VictoriaCombo 2.5G Module

Custom-Tailored Test Solution for the NGN World

Technical Specifications

Electrical Interfaces

- BNC (default), DIN 1.6/5.6 (option C25DIN55)

- Rates: 2048 kbit/s HDB3 and AMI, 8448 kbit/s HDB3 and AMI, 34368 kbit/s HDB3, 139264 kbit/s CMI, 155520 kbit/s CMI

- Optional: 1544 kbit/s B8ZS and AMI (option C25554), 44736 kbit/s B3ZS & AMI (option C25552), DS3-HI and DSX-3 pulses (with AD045 accessory), 51840 kbit/s B3ZS (option C25551)

- Balanced Bantam (accessory AD300), Siemens (accessory AD320) and RJ48 (accessory AD322) for 1544 kbit/s and 2048 kbit/s

- Interfaces according to G.703, ANSI T1.102 and G.772

- Gain: 0, 20, 26, 30 dB from 1544 kbit/s to 51840 kbit/s; 0, 20, 26 dB for 139264 kbit/s and 0, 20 dB for 155520 kbit/s

Optical Interfaces

- Built-in, field-removable connectors for 155520 kbit/s, 622080 kbit/s and 2488320 kbit/s

- Interfaces according to the ITU-T G.957 L-16.1 and L-16.3

- FC (default), SC (option C25SC) or ST (option C25ST) connectors

- Automatic disconnection of the receiver for overload protection

- 1310 nm transmitter (modules C25C1, C25C4) and 1550 nm transmitter (modules C25C2, C25C4)

- Via external optical micromodules fed by the equipment for 34368 kbit/s (option C255531), 51840 kbit/s (option C255511), and 155520 kbit/s

Modes

- Standard (SDH/SONET/PDH//T-Carrier termination)

- Through mode for all the interfaces

SDH

General

- According to G.707 and O.181

- Programmable content of tributaries not being tested

Mappings

- C-4-16c in STM-16

- C-4-4c in STM-4 and STM-16

- C-4 (unstructured or with framed E4) in STM-1, STM-4 and STM-16.

- C-3 (unstructured or with framed E3 or DS3) in STM-0, STM-1, STM-4 and STM-16 (both with an AU-3 or AU-4)

- C-12 (unstructured or with framed E1, asynchronous or byte synchronous) in STM-0, STM-1, STM-4 and STM-16

- C-11 (unstructured or with framed DS1) in STM-0, STM-1, STM-4 or STM-16

Programmable Bytes
Editing and display in hexadecimal or by descriptor

- RSOH: J0/C1

- MSOH: K1, K2, S1

- HO-POH (VC-4, VC-3): J1, C2, G1, H4, K3, N1

- LO-POH (VC-3): J1, C2, G1, H4, K3

- LO-POH (VC-12, VC-11): V5, J2, N2, K4

Path Trace

- Generation, analysis and expected 16- and 64-byte messages in J0, J1 and J2

Errors

- Insertion and detection of ECOD, EFAS, OOF, B1, B2, MS-REI, HP-B3, HP-REI, LP-B3, LP-REI, BIP-2, slips and bit errors

- Insertion mode: single, burst, repetitive burst and rate (1.1×10^{-3} to 0.9×10^{-9}s)

Alarms

- Insertion and detection of LOS, LOF, RS-TIM, MS-AIS, MS-RDI, AU-AIS, AU-LOP, HP-UNEQ, HP-RDI, HP-TIM, HP-PLM, TU-LOM, TU-AIS, TU-LOP, LP-UNEQ, LP-RDI, RFI, LP-TIM, LP-PLM, LSS, pattern AIS

- Insertion mode: continuous, burst of M frames with alarm, repetitive M/N burst

Pointer Events

- Increment, decrement, manual value with or without NDF, invalid pointer in AU-4, AU-3, TU-3, TU-2, TU-12 and TU-11

- G.783/O.172 pointer sequences

- Programming of SS bits

SONET

General

- According to ANSI.105-1995 and Telcordia GR.253

- Programmable content of tributaries not being tested

Mappings

- STS-48c

- STS -12c

- STS-3c bulk or with framed E4

- STS-1 bulk or with framed DS3 or E3

- VT-2 bulk or with framed E1 (asynchronous or byte synchronous)

- VT-1.5 bulk or with framed DS1

TrendCommunications

Programmable Bytes

Display of all bytes and editing in hexadecimal or by descriptor of:

- SOH: A1, A2, J0, C1
- LOH: K1, K2, S1
- STS-POH: J1, C2, G1, H4, K3, Z5
- VT-POH: J2, V5, K4, Z6

J0, J1, J2 Trail Trace

- Generation, analysis and expected 16- and 64-byte messages in J0, J1 and J2

Errors

- Insertion and detection of ECOD, EFAS, SEF, B1, B2, REI-L, STS-B3, REI-P, VT-B3, REI-V, BIP-2, slip and bit errors
- Insertion mode: single, burst, repetitive burst and rate (1.1×10^{-3} to 0.9×10^{-9}s)

Alarms

- Insertion and detection of LOS, LOF, TIM-S, AIS-L, RDI-L, AIS-P, LOP-P, UNEQ-P, RDI-P, TIM-P, PLM-P, LOM-V, AIS-V, LOP-V, UNEQ-V, RDI-V, RFI-V, TIM-V, PLM-V, LSS, pattern AIS
- Insertion mode: continuous, burst of M frames with alarm, repetitive M/N burst

Pointer Events

- Increment, decrement, manual value with or without NDF, invalid pointer in STS-3c, STS-1, VT-2, VT-1.5
- G.783/O.172 pointer sequences
- Programming of SS bits

PDH

Structure

- 140 and 8 Mbit/s according to G.751, G.742, G.704, framed and unframed
- 34 Mbit/s according to G.751 or optionally according to G.832 for transporting 14 TU-12s (options C25553, C255531), or unframed
- PCM30/31 frame structure with/without CRC for 2 Mbit/s signals. Test signal in 64 or N x 64 kbit/s. CAS signalling: setup and display of the CAS multiframe and spare bits of frame 0

Errors

- Insertion and detection of code errors, FAS errors, CRC errors, REBE, slips and bit errors
- For G.832 framing in 34 Mbit/s, insertion and detection of EM, REI, LP-REI, BIP-2
- Insertion mode: single, burst, repetitive burst and rate (1.1×10^{-3} to 0.9×10^{-9}s)

Alarms

- Insertion and detection of LOS, AIS, LOF, RAI, CRC-LOM, MAIS, CAS-LOM, MRAI, LSS and AIS pattern
- For G.832 framing in 34 Mbit/s, insertion and detection of OOF, LOF, TIM, RDI, UNEQ, PLM, TU-AIS, TU-LOP, TU-LOM, LP-UNEQ, LP-RDI, RFI, LP-TIM, LP-PLM
- Insertion mode: continuous, burst of M frames with alarm, repetitive M/N burst

45 Mbit/s

Structure

- Framed M13 and C-bit according to G.752, G.704, also unframed

Errors

- Insertion and detection of BPV, M-BIT, F-PAR, P-PAR, C-PAR, FEBE, slips and bit errors
- Insertion mode: single, burst, repetitive burst and rate (1.1×10^{-3} to 0.9×10^{-9}s)

Alarms

- Insertion and detection of LOS, AIS, LOF, Blue Alarm, IDLE, RAI (Yellow Alarm), LSS and AIS pattern
- Insertion mode: continuous, burst of M frames with alarm, repetitive M/N burst

1.5 Mbit/s

Structure

- SF & ESF framing according to ANSI T1-400-1995, SLC-96 framing according to Telcordia TR-TSY-00008, and also unframed
- Fractional DS1: DS1 with test pattern in N x 64 & N x 56 kbit/s

Errors

- Insertion and detection of BPV, EFAS, ECRC and bit errors
- Insertion mode: single, burst, repetitive burst and rate (1.1×10^{-3} to 0.9×10^{-9}s)

Alarms

- Insertion and detection of LOS, LOF, RAI, LSS and line AIS
- Insertion mode: continuous, burst of M frames with alarm, repetitive M/N burst

Signalling

- Generation and analysis of *Robbed Bit* signalling
- Generation and analysis of *Data Link* messages in ESF & SLC-96 framing

TCM

- Generation and analysis of N1 and N2
- Events generated: TC-IEC, TC-OEI, TC-REI, TC-AIS, TC-LTC, TC-UNEQ, TC-ODI, TC-RDI, TC-TIM
- Detection, display, performance calculation and storage of events: TC-IEC, TC-OEI, TC-REI, TC-AIS, TC-LTC, TC-UNEQ, TC-ODI, TC-RDI, TC-TIM
- B3 or BIP-2 compensation
- Analysis and generation of APId (Access Point Identifier)

