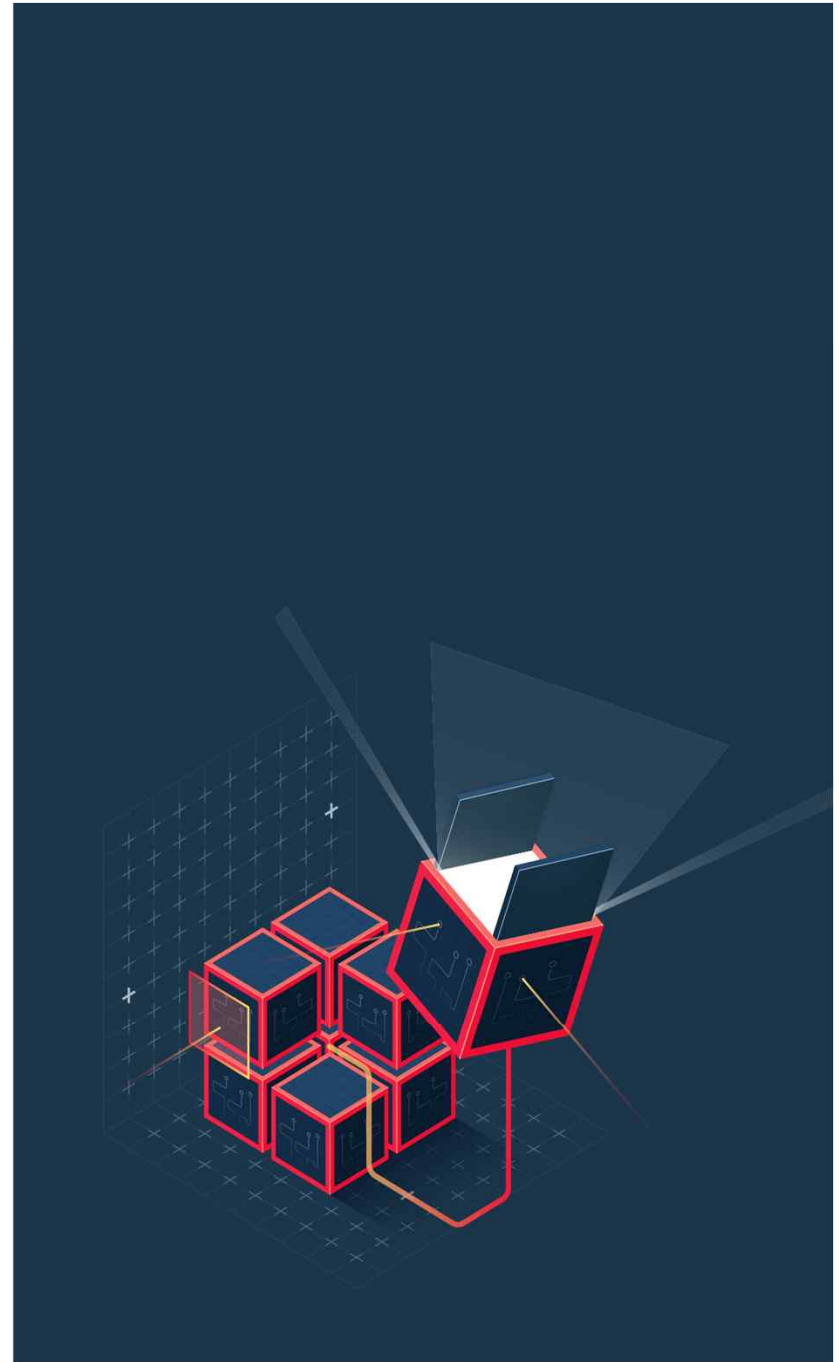


MFO (**M**ulti-**F**unction **O**TDR)

January. 2022

 GISYSTEM Co., LTD



목차

1. MFO introduction

2. Dimension & Outline

3. Major Functions

4. Functional Descriptions

5. User interface for Android mobile device

6. Specification

1. MFO introduction

➤ 7 major functions in one device for field application tools

OTDR



CWDM Analyzer



DWDM Channel Checker



Laser Source



SFP Tester



Fault Finder



OPM



- Individual Instruments : high Price (> USD50,000)
- Hard to carry each instruments
- Different operation method for each instruments
- Hard to share measurement data between operators and filed engineers



- Complete interfaces with Android mobile device App.
- Highly Economic
- Light weight(<900g)
- Easy operations
- Support Bluetooth/USB

