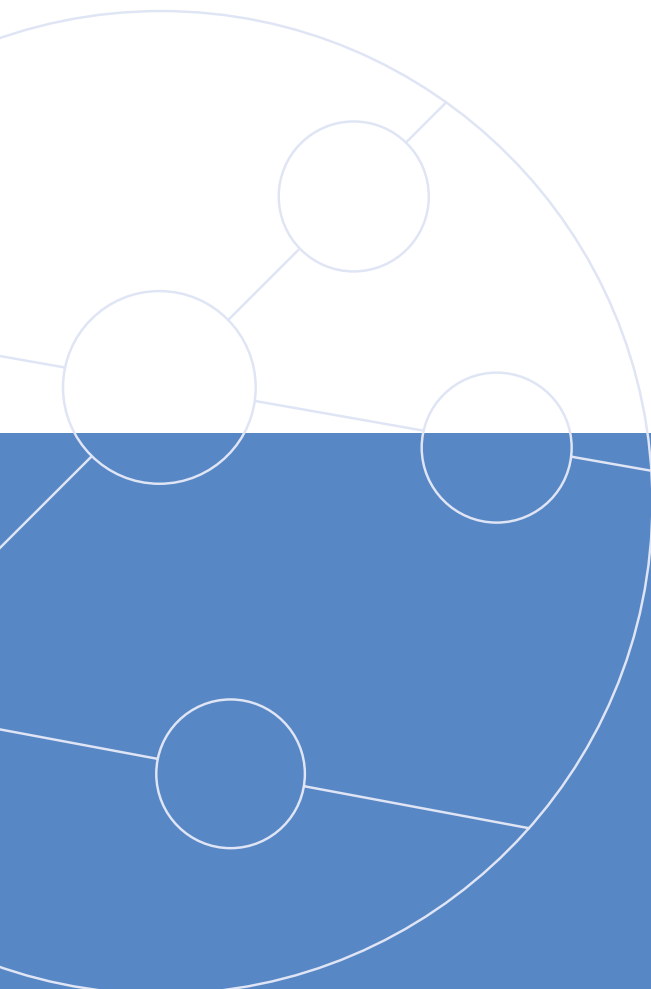


# VictoriaCombo



*Full Testing up to 10 Gbit/s*



## SDH and SONET

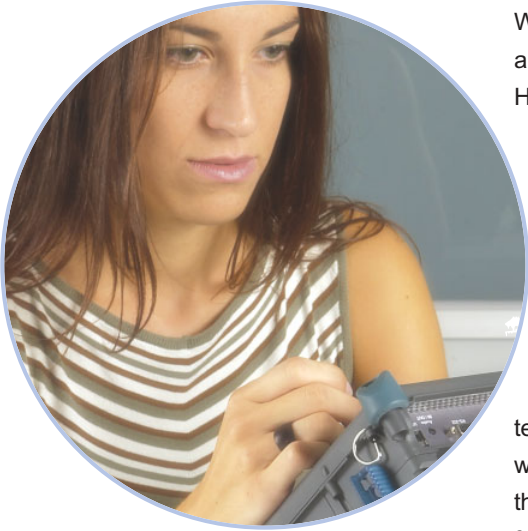
*Tailored Test Solution for NGN*



**Trend**Communications

# Designed for the User

- modular and easy to handle



When working in the central office, we prefer to use testers with different modules and accessories that enable us to analyse each and every bit of the network. However, when we have to go and work out in the field, we often find out that even the nearest mains electricity supply is too far away. In these circumstances light weight, long battery life and flexibility are keys to efficiency.

