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PRODUCT INTRODUCTION

MT9080 Series

ACCESS Master

ANRITSU CORPORATION

MBP-1SG040150-02

Product Introduction

MT9080 Series ACCESS Master

Sep 8th 2005

IP Network Division

Product Marketing dept.

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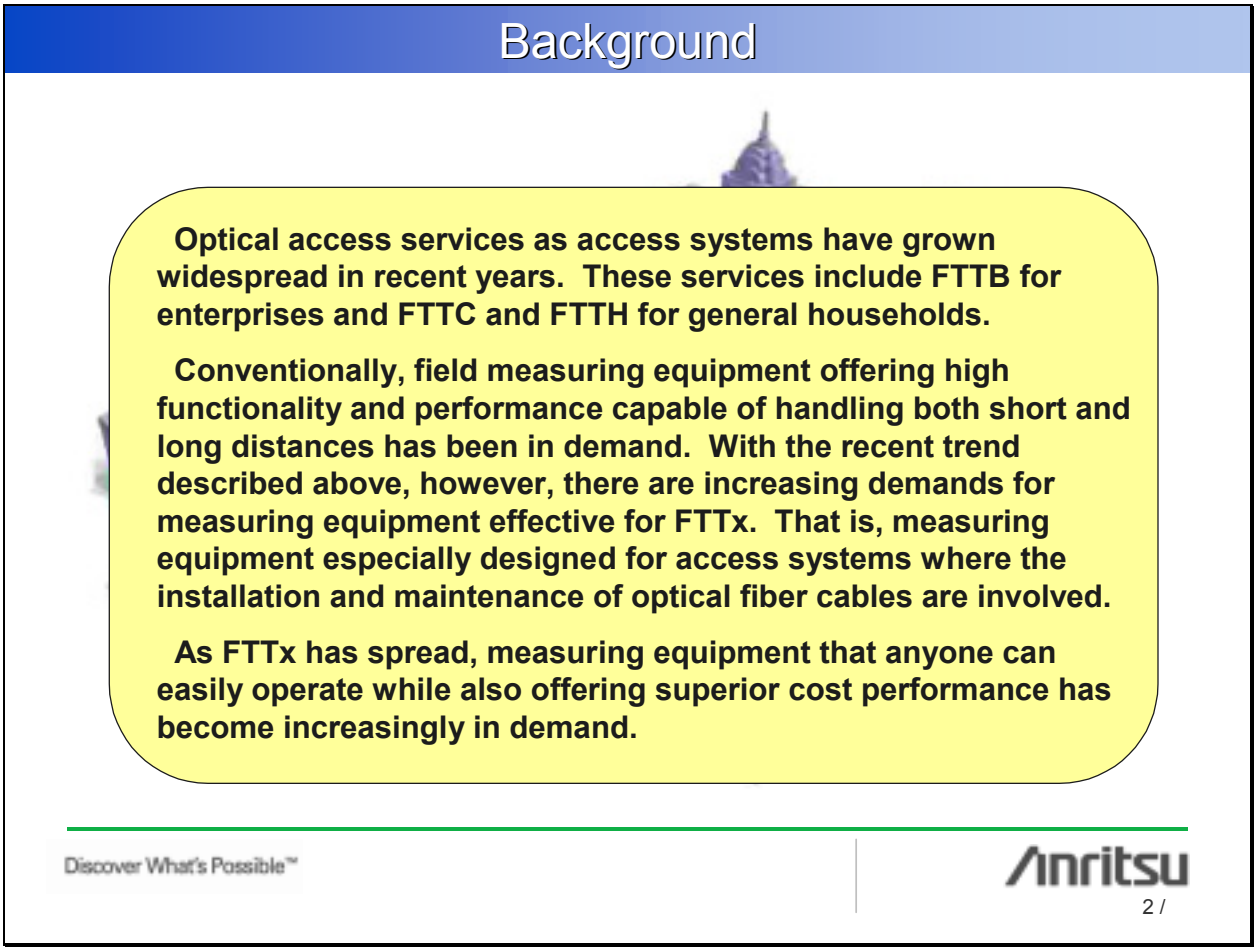
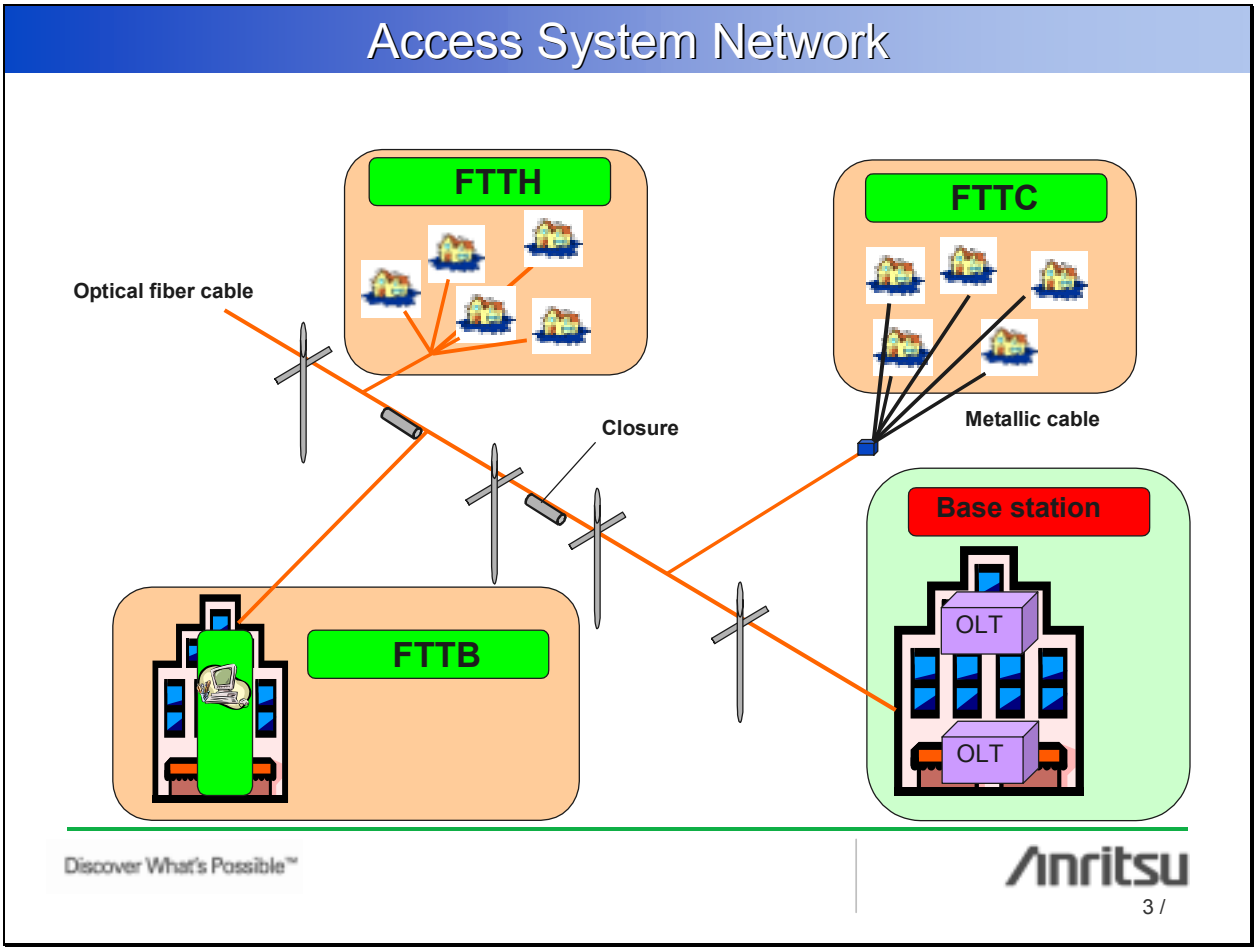
Anritsu Corp. has developed the MT9080 Series ACCESS Master. At this time, we would like to introduce the product and its applications.



Optical access services as access systems have grown widespread in recent years. These services include FTTB for enterprises and FTTC and FTTH for general households.
Conventionally, field measuring equipment offering high functionality and performance capable of handling both short and long distances has been in demand. With the recent trend described above, however, there are increasing demands for measuring equipment effective for FTTx. That is, measuring equipment especially designed for access systems where the installation and maintenance of optical fiber cables are involved.
As FTTx has spread, measuring equipment that anyone can easily operate while also offering superior cost performance has become increasingly in demand.