2. Outlines



Optical interfaces

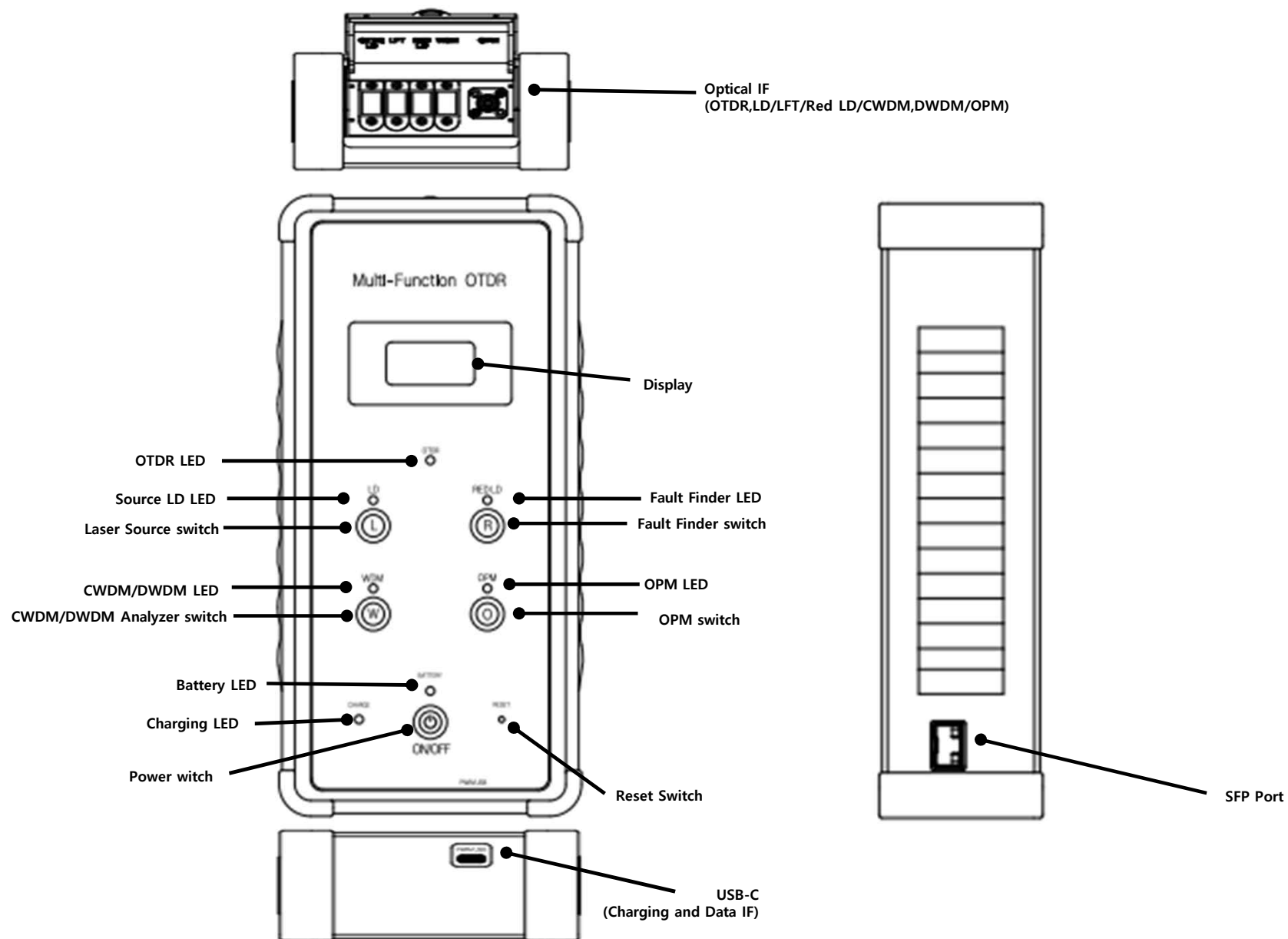


MFO



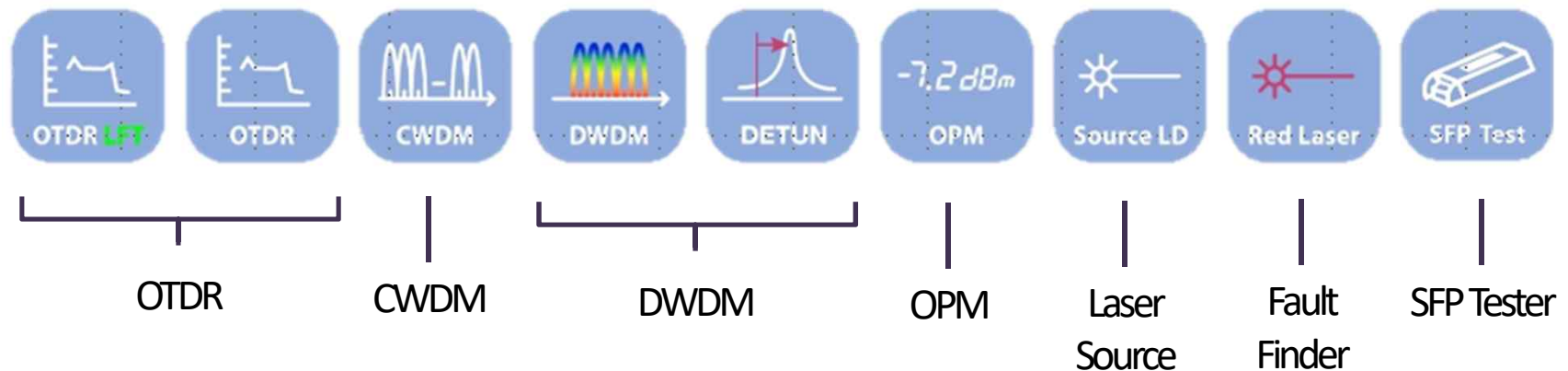
Carrying Cases

2. Outlines



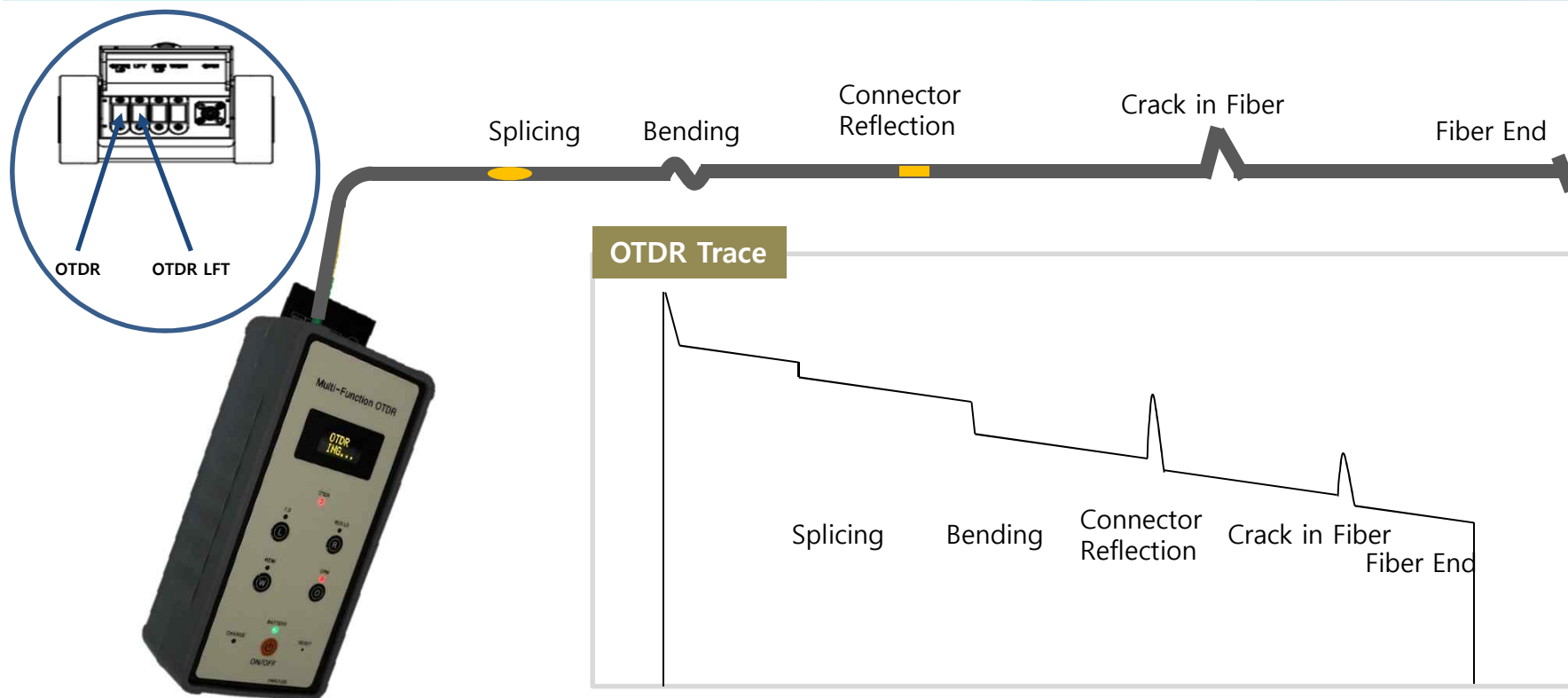
3. Major Functions

