

CMA 3000, all-in-one field tester Tandem Connection Monitoring (TCM) option



KEY FEATURES

- Simultaneous bi-directional monitoring of TCM information on SDH lines
- TCM overhead byte testing and monitoring
- Comprehensive TCM error and alarm statistics

General description

When equipped with the SDH test option, the CMA 3000 is an easy-to-use, powerful tool for testing SDH and PDH systems.

CMA 3000 spans across a wide range of applications, from fast first aid troubleshooting to comprehensive, in-depth and all-layer analysis of transmission problems.

It's possible to further test SDH systems by adding the Tandem Connection Monitoring (TCM) option to a CMA 3000 with SDH option installed. The TCM option contains very powerful features for testing and monitoring TCM systems in SDH networks.

An SDH system has a number of error detection mechanisms, supporting end-to-end monitoring or section-based monitoring. Today operators may transport SDH traffic through a second operator's networks. Therefore a new system has been added to the original error detection mechanisms of SDH,

this being the Tandem Connection Monitoring.

The system is based on in-service error detection of SDH Virtual Containers. By checking the Virtual Containers for errors upon entering the second operator's network and leaving it again you can supervise the transmission quality throughout the second operator's networks.

Interval	TCM Section	RxA HI (Count: Ratio)	RxB HI (Count: Ratio)
2005/10/07 08:17:18	TC-UMRQ	0	0
2005/10/07 08:17:22	TC-LTC	0	0
2005/10/07 08:17:27	TC-TBH	0	0
2005/10/07 08:17:32	TC-AIS	0	0
2005/10/07 08:17:37	TC-RDI	0	0
2005/10/07 08:17:42	TC-ODI	0	0
2005/10/07 08:17:47	TC-ISC	2	2.19e+10
2005/10/07 08:17:52	TC-BIP-2	0	0
2005/10/07 08:17:57	TC-REI	0	0
2005/10/07 08:18:02	TC-ORI	0	0

Figure 1 Result screen with comprehensive statistics on TCM events.

As CMA 3000 can be outfitted to support bi-directional in-service monitoring you can inspect TCM parameters for both sides of a line simultaneously. This allows you to analyze the overall transmission quality of the monitored part of the line in the fastest way possible.

For out-of service testing and verification of the TCM system CMA 3000 includes features to inject the various conditions that provoke TCM events.

Specifications

The specifications below list the functionality when adding the TCM option to the basic CMA 3000.

For further information on the basic functionality please refer to the CMA 3000 basic instrument specifications sheet.

APPLICATIONS

- Comprehensive out-of-service test of TCM systems for:
 - Installation
 - Provisioning
- In-service monitoring of TCM systems for:
 - Fast troubleshooting
 - TCM overhead byte analysis
 - In-service error-performance measurement

NOTES

- ¹ Planned

General	
TCM frame format	ITU-T G 783, G 707 annex D (TCM option 2) and annex E
POH bytes	N1 (VC-4, VC-3) N2 (VC-12)
TCM Access Point Identifier (Apid)	15 bytes ASCII sequence, CRC-7
Alarms	Alarms can be detected and inserted: <ul style="list-style-type: none"> • TC-LTC, TC-TIM, TC-UNEQ, TC-AIS, TC-RDI, TC-ODI Alarm insertion is manual on/off
Errors	Errors can be detected and inserted: <ul style="list-style-type: none"> • B3 (VC-4, VC-3), TC-IEC (VC-4, VC-3), V5 (VC-12), TC-REI, TC-OEI Error insertion: <ul style="list-style-type: none"> • Manual: 1-8000 consecutive errors • Continuous 10-5, 10-6, 10-7, 10-8, 10-9, 10-10

Results	
Status	Current information on TCM alarms and errors on the monitored line
Statistics	User-defined resolution: <ul style="list-style-type: none"> • 1, 2, 5, 10, 15, 30s, 1, 5, 15, 30 min, 1, 2, 4, 6, 12 hours Information logged on TCM alarms and errors
Event log ¹	N1, N2 byte events are logged with 125 µsec resolution time stamps



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