DWDM Sweep Tool Kit

The DWDM Sweep Tool Kit* revolutionizes and simplifies the testing methodology for DWDM networks. Verify a 98-channel 50 GHz C-band DWDM network in about a minute, verify cable routing through MUX/DeMUX and wavelength accuracy and record Channel insertion loss with Pass/Fail indicator. The kit includes an FX87s Optical Sweep Generator, which automatically sequences through all the channels at the multiplexer input port, and an FX82s Optical Sweep Receiver to analyze the actual received channels at the far-end de-multiplexer output port.

Key Features

- Low cost tool kit for construction and maintenance of DWDM networks
- Fast detecting algorithm verifies all 49 channels of a 100GHz/ C-band in about 30 seconds and all 98 channels of 50GHz/C-band in about a minute
- A single transmitter (FX87s) can be used with multiple receivers (FX82s) to verify cable routing accuracy at various locations simultaneously
- User-defined DWDM channel table
- User-defined network insertion loss threshold
- Large, day light readable LCD display with built-in backlight
- Rechargeable Li-Polymer battery with operation time >10 hours
- Internal memory stores >1000 results
- Data transfer via micro-USB or optional Bluetooth®

**Patent Pending*

Key Specifications

FX87s DWDM Sweep Generator

- Wavelength range: 1527.60 to 1566.31 nm
- Frequency range: 191.40 to 196.30 THz
- Channel spacing: 50GHz per ITU G.694.1
- Built-in wavelength locker (stable to within ±3 GHz)
- User selectable output power: -5, 0, and +5 dBm ±0.5dB
- 5 User-definable channel tables
- Laser Safety: Class 1M per IEC 60825-1:2014

FX82s DWDM Sweep Receiver

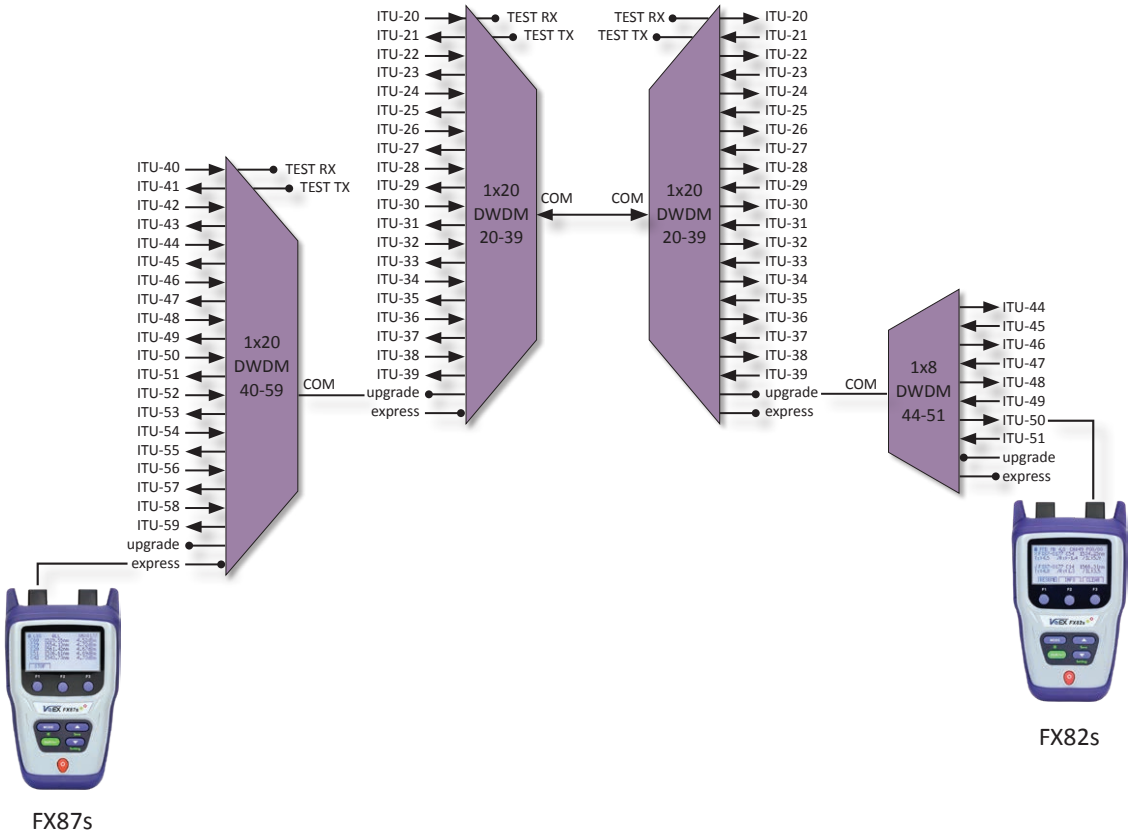
- Sweep Receiver Mode or Optical Power Meter mode
- Supports up to 4 user-defined pass/fail loss thresholds
- Supports up to 5 user-definable FX87s Device IDs
- Supports up to 5 user-definable channel tables
- On-screen analysis for PASS, FAIL, ROGUE, VALID, TOTAL channels

