OBSERVA Field Monitor

RF RECEIVER FOR DAB+ DECODING AND ANALYSIS

Data Sheet

Overview

The OBSERVA Field Monitor is a portable instrument for RF surveys to verify RF content, RF signal performance and signal coverage.
Supported signal inputs and files:

RF: DAB/DAB+ and FM
ETI/NI Files
IP Streams:
- EDI
- FEP (Factum Encapsulated Protocol)

Audio Streams:
- Multicast AAC, Unicast AAC,
- Multicast MP2 and Unicast MP2

Audio Files:
- MP2 File and AAC File

Equipment

Stored in a rugged protective travel case, the OBSERVA Field Monitor unit comprises:

Receiver unit with internal GPS receiver and licence key.
Band-III RF antenna and GPS antenna with magnetic mount, RF antenna cable, and USB power cable .
Software installer, user guide & release notes.

Standards Compatibility

Factum Radioscape products are fully compatible to the latest version of the DAB ETSI family of standards:

EN 300 401: DAB system standard
TS 101 756: Registered Tables
TS 103 176: Rules of implementation
TS 102 367: Conditional access
TS 102 563: DAB+ audio
TS 103 466: DAB audio
EN 301 234: MOT
TS 101 759: TDC
TS 102 427: MPEG-2 TS
EN 300 797: STI
TS 101 860: STI Levels
ETS 300 799: ETI
TS 102 693: EDI
TS 101 499: SlideShow
TS 102 818: SPI xml
TS 102 371: SPI binary
TS 103 177: Filecasting
TS 102 980: DL Plus
TS 102 428: DMB
TS 103 551: TPEG
TS 103 689: Filtered Information Service

Save to File

Save to file options: ETI, Sub-channel, PAD, Audio (PCM or WAV), CSV and KML.

Analysis Views

The OBSERVA Field Monitor software application captures real-time data is displayed through the following 'Views'. For detailed information about each 'View' please consult the Field Monitor User Guide.

Ensemble: Shows the Ensemble contents including number of services, components and sub-channels, Fast Information Groups (FIGs) and repetition rates, Service Linking, Frequency Information, Other Ensembles, Announcements, Service Component Identifier and MNSC data.

Audio: measures audio levels and graphically displays CRC errors

PAD: Programme Associated Data (PAD) rates, and performance

DLS: Dynamic Label Segment (DLS/DL+) flow

Data Groups: Details the state of the data packets sub-channel a visual representation of the incoming packet data.

MOT Objects: Multimedia Object Transfer for a subchannel under analysis

Stations: Display information for all decoded audio service in the ensemble including Service Label, Format, Audio Mode, Bit-rate, Volume, DLS/DL+ and Slideshow image. Ability to play out the audio service and set silence alerts are possible.

MOT Carousel: Displays EPG, station logos and the last 9 slideshow images received.

ETI: Displays the details of the incoming ETI stream, by alarms, metrics and graphs for frame continuity, frame-rate and header CRC.

RF Statistics: Provides real-time representation of the RF signal, including Modulation Error Ratio (MER), Field Strength, Bit Error-Rate (BER), and Signal Level values.

Modulation Characteristics: Displays the modulated signal by graphs, including Phase Reference Symbol (PRS), Channel Impulse Response (CIR), Null Symbol, & Constellation Diagram.

Transmitters: A display of all visible transmitters, with information on TII, CNR, Delay for each.

EPG: Shows the Programme Guide content, including EPG/SPI Modules, Ensembles, Services and Schedules.

Map: For drive surveys where signal level and BER values are plotted on the map and uses GPS. The map displays the location of detected transmitters. Coverage data can be imported to display in Map View, or exported as KMZ files for Google Earth.

Data Logging: Selected form a comprehensive list of General (RF, ETI, and GPS), Service, or Transmitter Metrics to show their source, values and status.

Custom: a customisable grid to display a selection of metric graphs.

System Requirements

The Factum Radioscape range of software products, like all real-time processing software requires an operating environment suitable for continuous, stable operation along with appropriate processing and storage resources.