➤ 7 major functions



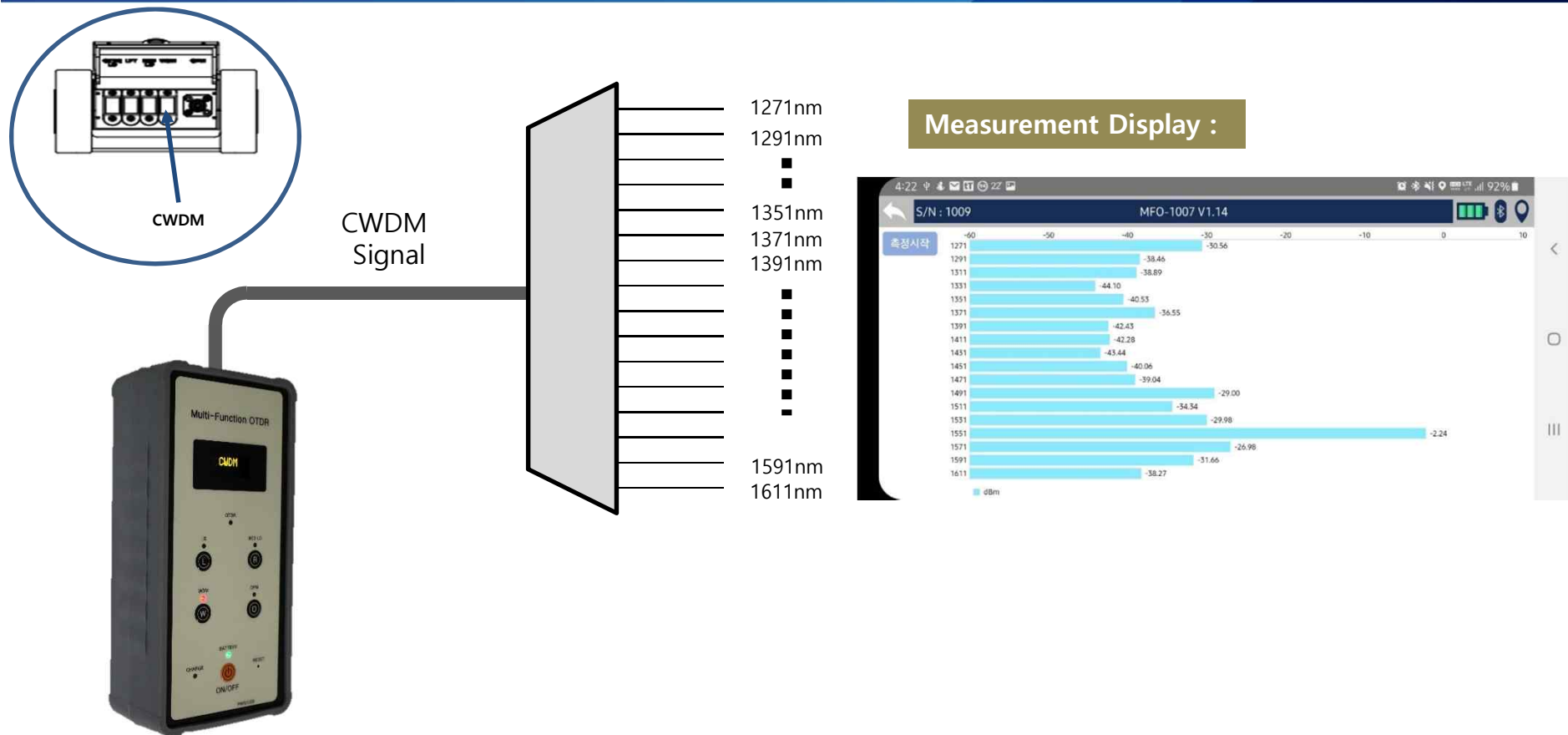
- Complete interfaces with Android mobile-phone App.
- Standard charging with android mobile-phone(High speed charging support)
- Small foot-print in 1-device for 7 functions