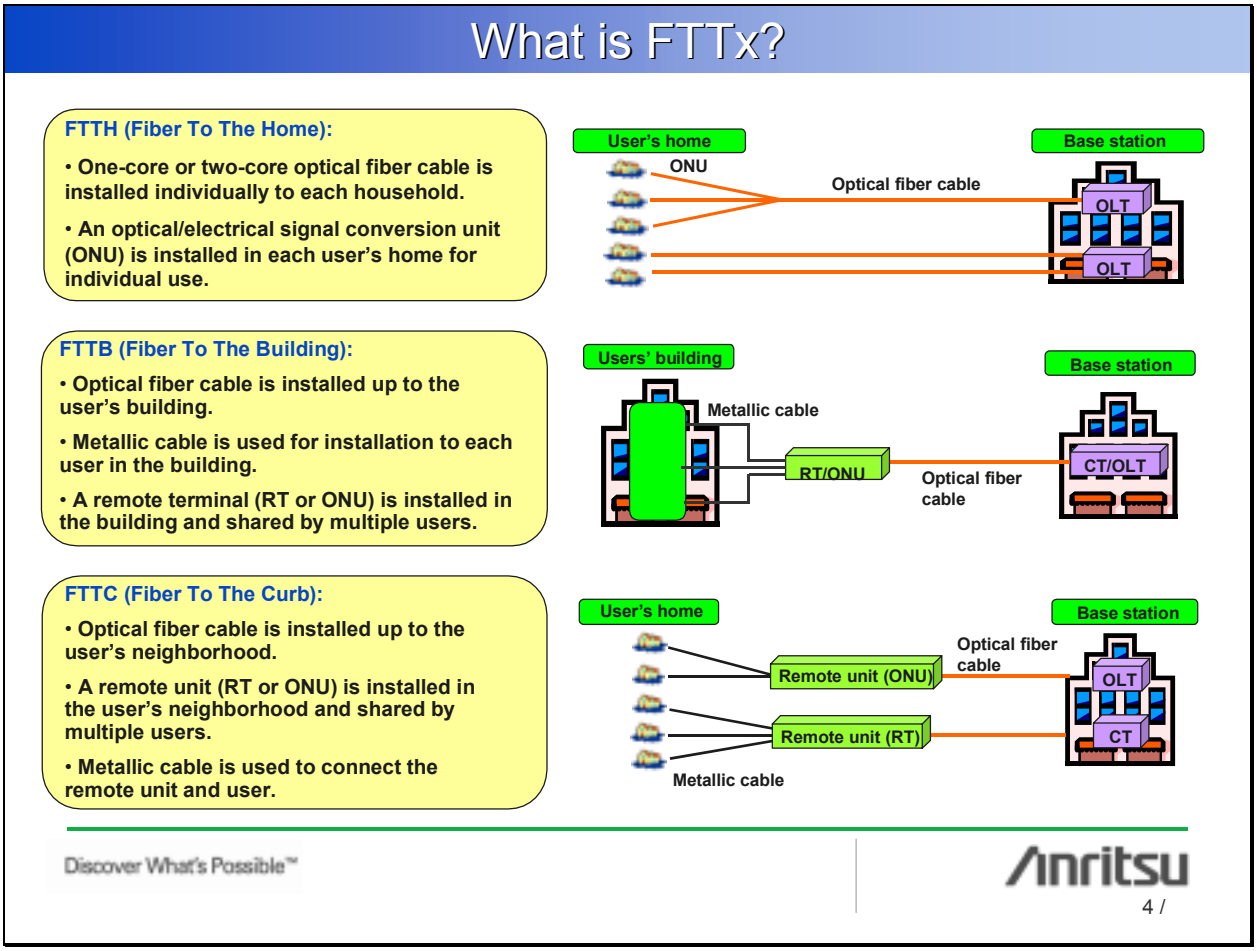


Optical fiber cables have conventionally been used for long-distance communications. However, with the growing use of the Internet by businesses and general households in recent years, coupled with demands for increased capacity such as for the distribution of images, the need for optical fiber cable for the last mile has increased. The optical fiber communications market was previously centered on long-distance usage. Today, however, long-distance usage accounts for only about 10% of the overall optical fiber communications market. Communication enterprises are now looking for profits in metro access networks.

Given this background, FTTx for access systems has seen a huge expansion in recent years resulting in increased demands for access system measuring equipment designed specifically for the installation and maintenance of fiber cable. The ACCESS Master is particularly effective as measuring equipment for the installation and maintenance of optical fiber cable in the access system FTTx field.

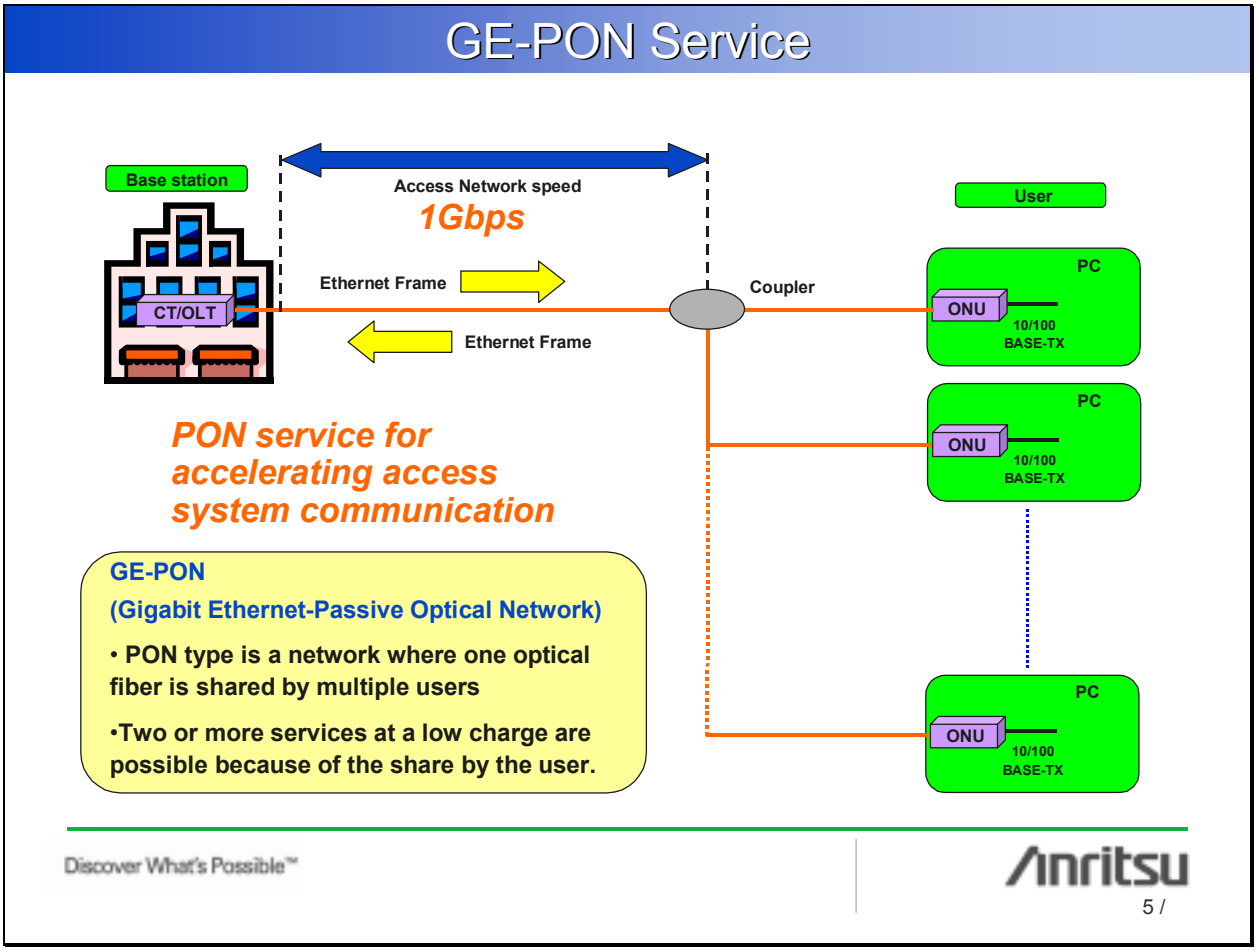
The FTT in FTTx stands for Fiber To The. How the fiber cable is to be used determines what will replace the letter x.

FTTH, FTTB, and FTTC each have different configurations and characteristics.



The FTT in FTTx stands for Fiber To The.　How the fiber cable is to be used determines what will replace the letter x.

FTTH:　A method of installing optical fiber cable to the home.　FTTH is the final configuration of access networks using optical fiber cable.　FTTH consists of a single optical fiber cable from the base station to the home.　The optical/electrical signals are converted and connection to the user's PC via an Ethernet card.
FTTB:　Optical fiber cable is installed up to the M/C installed within the building.　A LAN or existing telephone metallic cable is then used to connect to the user.
FTTC:　A method of installing optical fiber cable by the curb near the user's home.　An optical communications system is then used between the remote unit (optical signal/electrical conversion unit) installed outside (such as near the curb or on a telephone pole) from the installation center.　Finally, coaxial or other similar cable is used between the remote unit and user.



PON type FTTH is a network where one optical fiber is shared by multiple users. The optical fiber is branched using optical couplers along the route.
Because the total length of the optical fiber can be controlled even if the number of users increases, the ability to build FTTH economically is one of its features. Generally, the upload and download wavelengths are split using a WDM. A TDM is used for the download bandwidth and a TDMA is used for the upload bandwidth to share the optical fiber.

MT9080 Series Performance and Function Introduction

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MT9080 Series Product Outline (1)

MT9081x(color, TFT-LCD) / MT9081x1(monochrome-LCD)

MT9080x (monochrome-LCD)

Installation and maintenance of fiber for access systems

- **Short dead zone less than 1.0m (event)**
- **Lighter, more compact than the MW9076 Series**
- **Light source and optical power measurement functions installed as standard**
- **Simple operation from top menu**
- **Built in IP network connection check function**

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In our long-running Anritsu MW9076 Series, we have provided our customers with several models of highly functional, high-performance measuring equipment capable of handling both short and long distances. In recent years, however, we have seen the popularization of regionally- and usage-dependent FTTx (FTTB, FTTC, and FTTH), and the advancement of access network services both in corporations and in the home. Of course, these access network services do not always require long distance, advanced functions, or high performance specifications.

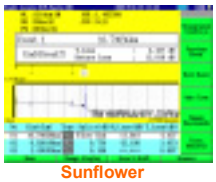
Therefore, for the purpose of installing and maintaining short-distance access optical fibers in particular, we have introduced the MT9080 Series as high-resolution measuring equipment.

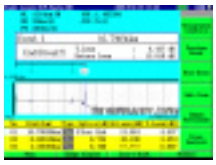
Among the features of the MT9080 Series is a short dead zone (event) of less than 1.0 m. The MT9080 Series is thus extremely effective for determining the locations of nearby fault points.

Assuming that the MT9080 Series will be used for work involving access systems, we also made it lighter and more compact than the conventional Mini-OTDR (254 (W) x 162 (H) x 61 (D) mm and weighing 2.2kg).

Finally, the core wire reference light source and optical power measurement functions for each wavelength type are installed as standard.