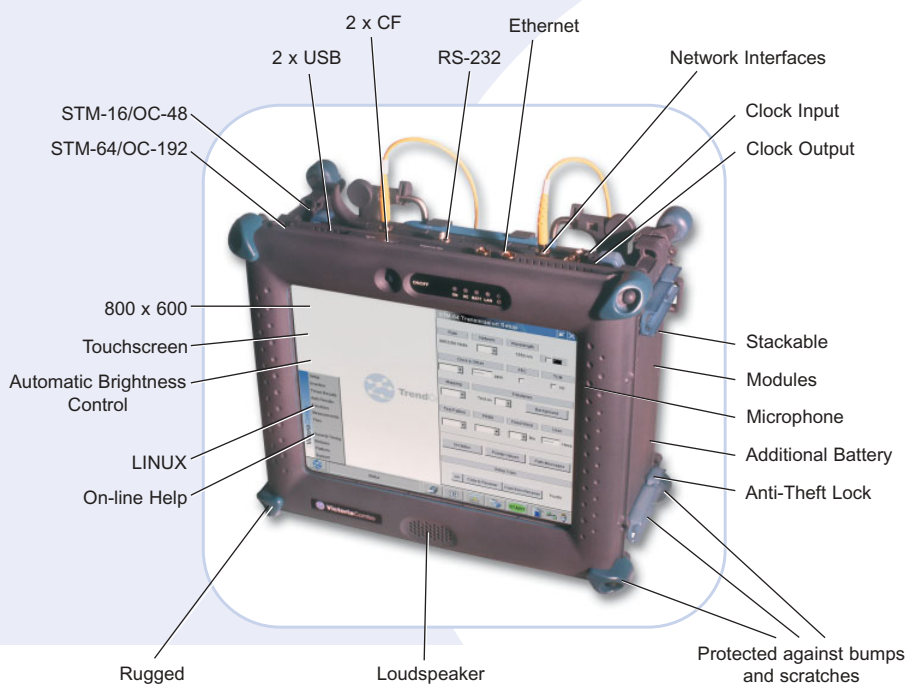
Of course, human factors are very important as well. Not all of us have the same expertise. Testers that do not meet the needs of different users and can only be used in a standard way tend to frustrate the less experienced users, and on the other hand leave expert users unsatisfied.

An ideal tester must be able to adapt to all working environments and all technologies, and it must offer an efficient way to communicate with the outside world to transfer results, import configurations or access the Internet to download the latest applications. Remote control is an important feature as well, especially for troubleshooting directly from the central office.



## VictoriaCombo

*Multi-task, Multi-user, Multi-technology*



- Universal tester up to 10 Gbit/s for SDH, SONET, PDH and T-Carrier
- Modular, stackable and expandable, designed to work in a wide range of applications
- Easy to integrate into centralised remote control platforms
- Battery and mains operated
- With TCP/IP connectivity you can control Victoria Combo from anywhere, via any network
- Multi-Task and Multi-User
- Ethernet, TCP/IP, Wireless and RS-232 connectivity
- All you need for installation, Bringing-into-Service and maintenance

More Information: Technical details available at [www.trendtest.com](http://www.trendtest.com), including datasheets, presentations, application notes, press releases and more.