4. Functional Descriptions - OTDR



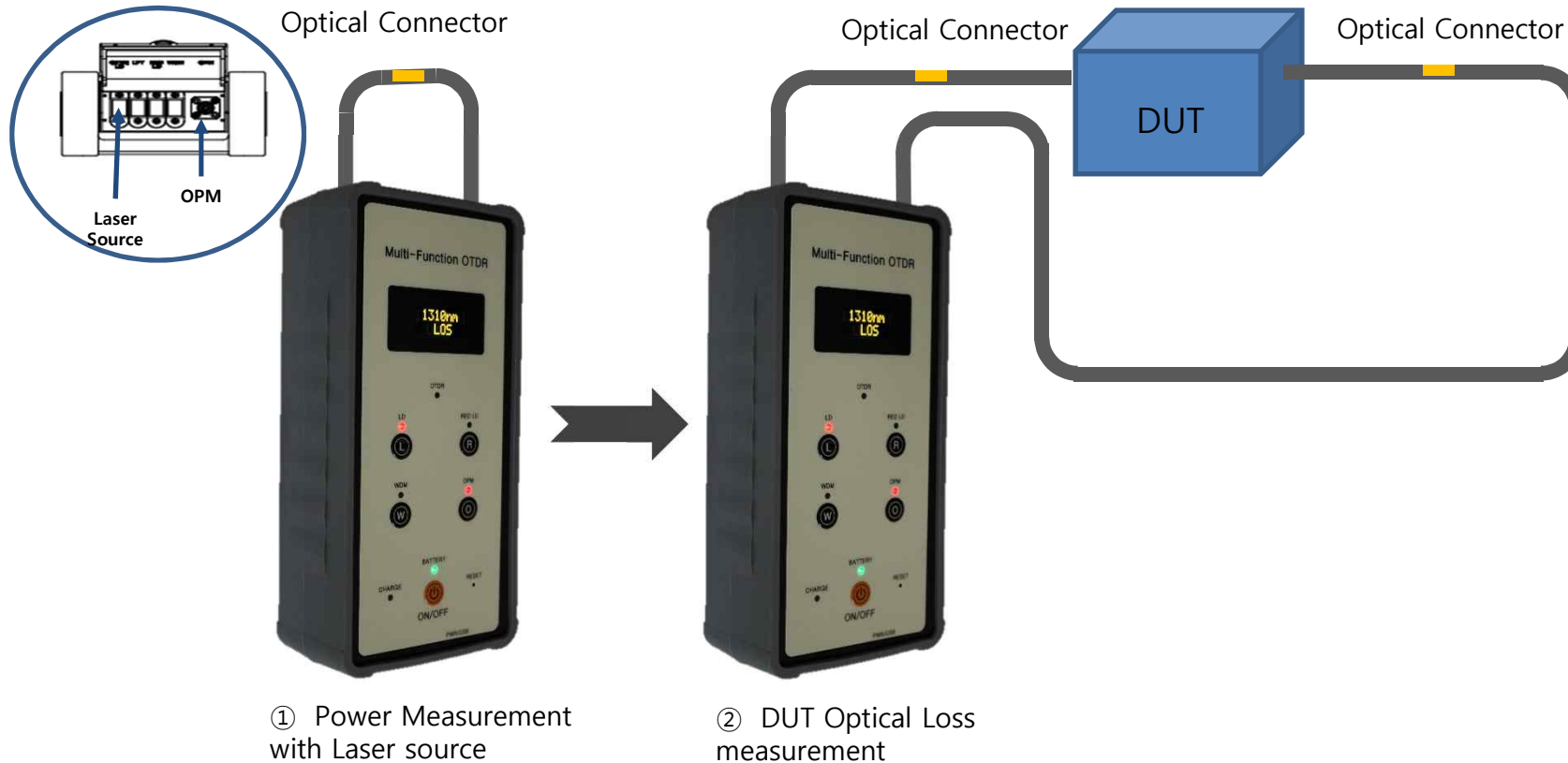
- **Wavelength : 1550nm/1625nm (can be changed by request)**
- **Live Fiber Test support (1625nm OTDR)**
- Fiber end auto detection
- Live-fiber test
- **Quick start in 10 sec after power-on**
- SOR/jpg File format support
- Event analysis function

4. Functional Descriptions - CWDM Analyser



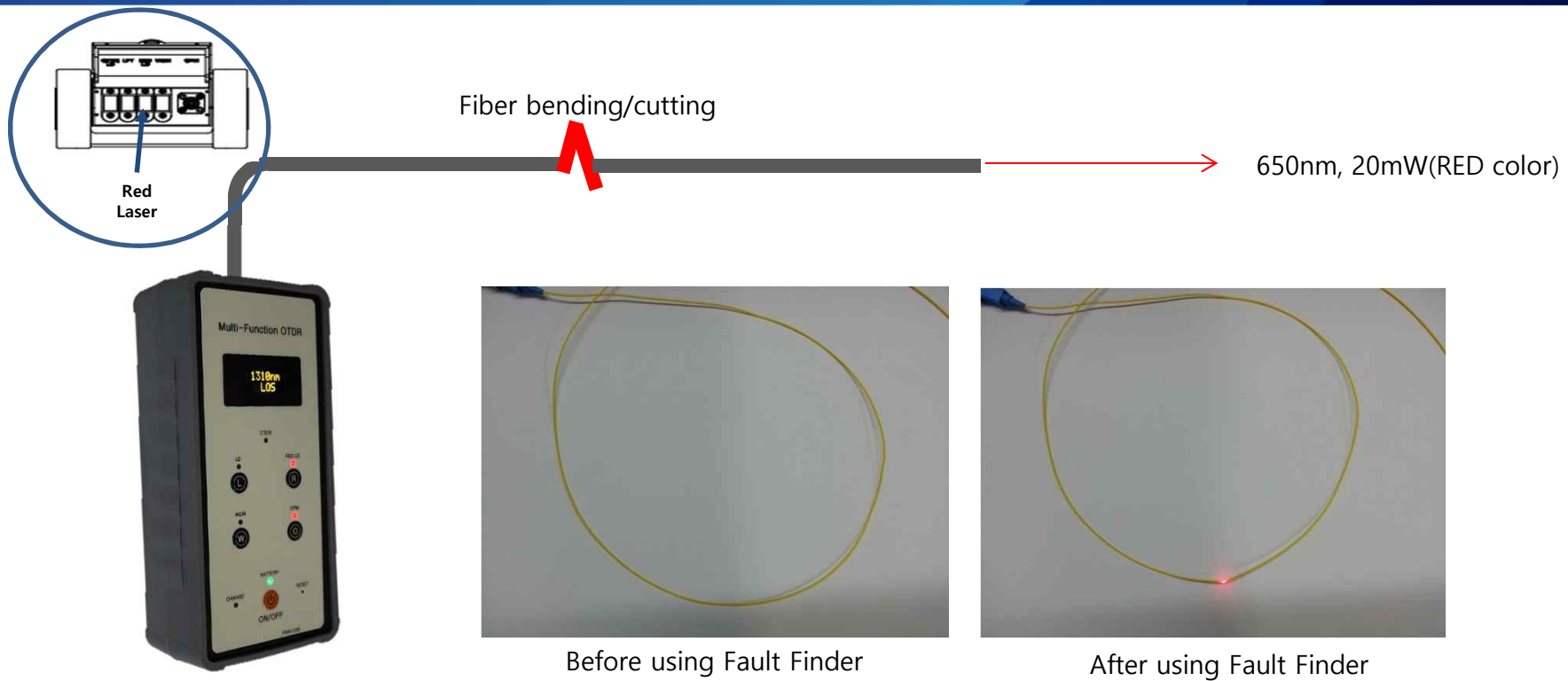
- Support CWDM 18 wavelengths (1271 ~ 1611nm, 20nm spacing, in ± 1.5 dB)
- Bar type display for easy understanding
- Measurement in 5 seconds

