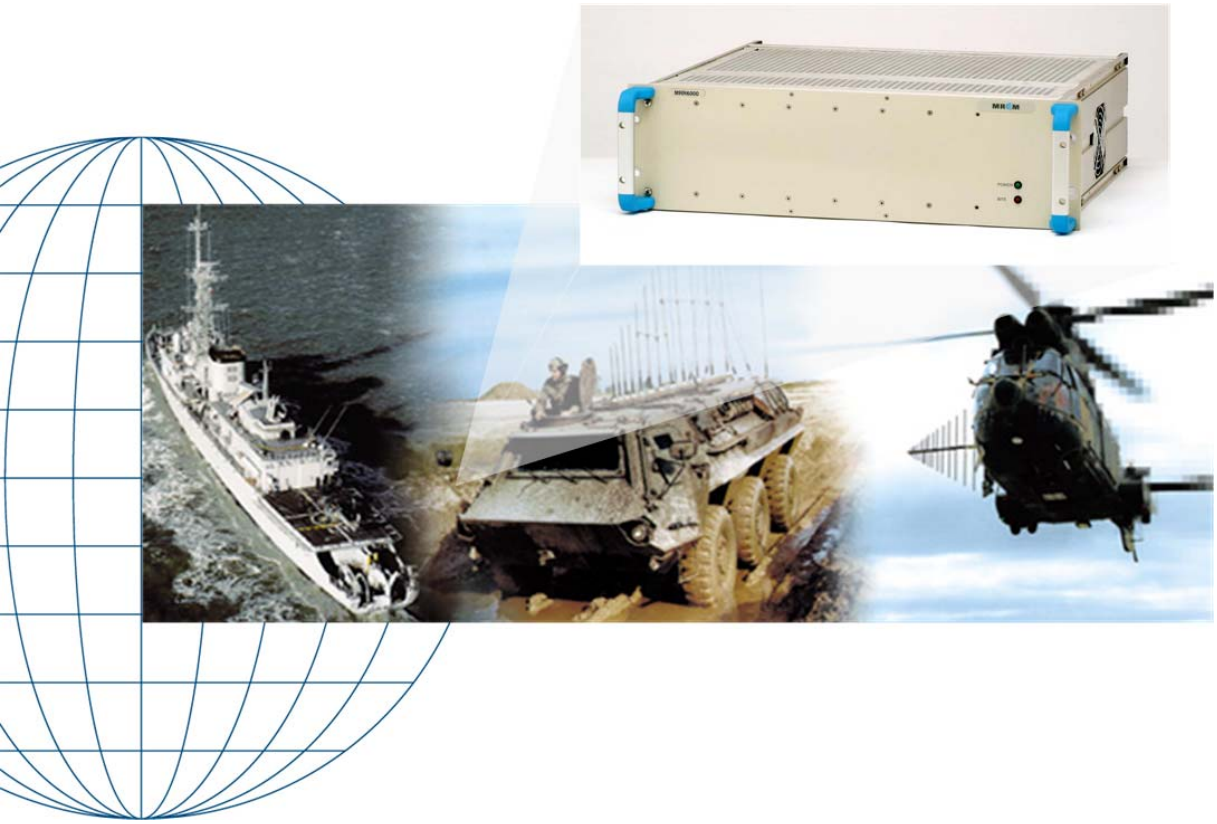
MRCM Products

MRR6000 MULTI-CHANNEL MONITORING RECEIVER FAMILY

- HF Frequency Range 9 kHz to 30 MHz
- V/UHF Frequency Range 20 MHz to 3000 MHz
- Combined H/V/UHF model
- 1 to 4 channels (also 5 channel HF option)



