

MTM400A

New MPEG Monitor with *FlexVuPlus*™

Simplifying DTV & IPTV Monitoring



Simplifying DTV & IP Video Monitoring . . .

The MTM400A with *FlexVuPlus*™ delivers

- Complete solution for real-time transmission monitoring of MPEG transport streams over RF, IP, and ASI interfaces.
- Highly scalable monitoring solution combining powerful confidence monitoring capability with diagnostics measurements, to tailor capital expenditure with operational growth.
- Intuitive and simplified presentation of video quality and diagnostic information, to empower operational and engineering teams with simplest information to enable delivery of superior QoS levels.



Building on Industry Leadership

The MTM400A with *FlexVuPlus*™ delivers

- Powerful end to end monitoring with video management solution and 3rd party management support.
- Comprehensive monitoring solution to support:
 - Superior QoS levels to maximise subscriber growth and advertising revenue.
 - Reduced operational costs by empowering operations staff with concise information to deliver greater accountability for QoS levels; whilst also optimising workflow between varying operations and engineering resources.
 - Minimised network downtime with subsequent advertising revenue penalties and subscriber churn.



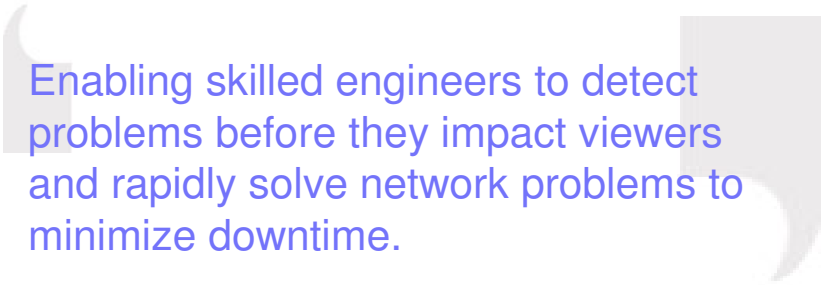
2007 Technical Emmy for
MPEG Monitoring Technology

Confidence Monitoring

Enabling Network Operation Centre operators to provide assurance that broadcast services are being delivered within defined quality thresholds.

- *FlexVuPlus*™ **uniquely** presents simplified presentation of video quality and diagnostic information, to enable delivery of superior QoS levels in an increasing complex broadcast environment.
- At a glance service view with video thumbnails empowering operations staff with the simplest information to monitor service delivery.
- Comprehensive seven day trending of IP and RF broadcast streams with **unique** dual level alarming supports proactive network monitoring to minimise downtime.

Diagnostic Monitoring

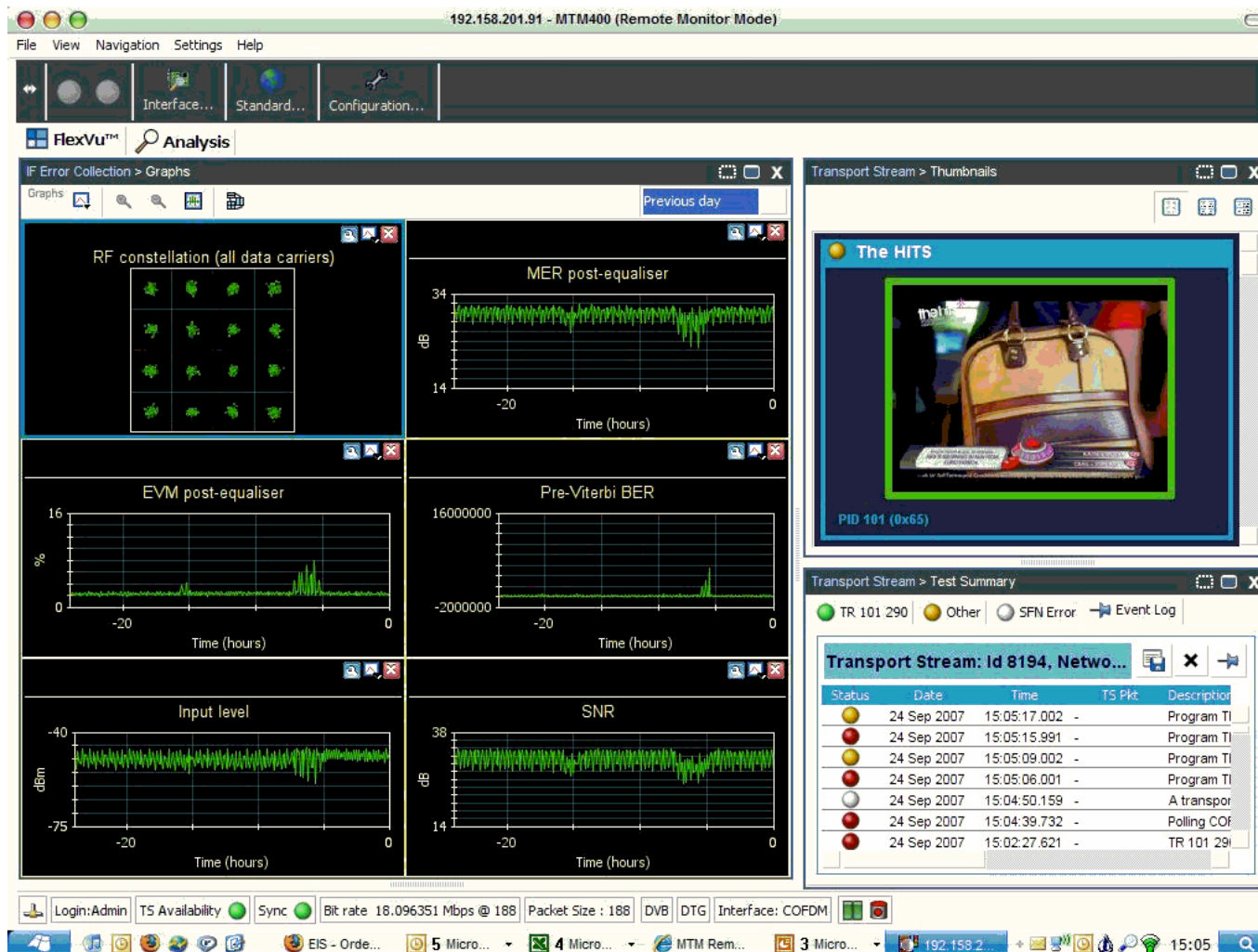


Enabling skilled engineers to detect problems before they impact viewers and rapidly solve network problems to minimize downtime.

- Powerful user interface provides intuitive hierarchical views of IP/RF parameters, Programs, SI/PSI and PIDs etc allowing Engineers to rapidly identify the root cause of underlying service problems.
- Accelerate time to insight with context sensitive navigation and filtered logging to isolate root cause of test failure.
- Deep cross-layer diagnostic capability correlates relationship between the physical interface (RF/IP) and the MPEG TS.

