FX180X

Channel Checker

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1.0   About This User Manual

This user manual is suitable for novice, intermediate, and experienced users and is intended to help you successfully use the features and capabilities of the FX180X Optical Channel Checker Meter. It is assumed that the user has basic computer skills and is familiar with optical fiber, telecommunication concepts, terminology, and safety.

Every effort was made to ensure that the information contained in this user manual is accurate. Information is subject to change without notice and we accept no responsibility for any errors or omissions. In case of discrepancy, the web version takes precedence over any printed literature. The content in this manual may vary from the software version installed in the unit.

For more technical resources, visit the VeEX, Inc. web site at www.veexinc.com.

If you need assistance or have questions related to the use of this product, call or e-mail our customer care department for customer support. Before contacting our customer care department, you must have your product serial number and software version ready. Please provide this number when contacting VeEX customer service.

Customer Care:

Phone: + 1 510 651 0500
E-mail: customercare@veexinc.com
Website: www.veexinc.com

2.0   Product Introduction

The **FX180X Channel Checker** is a handheld measurement tool for xWDM fiber networks. It tests all 18 CWDM channels (*CWDM model*) or 96 C-band DWDM channels (*DWDM C Band model*) in a single test. It measures individual channel power and wavelength or frequency, as well as total span power between two markers. An optional fiberscope is available to assist with inspecting connector endfaces.

2.1   FX180X Highlights

- Compact, hand-held field test unit with color touch-screen for easy viewing, fast navigation, and easy operation

- Internal 8G data storage

- Micro-USB OTG interface for flash drives, fiber inspection probe connection and test data transfer

- EZ Remote, VNC, or browser for remote control, and file management and transfer

- Rechargeable Lithium Polymer battery with >9 hours continuous operation, which features a capacity indicator, low voltage alarm, and Auto-off function

- Optional built-in WiFi and Bluetooth support to perform software upgrades and pair with mobile devices, respectively

- Optional OTG to Ethernet for network connection

2.2   Key Features

- *DWDM C Band Model*: Measures 50/100/200GHz DWDM ITU-T G.694.1 Channels 14-62
  CWDM Model: Measures CWDM ITU-T G.694.2 from 1271 to 1611 nm

- Ideal for Remote PHY Deployments

- Bar Graph or Table View mode

- Active Channel Pass/Fail detection

- Pass/Fail thresholds

- A/B channel markers

- Built-in wavelength reference

- Fast < 3 seconds measurement time

- Continuous Testing

- Generate and save test results in HTML file format

- High wavelength accuracy: CWDM ± 500 pm; DWDM C Band ± 75 pm

- Dynamic Measurement range: ≥ 65 dB

- Low Polarization Dependent Loss (PDL): CWDM < 0.5; DWDM C Band < 0.3 dB

- Optical Return Loss: > 30 dB

- Optional universal interface with interchangeable adaptors

2.3 FX180 Package Contents

- FX180X test unit

- AC/DC adaptor

    - Input: 100-240 VAC (50/60 Hz)
    - Output: 16VDC

- Li-Ion battery (8400 mAH battery)

- USB memory stick (2 Gbyte) or CD-ROM containing:

    - FX180X Channel Checker Users' Manual (pdf)
    - Software Upgrade Instructions

3.0   Safety Information

Safety precautions should be observed during all phases of operation of this instrument. The instrument has been designed to ensure safe operation however please observe all safety markings and instructions. Do not operate the instrument in the presence of flammable gases or fumes or any other combustible environment. VeEX Inc. assumes no liability for the customer's failure to comply with safety precautions and requirements.

Optical Connectors

The test platform displays a laser warning icon when the laser source is active to alert the user about a potentially dangerous situation. Make sure that optical sources are inactive before connecting fiber to the test set to avoid skin or eye damage. To avoid damage to the unit, it is recommended to:

- Deactivate the laser before connecting or disconnecting optical cables or patchcords.

- Never look directly into an optical patchcord or an optical interface (e.g. CFP, CFP2, CFP4, QSFP+, SFP+, SFP, OTDR, LS, VFL) while the laser is enabled. Even though optical transceivers are typically fitted with Class 1 lasers, which are considered eye safe, optical radiation for an extended period can cause irreparable damage to the eyes.

- Never use a fiber microscope to check the optical connectors when the laser source is active.

Electrical Connectors

Telephone lines may carry dangerous voltages. Always connect the electrical test ports to known test interfaces which carry low level signals.

4.0   Basic Operation

4.1   FX180X Front Panel Layout

The FX180 Channel Checker Meter is available for CWDM or DWDM C-band network testing, depending on the model ordered.

- CWDM model: 1271 – 1611nm (up to 20 channels)
- DWDM C-Band model: 1527 - 1567nm (up to 96 channels)

Display Modes include: Bar Graph and Table views.
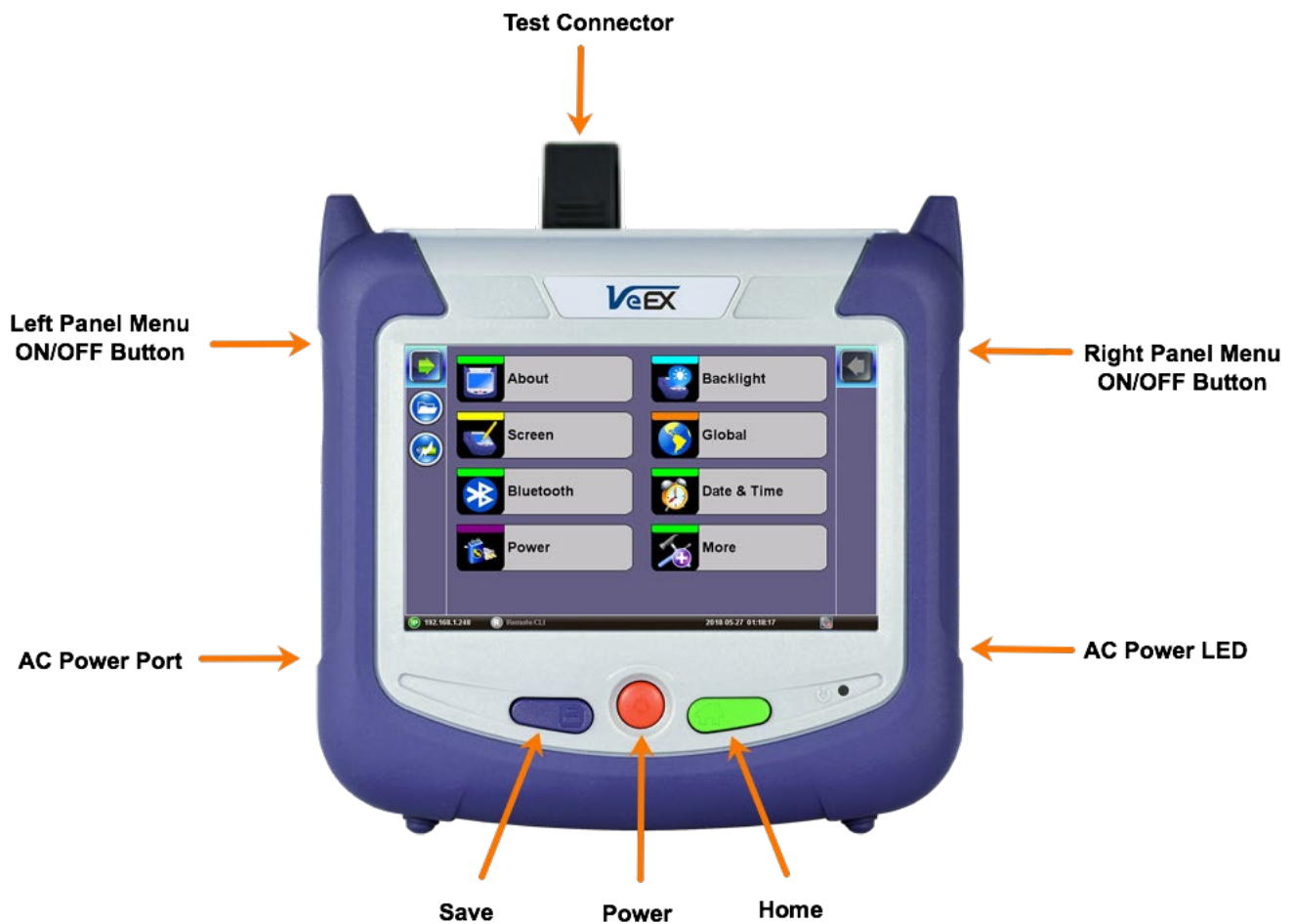
4.1.1   LED Indicators

Power LED: A single LED indicates the power state of the unit.

- The LED is off when the unit is powered off.
- The LED is green when the unit is powered on.

    The LED is orange when the unit is connected to the AC power port and powered off (charging).

4.1.2   Rubber Keypad
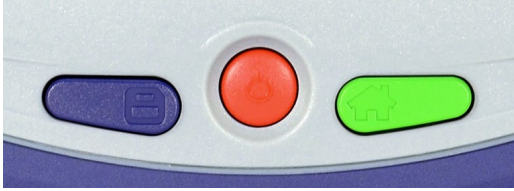
- **Save**: Saves current test results with automatic naming and time stamping. Also saves the current screenshot.

- **Power:** Press for 2 seconds to turn the test set ON or OFF (prevents accidental ON/OFF).
  To force the Power OFF, press for 6 seconds.

- **Home:** Resets user interface to Main menu. Press the **Home** key for 3 seconds to put the test unit in *Sleep Mode*. Press the **Home** key for 3 seconds again to return to normal operation.

- **Power + Save:** Formats SD card and upgrades firmware. *This clears data and settings on the test unit.*

- **Power + Home:** Upgrades firmware. This does not clear data and settings.

- **Save + Home:** Calibrates touchscreen

Activating Touchscreen Calibration Mode

To calibrate the touchscreen:

1. Press the **SAVE + HOME** keys simultaneously, and then release.

2. To cancel, press any button. To continue the calibration, press the LEFT SIDE rocker button, then press the **SAVE + HOME** keys simultaneously, and then release.

3. Use the Stylus to tap individual calibration targets.

Press SAVE and HOME simultaneously, then release.

For more detailed instructions, see the ***V150 Series Common Functions User Manual*** at www.veexinc.com.

4.2   Getting Started with the FX180X

4.2.1   View/Hide side menu panels

The left and right menu panels contain icons to access key functions of the FX180. These panels can be minimized to enable a better view of the application screens.

Use the rocker buttons located on the left and right sides of the unit to expand/contract the left and right menu panels.

Press the **LEFT SIDE KEY** to access:

File Storage – Tap to see the size and current capacity of the internal SSD storage.

Power Source Indicator– Indicates when unit is powered by external AC power and battery charging level. Tap to see battery charge status.

The **RIGHT-SIDE KEY** provides access to Spectrum Mode and ITU Test Modes.

Expands menu

Test set information

Exits/Contracts menu

Repeat Sweep — Begin Repeat Sweep Test

View Mode — Screen Viewing Mode

nm/THz — Unit type

50 100 200 — ITU-T Grid

Channel A and B Markers

Active Channel/Pass-Fail Thresholds
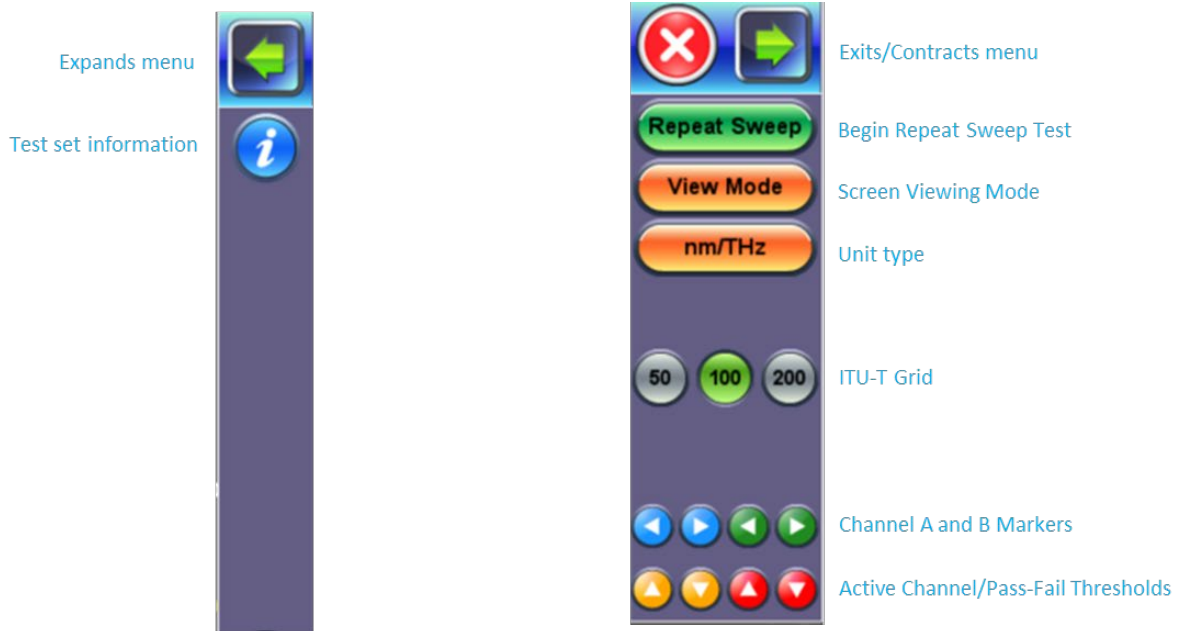
Spectrum Mode and ITU Test Modes: Right side Touchscreen Controls

4.2.2 A/B Markers

Use the stylus provided with the test set and select A or B markers on the touchscreen to drag the marker left or right to the point of interest. Alternatively, tap the left/right arrows whose color matches the marker. You can also tap next to the left or right side of the marker to move one display pixel. Channel details can be viewed on the touchscreen or the marker detail box. The span power between the two markers is displayed also.
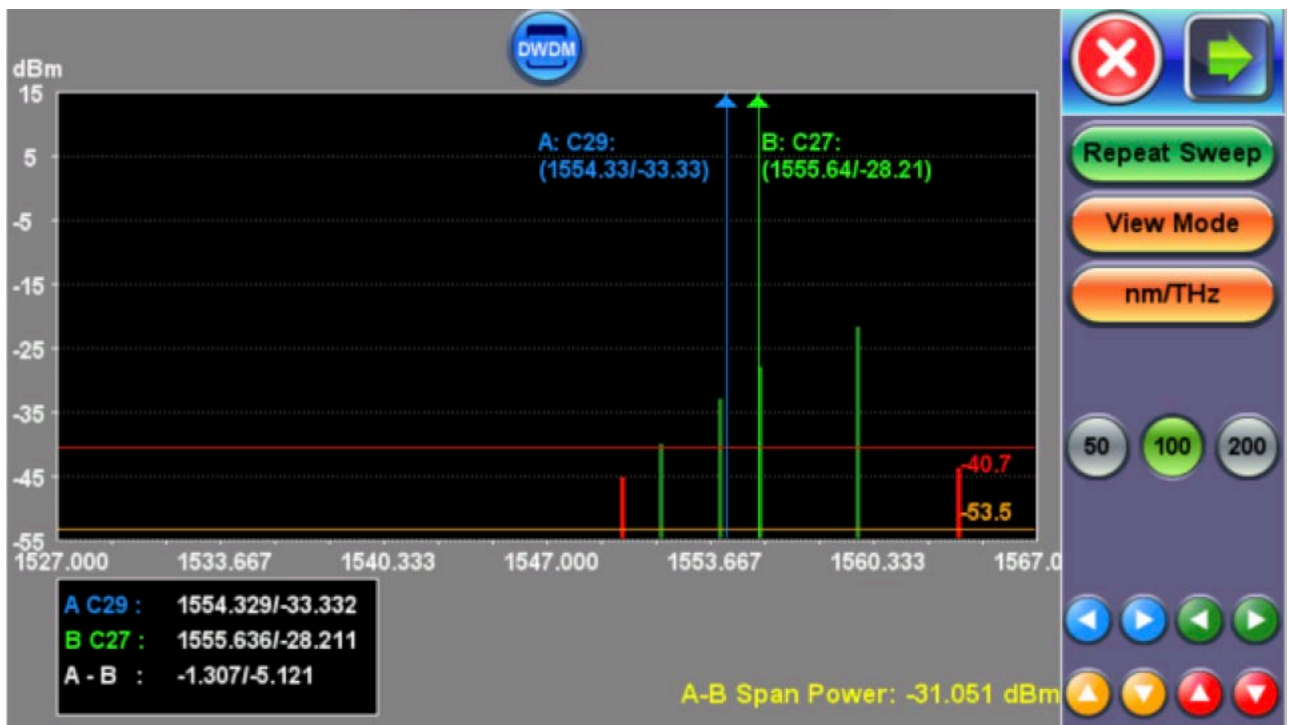
A/B Markers Control

4.2.3 Active Channel Threshold

Use the stylus provided with the test set to select the gold color horizontal line to move up and down or tap the gold up/down arrows. You can also tap next just above or below the gold line to move the threshold level. Any channel below the line will not appear in the results table.

4.2.4 Pass/Fail Threshold

Use the stylus provided with the test set to select the red color horizontal P/F threshold to move up and down or tap the gold up/down arrows. You can also tap next just above or below the red line to move the level. Any channel above the red line will be displayed in green. Channels that fall below the P/F level will appear in red in the graph.

4.2.5 Setting up FX180X WiFi/Bluetooth

The FX180X unit contains an optional built-in WiFi and Bluetooth interface allowing you to transfer OSA results and upgrade software on the unit.

For detailed instructions, see the *V150 Series Common Functions User Manual* at www.veexinc.com.

4.3 Customizing the Test Unit

Customize the settings on your device in the **Utilities>Settings** menu.

FX180X Channel Checker Utilities Settings menu

About: Provides information about the serial number, MAC address, software version, and software options installed on test set.

Screen Calibration: Calibrates the touch screen.

Bluetooth/WiFi: Define settings for optional built-in Bluetooth and WiFi connectivity.

LAN (USB adapt): Settings for WiFi connectivity to the unit and for the micro-USB Bluetooth adaptor offering wireless connectivity up to 10 meters (30 feet), so test results can be transferred without having to use a memory stick or having an Ethernet connection.

Backlight: Define settings when unit is used on battery or AC power, including brightness settings. The Backlight settings affect battery autonomy and LCD life.

Global: Settings for language, alarm, password, and user interface (International or USA)

Date & Time: Settings for the data and time on the unit. Daylight savings is enabled automatically.

Remote Access: Settings for the unit's VNC service. It is not recommended for multi-user or multi-test environments.

Power: Provides information about current power source and information about the battery gauge.

