impedance	5KΩ selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU Input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU - Analog input automatic changeover	Yes
THD+N	< 0.03% @ 1KHz
Pre-emphasis	0.25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB unweighted > = 72 dB weighted @ fmod = 400 Hz, 75 KHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	> 60 dB linear > 60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05% @ L/R channel, 60Hz/7KHz, 4:1, +4dBu
Intermodulation distortion	F3
Class of emission	According to ITU-R recommendation
Stereo emission	450 (pilot tone)

Indium Series ETG 150

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PERFORMANCE EXCITER

PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase; 53KHz to 100KHz
Modulation Capability	+/-250 KHz

INSTALLATION REQUIREMENTS

Power supply	110, 230 Two-Singlephase Version 50-60Hz VAC
Power consumption (typical)	230W
Current consumption (typical@230V)	1A
Overall efficiency (typical from -34dB to Pnom)	>= 70%
Power factor	> 0.95

COOLING/NOISE/ELECTRIC/MAGNETIC DATA

Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter

ENVIRONMENT

Temperature range (operating)	-5 -+45 °C
Temperature range (non operating)	-20 -+55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY

Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 300.3

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GENERAL DATA	
Output Nominal Power	300W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	1 MRF6V4300NR1
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	9.4 Kg
Number of cooling fans	2
PERFORMANCE RF	
Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc
PERFORMANCE AUDIO/STEREO CODER	
AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω, balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX Input Impedance	5KΩ selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU Input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	<0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 kHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/-0.1 dB (without pre-emphasis) +/-0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	>60 dB linear >60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	@ L/R channel, 60Hz/7KHz 4:1, +4dBu F3
Class of emission	F3
Stereo emission	According to TU-R recommendation 450 (pilot tone)



Indium Series ETG 300.3

PERFORMANCE EXCITER

PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 kHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase; 53kHz to 100kHz
Modulation Capability	+/-250KHz

INSTALLATION REQUIREMENTS

Power supply	110/230 Two-Single phase Version 50-60Hz VAC
Power consumption (typical)	430W
Current consumption (typical@230V)	1.9A
Overall efficiency (typical from -3dB to 90dB)	> = 70%
Power factor	> 0.95

COOLING/NOISE/ELECTRIC/MAGNETIC DATA

Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter

ENVIRONMENT

Temperature range (operating)	-5 - +45 °C
Temperature range (non operating)	-20 -+55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY

Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 500.5

GENERAL DATA

Output Nominal Power	500W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	1 BLF578
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	9.4 Kg
Number of cooling fans	2

PERFORMANCE RF

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc < -80dBc

PERFORMANCE AUDIO/STEREO CODER

AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω , balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX input impedance	5K Ω selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	<0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 kHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/-0.1 dB (without pre-emphasis) +/-0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	> 60 dB linear > 60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	< 0.05% @ L/R channel, 60Hz/7KHz, 4:1, +4dBu
Class of emission	F3
Stereo emission	According to TU-R recommendation 450 (pilot tone)



Indium Series ETG 500.5

PERFORMANCE EXCITER

PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1 KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase: 53KHz to 100KHz
Modulation Capability	+/-250 KHz

INSTALLATION REQUIREMENTS

Power supply	110, 230 Two-Singlephase Version 50-60Hz VAC
Power consumption (typical)	570W
Current consumption (typical@230V)	2.5A
Overall efficiency (typical from -3dB to 0dBm)	> = 70%
Power factor	> 0.95

COOLING/NOISE/ELECTROMAGNETIC DATA

Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter

ENVIRONMENT

Temperature range (operating)	-5 ~+45 °C
Temperature range (non operating)	-20 ~ +55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY

Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 700.7

GENERAL DATA

Output Nominal Power	700W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	1 BLF578
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	9.4 Kg
Number of cooling fans	2

PERFORMANCE RF

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc < -80dBc

PERFORMANCE AUDIO/STEREO CODER

AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω , balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX input impedance	5K Ω selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	<0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 kHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/-0.1 dB (without pre-emphasis) +/-0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	> 60 dB linear > 60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	< 0.05% @ L/R channel, 60Hz/7KHz, 4:1, +4dBu
Class of emission	F3
Stereo emission	According to TU-R recommendation 450 (pilot tone)



Indium Series ETG 700.7

PERFORMANCE EXCITER

PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1 KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase: 53KHz to 100KHz
Modulation Capability	+/-250 KHz

INSTALLATION REQUIREMENTS

Power supply	110, 230 Two-Singlephase Version 50-60Hz VAC
Power consumption (typical)	800W
Current consumption (typical@230V)	3.5A
Overall efficiency (typical from -3dB to 0dBm)	> = 70%
Power factor	> 0.95

COOLING/NOISE/ELECTROMAGNETIC DATA

Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter

ENVIRONMENT

Temperature range (operating)	-5 ~+45 °C
Temperature range (non operating)	-20 ~ +55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY

Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 1000.10

GENERAL DATA

Output Nominal Power	1000W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	2 MRF6VP2600H
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	13.2 Kg
Number of cooling fans	3

