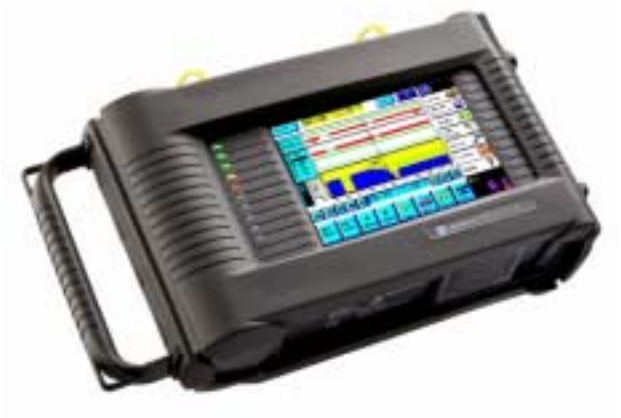
Victoria STM-4/OC-12



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Features and Benefits FB.VASTM4.1.1.UK

TrendCommunications

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Document	Features and benefits for Victoria STM-4/OC-12
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Product Definition

Victoria STM-4/OC-12 (3062C) is a hand-held Analyser/Generator for SDH (STM-4, STM-1, STM-0), SONET (OC-12, OC-3, STS-3, OC-1, STS-1), PDH (E1, E2, E3 and E4) and DSn (DS1, DS3) networks.

Victoria STM-4/OC-12 (3062C) differs from the rest of the *Victoria Tester* family in that it is a more advanced version of Victoria STM-4/OC-12 (3060C), with new elements that can also be found in Victoria STM-16/OC-48: Optical integrated interfaces. Moreover, some of the new features, such as generation and analysis of the ATM layer, increase the measurement capacity of Victoria at 622 Mbit/s.

The specifications for Victoria STM-4/OC-12 are based on the recommendation O.181 for STM-N interfaces.Victoria adds a variety of useful benefits to most of the network points and interfaces based on different digital transmission hierarchies.

Some of the most relevant features of Victoria STM-4/OC-12 (3062C) are:

Universal Tester. Victoria STM-4/OC-12 is the only hand-held in the European and American market that includes all the common interfaces. At DS1 level, it can operate with three different types of framing (SF, ESF, SLC-96) and at E1 with four different frames (PCM30, PCM30C, PCM31 and PCM31C). At DS3, it generates and analyses M13 and C-Bit frames.

Victoria generates and analyses framing according to the ITU, ANSI and Bellcore (Telcordia) recommendations at all the levels. At E3 level, it includes G.832 framing with transportation of the VC-12, besides the classical G.751 framing. This type of frame can be applied to mixed SDH/PDH networks, where it is necessary to transport SDH and PDH structures. The STM-0/STS-1 interface at 51840 kbit/s, optical and electrical, is also included, as in Europe it is commonly applied to the radio environment.

These are the main reasons that have transformed Victoria into a hybrid platform with European interfaces:

1. The global liberation of telecommunications has raised the need for interconnectivity between SDH and SONET networks. There are international gateways able to switch directly between SDH and SONET signals, therefore having interfaces of both hierarchies. Making measurements with this kind of instruments calls for hybrid testers.
2. In some European countries, T-Carrier interfaces, i.e American plesiochronous hierarchies (particularly 45 Mbit/s) are starting to be commonly used. This is because the VC-3 bandwith is used more efficiently than the mapping of 34 Mbit/s signals in applications such as MPEG video transport.
3. Presence in the American market requires the incorporation of SONET/DSn interfaces.

Optical Integrated Interfaces. Victoria STM-4/OC-12 makes the use of adapters and converters needless by including both optical and electrical interfaces. Both the electrical and optical interfaces are universal, so there is no need to use a different connector for each digital hierarchy level. Alternatively, Victoria incorporates two optical sources, at 1310 nm and 1550 nm.

It is quite usual that the high transport capacity containers, such as VC-4-4c, are reserved for ATM transportation. Victoria STM-4/OC-12 is able to detect a payload formed by ATM cells on this type of container, syncronise with this payload and detect errors in the cell headers by using the HEC. In generation, Victoria can fill the VC-4-4c with a fixed ATM test sequence, which is useful for testing ATM network elements: ATM or DSLAMs ADSL switches.

E1 and fractional DS1 Tests. In the case of lower levels in PDH and T-Carrier hierarchies, it is possible to access the time slots (24 of them for DS1 and 32 for E1) and insert test sequences for each of them separately.
Furthermore, Victoria STM-4/OC-12 can generate and analyse the signalling bits on these levels.