# The NGN Challenge

*All the Best Features in One Single Tester*

## New Generation

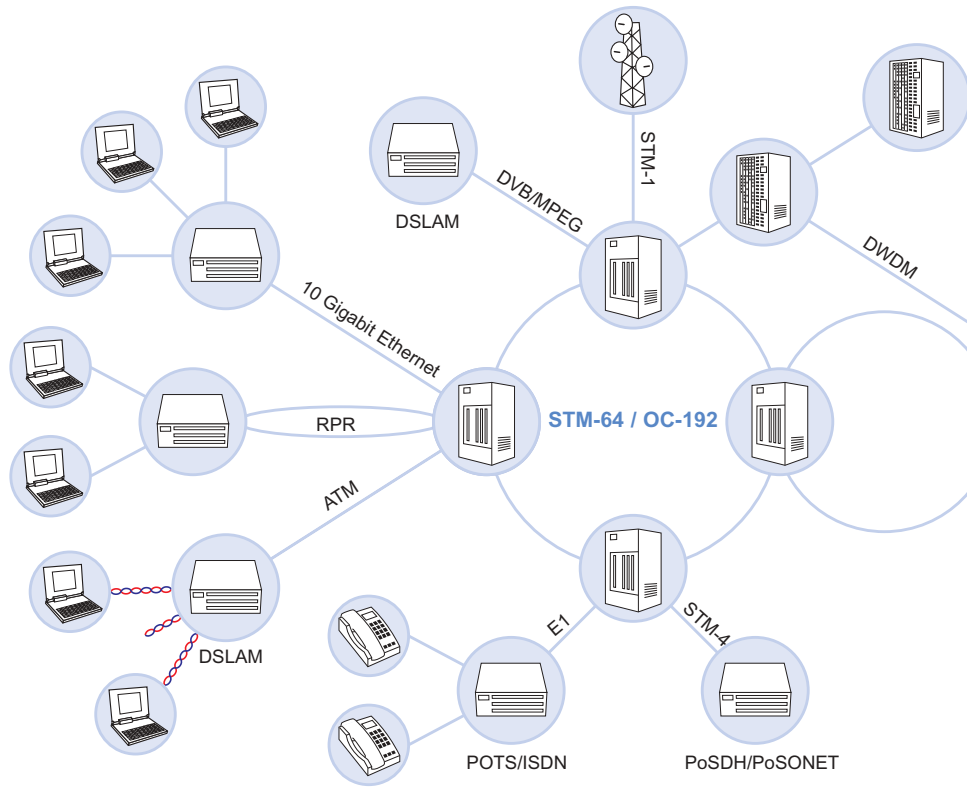
New technologies, deregulatory policies and the appearance of Next Generation Networks (NGN) have redefined the telecoms business. The Internet and all the technologies associated with it have modified network architectures by giving rise to circuit and packet convergence. Today, TCP/IP, 10 GbEnet, ATM, SDH, SONET and DWDM are mixed in NGN nodes that integrate access, routing, multiplexing and switching to create flexible networks.

## Deregulation

This new and innovative generation of nodes as such does not guarantee perfect operation nor profitability. Deregulation policies and the appearance of new operators have reduced margins and improved the quality of SLA. Today's operators have to reduce operational costs while constantly improving the profitability of their networks, to maintain the existing customers and attract new clients.

## Victoria Combo

The growing need for a solution to meet these challenges has now been addressed. Using advice from test and measurement professionals around the world, the concept of the multi-functional tester has been redefined. The result is Victoria Combo, an open stackable solution that is sophisticated and easy for any user to manage. As a stackable tester, Victoria Combo is both a hand-held and a desktop equipment, or even a probe that can be integrated into a remote control platform or an OSS system.



The Next Generation Network is based on multi-technology SDH/SONET nodes.

*"Now more than ever our customers need to make their networks more profitable and follow the SLA without any extra costs."*



Modular



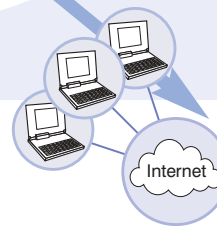
Stackable



Field Use



Portable



Remote Test

Victoria Combo adapts to meet even the most demanding requirements.

# Install, Maintain, Monitor

- the World is Yours

Victoria Combo heralds the arrival of a new concept for Test and Measurement solutions.

## One Single Platform

The stackable design of Combo makes it a tester that adapts, both in size and technology, to any test scenario. Within minutes you can change Combo from a light battery-fed hand-held into a portable tester or a remote control platform.

## Steady and Reliable

Trend Communications has chosen LINUX as the operating system of Victoria Combo, to guarantee you years of continuous operation, essential for remote control platforms and for long-term measurements.

## Universal

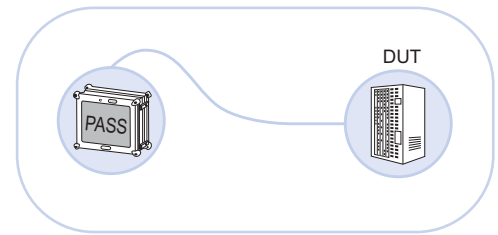
Victoria Combo is equipped with all SDH, SONET, PDH and T-Carrier interfaces up to 10 Gbit/s, which makes it your ideal tester for international connections.

## Operating Modes

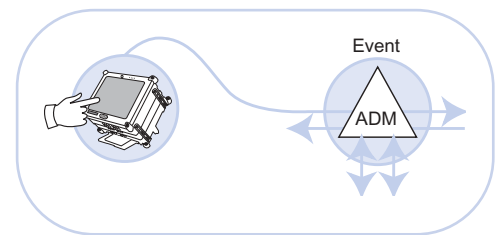
You can interact with Victoria Combo in the way most appropriate to your needs. In Local or Remote Mode, by touch-screen, keyboard or mouse. Whichever way you choose, you will either be running automatic Pass/Fail tests or detailed specialist analysis in Expert mode.

