

Technical Data

Victoria Combo 2.5G Module

Tailored Test Solution for the Next Generation Networks

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 (1310nm) and L-16.2 (1550nm)
- 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

J0, J1, J2 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 (detection) and TSE
- Insertion mode: single, burst, repetitive burst and rate ($M \times 10^{-N}$ with M, N programmable. M= 0.9, 1, 1.1; N= 3, 4, 5, 6, 7, 8, 9)

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
- Repetitive M/N burst applies to: OOF, LOF, MS-AIS, AU-AIS, AU-LOP, HP-RDI, TU-LOM, TU-AIS, TU-LOP, LP-RDI

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



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)

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

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 Path 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, slips(detection) and TSE
- Insertion mode: single, burst, repetitive burst and rate ($M \times 10^{-N}$ with M, N programmable. M= 0.9, 1, 1.1; N= 3, 4, 5, 6, 7, 8, 9)

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
- Repetitive M/N burst applies to: SEF, LOF, AIS-L, AIS-P, LOP-P, RDI-P, LOM-V, AIS-V, LOP-V, RDI-V

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

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)

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 (detection) and bit errors (TSE)
- 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 ($M \times 10^{-N}$ with M, N programmable. M= 0.9, 1, 1.1; N= 3, 4, 5, 6, 7, 8, 9)

Alarms

- Insertion (continuous mode) 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 (detection) and bit errors (TSE)
- Insertion mode: single, burst, repetitive burst and rate ($M \times 10^{-N}$ with M, N programmable. M= 0.9, 1, 1.1; N= 3, 4, 5, 6, 7, 8, 9)

Alarms

- Insertion (continuous mode) and detection of LOS, AIS, LOF, Blue Alarm, IDLE, RAI (Yellow Alarm), LSS and AIS pattern

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, slips (detection) and bit errors (TSE)
- Insertion mode: single, burst, repetitive burst and rate ($M \times 10^{-N}$ with M, N programmable. M= 0.9, 1, 1.1; N= 3, 4, 5, 6, 7, 8, 9)

Alarms

- Insertion (continuous mode) and detection of LOS, LOF, RAI, LSS and line AIS

Signalling

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

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, 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 μ s 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

- Triggers: MS-AIS/AIS-L, AU-AIS/AIS-P, Pattern AIS, B1 errors, B2 errors, bit error (TSE)
- Range: 1 ms to 10 s
- Resolution: 1 ms

Optical Power Measurement

- Range: 0 to -40 dBm
- Resolution: ± 1 dB

Frequency Measurement

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

Frequency Offset of the Transmission Clock

- Up to 50 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: EN61000-4-3
- ESD: EN61000-4-2
- Electrical safety: EN60950

Environmental conditions

- Operates from 0 to 45 °C
- Storage: -25 to +70 °C
- 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 platform without application modules
C25C4	2.5Gbit/s module with both 1310 and 1550nm Long Haul Tx
AD15FC	FC-FC 15dB optical attenuator

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
CAETHX	Ethernet Data Crossed Cord
CSTYL	Stylus

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

NOTE: Other configurations for 10Gbit/s and combined 2.5Gbit/s-10Gbit/s applications are also available.



TrendCommunications

Trend Communications S.L.
Pujades, 60
08005 Barcelona, Spain

web: <http://www.trendcomms.com/>
e-mail: infoline@trendcomms.com

International +44 (0)1628 503500
United Kingdom 01628 503529
France 01 69 35 54 70
Deutschland 089 32 30 09 30
Spain 93 300 33 13
India 22-28521059 / 22-28521063
China 10 8518 3141
USA 1 256 461 0790

TrendCommunications S.L. reserves the right to change their product specifications without prior notification. This document is for information only and does not represent a contractual obligation.

A Member of IDEAL INDUSTRIES, INC.