PERFORMANCE RF

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc
Out of band emission (spurious)	< -80dBc

PERFORMANCE AUDIO/STEREO CODER

AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω , balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX input impedance	5K Ω selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	<0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 kHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/-0.1 dB (without pre-emphasis) +/-0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	>60 dB linear >60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	< 0.05%
Class of emission	@ L/R channel, 60Hz/7KHz, 4:1, +4dBu F3
Stereo emission	According to ITU-R recommendation 450 (pilot tone)

Indium Series ETG 1000.10

PERFORMANCE EXCITER	
PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase; 53KHz to 100KHz
Modulation Capability	+/- 250 KHz
INSTALLATION REQUIREMENTS	
Power supply	230 Singlephase Version 50-60Hz VAC
Power consumption (typical)	1400W
Current consumption (typical @ 230V)	6A
Overall efficiency (typical from -3dB to 0dBm)	>= 70%
Power factor	> 0.95
COOLING/NOISE/ELECTRIC/MAGNETIC DATA	
Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter
ENVIRONMENT	
Temperature range (operating)	-5 - +45 °C
Temperature range (non operating)	-20 - +55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY	
Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 1500.15

GENERAL DATA

Output Nominal Power	1500W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	2 MRF6VP11KH
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	13.2 Kg
Number of cooling fans	3

PERFORMANCE RF

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc

PERFORMANCE AUDIO/STEREO CODER

AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω , balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX input impedance	5K Ω selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	< 0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 KHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15KHz
Amplitude-frequency characteristic	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	> 60 dB linear > 60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	@ L/R channel, 60Hz/7KHz 4:1, +4dBu F3
Class of emission	F3
Stereo emission	According to TU-R recommendation 450 (pilot tone)



Indium Series ETG 1500.15

PERFORMANCE EXCITER	
PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 db steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase; 53kHz to 100kHz
Modulation Capability	+/-250 KHz
INSTALLATION REQUIREMENTS	
Power supply	230 Single Phase Version 50-60Hz VAC
Power consumption (typical)	2000W
Current consumption (typical@230V)	8.7A
Overall efficiency (typical from -3dB to 90dB)	> = 70%
Power factor	> 0.95
COOLING/NOISE/ELECTRIC/MAGNETIC DATA	
Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2 m distance of the front of transmitter
ENVIRONMENT	
Temperature range (operating)	-5 ~+45 °C
Temperature range (non operating)	-20 ~ +55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY	
Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

Indium Series ETG 2000.20

GENERAL DATA

Output Nominal Power	2000W adjustable
Operating band	87.5 - 108 MHz
RS232/RS485	Yes
Points of measure	RF Sample - MPX Monitor
Displayed Parameters	More than 50 parameters displayed on a wide graphic OLED
Adjustments	From the frontal panel through OLED / from PC
Number of MOSFETs in power amplifier stage	3 MRF6VP11KH
RF power stage technology / Protection	ICEFET & ECOSAVING The transmitter is provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
Dimensions: Rack units	2U
Dimensions: W - H - D	48.5 - 85 - 58.5 cm
Weight	13.2 Kg
Number of cooling fans	3

PERFORMANCE RF

Output impedance	50 Ω
Automatic power RF control	Stabilizes the output power value on the set value
Overall output power RF stability	+/- 0.1 dB
VSWR	2:1 on full power automatic power reduction beyond 1.5:1 transmitter is protected for short and open circuit
Harmonics	Out of band emission (spurious) < -75 dBc
Out of band emission (spurious)	< -80dBc

PERFORMANCE AUDIO/STEREO CODER

AES/EBU Input Resolution	24bits
AES/EBU Input Sample Rate	32, 44.1, 48, 96 KHz Automatically selected
L/R Audio input level	+15/-10 dBm for 75KHz standard deviation
L/R level adjustment	Soft adjust 0.1 dBm steps from front panel
L/R Input Impedance	Selectable 10K - 600 Ω, balanced (for analog) 110 Ω (for digital)
MPX audio input level	+15/-10 dBm for 75KHz standard deviation
MPX level adjustment	Soft adjust 0.1 dBm steps from front panel
MPX input impedance	5KΩ selectable
SCA/RDS audio input level	0 dBm for 75KHz standard deviation

AES/EBU input level	-20 dBFS - 0 dBFS
PILOT Amplitude adjustment	Soft adjust 0.05% steps from front panel
PILOT Phase adjustment	Soft adjust 0.01 degree steps from front panel
PILOT tone frequency	19 KHz
PILOT tone deviation	Soft adjust +/- 7.5 KHz
PILOT tone frequency stability	+/- 1 Hz
19KHz Output	Yes
AES/EBU-Analog input automatic changeover	Yes
THD+N	< 0.03% @ 1KHz
Pre-emphasis	0/25/50/75 microseconds selectable
Pre-emphasis tolerance	+/- 0.1 us
FM S/N MPX FCC	82 dB 20Hz - 23KHz - 50uS - ref @ 53KHz - RMS
FM S/N STEREO CCIR	> = 72 dB weighted > = 72 dB unweighted @ fmod = 400 Hz, 75 kHz frequency deviation, peak value measurement, L/R/MONO channel
Asynchronous AM S/N unweighted	> 55dB
Synchronous AM S/N	> 50 dB
Modulation frequency range	30Hz to 15kHz
Amplitude-frequency characteristic	+/- 0.1 dB (without pre-emphasis) +/- 0.1 dB (with pre-emphasis) @ fmod = 400 Hz, 30 Hz to 15 KHz, L/R/MONO channel
Stereo Crosstalk	> 60 dB linear > 60 dB non-linear @ 30 Hz to 15 KHz, L/R channel (100% modulation) < 0.05% with 75 KHz frequency deviation < 0.05% with 100 KHz frequency deviation @ 30 Hz to 15 KHz, L/R channel
Distortion	< 0.05%
Intermodulation distortion	< 0.05%
Class of emission	@ L/R channel, 60Hz/7kHz, 4:1, +4dBu F3
Stereo emission	According to ITU-R recommendation 450 (pilot tone)


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PERFORMANCE EXCITER

PLL lock time	<10sec
Intermodulation distortion	<0.05% Measured with two of tones 1KHz & 1.3KHz, ratio 1:1 at 100% modulation
Frequency deviation	+/- 75 KHz 0.1 dB steps adjustable
Maximum frequency deviation	+/- 150 KHz
Frequency stability	+/- 200 Hz/year
RF Frequency steps	10 KHz
Phase Response	0.1 degree from linear phase, 53kHz to 100kHz
Modulation Capability	+/- 250 KHz

INSTALLATION REQUIREMENTS

Power supply	230 Singlephase Version 50-60Hz VAC
Power consumption (typical)	2700W
Current consumption (typical@230V)	11.7A
Overall efficiency (typical from -3dB to Pnom)	> = 70%
Power factor	> 0.95

COOLING/NOISE/ELECTROMAGNETIC DATA

Cooling system	Forced air-cooling
Electric field	< 10V/m @ one meter in front of the transmitter cabinets during normal operation
Magnetic field	< 4 A/m @ one meter in front of the transmitter cabinets during normal operation
Acoustic noise	< 65 phones @ transmitter room, 2m distance of the front of transmitter

ENVIRONMENT

Temperature range (operating)	-5 - +45 °C
Temperature range (non operating)	-20 - +55 °C
Humidity range (operating)	95% @ 40 °C
Humidity range (non operating)	90% @ 55 °C
Altitude range (operating)	<3000 meters
Altitude range (non operating)	<15000 meters

TELECONTROL & TELEMETRY

Remote control	Yes
Remote Control at clean contacts	Yes
SNMP option	Yes (external)

2.3 Protections

The device has a protection system, partly integrated and partly optional, related to hardware and software.

2.3.1 Software protections

2.3.1.1 IPF (Intelligent Proportional Foldback)

IPF is an intelligent system that reduces the output power in case of unbalanced load avoiding shutdown.

On the display the activation of this mechanism is manifested by the "026" alarm.

2.3.1.2 IPC (Intelligent Power Control)

The IPC shall, under proper operation, to maintain constant output power by $\pm 1\%$ of target set, independent of changes in voltage, temperature or load.

This contributes largely to make the apparatus insensitive to the conditions in which he is forced to operate.

The IPC also helps to optimize the RF efficiency, leading the MOSFET to work at maximum efficiency, minimizing the total power consumption.

2.3.1.3 Safety Management (option Lifextender[®])

The Safety Management is a set of algorithms that perform real-time analysis of transmitter functional state and operates to maintain the output power provided, depending on the type and extent of any anomalies (internal or environmental) to be arise. The Safety Management can command a reduction in output power depending on the anomaly seriousness that has occurred.

The algorithms operate at different levels and in different sections of the apparatus: Thermal Management on RF group, Current Management on power supply, Thermal Management on power supply, Fault Management on RF group, Fault Management on power supply, Cooling Management on fans group.

Thermal Management on RF group (Lifextender[®])

If the temperature measured at the MOSFETs exceed the value of 72 °C it involves an initial level of Derating, operating to reduce the temperature by reducing output power. The power reduction is the minimum possible to reach a thermal equilibrium at a temperature below 72 degrees. The reduction of output power, with this first derating, never exceeds 48%. In other words, the output power remains above 52% of that set by the user, and it does not activate "- 3 dB" alarm.

This first level of Derating is effective in almost all cases.

On the display the activation of this mechanism is manifested by the "010" alarm.

If this Derating is not enough (very rare), it involves a second level that, reducing the power, reaches a state of thermal equilibrium compatible with the safe operation of the device, even if under - 3 dB ("005" alarm).

In case of ineffectiveness also of this second derating (case of external conditions that are not compatible with the safe operation of the apparatus) the transmitter is turned off. In this case, if the temperature drops, the power is raised proportionally. If it changes by 10°C (that goes to 62°C) it leaves the mechanism of derating and resumes full power. After three unsuccessful attempts, the control logic blocks the apparatus ("011" alarm).

Current management on power supply (Lifextender[®])

It is activated when it exceeded the maximum current for continuous operation of power supply. This value is set below the limit of output current, and it represents the