MT9080 Series Product Outline (2)

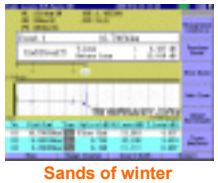

Sunflower


Marine blue


Grassy plain


Rose


Lavender


Sands of winter


Monochrome(White base)


Monochrome(Black base)

Simple operation using function and panel keys

Screen layout colors can be chosen for system settings with the MT9081x

Display
MT9081x
6.4 inch color TFT (recommended for inside use)
MT9081x1 / MT9080x
6.2 inch monochrome LCD (recommended for outside use)

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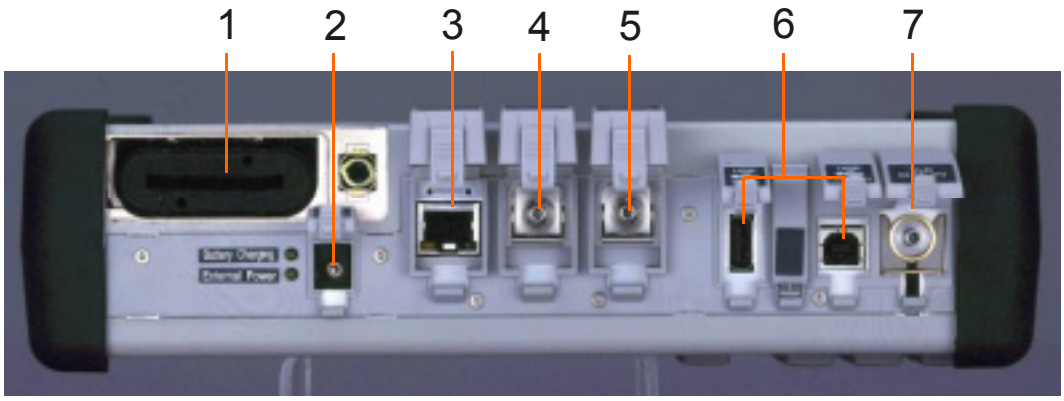
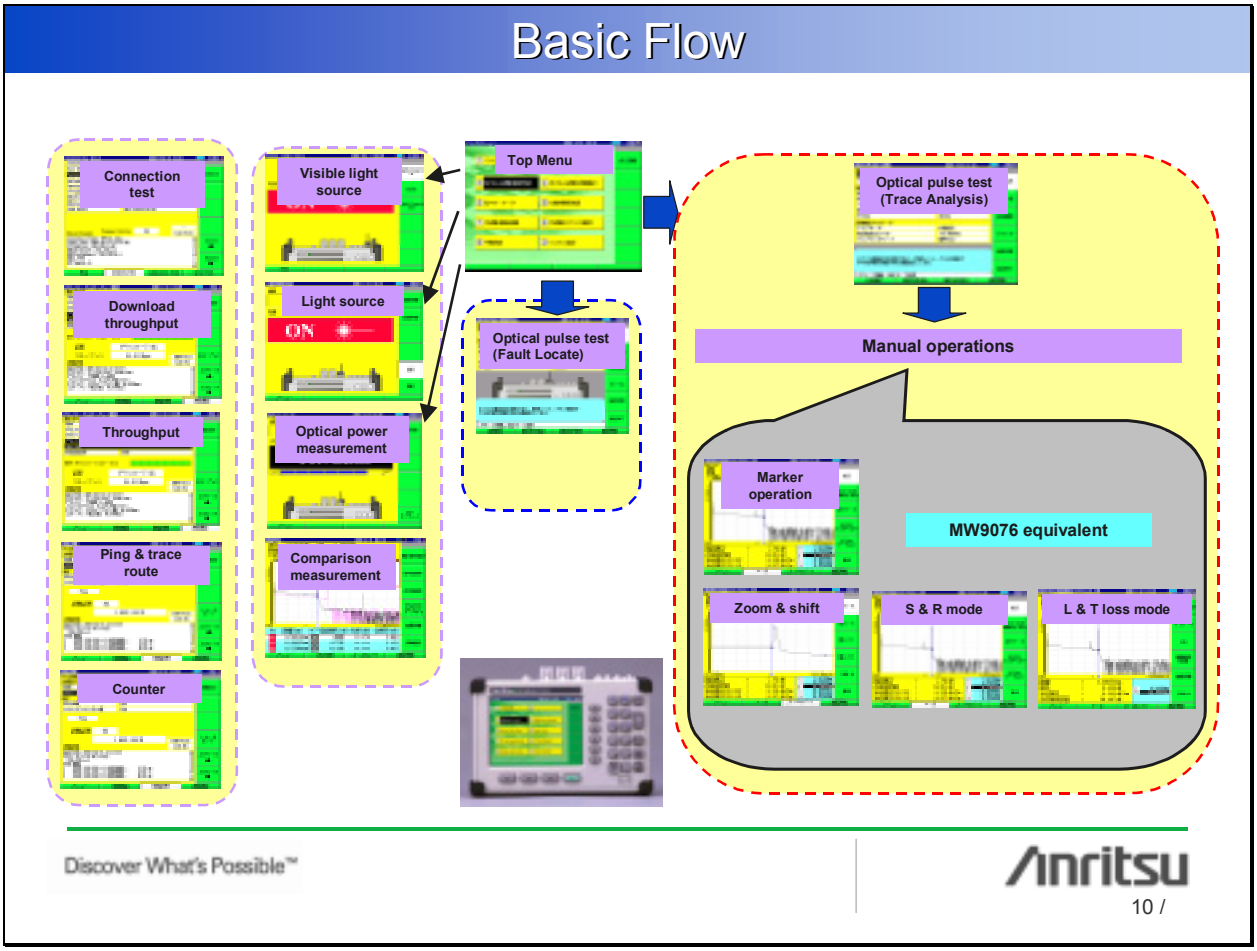
The MT9080 Series ACCESS Master is mainly operated using the function and panel keys.
The MT9081x1/MT9080x have a 6.2-inch monochrome LCD which is good for use outside in direct sunlight.
The MT9081x has a 6.4-inch color LCD allowing the system settings screen layout to be displayed in a favorite color pattern and providing good indoors visibility.

MT9080 Series Product Outline (3)



1. Battery pack
2. AC Adapter connector
3. IP Network connection check function port (option install)
4. OTDR, light source, optical power measurement connector (1.65 µm)
5. OTDR, light source, optical power measurement connector (1.31/1.55 µm)
6. USB Port
7. Visible light source connector (option install)

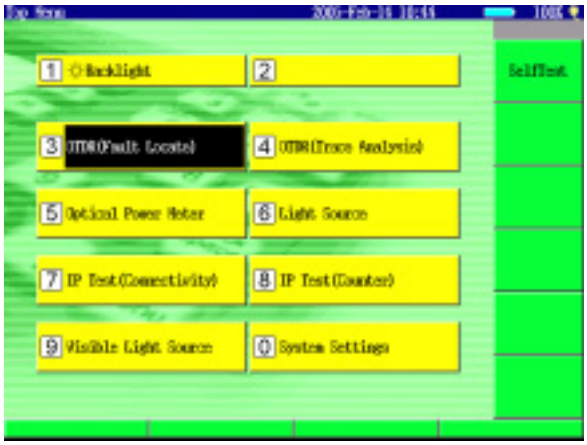
These are the connectors and the interface section.



This is the basic flow of the MT9080 Series ACCESS Master.
The Top Menu appears when power is turned on.　From the Top Menu, first select the measurement items and functions to be used.
These are roughly classified as the optical pulse test (fault Locate), optical pulse test (Trace Analysis), light source functions, optical power measurement functions, IP network connection check functions, and file handling functions.

Easy Operation From the Top Menu

Select measurement and setting contents from the Top Menu



- **Optical pulse test (Fault Locate)**
- **Optical pulse test (Trace Analysis)**
- **Light source**
- **Optical power measurement function**
- **Visible light source function (option)**
- **IP network connection check function (option)**
- **File read function, etc.**