RS-232 remote control and LAN with graphical user interface. Victoria STM-4/OC-12 is prepared to be directly integrated to the RemoteGUI advanced remote control system. This makes Victoria a powerful measurement tool controlled by clients (RClients) connected to a TCP/IP network, from anywhere in the world.

Specialised Tests. Capacity to generate normalized G.783 pointer sequences, very useful when testing pointer processors in SDH/SONET equipments; measurement of TCM parameters; Round Trip Delay measurement (RTD); Automatic Protection Switching Test (APS); performance measurements G.821, G.826, M.2100 and M.2101.

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Positioning

Victoria STM-4/OC-12 weighs about 2 kg and its dimensions are 257x147x70 mm. It is fed by long-life batteries and is covered by a rubber boot to protect it from damage. All these features make Victoria especially handy for tests both in communications centrals and on the field.

When it comes to field work, Victoria can be applied to:

1. installation
2. acceptance and commissioning.
3. surveillance and monitoring
4. manteinance and repairment

Below you can find a list of the main features of Victoria STM-4/OC-12 and the specific applications that transform these features into sales arguments.

	Installation	Supervision	Manteinance
Small size and light weight	X		X
Battery operation mode	X		X
Covered by rubber boot for more protection	X	X	X
Graphical User Interface	X	X	X
Remote control with GUI		X	
Automatisation with macros	X		
Print	X	X	X
Trace	X	X	X
Optical Power measurement	X		X
Frequency mesaurement	X		
Frequency Offset	X		
Autoconfiguration			X
Fast Scan			X
Through Mode		X	X
Insertion/detection of defects/anomalies	X	X	
Overhead programming/reading	X	X	
BERT for unframed signals	X		
BERT for framed signals	X		X
Overhead BERT (Transparency test)	X		X
G.783 Pointer Sequences	X		X
Generation/Analysis of trace identifiers	X	X	X
Performance G.821, G.826, M.2100 and M.2101	X		
Tandem Connection Monitoring (TCM)	X	X	X
Automatic Protection Switching (APS)	X	X	X
E1 and Fractional DS1 Test	X		X
ATM in concatenated containers	X		X

In addition to this, Victoria STM-4/OC-12 can be of interest for manufactures in:

1. Production testing
2. Approval of components and network equipment
3. Systems integration tests

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Features-functions-benefits

Generals

Feature	Function	Benefit
Hand-held	Concentrate measuring capabilities in a small instrument	Ease of handling and transport
VC-4-4c/STS-12c SPE	622 Mbit/s concatenated containers	Carries signals that do not fit in smaller containers (e.g ATM interfaces at high bit rates or IP over SDH/SONET)
G.832 in 34 Mbit/s	Carry TU-12s in special frame at 34 Mbit/s	Possibility of better control than in PDH due to SDH overhead bytes. Applications in GSM
Operates with rechargeable batteries (1 pack incorporated)	Device can run without being connected to the mains (being connected to the electrical network or by means of batteries)	User is free to move to any measuring poin
For installation, acceptance, bringing-into-service and maintenance	Versatility of applications	Satisfies all the user's measuring needs
O.181 compliant	Guarantee features recommended by the ITU for SDH instruments	Provides user with all capabilities needed for measuring in STM-1
Large color touchscreen	Eliminate the need for a keyboard and provide a bigger screen	Increases legibility while keeping instrument small
Graphical User Interface (GUI)	Make programming the instrument easier	Easy to learn and use
Ten tricolor SoftLEDs	Visual display of events detected	User sees all events as and when they occur (and can distinguish them by their color), thus enabling corrective action to be taken immediately
SDH and SONET map	Graphical selection of SDH and SONET mapping to be worked with	User can see the mapping rate being selected in the SDH or SONET map both quickly and clearly
Integrated multihierarchy optical interfaces for 155 Mbit/s and 622 Mbit/s	Optical interfaces STM-N/OC-M share the same optical connector	Users do not need to disconnect the FO from one connector to put in another when the configuration of the instrument varies (binary bit rate)
Integrated multihierarchy electrical connectors	PDH/T-Carrier and SDH/SONET interfaces share the same electrical connector	Users do not need to disconnect the cable from one connector to put in another when the configuration of the instrument varies (binary bit rate)
Until two optical transmitters (separated) in the same instrument.	Connection to optical interfaces at 1310 nm Connection to optical interfaces at 1550 nm	Enable measurement performance over optical interfaces at 1310 nm and 1550 nm with the same instrument
ST, SC, FC/PC and other types of connectors available	Versatility of the optical connectors	The instrument can run directly with the optical connectors more commonly used (No adapter needed)
Hybrid device for SDH/SONET/PDH/T-Carrier (I)	Perform measurements in European and North American synchronous and plesiochronous hierarchies in a single instrument	In addition to the usual tests for each hierarchy, also allows tests to be carried out on equipment that converts between the signals from European and North American hierarchies found in international overheads, along with measurements at T-Carrier rates that are starting to be used in Europe (e.g. 45M)

