MP1800A
Signal Quality Analyzer
Installation Guide

15th Edition

For safety and warning information, please read this manual before attempting to use the equipment.
Keep this manual with the equipment.

ANRITSU CORPORATION

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual

⚠ **DANGER**	This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.
⚠ **WARNING**	This indicates a hazardous procedure that could result in serious injury or death if not performed properly.
⚠ **CAUTION**	This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.

This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.

This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.

This indicates a note. The contents are described in the box.

These indicate that the marked part should be recycled.

For Safety

⚠ **WARNING**

- ALWAYS refer to the operation manual when working near locations at which the alert mark shown on the left is attached. If the advice in the operation manual is not followed, there is a risk of personal injury or reduced equipment performance. The alert mark shown on the left may also be used with other marks and descriptions to indicate other dangers.

- Overvoltage Category
  This equipment complies with overvoltage category II defined in IEC 61010. DO NOT connect this equipment to the power supply of overvoltage category III or IV.

- Laser radiation warning
  - NEVER look directly into the cable connector on the equipment nor into the end of a cable connected to the equipment. There is a risk of injury if laser radiation enters the eye.
  - The Laser Safety label is attached to the equipment for safety use as indicated in "Laser Safety" later in this section.

Electric Shock

- To ensure that the equipment is grounded, always use the supplied 3-pin power cord, and insert the plug into an outlet with a ground terminal. If power is supplied without grounding the equipment, there is a risk of receiving a severe or fatal electric shock or causing damage to the internal components.

For Safety

⚠ WARNING

Repair

⚠ **WARNING**
NO OPERATOR SERVICE-
ABLE PARTS INSIDE.
REFER SERVICING TO
QUALIFIED PERSONNEL.

- Only qualified service personnel with a knowledge of electrical fire and shock hazards should service this equipment. This equipment cannot be repaired by the operator. DO NOT attempt to remove the equipment covers or unit covers or to disassemble internal components. There are high-voltage parts in this equipment presenting a risk of severe injury or fatal electric shock to untrained personnel. In addition, there is a risk of damage to precision components.

Calibration

VOID IF SEAL BROKEN
Anritsu
CALIBRATION SERVICES

- The performance-guarantee seal verifies the integrity of the equipment. To ensure the continued integrity of the equipment, only Anritsu service personnel, or service personnel of an Anritsu sales representative, should break this seal to repair or calibrate the equipment. Be careful not to break the seal by opening the equipment or unit covers.If the performance-guarantee seal is broken by you or a third party, the performance of the equipment cannot be guaranteed.

Falling Over

- This equipment should always be positioned in the correct manner. If the cabinet is turned on its side, etc., it will be unstable and may be damaged if it falls over as a result of receiving a slight mechanical shock.
  Always set up the equipment in a position where the power switch can be reached without difficulty.

LCD

- This equipment uses a Liquid Crystal Display (LCD). DO NOT subject the equipment to excessive force or drop it. If the LCD is subjected to strong mechanical shock, it may break and liquid may leak.
  This liquid is very caustic and poisonous.
  DO NOT touch it, ingest it, or get in your eyes. If it is ingested accidentally, spit it out immediately, rinse your mouth with water and seek medical help. If it enters your eyes accidentally, do not rub your eyes, rinse them with clean running water and seek medical help. If the liquid gets on your skin or clothes, wash it off carefully and thoroughly.

For Safety

⚠ **CAUTION**

Cleaning

- Always remove the main power cable from the power outlet before cleaning dust around the power supply and fan.
  - Clean the power inlet regularly. If dust accumulates around the power pins, there is a risk of fire.
  - Keep the cooling fan clean so that the ventilation holes are not obstructed. If the ventilation is obstructed, the cabinet may overheat and catch fire.

⚠ CAUTION／注意
≧18kg
HEAVY WEIGHT／重量物

- Use two or more people to lift and move this equipment, or use a trolley. There is a risk of back injury, if this equipment is lifted by one person.

Check Terminal

⚠

- Never input a signal of more than the indicated value between the measured terminal and ground. Input of an excessive signal may damage the equipment.

For Safety

Class 1 indicates the danger degree of the laser radiation specified below according to IEC 60825-1:2007.