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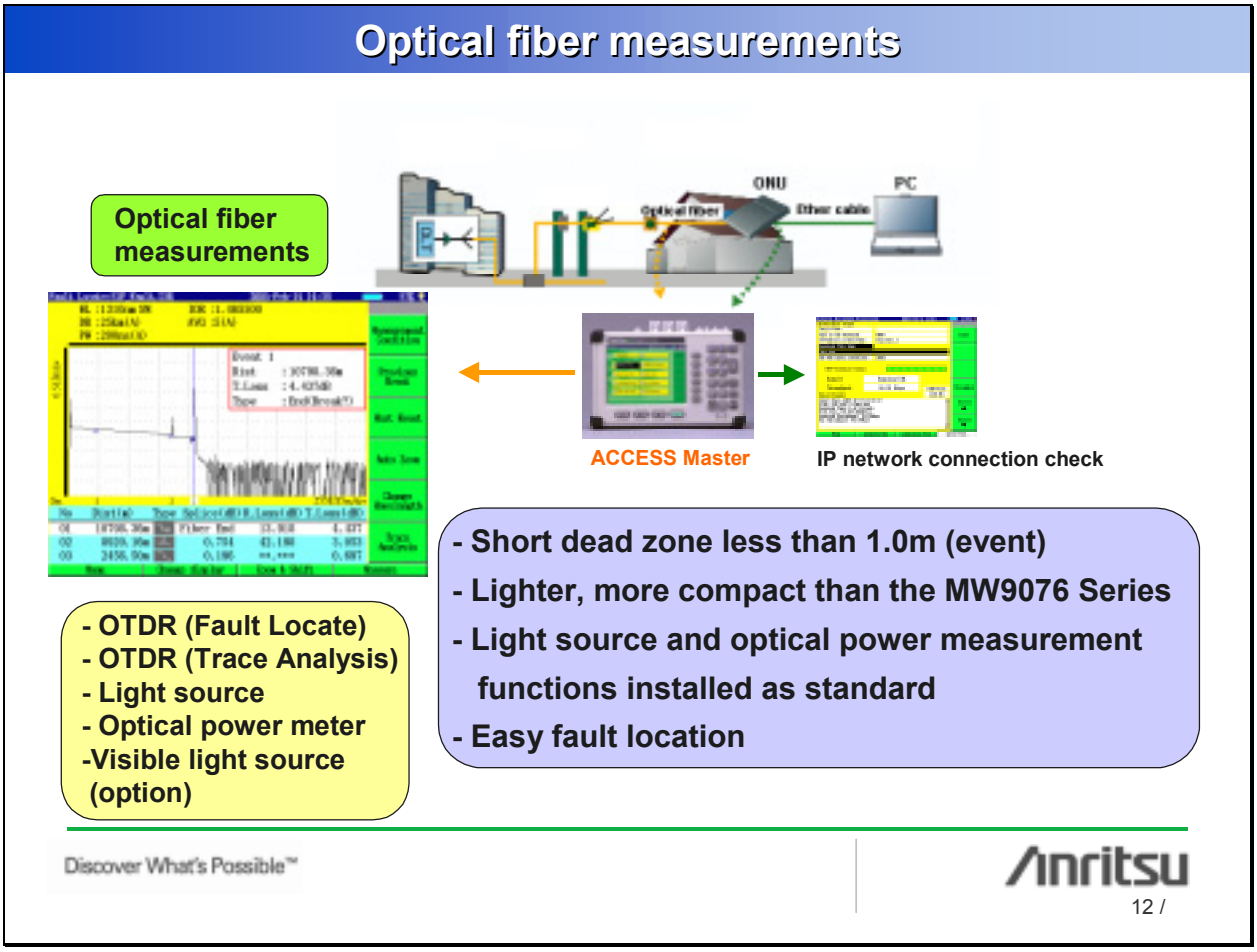
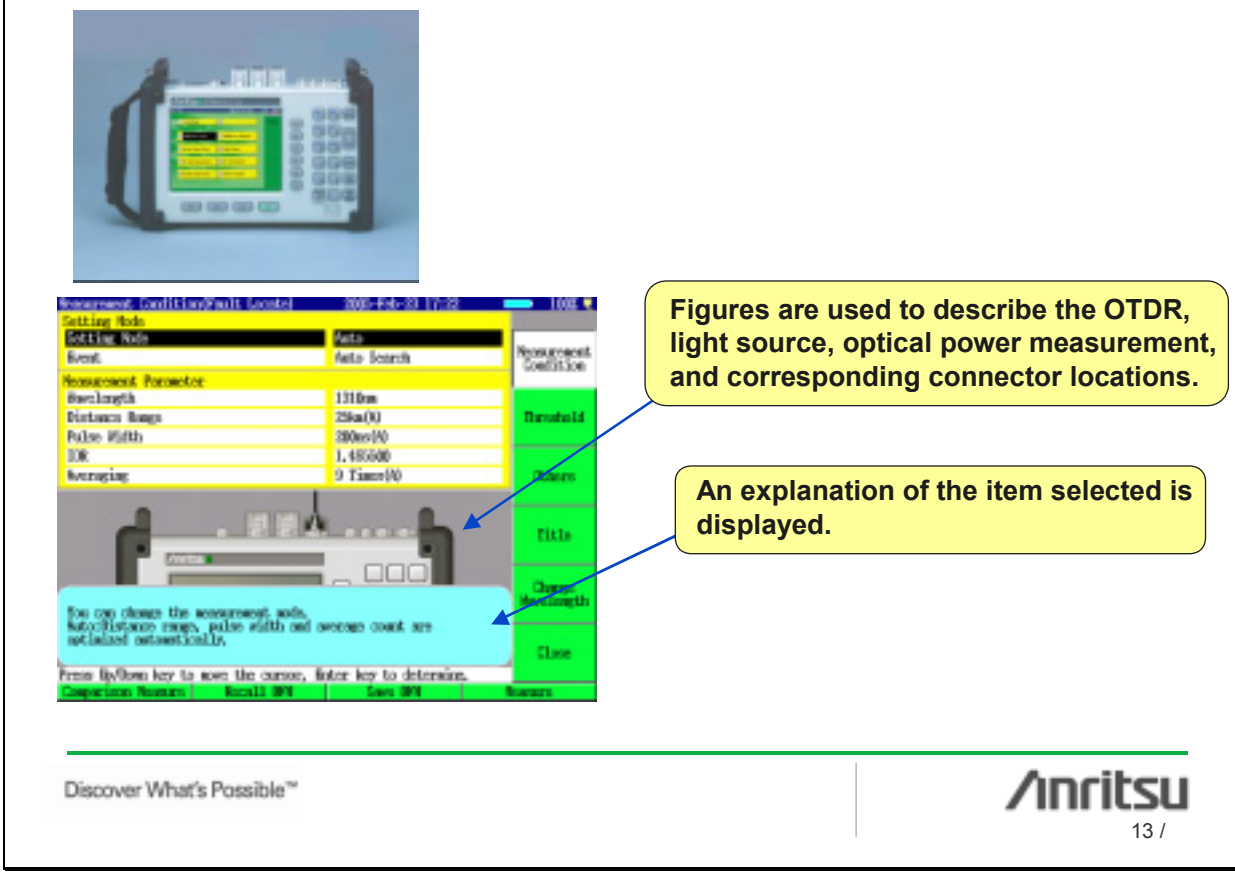
The Top Menu initially appears when the power of the MT9080 Series ACCESS Master is turned on. The Top Menu displays the measurement and setting items. (Optional products such as the visible light source are displayed only if installed.)
The customer can select the function to be performed from optical pulse test (fault Locate), optical pulse test (Trace Analysis), light source function, optical power measurement function, IP network connection check functions , file read function, etc.
As described above, easy operation is one design concept of the ACCESS Master. We have designed the ACCESS Master so that all customers can perform operations smoothly.
Except at specific times such as during measurements, the Top Menu button of the panel keys can be pressed to return to the Top Menu. To go to another measurement item or determine which section is currently operating, simply go to the Top Menu.



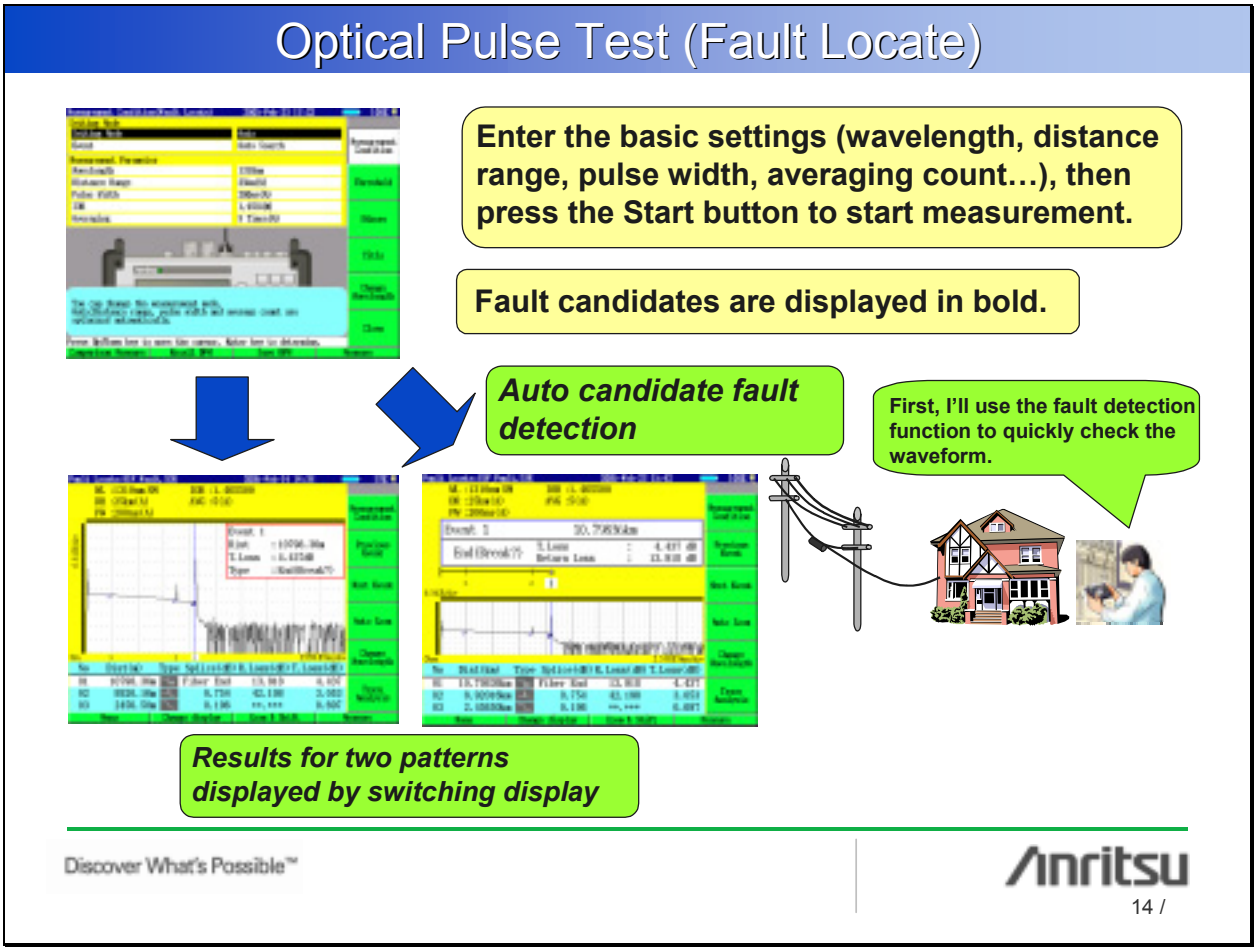
With the MT9080 Series ACCESS Master, optical fiber tests using the OTDR, light source, and power meter as well as IP network connection checks using the network check functions can be performed with a single instrument.
Optical fiber tests are performed using the built-in OTDR, light source and power meter. A visible light source option can be installed too. The OTDR function has an event dead zone of less than 1.0 m enabling connection checks of much shorter optical fibers than previously possible.