Test Patterns

The following test patterns can be generated:

- PRBS11, PRBS15, PRBS20, PRBS23, PRBS31: normal or inverted
- Word: user defined, all zeros, all ones, 1010, 1000 and 1100

Functions

Results

- Counters, errored seconds and rate for all events: errors, alarms and pointer events

Trace

- Events are shown graphically in time plots and histograms that have advanced filter, identification and quantization functions and a zoom from 1 s to 1 h

Performance

- Performance measurements in line with ITU-T G.821, M.2100, M.2101.1, G.826, G.828 and G.829. Counter, rate, unavailability and PASS/FAIL indication of compliance with programmed objectives

Round Trip Delay

- In all interfaces; range from 1 µs to 10 s

AutoConfiguration

- Identification of the incoming signal parameters: network (SDH, SONET, T-Carrier, PDH or G.832), bit rate, line code, optimal gain, frame structure, mapping
- PRBS auto search

FastScan

- Search the incoming signal for all types of errors, alarms and events

Transparency Test

- Generation and analysis of PRBS pattern in DCC channels or E1, E2, F1, N1 and N2 bytes
- Bit error counter, rate and errored seconds
- Seconds with alarm counter for LSS

APS

- Measurement of disruption time for any STM-N/OC-N
- Tributaries: PDH, T-Carrier, SDH, SONET
- Range: 1 ms to 10 s
- Resolution: 1 ms

Optical Power Measurement

- Range: 0 to -28 dBm (+2 to -40 dBm with external optical modules)
- Resolution: ±1 dB

Frequency Measurement

- In Hertz and bit/s with deviation in ppm
- ITU-T/ANSI in-range or out-of-range indication

Frequency Offset of the Transmission Clock

- Up to 40 ppm in steps of 0.01 ppm for the integrated optical interfaces
- Up to 20,000 ppm in steps of 0.01 ppm for electrical interfaces and for optical interface at 155 Mbit/s with external module

General

- Dimensions(w x h x d): 270 x 220 x 50.8 mm
- Weigh: 1.37 kg

RF/EMI, ESD and Electrical Safety

- Radiated EMI: EN55022
- Immunity to EMI: EN61000-3-3
- ESD: EN61000-3-2
- Electrical safety: EN60950

Environmental conditions

- Operates from 0 to 45 ºC
- Storage: -25 to +70 ºC
- Humidity: 5 to 90%, without condensation ❑

Ordering Information

Configurations

Part Number	Description
COMBO25C4	Victoria Combo for SDH/SONET 2.5Gbit/s applications. 1310 and 1550nm optical transmitters.

Components of COMBO25C4

Part Number	Description
COMBOPT	Victoria Combo without application modules
C25C4	2.5Gbit/s module with both 1310 and 1550nm Long Haul Tx
C25552	DS-3 Test [a] Option
C25561	Advanced Features Option: Tandem Connection Monitoring (TCM), Generation of M/N alarm conditions, G.783 pointer sequences, Asynchronous tributary offset

a. DS3-HI and DSX-3 pulses with AD045 adapter

Components of COMBOPT

| Part Number	Description
CDISP	Victoria Combo Front Module with display
CREAR	Victoria Combo Rear Module
ML360	Victoria Combo soft carrying bag
CSTRAP	Multi-Use strap
CCDROM	CD-ROM
MOCOMBO	English Quick Reference Guide (50 pages)
BT420	Li-Ion battery pack Victoria Combo
AL320	Victoria Combo AC/DC adapter
CA110	Mains cord Victor/Victoria
CAETH	Ethernet Data Cord
CA260	RS-232C cable 9M-9F
CAUSB	USB Cable
CMM1G	Compact Flash Memory Microdrive 1GB
CCFPCMCIA	Compact Flash to PCMCIA adapter
CWL	Compact Flash Wireless LAN Card
CSTYL	Stylus
KL1	Security lock