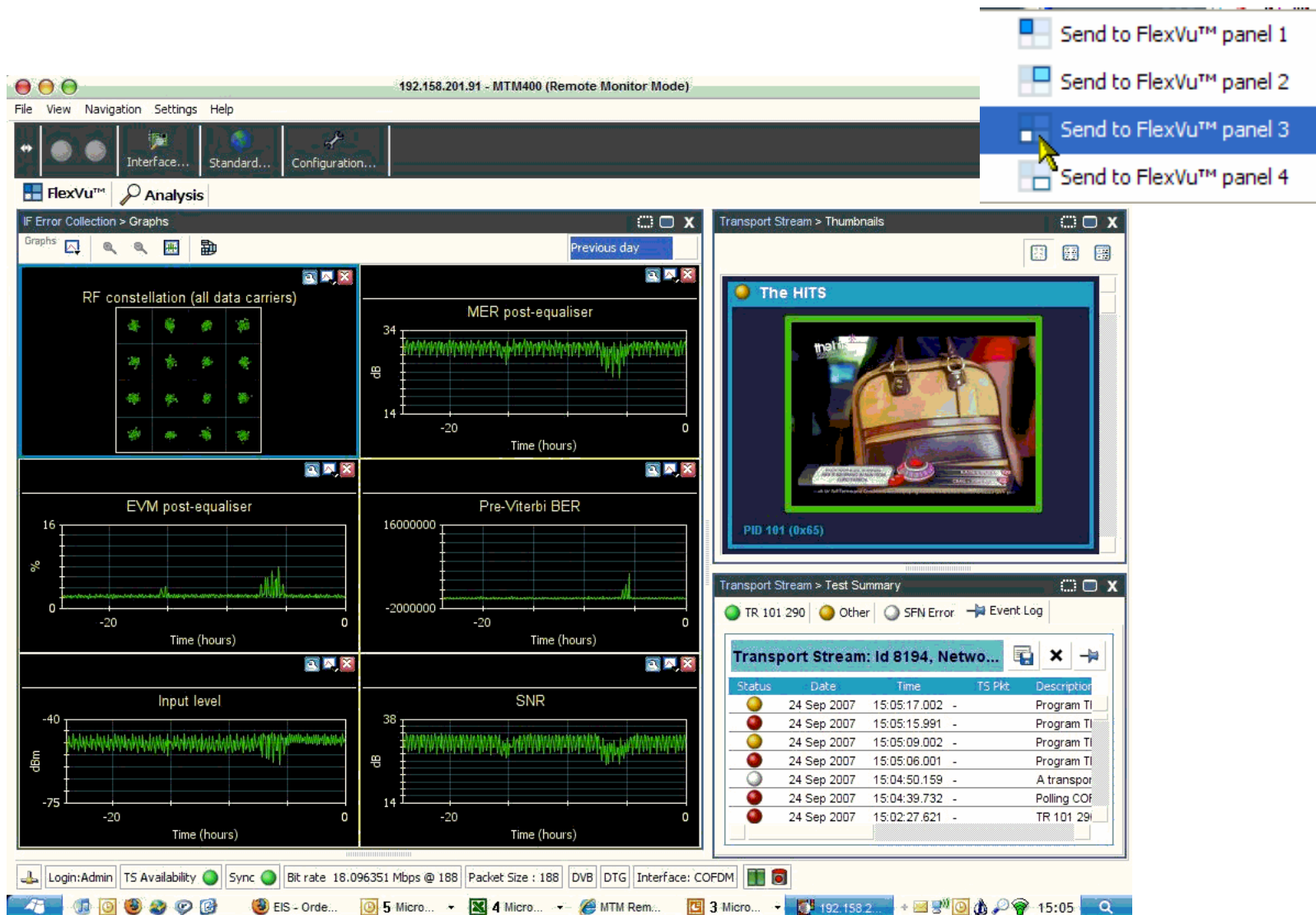
FlexVuPlus™ Digital Terrestrial TV

Unique presentation of video quality information



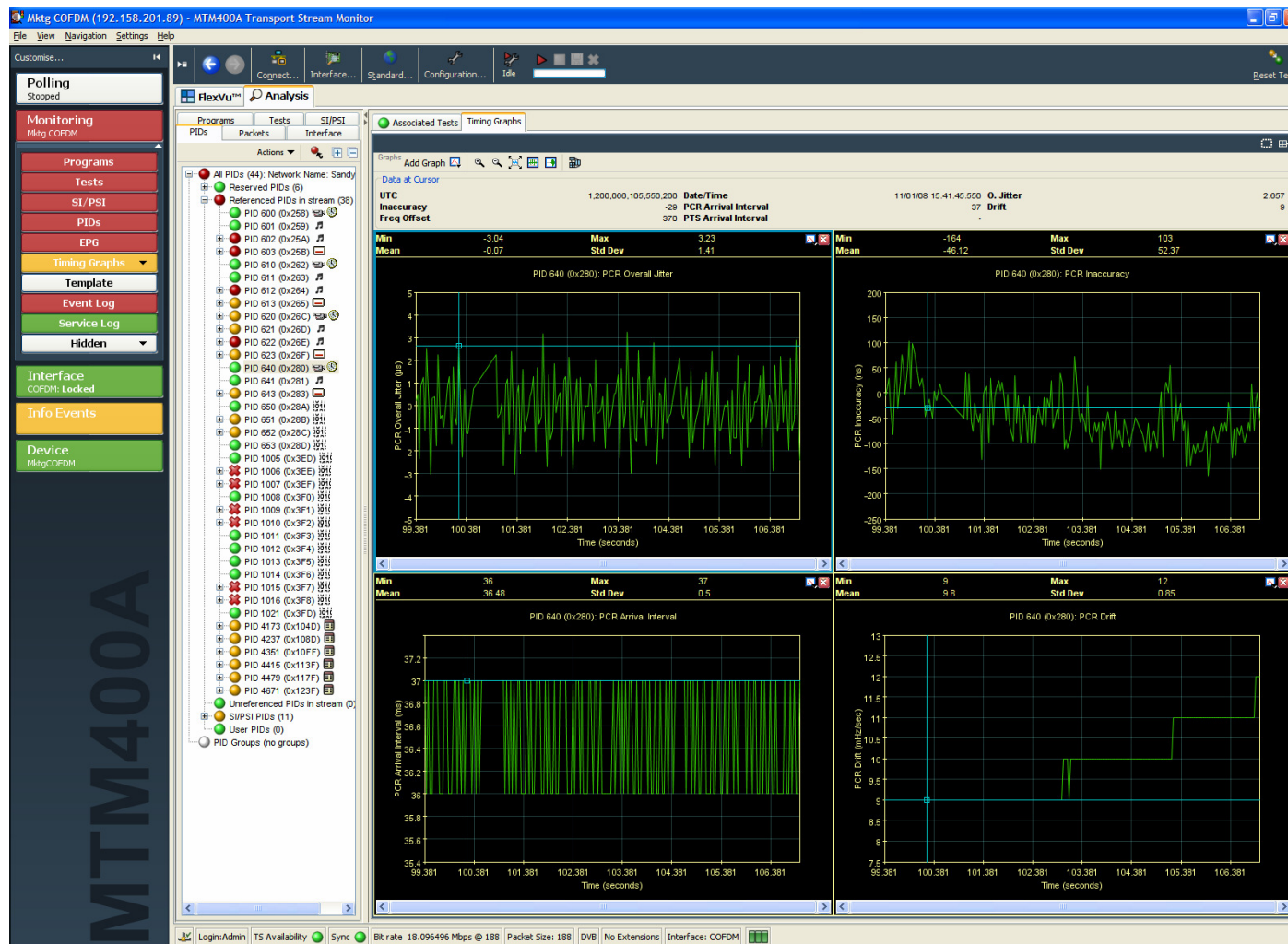
FlexVuPlus™ Digital Terrestrial TV

Video quality information your way



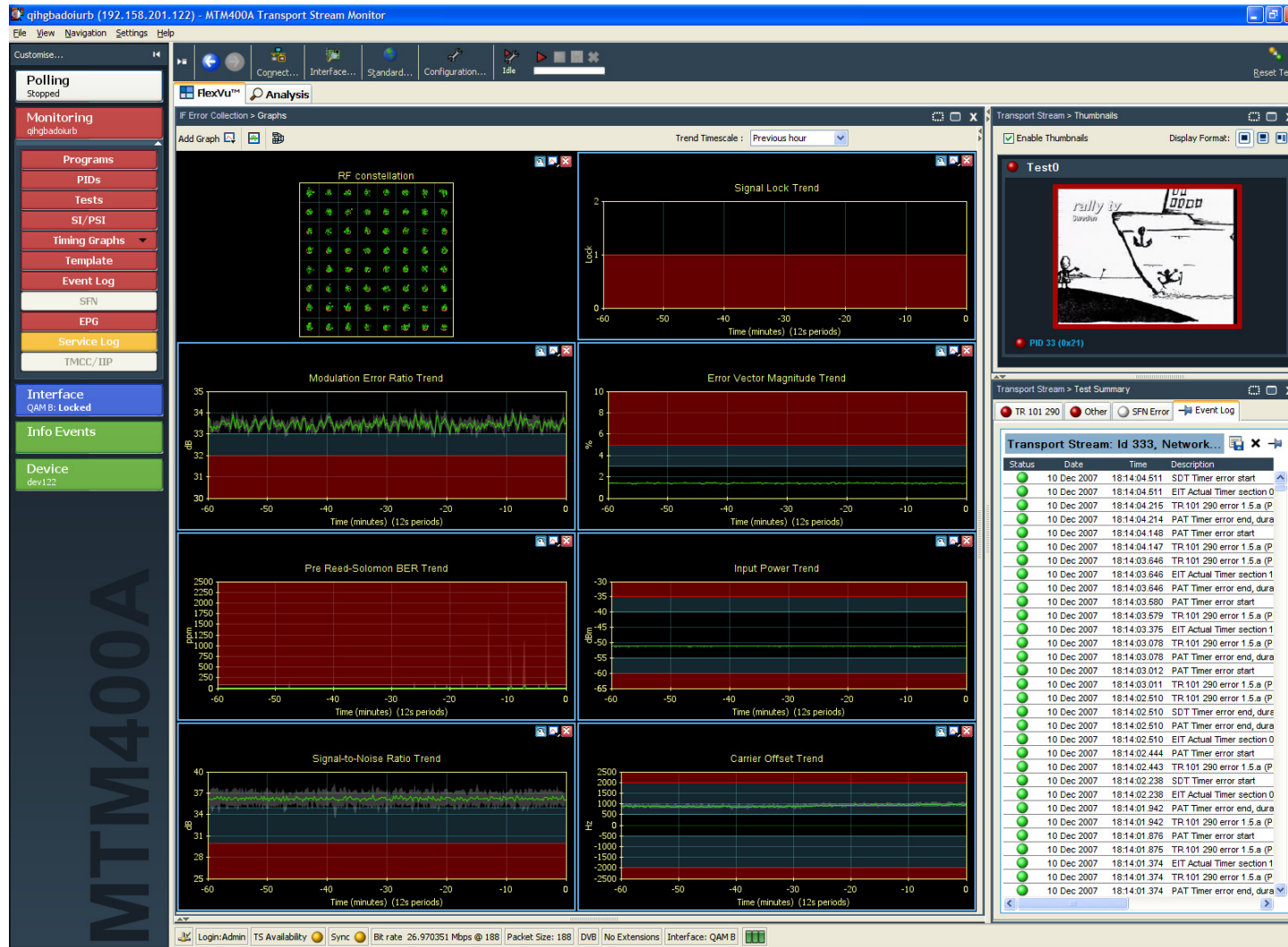
FlexVuPlus™ Digital Terrestrial TV

Deep diagnostic with “One click”