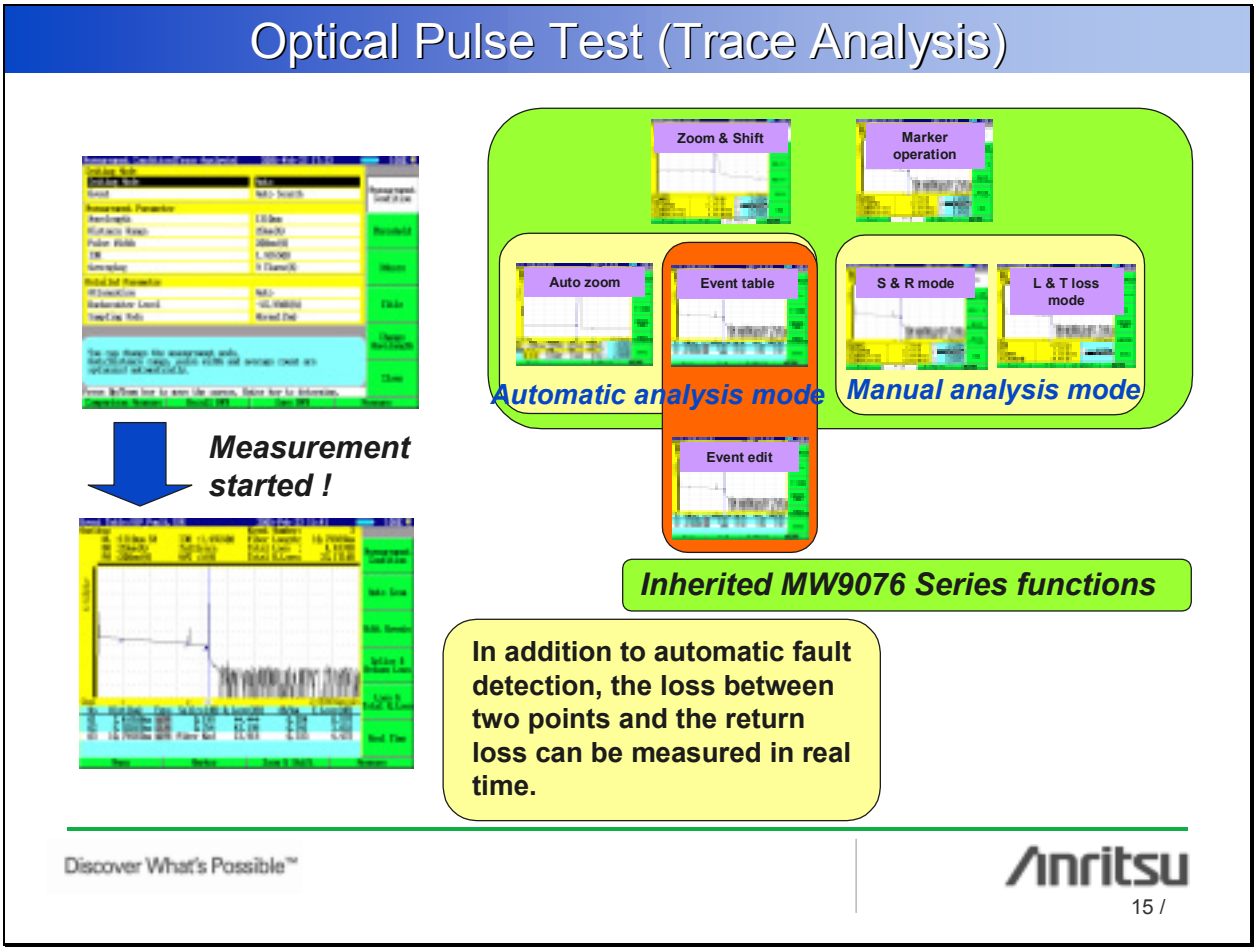
Easy operation by anyone is one design concept of the MT9080 Series ACCESS Master. Figures and explanations are provided in the settings and measurement windows of each measurement operation.

For example, although the ACCESS Master has three connector connection sections, the output and receiving light sections are divided by the light source and power meter. The connector connection section of measurement currently being performed is displayed.　Moreover, because an explanation of the function currently selected is displayed, even first-time users can easily perform basic operations.

The following slides briefly describe each function of the menu items.

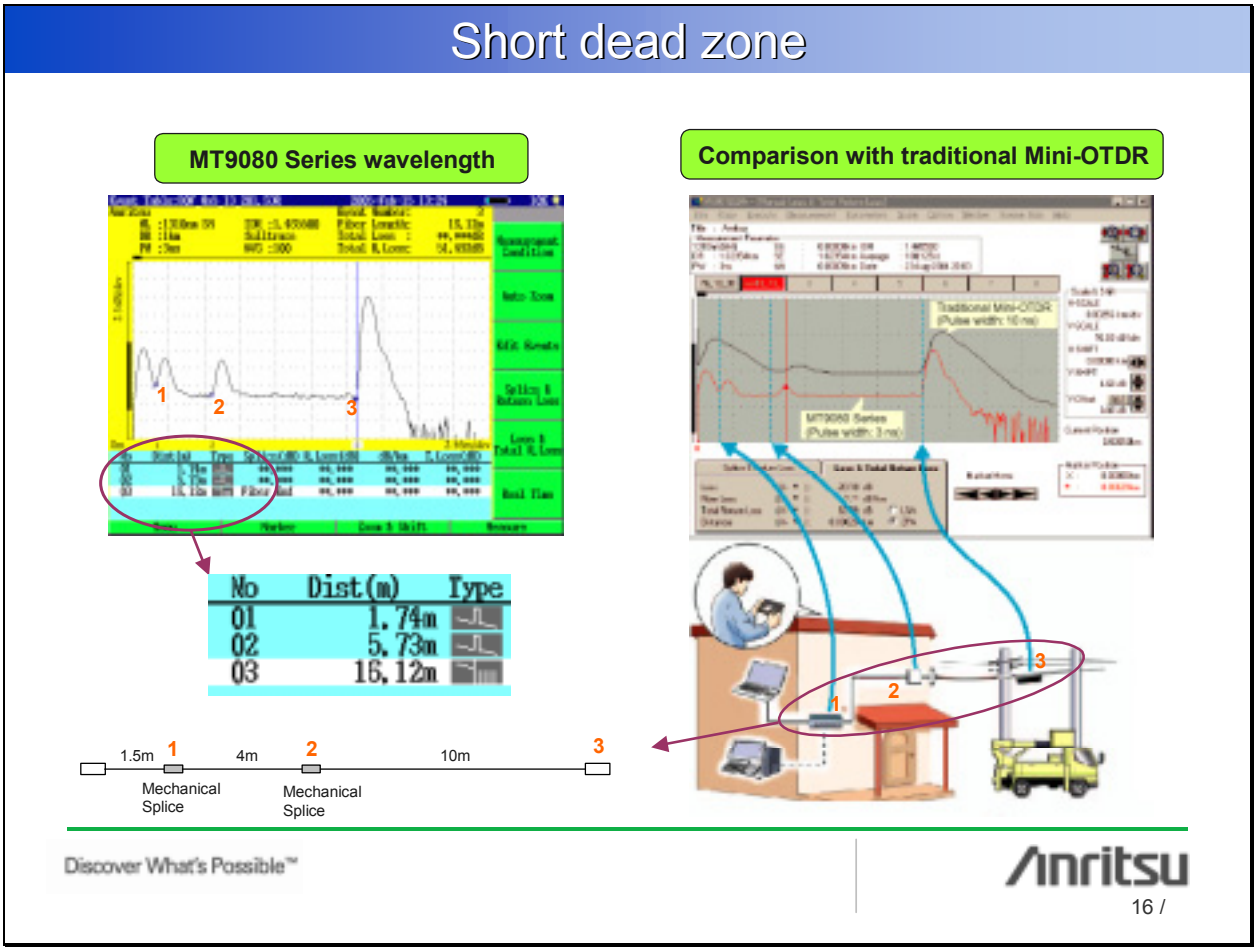


For the optical pulse test (Fault Locate), select the wavelength to use, and enter the basic settings (e.g., pulse width, distance range, averaging count), which can also be set automatically. Then simply press the Start button to obtain the measurement result. Values such as distance up to the fault point, total loss, and connection loss and reflection at each detected fault point are obtained for the measurement result.
If an obviously different fault point due to noise or other cause is detected, the user can also go to the optical pulse test (Trace Analysis) and edit the waveform obtained from the fault locate.
The optical pulse test (Fault Locate) is effective for quickly detecting fault points without needing a detailed waveform such as the one used for the optical pulse test (Trace Analysis).
The optical pulse test (Fault Locate) is also easy to set up and conduct. Operator skills such as those needed for OTDR are not required. The ACCESS Master also does not require intensive training at the worksite. Anyone can easily operate the ACCESS Master.



The optical pulse test (Trace Analysis) provides important measurement items for which results are retained not only for fault judgment, but also as accurate waveform data. The waveform output as the result of the test depends on the specified pulse width, averaging count, etc. Moreover, event errors can be detected depending on the measurement and setup conditions. In this case, the waveform data must be corrected.
For fiber conductivity tests, it is also necessary to retain accurate waveform data for comparing waveforms for later maintenance should any problems occur. At this time, the optical pulse test (Trace Analysis) can be conducted for detecting problems by manual operation or measurement.

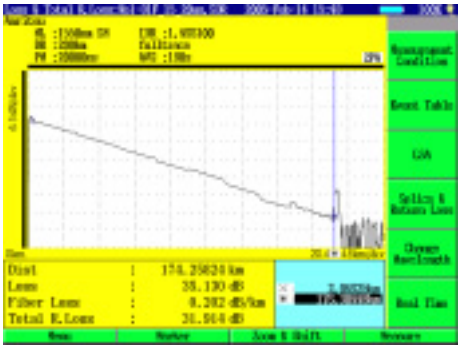
For the optical pulse test (Trace Analysis), event editing can be performed on the measurement waveform obtained by automatic measurement to edit error-detected sections. Connection loss and reflection attenuation amount measurements, as well as loss and total loss measurements can also be performed manually.
The waveform can be edited and measured while using the zoom & shift and marker operation functions.
These optical pulse test (Trace Analysis) functions are equivalent to those of the MW9076 Series. Compared to the optical pulse test (fault Locate), these operations require nearly the same level of skill and training as those for OTDR. However, operations can be smoothly performed by simply selecting items from the function and panel keys.



The ACCESS Master has a short dead zone (event) of 1.0 m. Making a short dead zone of events enables the locations of nearby fault points to be determined.
For example, when there are connection points within a 1-m connector interval on the evaluation path, the ACCESS Master can recognize them as two fault points. For OTDRs that have a dead zone exceeding 1 m, the OTDR will recognize them as one fault point. As such, our ACCESS Master offers higher functionality as a measuring instrument than conventional Mini-OTDRs offered by other companies. Moreover, the dead zone of backscattered light is 7.5 m (1.31 μm).

