

MRK 960
Modular Wireless-Microphone Receiver System

19" 1U module, stackable, with dual true diversity receivers



Main Features

- **Wide bandwidth:** up to 370 MHz with tunable filters (2 ch's independent): **470 MHz to 840 MHz** (Europe TV ch. 21/67) **with internal active splitter**
- **Extreme immunity:** IIP3 > 20dBm, practically intermodulation free
- **Powerful and quick:** thanks to the latest DSP class "shark" by Analog Design (2Gigaflops 40bit power), providing the highest audio quality (40bit floating point) and a delay of only **0,39 msec** (AES3 output) and **0,46 msec** (analogue output)
- **Audio quality:** Analogue (electronically balanced) and digital output (AES3)
- **Network:** 2 USB's connectors for configuration/monitor and cascade rack connections and a Ethernet 10/100 base TX port (RJ45) for network connection
- **Automatic scan:** for best channels, squelch and other automatic setup
- Infrared interface (i.e. for system setup, microphone programming).
- **Automatic reprogramming** of transmitter (thru infrared)
- **PC Software** to monitor/setup units, spectrum analyzer mode, intermodulation free frequencies calculator, embedded database by area or to archive existing setups



Optional (upgradable):

- Multicompanying (/DIGCOM960)
- Ethersound interface in alternative to AES3 (/ETS)
- **Patented** PTT (Push to Talk) function with audio exit and GPI signals (/PTT)
- Low impedance transformers outputs (/XLR on line ports or /XRC on ptt ports)

General Description

The system presents exceptional selectivity and inter-modulation immunity for best operating performance of the wireless-microphone system even in the presence of DVTB-T transmitter's signals.

MRK 960 is designed to be:

- **"easy & quick to use"** thanks to automatic setup functions (i.e. frequencies, squelch), remote configuration utilities (USB/Ethernet), display with intuitive context menu navigation.
- **"extremely flexible"**, in fact each of the two receivers can work in a 370 MHz bandwidth, more than one rack can be connected together thru a simple USB cable to act a multi-channel receiver. Moreover, the DSP interface allows the units to work with several digital audio output (i.e. AES/EBU, Ethersound,), multi-companying compatibilities and other digital features.
- **"best in class performances"**, thanks to the latest Wisycom technology the unit has extreme RF sensitivity and immunity and superb audio quality.
- **"a durable & upgradable investment"**, thanks to the very robust design (aluminum housing) and the possibility of upgrade/enhance unit's performances with simple slot in card (pc-like thru the DEXB expansion bus).

Moreover, MRK 960 system is already set up for the exclusive PTT function, recently developed by Wisycom and now appreciated in the broadcast world. It's able to work directly with the new wireless microphones provided with built-in telemetry (either body-pack or hand-held transmitters) and Push-To-Talk button: simply pushing this button, the presenter causes the remote switching of the receiver's output-line, from the "main line" to the additional "intercom line", in order to be able to talk "off-air" directly with the technical team (optionally a stuttering tone is back generated to signal the presenter of the push to talk status).



