



OBSERVER™ RPM

The **Observer RPM (Remote Program Monitor)** is Volicon's solution for MSOs, Independent Cable operators, IPTV, and Satellite providers looking to automatically evaluate the quality of their NOC/headend and remote hubsite broadcasts from a central location.

Based on technology employed in Volicon's award-winning Observer broadcast monitoring system, the Observer RPM scans hundreds of channels, automatically testing signal integrity 24/7, issuing alerts (via email and SNMP), and capturing the problematic content when channels do not conform to pre-specified limits. Monitoring includes detection of audio levels and missing/frozen/black video, including notifications when the signal is restored. Additionally, Observer RPM has a unique patent pending feature that detects macroblocking errors which typically result from data loss or over-compression of digital video.

In addition to providing alerts, Observer RPM can record content for later review, facilitating diagnostics by allowing technicians to carefully observe an intermittently faulty channel. Armed with a standard MS Windows-based PC, one technician is capable of reaching out and inspecting the entire video pipeline – from central headend to remote hubsite – without leaving his or her seat.

Observer RPM eliminates the need for manual, visual channel inspections – an expensive and time-consuming task. It allows proactive response to faults, instead of waiting passively for customer complaints. Improve service and save on operating costs by eliminating unnecessary service trips to remote locations.

- **Automatically monitor** the entire channel lineup
- **Identify** and evaluate severity and cause of failure, often eliminating the need to send a technician to a remote site
- **Alert** generation when faults are detected and confirmed
- **Record** problematic channels 24/7 for closer scrutiny
- **Stream** desired channels for remote viewing from any location
- **Log and review** faults via web interface

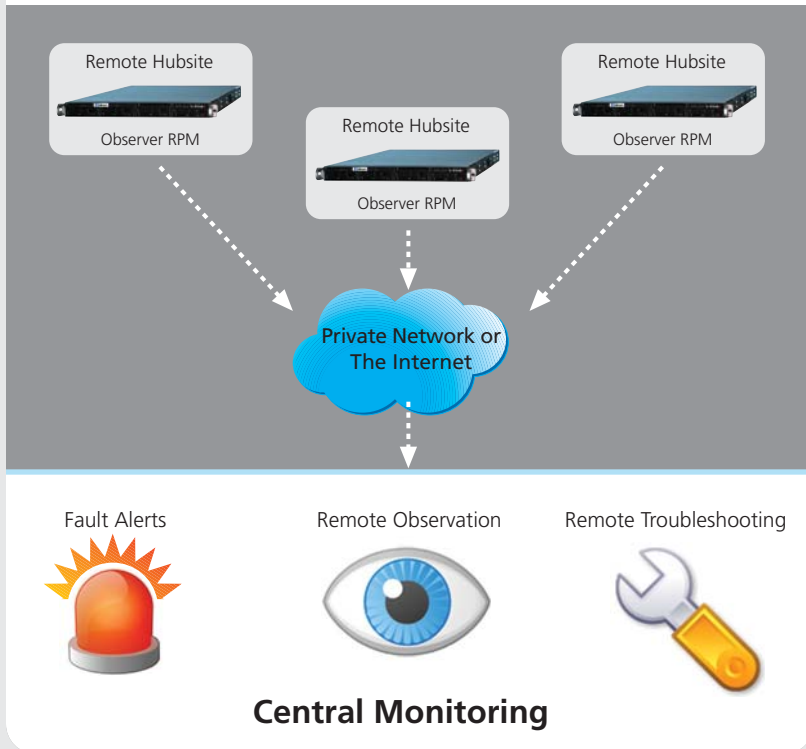
Observer RPM is available in two variants Enterprise and Standard. Observer RPM-E (Enterprise) is for those customers who need a high-end enterprise solution for mission-critical applications. Observer RPM-S (Standard) is for applications that do not need power redundancy and RAID drives.



HOW IT WORKS

1

Overview

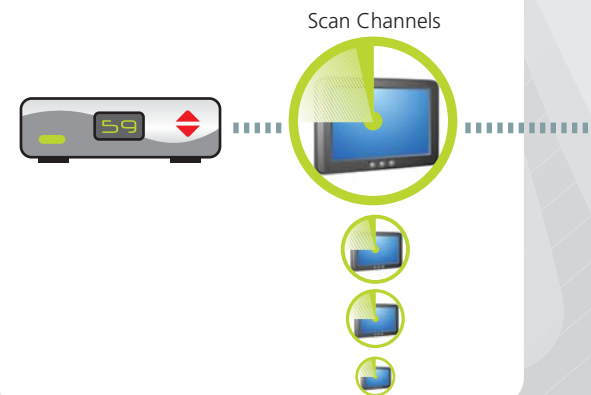


Scan

The Observer RPM controls the attached set-top boxes, quickly changing channels and evaluating each for faults:

- No Video Signal
- Macroblock Errors
- Black Screen
- Static Image
- Low/Missing Audio
- Shut-down Set-Top Box

Multiple fast-scanners may be employed to speed up scan cycle.