Features of MT9081x/x1

Wide dynamic range support



The MT9081x / x1 even supports accurate far-end measurement of SM fiber (1.55 um) up to 170 km in length

MT9081A/A1
38.5 dB (1.31 um)
MT9081B/B1
37.0 dB (1.55 um)
MT9081C/C1
33.5 dB (1.65 um)
MT9081D/D1
38/36.5 dB (1.31 / 1.55 um)
MT9081E/E1
36/33.5 dB (1.55/1.65 um)
MT9081F/F1
37.5/36/33.5 dB (1.31/1.55/1.65 um)
MT9081G/G1
36/34.5/34.5 dB (1.31/1.49/1.55 um)

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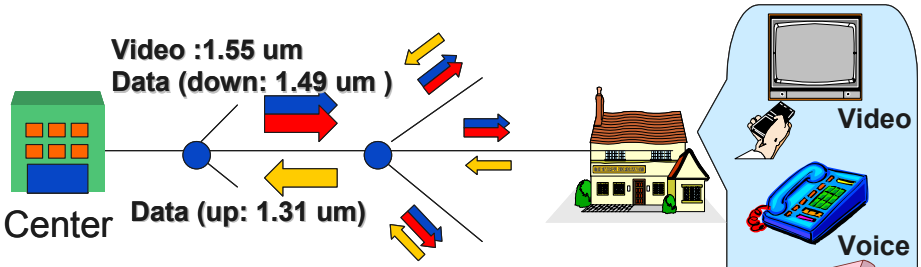
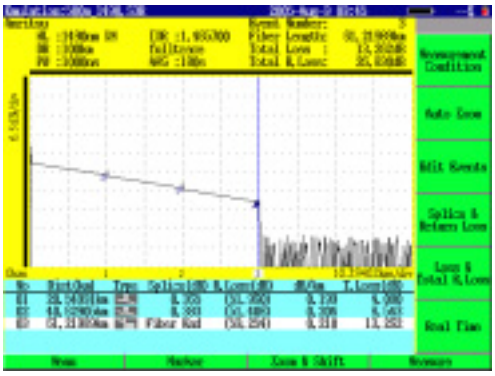
The MT9081x/x1 models in the MT9080 series support wide dynamic range measurements of access systems. The MT9081D/D1 has a dynamic range of 38 dB/36.5 dB (1.31/1.55 um).
And the MT9081x / x1 even supports accurate far-end measurement of SM fiber (1.55 um) up to 170 km in length.

MT9081G/G1 for B-PON,GE-PON and G-PON

For Fiber Evaluation of all the PON wavelength





Dynamic range 34.5dB at 1.49um

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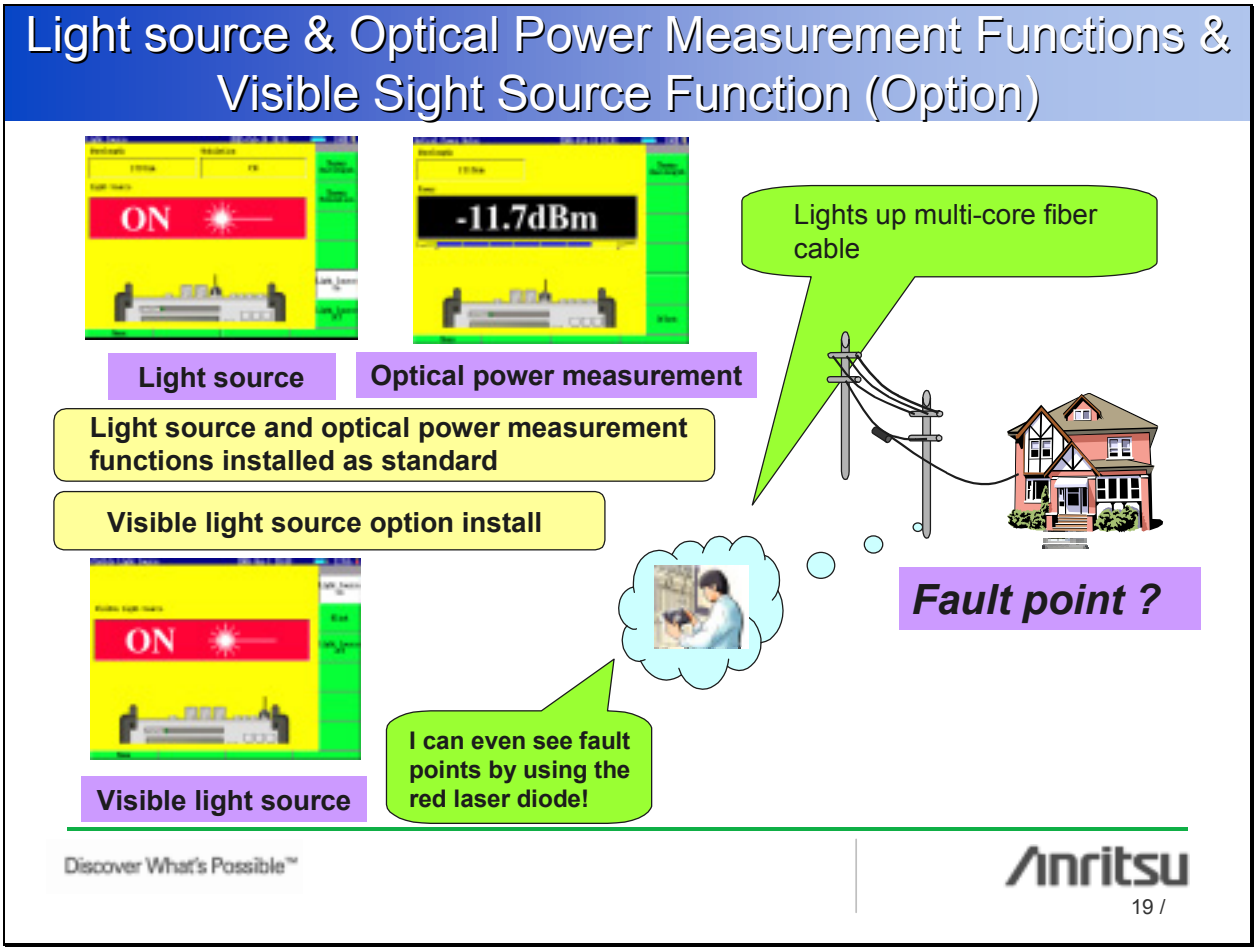
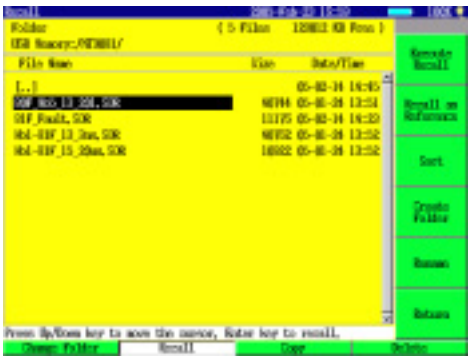
Triple Play Service of Data, Phone and TV, will become Main Stream Service in FTTP. This Service is based on B-PON, G-PON and GE-PON. In PON-System, 1.31um, 1.49um and 1.55um wavelength for up-down stream and video are used in its Service. Usually, Evaluation of Optical Fiber is necessary at construction stage by in-Service wavelength. MT9081G/G1 has a capability to measure fiber characteristics at the all wavelength of PON system, especially 1.49um.



The light source and optical power functions are particularly important when installing and maintaining fiber cables.
The MT9080 Series ACCESS Master has light source and optical power meter measurement functions installed as standard. The light source and optical power meter measurement operations can easily be performed by simply selecting the desired operation from the Top Menu, then following the displayed figures and explanations.

A visible light source is provided as an option. The visible light source is installed completely inside the equipment to form an all-in-one measuring device capable of handling optical fiber cable installation and maintenance as a single unit.

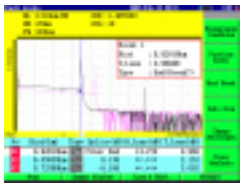
File Read and Storage



More than 1000 waveforms can be stored in internal memory.

When using USB memory, more than 30000 waveform files can be stored (512M bytes).

Effective for comparing the data stored at installation with the waveform data at error occurrence.



Comparison with previous maintenance data

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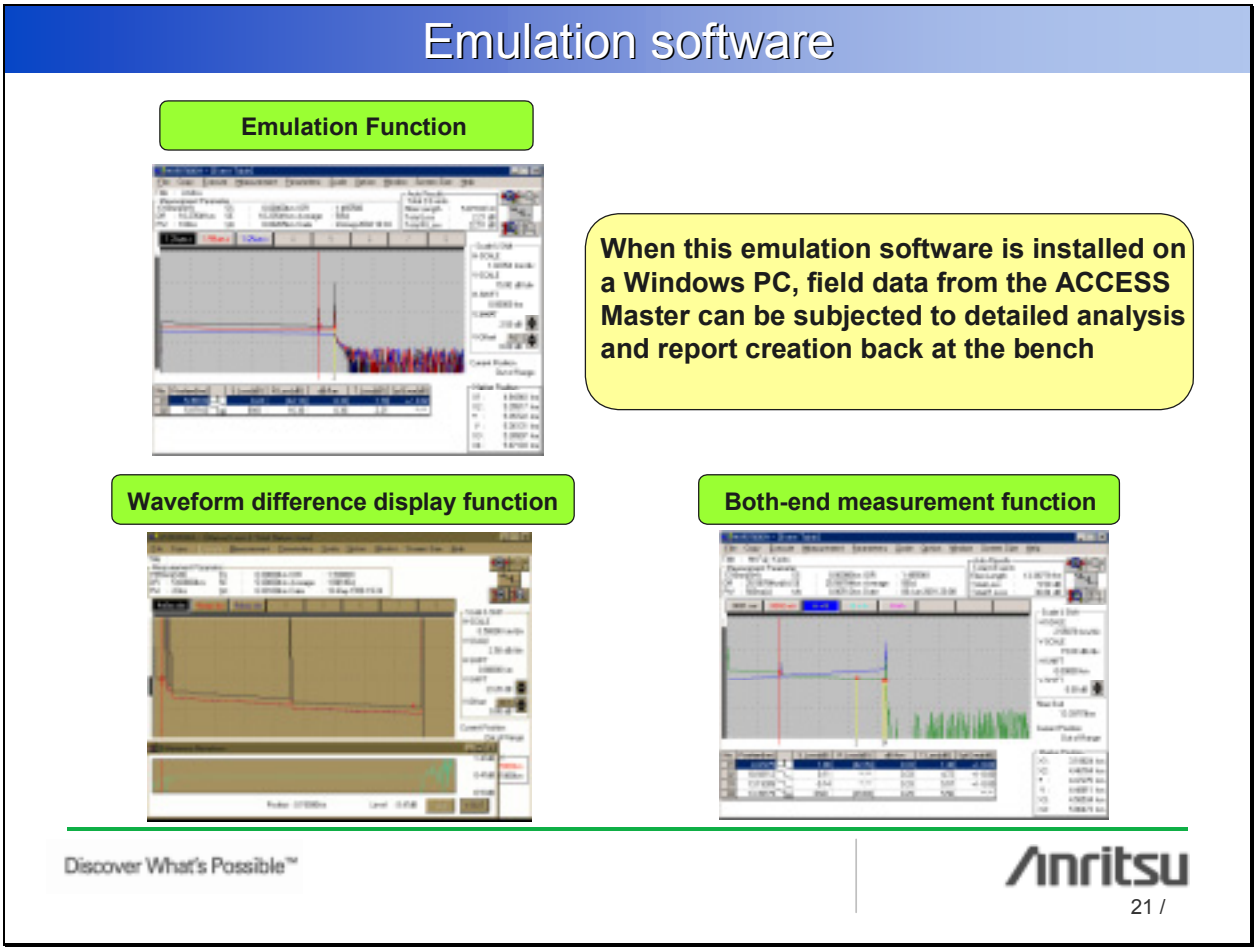
More than 1000 waveform files can be stored in internal memory.　A USB port is also installed as standard.　When using USB memory, more than 30000 waveform files can be stored (512M bytes).