4. Functional Descriptions – OPM & Laser Source



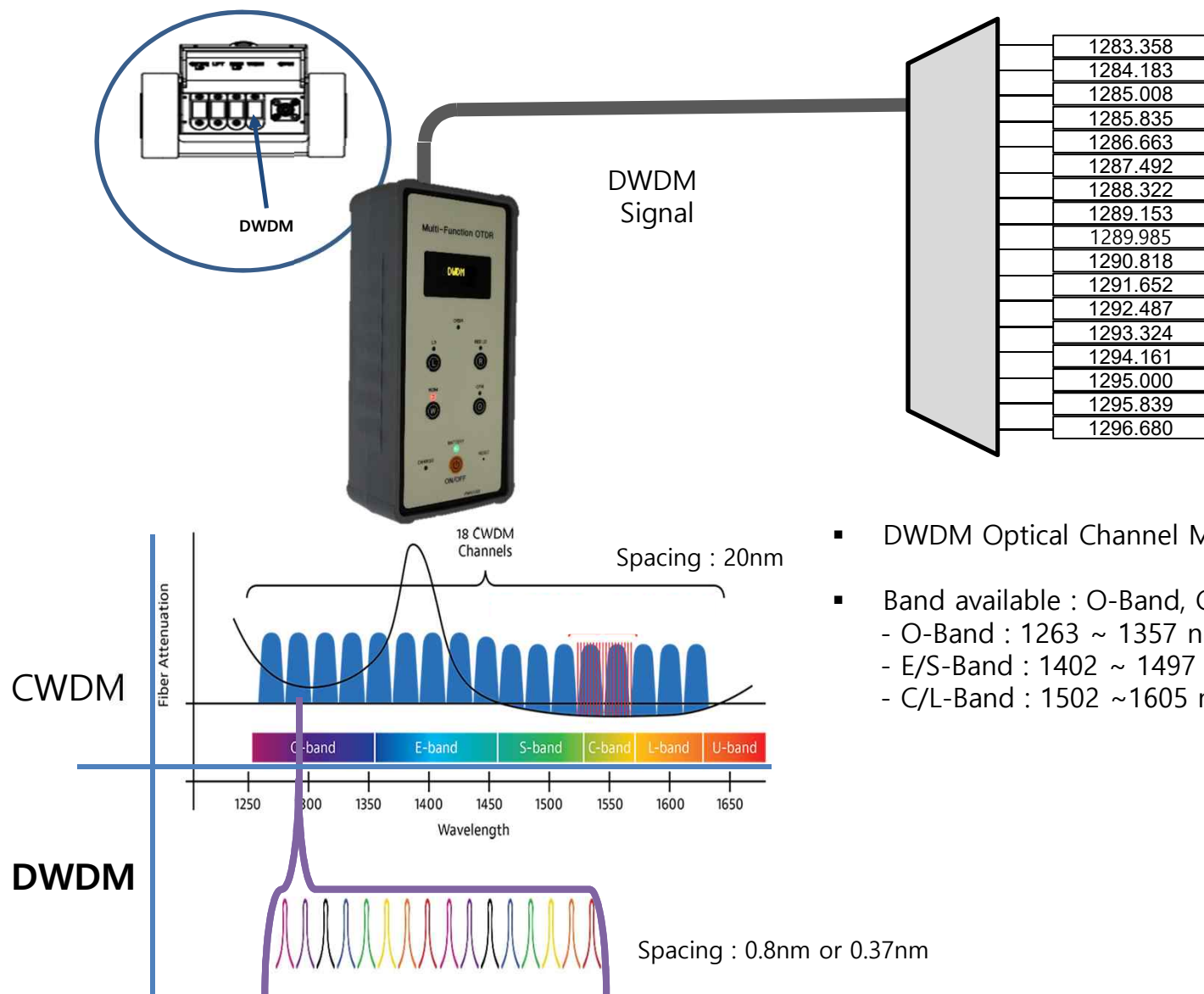
- Laser source on/off on OPM mode
- OPM : 1200nm ~ 1700nm, Range (-60 ~ 10dBm)
- Laser Source : 1550nm, >-3dBm
- Optical Loss test in a single instrument