Key Features

- Suitable for fixed, mobile, airborne and naval applications
- Multiple receiver channels in one 19" rack:
  MRR6000LH: 1 – 5 HF channels
  MRR6000VU: 1 – 4 V/UHF channels
  MRR6000LU: 1 HF & 1 V/UHF channel, or 2 HF channels, or 2 V/UHF channels
- Digital Signal pre-processing for optimum adaptation to receiving and signal conditions
- Excellent large signal behavior i.e. low levels of intermodulation and cross-modulation
- Wide dynamic range for applications in different electromagnetic scenarios
- Highly accurate and fully reproducible filter characteristics
- Digital demodulators
- 20 kHz HF bandwidth (switchable)
- IF outputs for signal processing / recording
- Digital audio and IF streaming via LAN
- Memory and frequency scan
- Interfaces: RS232, Ethernet LAN for remote control and high speed Synchronous Serial Interface (SSI) for IF / demodulation data output
- LU provides two independent receiver channels that may be connected to their own antennas – no complicated and expensive antenna switching units required
- ITU-R spectral measurements using SM.377, SM.328 and SM.443 recommendations as guidelines.
- Multi-level BITE feature for effective diagnostics to Module Level
- Modular construction for flexibility and efficient maintenance
- State-of-the-art detection sensitivity
- AC or DC power options
- Host system software components designed for easy system integration with:
  - TCP/IP based Application Interfaces
  - Pool management of valuable resources
  - Simultaneous Multi-Client Application Support
  - Fault tolerant interface management
  - Manual and Automatic Tasking and Process Flow (Optional)
  - User Interface support for Spectrum Recording and Playback (Optional)

Optional Features

- BF6000 Control Panel for stand alone operation, switched to any individual channel and including a channel spectrum display
- High-speed V/UHF scanning with LO2002 Module (MRR6000LU receivers)
- PAN3030 panoramic interface for wideband spectrum and narrow-band spectrum, for MRR6000LU receivers
- Fixed Task User Interface with **MRCM^{ifs}** Comint Server as well as all MRCM ifs DF and scanning receiver Servers. Used for management of tasks containing frequencies of interest
- SI6000 SSI to LAN convertor for streaming digitised IF via LAN up to full 4 x WBFM (160 kHz) bandwidth of MRR6000VU

The "MRR" Advantage:

Meeting the challenge of the modern HF & V/UHF signals scenario, the MRCM® MRR6000 monitoring receiver series utilises the latest technology to achieve outstanding receiver performance.

High dynamic range circuitry, Digital Signal Processing and sophisticated host man-machine interface graphics combine in a cutting edge solution to modern HF & V/UHF ESM monitoring requirements.

Rear View of MRR6000 Receiver

Applications

The MRCM MRR6000 Multi-channel HF & V/UHF Monitoring Receivers provide an excellent and versatile solution in host systems where multiple single frequency channels need to be monitored, demodulated. or scanned. This happens up to total of 5 channels.

In conjunction with MRCM Intelligence Flow System software and appropriate hardware, AF and IF recording, and data decoding functions, can be seamlessly integrated. Receiver channel pooling and connection interlocking facilities ensure optimum and error-free usage of shared resources amongst operators or automated processes. Signal wiring is simplified, and switching is automated, so that operators can focus on their allocated tasks.

The multiple receiver channels in one 19" unit optimize the space required in large systems, as well as minimizing the number of interfaces, e.g. 4 receivers in the MRR6000VU require only one digital control interface but still operate as four individual receivers. This simplifies the system integration.

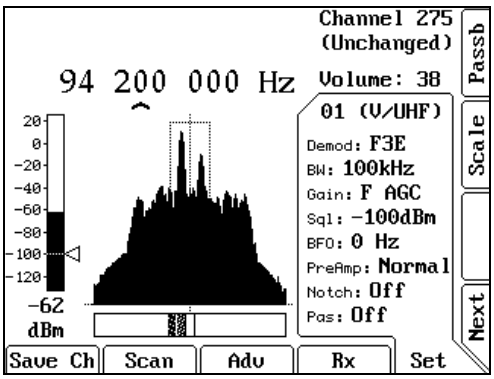
The addition of audio and IF streaming over the LAN port further enhances the level of integration for remote operation.

Three operating modes are possible for each channel:

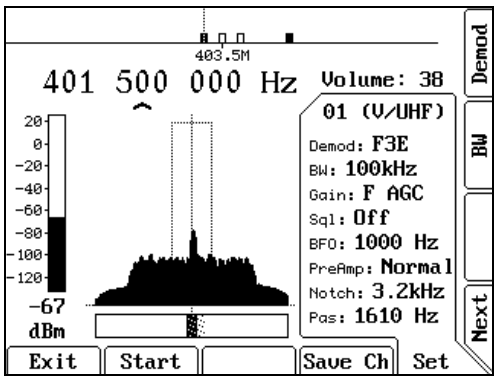
- Fixed frequency mode: The receiver is operated as a monitoring receiver.
- Channel scanning mode: A scan rate of 30 channels/second for the LH and 100 channels/s for the VU is possible, upgrade-able to 1000 channels/s with the LO2002 option.
- Frequency scanning mode: A frequency band can be entered that is scanned for signal activity.

