

## Miniport Receiver EB200 and Handheld Directional Antenna HE200

# Radiolocation from 10 kHz to 3 GHz now with portable equipment

Radiolocation in the frequency range 10 kHz to 3 GHz has now become portable: with Miniport Receiver EB200 and active Handheld Directional Antenna HE200 for searching and monitoring emissions, detecting interference and locating miniature transmitters even in difficult terrain – with performance characteristics so far unparalleled by equipment of this size. Moreover, when accommodated in a rack, EB200 is a cost-effective, compact receiver that can be remotely controlled via LAN interface.



### Designed for portable use

The **ergonomic front panel** of Miniport Receiver EB200 makes for convenient operation in portable applications (FIG 1). The connectors for antenna and headphones are located on the left side of the front panel, providing an unobstructed view of receiver settings. All settings can be made with one hand since all important keys and controls are within easy reach without blocking out the graphic display, which not only furnishes alphanumeric information but also displays symbols and spectra. Various display modes are available to allow for zoomed representation of parameters important for a given application (FIG 2). Digital recording and subsequent evaluation of emissions is possible by means of a recorder connected to EB200.

EB200 is **powered from a battery pack** (optional) plugged to the unit. The battery pack can be replaced easily and conveniently. It can be charged from the power supply unit and the integrated electronics while the receiver is powered from a second battery pack. The power-saving receiver concept enables about four hours of continuous operation, which is sufficient for most applications. 24-hour operation is possible with an additional, commercial battery belt for which EB200 has a separate connector.

FIG 1  
With a weight as little as 4 kg, Miniport Receiver EB200 can conveniently be carried and operated, leaving one hand free for Directional Antenna HE200.  
Photo 43 016/1

The **sturdy aluminum housing** withstands even major impacts without any damage. Because of its compact size it can be accommodated in the glove box of a car. Powered from the car battery (10 to 30 V), the receiver can be operated for several days since it requires less than 22 W. This also means that no blower is required so that the receiver – with the loudspeaker switched off – operates absolutely noiselessly.

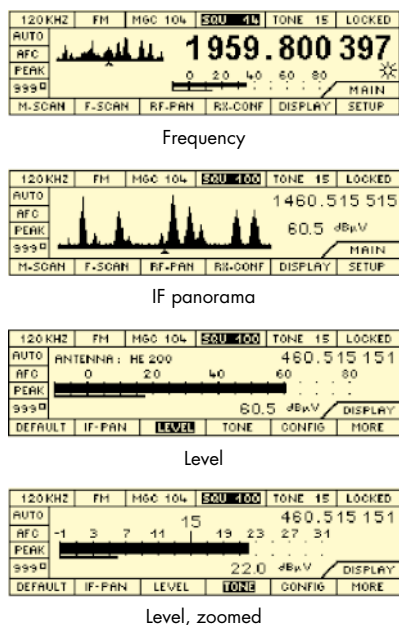
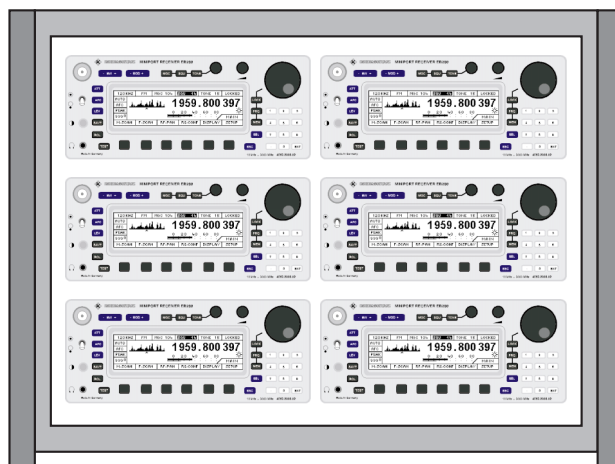


FIG 2 EB200 offers optimum display mode for any application.

### System-compatible for stationary use

EB200 is a compact, budget-priced and high-quality solution for use in stationary systems. Due to the small size of the receiver, a bank of six EB200 units will take up no more space than a PC (FIG 3). This allows the configuration of compact radiomonitoring systems including analyzers, direction finders and recorders. **Networking via LAN** makes for simple cabling and fast transfer of commands. Since EB200 is controlled by means of SCPI commands, any existing control software for Monitoring Receiver ESMC can be

FIG 3 Receiver bank with six Miniport Receivers EB200



used for operating EB200. The receiver incorporates as a standard an input filter that tracks frequencies in the range 20 to 1800 MHz. This allows undisturbed reception of weak useful signals even in the vicinity of powerful transmitters. For the range 10 kHz to 30 MHz, EB200 can be fitted with an optional external input filter.

### Optimally equipped for all operating modes

Fitted with the **Frequency Spectrum (DIGI-Scan)** option, EB200 scans the frequency range of interest with digital control and displays the associated spectrum (FIG 4). Emissions detected can be seen at a glance. Aural monitoring of the information is possible by simply pressing a softkey. EB200 then goes to the DIGI-Scan listen mode. The stored spectrum is displayed in the background, and the emission of interest can be selected and monitored by marking it with the frequency cursor.

**Location of miniature transmitters** at close range is possible in the differential mode of the DIGI-Scan option. In this mode, the displayed spectrum is stored as a reference. Current spectra are superimposed on the reference spectrum, and any new signals or variations in signal strength are clearly discernible as peaks. If the measurement is made with the distance, the field strength of transmitters at close

range varies to a greater extent than that of transmitters located far away. This differential display allows the fast and reliable location of miniature transmitters even with spread-spectrum transmission.