FX82s/FX87s Optical Power Meter

- Calibrated wavelengths (850, 1300, 1310, 1490, 1550, 1625, 1650 nm)
- Measurement range: +25 to -50 dBm
- Accuracy: ± 0.2 dB (5%)
- Display resolution: 0.1 dB

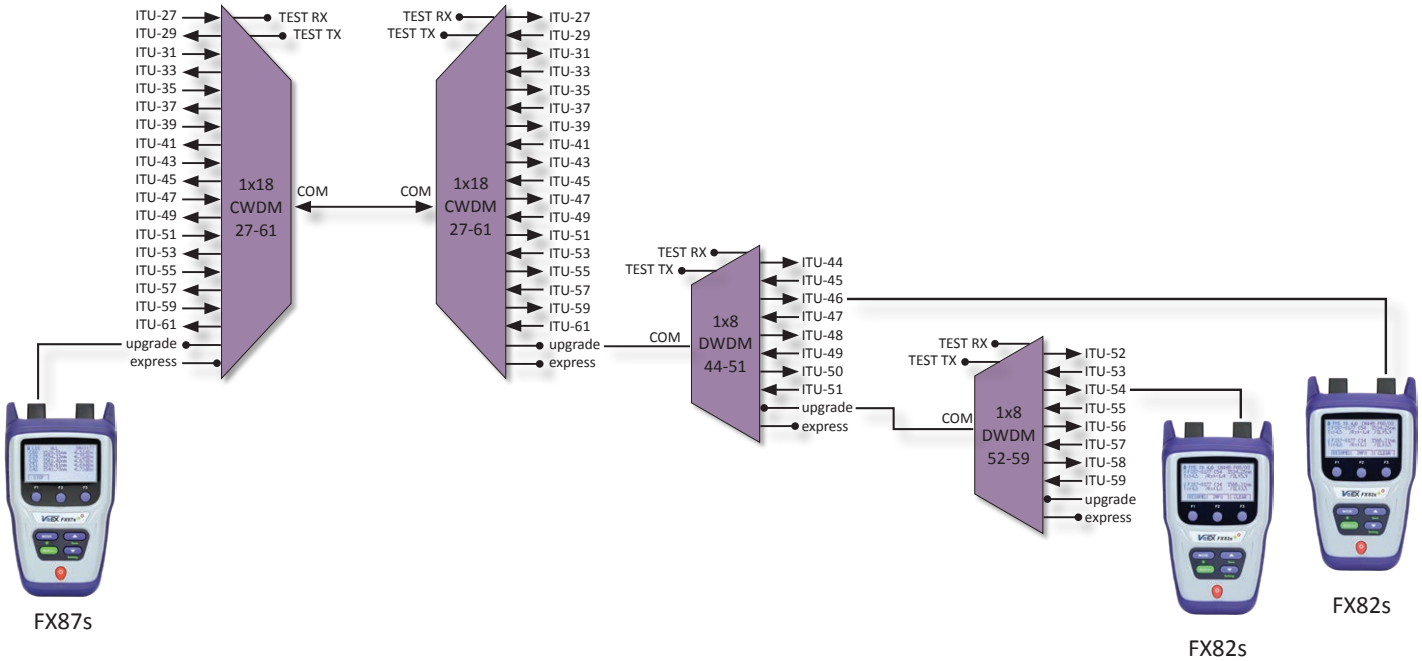
DWDM Channel Drop and Insert Testing

When connected to the Express port on the initial DWDM MUX, the FX87s generator can be configured to sweep through multiple ITU-T channels for specific network applications. The FX82s Receiver can then be used to verify correct cable routing and measure insertion loss of each receive port for each De-MUX location.



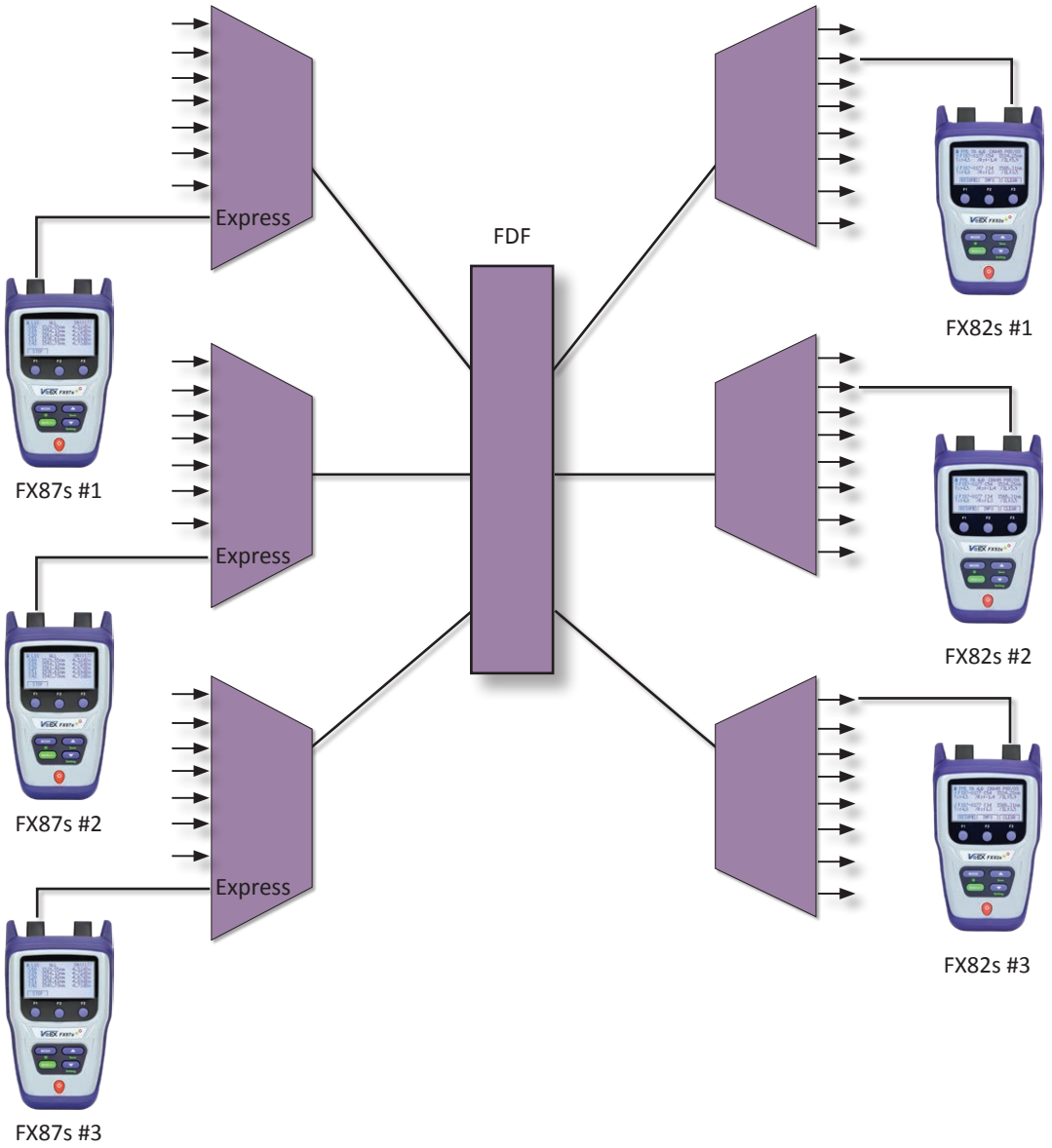
Network Expansion to Add DWDM to an Existing CWDM Network

FiberDeep continues pushing broadband services to previously underserved rural communities. Legacy CWDM networks are being tapped to create hybrid CWDM/DWDM networks by converting the 1550nm CWDM MUX ports for DWDM channels extending reach and increasing network bandwidth. When connected to the Express port on the initial CWDM MUX, the FX87s generator can be configured to sweep through multiple ITU-T channels for specific network applications. The FX82s Receiver can then be used to verify correct cable routing and measure insertion loss of each receive port for each De-MUX location.



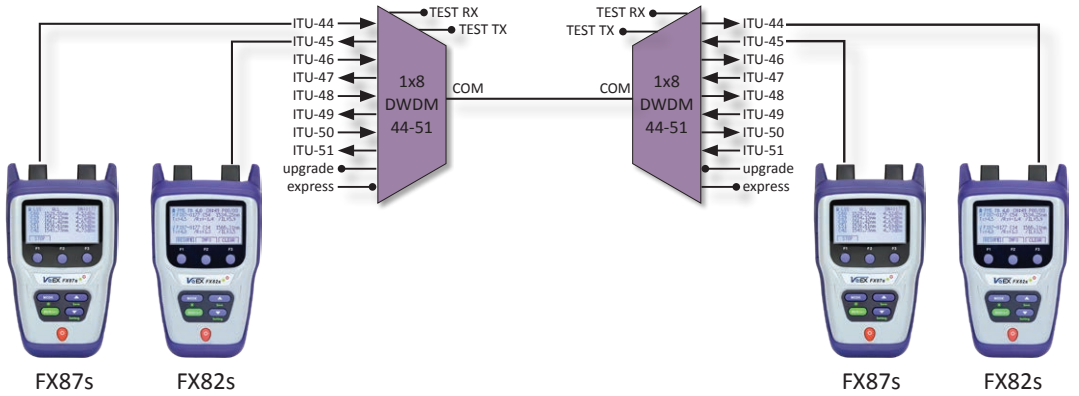
Mutliple Fiber WDM Network

Multiple FX87s and FX82s can be used, at the same time, to verify proper cable routing and insertion loss in WDM networks with multiple fibers and multiplexers, to ensure that cable routing and multiplexing are configured properly.



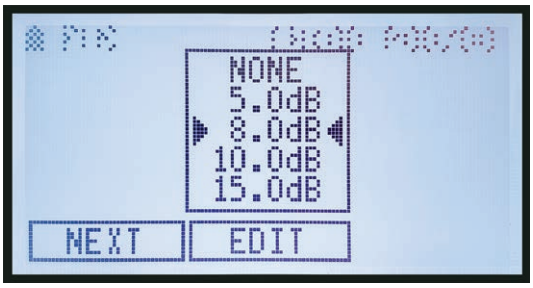
Bi-Directional Testing

Two FX87s and two FX82s can be used to check the point-to-point connection of a bi-directional 50GHz DWDM network.



User Defined Insertion Loss Thresholds

The FX87s generates signals for every DWDM channel as well as n-band information about the FX87s device ID, channel ID and pre-calibrated transmit power. The FX82s decodes the received information to identify the received channel and calculate the insertion loss, based on the difference between the received and transmitted optical power. Various insertion loss thresholds are stored in FX82s and one of them can be used for pass/fail determination, depending on the configuration of the DWDM network at the measurement point.

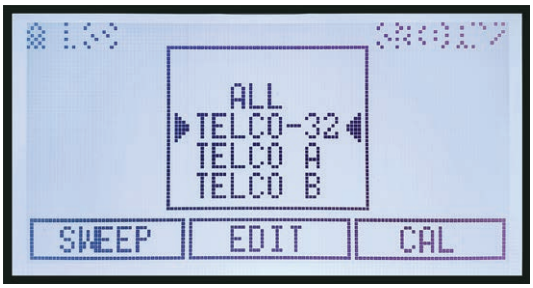


Sweep Generator ID

Multiple FX87s Sweep Generators can be used simultaneously, depending on the network configuration. Because each FX87s generates a unique device ID, using the last 4 digits of its Serial Number, this allows the FX82s to verify the proper fiber is routed to the de-mux point. Any DWDM channel detected with unexpected Sweep Generator's ID will be reported as a rogue channel.