By using the waveform comparison function, the data saved at fiber cable installation can be compared with the waveform data at error occurrence.



Emulation software

This PC software is used to analyze and edit the recorded data on a Windows-based PC in the office. A report can also be created.

Emulation function

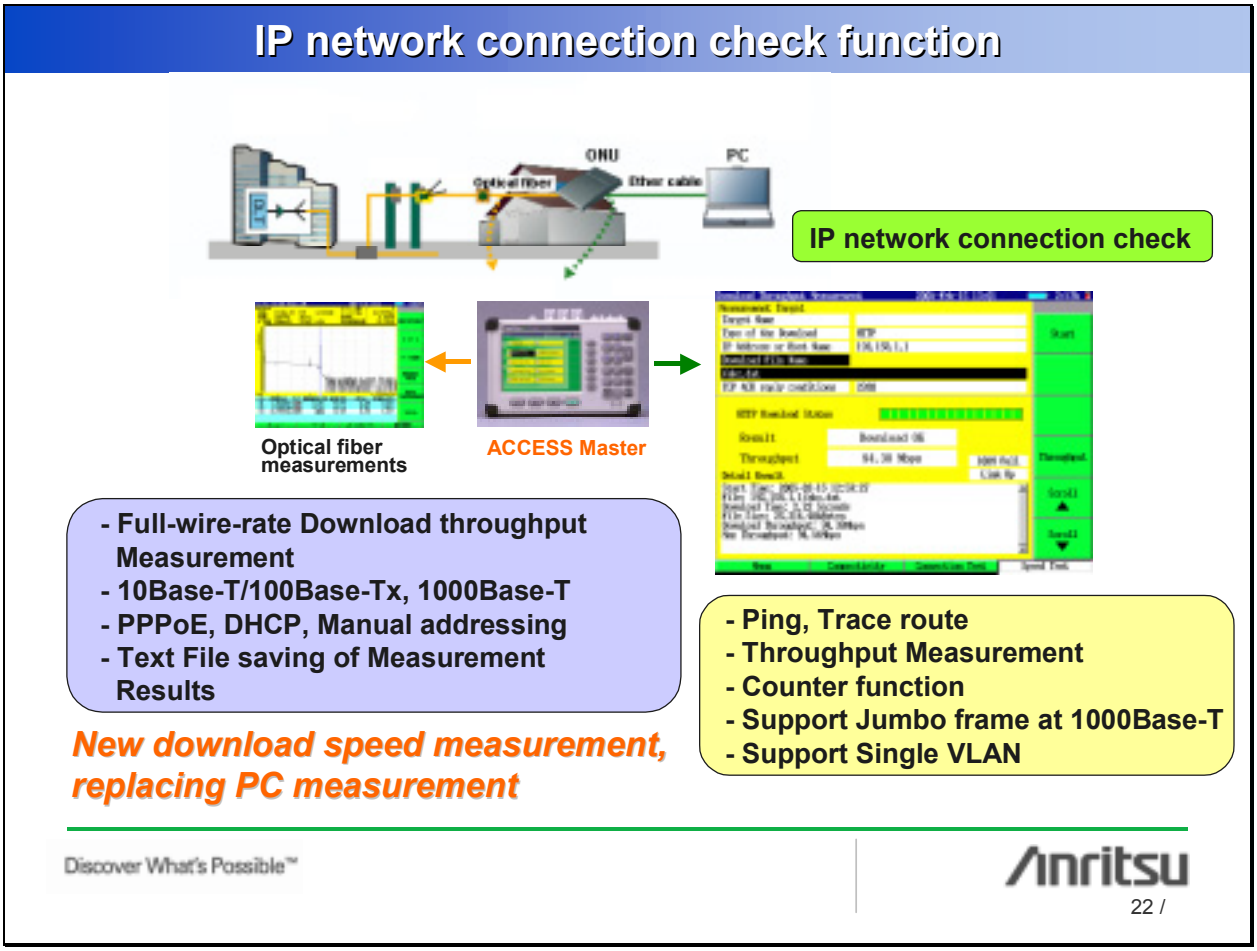
Measured waveform data can be analyzed using a PC.

-Both-end measurement function

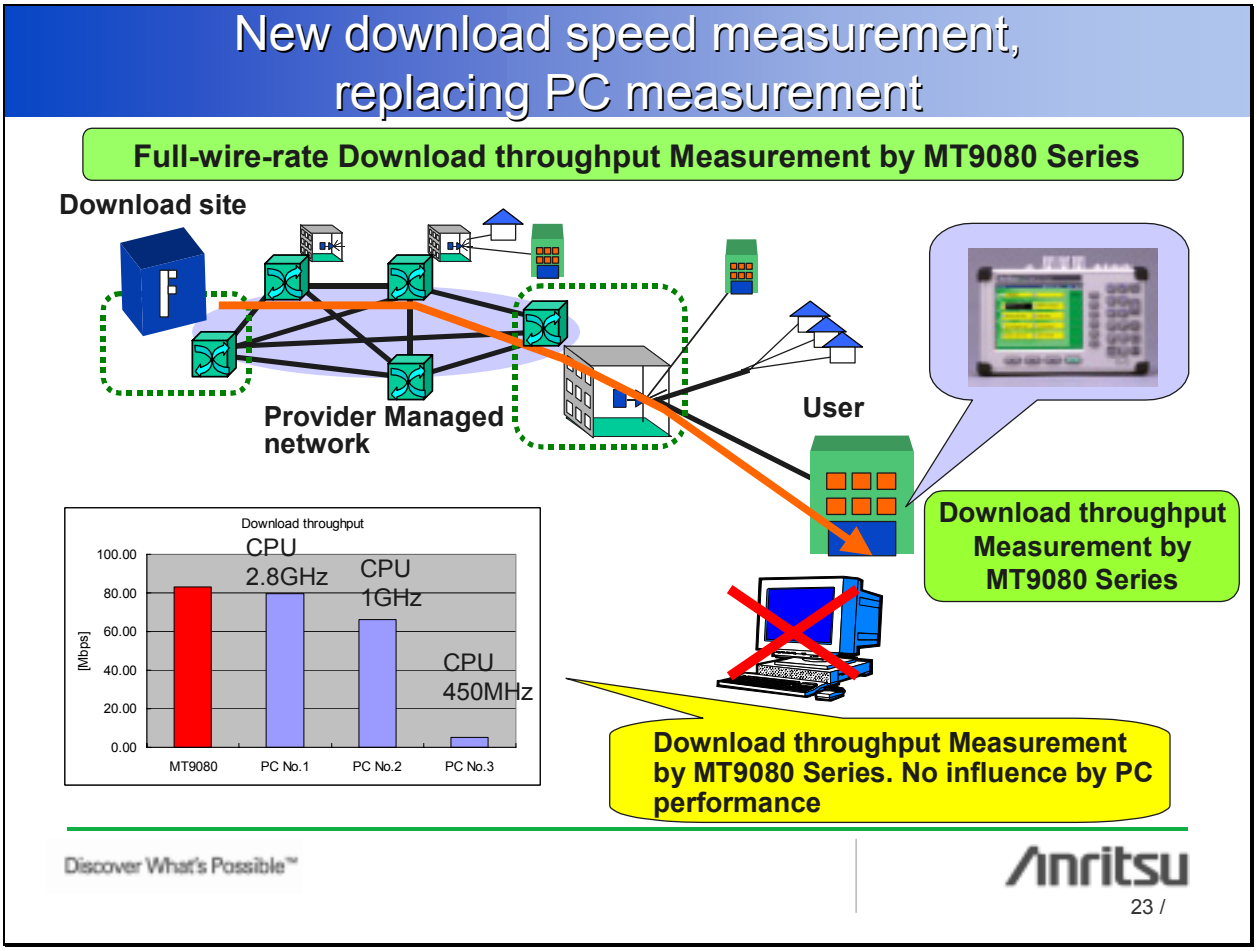
A new waveform can be composed by averaging data measured at both ends of an optical fiber.