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TECHNICAL SPECIFICATIONS

- Frequency ranges : up to 370 MHz switching bandwidth in 470/940 MHz
- Switchable channels : 2400 managed in 40 groups of 60 frequencies completely user customizable
- Frequencies : microprocessor controlled PLL frequency synthesizer circuit, with 25 KHz minimum step.
- Frequency error : $< \pm 2.5$ ppm, within the rated temperature range.
- Temperature range : $-10 \div + 55$ °C.
- Modulation : FM (50 μ s de-emphasis), other de-emphasis can be pre-set on request and can be recalled from the menu.
- Nominal deviation : ± 40 KHz @ 1 KHz, ± 65 KHz peak (Max acceptable deviation = ± 80 KHz).
- "A" / "B" antenna inputs : with BNC type female connectors.
- RF input impedance : 50 ohm (SWR $< 1:2$).
- Sensitivity **[1]** : < 0.9 μ V (-1 dB μ V), for SND/N = 52 dBA**[2]**, in the whole switching-range; < 10 μ V (+20 dB μ V), for SND/N = 115 dBA**[2]**, in the whole switching-range.
- Amplitude response : < 0.2 dB (for RF input signal: +4 dB μ V \div +120 dB μ V).
- Co-channel rejection : > -3.5 dB @ 2 μ V RF; > -1.5 dB @ 100 μ V RF.
- Adjacent chan. selectivity: > 90 dB @ ± 300 KHz.
- Spurious rec. rejection : > 90 dB.
- IF image rejection : > 110 dB.
- IIP3 : $\geq +20$ dBm (typical)
- Spurious emissions : < 1 pW (typical. = 0.1 pW).
- Squelch : - signal strength squelch: with menu adjustable threshold and "adaptive type" working: the receiver adapts itself automatically to different conditions of both medium strength and speed variation of the received signal; - tone-squelch: it works by decoding the special key, sub-carrier (digitally modulated) present on the carrier of the actual WisycOM transmitters. The tone squelch function can be inhibited for compatibility with other types of transmitters.
- Noise Reduction system : compander circuit, can be pre-set (or switched off) to the following modes:
 - ENR (WisycOM Extended-NR) as default;
 - CUSTOM (to be compatible with other brands transmitters).
- AF line output electrically balanced on XLR-3M connector (**option XRL**, transformer with 30 Ohm imp.)
- AF line output level : +12 dBu (3.1 Vrms) @ nominal deviation.
- AF line output peak level : +20 dBu (7.75 Vrms).
- AES3 on XLR-3M with word clock in/out
- AF bandwidth : 40 Hz \div 20 KHz.
- Frequency response : $< \pm 0.5$ dB (± 0.2 dB typ.) in the 50 Hz \div 19 KHz range.
- Distortion : < 0.3 % (0.10 % typ.) @ peak deviation.
- SND/N ratio **[1]** > 115 dBA (118 dBA typ.) **[2]**.
- Monitor output : 1/4" (6.3 mm) stereo jack connector.
- Monitor output level : max 6 Vrms / 150 ohm.
- Monitor out impedance : 100 ohm for auricle.
- Diversity technique : true-diversity (Twin receiver circuits).
- Bar-graph meters : - RF field strengths (both "A" and "B" inputs) - AF deviation (5% \div 150%), with peak-hold mode.
- Display: 64 x 256 OLED (yellow)
- Calibrating AF tone : 1 KHz, +12 dBu (other on request).
- Powering : 99 \div 138 Vac and 187 \div 264 Vac, with automatic switching / 100 VA max.
- Dimensions : 19"/1U.
- 2 USBs type A/B for network connection and devices cascade
- 10/100 Base TX Ethernet port on RJ45 connector

Note **[1]**: ENR-system included.

Note **[2]**: RMS value, A-weighted, 22 Hz / 22 KHz, and referred to the peak deviation.

The MRK 960 Receiver System complies with ETSI 300 422.

DIGITAL OPTIONS

MULTICOMPANDING (DIGCOM960 option)

Mrk960 system has a powerful core digital sound processor capable of **40bit floating point operation** at 2 Gigaflops (Shark™ by Analogue Device). It is able to deliver a full digital emulation of most analogue compander chipsets with the highest quality and with a delay of 390 usec (AES3 output) and 460 usec (analogue output).

This option allows emulation of SA572/SA575 and rms detector.

ETS950

This option upgrades the receiver with add 2 digital audio ETHERSOUND outputs.

Thanks to this additional board MRK950/960 can interoperate in a ETHERSOUND audio distribution network delivering crystal clear audio and low time latency (0,6 msec) through a legacy 10/100 Base TX network.



ACCESSORIES

FLT950

Kit to mount a removable air-filter on Mrk 950/960.

This is installed on the left side and can be easily removed for cleaning.