## Multi-task and Multi-user

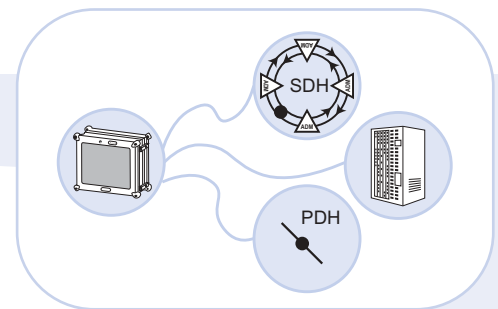
Combo is a multi-task tester that can run both simultaneous and separate tests with each and every one of its modules. It is also a multi-user test set, offering fast and flexible test and measurement access to many technicians at a time.



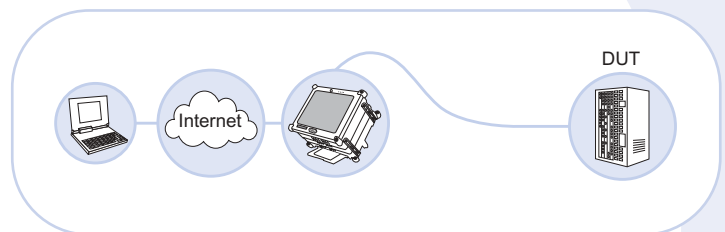
Automatic Tests



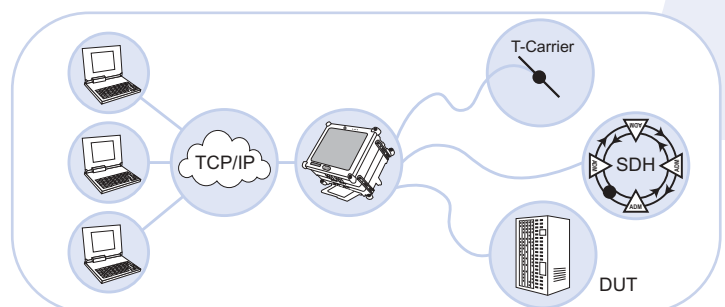
Expert Mode



Multi-Task



Remote Tests



Multi-User

*A test and measurement solution must be easy to use and efficient, to speed up the development of new networks while reducing operational costs.*

# Universal Connectivity

- Your Window to the World



## Connectivity

Victoria Combo has built-in Ethernet, USB and RS-232C connectors. The two CF slots extend the possibilities for wireless links and removable memory modules, making your work as mobile and independent as possible.

## Web Browser

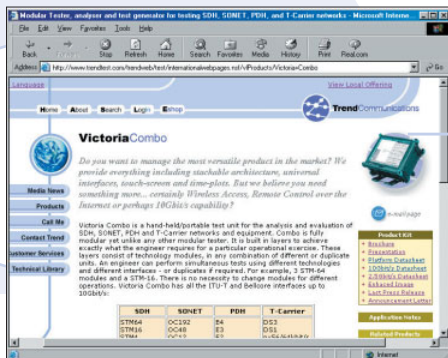
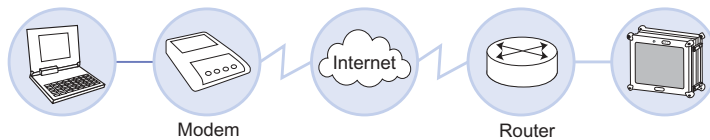
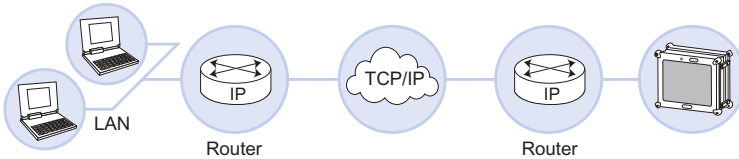
The built-in browser of Victoria Combo enables you to transfer results, screenshots or configuration files from Victoria Combo onto your computer. It also provides you with on-screen help, and you can use it to connect to the Trend web site for free software updates and the latest user information.