Options

Part Number	Description
C25551	STS-1/STM-0 electrical Test
C255511	OC-1/STM-0 optical Test
C25552	DS-3 Test [a]
C25553	G.832 34M electrical Test
C255531	G.832 34M optical Test
C25554	DS-1 Test
C25561	Advanced Features: Includes following tests at the physical layer: Tandem Connection Monitoring (TCM), Generation of M/N alarm conditions, G.783 pointer sequences, Asynchronous tributary offset
C25SC	SC replacing FC-PC
C25ST	ST replacing FC-PC
CDIN55	DIN1.6/5.6 replacing BNC

a. DS3-HI and DSX-3 pulses with AD045 adapter

Contact Trend Communications for information on additional options and accessories

These specifications can be changed without prior notice
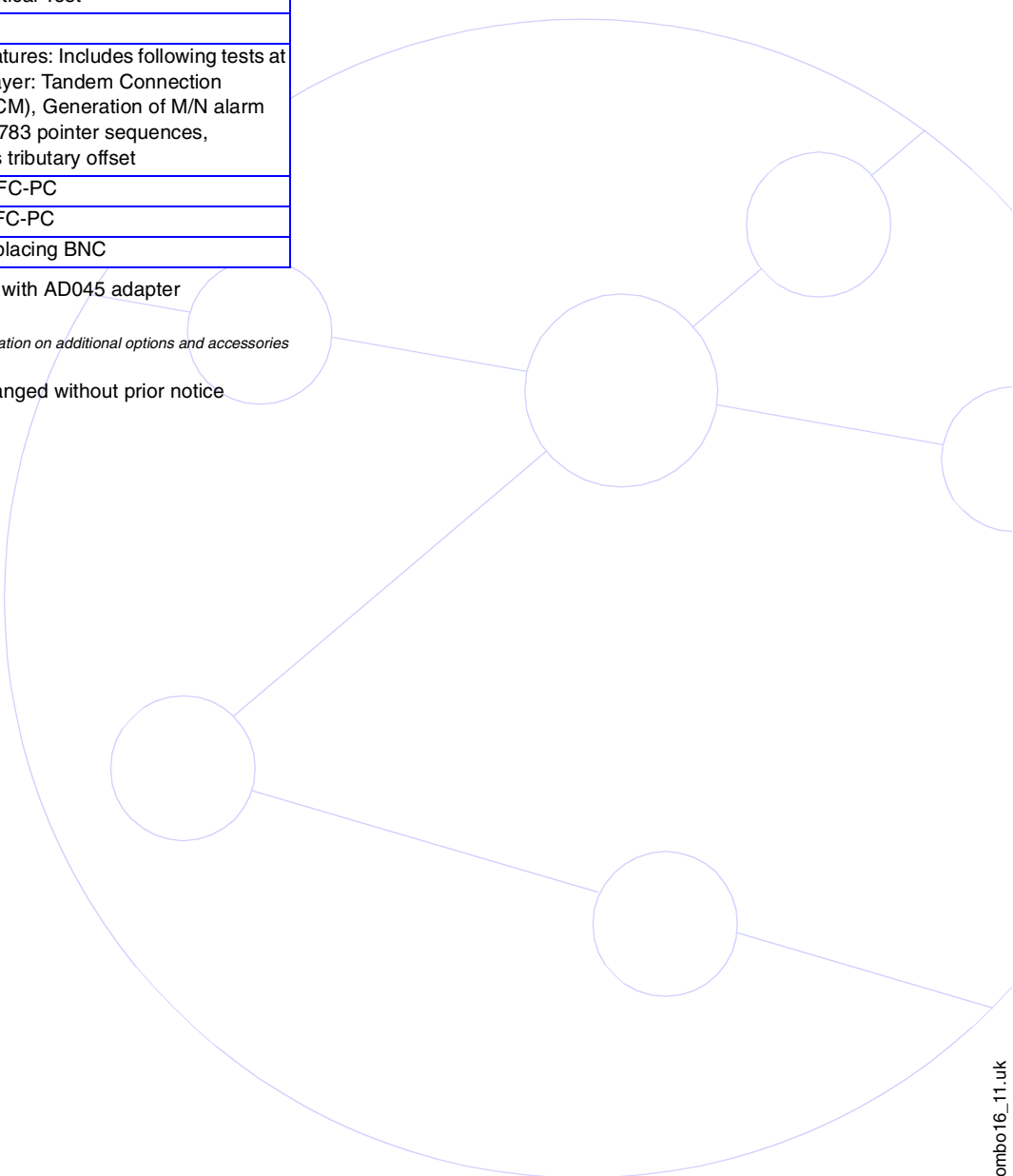
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