



MERKUR

Digital FM Transmitters



One of the top-class equipment in the new family of broadcasting transmitters powered by Neetra is **MERKUR**, a unique solution on the market for the FM Radio operators demanding for top quality audio at a very competitive price level.

The extensive use of high-level Digital Signal Processing gives **MERKUR** unique features in the audio broadcasting world. The native AES/EBU input module guarantees pure digital quality avoiding the conversion from an analogue source and a legacy analogue input assures top performances even with standard analogue audio.

The FM modulation is implemented by an innovative direct-RF synthesis algorithm with sub-Hz accuracy onto an **FPGA-based digital processing core**. The result is a frequency-agile transmitter with immediate installation procedure, allowing operators to broadcast their audio content with excellent purity and maximum reliability.

Moreover, the total absence of analogue trimming points guarantees lifetime top performances and zero degradation due to component ageing.

MERKUR can be locked to the GPS time/frequency reference signal for exact carrier allocation and **Synchro FM operation**, a promising band-efficient method of operating adjacent FM transmitters on the same RF frequency after aligning all the RF and audio parameters of the transmission. The result is a clearly improved listener's reception in the overlapping signal area, extending the coverage to shadow areas normally characterized by inter-channel interference.

A typical application of this iso-frequency approach is the coverage of branches of highways, allowing car radio receivers to keep tuning the same carrier while driving, without the annoying effect of black spots along the road.

Models

MERKUR50	50W
MERKUR100	100W
MERKUR300	300W
MERKUR500	500W
MERKUR1000	1000W
MERKUR3000	3000W
MERKUR5000	5000W



The pure digital audio sensation that **MERKUR** can create is obtained also thanks to a revolutionary Soft Limiter avoiding audio intermodulation peaks while safeguarding the integrity of the whole input dynamic range, and with the use of accurate signal processing allowing high full-band stereo separation and extreme signal-to-noise ratio.

The unit comes with a **full-option** outfit: analogue and digital audio, analogue MPX and additional wideband SCA inputs, embedded RDS Generator and Digital Stereo Coder and Web/SNMP remote control.

Thanks to the all-digital implementation, **MERKUR** is lifetime firmware upgradeable through PC serial connection and is fully remotely controllable by means of different cabled or wireless telecommunications networks.

Compact, accurate, and flexible: definitely a milestone in the radio broadcasting world, you simply cannot miss it!

Main characteristics

- Crystal Digital Sound purity
- Fully Digital Signal Processing
- Embedded RDS generator
- Auto-calibration at power-on
- Internal 32-bit Digital Signal Processing
- Unbeatable price/performance ratio
- Lifetime firmware upgradeable
- Absolutely no analogue trimming points
- Single-chip Digital Processing guarantees maximum compactness
- Minimum BOM, maximum long-term reliability
- Fully remotely controllable by Web/SNMP interface
- Ipps and 10MHz Inputs for Synchro FM Operation

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Technical characteristics

SIGNAL PROCESSING SECTION

FM Carrier generation	NCO-based synthesis
FM Modulation	Fully digital
Stereo Coder	Fully digital, integrated
Input Audio Limiter	Proprietary integrated Soft Limiter
Digital Processing Resolution	Real-time internal 32-bit digital processing
RDS Generator	Fully integrated
Monitoring Output Signals	Fully digitally generated

INPUT SECTION

- Analog L/R Input Section

L/R Analogue Inputs	30Hz - 15kHz (integrated digital stereo coder) 0dBu nominal (adjustable from -12dBu to +12dBu)
L/R Analogue Inputs Impedance	600 Ohm/10kOhm balanced/unbalanced

- Analog MPX and SCA Input Section

Analogue MPX Input	30Hz - 100kHz 0dBu nominal
MPX Analogue Inputs Impedance	10kOhm unbalanced
SCA1/SCA2 Inputs	40kHz - 100kHz 2Vpp nominal for ± 7.5 kHz deviation
SCA1/SCA2 Analogue Inputs Impedance	10kOhm unbalanced

- Digital L/R Input Section

Digital Audio Input	AES/EBU (XLR Female), S/PDIF (BNC), TosLink (Fiber Optic) with automatic Sample Rate Converter
Balanced AES/EBU Input Impedance	110 Ohm
Unbalanced S/PIDIF Input Impedance	75 Ohm

- Audio Delay

Audio Input Delay (all audio inputs)	0 - 4ms, step 1us
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OUTPUT SECTION

RF Output Frequency (FM / OIRT bands)	87.5MHz-108MHz step 1Hz, ± 1 ppm frequency stability / 65.8MHz-74MHz step 1Hz
Output Level	50W, 100W, 300W, 500W, 1000W, 3000W, 5000W
Output Interface / Impedance	N type (50W to 300W), EIA 7/16" type (500W - 1000W), EIA 7/8" type (3000W - 5000W) / 50 Ohm
Pilot Carrier frequency	19kHz 0.001Hz
Pilot Carrier level	0-12% modulation in 0.1% steps
Pilot Carrier Output	1Vpp digitally synthesized
MPX Analogue Output	0dBu from integrated digital stereo coder
19kHz and 38kHz Tone Suppression	<-63dB
THD (30Hz-15kHz)+N	<0.1%
Synchronous AM	Better than -60dB
Asynchronous AM	Better than -70dB
Mono SNR RMS	Better than -85dB
Stereo SNR RMS	Better than -80dB
L/R and R/L Crosstalk	> 50dB (60dB typ.)
M/S and S/M Crosstalk	> 45dB full-band
Pilot Carrier Phase	User-adjustable (step <1°)
Frequency Deviation Range	User adjustable 0 to 200 kHz
Pre-emphasis	Flat, 25us, 50us or 75us

GENERAL

Physical	Case 19"-2U (50W to 1000W), 4U (3000W), 6U (5000W)
Remote Control Port	RS232/RS485
Remote Control Options	PSTN, GSM, Ethernet, SNMP
Front Panel User Interface	LCD Display + Keyboard
Power Supply Voltage	90 - 260VAC (50W to 1000W), 1P+N 230V $\pm 15\%$ (3000W), 3P+N 400V $\pm 15\%$ (5000W)
Power Consumption	120VA (50W), 200VA (100W), 500VA (300W), 830VA (500W), 1650VA (1000W), 5000VA (3000W), 8300VA (5000W)
Operating Temperature	0 - 45°C

Specifications and characteristics are subject to change without notice