



Digital Analog 30-50-100 FM Stereo Transmitter

Hi-Performances, Fully Customizable



BIC30-50-100SD

State of the art performances at very moderate cost.
 uP controlled.
 Extremely low distortion: **THD, IMD & TIM** (Transient Intermodulation Distortion) specified.
 Very quiet operation (S/N).
 Highest stereo performances: separation 80 Hz 15 kHz **typ. 70 dB** (30 80Hz typ. 56dB).
 L, R (balanced & unbalanced), RDS / SCA, AUX, MPX, Digital inputs AES-EBUXLR & Optical (Optional), External Reference Oscillator input & output (Optional).
 Lin, 50, 75us accentuation.
 Seven complete set-up (frequency, sensitivity, power, etc.) can be stored and selected in local or remote mode, without retuning or adjustments. Ready for 6+1 systems.
 Completely broadband: instantaneous BW > 20 MHz.
 Easy to handle: comprehensive monitoring of all relevant parameters and setting values.
 Complete tele-measurements and tele-controls available on the rear panel (DB25)
 Two independent RS485 ports (on rear panel).
 Modular construction, easy to customise and fast to test. Smartly designed to minimise spare parts.
 Auxiliary functions as multi-frequency external synchronization (1-2-2.5-5-10 MHz self-select type) on request.
 All RF amplifiers based on last generation semiconductors: **RF Power LDMOS** in the driver and output stage.
Automatic Power Control (APC) maintains required RF power at 45 °C & at 1.5:1 VSWR. Higher value of VSWR causes the power reduction.
 Lightweight RF power module, can be removed from mainframe and replaced in less than two minutes.
 Very fast acquisition latching indicators shows the transitory conditions.
 Nominal RF o/p level = 30-50-100W. Power output continuously adjustable
 Built-in RF harmonic filter and true wattmeter.
 High spectral purity: > -100 dBc spurious and >-70 dBc harmonics (typ.).
 Provides the following outputs: RF, RF monitor, 19 kHz to lock RDS, RS485, USB, remote alarm, and remote memory setting. Telemeasurement. External Battery socket (Optional), with built-in charger, (2x12V) for emergency.
 AC mains (90-260V in two ranges) reliable PWS.
 Software for station management (e.g. power reduction in night hours) available.
 Various options available. RDS available.
 FCC LPFM code station available and programmable by front panel (frequency shift Morse code), CCIR & FCC compliant.
 All functions are controlled by a single knob and a two-rows/sixteen characters LCD display
 Friendly parameters configuration.
 External control of alarms, of active memory, interlock, force to internal stereo, TX-on, TX-off, ack-on, ack-off, mains absence, power good, IPA, VPA, MODULATION, REFLECTED PWR, FORWARD PWR through a DB25 connector located on the rear panel
 Seven memories (M1 to M7): all data (i.e. frequency, audio sensitivity, RF power, etc.) can be stored on a flash memory of the microprocessor and recalled by internal/external command.
 Windows SW for a complete management of all transmitter function
 Customizable slides on the LCD display: web address, phone, network identification or local sales organization, can be inserted on demand.

TECHNICAL SPECIFICATIONS

RF CHARACTERISTICS	
1. Power	30-50-100w adjustable from front panel
2. RF output impedance	50 Ω unbalanced, VSWR less than 1.5:1
3. Frequency range	87.5 to 108 MHz, 7 channels (10kHz / step [p selected] can be stored and recalled from panel, rear contacts, or via USB connection.
4. Frequency control	Synthesizer [processor controlled
5. Lock in Time	From starting moment to any programmed frequency typically 4 sec.
6. Off lock attenuation	> 80 dBc (typical -85 dB)
7. Type of modulation	F3E / F8E direct FM at the carrier frequency
8. Modulation mode	Mono, Stereo, Multiplex, SCA, RDS, AUX (input selected by front panel)
9. Frequency deviation	± 75 kHz =100 %, ± 150 kHz capability
10. Reference	TCXO = 12.8 MHz.
11. Constancy of fq. dev.	± 1 % over six months.
12. Variation of fq.	δ 1kHz/year (internal TCXO)
13. Short term stability	± 1 ppm from -5 to +45 °C, Can be synchronized by 1-2-2.5-5-10MHz self select external clock (OPT 01)
14. Instantaneous BW	>20 MHz
15. RF harmonics	Exceeds EBU/CCIR/FCC requirements < -70dBc
16. RF spurious	Exceeds EBU/CCIR/FCC requirements < -100 dBc @ ± 1 MHz min. out of carrier (typical -110dB)
17. Preemphasis	Flat/50/75 μ s selectable via front panel
18. Pre-emphasis precision	Nominal 1% (typical 0,4%)
19. Stereo operation	CCIR 450/S2 "pilot tone system"