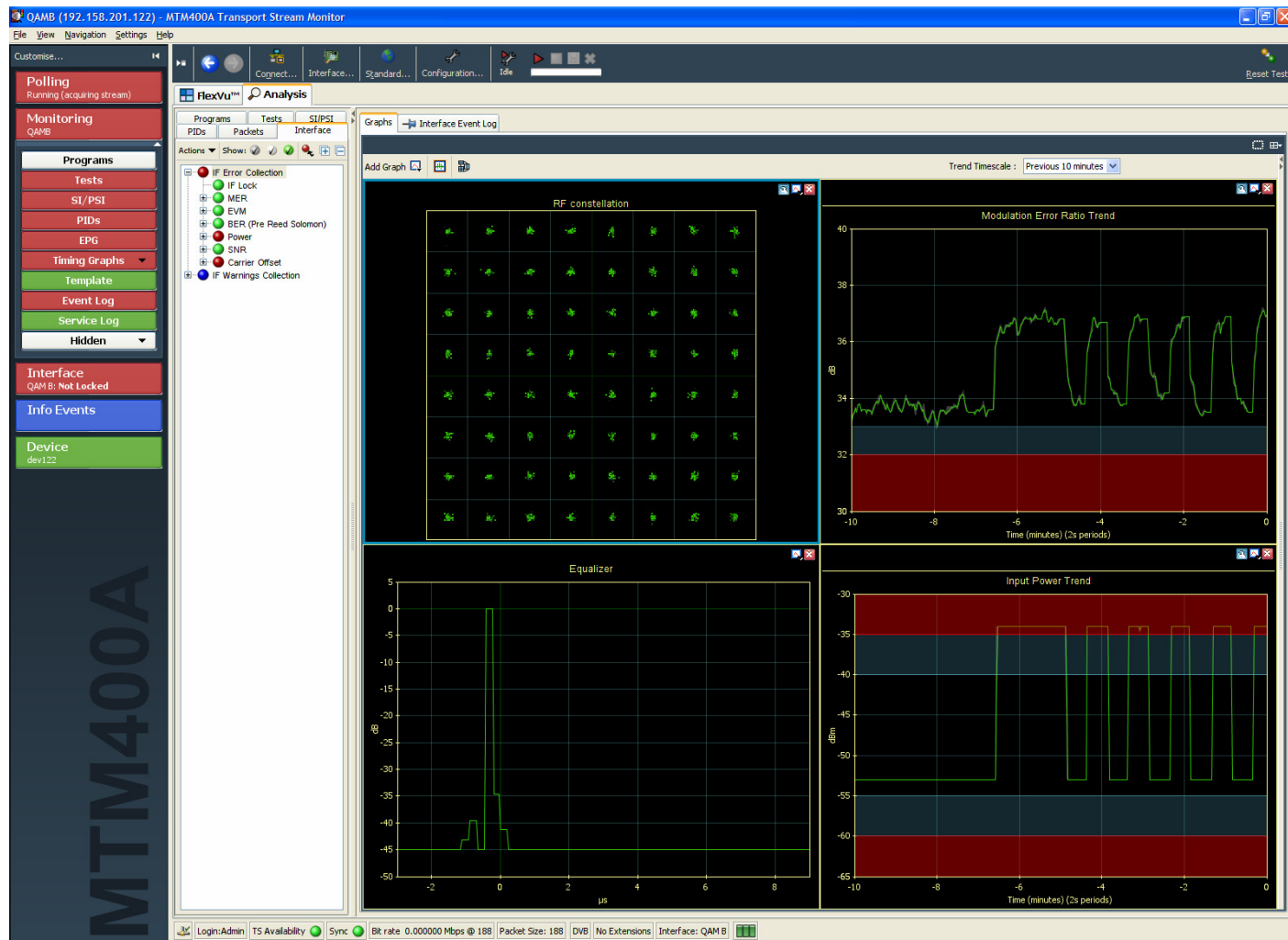
FlexVuPlus™ for Cable

7 Day RF Trending with *unique* Dual Level Alarming



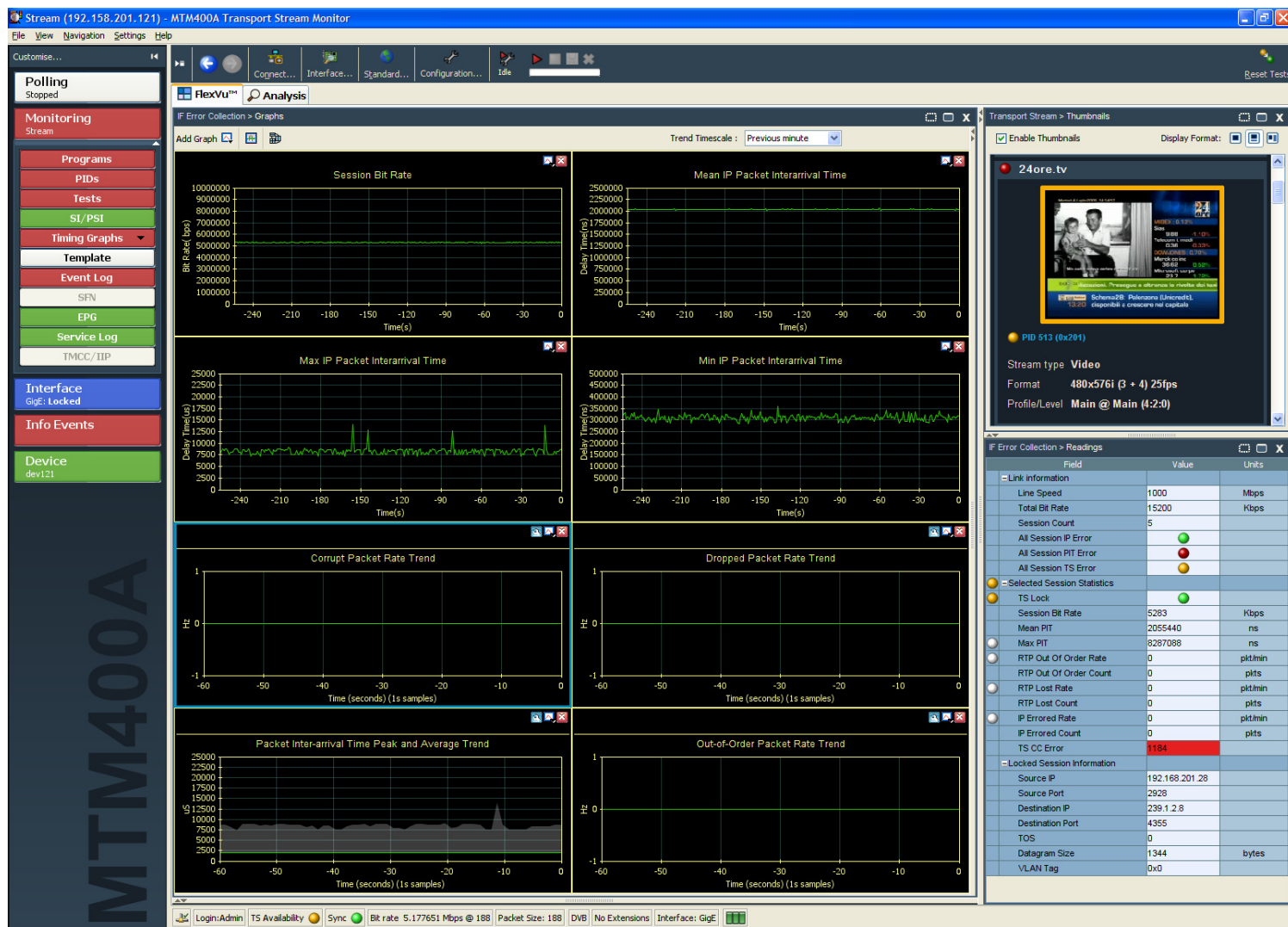
FlexVuPlus™ for Cable

Deep diagnostic with “*One click*”



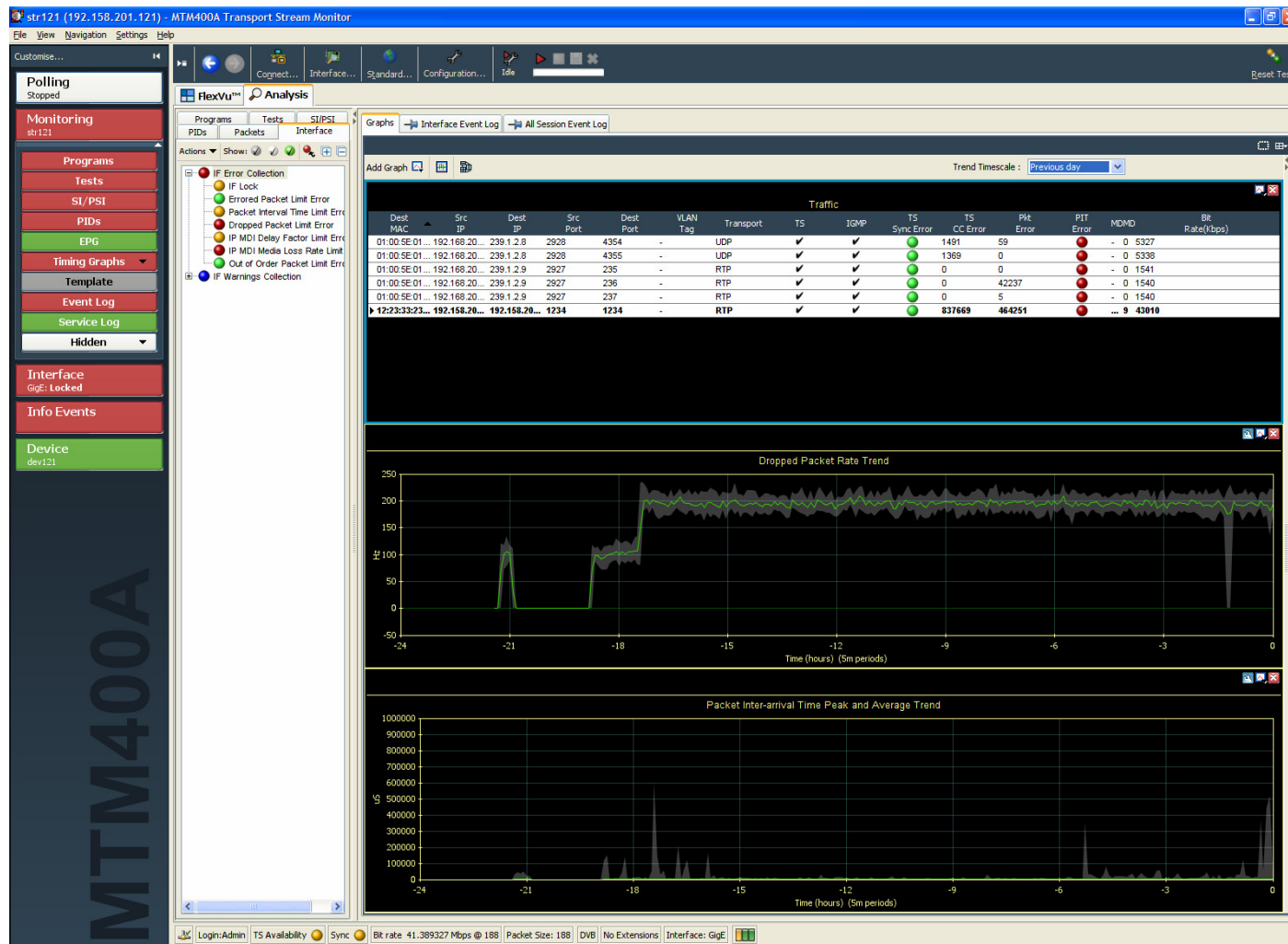
FlexVuPlus™ for IP Video & IPTV

7 Day IP Trending with *unique* Dual Level Alarming



FlexVuPlus™ for IP Video & IPTV

Deep diagnostic with “*One click*”



MTM400A - Summary

Electronic Program Guide (EPG) view

Stream (192.158.201.102) - Summary | This Transport Stream (SDT/EIT actual)

Tables > EPG (EIT/SDT/RST) > This Transport Stream (SDT/EIT actual) > Summary

This Transport Stream (SDT/EIT actual)

Display Time Zone

GBR (GMT+00:00)

Start Time

21 November 2007 15:00

Display Range

03 hours 00 minutes

Jump to Now

Lock to Now

15:00:00

15:15:00

15:23:31

15:30:00

15:45:00

16:00:00

16:15:00

16:30:00

16:45:00

17:00:00

17:15:00

17:30:00

17:45:00

18:00:00

BBC ONE
BBC

friend of Dr Slom's is murdered, the motive things as clearcut as they seem? [S]

BBC...
15:25 to 15:45
Event ID: 27489 (0x6861)

Pitt and Kantrop

15:25 to 15:45
Event ID: 27489 (0x6861)

BBC...
15:25 to 15:45
Event ID: 27489 (0x6861)

Pitt and Kantrop

15:25 to 15:45
Event ID: 27489 (0x6861)

The Secret Show

15:45 to 16:00
27469
CBBC Secret Double Agent: Anew...

Animalia

16:00 to 16:30
Event ID: 27508 (0x6874)
CBBC The Mist of Time: After the Copsore of Time blasts off, O'Gubu is swept back in time to an ancient era when his gorilla ancestors fought for control. [S] Then Thumb Wrestling Federation.

SMart

16:30 to 17:00
Event ID: 27476 (0x6854)
CBBC The art show that turns everyday objects into exciting and easy-to-make pictures, as well as answering art queries. [S]

Blue Peter

17:00 to 17:25
Event ID: 27468 (0x684C)
CBBC Andy gets a hair raising challenge and the Blue Peter set gets a makeover that looks good enough to eat. [S]

Newsround

17:25 to 17:45
27494
CBBC Daily news magazine keeping you up to date on the latest stories...

Neighbours

17:35 to 18:00
Event ID: 27501 (0x686D)
Riley's confession makes Steve and Miranda's world crumble, but Riley is given pause to reconsider when he makes a connection with Ella. Ned catches Kirsten lying to Mickey. [AD.S]

BBC News

18:00 to 18:30
Event ID: 27501 (0x686D)
National and international news followed by World News.

BBC TWO
BBC

to the Country
15:45
26929 (0x6931)

Flog It!

15:45 to 16:30
Event ID: 26907 (0x691B)

Food Poker

16:30 to 17:15
Event ID: 26903 (0x6917)
Chefs Paul Rankin, Galton Blackiston, Jun Tanaka and Stuart Gillies get creative in the kitchen and make thyme smoked tuna and sautéed pigeon breast. [S]

The Weakest Link

17:15 to 18:00
Event ID: 26942 (0x693E)
Nine contestants must play as a team to build up the prize fund and then act ruthlessly to remain in the game as, round by round, the weakest link is removed. [S]

Eggheads

18:00 to 18:30
Event ID: 26942 (0x693E)
Demented Mums of challengers and eggheads who are champions. [S]

BBC THREE
BBC

BBC NEWS 24
BBC

BBC News

15:00 to 16:00
Event ID: 26342 (0x66E6)
Twenty-four hours a day: the latest national and international stories as they break.

BBC News

15:00 to 16:00
Event ID: 26342 (0x66E6)
Twenty-four hours a day: the latest national and international stories as they break.

BBC News

16:00 to 17:00
Event ID: 26340 (0x66E4)
Twenty-four hours a day: the latest national and international stories as they break.

BBC News

16:00 to 17:00
Event ID: 26340 (0x66E4)
Twenty-four hours a day: the latest national and international stories as they break.

BBC Five O'Clock News with Huw Edwards

17:00 to 18:00
Event ID: 26322 (0x66D2)
Presented by Huw Edwards, the BBC Five O'Clock News Hour with in-depth discussions and analysis as well as breaking news.

BBC Six O'Clock

18:00 to 18:30
Event ID: 26342 (0x66E6)
National and international news.

BBCi
BBC

BBCi
18:00 to 00:00
Event ID: 374...
BBCi - featuring...

CBBC Channel
BBC

The Queen's Nose

15:00 to 15:25
Event ID: 26761 (0x6889)

The Queen's Nose

15:00 to 15:25
Event ID: 26761 (0x6889)

Mona the Vampire

15:25 to 15:40
26740

Mona the Vampire

15:25 to 15:40
26740

Cramp Twins

15:40 to 16:00
Event ID: 26736 (0x6870)
Twin Studies: Wayne and Lucien come under the studious eye of twin psychologist Miss Monkfish, who intends to prove that all twins are alike. [S] Followed by News...

Tracy Beaker

16:00 to 16:25
Event ID: 26767 (0x688F)
Scary Mily/Life Coach: The kids in the Dumping Ground think they have been cursed by an evil spirit. Crash lives up to his name when he gets some shocking news. [AD.S]

Best of Friends

16:25 to 17:00
Event ID: 26764 (0x688C)
Rani and Abs bring you the show that tests the friendships of five close mates with a series of terrible tasks and tantalising treats. Will they choose fun over friendship? [S]

The Slammer

17:00 to 17:30
Event ID: 26760 (0x6888)
Lots of prisoners are escaping. And Pete decides to give up ventriloquism in favour of magic after he is influenced by a mysterious visitor to The Slammer called Alan. [S]

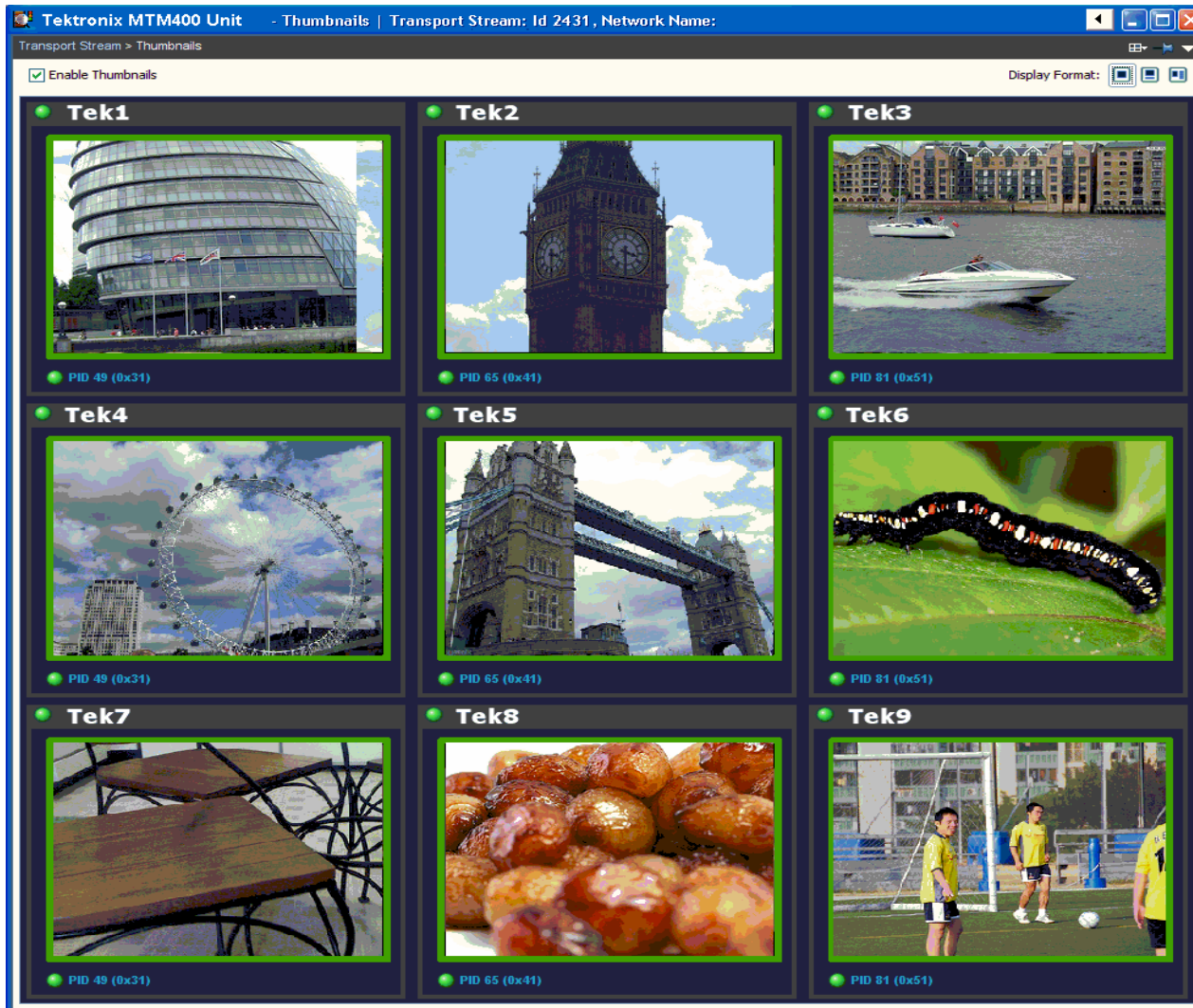
Prank Patrol

17:30 to 18:00
Event ID: 26745 (0x6879)
Fortune Teller: Prepare for laughter and surprises as friends play great pranks on each other! [S]

Animalia

18:00 to 18:30
Event ID: 27508 (0x6874)
The Mist of Time: After the Copsore of Time blasts off, O'Gubu is swept back in time to an ancient era when his gorilla ancestors fought for control of the time.

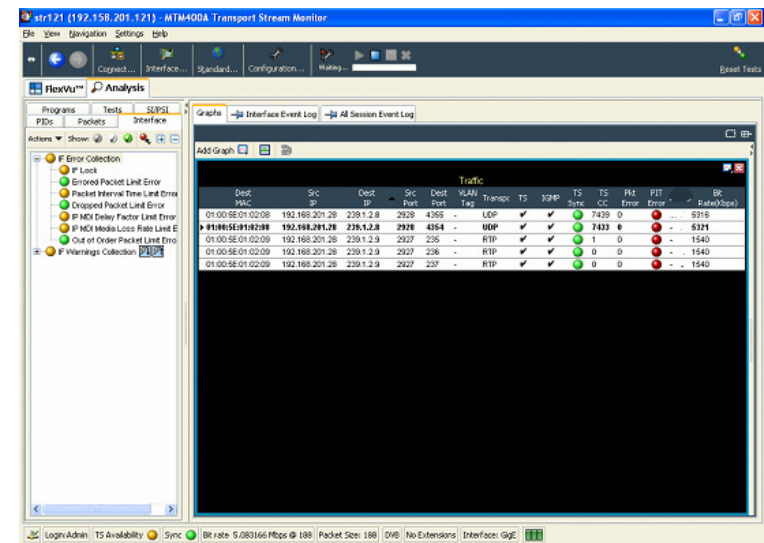
Video Thumbnail with “*at a glance*” Channel Health



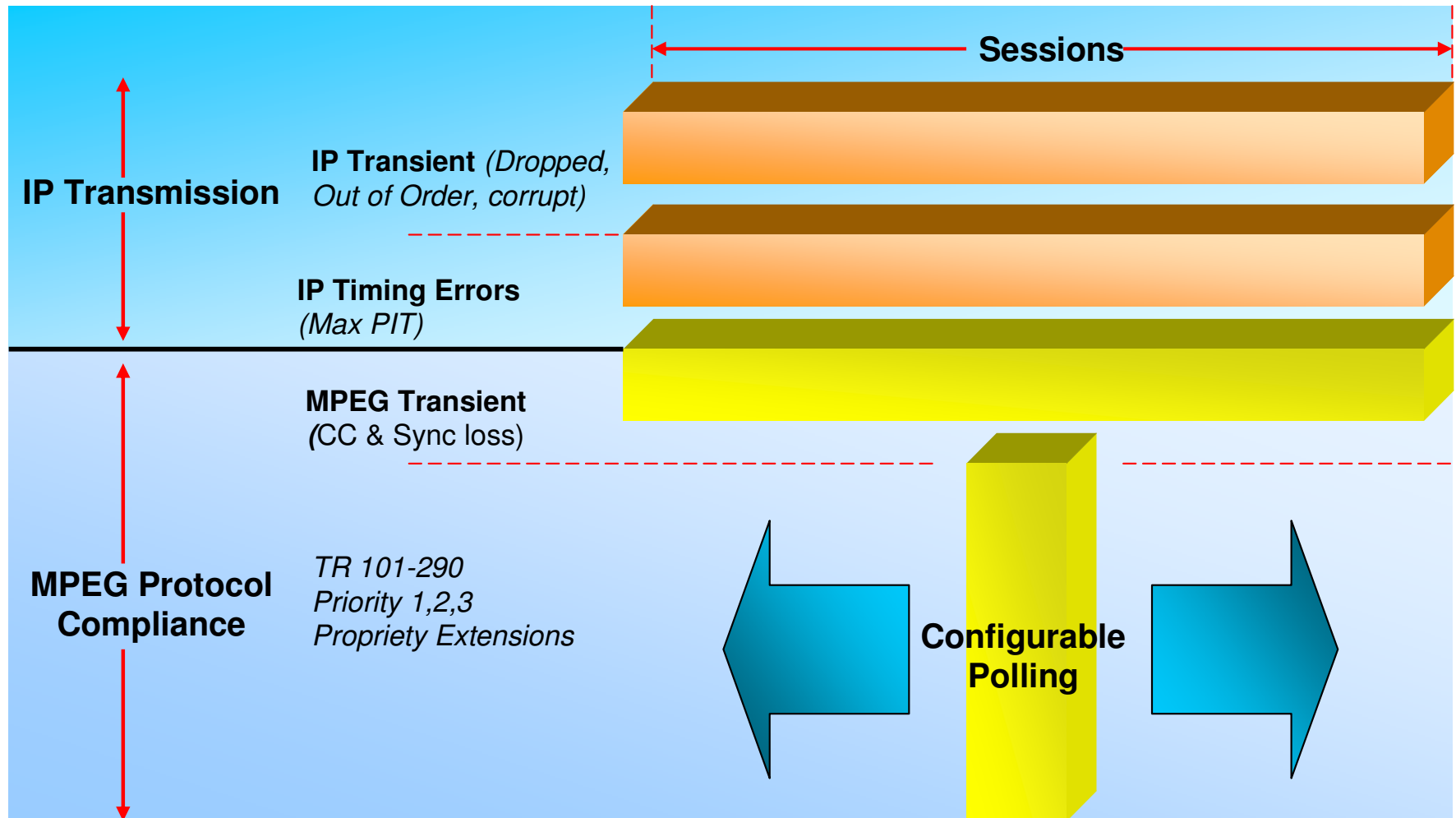
MTM400A - Summary

Simultaneously monitor up to 500 IP sessions

- IP Layer KPIs
 - MDI
 - Ethernet Frame Check Sum
 - IP Header Check Sum
 - Dropped packets
 - Out of order packets
 - Packet Inter-arrival Time (PIT)
- MPEG KPIs
 - Sync byte
 - Sync Loss
 - Continuity Counter (4 bit counter & header)
 - PCR measurements
- Bit Rate alarming on all sessions
- IGMPv3 multicast & IPv6 protocol support



Cross Layer IP/ MPEG Monitoring



Unique 'Green Stream' Learning Mode

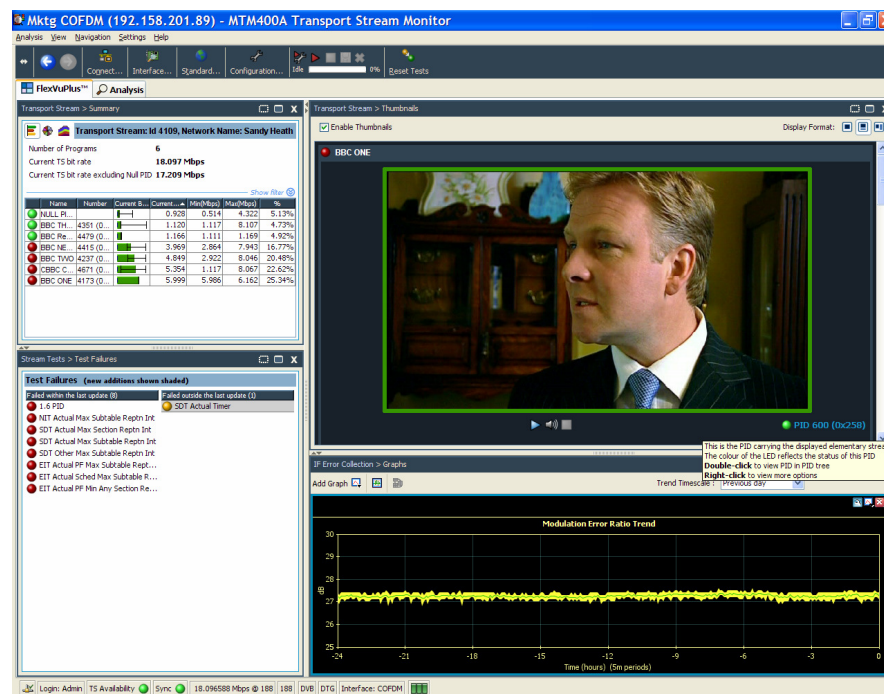
New Feature

- Create an automatic baseline for physical & Transport Stream parameters to eliminate non-customer impacting alarms.
- Enables “**monitor by exception**” showing only real deviations from known good measurement parameters
- *Example*
 - *PMT repetition rate is 550ms (TR 101 290 standard is 500ms) so TR 101 290 test 1.5 fails and gives alarm*
 - *Applying learning mode will auto-configure the repetition rate measurement limit is set >550ms*
 - *TR 101 290 standard 1.5 test is no longer failing and generating alarms*
- Auto configure mode optimises test parameters at the IP physical layer (e.g. PIT, MDI); RF physical layer (e.g. MER, SNR) and Transport Layer (e.g. repetition rates, PCR drift),
- Reduce operational expenditure by eliminating non-customer impacting alarms and focusing resources on other critical activities