EZ Remote: Settings for connecting to the unit across the Internet or Network Segments without requiring public IP addresses, port forwarding, or holes in the firewall.

For detailed instructions about customizing the test unit, see the *V150 Series Common Functions User Manual* at www.veexinc.com.

5.0　Working with the Channel Checker

The following models are available: *(Refer to the datasheets for exact model availability and analysis plans at www.veexinc.com .)*

- CWDM Channel Checker
- DWDM C Band Channel Checker

5.1　Repeat Sweep

The FX180X will measure all channels on the WDM network.

Repeat Sweep: Continues sweep until measurement is terminated manually by selecting the **Stop** button. When in Repeat Sweep test mode, the label will change to **Stop**.

5.2　View Mode

5.2.1　Bar Graph View

Any channel that measures within 24.5% of an ITU-T channel will be displayed in this view. In the figure below, Channels 20 to 28, except 24, are displayed. This can be due to CH24 having shifted too far from the nominal ITU-T channel frequency or CH24 has not been brought into service yet.
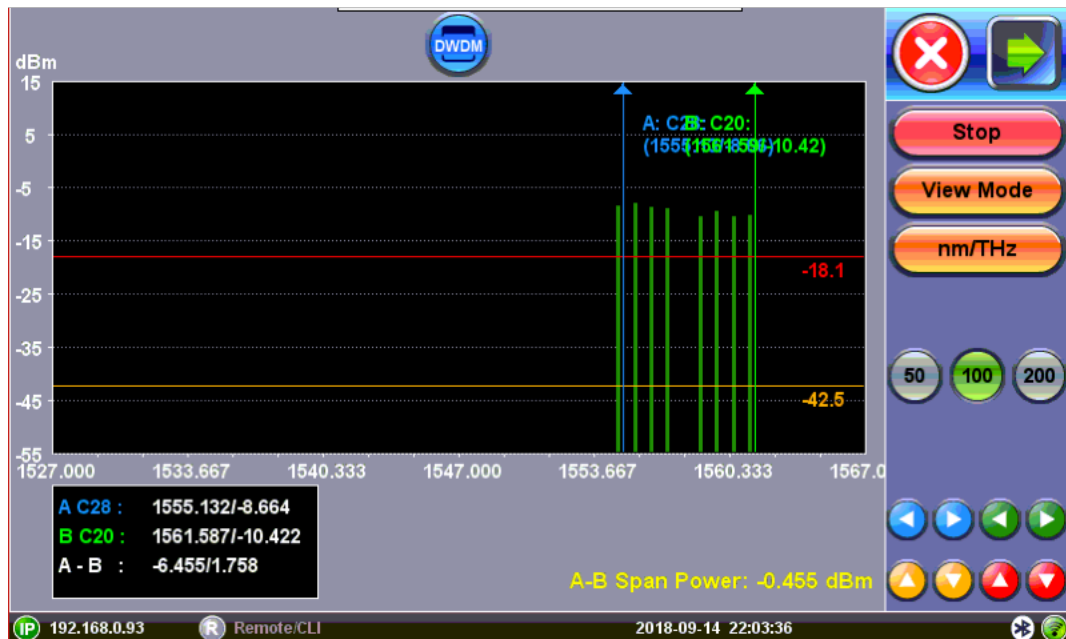
ITU Bar Graph view

5.2.2 Table View

All active ITU-T channels will be displayed in the table. Each channel #, peak frequency or wavelength, and channel power is displayed.

ITU#	Peak (nm)	Power	Pass/Fail	ITU#	Peak (nm)	Power	Pass/Fail
C28	1555.132	-8.645	PASS				
C27	1555.936	-8.137	PASS				
C26	1556.741	-8.699	PASS				
C25	1557.556	-9.047	PASS				
C23	1559.160	-10.578	PASS				
C22	1559.978	-9.582	PASS				
C21	1560.777	-10.574	PASS				
C20	1561.587	-10.410	PASS				

ITU-T Table view

5.3 Saving Results

Use the Files menu on the home page left panel to access File Management functions. For detailed instructions, see the *V150 Series Common Functions User Manual* at www.veexinc.com.