Please ensure that the host system for Factum Radioscape products meets the minimum hardware specifications listed below. If you are unsure if your hardware is compatible, please contact either your account manager or technical support: support@factumradioscape.com

Minimum Operating Environment

Operating System:

Windows 10 Pro (build 20H2 or newer)
Windows 11 Pro (build 21H1 or newer)

CPU:

Intel i5 (8th Generation or newer), 4 Cores, min 2GHz
AMD Ryzen 5 (3000 series or newer), 4 Cores, min 2Ghz

8GB RAM
At least 2GB HDD/SSD space available

USB 2 type A socket required, note that connecting the device via a USB hub is not supported.

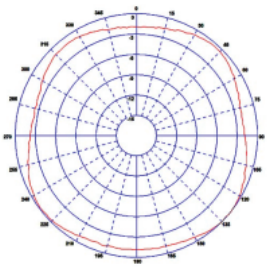
Hardware - DAB Antenna

All Field Monitors are supplied with a Band III DAB antenna, it is possible to use a different antenna, please consult the User Guilde for further details. Please note that for FM measurements, a separate antenna is required.

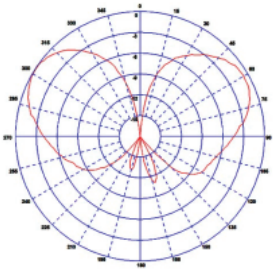
Whip

Frequency Range (MHz)	162-174MHz
Typical Gain:	Isotropic 2dBi
Compared to 1/4 wave	0dB
Polarisation	Vertical
Pattern	Omni-directional
Impedance	50Ω
Max Input Power (W)	100
Dimensions (mm)	Height 397 (15.63") Diameter 12.5 (0.49")
Operating Temp (°C)	-40°/+80°C (-40°/176°F)
Material	TPE

Typical H-Plane (168MHz)



Typcial E-Plane (168MHz)



Base

Cable Connector	FME
Mounting Type	Magnetic with rubber boot
Maximum Whip Length (mm)	600
Dimensions (mm):	Height 44.4, Diameter 73

Hardware - GPS

Frequency:	1575MHz ±5MHz
VSWR:	≤1.5dB
Polarisation:	right hand circular
Antenna gain:	-3.5dB at 10°C
Amplifier gain:	≥27dB typically
Noise figure:	≤1.5dB typically
Interference rejection:	20dB (fo ± 140MHz)
Power consumption:	10mA/3V, 18mA/5V
Supply voltage:	3V, 5V compatible
Operating Temperature:	-45°C to +85°C
Relative Humidity:	100%
Connector:	SMA
Update Rate	NMEA: 1Hz

Accuracy (24-hour static)

Horizontal (without SBAS):	<2.5m 50%, <5m 90%
Horizontal (with SBAS):	<2.0m 50%, <4m 90%
Altitude (without SBAS):	<5m 50%, <8m 90%
Altitude (with SBAS):	<3m 50%, <5m 90%
Velocity:	0.06m/sec
PPS (static):	±25ns, 1 sigma

Acquisition

Reacquisition:	<2 sec 50%

Autonomous operation

Hot-start:	<2 secs 50%
Warm-start:	35 secs 50%
Cold-start:	38 secs 50%

Sensitivity

Tracking:	-160dBm
Acquisition sensitivity:	-146dBm

Operational

Speed Limit:	515m/sec

Hardware - RF

Full Band III coverage:	(162 - 240Mhz)
Typical Sensitivity:	-101.8dBm (C/N = 6.5dB, Band 3)
RF Input Frequency	162 240 MHz
Input resistance	Max / Min Gain 100
Input return loss	12 dB (50 Ohm source)
DSB Noise figure	4.7 dB
Max Voltage Gain	FIF = 0 Hz 107 dB
LNA Gain Reduction Gain Reg.	24 dB
LNA Gain Reduction NF	24 dB
Mixer Gain Reduction Gain Reg.	19 dB
IIP2 Max Gain	+40 dBm
IIP3 Max Gain	-12 dBm
IIP3 Min Gain	+17 dBm
Local Oscillator phase noise	(at FLO =195 MHz, Δf ≥ 1 MHz) -140 dBc/Hz
Local Oscillator Jitter	(1 kHz – 1 MHz) 0.3 º rms

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