Technical Specifications

PDU and PDU Sequence Builder

The Protocol Data Unit (PDU) and PDU Sequence builders can be used to create, custom-built libraries of predefined traffic. These libraries can contain ATM cells and AAL1 PDUs. Cells and PDUs can be linked to form a complex library of sequences. The PDU editor can create, edit, copy, rename, and delete PDUs.

ATM Cell Editing

Header	• User defined by field GFC, VPI, VCI, PT, CLP
Interface	• UNI/NNI selectable
HEC	• User defined • Auto-calculate
Trailer	• User defined by field
Payload	• User defined in hex • Can be incrementing or decrementing

AAL1 PDU Editing

Header	• User defined by Field CSI
Sequence Number Protection	• User defined or auto-calculated
Payload	• User defined in hex, can be incrementing

Encoding Options

AAL1 PDUs can be automatically encoded down to lower layer ATM cells. The user specifies the encode options to be applied during the encoding process.

ATM interface options (UNI/NNI)	• VPI • VCI • PT • CLP

Traffic Generation

The transmission of the ATM Cells, PDUs and PDU sequences can be done as a single-shot or as distributed traffic. Single-shot and distributed traffic can be sent simultaneously.

Single-Shot

In single-shot operation, you can select on PDU or PDU sequence to be sent.

Cell rate	• User selectable (0 - 100% of line rate)
Number of cells	• Up to 2047 unique cells
Encoding	• AAL1 to ATM cell

Distributed Channels

Up to eight independent traffic streams can be generated using predefined PDUs and PDU sequences.

Transmission	• Continuous and repetitive
Number of cells combined	• 2047 unique cells on all streams
Multiplexing	• Distributed streams are multiplexed with single-shot traffic
Priority	• Single-shot takes precedence over distributed traffic; stream 1 has the highest priority

Stream 1 Distribution & Parameters

Constant cell rate (CCR)	• Mean load
Burst/Max Load	• Burst gap length
Sawtooth	• Minimum/maximum load, burst gap length
Poisson	• Mean cell interarrival time

Streams 2-8

CCR	• Mean load

Real-Time Measurements

Measurements can be displayed in real-time either numerically or graphically. These measurements can be recorded to disk in a Lotus 1-2-3 compatible format for storage and later use.

PDU Data Capture

Live PDU data can be captured into memory

Capture capacity	• 131,072 cells per 8 MB of capture RAM
Capture control event	• Manually or on a specified trigger
Time stamping	• All captured data is timestamped with the calendar time (resolution = 0.1 us)

Capture Filters

Incoming cells are filtered using up to eight Pattern Matchers. Real-time filtering determines which cells are kept for analysis.

Receive Streams

Each received cell undergoes the following reassembly and analysis process.

- Pattern matcher filtering
- Error checking
- Reassembly
- Event triggers

Pattern Matchers

Incoming cells are matched against up to eight programmable patterns. The results are used as inputs to the trigger engine.

Patterns	• 53 byte cell
Editing forms	• ATM cells, AAI1
Pattern matching	• Inverted or non-inverted
Bit matching	• 0, 1 or wildcard

Trigger Event Engine

A programmable event/action matrix is provided in the CPP. It is used to trigger actions when specified events are detected.

Actions	• Start/restart capturing • Suspend or stop capturing • Capture cells • Increment counter • Reset counter • Start/restart timer • Stop timer • Exert external trigger • Start transmitter
Events	• Pattern match (1-8) • Cell received • Timer expiry (programmable 1-256ms +/- 1 ms) • External trigger input detected • Logically ORed combinations of the above • Decode errors

Statistical Measurements

Real-time statistics can be calculated on the incoming cell streams.

- Total cells received
- Total unassigned cells
- Total cells received on a channel
- Number of pattern matches

Playback

Event streams can be reconstructed from recorded cell-streams for off-line analysis using the playback facility.

- Detection of protocol errors
- Filtering
- Cell and PDU display
- Results archiving facility

ATM Analysis

Options	• UNI/NNI selectable
Decode Errors	• Invalid HEC VPI < > 0, VCI = 0

As per ITU-T I.361

AAL1 Analysis

Decode information

Sequence Number	• CSI Sequence count
SNP	• CRC-3 Parity
Payload	• Hex or ASCII display

As per ITU-T I.363

OAM F4 and F5 Analysis

OAM Decode information

Flow level	• F5 VC segment • F5 VC end-to-end • F4 VP segment • F4 VP end-to-end
Cell type	• Fault & performance management, activation, or deactivation of user management
Function type	• AIS, FERF, Continuity check, Forward monitor, Backward monitor, Monitoring/reporting

As per ITU-T I.610 & T1S1.5/92-029R91