STEREO OPERATION	
20. Audio response	± 0.15 dB da 20 Hz to 15 kHz (+0/-2%)
21. Audio filter attenuation	> 55 dB @ 19 kHz, >45dB 19 to 100kHz
22. Common mode rejection	20 Hz to 15 kHz > 45 dB
23. Stereo Separation	30 \div 80Hz >53dB (typ. 56), 80Hz \div 15kHz >60 dB (typ.70)
24. Crosstalk attenuation (M / S)	> 40 dB 30 Hz to 15 kHz (typ. 55dB / 100Hz to 8kHz)
25. Spurious products	> 53 kHz > 50 dB
26. 38 kHz suppression	> 70 dB (Typ -85dB)
27. Subcarrier frequency	38 kHz ± 2 Hz
28. Subcarrier generation	Internal crystal
29. Pilot frequency	19 kHz ± 1 Hz
30. Phase difference	19/38 kHz 0 $^\circ$ \pm 2 $^\circ$ adjustable
31. THD+N on encoded channels	< 0.03 % 30 Hz TO 15 kHz (typ -74dB)
32. IMD	Measured with a 1 KHz and 1.3 KHz tones, 1:1 ratio, at FM 75 kHz < 0.03 % . Typ. IMD D2 < -83 dB D3 < -88 dB
33. TIM (DIM30)	< 0.03 % (square/sinus) Typ. < -77 dB
34. Nominal pilot deviation	± 7 kHz

MONO OPERATION	
35. Audio response	± 0.15 dB da 20 Hz to 15 kHz (+0 / -2%)
36. THD+N on encoded channels	30 Hz to 15 kHz < 0.02% (typ. 0.03 %) typ. -74dB
37. IMD	Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz D2 < -75 dB D3 < -80 dB Typ. D2<-80dB D3< -85 dB
38. TIM (DIM30)	Measured with a 2.96 kHz square wave and a 14 kHz sine wave at 75 kHz FM < -70 dB Typ. < -77 dB

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MPX OPERATION (External coder)	
39. Audio response	30Hz ÷ 53kHz ± 0.1 dB
	53kHz ÷ 100kHz ± 0.2 dB
40. THD+N on encoded channels	30 Hz to 15 kHz < 0.03% (typ. 0.02% , < -75dB)
41. IMD	Measured with a 1 KHz and 1.3 KHz tones, 1:1ratio, at FM 75 kHz D2<-75 dB D3<-80 dB Typ. D2<-80dB D3< -85 dB
42. TIM (DIM30)	Measured with a 2.96 kHz square wave and a 14 kHz sine wave at 75 kHz FM < -70 dB Typ. <-75 dB

S/N RATIO (Typ. Values)			
Type	Condition	Value (Peak CCIR)	Value (RMS detector)
Mono Ref. ± 75kHz	Weighted (CCIR 468/2)	85 dB/50 [s 80 dB/flat	89 dB/50 [s 83 dB/flat
	Unweighted 20 Hz - 23kHz		92 dB/50 [s 88 dB/flat
Built-in stereo encoder L & R Or external stereo	Weighted (CCIR 468/2)	75 dB/50 [s 69 dB/flat	79 dB/50 [s 72 dB/flat
	Unweighted 20 Hz ÷ 23kHz		86 dB/50 [s 80 dB/flat
Am synchronous AM=400 Hz Fm=400 Hz ± 75 kHz Ref. = 100 % AM	Unweighted 20 Hz ÷ 23kHz	69 dB (detector $\frac{P^+ + P^-}{2}$)	
Am asynchronous Fm = no modulation Ref. = 100 % AM	Weighted & unweighted	70 dB (detector $\frac{P^+ + P^-}{2}$)	

AUDIO INPUTS						
Function	Input level / Adjustment range	B W	Impedance	Type	Conn.	N°
Composite	-3 to +6 dBm	0.15 dB 30 Hz 100kHz	~1.2 k \wedge	Unbal.	BNC	1
Sca/RDS	-3 to +6 dBm	0.15 dB 40kHz 100kHz	~3 k \wedge	Unbal.	BNC	2
A u	-3 to +6 dBm	0.15 dB 40kHz 100kHz	~3 k \wedge	Unbal.	BNC	3
L	(3 dB step adjustable by software) -3 to +9 dBm / ± 0.5 dBm	0.1 dB 30Hz 15kHz	10 k \wedge 600 \wedge	Unbal. Bal.	XLR	4
R	(3 dB step adjustable by software) -3 to +9 dBm / ± 0.5 dBm	0.1 dB 30Hz 15kHz	10 k \wedge 600 \wedge	Unbal. Bal.	XLR	5

OUPUTS	
RF connector	N female
Monitor RF output	BNC Female on front panel -44dBc ± 2dB from 87.5 to 108 MHz
Pilot	BNC Female 19 kHz Squarewave, 1 Vpp, impedance >5k \wedge , unbalanced
Buffered External Clock (Optional)	SMA Female Same frequency of the input frequency, Squarewave, 2,8Vpp Zout=1k0 Ohm

