

# MULTIMONITOR

## DAB+ MONITORING SYSTEM DATA SHEET

### Features and Compatibility

#### Service (Audio and/or Data) Monitoring

MultiMonitor fully decodes the entirety of multiple ensembles. Real time alarm data and information is provided on the following aspects:

Audio Silence  
Dynamic Label Presence  
Dynamic Label Stall (timeout for DLS content change)  
MOT Presence  
MOT Stall  
PAD presence  
Data channel content presence  
Subchannel CRC check

All audio subchannels can be selected for further analysis:

Audio VU display  
DLS display  
MOT display  
Audio Payout with volume control

Each parameter listed above has an associated UI prompt, email alert and SNMP v1/v2c trap

#### Email Alert System

An email alert system is provided as standard with Multimonitor. The email alert system uses the same subsystem as SNMP and UI alerts to provide consistent alarm change timing.

A working SMTP server is required, email test functionality is provided.

Alert recipients are unlimited and can be grouped and configured to receive specific alarms from defined inputs, if required, using groups and triggers. Users can be assigned to one or more groups, each with their own list of email triggers:

Frame Rate  
Frame Length changes  
Invalid Frames  
Header CRC Failures  
Frame CRC Failures  
Frame Continuity Failures  
Frame Phase Failures  
Frame Length Failures  
FIC CRC Failures  
Audio Silence  
Dynamic Label Presence  
Dynamic Label Stall (timeout for DLS content change)  
MOT Presence  
MOT Stall  
PAD presence  
Audio CRC  
Data CRC  
Data channel content presence  
TIST at FCT (alarm on change)  
Reconfiguration

#### Presence Monitoring

Optional Presence monitoring raises an alarm if unexpected changes occur in the ensemble composition. Presence monitored:

Ensemble (Label or EID)  
Services (Label or SID)  
Subchannel (SCIDs)

### Input Monitoring

Unlimited EDI inputs are permitted depending on licence, Inputs alarms:

Encapsulation of DAB Interfaces (EDI) as per ETSI TSI 102 693:

Frame Rate  
Packet Rate  
Malformed Packet  
Malformed Frames  
Packet CRC Errors  
Frame CRC Errors  
Frame Sequence Errors

Ensemble Transport Interface (ETI) as per ETS 300 799:

MST Length  
ERR Byte  
Stream Count  
TIST at FCT (alarm on change)  
Frame Rate  
Header CRC Failures  
Frame CRC Failures  
Frame Continuity Failures  
Frame Phase Failures  
Frame Length Failures  
FIC CRC Failures

Each parameter listed above has an associated UI prompt, email alert and SNMP v1/v2c trap

### Logging

All alarm status changes are logged to the database and available either in the UI or via CSV file download.

Logging can be managed in the User Interface and filtered by:

Start Time/End Time  
Record Limit  
Input Channel  
SCIdS  
Service ID  
Alarm Status:

OK  
Warning  
Minor Alarm  
Alarm  
Error  
Information  
Trace

Alarm Type (please see 'Inputs' and 'Service' monitoring sections)

A history of the last 40 reconfigurations is stored and available both in the UI and CSV download containing:

Service List  
Subchannel List  
Time of Reconfiguration

### Service Alarm Settings

Silence settings can be set on a per service basis, or based on a system wide template.

Audio/DLS/MOT/PAD timeout, set in HH:MM:SS format  
Audio/DLS/MOT/PAD recovery, set in HH:MM:SS format  
Audio Silence threshold: -80 to -20dBFS  
Audio Silence recovery: -60 to -10dBFS

# 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

## Operating Environment

### Virtualised

#### Hypervisor

VMware ESXI v6.7 or newer (v7.0 recommended)

Oracle VM VirtualBox

#### Host

Intel Xeon E5/Silver CPU (Sandy Bridge generation or newer)

Suitable RAM, HDD to accommodate the required number of Virtual Machines:

#### Guest

Windows Operating System:

Windows 10 Pro (build 1903 or newer)

Windows 10 Enterprise LTSC (build 21H2 or newer)

Windows Server 2019 (build 1903 or newer)

Linux Operating System:

Ubuntu v22.0 or newer

Debian v11.6 or newer

Mint v21.0 or newer

8 vCPUs of which (minimum):

1 Sockets

8 Cores per Socket

8GB RAM

38GB Hard Disk Space connected via LSI Logical SAS

Default Video Card enabled

#### Networking

Either: fixed 100Mbps or 1 Gbps Full Duplex on Network

Separate networks for management traffic (HTTPS, SNMP etc) and data throughput (Audio, EDI etc) is recommended

If NIC Teaming is enabled, ensure 'Explicit Fail over Mode' is selected

#### Virtual Machine Setup

The following is required to ensure stable operation of virtual machines:

Full Administrator access is available

No contending timing sources (e.g. "Windows Time") are enabled

Defragmentation services are turned off

Resource allocation between Virtual Machines is set appropriately to avoid contention

### System Timing

A proper clock source must be provided that conforms with RFC 5905v4 and is disciplined by a recognised time reference source (i.e. GPS/GAL etc.). Performance profile must not exceed:

- 40ms Latency

- Less than 10ms Jitter

### Containers

Multimonitor supports deployment in a containerised environment, via either Linux/Windows hosts and containers. Compatible systems include:

Docker v22 and newer

Please contact Factum Radioscape support if you are interested in deploying digital radio in a containerised environment

### Industrial PC (IPC)

Intel i5/i7 CPU (Sandy Bridge generation or newer)

Windows Operating System:

Windows 10 Pro (build 1903 or newer)

Windows 10 Enterprise LTSC (build 21H2 or newer)

Windows Server 2016 (build 1903 or newer)

Linux Operating System:

Ubuntu v22.0 or newer

Debian v11.6 or newer

Mint v21.0 or newer

8GB RAM

At least 2GB Hard Disk Space after OS installation

Redundant Power Supply Units recommended

#### Networking

Either: fixed 100Mbps or 1 Gbps Full Duplex on Network

Separate networks for management traffic (HTTPS, SNMP etc.) and data throughput (Audio, EDI etc.) is recommended

If NIC Teaming is enabled, ensure 'Explicit Fail-over Mode' is selected

### 3rd Party Requirements

Factum Radioscape products require the following third-party applications, installation of such products is completed at deployment by a Factum Radioscape engineer

MySQL v10.5

Microsoft .NET6 Runtime libraries

Greyware NTP client v5.2

The following third party software is recommended for installation on all host environments:

Wireshark v4

HTML5 compatible browser such as Firefox (v100 or newer) or

Chrome (v100 or newer)

### Support Access

All remote customer deployment are requested to provide VPN access for remote support using a recognised VPN system (i.e. OpenVPN).

Anydesk or Teamviewer remote desktop software may be used, but response times may be impacted should improper setup of these software occurs and remote access is impeded as a result.

Please talk to your account manager or technical support should you require further information



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