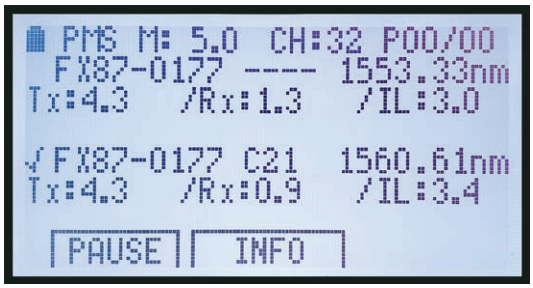
User Defined Channel Table

The FX87s and FX82s allows users to customize and name each WDM test plan; verify all channels adhering to the channel plan. The channel table is used by FX82s to report all received channels that are expected or unexpected as well as missing ones.



FX82s Sweep Measurement & Analysis

FX82s sweep results provide onboard information to evaluate the test outcome. It checks for insertion loss pass and fail threshold per channel and identifies missing and unexpected, rogue channels.



Optical Power Meter (OPM)

FX82s/FX87s built-in OPM features a large 1mm InGaAs detector ensuring superb measurement accuracy over a wide range of wavelengths and dynamic range. The detector's flat spectral response across the 1500 – 1600nm bandwidth is particularly suited for DWDM measurement. The optical power meter is factory calibrated at all legacy and CWDM wavelengths.

The unit measures continuous wave signal levels and detects 270Hz, 330Hz, 1000Hz and 2000Hz modulated signals for fiber identification. When paired with a VeEX optical light source, aside from the FX40, the unit automatically recognizes the WaveID and applies the correct calibration factor.

Preliminary Specifications[1,2]

FX87s Sweep Generator	Specification
Number of Channels @50GHz channel spacing	98
Wavelength Range (nm)	1527.60 to 1566.31
Frequency Range (THz)	191.40 to 196.30
Linewidth (kHz)	500
SMSR (dB)	40
Minimum channel spacing (GHz)	50
Internal Wavelength Stabilization (GHz)	±3
Output Power (dBm)	-5, 0, +5, ±0.5dB
Laser Safety (IEC 60825-1:2014)	Class 1M
Connector type	SC-APC
FX87s Tunable Laser Source	
Output Power (dBm)	+5
Wave ID	DWDM Channel Number
Modulation (Hz)	270/330/1000/2000
FX82s Sweep Receiver	
Wavelength range (nm)	1527.60 to 1566.31
Power measurement range (dBm)	+25 to -50
Power measurement accuracy %, (dB)	± 8, (0.5)
Display resolution	0.1 dB
Measurement analysis	Pass/Fail, Valid/Missed/Rogue/Total
FX87s/FX82s Optical Power Meter	
Wavelength range (nm)	850 to 1650
Power measurement range (dBm)	+25 to -50
Calibrated Wavelengths (nm)	850, 1300, 1310, 1490, 1550, 1625, 1650
Power measurement accuracy %, (dB)	± 5, (0.22)
Display Resolution	0.1 dB
Optical adaptors (interchangeable)	SC, FC, LC, Universal 1.25 & 2.5 mm
Tone Detection (Hz)	270/330/1000/2000
Wave ID	Automatic, compatible with VeEX Light Source

Notes:
1. All specifications valid at 23°C ± 10°C after 15 minutes warm up
2. Refer to FX82s and FX87s data sheet for full details

General Specifications

Size:	164.39 x 100 x 46.93 mm (H x W x D)** 6.47 x 3.94 x 1.85 in	Power Supply:	Micro USB interface, 5 VDC charger
Weight:	<400 g (<0.7 lbs.)**	Data connection:	Micro USB and optional Bluetooth (FX82s)
Construction:	Rugged, Polycarbonate chassis, 1 meter drop tested	Display:	Monochrome LCD with backlight
Battery:	Built-in Rechargeable Li-Polymer, Operation time >10 hours, no backlight	Operating Temp:	-10 °C to +50 °C
		Storage Temp:	-20 °C to +70 °C
		Humidity:	0% to 95%, non-condensing

**US patent pending*
***Per unit*

VeEX
The Verification Experts

CE

VeEX Inc.
2827 Lakeview Court
Fremont, CA 94538 USA
Tel: +1.510.651.0500
Fax: +1.510.651.0505
www.veexinc.com
customercare@veexinc.com

D05-00-999P A00 2021/07