## Sleep Mode

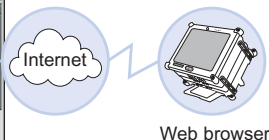
You can switch Victoria Combo into power save mode any time, and quickly set it back into action when you wish to continue testing.

This feature has many advantages. You save the battery when you are not working with the tester. You also save time, as you can get back to work without needing to restart the tester.

When the tester is reactivated, it automatically returns to the state it was left when entering Sleep mode. Needless to say all your test results were automatically saved, so you can truly go back to where you left off.



[www.trendtest.com](http://www.trendtest.com)



# Full Functionality

*Trend's Big Band*



- Easy-to-clean optical connectors
- One single connector for all electrical interfaces
- Optical Receiver Shutdown
- ITU-T-compliant line attenuation compensation
- Combined SDH/SONET tests
- Clear Pass/Fail screen
- Built-in Stratum 3 clock
- Reference Clock Output
- Fast-charge batteries

## Auto-Setup

This function detects the signal structure, coding and mapping automatically.

## Event Scan

The FastScan is a function that examines the signal and detects alarms and errors in synchronous tributaries.

## Removable Optical Connectors

Victoria Combo is equipped with first-class optical connectors that are easy to remove or replace.

By removing the optical connectors you can easily clean the internal parts of the tester and keep your tester as good as new.

## Programmable Frame Capture

To check the network status or analyse protocols, you must study the evolution of some parameters across several consecutive frames.

To define the type of traffic being transmitted across the network (C2 and V5 signal tags), analyse its behaviour in uncommon situations (APS K1 and K2 bytes) or verify synchronisation performance, you must evaluate the evolution of certain frame OH bytes across consecutive frames. With the programmable Capture function you can easily capture and check a set of consecutive frames.

## Automatic Test

You can automate a customisable set of tests by means of a screen that displays the progress of each test and gives a clear pass/fail indication at the end of the process. This functionality makes Victoria Combo easy to use with practically no training at all.



# Efficiency

for central office and field work



- Simultaneous measurements
- Advanced event log and trace
- Ergonomic, multi-position support leg for desktop use
- Hand-held, probe or desktop equipment

## Simultaneous Measurements

Thanks to its multi-tasking OS and fully independent modules, you can use Victoria Combo to carry out simultaneous measurements and correlate their results to easily identify faults.

## Event Log and Trace

Tracing is the most powerful analysing tool any tester can have. With Victoria Combo you can register, filter, search and quantify all the events that occur. It is also very easy to save, print or transfer results onto a PC.

## Remote Network Control

Thanks to the connectivity options on Victoria Combo, you can access its resources from anywhere, in a variety of ways.

If you use a TCP/IP network, your possibilities are multiple, such as LAN, Intranet, VPN, and even Internet.

With Victoria Combo, distance makes no difference. All you need is a computer equipped with the free remote control software of Victoria Combo, downloadable from Trend's website, and you can access your tester's GUI any time, from anywhere, and use it as if you were there.

You can also integrate Combo as a permanent test and measurement probe in your Control Centre, by means of an OSS.



# Superior Capacity

*the Best Features for All Test Scenarios*

## Event Insertion and Analysis

The Alarm and Error display of Victoria Combo ranges from event tables to graphical traces. You can always access all your test results in real time. Furthermore, Combo can generate M/N alarm sequences to check the network equipment event detection criteria.

## Generation of G.783 Sequences

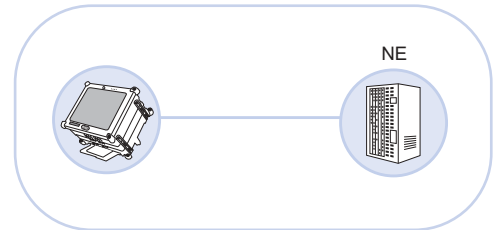
One of the main causes of error in SDH and SONET are phase fluctuations (Jitter) due to pointer adjustments. Combo can generate pointer movement sequences (ITU-T G.873) to simulate real situations and carry out stress tests in network equipment.