Optional BF6000 Receiver Control Panel

The BF6000 control panel provides a full set of controls and indicators switchable to each individual receiving channel. Included is a spectrum display to assist tuning and scanning, as well as a special display for monitoring activity in channel scanning mode. Also includes spectral measurements which use ITU-R SM.377, SM.328 and SM.443 recommendations as guidelines.



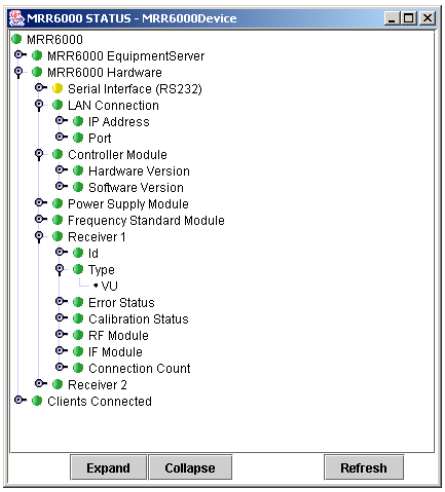
Receiver settings, softkey functions and channel spectrum



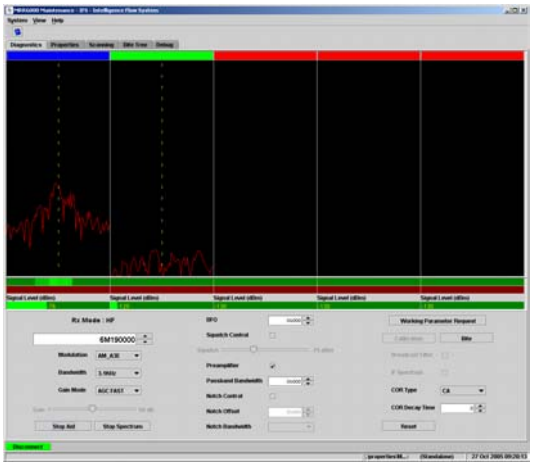
Display for monitoring activity in scanned channels

User Interfaces

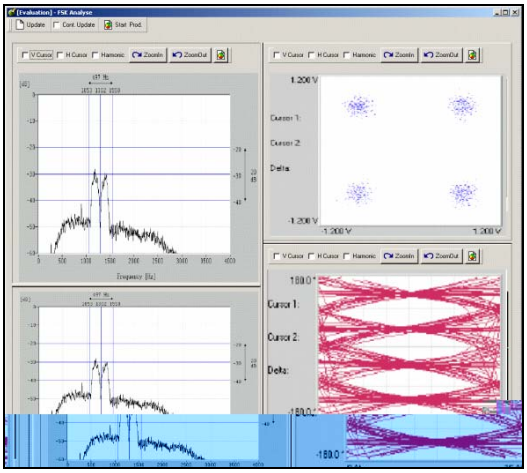
Multi-client access to the full functionality of each receiver channel is provided by ifs Equipment Server software for the MRR6000 running on a remote processor.



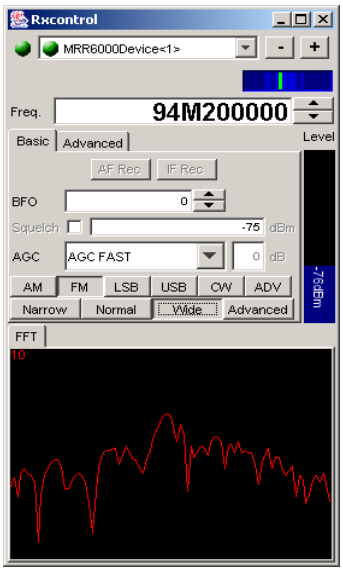
The equipment server display shows status and current activities of the receiver channels.