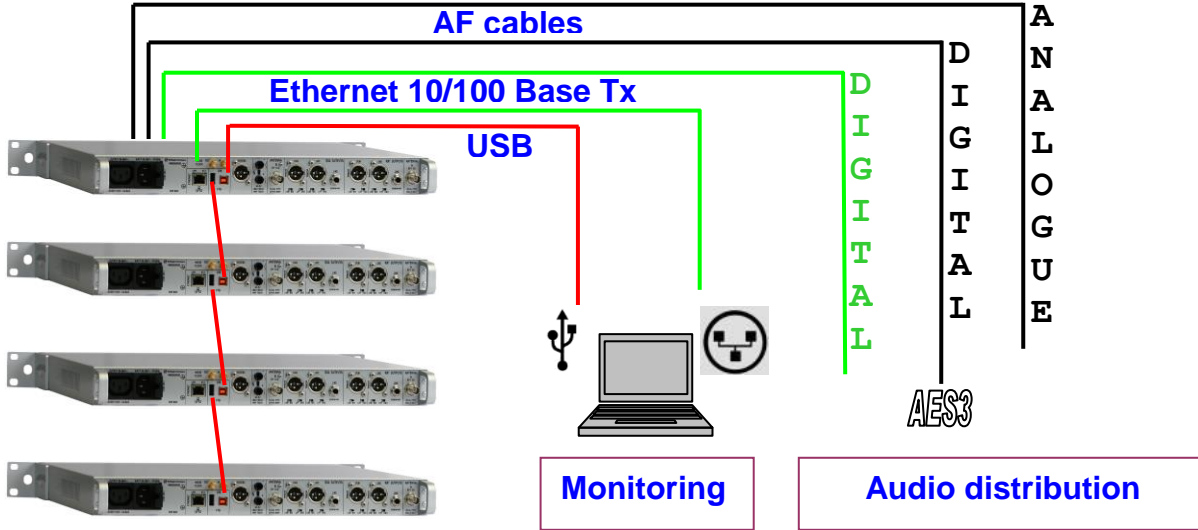
REMOTE MANAGEMENT

Network connections & audio interfaces

MRK9xx's can be easily connected **in cascade** using the 2 usb ports (current SW version support 4 racks cascade max for each daisy chain).

On the below example the unit on the top behave as a single 8 receiver rack (concentrating data from the below receivers); this way all the units can be easily monitored/configured thru a single USB interface or Ethernet connection (a single IP).

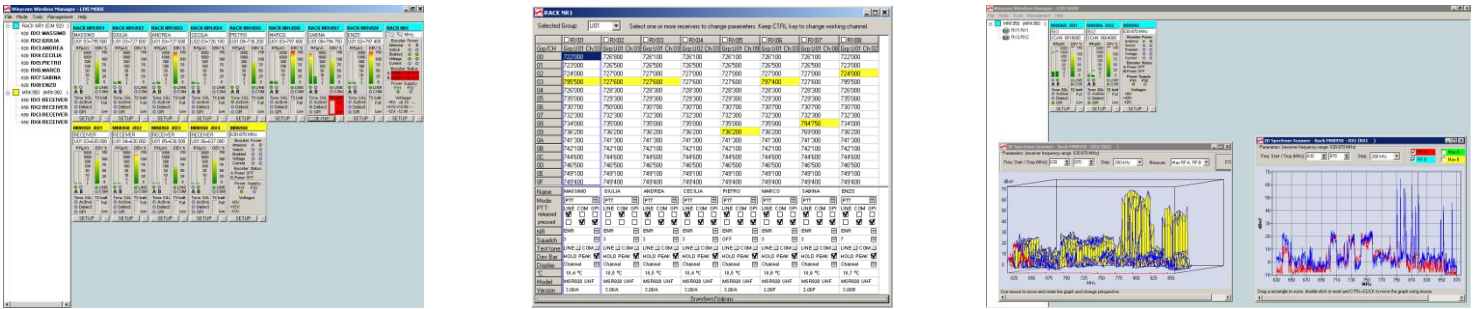
Mrk9xx is an upgradable platform with several audio distribution options both analogue (also available a command line usable to double the audio output) and digital (AES3, Ethersound)



Wisycom wireless manager

This is a windows application that will allow an easy management of one or many receivers, connected either with USB connection or Ethernet network.

The user can easily monitor all the receivers at a glance, changing basic and advanced parameters. Frequency and overall setup copied, saved and mirrored among receivers.



The software allows also more advanced functionalities, for instance spectrum monitor (in the full 370 MHz Mrk960 bandwidth), control of receiver infrared interface for transmitter reprogramming. MRK9xx has a RSSI (RF signal level monitor) calibrated so it can work as a very sensitive spectrum analyzer. Moreover the software allows an automatic frequency calculation along with a fetch in a location database to always load the proper range:

