CMA 3000 SPECIFICATIONS

ATM Test Options

Testing ATM connections has never been easier

CMA 3000 is Anritsu's next-generation portable and futureproof field tester for the installation and maintenance of fixed line and mobile access networks. The instrument covers a wide range of applications, from fast first-aid troubleshooting to comprehensive in-depth analysis of transmission problems.

When equipped with the ATM test options, the CMA 3000 is a powerful and easy-to-use tool for testing ATM channels in SDH and PDH systems.

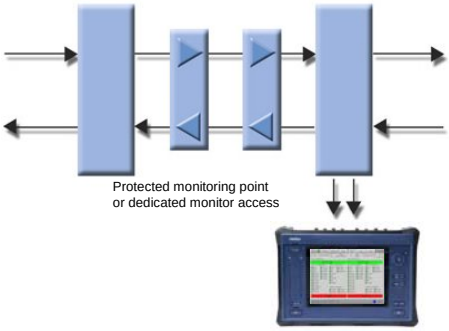

Fig. 1 With the CMA 3000 you're able to perform bi-directional in-service monitoring of ATM traffic.

Key Features	Key Applications
• Simultaneous bi-directional monitoring of ATM streams • Powerful testing of ATM channels through SDH and PDH systems • Comprehensive error and alarm statistics	• Comprehensive out-of-service testing for: • Installation • Provisioning • Performance analysis • In-service monitoring for: o Fast troubleshooting o Traffic monitoring o In-service ATM traffic analysis

The ATM option allows both active testing with one transmitter and one or two receivers and simultaneous bi-directional monitoring of ATM traffic with two receivers. This makes CMA 3000 the ideal instrument for both in- and out-of-service transmission-quality measurements.

The intuitive user interface, with a large color LCD display and easy-to-understand graphical symbols allows you to easily read and interpret important information from the ATM traffic.

ATM in the access network

ATM is used heavily in the access networks of today. In the mobile environment the 3G (UMTS) access networks (UTRAN) are based on ATM. In the fixed line access networks ATM is used to provide access for ADSL customers. ATM can be carried over SDH lines or in some cases over a set of 2 Mbps lines utilizing the IMA (Inverse Multiplexing for ATM) technique. It is important for field technicians installing and maintaining these types of networks to have an optimal tool to test ATM together with all the other technologies they have to take care of.

Speeds ATM troubleshooting

The CMA 3000 status monitor allows you to speed troubleshooting, as the status monitor is always active providing essential information on the monitored transmission system and ATM traffic on top of that. Through bidirectional monitoring the user can quickly verify that both sides of the ATM connection are working properly. The ATM scan facility in the CMA 3000 give a quick overview of the active virtual channels in the monitored ATM traffic. Up to 150 channels can be identified.

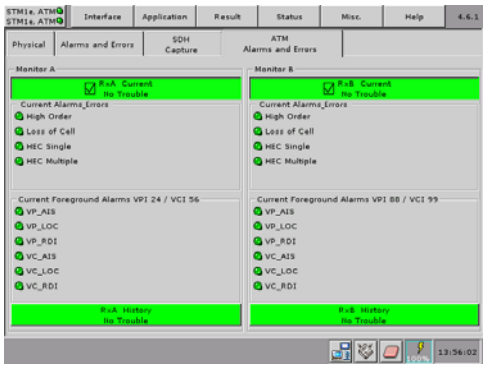

Fig. 2 The CMA 3000 gives you a quick overview of errors and alarms of both sides of the ATM connection.

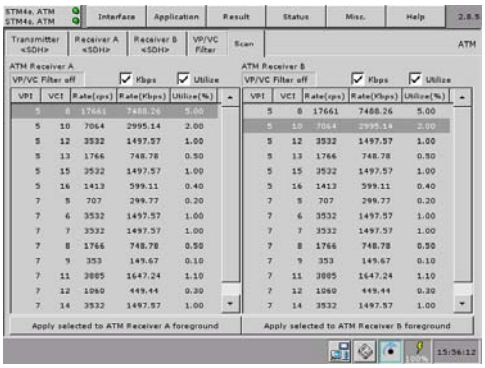

Fig. 3 The user can quickly get an overview of the active virtual channels in the monitored ATM traffic through the ATM scan facility in the CMA 3000.

In-service ATM statistics

For in -service troubleshooting of ATM channels on SDH links the CMA 3000 provides powerful bidirectional statistical measurements of general ATM alarms and errors and Virtual Path (VP) OAM F4 and Virtual Circuit (VC) OAM F5 alarms for one selected foreground channel.

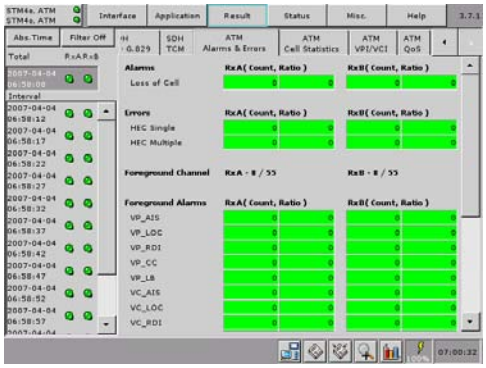

Fig. 4 The CMA 3000's color indications make it easy to identify alarms or errors in the monitored signal

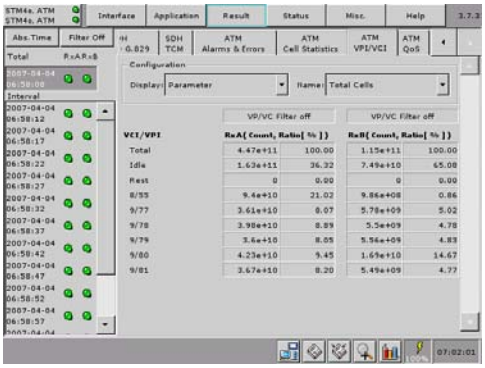

Fig. 5 Comparing total cell count for the monitored VPI/VCI channels

Statistics are also available for in-service analysis of up to 30 ATM channels, identified by their VP/VC identifiers (VPI/VCI). The user can specify a number of ATM channels to be monitored. The instrument will complete the list by identifying active VPI/VCI pairs in the monitored ATM traffic.

The user can compare one selected parameter for all channels or see all parameters for one channel. The parameters include User cells, User Congestion cells, OAM cells and Resource Management cells. A number of traffic descriptor parameters are also measured. The traffic descriptor parameters describe the behavior of an ATM virtual traffic channel: Peak Cell Rate (PCR), Sustainable Cell Rate (SCR), Minimum Cell Rate (MCR), Maximum Burst Size (MBS) and Cell Delay Variation Tolerance (CDVT).

The instrument can monitor status and synchronization cells for 2 Mbps lines running IMA (Inverse Multiplexing for ATM). Hereby it is easy for the user to check the status of the 2 Mbps lines that are used in the IMA connection.

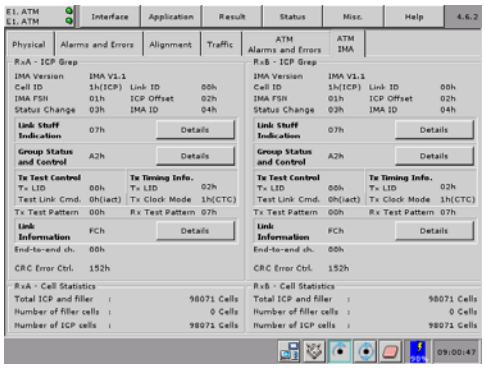

Fig. 6 Presentation of the status of the IMA connection. By clicking "Details" the user gets information bytes presented in decoded format.

Out-of-service ATM tests

During installation/commissioning and stress testing of network elements you can control the signal transmitted by the CMA 3000. UNI and NNI ATM traffic can be generated from E1 rate up to STM-4 rate (VC4-4c). The instrument can generate ATM cells in one foreground channel for the actual test and add traffic in up to 14 background channels to emulate a realistic signal for testing the ATM network. The instrument offers a selection of traffic profiles in the foreground channel, allowing emulation of different types of traffic.

The instrument can also generate test signals defined in ITU-T rec. O.191 for measurement of Quality of Service (QoS). The QoS parameters include information on lost or misinserted cells, delay and delay variation. The instrument measures the parameters whereby the user can verify that the QoS is in accordance with an ATM Traffic Contract.

For testing of the lower PDH or SDH layer the CMA 3000 provides you with great flexibility for injecting errors and alarms and for SDH making pointer operations and overhead byte changes into the transmitted signal.

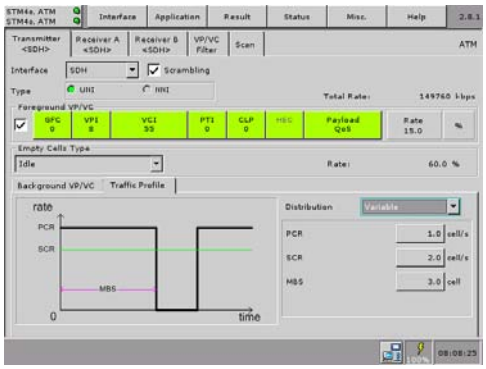

Fig. 7 The intuitive user interface of CMA 3000 facilitates the ATM test setup.