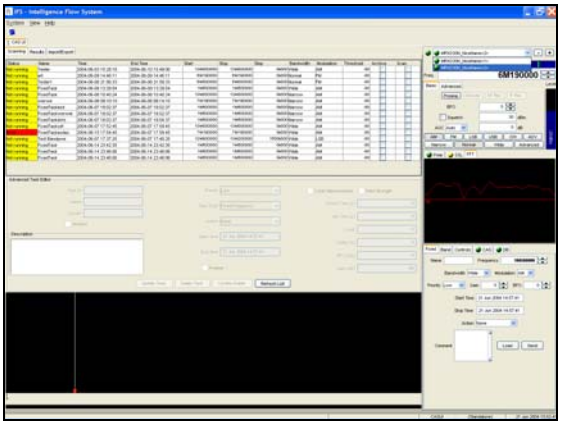
Maintenance User Interface for faultfinding. Receiver channel parameters can be set and tested via the LAN from a remote computer.



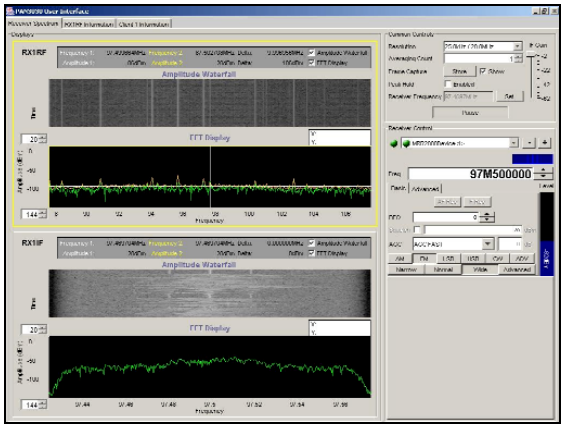
Typical Signal Classification client to IF stream.



Generic intuitive receiver control dialog giving access to an individual receiver channel, with received spectrum FFT for fine tuning and the ability to receive digital streamed audio.

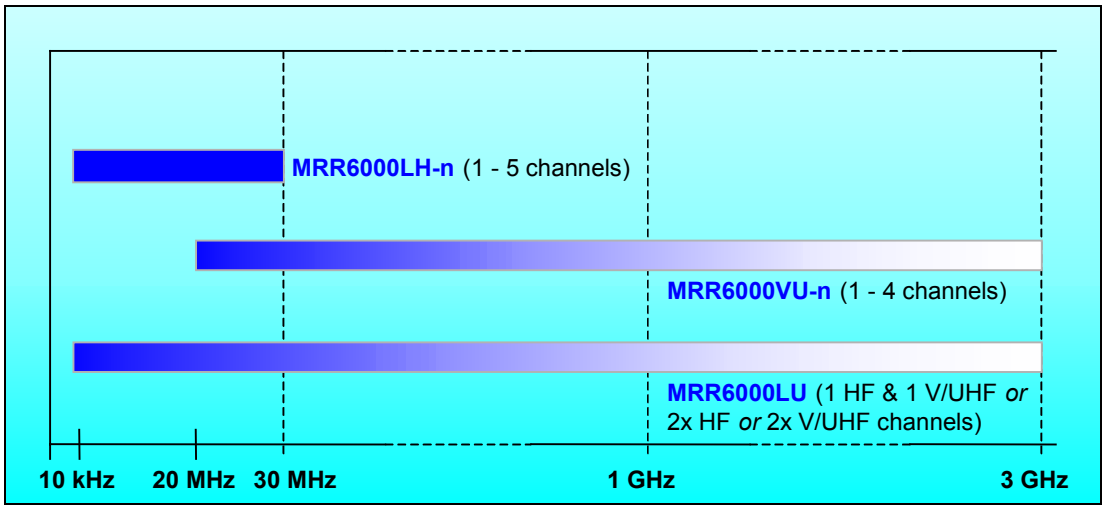


Example of the receiver control dialog used in the optional COMINT Automation Suite User Interface, allowing receiver access for manual use and for automated tasking.

