



TSU IQ+

Frame Relay T1/FT1 DSU/CSU with DSX-1

Product Features

- T1/FT1 DSU/CSU with integral DSX-1 port for mixed mode Frame Relay
- Real-time measurement of throughput, bandwidth utilization, bursting, congestion, and network delay on each PVC
- Bandwidth utilization by protocol and top talkers
- End-to-end network delay measurements for network optimization
- N-Form™ provides a web-based, cost-effective, easy-to-use management platform
- True non-intrusive in-band transmission of statistics
- Embedded SNMP and Telnet through SLIP/PPP port or optional Ethernet interface
- Optional Dial Backup to avoid service interruption
- Easy configuration from Front Panel, SNMP, Telnet or VT100
- Standard five-year warranty

ADTRAN's industry-leading and award-winning DSU/CSU family continues to provide more flexibility with the addition of the TSU IQ+™. The TSU IQ+ is a T1/FT1 frame-aware DSU with an integral DSX-1 interface that terminates voice and data from a mixed mode Frame Relay circuit. This intelligent solution allows a cost-effective approach for customers requiring equipment that supports voice and frame relay data over a single T1/FT1 circuit.

Real-time measurements of Frame Relay metrics are stored in the TSU IQ+. These metrics include statistics on throughput and utilization per port and PVC, availability, utilization by protocol, top talkers, lost frames and PVC state, excess bursting above CIR, network congestion (FECN, BECN, and DE), and end-to-end delay on any or all PVCs. This data is crucial for pinpointing specific traffic demands and problem sources in the network, for analyzing traffic patterns, and for general maintenance and troubleshooting of the Frame Relay circuit.

The statistics are stored in the TSU IQ+ in a standard ASN.1 format making the statistics available to any SNMP management platform or trend analysis package. ADTRAN offers N-Form, a powerful proactive network management software suite. Modular in design, N-Form combines the features of a complete SNMP management platform, with a network trend analysis tool, in an easy-to-use, web-based, low cost package.

The TSU IQ+ supports multiple methods of access to the collected performance data. Options include simple VT100 connection, front panel, management access through inband dedicated or shared PVCs, SLIP/PPP or Ethernet, and combination management. Combination management allows for simultaneous and independent management by the service provider and the end user.

The IQ family provides automatic dial backup upon interruption of Frame Relay services. Once detected, the unit automatically initiates a dial-up call around the Frame Relay network. A host IQ unit initiates and accepts calls to and from IQ units at remote sites. Once connected, the host unit merges backup traffic with the primary traffic still being received from unaffected remote sites. The router or Frame Relay device connected to the TSU IQ+ still receives all data as Frame Relay traffic over the primary connection, allowing a virtually transparent transition. Once the failed condition has been cleared and the Frame Relay interruption is over, the IQ unit automatically restores traffic to the primary link.

Additional features such as an easy-to-use front panel interface and modular option cards combined with the quality, service and support that ADTRAN is known for makes the TSU IQ+ the obvious choice for Frame Relay monitoring. The IQ series also includes the IQ Probe, TSU IQ™, DSU IQ™, and the NxIQ module for the TSU multiplexer family.



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Product Specifications

Operating Modes

- 100 DLCIs supported
- T1/FT1 Frame Relay
- Auto LMI/Annex D detection

Frame Relay Statistics

Access Line Statistics

- T1 BPVs, CRCs, ES, SES, UAS, %AS, %EFSEC, Alarm, Errors
- Telco loop test in progress

PVC Statistics

- PVC state
- Bytes Tx/Rx; Frame Tx/Rx
- Frames with BECN/FECN/DE
- Max/Min/Avg frame size
- Throughput/bandwidth utilization per PVC
- Lost frames/Sequence check
- Max/Min/Avg end-to-end PVC delay
- Burst rate

Port Statistics

- Byte Tx/Rx; Frame Tx/Rx
- Throughput/Utilization
- Frame size violations (invalid frames)
- CRC Errors/abort frames
- Non-octet aligned frames

LMI Statistics

- LMI state/state changes
- Polls in; Responses in
- Time-outs/link integrity frames
- Polls with protocol error

Layer 3 Statistics

- Monitor protocols on port and pvc
- Protocols supported: IP/IPX, ARP, SNA, other
- Top Talkers

Diagnostics

Frame Relay

- PVC loopback w/ test pattern/sequence check
- PVC round trip delay

Network/User

- CSU loopbacks

DSX-1

- Line loopback
- Port loopback (internal towards the TSU)

Line Interface

- RJ-48S, 4 wire
- Timing derived from the Frame Relay Network
- Framing: SF/ESF with auto detection
- ESF format: AT&T 54016, ANSI T1.403
- Line coding: AMI/B8ZS
- Input signal: 0 to -36dB
- DS0 Assignment: contiguous or alternate

DTE Interface

- V.35 Winchester M block female
- 56 to 1.536, Nx56 or Nx64 kbps (N=1 to 24)

DSX-1 Interface

- RJ-48S Line interface per ANSI T1.102
- Framing: SF/ESF
- Line coding: AMI/B8ZS
- Input signal: -10dB to +6dB
- Line length: -3dB to 655 ft. in 110 ft steps
- Line rate: 56k to 1.544 Mbps

SNMP/Telnet

- Embedded SNMP and Telnet inband access through shared or dedicated PVC
- Integrated SLIP/PPP (async) port
- Optional 10BaseT interface
- RFC 1213 MIB II, RFC 1315 compliant
- ADTRAN Enterprise MIB for Frame Monitoring and TSU Control

Agency Approvals

- FCC Part 68, Part 15 Class A, UL1950 and CUL, Industry Canada CS03

Environment

- Operating Temperature: 0° to 50° C, (32° to 122° F)
- Storage Temperature: -20° to 70° C, (-4° to 158° F)
- Relative Humidity: Up to 95%, non-condensing

Physical

- Dimensions: 10.4" D, 8.0" W, 2.4" H
- Weight: 4.5 lbs
- Power: 115 vAC, 60 Hz, 7 W

Product Includes

- Three 8-pin to 8-pin modular cables, modular to female DB-25 adapter, and user manual

Ordering Information

Equipment	Part #
TSU IQ+™	1200275L1
V.34 DBU card	1204002L1
SW56 DBU card	1204001L1
ISDN BRI DBU card	1204004L1
ISDN PRI DBU card	1204008L1
External DBU card	1204006L1
Ethernet card	1204005L1



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