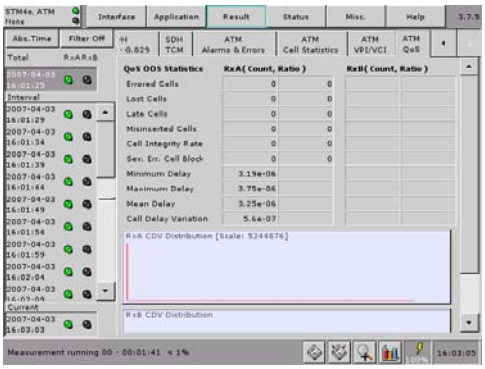

Fig. 8 QoS parameters measured by the CMA 3000.

Specifications

The specifications below list the functionality for a basic CMA 3000 with SDH and/or E3 test module installed together with the ATM option.

For more information on the functionality of the basic configuration please refer to the CMA 3000 basic instrument specifications sheet. For more information on the functionality of the SDH and E3 test modules please refer to the SDH, E3 and E4 test options specifications sheet.

Specifications	
ATM over SDH option	• ATM over STM-1: requires that an SDH test option is installed in the instrument • ATM over STM-4 VC4-4c or in one VC4: requires that an SDH test option and at least one STM-1/-4 optical module is installed in the instrument • ATM over STM-16 in one VC4-4c or in one VC4: requires that the enhanced SDH test option and at least one STM-1/-4/-16 optical module is installed in the instrument
ATM over E1/E3 option	• ATM over E1 and E3. ATM is mapped to E3 in accordance with ITU-T recommendation G.832. ATM over E3 requires that the E3 test option is installed in the instrument

Traffic generation	
No. of transmitters	One transmitter can be activated for generating ATM traffic
Channels	1 foreground channel, 14 background channels
Interface	UNI/NNI
Traffic profiles	Constant, Variable, Burst, Poisson, Binominal, 2 state Markovian
Cell scrambler	User selectable: On/Off
Cell header editing	VPI, VCI, GFC, PTI, CLP
Payload contents	Foreground channel: • PRBS9, PRBS11, PRBS 15, PRBS 20, PRBS 23, PRBS 29, PRBS 31, Normal/inverted, • User defined cell • User defined 8 bit word • ITU-T rec. O.191 test cells Background channels: • A fixed 8 bit value selectable for each channel Payload programmable as kbps, cps and %
Error generation	HEC single, HEC multiple, PRBS error insertion, O.191 cell late, O.191 cell loss, O.191 CRC16, O.191 cell out-of sequence.
Alarm generation	Loss of Cell Delineation VP-AIS, VP-LOC, VP-RDI, VP-CC, VP-LB VC-AIS, VC-LOC, VC-RDI VC-CC, VC-LB

ATM Layer Traffic Analysis	
No. of receivers	One or two receivers can be activated for receiving ATM traffic
Auto-detect active VCI/VPIs	Up to 30 VCI/VPI pairs
No. of channels monitored	Up to 30 VCI/VPI pairs + total ATM stream
Channel definition	VCI/VPI
Statistics	Total ATM stream: Idle, Unassigned, HEC correctable, HEC uncorrectable. Total ATM stream and selected VCI/VPI pairs: User, User Congestion, Segmented OAM F5, End-to-end OAM F5, Resource Management, Reserved, Cells with CLP = 1. Selected VCI/VPI pairs: Traffic descriptor parameters: Peak Cell Rate (PCR), Sustainable Cell Rate (SCR) , Minimum Cell Rate (MCR), Maximum Burst Size (MBS), Cell Delay Variation Tolerance (CDVT)
Error detection/statistics	Total ATM stream: HEC correctable, HEC uncorrectable
Alarm detection	Loss of Cell Delineation, VP-AIS, VP-LOC, VP-RDI, VC-AIS, VC-LOC, VC-RDI
O.191 QoS measurements	CER, CLR, CMR, SECBR, CTD max/mean/min, CDVpp, 1-point CDV, 2-point CDV estimated as described in ITU-T rec. O.191 section 7.1.4.
Cell BER tests	Detection of errors in user defined payload in the foreground channel G.826/M.2100 parameters
OAM functionality	Generation of AIS and RDI OAM F4 and F5 frames. Monitoring of AIS and RDI for F4 and F5 level.
ATM Channel Scan	Identification of currently active virtual (VCI/VPI pair) channels. Up to 150 channels can be identified.
IMA Support (E1 only)	IMA versions supported: v1.0 and v1.1 IMA Status monitor: Readout of ICP cell information, including: • IMA version • Cell and Link ID • Link stuff indication • Group status and control • Tx Test control and Timing information • Link information for the up to 32 lines that can be included in an IMA system IMA statistics: • Total cells count • Filler cell count • ICP cell count

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