Generation

Feature	Function	Benefits
Programming of OH bytes	Assign user values to overhead bytes	Allows assessment of how the multiplexer responds to the values programmed in the overhead bytes
Generation of path trace messages	Allow user to edit path trace messages	Allows path trace message configuration tests to be performed on network elements
Structure of synchronous signal generated: Pattern mapped or by filling the payload capacity	Provide two ways of inserting test signals in different signal containers	Complies with test structures defined in recommendations (e.g. O.181)
PDH structure: Framed/unframed pattern G.751 (140M, 34M), G.742 (8M) and G.704 (2M) ANSI structure: Framed/unframed pattern at 45M (M13, C-bit) and unframed at 1.5M	Allow the insertion of test signals in plesiochronous signals or in the whole of the channel available	User provided with BER test capabilities in unframed tests and also with assessment of other errors and alarms in framed tests
Generation of PRBS in DCC and other OH bytes	Insert test patterns in overhead bytes	Integrity tests can be carried out on overhead bytes of synchronous signals
Insertion of errors and generation of alarms	Simulate real situations by producing events in the signal generated	Response of network elements to events generated can be checked
Generation of pointer actions	Introduce pointer movements (increments, decrements, sequences) in the signal generated	Allows user to perform stress tests on network elements under measurement
Generation of frequency offset	Deviation of several ppm from nominal value for frequency of signal generated	Allows user to perform stress tests on network elements, as well as a number of acceptance tests
Pointer sequences according to G.783	Selection and generation of pointer action sequences defined by recommendation G.783	Possibility to carry out sophisticated stress tests on pointer processing circuits in the network elements under test

Feature	Function	Benefits
M/N alarms	Introduction of bursts of M frames with alarm followed by N-M frames without alarm, in a set of N frames	For checking the alarm activation criteria in network elements
ATM	Generation of a fixed ATM cell sequence in the VC-4-4c	Tests of ATM equipments: ATM switches, DSLAMs

Analysis

Feature	Function	Benefits
Analysis of events for SDH/SONET and PDH/DSn (errors, alarms and slips, power failure)	Classify and quantify events in signal received	Evaluates transmission quality
Events detected simultaneously	Detect any combination of events occurring at the same time	Saves time, as tests can be performed in parallel and not one after the other. This makes it easier to detect and identify failures during maintenance (determining where and why the problem has occurred due to correlation of events)
Display of OH bytes	Show value of overhead bytes received at all times	Allows the user to check overhead bytes against different stimuli at all times
Measurement of frequency and offset compared to nominal value	Obtain frequency value of signal received and its deviation from nominal value in ppm	Checks exact frequency of the signal received and whether this is within expect limits
Analysis of pointer events (pointer adjustments and corresponding frequency offsets in ppm and ns) - displayed graphically	Classify and quantify pointer events in signal received	Allows user to assess response of network elements to pointer events
Display of path trace messages	Capture path trace message sent from generating section	Allows user to check path integrity either for the SOH or for HP or LP overhead
Quality performance analysis: G.821, G-826 and M.2100	Measure performance parameters defined by those recommendations cited	User can program all types of pass/fail performance tests in SDH and PDH
Quality performance objectives	Program user values for quality performance objectives	Flexibility: Carry out measurements according to the specific requirements of each individual user
Results trace	Present events detected in histograms and time plots	Results tracing is the most convenient way for the user to display the results of measurements carried out over a long period of time (e.g. ISM)
Analysis of signal structures generated by the transmitter	Classify and quantify events in signals from different hierarchies	Duality with generation capabilities of said structures for carrying out integrity tests or BER tests
Analysis of PRBS in DCC and other OH bytes	Classify and quantify events in overhead bytes	Allows user to carry out integrity tests on the overhead channels of synchronous signals
Measurement of optical power	Obtain level in dBm of optical signal analyzed	Allows user to check that signal is received with minimum level of power required by the network
Through mode	The incoming signal is sent out again exactly as received	Allows in-service analysis to be carried out when no monitoring point or attenuating probes are available
Tandem Connection Monitoring (TCM)	Generation and analysis of TCM events	Allow the TCM mechanism to be checked, identifying the origin of events detected in connections in which several carriers take part
ATM cell sequences analysis in the VC-4-4c	Synchronization with an ATM cell sequence in VC-4-4c and analsis of alarms and errors	Allows user to verify that the content of VC-4-4c are ATM cells. Allows to verify that the cell flow doesn´t contain errors at ATM level

