TX300s Platform
Multi-Service Test Solution

VeEX

VeExpress

VePAL TX300s

Advanced Multi-Service Test Platform - From 64k to 100G

Flexible hardware configuration options to match any Core, Transport, Metro, Carrier Ethernet, Mobile Backhaul/Fronthaul, Storage Area Network and Fiber Optics Applications

Platform Highlights

This all-in-one rugged field test platform can be configured to meet all technologies required by field engineers to install, maintain and troubleshoot any communication technology and service. From Fiber Optics characterization to SAN, metro, core, and transport technologies, as well as IPv4/6, MPLS, ISDN, VoIP, IPTV, Precision Timing Protocol and synchronization services.

- All-in-One hardware platform reduces CAPEX
- The VeExpress ecosystem allows users to Buy, Rent, Lease-to-own and share test feature licenses to optimize OPEX
- Optimized for field engineers or technicians installing and maintaining Transport, Carrier Ethernet, Storage Area Network, Fiber Optics, backhaul and fronthaul mobile networks
- Flexible Software platform allows for multiple test applications running simultaneously
- Multiple factory-installed all-inclusive hardware options, including Single & Dual-port with optional built-in OTDR
- Test set connectivity via Ethernet Management interface, Wi-Fi, Bluetooth®, or Cellular Data Card for back office applications and workflow optimization
- User defined test profiles and thresholds
- Fast and efficient test result transfer to USB memory stick
- Asset Management: Maintain instrument software, manage test configurations, process measurement results and generate customer test reports using VeExpress and VeSion
- Built-in precision GPS and chip-scale atomic clocks references
- Interchangeable Li-ion battery pack extends field testing time

TX300s Built-in Hardware Options

Port Group	1	2
TX300sm	✓	✓
TX320sm	✓	
TX300s-100G [1,2]		✓
TX300s-OTDR [2]		✓

[1] Auxiliary serial port (RJ11) not available
[2] Atomic Clock option may not be available in high dynamic range versions.

Core, Transport, Metro, Backhaul & Fronthaul Optical Test Interfaces (per module)

Test Modules	TX300s-100G		TX320sm	TX300sm	
Optical Modules	CFP4	QSFP+	SFP+	XFP	SFP
OTU4	1				
OTU3, STL256.4		1			
OTU2/2e/1e			2	1	
OTU1			2		1
STM64, OC192			2	1	
STM16/4/1/0			2		1
OC48/12/3/1			2		1
100GE	1				
40GE		1			
10GE			2	1	
1GE			2		1
100Base-FX			2		1
1/2/4G FC			2		1
8/10G FC			2	1*	
CPRI 614.4M to 6.1G**			2		1
CPRI 9.8G**			2	1	
OBSAI 768M to 6.1G			1		1
IEEE C37.94**			2		

*8G FC not available on the TX300sm
**Second port used for monitoring

Transport Expert

Complete Field Test Solution

OTN, SDH, SONET, PDH & DSn

- Advanced flexible OTN, SDH/SONET, PDH/DSn test payload mapping and multiplexing, including EoOTN support (ODU0 and ODUflex)
- Overhead Monitoring and Byte decoding
- Automatic Protection Switching and Service Disruption
- Round Trip Delay on all interfaces and payload mappings
- Tandem Connection Monitoring
- Jitter and Wander (E1, E3, DS1, DS3, STM-1o, OC-3)
- Non-intrusive Pulse Mask Analysis at E1, E3 and DS1, DS3
- G.703 64k Codirectional and IEEE C37.94

Ethernet

- RFC2544 Throughput, latency, frame loss and back to back tests
- V-SAM test suite compliant with ITU-T Y.1564 standard
- Q in Q (VLAN stacking), MPLS, MPLS-TP, PBB support
- IEEE 802.3ah, ITU-T Y.1731, IEEE 802.1ag, MPLS-TP OAM support
- RFC6349 V-PERF TCP test suite

SyncE & IEEE 1588v2

- Fully integrated solution for synchronized packet networks
- Supports IEEE 1588v2/PTP and SyncE/ITU-T G.8261 standards
- Master Clock and Slave clock emulation
- IEEE 1588v2/PTP protocol monitoring and decoding
- IEEE 1588v2/PTP PDV analysis
- Clock recovery from SyncE and output to physical port
- ESMC SSM generation, monitoring, and decoding

Fibre Channel

- Storage Area Networks (SAN) testing
- BERT and Throughput test
- RFC2544: Throughput, latency, frame loss, back to back tests
- Layer 1 and layer 2 loopbacks