6.0   Warranty and Software

Warranty Period: The warranty period for hardware, software and firmware is one (1) year from the date of shipment to the customer. The warranty period for battery pack, LCD, LCD touch panel, LCD protective cover, and accessories (including, but not limited to patch cords, AC adaptor, SFP, USB adaptors, carrying case, carrying pouch) is limited to one (1) year.

Hardware Coverage: VeEX Inc. warrants hardware products against defects in materials and workmanship. During the warranty period, VeEX Inc. will, at its sole discretion, either

- Repair the products

    Replace hardware which prove to be defective

provided that the products that the customer elects to replace are returned to VeEX Inc. by the customer, along with Proof of Purchase, within thirty (30) days of the request by the customer, freight prepaid.

Software Coverage: VeEX Inc. warrants software and firmware materials against defects in materials and workmanship. During the warranty period, VeEX Inc. will, at its sole discretion, either

- Repair the products

    Replace software and/or firmware which prove to be defective

provided that the products that the customer elects to replace are returned to VeEX Inc. by the customer, along with proof of purchase, within thirty (30) days of the request by the customer, freight prepaid.

Additionally, during the warranty period, VeEX Inc. will provide, without charge to the customer, all fixes, patches and enhancements to the purchased software, firmware and software options. VeEX Inc. does not warrant that all software or firmware defects will be corrected. New enhancements attached to a software option require the option to be purchased (at the time of order or the time of upgrade) in order to benefit from such enhancements.

Limitations: The warranty is only for the benefit of the customer and not for the benefit of any subsequent purchaser or licensee of any merchandise (hardware, software, firmware and/or accessories).

Revoking the warranty: VeEX Inc. does not guarantee or warrant that the operation of the hardware, software or firmware will be uninterrupted or error-free. The warranty will not apply in any of the following cases:

- Improper or inadequate maintenance by the customer

- Damage due to software installed by the customer on the unit without prior authorization (written) from VeEX Inc.

- Unauthorized alteration or misuse

- Damage occurred from operating the unit outside of the environmental specifications for the product

- Improper installation by the customer

7.0   Product Specifications

The most recent product specifications can be found on the VeEX web site at www.veexinc.com.

8.0 Certifications and Declarations

What is CE?

The CE marking is a mandatory European marking for certain product groups to indicate conformity with the essential health and safety requirements set out in European Directives. To permit the use of a CE mark on a product, proof that the item meets the relevant requirements must be documented.

Use of this logo implies that the unit conforms to requirements of European Union and European Free Trade Association (EFTA). EN61010-1

For a copy of the CE Declaration of Conformity relating to VeEX products, please contact VeEX customer service.

What is RoHS?

RoHS is the acronym for Restriction of Hazardous Substances. Also known as Directive 2002/95/EC, it originated in the European Union and restricts the use of specific hazardous materials found in electrical and electronic products. All applicable products imported into the EU market after July 1, 2006 must pass RoHS compliance.

For more information about RoHS as it relates to VeEX Inc, go to the VeEX web site at www.veexinc.com.

9.0   About VeEX

VeEX Inc., an innovative, customer-focused communications test and measurement company, develops next-generation test and monitoring solutions for telecommunication networks and services. With a blend of advanced technologies and vast technical expertise, VeEX has developed products that diligently address all stages of network deployment, maintenance, and field service turn-up and integrate service verification features across DSL, fiber optics, CATV/DOCSIS, mobile backhaul and fronthaul (CPRI/OBSAI), next-generation transport network, fiber channel, carrier and metro Ethernet technologies, WLAN, and synchronization.

Visit us online at www.veexinc.com for the latest updates and additional documentation.

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