Waveform difference display function

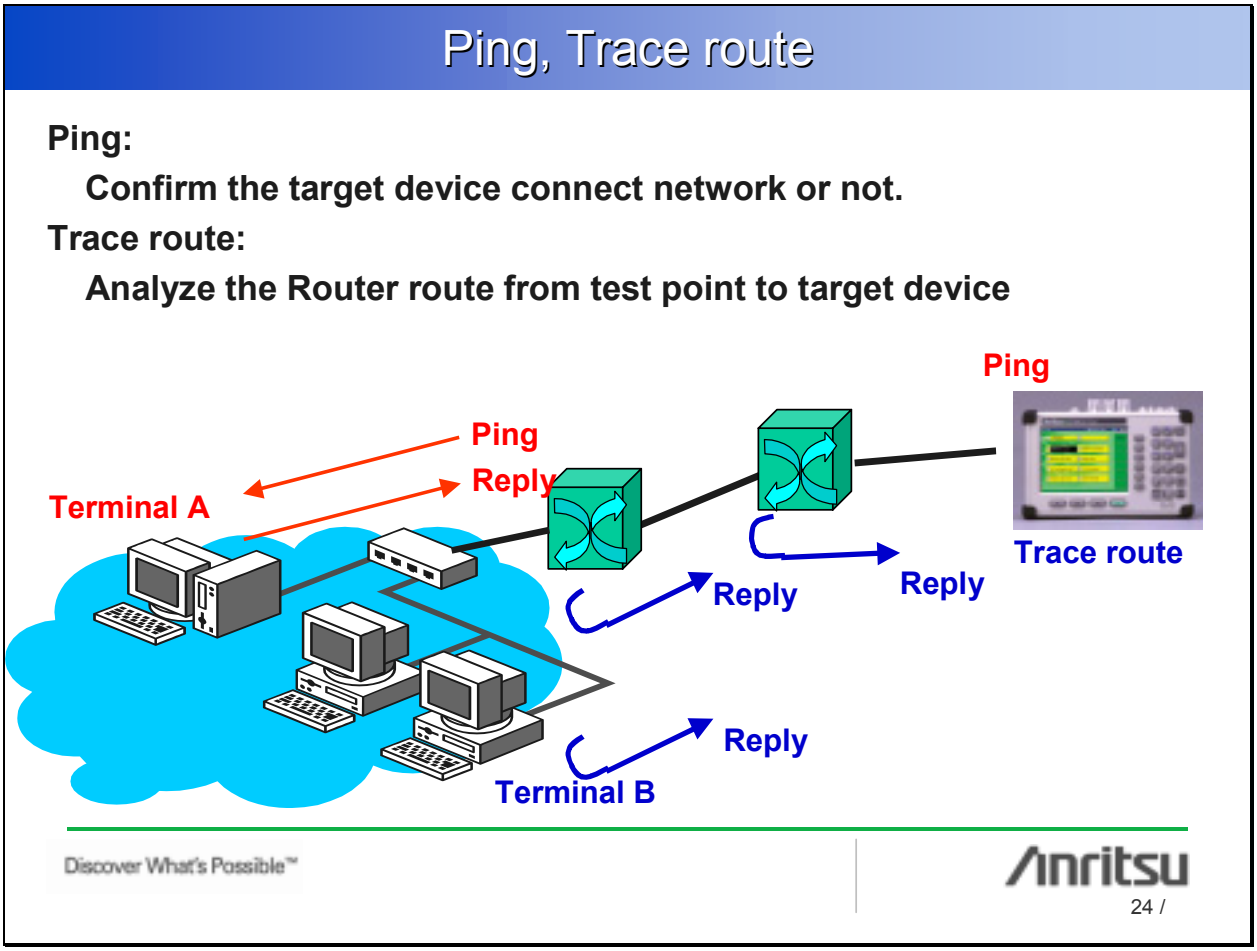
When two wavelengths are chosen from waveforms read in the emulation mode, the difference between these two waveforms is displayed in another window, permitting easy comparison of aging changes in optical fibers.



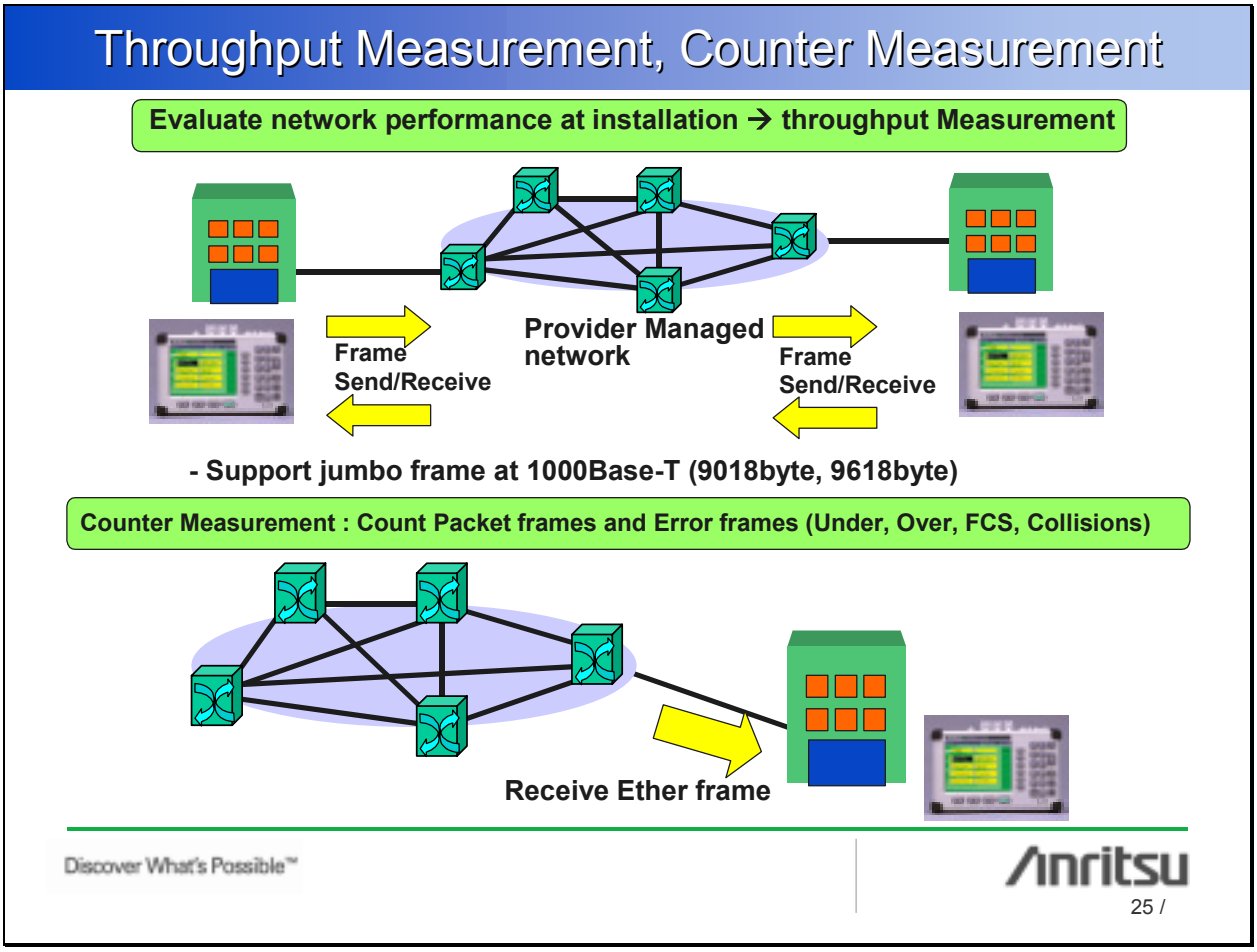
MT9080 Series ACCESS Master has an optional built-in IP network connection check function that can be used to check the IP connection, a function that previously required a PC and IP tester. Just one MT9080 Series ACCESS Master is all that is needed to perform quick and comprehensive fiber maintenance and troubleshooting, greatly cutting job time.



The MT9080 IP option offers a new way of measuring download speed that eliminates the impact of a PC. As shown in the diagram, using the MT9080 Series IP network connection check function, it is possible to measure the download speed of a 100Base-Tx access service with the same accuracy as a high-speed PC and the performance is sufficient to perform full-wire-rate download speed measurement. Moreover, the performance is even good enough to perform full-wire rate download speed measurement of 1000Base-T access services, making the MT9080 Series IP network connection check function future-proof for the coming widespread introduction of Gigabit services and eliminating any need to buy the latest and fastest PC to make measurements.



The MT9080 IP option is not only able to perform download speed tests; it also supports basic network test functions, such as Ping and Trace route, to enable network confirmation just as easily as using a PC.



Not only does the MT9080 IP option support download speed testing—it also supports network test functions. In addition to Ping and Trace route, it can also perform throughput testing. When the MT9080 with built-in IP option is connected to both ends of the network, frame data can be sent and received in both directions to measure the network send rate. This is the first test to use when evaluating a newly lit network.
And of course, the MT9080 has counter functions too.
Counts are often used when opening a network and performing maintenance. Packets passing through the network are monitored and the numbers of packet errors (Under, Over, FCS, Collisions) are counted. The counter function can be used to ensure that the network bandwidth is being used effectively by counting the packet types.

MT9080 Series (Specifications)

Specifications

Model	MT9081x	MT9081x1	MT9080x
			
Specifications			
Display	6.4 inch color TFT-LCD (with back light, transparent type)	6.2 inch monochrome LCD (with back light, semi-transparent)	
Distance range	max. 200km		max. 50km
pulse width	3ns, 10ns, 20ns, 50ns, 100ns, 200ns, 500ns, 1us, 2us, 4us, 10us, 20us		3ns, 20ns, 50ns, 100ns, 200ns,500ns, 1us, 2us
Dynamic range 1.31/1.55/1.65 um (F type)	37.5dB / 36dB / 33.5dB		25.5 dB/24dB/22dB
Dead zone (back-scattered light) 1.31/1.55/1.65 um (F type)	<=7.0m / <=8.0m / <= 11m (Returen loss 40dB) <=5.0m / <=5.5m / <= 6.5m (Returen loss 55dB)		<=7.5m / <=8.5m / <= 11m (Returen loss 40dB)
Dead zone (back-scattered light) 1.31/1.55/1.65 um (F type)	<=1.0m (Typ. <=0.8m)		
Options			
IP Network Connection Check Function	x	x	x
Gigabit Ethernet Upgrade	x	x	x
Visible LD	x	x	x

X: A to F

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The MT9080 Series ACCESS Master is available in three models. Moreover, each model is available in six types A thru F depending on the wavelength. All models support SM fiber.

The light source and optical power meter functions are installed for all models and types as standard. The visible light source and IP network connection check function available as an option can be installed on all Models and types.

For different wavelengths or requests outside the standard specifications, please consult with your Anritsu representative separately.

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Specifications are subject to change without notice.

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