An Observer RPM monitoring network consists of RPM servers, situated wherever monitoring is desired (usually remote hubsites). At minimum, one RPM server is necessary for each distinct monitored location. Each RPM server is designed to control and inspect the output of several set-top boxes. Each set-top box is attached to one composite video input, and is controlled by means of a programmable infrared emitter, configured to mimic the set-top box's original remote control.

Once attached, each input on the RPM can be configured in one of four modes:

- **Fast Scan:** the attached set-top box will be instructed to scan the channel list as quickly as possible, spending the minimum amount of time possible (typically 5-10 seconds) to inspect each channel. If a channel is found to be faulty, it is added to a list of "faulty channels" which a reviewer will inspect, and an alert is issued.
- **Reviewer:** the attached set-top box will be instructed to scan each channel in the "faulty channels" list for a longer duration (usually 1-2 minutes), carefully monitoring faulty channels for the return of normal service. If a faulty channel returns to normal, the reviewer issues a "signal restored" alert and removes the channel from the faulty channel list.

- **Manual:** in this mode, the attached set-top box does not automatically scan the channel list, instead it is remotely controllable via the Observer RPM's web interface. Operators may issue any series of remote-control keypresses to the set-top box, including power on/off commands. A selected channel will be streamed in real time for remote viewing.
- **Scheduled Recording:** the attached set-top box will be instructed to scan specific channels at specific dates and times presented to the operator either through a calendar interface or an electronic program guide.

Any combination of these four modes may be applied to attain the desired functionality. Nominally, multiple fast scanners are used in tandem, each one scanning a subset of the channel list and thus reducing the amount of time between channel inspections. Once a fault is detected, a clip is generated depicting the faulty channel, and an alert is dispatched to operators via email or SNMP trap. Operators may then log into the web interface to see the clip and share it, and may use the manual tuners to diagnose the fault. Channel faults can be sorted by channel name/number, set-top box, and QAM to aid in diagnosis and reporting. In each of the modes there is a capability of inserting scripts as part of the channel lineup. These scripts, generated on the OBSERVER RPM, send the attached set-top boxes a series of commands to execute. This enables the acquisition and monitoring of assets such as VOD that require more than simple channel tuning. For set-top boxes that have it, scripting in Manual mode enables the operator to put the set-top boxes into a diagnostics mode and monitor the results.

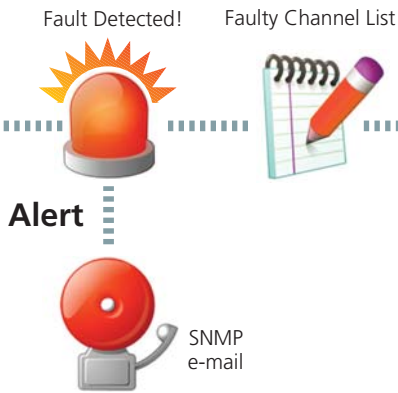
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Alert

Once a fault is detected, an alert is issued to operators via SNMP or e-mail.

A 90-second "fault clip" is logged and archived on the server.

The malfunctioning channel is added to the list of faulty channels.

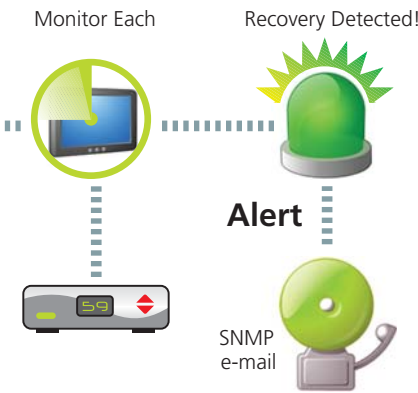


3

Recovery

A reviewer rotates through the faulty channels, watching each for a return to normal functionality.

Once recovery is confirmed for a channel, it is removed from the faulty channel list and a recovery alert is issued to operators.

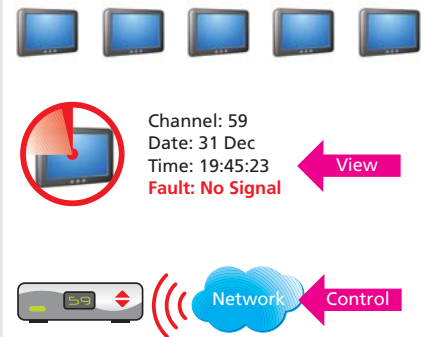


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Review

Operators can review the fault clips from their desks, providing quick visual confirmation of the fault.

Operators can issue commands to RPM-attached set-top boxes, including poweron/poweroff, channel tuning commands, and EPG control. The result is viewable live via the Observer RPM web interface.



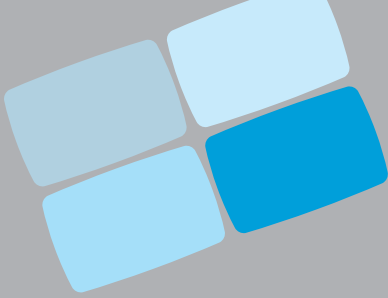
For central monitoring applications, an additional Observer-WEB server is needed at the central location to facilitate aggregation of the information from each Observer RPM machine in the monitoring network. The network-based alerting of the Observer RPM does not require any contact-closure wiring or installation, reducing complexity, maintenance, and equipment costs.