## Header and SPE Tests

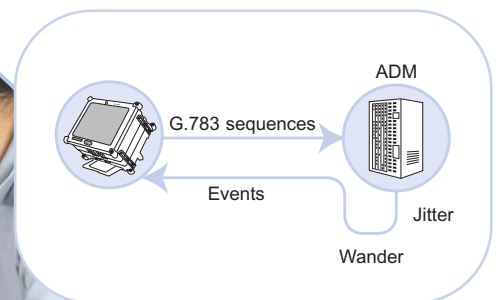
Victoria Combo enables you to access all frame and container headers and enables you to program and analyse them. You can also carry out standard or programmable BER tests in containers/SPE and OH bytes.

## Frequency Offset

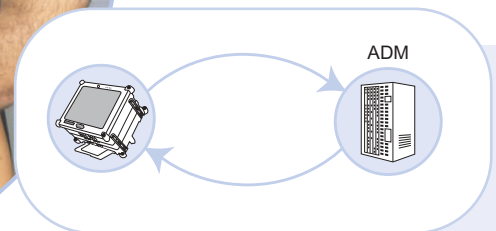
The Frequency Offset function is essential for stress measurements in networks and nodes. It deviates the signal frequency from its nominal value to check the proper behaviour of the DUT in the limits of the tolerable operation margins.



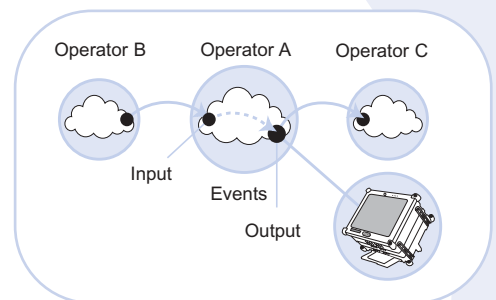
**Optical Power and Frequency Offset test**



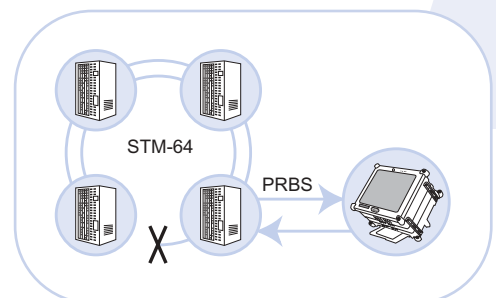
**Pointer Sequences**



**Error Performance including G.828/G.829**



**Tandem Connection Monitoring**



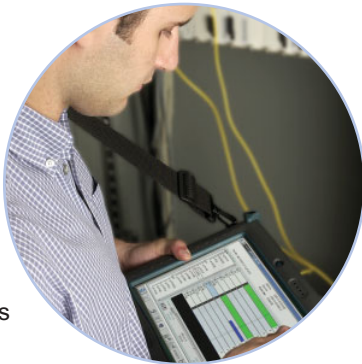
**Automatic Protection Switching**

# For the Next Generation

*of SDH/SONET Networks*

## Tandem Connection Monitoring

The TCM function of Victoria Combo enables you to establish those network trails where impairments occur to test that SLA is met when the link is shared by many Service Providers.



## Automatic Protection Switching

SDH and SONET networks are fault-tolerant where Automatic Protection Switching (APS) is used as the protection strategy. Victoria Combo evaluates those APS mechanisms that are in charge of re-establishing the service in case of failure, and measures the APS switching time.



## G.707 In-Band FEC

Victoria Combo implements a Forward Error Correction Service for errors detected in the regeneration section. This is defined in Recommendation G.707 for STM-64.

## Error Performance

With Victoria Combo you can carry out all the existing performance measurements: G.821, G.826, M.2100, M.2101, M.2110, M.2120, including G.828 and G.829 measurements.