4. Functional Descriptions – Fault Finder



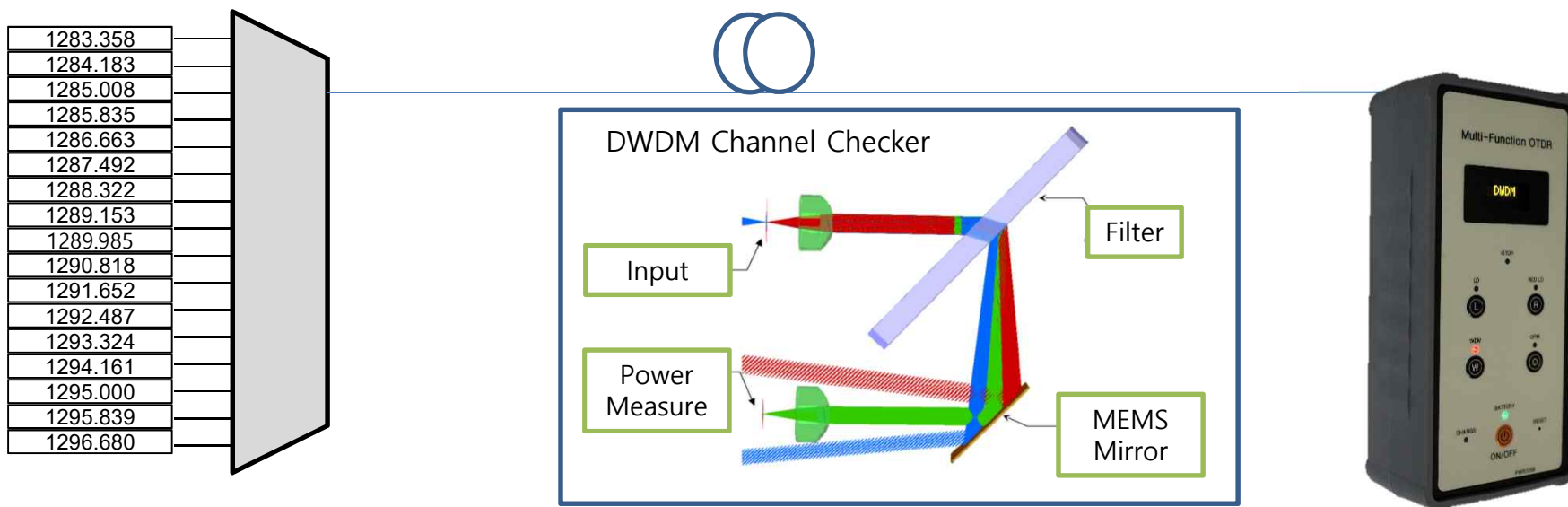
- Finding fiber fault(Bending/Cutting)
- High output power > 10mW

4. Functional Descriptions - DWDM Channel Checker



- DWDM Optical Channel Monitoring function
- Band available : O-Band, C-Band, L-Band, (E/S-Band)
 - O-Band : 1263 ~ 1357 nm
 - E/S-Band : 1402 ~ 1497 nm
 - C/L-Band : 1502 ~ 1605 nm

DWDM Channel Checker Principle – Tunable Filter



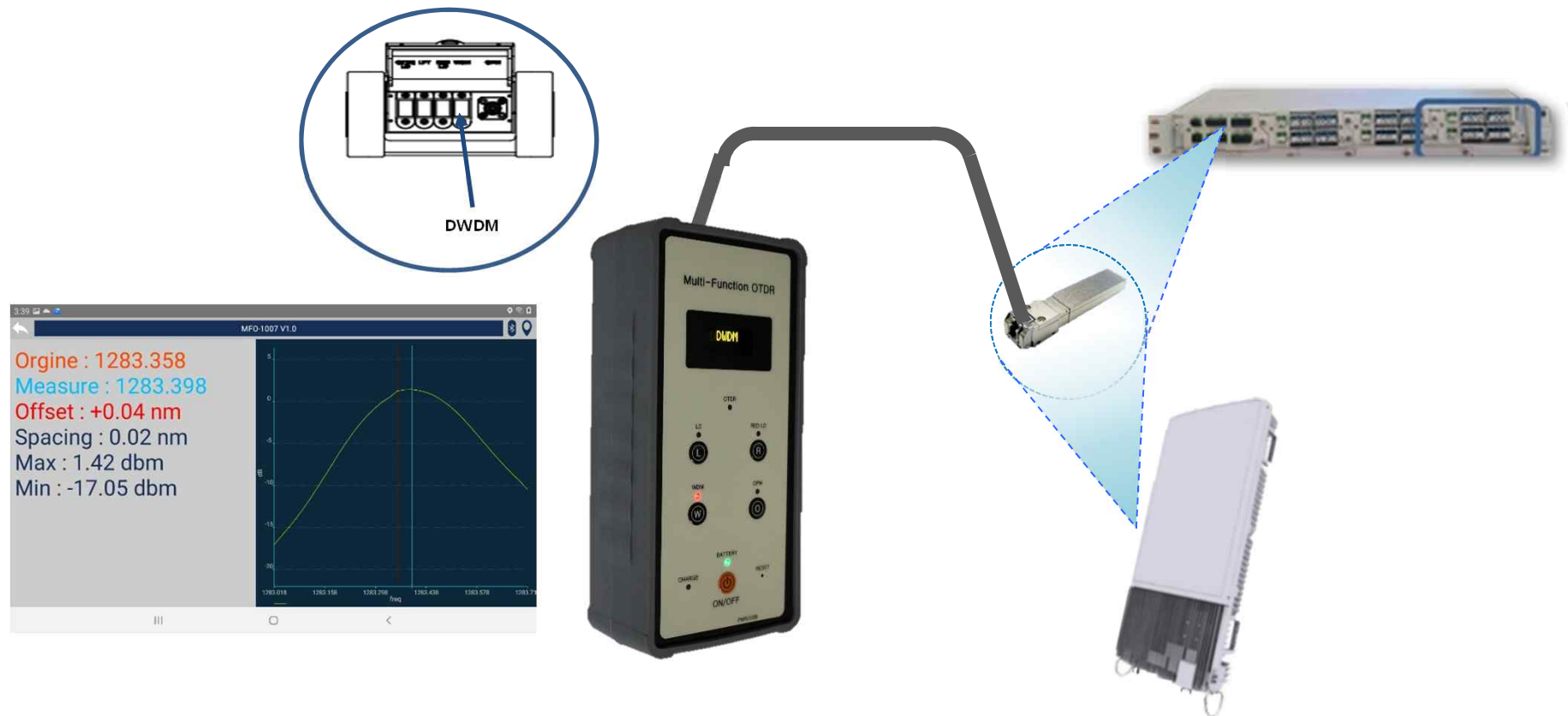
Tunable Filter Method?