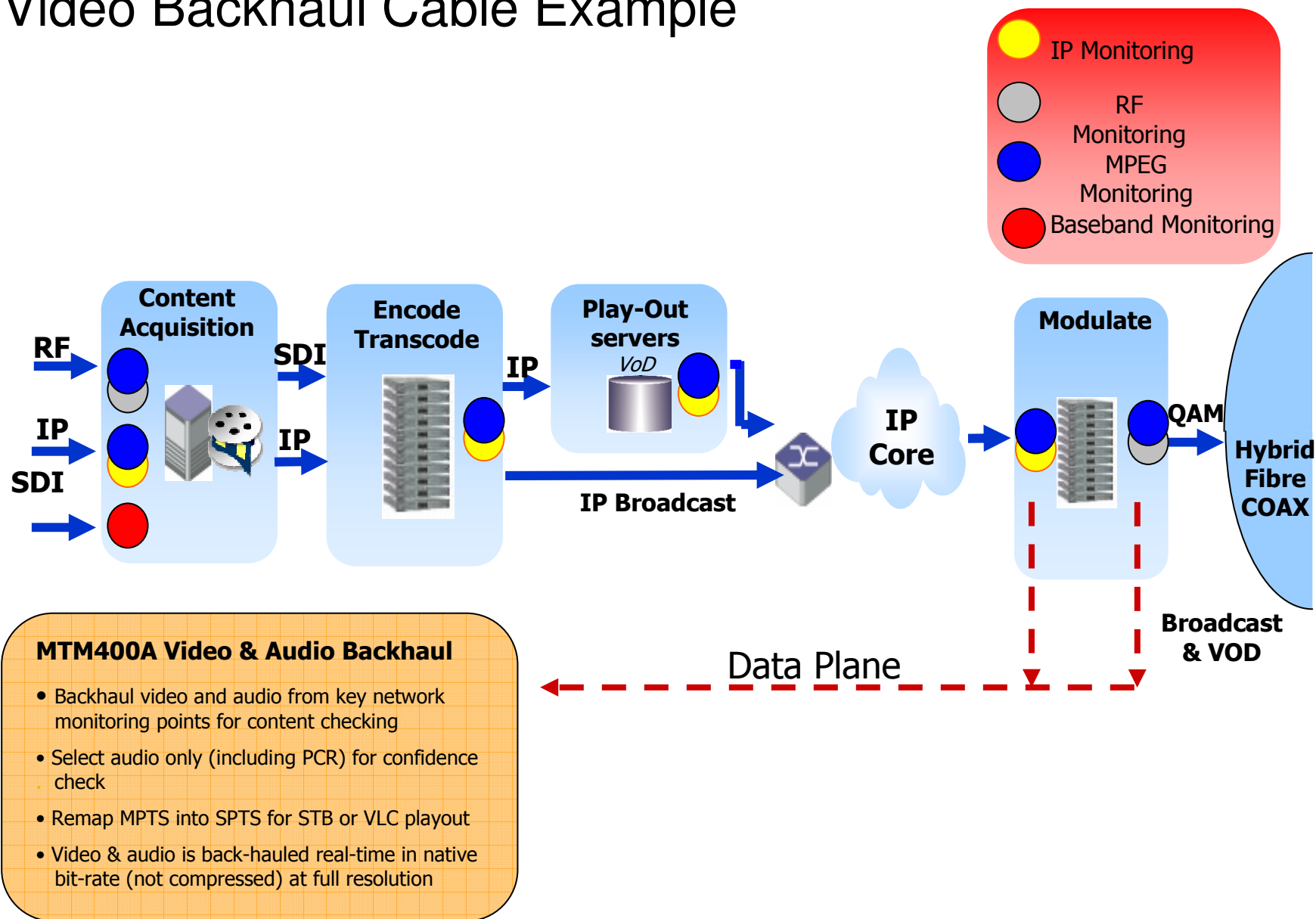
MTM400A Summary Video Backhaul

New Feature

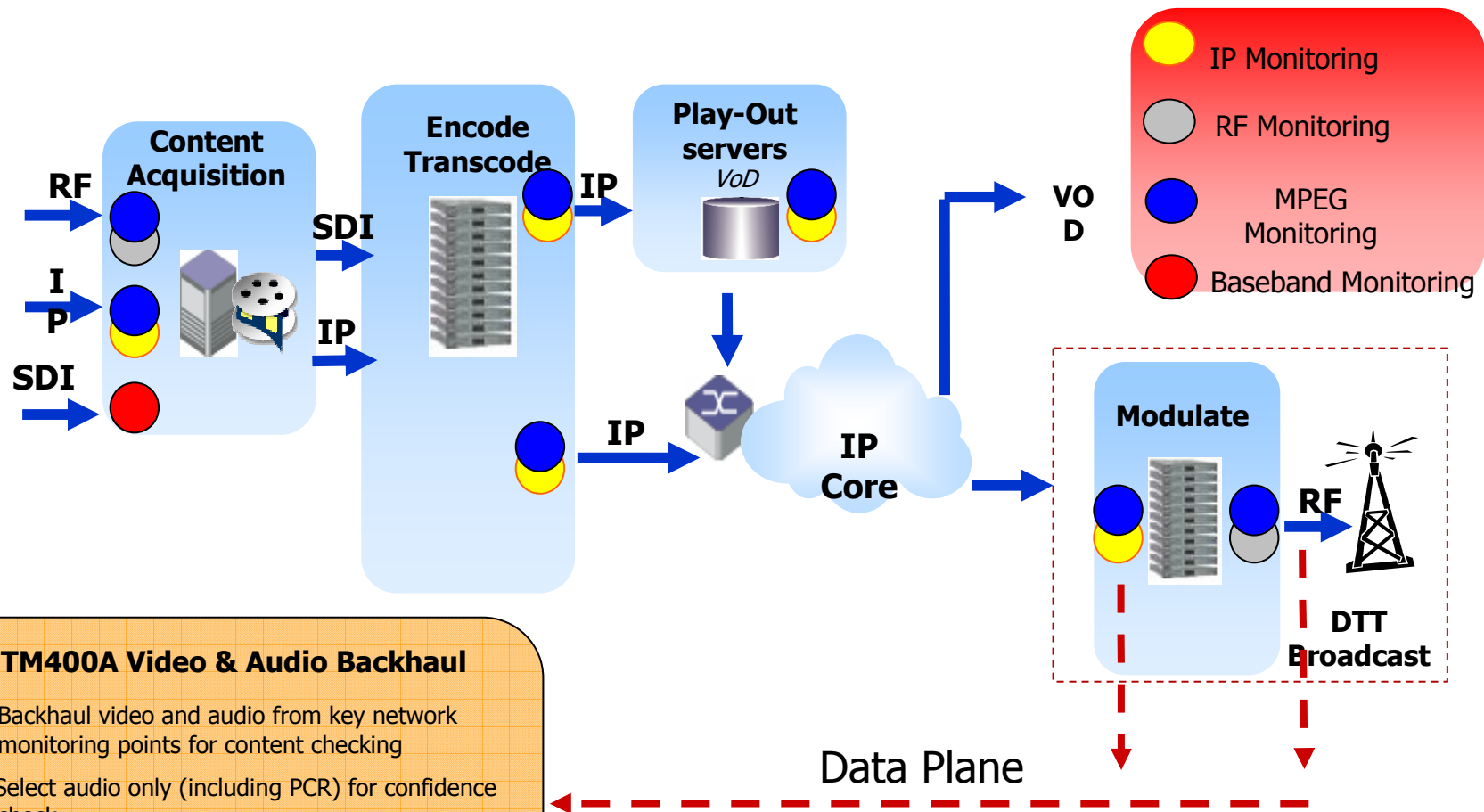
- Backhaul video and audio from key network monitoring points for content checking
- Select audio only (including PCR) for confidence check
- Remap MPTS into SPTS for STB or VLC playout
- Video & audio is back-hauled real-time in native bit-rate (not compressed) at full resolution



Video Backhaul Cable Example



Video Backhaul Terrestrial Hybrid System Example

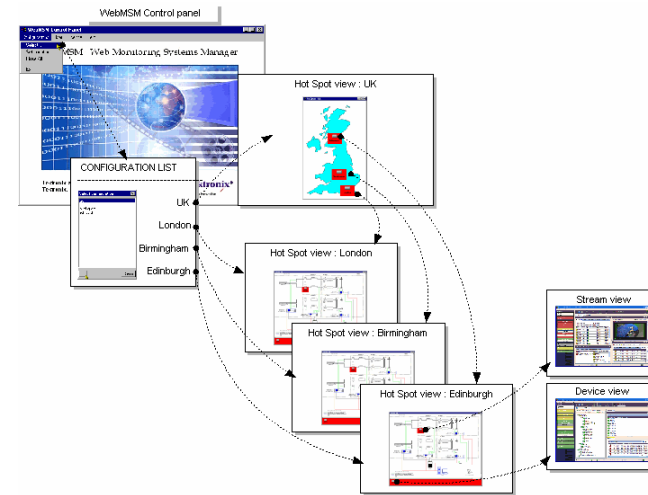


MTM400A Video & Audio Backhaul

- Backhaul video and audio from key network monitoring points for content checking
- Select audio only (including PCR) for confidence check
- Remap MPTS into SPTS for STB or VLC playout
- Video & audio is back-hauled real-time in native bit-rate (not compressed) at full resolution

MTM400A Monitoring System Manager

- The WebMSM Monitoring System Manager is an installable application that enables complete visibility of the error status of a transmission network, as measured by the MTM400 or MTM400A, from a standard Web browser.
- The Network Manager is able to customize the user interface, building up geographical maps showing the location and status of the monitoring network as well as mimic diagrams of the transmission network.
- When a fault occurs, the corresponding monitoring point is highlighted in red, enabling the network manager to drill down to the individual monitor and determine the nature of the fault.



Extended Confidence Monitor in Standard Configuration

- MPEG-2, DVB (TR 101 290), ATSC, and ISDB for Brazil and Japan supported
- TR 101 290 Priority 1, 2, and 3 measurements in accordance with the techniques specified in TR 101 290
- Constant Bit Rate (CBR) and Variable Bit Rate (VBR) streams supported
- Continuity Count displayed on a per PID or per TS basis
- Bit rate measurement in accordance with the methodology specified in TR 101 290 MGB2
- Maximum input transport stream bit rate up to 155 Mbps
- SFN measurements according to TR 101 290
- Packet size detection
- Comprehensive error logging that context filters with navigation
- Status of all tests and measurements available via SNMP MIB with support for SNMP traps



Diagnostic Monitoring Options



- Service logging of user-selected PIDs to record packet rates at user definable intervals
- Channel polling allows up to 200 channels to be polled sequentially from either the IP or the RF interface.
- Triggered recording with user definable pre-triggered buffering and up to 160 MB available storage
- PSI/SI/PSIP/ARIB SI analysis and repetition rate graphing. Transport stream structure view with ability to drill down to examine tables and service contents plus real-time graphical representation of table repetition rates
- Template testing (for user-defined service plan testing). User-definable tests with scheduled template updating
- Bit rate testing on a per PID, program, or user-defined groups of PIDs basis
- In-depth timing analysis with graphical results views for
 - PCR_OJ (overall jitter)
 - PCR_AC (accuracy)
 - PCR_FO (frequency offset)
 - PCR_DR (drift rate)
 - PTS Arrival interval

MTM400A - Summary

Standards Compliance



- Standards change, grow, and are updated
 - MTM400 grows with them
- Common code base with new MTS400 series
 - Consistent results across products

■ Interfaces & Standards

- Tektronix has the broadest range of industry standard electrical interfaces & Standards support
 - Gigabit Ethernet
 - ASI
 - SMPTE 310M
 - COFDM
 - QAM Annex A/B/C
 - 8-PSK
 - 8-VSB
 - DVB
 - ATSC
 - ISBD
 - SCTE 35 DPI
 - Digicipher II
- Signalling Support:
 - DVB-H SI
 - TV Anytime SI
 - MPEG-4, H.264, VC-1 SI

Why Choose Tektronix for Video and IPTV?