CPRI/OBSAI DAS Testing

- Common Public Radio Interface standard (CPRI): supports all rates from 614.4 Mbps to 9.8304 Gbps
- Open Base Station Architecture Initiative (OBSAI): supports all rates from 768 Mbps to 6.144 Gbps
- Unframed, Layer 1 Framed and Layer 2 BER testing with PRBS stress patterns
- Latency measurements

Fiber Optics Tools

- High Dynamic Range OTDRs
- V-Scan Optical Link Mapper function
- Fiber Inspection Scope
- OPM, OLS, VFL
- Fiberizer Cloud

Timing & Synchronization

- Absolute Time Error Measurements (1PPS vs. UTC)
- Wander Measurements with run-time MTIE/TDEV Analysis on external and recovered clocks
- Frequency Offset Measurement
- Supports multiple external references signals
- Built-in GNSS receiver options
- Built-in Atomic Clock reference option

Hardware Options

The TX300s platform can be customized by ordering one or two factory-installed test modules to match specific target applications (refer to the individual test module specs for further details)

TX300sm XFP/SFP Multi-Service Option

- All-in-one multi-service test solution - 64k to 11Gbps
- Advanced OTN, SDH/SONET, PDH/DSn, Ethernet, SyncE, 1588v2 PTP, Fibre Channel, CPRI/OBSAI, G.703 64k Codirectional technologies testing
- Synchronization testing: Jitter, Wander and Phase/Timing measurements
- Up to two TX300sm modules can be ordered for concurrent dual independent testing
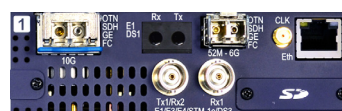
TX320sm Dual SFP+ Multi-Service Option

- All-in-one multi-service test solution - 64k to 11Gbps
- Advanced OTN, SDH/SONET, PDH/DSn, Ethernet, SyncE, 1588v2 PTP, Fibre Channel, CPRI/OBSAI, IEEE C37.94, G.703 64k Codirectional technologies testing
- Synchronization testing: Jitter, Wander and Phase/Timing measurements
- Bidirectional Ethernet pass-through and monitoring, and IEEE 1588v2 Through mode monitoring and PDV analysis
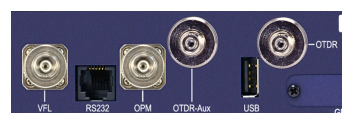
TX300s-100G CFP4/QSFP+ Multi-Service Option

- 100G and 40G multi-service test solution
- OTU4, OTU3, STM64/OC768, STL256.4, 40GE and 100GE testing
- Advanced multi-step mapping and multiplexing
- Complete 64k to 100G solution, when combined with TX320sm
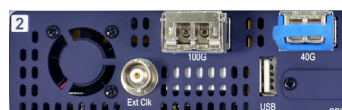
TX300s-OTDR Fiber Optics Options

- High dynamic range OTDR versions for FTTx, PON and CWDM applications
- V-Scout™ Optical Link Mapper
- OLS, OPM, OLTS, VFL
- Fiberizer Cloud compatibility

Admin: Users, Assets, Licenses, Version Approval, Reports, ...

VeExpress

One-click web download

Work Orders / Training Material

Test Profiles / Test Results

SW Updates / License Sharing

Web client

Full SW upgrade

Manager

Users

VeExpress™

Minimize CAPEX and optimize OPEX by managing your TX300s fleet with VeExpress. The TX300s provides an all-inclusive test platform* at lower cost while VeExpress manages the test sets, test functions licenses and workflow in real time.

Stop purchasing test sets loaded with extra features, just in case, or placing multiple orders with varying configurations for different user groups. Reduce your CAPEX by buying what you really need and proactively manage your software and hardware assets.

Own, Rent or Lease-to-own only the required test features, in the right quantities, to optimize your OPEX
- Buy commonly used test functions required to get the day-to-day job done
- Lease newly adopted technologies without the risk of paying for it up-front
- Rent test features used on a contingency-basis for special cases or projects. Rent ticker only starts when the feature is first assigned and used
- Share the software license pool among different users, including owned, leased and rented features.