MEMS Mirror with optical filter measurement method. Moving MEMS Mirror will select desired wavelength in +/- 0.01nm wavelength spacing

Tunable Filter advantages

- Center wavelength can be easily upgraded by Firmware without HW changes
- Maximum up to 1263 ~ 1605nm measurement (up to 4 tunable filters required)
- No risk on mechanical impact

4. Functional Descriptions - Detuning(DWDM channel checker)



- Detailed wavelength peak searching function in DWDM
- Can find wavelength shift on DWDM sources including SFP LS degradations
- Analyze in +/- 0.01nm wavelength spacing

4. Functional Descriptions - SFP Tester



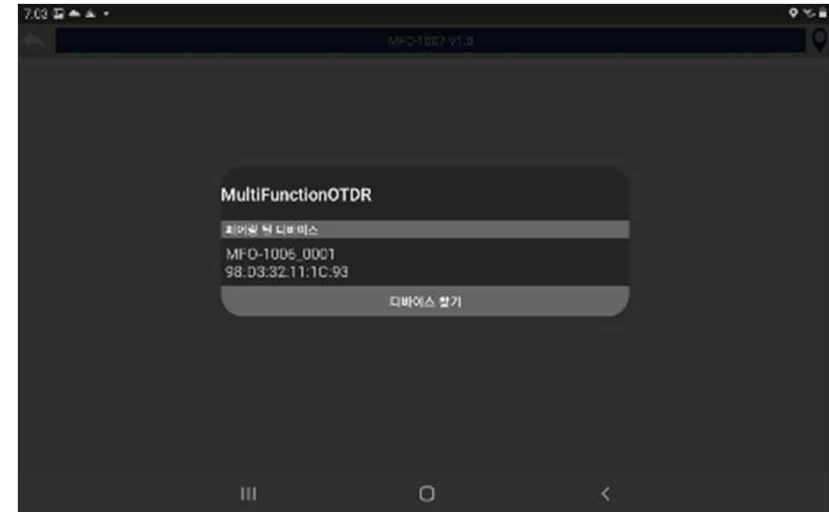
➤ SFP major information reading

- ❖ SFP Tx/Rx Power
- ❖ SFP Laser wavelength
- ❖ SFP Manufacturer
- ❖ SFP Model Number
- ❖ SFP Serial Number