- Trusted brand with over 50 years of industry experience
- Market leader with broadest portfolio of products
- Recognized technology expertise and innovation
- Strong new product pipeline
- Number one supplier of monitoring systems for modern IP networks
- Well positioned to enable the transition to digital and the convergence of voice, video and data on a wide variety of networks

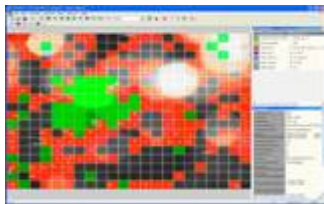


Tektronix Compressed Digital TV: Product Portfolio

Solving today's digital video delivery and quality challenges



MPEG Test Systems & Software
MTS400/430/4SA

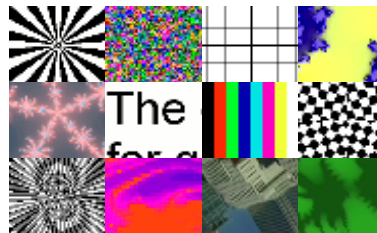


Next Generation Compressed
Video ES Analysis
MTS4EA/MTS4CC

Analysis



MPEG Generators
MTX100B/RTX100B/RTX130B



Test Streams
Vclips

Generation



MPEG Monitors
MTM400A



File-Based
Video Content Analysis
Cerify™

Operational



Tektronix®

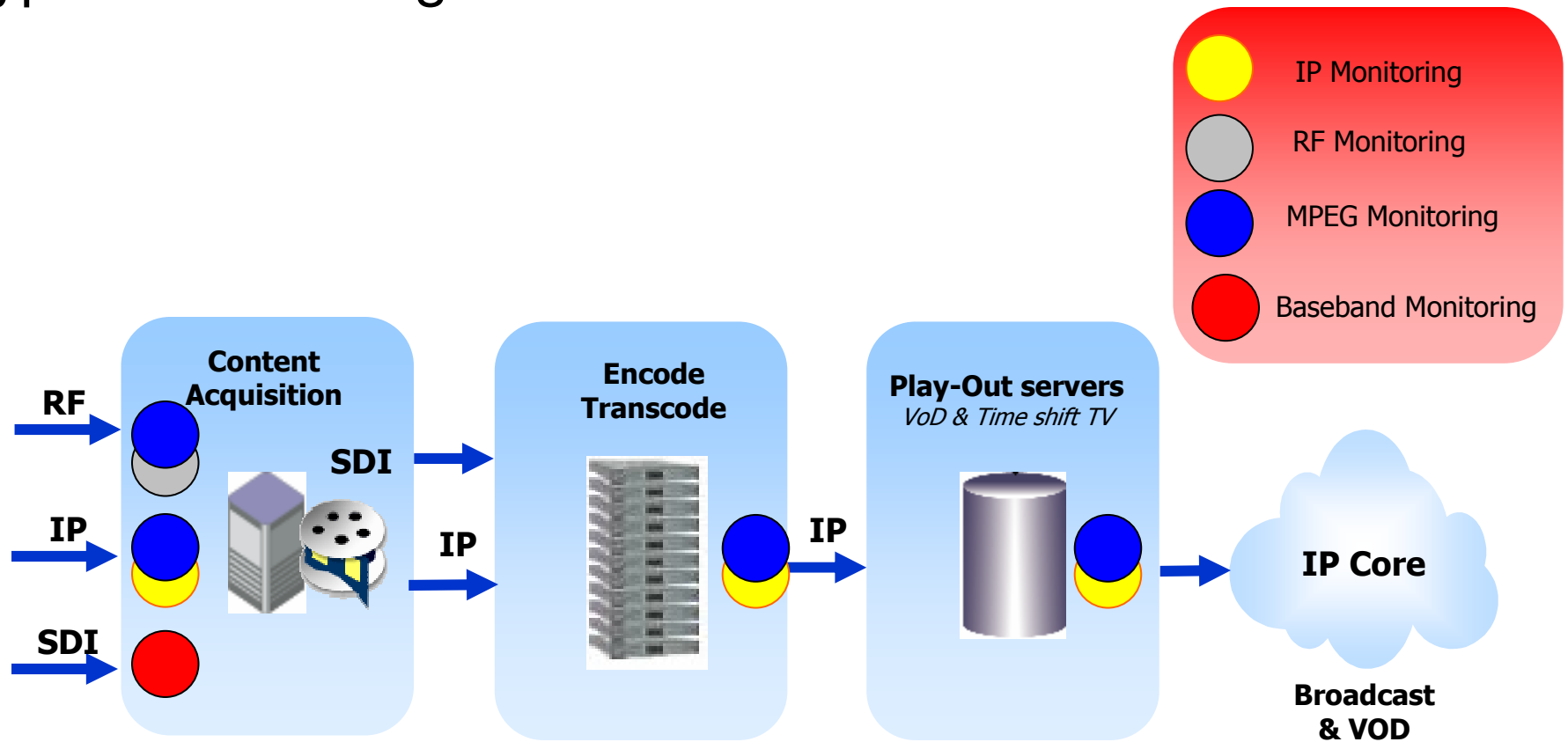


Appendix A

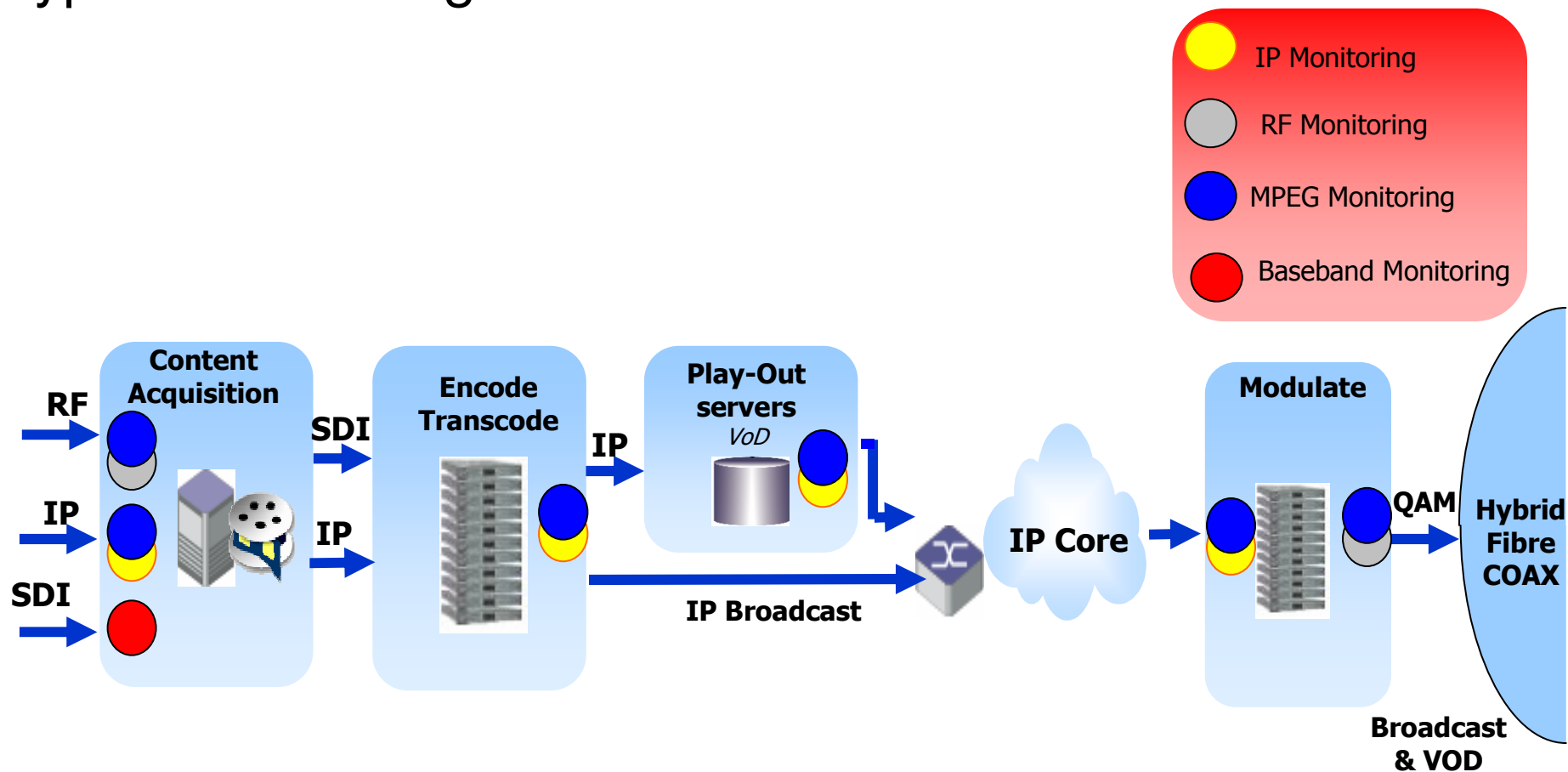
Customer Network Examples



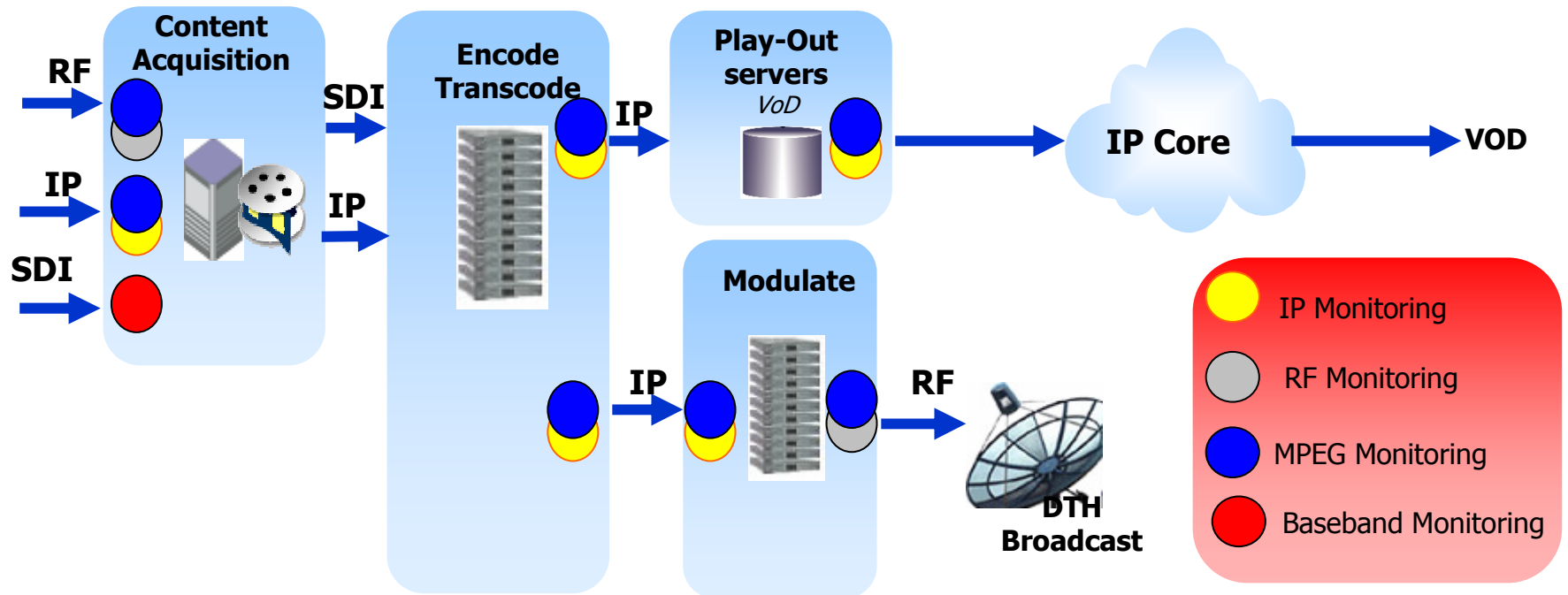
Typical Monitoring Points for IPTV Headend



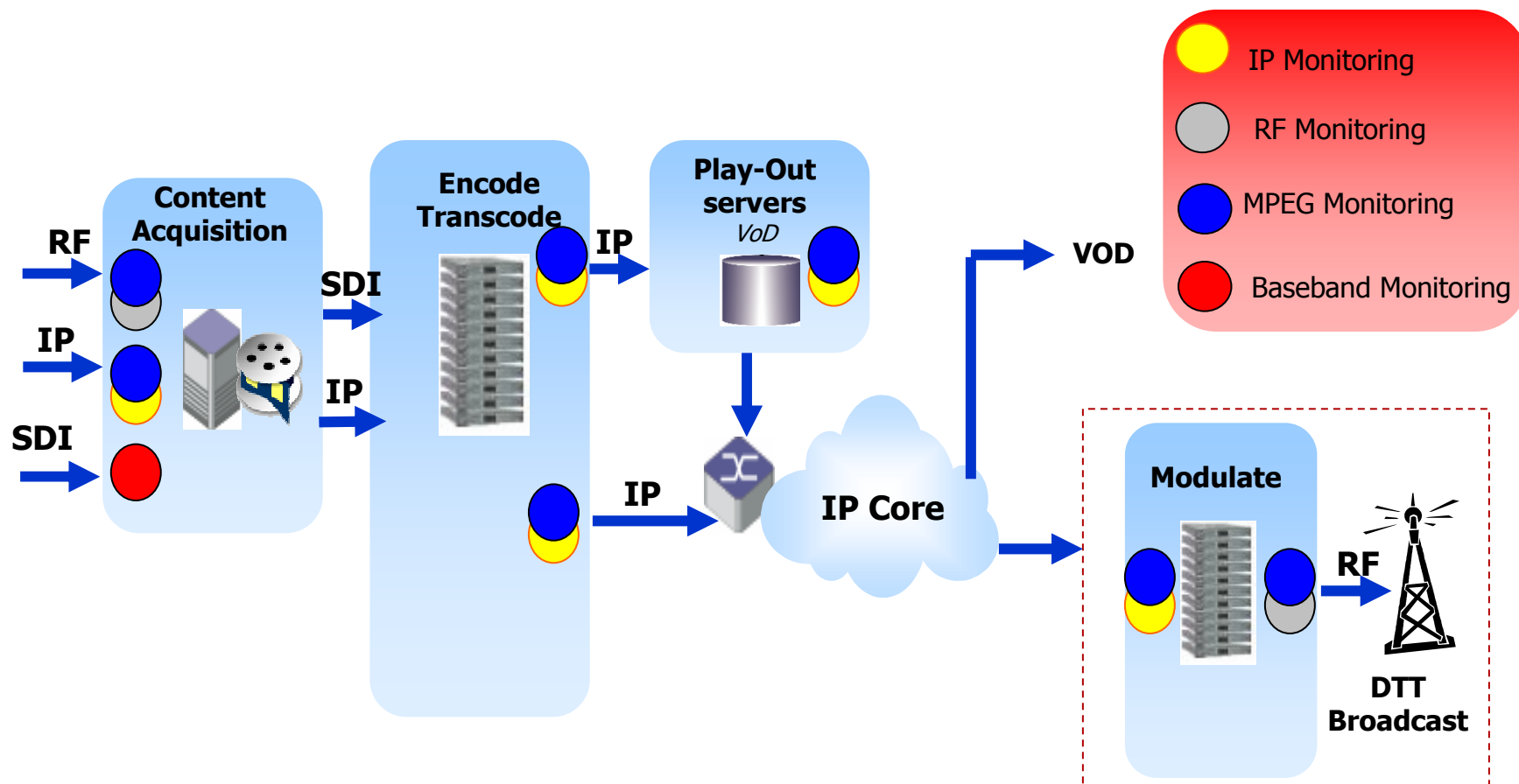
Typical Monitoring Points for Cable Headend



Typical Monitoring Points for Satellite Hybrid Uplink



Typical Monitoring Points for Terrestrial Hybrid System



Appendix B

MTM400A Nomenclature



MTM400A Base Product, Options & Field Upgrades

MTM400A Nomenclature	Other Opts	Description
MTM400A	N/A	MPEG Transport Stream Monitor. Includes: 1RU chassis fitted with transport stream processor card, manual, rack slides, power cord, and license key certificate.
MTM400A	01	Triggered recording capability up to 160 MB.
MTM400A	02	Transport stream service information analysis (PSI/SI/PSIP/ARIB view).
MTM400A	03	Template testing (for user-defined service plan testing).
MTM400A	04	In-depth PCR analysis with graphical result views.
MTM400A	05	Bit rate testing functionality.
MTM400A	06	Service logging.
MTM400A	07	IP/RF Polling functionality
MTM400A	CF	COFDM Interface

MTM400A Base Product, Options & Field Upgrades

MTM400A Nomenclature	Other Opts	Description
MTM400A	QB2	QAM Annex B Level 1 and Level 2 Interface
MTM400A	EP	8PSK/QPSK Interface
MTM400A	VS	8-VSB Interface
MTM400A	QA	QAM Annex A interface.
MTM400A	QC	QAM Annex C interface.
MTM400A	GE	Ethernet Interface With 10/100/1000Base-T RJ-45 Electrical Port
MTM400A	SX	1000Base-SX Short Wavelength Optical port with LC connector (Multi-Mode 850 nm)
MTM400A	LX	1000Base-SX Short Wavelength Optical port with LC connector (Multi-Mode 1310 nm)
MTM400A	ZX	1000Base-SX Short Wavelength Optical port with LC connector (Multi-Mode 1550 nm)

