

Optical Distance-To-Fault Accessory Module

ODTF-1

Introduction

The ODTF-1 module is primarily intended for field use by technicians and engineers responsible for the deployment and maintenance of remote radio heads (RRH). The majority of next generation high speed data networks are being deployed with fiber between the main and remote unit creating a need for contractors to sweep both RF and fiber systems.

The ODTF-1 module connects to Anritsu's handheld cable & antenna analyzers equipped with a DTF measurement.

Users will need to connect a short cable between the RF output of the VNA and the ODTF-1 module and perform a 1-port calibration at the end of the cable. The same physics that apply to the traditional DTF measurements apply to ODTF-1 meaning highly accurate measurements can be made with event resolution as good as 10 cm. The same trade-offs carry over as well so better event resolution translates to shorter maximum distance, and vice-versa. Max distance is specified at 1020 meters (3345 ft).

Site Master S33XD/S31XD and Cell Master MT8212B are equipped with a special Optical DTF mode ($F/W \geq 5.23$). This mode is very similar to a normal DTF mode but is designed specifically to simplify the setup for optical users.

Customers can still use the BTS Master, Site Master S3xxE and Cell Master without an optical DTF mode by using the normal DTF mode and modifying some of the parameters such as vp, cable loss, and frequency.

The battery life of the ODTF-1 module matches the battery life of the Site Master. It can be charged with the same 40-168-R power supply so there is no need to maintain different power supplies.



Key Features & Benefits

Features	Benefits
No Training	No need for RF techs to learn about OTDR's. The ODTF measurement is very similar to the familiar RF DTF measurement.
Easy to Use	Site Master and Cell Master products are equipped with an ODTF mode that allows users to make fiber measurements with minimal user entries.
Easy Upgrade	Customers who already have a Site Master can get a high accuracy fiber solution at a very low cost
10 cm Event Resolution	Monitor closely spaced events.

Specifications

Performance	
Wavelength	1550 nm typical
Frequency Range	1 GHz to 2 GHz
Fiber Type	Single Mode Fiber (SMF)
Event Resolution	10.2 cm (0.335 ft) maximum, or $150/(n \cdot \Delta F)$, ΔF in MHz, n is IOR
Horizontal Range	1020 meter (3345 ft) maximum, or $(\#dp-1) \cdot \text{Event Resolution}$
Optical Dynamic Range	30 dB
Optical Output Power	3 dBm typical

Input and Output Ports	
RF Connector	N(m)
Max RF Input Power	+ 5 dBm
Optical Connector	FC/APC

General Specifications	
External DC Input	+12.5 to +15 VDC, 3A maximum
Electromagnetic Compatibility	Meets European Community requirements for CE marking
Temperature	Operating: 0 to 50 °C Non-operating: 0 to 70 °C recommended

Dimensions	
Size	15.7*5.37*18.6 cm (6.18*2.1*7.3 in.)
Weight	< 1 kg (2.2 lbs)

Ordering Information

The following optional items can be ordered for the ODTF-1:

- 15NNF50-1.5C Armored Test Port Cable, 1.5 meter, N(m) to N(f)
- OSLN50-1 Precision Open/Short/Load, DC to 6 GHz, 42 dB Return Loss

Frequency Domain Reflectometry

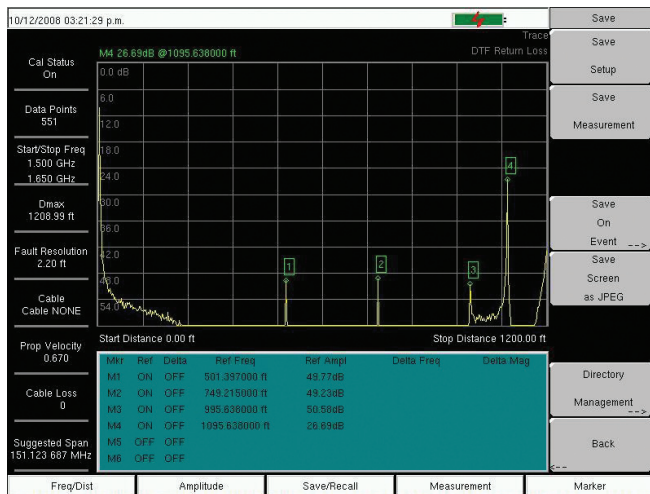
The handheld instruments operate in the frequency domain and converts data to the time domain. The following relationships illustrate the trade-offs between MaxRange and Event Resolution

$$\text{Event Resolution: } \frac{150 * v_p}{\Delta F} \text{ OR } \frac{150}{\text{IOR} * \Delta F}$$

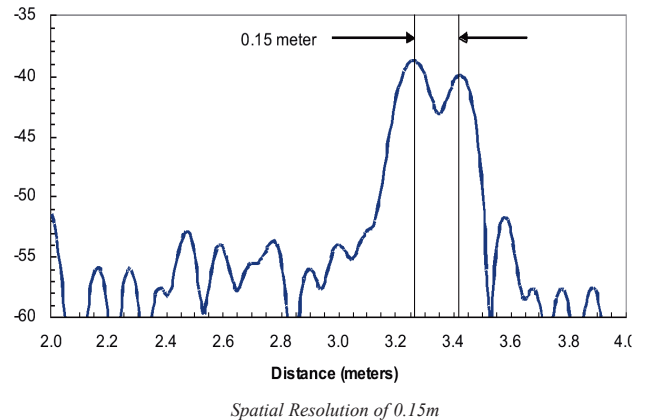
(v_p is the propagation velocity, ΔF is the frequency in MHz, IOR is the index of refraction)

Max Range: $(\#Data\ Points - 1) * \text{Event Resolution} \geq$

$$\frac{150 * (\#DataPoints - 1)}{\text{IOR} * \Delta F}$$



ODTF measurement of 500, 250, 250, 100 ft. fiber



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