VeExpress secure cloud-based environment provides the redundancy and speed of geographically-distributed servers around the world as well as scalability and up time. Test sets and web clients automatically connect to the closest/fastest server available

Workflow Optimization
- Manage work orders (trouble tickets)
- Quickly download, upload and share test profiles and test results
- Improve first-dispatch success by making sure test sets are up-to-date, have all required test options, and the right test profiles to get each job done right the first time
- Missing a test function? Supervisors can assign test features on the go, making them immediately available in the test set, using VeExpress. Less time wasted due to unexpected cases

Asset Management
- Buy, Rent or Lease new test functions
- Share test features assignment with floating licenses
- Test features are no longer tied to specific test sets, so software assets can be reallocated as needed
- Track test sets and usage
- Manage software versions to keep all test sets aligned to the latest approved software version. With time saving "Delta Push" software upgrade mechanism, no need for a full software upgrade each time
- Simple to use VeExpress user interface integrated into the TX300s to avoid getting in the way of users' daily tasks
- Intuitive web-based VeExpress client interface for users and managers
- Customized reporting

* Excludes optional factory-installed hardware options such as 8GFC, GPS, Atomic Clock or pluggable optics

Network Troubleshooting Tools

Wi-Fi Spectrum Analyzer

The TX300s offers an optional powerful portable spectrum analyzer on a USB dongle that displays all RF activity in the Wi-Fi bands. With dual 2.4 GHz and 5 GHz bands support, the analyzer covers all 802.11a/b/g/n/ac networks and is the ideal tool for enterprise environments with a mix of wireless technologies.
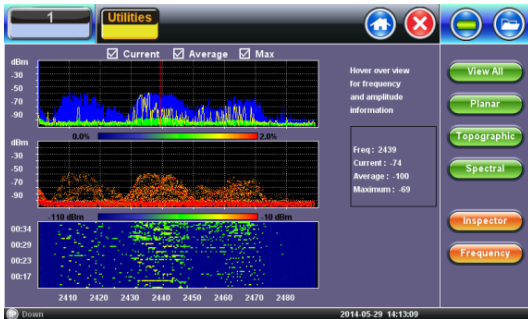
With multiple graphical format displays it helps to visualize and locate RF signals in the spectrums as well as locate and eliminate interference sources (cordless phones, microwave ovens, Bluetooth devices, etc.), discover and remedy competing access points.

- Frequency Range: 2.400 to 2.495 GHz and 5.150 to 5.850 GHz
- Amplitude Range: -100 to -6.5 dBm
- Antenna: RP-SMA
- Planar, topographic, spectral view

* Requires Wi-Fi Spectrum Analyzer USB dongle

Wi-Fi inSSIDer

The Wi-Fi InSSIDer provides the best tools for Wi-Fi networks discovery and performance troubleshooting. With compatible USB Wi-Fi adapter for 802.11 a/b/g/n/ac wireless in 2.4 GHz and 5 GHz bands the inSSIDer provides a clear picture of the environment. It helps identify poor channel placement, low signal strength and interferences in easy to understand graphs and tables.

- Requires compatible USB Wi-Fi adapter for a/b/g/n/ac networks in 2.4 GHz and 5 GHz bands
- Network scan results in Graphical or table format
- Lists: Network names, BSSID, encryption type, channel allocation, signal strength, co-channels, and overlapping channels
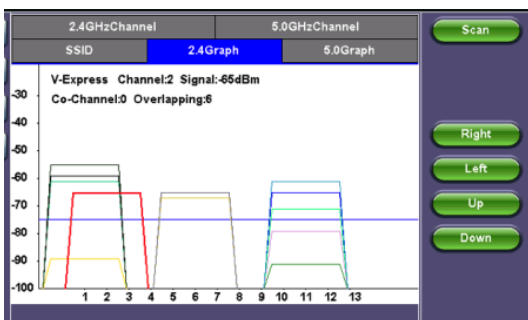
Wi-Fi Wiz

The Wi-Fi Wiz function with USB Wi-Fi adapter for 802.11 a/b/g/n/ac wireless in 2.4 GHz and 5 GHz bands makes troubleshooting Wi-Fi connectivity issues a simple task.

Scan for available networks and view all access points detailed information along with SSID, signal strength and channel allocation. Connect to Access Points with WEP/WPA or WPA2 encryption and verify IP capabilities to ensure the wireless network is properly installed and configured. A full suite of IP testing features is supported (ping, trace, web browser, etc.).