Functions

Feature	Function	Benefits
DCC transparency test	Check whether the signal introduced in the overhead of a synchronous signal (in this case in the DCC channel) is not degraded in an out-of-service loop measurement	Allows user to check that the system maintains the integrity of the DCC channels of the synchronous signal
Autoconfiguration	The instrument programs itself automatically in order to be able to analyze the incoming signal	Any unknown signal can be identified and analyzed
Fastscan	Ensure an event-free transmission in plesiochronous and synchronous signals	Fast and accurate detection of events in plesiochronous signals and synchronous tributaries
Round Trip Delay (RTD) measurement (I)	Measure the propagation delay both in transmission circuits and in network elements	Allows measurements to be made in long transmission paths (such as satellite links or network backbones) in which the RTD in an important parameter
Round Trip Delay (RTD) measurement (II)	Measure the propagation delay both in transmission circuits and in network elements	Allows for measuring the delay introduced by a single network element (DXC, ADMs, etc.)
TIE measurements	Measure TIE by counting pointer adjustments	Helps diagnose the cause of problems in synchronization sources
APS measurements	Quantify APS switching time	Allows user to check that the protection system implemented by the network meets recommendations

Other features

Feature	Function	Benefit
Test signal at Nx64 kbit/s	BER Test at Nx64 kbit/s in 2 Mbit/s PCM30/31 frame, in contiguous or non contiguous time slots	The user does not need specialised equipment in E1 level aplications
CAS Test	Analysis and generation of CAS and E1	The user does not need specialised equipment in E1 level aplications
Remote Control from PC via serial port RS232	Remote programming and data reading	Comfort: the instrument can be placed in a remote location, but the user stays in his common work environment
RemoteGUI	Multiple users of TCP/IP remote control with GUI	Ability to control the instrument remotely from anywhere in the world
Remote control from PC via RS-232 serial port	Program and retrieve data from the instrument from a remote location	Comfort: The instrument can be in a remote location while the user remains in his/her usual place of work
Printing of results via RS-232 serial port	Connection to external printer or PC	Printout or dumping to file of measurement results for quick inclusion in reports
Storage of performance results	Save the measurement results obtained during the periods specified	Make it easy to analyze the results, which are often obtained during long-term measurements
Storage of events with a 1 second time-stamp	Save the information with high resolution	Allows an in-depth analysis of the detected events to be carried out later with a high level of detail
SCPI syntax-based macros (I)	Automation of measurements	Comfort: Presence of user not required (macros)
SCPI syntax-based macros (II)	Automation of measurements	SCPI is a high level programming language, so it is easy to generate macros
SCPI syntax-based macros (III)	Automation of measurements	SCPI is an industry standard, and as such its macros are robust and reliable
Transfer of results to PC under Windows[a]	Make it possible to incorporate measurement results in reports and spreadsheets	Allows the user to produce complete and accurate reports more quickly
Storage of up to 30 macros	The instrument stores pre-programmed measurement procedures	Avoid the need to reprogram often repeated measurements time and again
Storage of up to 10 measurement files (I)	The instrument stores the measurements performed	The operator can review the measurements once they have finished and add them to reports or process the data they contain at a later date
Storage of up to 10 measurement files (II)	The instrument stores the measurements performed	Each measurement can be reviewed at a later date, thus reducing the possibility of errors in the interpretation of results by a single user
Storage of up to 20 configuration files	The instrument stores different configuration files	Avoid the need to reprogram often repeated configurations time and again
Editable text attached to files	User can save a series of comments with the stored files	Make easy for the operator to identify files saved a long time ago
Onscreen help (I)	Display a glossary of acronyms used in the GUI	The user can consult the meaning of an acronym at all times without needing to carry documentation around
Onscreen help (II)	Display information related to the model, serial number, SW version, SW options installed, etc.	The user can ask for useful information in order to know the test unit features
Different languages	GUI available in English, French, German or Spanish	User receives information from the device in his/her own language
Autosave configuration/results	When Victoria STM-4/OC-12 is performing a measurement and there is a power failure, the stored results are not lost. When the power is restored, the running measurement continues. The period of time without feeding will be marked by means of the POWF alarm activation	Protect the configuration and the current results when there is a power failure

a. Windows is a registered trademark of Microsoft Corporation in the USA and other countries.

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