EB200 and Handheld Antenna HE200 are an ideal combination for the **determination of transmitter location**. The handheld antenna helps to find the direction of a transmitter, which is useful especially in difficult terrain where even four-wheel drive DF vehicles have no chance to get there. For long-term monitoring, an adapter comes with the antenna for mounting it on any commercial tripod. A high-sensitivity amplifier accommodated in the antenna han-

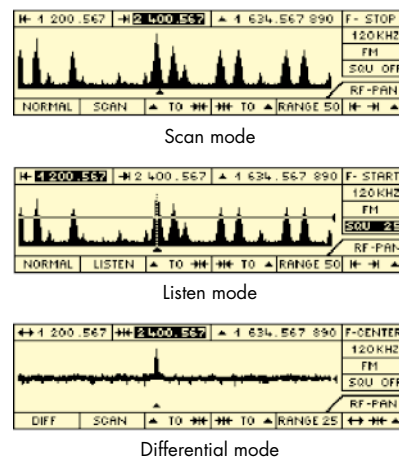


FIG 4 Displaying, monitoring and detecting signals with DIGI-Scan option

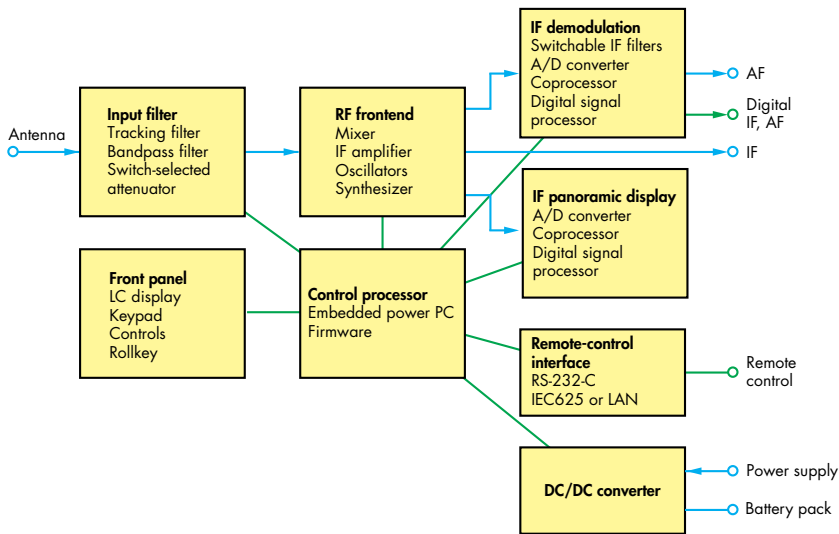


FIG 5 Modular design of EB200 (green: digital data exchange; blue: analog RF, IF, AF)

dle detects even extremely weak emissions. Direction finding is very easy by means of a synthetic tone whose pitch corresponds to the signal level. Monitoring this tone and direction finding is possible at the same time by matching the tone to the signal contents. This tone is switched on also with pulsed transmitters, and level changes can be recognized by the change in pitch.

**Signal evaluation** is based on the signal contents and the signal spectrum. Especially with digital transmission, the spectrum is often the only means of identifying a signal without resorting to more sophisticated analysis equipment. Since signals are emitted at different bandwidths, a fixed IF spectrum can at best be a compromise. Therefore, an **IF Spectrum** option is offered for EB200 that allows variation of the resolution. This enables the signal spectrum to be displayed at the optimum bandwidth in each case, and the user is always provided with the correct information for evaluating the emissions received.

**Ten bandwidths** from 150 Hz to 120 kHz are available to cater for any

requirements. EB200 demodulates as standard not only AM and FM, but also LSB, USB and CW. A telephone filter is not necessary since the AF filter automatically follows the bandwidth. With extremely broadband signals (up to 1 MHz), the IF Spectrum option comes into its own, adding five more bandwidths, so that EB200 will display

the spectrum, level and offset for any signal. The broadband signals are however not demodulated. With the IF Spectrum option, virtually any type of emission can be identified.

### Future-proof with digital signal processing

Accommodating the functionality of a unit of much larger size in the compact EB200 has been possible through the use of LSI components and digital signal processing in the IF filters, demodulators and synthesizer modules (FIG 5). These design features give a wide variety of selectable bandwidths and demodulators and offer a future-proof solution since additional functions or special analysis methods can subsequently be integrated at the customer's by simply downloading them from a PC. Any new features and improvements, too, can in this way be added to the receiver. With EB200, the user will therefore always have a state-of-the-art instrument.

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#### Condensed data of Miniport Receiver EB200

Frequency range	10 kHz to 3 GHz
Dynamic range	-10 to 110 dBµV
Demodulation	AM, FM, USB, LSB, CW (further modes as options)
Bandwidths with demodulation	10 (150 Hz to 120 kHz)
Bandwidths for signal analysis	15 (up to 1 MHz with IF Spectrum option)
Display	full graphics, 240 x 64 pixels, backlit
Operator controls	numeric keypad, softkeys, controls, rollkey
RF connectors	for antenna, IF (10.7 ± 1 MHz), reference
Audio connectors	balanced, unbalanced, 600 Ω mono output, stereo output, ext. loudspeaker, headphones
Digital connectors	IF as I/Q signal, AF
Remote control	via RS-232-C, IEC625 or LAN (RJ45) interface, SCPI-conforming command syntax
Dimensions of case	88 mm x 210 mm x 270 mm
Weight	4 kg; 5.5 kg with battery pack
Continuous operation	typ. 4 h with battery pack
Power consumption	<22 W

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