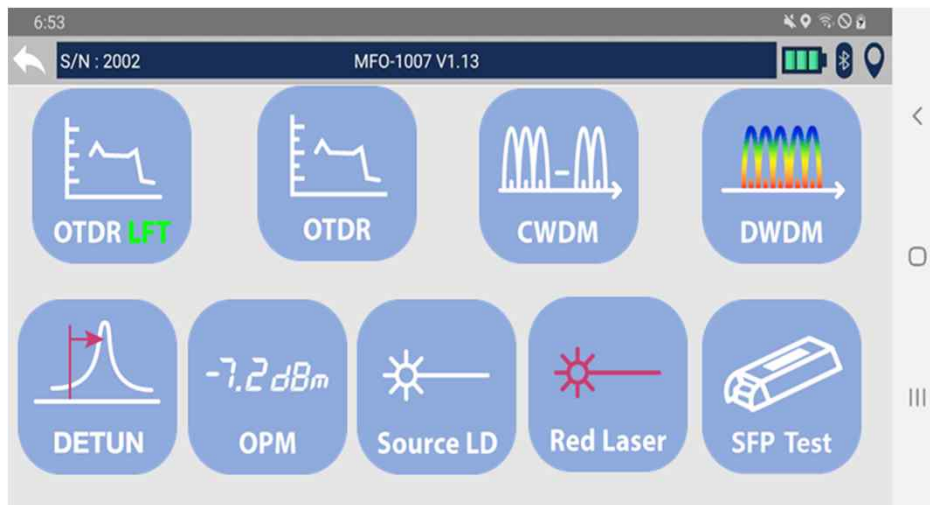
5. Android User Interfaces



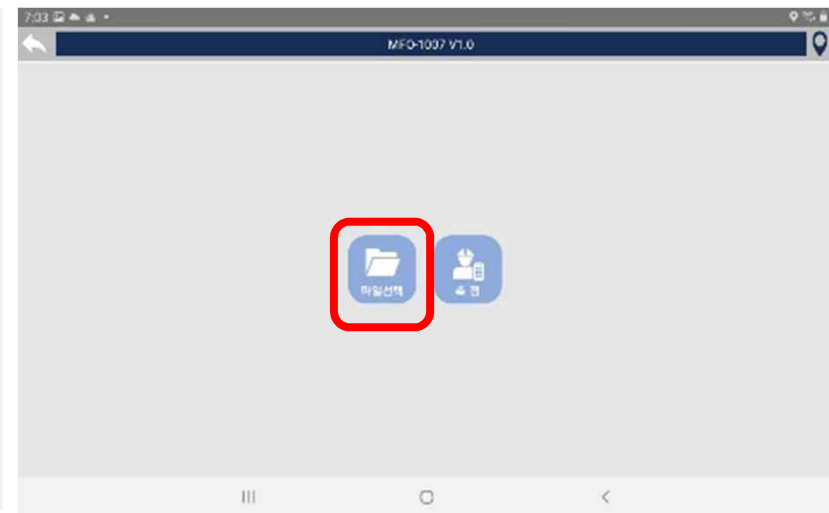
Start Screen



Setup for interfaces

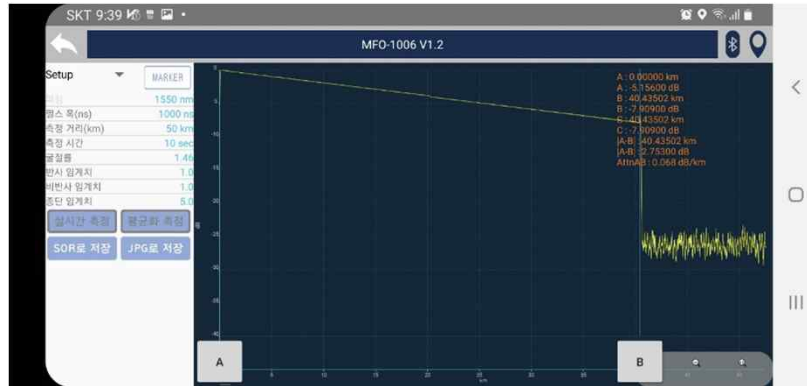


Function Selection
Interfaces

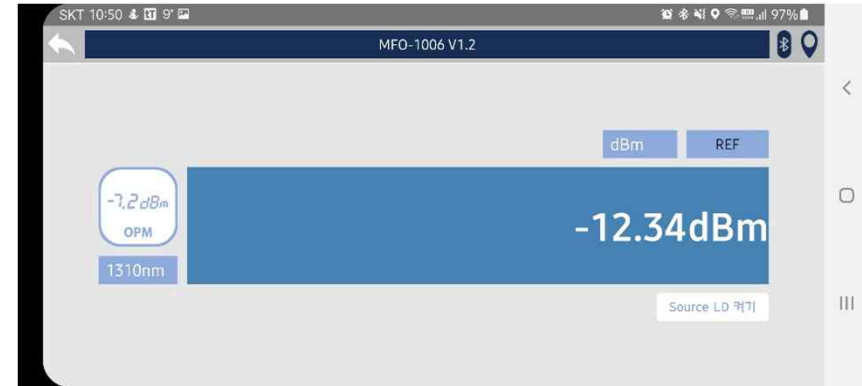


OTDR file retrieve

5. Android User Interfaces



OTDR/OTDR LFT



OPM

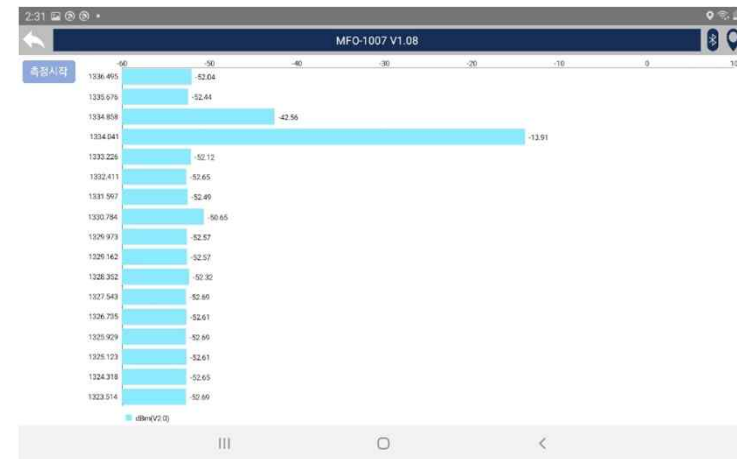
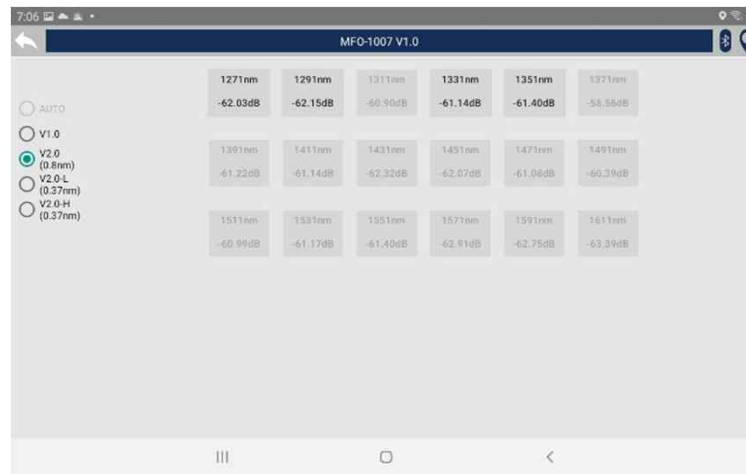


Laser Source



Fault Finder

5. Android User Interfaces



5G-PON DWDM Channel Checker

CWDM Analyzer

5. Android User Interfaces



Detuning Function



SFP Tester



6. Specifications

6. Specification

- General

Function	Item	Specification
Interfaces	Bluetooth / USB-C	
Display	OLED	
Charging	5V / 3A	
Charging Time	< 6 Hours	< 3Hr for 75%
Continuous Using Time	> 6 Hours	Excluding SFP measurement
Dimension	101(W) X 216(H) X 52(T) mm	
Weight	< 900 g	
Operating Temp.	-10 °C ~ 60 °C	
Storage Temp.	-20 °C ~ 60 °C	
Battery	> 10,000 mAh	

6. Specification

- Optical

Function	Item	Specification	Description
OTDR	Wavelength	1550/1625 nm	Support LFT
	Dynamic Range	32/32 dB	
	Pulse Width	10 ~ 20,000 ns	
	Averaging Time	1 ~ 300 sec	
	Event Dead zone	≤ 3 m	
	Attenuation Dead zone	≤ 10 m	
	Optical Connector Type	SC/APC	
	Distance Measurement Accuracy	± 5 m	
	Live Fiber Test	Available	
CWDM	Wavelength	18 Channel(1271 ~ 1611 nm)	
	Spectral Resolution	20 nm	
	Test Time	≤ 5 sec	
	Accuracy	± 1.5 dB	
	Dynamic Range	> 40 dB	
	Display Resolution	0.01 dB	
Laser Source	Wavelength	1550 nm	
	Output Power	> -3 dBm	
	Optical Connector Type	SC/APC	

6. Specification

■ Optical

Function	Item	Specification	Description
DWDM	Center Wavelength	- O-Band : 1263 ~ 1357 nm - E/S-Band : 1402 ~ 1497 nm - C/L-band : 1502 ~ 1605 nm	
	Channel Spacing	0.8, 0.4nm	
	Accuracy	± 1.5 dB	
	Measurement Range	+10 ~ -30 dBm	
OPM	Spectral Range	1200 ~ 1700 nm	
	Detect Type	InGaAs	
	Test Range	-60 ~ 10 dBm	
	Display Resolution	0.01 dB	
	Accuracy	± 1.0 dB	
	Optical Connector Type	FC/APC	
Fault Finder	Wavelength	650 nm	
	Laser type	Fabry-Perot	
	Output Power	≥ 20 mW	
	Optical Connector Type	SC/APC	

6. Specification

- Optical

Function	Item	Specification	Description
Detuning	Center Wavelength	- O-Band : 1263 ~ 1357 nm - E/S-Band : 1402 ~ 1497 nm - C/L-band : 1502 ~ 1605 nm	
	Accuracy	< ± 0.1 nm	
	Measurement Range	< Center Wavelength ± 0.4 nm	
SFP Tester	Tx Power	SFP Tx Power	
	Rx Power	SFP Rx Power	
	Wavelength	SFP Laser Wavelength	
	Vender Name	SFP Manufacturer	
	Vender PIN	SFP Model Number	
	Vender SN	SFP Serial Number	



Thank you.