- Requires compatible USB Wi-Fi adapter for a/b/g/n/ac networks in 2.4 GHz and 5 GHz bands
- Access Points scan with signal level and link quality measurement
- WEP/WPA1/WPA2 encryption
- IP Connectivity test (Ping, trace route, ARPWiz, Web browser)
- Provides Wi-Fi LAN access to the test set (e.g. VeExpress, R-Server, Remote Control, ReVeal)

Net Wiz

Network Discovery Tool
- Discovery: TX Frames, RX Frames, RX Errors, Advertised Speed, Advertised Duplex, Devices found, Networks found
- Devices: Total number, Routers, Servers, Hosts
- Device Details: Attribute, IP address, MAC address, Group Name, Machine Name, Ping OK
- Networks: IP Subnets, Hosts, Domains, Hosts Names

IP Tools

Provides basic Ethernet and Internet connectivity to the test set as well as connectivity troubleshooting tools to Ethernet Management port (10/100BaseT)
- IP: IPv4 (Static, DHCP)
- Ping, Trace Route check
- HTTP Web browsing internet connectivity check

Fiber Optic Tools

Digital Fiber Inspection Scope

Dirty connectors can damage or degrade the performance of expensive optical modules, or produce inaccurate results. Inspecting and cleaning patch cords and pluggable optics connectors before mating them is always recommended.

This option allows digital video microscope probes* to be connected directly to the TX300s through a USB 2.0 port. Featuring live video feed on the TX300s screen for visual analysis. It offers image capture, compare (before and after), IEC 61300-3-3 Sect 5.4 Pass/Fail templates for SMF and MMF, save, export and generate report to USB flash drives.

Visual Inspection
- Visual file selector
- Image comparison for before-after reports

Auto-Focus Detection and Analysis option

Test set automatically detects when image is in-focus, captures the image and analyzes it. This process is faster than complex mechanically-driven auto-focus systems as it uses human fast reaction and finesse.
- Analysis per IEC 61300-3-3
- SMF and MMF templates (Core, Cladding, Adhesive and Contact areas)
- Dots or square to highlight contamination, debris and scratches
- Report Generation

*USB Fiber Scope sold separately. Check its datasheet for details.

Optical Power Meter GUI**

Supports USB OPM dongles
The optional OPM helps checking for proper output power from optical ports before safely making an optical connection or running a test
- Numerical and bar graph readings
- Hold function
- Display Units: dBm, mW and µW
- User definable Maximum and Minimum power limits, with color-coded Pass/Fail indication
- Optical Loss Meter function with zero reference calibration
- Loss limit settable in dB, dB/km and dB/mi

** OPM dongle sold separately. For available Wavelength Range, Calibrated Wavelengths, Power Range, Accuracy and Connectors, refer to the USB dongle specs

Precision Timing References

The test platform offers highly accurate and stable clock reference options to provide precise timing to all its test modules. The physical clock can be used as a reference for frequency, phase and wander measurements and the UTC time of day (ToD) can be used for time sensitive tests like one-way-delay measurements.

Disciplining and holdover: Combining the long-term accuracy of the GNSS option, the stability of the Atomic clock option and its battery operation, the test platform can offer precision clock reference even in places where GNSS is not available or can't trusted (e.g. in-building or urban canyon applications). The test set precision oscillator can also be disciplined by an external 1PPS (Cs or Rb) 1PPS signal.

GPS Receiver Option (Z88-00-008P)

This optional high-sensitivity GPS module (built-in) provides UTC timing synchronization to the test platform, in the form of internal 1PPS clock source and ToD. This module is recommended for delay measurements and location tagging applications (not recommended for disciplining).

GNSS: GPS only
Frequency: 1575.42 MHz L1C/A
Channels: 20
Sensitivity
- Cold start: -144 dBm
- Tracking: -159 dBm

Clock Output: 1PPS (internal)
Accuracy
- Time: 50 ns RMS (clear sky)
- Position: 5m

Acquisition Time (first fix)
- Cold start: 35s
- Hot start: 1s
- Connector: SMA, 50 Ohms

Power: 3.3 Vdc, 30 mA
Temperature range: 0 to 45°C

GNSS Timing Receiver Option (Z88-00-009P)

This high-sensitivity timing GNSS module (built-in) provides precise UTC timing synchronization to the test platform, in the form of internal 1PPS clock source and ToD. It offers optimized accuracy with site survey and timing mode. Its timing mode provides a fixed-position mode to improve timing stability for stationary applications. This is the recommended module for atomic clock disciplining (GPS-DO), wander, phase error, holdover, delay measurements and location tagging applications.