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AUXILIARY CONNECTIONS	
USB	USB type B-female
RS485 Serial Interface #1	RJ45
RS485 Serial Interface #2	RJ45
Telemetry/Telecontrol Interface	DB25F
External Clock 1-2-2.5-5-10 MHz	SMA female (Optional)

STANDARD COMPLIANCE	
Safety	EN60215:1989
EMC	EN 301 489-11 V1,2,1
Spectrum Optimization	ETS 300 447

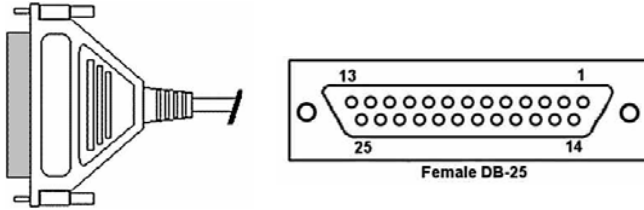
FUSES	
On Mains	1 External fuse F 2 T - 5x20 mm
On Battery Supply	2 External fuse F 10 A RL MINILAMA

ENVIRONMENTAL	
Storage temperature	-20°C TO + 60 °C
Operating temperature	-5 °C TO + 45 °C
Guaranteed performances temp.	0 °C TO + 40 °C
Relative humidity (non condensing)	90 % MA
Max operating altitude	2000 mt
Max extraneous field strength	δ10 V/m; δ 4 A/m

PHISICAL & ELECTRICAL	
Dimensions	Standard 19" chassis /1 U rack
Cabinet	385 mm deep by 485 mm wide, 44 mm height
Weight	Approx. 4.5 kg.
Finish	Plastic film on aluminum (front panels). Stainless steel (cabinet).
Power supply	110/223V single phase AC (+10 / -15 %) 50-60Hz/ ± 5%
DC Battery supply voltage	2 x 12 ÷ 14V Gelled Lead Acid Batteries
DC supply current	Measured at full power and 28VDC, 2A-2,5A-3A
AC Apparent Power Consumption	Measured at full power and nominal voltage. 115-135-180 VA
Power Consumption	Measured at full power and nominal voltage 65-95-145 W
Human interface input device	Rotary encoder with pushbutton
Display	Green-Yellow back panel, LCD - 2 raw 16 characters
Acoustic Noise	< 56 dBA Leq 3 min @ 1 m
Cooling	Forced air, with internal long life brush-less ball bearing fan

OPTIONS		
External Clock	JZOP-01	For PLL synchronizing purpose. 1-2-2.5-5-10 MHz EXT Ref. Oscillator with self selection of the incoming frequency
24V backup input	JZOP-02	Two 12V batteries sealed lead can be supplied
Telemetry interface	JZOP-03	From DB 25 to terminal block, opto isolated I/O
Digital audio Input	JZOP-04	AES-EBU facilities XLR balanced (S/PDIF) & TOS-LINK supplied
RDS	JZOP-05	RDS simple coder programmable via PC
OIRT Version	JZOP-06	Different band of frequency
FSK identification Version (FCC)	JZOP-07	LPFM frequency shift-key Morse code for station identification
Only MONO Version	JZOP-08	

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TELEMETRY / TELECONTROL ON DB25 REAR PANEL

PIN	Description	Function	Value	@	Notes
1	Forward Power	Measure	3 V	30W	560 ^
2	Modulation Output	Measure	3 V	117 Khz	560 ^
3	IPA	Measure	3V	4,5A	560 ^
4	Power Good Alarm	Status	Open Drain		Max 18V/100mA
5	Acknowledge OFF	Status	Open Collector		Max 24V/10mA Zout= 220^
6	General Alarm	Status	Open Collector		Max 24V/10mA Zout= 220^
7	Input Analog 1	Analog IN	TBD		
8	Tx-Off	Control		+9V to set	
9	Interlock	Control		GND to set	
10	Set Mem 6	Control		GND to set	
11	Set Mem 4	Control		GND to set	
12	Set Mem 2	Control		GND to set	
13	--	Ground	--	--	--
14	Reflected Power	Measure	3 V	12,5W	
15	VPA	Measure	3 V	30V	
16	--	Ground	--	--	--
17	Bat (Mains)	Status	Open Collector		Max 24V/10mA Zout= 220^
18	Acknowledge ON	Status	Open Collector		Max 24V/10mA Zout= 220^
19	Local/Remote	Status	Open Collector		Max 24V/10mA Zout= 220^
20	Tx-ON	Control		9V to set	
21	Force to internal Stereo	Control		GND to set	
22	Set Mem 7	Control		Ground to set	
23	Set Mem 5	Control		Ground to set	
24	Set Mem 3	Control		Ground to set	
25	Fuse Protected Aux	SUPPLY	Output	+9 Volt	100mA max

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