

TM1000 Monitoring Probe – Up to 128 T1/E1



The TelcoBridges *Tmonitor* TM1000 is a high-performance voice and data traffic monitoring solution that enables service providers to record and analyze messages, as well as optimize network performance and quality of service (QoS), while providing a foundation for new value-added offerings, such as location-based services (LBS).

Each *Tmonitor* TM1000 unit can perform non-intrusive, full-duplex monitoring and filtering of 64 T1/E1/J1 interfaces per device, providing up to 100% packet capture. Data captured by the TM1000 is then routed by TCP/IP to an application server where it can be analyzed and acted upon.

Unlike a network-monitoring probe, the *Tmonitor* TM1000 does not affect the performance of the network or the status of a call, or introduce unwanted data artefacts. For cases where it is located immediately next to the network to be monitored, the TM1000 is designed to work with a purpose-built 32-port Monitoring Patch Panel that features a high-impedance circuit to limit signal drain. For longer distances, TelcoBridges has designed an optional 16-port isolation patch panel, used in conjunction with the monitoring patch panel, which helps to maintain high-impedance resistance in the path to the monitoring equipment.

Product Characteristics:

- ✓ 1U Monitoring probe
- ✓ 16 to 128 passive half-duplex T1/E1 PRI receivers
- ✓ 8 to 64 passive full-duplex T1/E1 monitoring
- ✓ Hot-swap redundant power supplies (AC or DC)

Tmonitor™ **TM1000 Data Sheet**

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Tmonitor TM1000 (front view)



Tmonitor TM1000 AC (rear view)



Tmonitor Isolation patch panel (front view)

Features and Benefits:

Monitoring applications. In addition to recording and analyzing voice messages, generating and verifying call detail records (CDR), the TM1000 allows service providers to perform fraud detection, lawful interception, and location-based billing. The TM1000 also enables service providers to offer new valued-added location-based services, including proximity-based notification, real-time vehicle traffic reports, and the ability to alert roaming customers by SMS.

Carrier-grade performance. The Tmonitor TM1000 is a high volume monitoring solution. Multiple TM1000 devices and application servers can be clustered together in one or more facilities to provide essentially unlimited scalability. Application servers can also be deployed remotely for fully distributed monitoring.

Network monitoring flexibility. The Tmonitor TM1000 allows service providers to process and analyze all data captured in SS7, ISDN and HDLC packets and raw T1/E1 traffic, as well as record specified voice traffic. It features highly configurable on-board packet filters so that only relevant information is captured from traffic streams and stored.

Non-intrusive. In order to maintain overall system performance and Quality of Service (QoS), the TM1000 does not introduce latency or otherwise modify or alter the stream of communications. Installation of the TM1000 requires no modification to existing communications equipment.

Product Characteristics

Up to 128 E1/T1 interfaces (half-duplex), or
Up to 64 T1/E1 interfaces (full-duplex)
Interface type is software selectable per interface
Software upgradeable from 16 to 128 receivers
High-impedance isolation using monitoring patch panel
Channelized
Filtering of up to 2,048 packet filters based on a byte
boundary offset, bit mask, and matching value range

Interfaces

E1

HDB3 or AMI line coding
2 or 16 frames per multi-frame with or without CRC-4
High-impedance isolation according to ITU-T G.772
using monitoring patch panel T1/E1

T1

B8ZS or AMI line coding
SF or ESF frame formats
High-impedance isolation according to ANSI
T1.102-1993 using monitoring patch panel

Data Capture Recording

Captured packets are detected between 0x7E flags
Captured packets are checked for errors as per ITU-T
Q.703, Q.721 (16-bit CRC)
Packets are individually time-stamped to ensure proper
ordering (125 microsecond precision)
Captured data is forwarded to the application via
TelcoBridges' asynchronous API
Dual redundant GigE control paths

Management and Control

Live configuration and software upgrades via network
Configuration of multiple TM1000 devices in the same
system with a single interface
SNMP v2 GET of individual TM1000 appliance

Management and IP Interfaces

1 RJ45F serial console port with RS-232C adapter
2 100/1000Base-T management interface

Protocol and Compatibility

SS7
MTP1/MTP2-based wireless interfaces (e.g., A, Abis,
Q.921)
Frame relay-based wireless interfaces (e.g., Gb)
ISDN PRI
V5.1, V5.2
Any HDLC-like protocol (PPP, X.25)
Raw timeslot recording (64kbps)

Monitoring Capabilities

512 HDLC controllers (16, 32, 56, 64, n x 64 kbps
where n = 1 to 31, SS7 HSL)

Controller modes

Raw (captures complete bit stream)
HDLC (captures all HDLC frames)
SS7 (captures SS7 frames, FISU and LSSU filtered
out)
Processing capability: 175,000 HDLC frames per
second
Total maximum aggregate bandwidth capacity of 2 x
80 Mbps (Rx and Tx monitoring)

System Scalability

Unlimited number of TM1000 units per system
Unlimited number of target data recording servers
Redundant application server control (active-active or
active-standby)
Live TM1000 additions and removals

Application Development Environment

Easy to integrate asynchronous message-based API
OS support: Intel Linux, Windows®
Sample application source code for most functions

Monitoring Patch panel (optional)

32 RJ45 female E1/T1 input connectors
2 SCSI-3 female output connectors
Individually configurable high-impedance circuits for each link
19 inch or ETSI 600 mm rack mount options
Maximum insertion loss of 0.7 dB

Isolation Patch panel (optional)

32 RJ45 female E1/T1 input connectors
16 input ports + 16 output ports
19" or ETSI 600 mm rack mount options
Maximum insertion loss of 0.7 dB

Cross-Connect Wire with High-Z and Isolation (optional)

5 conductors, 5-metre tap side, 15-metre probe side

Electrical Characteristics

90 to 260 VAC, 47 to 63 Hz or -36 to -72 VDC
Hot-swap redundant power supplies (AC or DC)
Maximum 60W power consumption

Regulatory Compliance

Safety

CE

IEC60950-1:2005; UL60950-1, 2nd edition 2007
CSA C22.2 No.60950-1-07 first edition March 2007

EMC

FCC Part 15 (2004), sub-part b
EN55022 (1998)
EN61000
ENV50204 (1995)

Dimensions & Weight

1U, 19" rackmount or ETSI 600mm rack mount options
1.75" (44.5 mm)H x 17.4" (442 mm)W x 11" (279 mm)D
10 lbs (4.5 kg)

Environmental

Operating temperature:

0 to +50 °C, 95% rel. hum. non-condensing

Storage temperature:

-20 to +75 °C, 95% rel. hum. non-condensing

Designed to meet NEBS Level 3