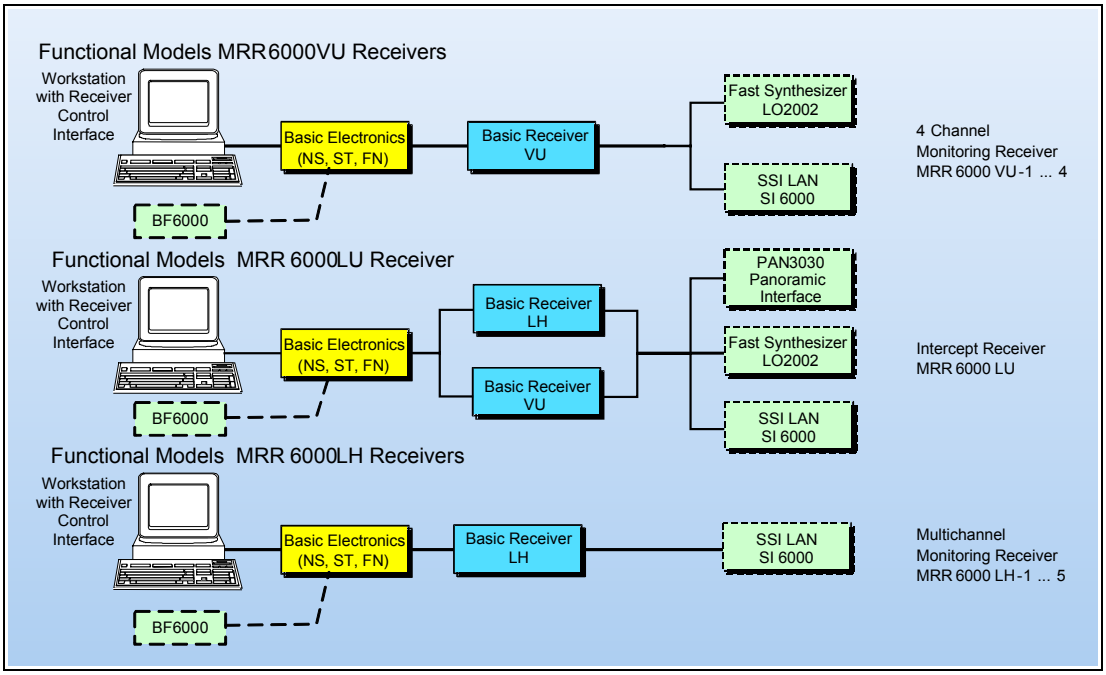


User interface for the PAN3030 Panoramic Interface.

Frequency Coverage and Functional Models



MRR6000 Monitoring Receiver Frequency Coverage



Functional Models of the MRR6000 Monitoring Receivers

Specification Summary

Parameter	HF	V/UHF
	MRR6000LH, MRR6000LU	**MRR6000VU, MRR6000LU**
Frequency range	9 kHz – 30 MHz*	20 to 3000 MHz
Frequency resolution	1 Hz	10 Hz
Types of demodulation	CW, AM, FM, SSB; FSK	CW; AM; FM; SSB
IF-Filter bandwidth	27 steep-edge and 17 phase-linear filters 0.1 to 20 kHz	13 phase-linear filters 0.3 – 160 kHz 325 kHz digital I/Q bandwidth
Notch Filter	3 filters, typical 40 dB rejection	6 filters, typical 40 dB rejection
Intermodulation IP2 (HL mode)	+70 dBm	+40 dBm
Intermodulation IP3 (HL mode)	+35 dBm (typical +40 dBm)	+20 dBm
Noise figure	14 dB	9 dB
Sensitivity:		
CW (SNR = 10 dB)	-125 dBm	-128 dBm
AM (SNR = 12 dB, m = 0.5)	-104 dBm	-107 dBm
SSB (SNR = 10 dB)	-115 dBm	-118 dBm
FM (SNR = 20 dB, d = ±10 kHz	-	-108 dBm
FM (SNR = 20 dB, d = ±3 kHz	-99 dBm	-
AGC/MGC range	140 dB	120 dB
Image rejection	≥ 90 dB	≥ 80 dB
IF rejection	≥ 90 dB	≥ 80 dB
Channel Scan Rate	30 ch/s	100 ch/s
IF output frequency	12.5 / 30 / 455 kHz (BW up to 20 kHz)	70 MHz (BW = 20 MHz Unregulated) 5 to 30 kHz (BW up to 30 kHz)
Data interface	RS232, LAN (TCP/IP), SSI LVDS, Digital audio streaming via LAN	
User interfaces	Windows® / Control panel	
Power supply	115 or 230 VAC (24VDC optional)	
Packaging	19’’x 3U x 467 mm	
Mass	16 kg for MRR6000VU-4, others depend on configuration	
Operating Temperature	-10°C to +55°C	
Storage Temperature	-40°C to +70°C	

** Degraded performance below 1 MHz*

MRCM Products®

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and Counter Measures provided by

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