MTM400A Base Product, Options & Field Upgrades

MTM400A Nomenclature	Other Opts	Description
MTM400A	C3	Calibration Service 3 Years
MTM400A	C5	Calibration Service 5 Years
MTM400A	R3	Repair Service 3 Years (including warranty)
MTM400A	QA	QAM Annex A interface.
MTM400A	CA1	Provides a single calibration event or coverage
MTM400A	R1PW	Repair Service coverage 1 year post warranty
MTM400A	R2PW	Repair service coverage 2 years post warranty
MTM400A	R3DW	Repair service coverage 3 years (includes product warranty period); 3 year period starts at time of customer instrument purchase
MTM400A	R5DW	Repair service coverage 5 years (includes product warranty period); 5 year period starts at time of customer instrument purchase

MTM400A Base Product, Options & Field Upgrades

MTM400A Nomenclature	Other Opts	Description
MTM4UP	01	Field upgrade kit to add triggered recording capability up to 160 MB.
MTM4UP	02	Field upgrade kit to add transport stream service information analysis (PSI/SI/PSIP/ARIB view).
MTM4UP	03	Field upgrade kit to add template testing (for user-defined service plan testing).
MTM4UP	04	Field upgrade kit to add in-depth PCR analysis with graphical result views.
MTM4UP	05	Field upgrade kit to add bit rate testing functionality.
MTM4UP	06	Field upgrade kit to add service logging.
MTM4UP	07	Field upgrade kit to add IP/ RF Polling functionally
MTM4UP	QA	Field upgrade kit to add QAM Annex A Interface to an existing probe.
MTM4UP	QC	Field upgrade kit to add QAM Annex C Interface to an existing probe.

MTM400A Base Product, Options & Field Upgrades

MTM400A Nomenclature	Other Opts	Description
MTM4UP	CF	Field Upgrade Kit To Add COFDM Interface
MTM4UP	QB2	Field Upgrade Kit To Add QAM Annex B Interface
MTM4UP	EP	Field Upgrade Kit To Add 8PSK/QPSK Interface
MTM4UP	VS	Field Upgrade Kit To Add 8-VSB Interface
MTM4UP	GE	Upgrade kit to add Gigabit Ethernet Interface With 10/100/1000 Base-T RJ-45 Electrical port to MTM400A
MTM4UP	SX	Upgrade kit to add 1000 Base-LX Long Wavelength Optical port with LC connector (Single Mode 850 nm) for MTM400 Gigabit Ethernet Interface (requires Option GE)
MTM4UP	LX	Upgrade kit to add 1000 Base-LX Long Wavelength Optical port with LC connector (Single Mode 1310 nm) for MTM400 Gigabit Ethernet Interface (requires Option GE)
MTM4UP	ZX	Upgrade kit to add 1000Base-LX Long Wavelength Optical port with LC connector (Single Mode 1550 nm) for MTM400 Gigabit Ethernet Interface (requires Option GE)
MTM4UP	ICF	One-time install of all selected options and calibration for one product (Does not include TSCL option)