- Universal SDH, SONET, PDH and T-Carrier interfaces up to 10 Gbit/s
- BER in overhead bytes (OH)
- Path trace in J0, J1 and J2
- G.821, G.826, G.828, G.829, M.2100, M.2101, M.2110 and M.2120 performance measurements.
- APS bytes analysis/generation and disruption time measurement
- Network latency (RTD)
- Tandem Connection Monitoring (TCM) and APid tests
- G.783 Pointer Sequences
- Frequency and offset measurement
- Compensation of line attenuation in line with ITU-T G.703
- Frequency Offset generation
- VC-4-4c / STS-12c SPE  
VC-4-16c / STS-48c SPE  
VC-4-64c/STS-192c SPE
- SDH at 34 Mbit/s in line with ITU-T G.832
- PDH/T-Carrier frame structures at 1.5, 2 and 45 Mbit/s
- CAS signalling for 2 Mbit/s
- Robbed bit for 1.5 Mbit/s

# Man-Machine Interface

Optimal Ergonomics



*"Victoria Combo is highly efficient, thanks to its intuitive Man-Machine Interface."*

Testers with touch-screens have proven to be the most suitable for field work. For the

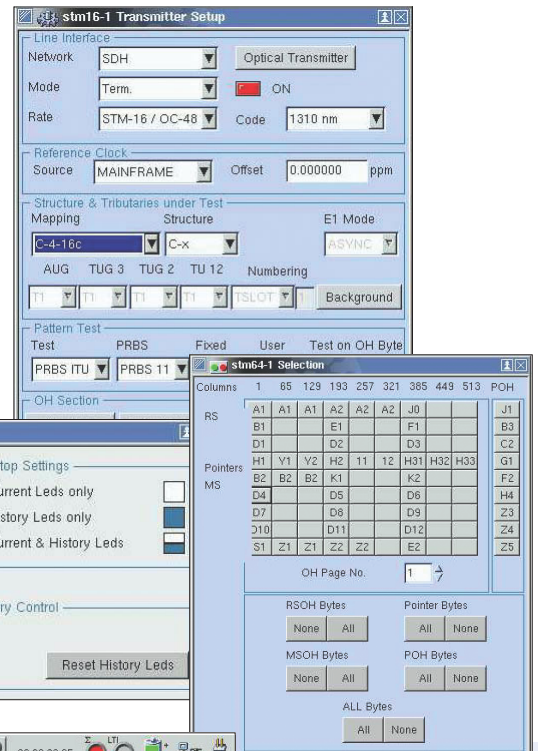
desktop environment,

Victoria Combo includes a USB port for keyboard and mouse as an additional comfort factor.

Combo has a spectacular 10.4" colour touch-screen with standard 800 x 600 pixel SVGA resolution, backlight and contrast control.

The menu, based on windows and icons, is very easy to use, and the desktop is as familiar as on your PC. The result is simply amazing.

*All the manufacturers say they have interactive user interfaces, but how many of them offer a graphical 10" touchscreen, SoftLEDs®, Remote Control and intelligent navigation? Only one: Trend Communications with Victoria Combo.*



## We Multiply

*Your Possibilities*

### Ergonomics

By making use of Victoria Combo's folding support leg, you can choose the position that best suits your needs - vertical, horizontal or leaning - and this way make your desktop working conditions even more comfortable.

### File Transfer

Generating results files and programming automated tasks is easy to achieve by transferring files to and from a PC. Combo's Compact Flash slots make it quick by using Micro-drive memory cards, which also work as a memory extension.





**Trend**Communications Ltd  
Knaves Beech Estate  
Loudwater  
High Wycombe  
Buckinghamshire  
HP10 9QZ  
United Kingdom

## **Trend**Communications

International: +44 (0)1628 524977

United Kingdom: 01628 524977

France: 01 69 35 54 70

Deutschland: 089 32 30 09 30

España: 93 300 3313

India: 022 28521059

Americas: 1 256 461 0790

US/Canada Toll Free: 1 877 78TREND

Email: [infoline@trendcomms.com](mailto:infoline@trendcomms.com)

Web: [www.trendcomms.com](http://www.trendcomms.com)

Distributor

To arrange a demonstration or to obtain the latest information on the Trend **Victoria**Combo or any of Trend's other test equipment, contact your nearest Trend Distributor.

Trend **Victoria**Combo is a registered trade mark of Trend Communications Ltd.



A Subsidiary of IDEAL INDUSTRIES, INC.