FAULT TYPES VIEW

ID	Encoder	Channel	Details	Audio	QAM	Detected ??
2010	834	13	Local Access (13), Encoder 834	Low audio	83	CGMP 34-12-07 03:24:48 pm
2011	834	13	Local Access (13), Encoder 834	Audio back	571	CGMP 34-12-07 03:28:27 pm
2014	834	13	Local Access (13), Encoder 834	Low audio	87	CGMP 34-12-07 03:28:48 pm
2015	834	13	Local Access (13), Encoder 834	Audio back	1740	CGMP 34-12-07 03:33:53 pm
2017	834	13	Local Access (13), Encoder 834	Low audio	95	CGMP 34-12-07 03:38:50 pm
2019	834	13	Local Access (13), Encoder 834	Audio back	462	CGMP 34-12-07 03:39:54 pm
2020	834	13	Local Access (13), Encoder 834	Low audio	103	CGMP 34-12-07 03:43:07 pm
2026	834	14	PGMP (PGMP (14)), Encoder 834	Off back	1879	CGMP 34-12-07 03:50:54 pm
2028	834	14	PGMP (PGMP (14)), Encoder 834	Signal cut	46	CGMP 34-12-07 03:50:56 pm
2029	834	13	Local Access (13), Encoder 834	Off back	884	CGMP 34-12-07 03:52:47 pm
2036	834	13	Local Access (13), Encoder 834	Static cut	133	CGMP 34-12-07 04:10:33 pm
2039	834	13	Local Access (13), Encoder 834	Audio back	2242	CGMP 34-12-07 04:20:28 pm
2044	834	13	Local Access (13), Encoder 834	Low audio	89	CGMP 34-12-07 04:20:36 pm
2045	834	13	Local Access (13), Encoder 834	Audio back	472	CGMP 34-12-07 04:23:54 pm
2050	834	13	Local Access (13), Encoder 834	Audio back	1187	CGMP 34-12-07 04:24:54 pm
2052	834	13	Local Access (13), Encoder 834	Low audio	89	CGMP 34-12-07 04:24:56 pm
2054	834	13	Local Access (13), Encoder 834	Audio back	472	CGMP 34-12-07 04:25:54 pm
2056	834	13	Local Access (13), Encoder 834	Low audio	83	CGMP 34-12-07 04:27:28 pm
2400	834	13	Local Access (13), Encoder 834	Audio back	2429	CGMP 34-12-07 04:53:53 pm
2408	834	13	Local Access (13), Encoder 834	Audio back	438	CGMP 34-12-07 05:02:27 pm
2409	834	13	Local Access (13), Encoder 834	Low audio	747	CGMP 34-12-07 05:06:16 pm

ALERT TYPE

No Video Signal	Generated when the video signal is absent for a configurable duration.
Macroblock errors	Generated when screen image is showing macroblock errors.
Low Audio	Generated when the audio signal is below a configurable threshold for a specified duration.
Black Video	Generated when there is a black screen for longer than a user-specified duration.
Static Video	Generated when there is a frozen image onscreen for longer than a user-specified duration.
Fault Restored	Generated when a faulty channel returns to normal.
Transport Stream Fault	Generated upon receipt of alert from supported transport stream analyzer.



MACHINE SPECIFICATIONS

The Observer RPM machines are designed with robust 24/7 unattended operations in mind. Enterprise version RPM machines feature redundant power supplies, dual gigabit ethernet, and hardware RAID-5 with extra standby "hot-spare" drive, as well as an IPMI baseboard management for remote hardware status inspection (including SNMP traps) and remote rebooting.

FEATURE	RPM-100-S	RPM-200-S	RPM-400-S	RPM-200-E	RPM-400-E
A/V Inputs (analog composite) autoscanners	1	2	4	2	4
Channels Scanned per Minute	12	24	48	24	48
Simultaneous Manual and Scanning Modes	no	yes	yes	yes	yes
Central Monitoring	yes	yes	yes	yes	yes
SNMP Alerting	yes	yes	yes	yes	yes
Storage Per Input (days)	7	7	7	30	30
RAID-5 with Hot Spare	no	no	no	yes	yes
IPMI Watchdog Module	no	no	no	yes	yes
CPU	single	single	dual	single	dual
Operating System	XP Professional	XP Professional	XP Professional	Windows Server 2003	Windows Server 2003
Network (Single or Dual Gigabit Ethernet Ports)	single	single	single	dual	dual
19" Rackmount Chassis Height	1RU	1RU	1RU	1RU	1RU
Weight (lbs/kg)	14 lbs/6.4 kg	14 lbs/6.4 kg	14 lbs/6.4 kg	45 lbs/20.5 kg	45 lbs/20.5 kg
Redundant Power Supplies	no	no	no	yes	yes
Rated Power Requirements	260W	260W	260W	560W	560W



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