GNSS: GPS + GLONASS
Frequency: 1575.42 MHz L1C/A, 1602 MHz L1OF, 1561.098 B1 (BeiDou ready)
Channels: Up to 72
Sensitivity
- Cold start: -148 dBm
- Tracking: -167 dBm

Clock Output: 1PPS (internal)

Accuracy
- Time: ≤ 20 ns RMS (clear sky)
- Position: 2.5m
- Programmable in-survey accuracy threshold and time window

Acquisition Time (first fix)
- Cold start: 26s
- Hot start: 1.5s
- Connector: SMA, 50 Ohms

Power: 3.3 Vdc, 30 mA
Temperature range: 0 to 45°C

Recommended Antenna
- GPS and GLONASS bands
- Type: Active, 3 to 3.3V
- Gain: 15 to 20 dBi
- Noise: <1.5 dB

Atomic Clock Option

The optional built-in chip-scale Atomic Clock module provides a highly stable clock source to the test platform and its modules, in the form of internal 1PPS or 10 MHz signals. The Atomic Clock can also be disciplined by the GNSS (requires Z88-00-009P option) and later be used in holdover mode for extended time (e.g. temporary timing holdover or frequency reference for indoor usage).
- Accuracy: <±5E-10 (free-running)
- Aging: <3.0E-10/month
- Warm-up time: <5 minutes
- Temperature range: 0 to 45°C

Modes of Operation
- Free run, GNSS-discipline and PRTC-discipline (ext. 1PPS)
- Programmable disciplining time constant up to 10000s
- Programmable stability threshold
- Precision References (internal)
- Frequency: Atomic 10 MHz
- Phase/Time: Atomic 1PPS

Platform Sleep Mode

Standby mode allow users to carry the test set in its carrying case with a fully active Atomic Clock in holdover mode. It also helps control the oscillator's temperature while stored in uncontrolled environments.
- Keeps the disciplined Atomic Clock fully powered to hold frequency and timing
- Holdover time counter while in standby
- Up to 20 hours of standby power

Platform Features & Options

Dedicated navigation and function buttons for non-touch screen operation (e.g. operating the test set with gloves on)
- Rugged design with integrated connector cover/stand and dual-shot rubber for protection, extra grip, and ergonomics
- Flexible shoulder straps configurations
- Integrated stylus holder

ReVeal RXTS

This companion management PC software is included standard with each test set. The ReVeal provides an easy-to-use and intuitive interface that allows users to take full advantage of TX300s and RXT-1200 test sets by providing the following productivity tools:
- Convenient test profile management
- Flexible test results management
- Advanced report generation with html, pdf, or csv formats, combine test results, add logos and comments
- Test profiles management: Online or offline Ethernet test profile creation, upload and download

Compatible with Windows XP, 7, 8.1 and 10, 32 bits or 64 bits operating systems.

Remote Access

The TX300s offers multiple ways to Remote Control it or access the information remotely (e.g. test results, test profiles, etc.). The test set can be reached via:
- ReVeal PC software
- Web browser (Web Remote Control)
- VNC® Client
- SCPI Remote and Command Reference Tool PC software*
- Scripting via SCPI commands
- Connectivity: 10/100Base-T, Wi-Fi 802.11 a/b/g/n/ac*

Not included

File Manager

Profiles: Save and recall test profiles

Saves results to internal SD card View, Rename, Delete and Lock profile and result files

Filter and sort by Name, Test Mode, Test Type, Port, Date and Result/Profile

Report generation: Test results generation in PDF format

Export test results and profiles via USB memory, Bluetooth, web browser, Data Card or ReVeal RXTS companion PC software

File Backup and Retrieve to/from USB

Screen capture: Screen shots in PNG format

Advanced Management

This option allow users to append work order information to test results (e.g. Job ID, account, location, comments).
- Compatible with R300 Productivity Server (R-Server)
- Authorized test sets can register with specific VeSion R300 Server
- Test results can be uploaded via LAN, Wi-Fi or cellular data connection

General

Size	290 x 140 x 66 mm (W x H x D) 11.40 x 5.50 x 2.60 in
Weight	1.58 kg (3.5 lb)
Battery	Li-ion smart battery 5200 mAh @ 10.8 VDC (extended battery pack available) Field replaceable
Power Supply (AC Adaptor)	Input: 100-240 VAC, 50-60 Hz Output: 15 VDC, 5.33 A
Operating Temperature	0˚C to 45˚C (32˚F to 113˚F)
Storage Temperature	-20˚C to 70˚C (-4˚F to 158˚F)*
Humidity	5% to 95% non-condensing
Display	800x480 TFT 7" color display Touch screen
Management Interfaces	2x USB 2.0, 1x 10/100Base-T Ethernet (RJ45) 1x Serial RS232 (RJ11) Bluetooth (optional via USB) Cellular Data Card (optional via USB) Wi-Fi 802.11a, b, g, n and/or ac (optional via USB)
System Memory	128 MB RAM, internal 2 GB SD card
Languages	Multiple languages can be supported
Ruggedness	Survives 1m drop to concrete on all sides

Test set with atomic clock option should be stored in temperature-controlled environments and/or be set to Sleep Mode.

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