Class 1: Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

⚠ **CAUTION**

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

The use of optical instruments with this product will increase eye hazard.

For Safety

Table 1   Laser Safety Classifications Based on IEC 60825-1:2007

Model Name	Recommended Module Model Name or Option Model Name/Part Name	Class	Max. Optical Output Power (mW)[1]	Pulse Width (s)/Rep-etition Rate	Emitted Wave-length (nm)	Beam Divergence (deg)	Laser Aperture
MU181600A	G0174A 850 nm XFP module	1	0.78	CW	840-860	36.9	Fig. 2, [1]
	G0175A 1310 nm XFP module	1	0.8	CW	1290-1330	11.5	Fig. 2, [1]
	G0176A 1550 nm XFP module	1	1.58	CW	1530-1565	11.5	Fig. 2, [1]
MU181601A	G0177A 850 nm SFP module	1	0.56	CW	830-860	36.9	Fig. 3, [1]
	G0178A 1310 nm SFP module	1	1.0	CW	1270-1360	11.5	Fig. 3, [1]
	G0179A 1550 nm SFP module	1	1.0	CW	1430-1590	11.5	Fig. 3, [1]
MU181620A	Optionx01 1310nm Reference	1	5.0	CW	1290-1330	11.5	Fig. 4, [1]
	Optionx02 1550nm Reference	1	5.0	CW	1530-1565	11.5	Fig. 4, [1]
	Optionx03 1310nm/1550nm Reference	1	5.0	CW	1290-1330 or 1530-1565[2]	11.5	Fig. 4, [1]
	Optionx11 1310nm Stressed Eye	1	5.0	CW	1290-1330	11.5	Fig. 4, [1]
	Optionx12 1550nm Stressed Eye	1	5.0	CW	1530-1565	11.5	Fig. 4, [1]
	Optionx13 1310nm/1550nm Stressed Eye	1	5.0	CW	1290-1330 or 1530-1565[2]	11.5	Fig. 4, [1]

*1:   Indicates the possible optical output power when each and every reasonably foreseeable single-fault condition is included.

*2:   A light of either wavelength will be emitted.

For Safety

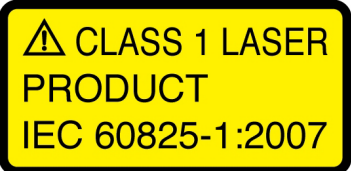**Table 2   Incorporated Laser Specification**

Model Name	Recommended Module Model Name or Option Model Name/Part Name	Max. Optical Output Power (mW)[*1]	Pulse Width (s)/Rep-etition Rate	Emitted Wave-length (nm)	Beam Divergence (deg)
MU181600A	G0174A 850 nm XFP module	0.78	CW	840-860	36.9
	G0175A 1310 nm XFP module	0.8	CW	1290-1330	11.5
	G0176A 1550 nm XFP module	1.58	CW	1530-1565	11.5
MU181601A	G0177A 850 nm SFP module	0.56	CW	830-860	36.9
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	G0179A 1550 nm SFP module	1.0	CW	1430-1590	11.5
MU181620A	Optionx01 1310nm Reference	5.0	CW	1290-1330	11.5
	Optionx02 1550nm Reference	5.0	CW	1530-1565	11.5
	Optionx03 1310nm/1550nm Reference	5.0	CW	1290-1330 or 1530-1565[*2]	11.5
	Optionx11 1310nm Stressed Eye	5.0	CW	1290-1330	11.5
	Optionx12 1550nm Stressed Eye	5.0	CW	1530-1565	11.5
	Optionx13 1310nm/1550nm Stressed Eye	5.0	CW	1290-1330 or 1530-1565[*2]	11.5

*1:   Indicates the possible optical output power when each and every reasonably foreseeable single-fault condition is included.

*2:   A light of either wavelength will be emitted.

For Safety

Table3   Labels on Product

	Type	Label	Affixed to:	Model Name
1	Explanation	⚠ IEC 60825-1:2007 CLASS 1 LASER PRODUCT	Fig. 1, A	MP1800A
2	Certification	CERTIFICATION LABEL THIS PRODUCT COMPLIES WITH 21 CFR 1040.10 AND 1040.11 EXCEPT FOR DEVIATIONS PURSUANT TO LASER NOTICE NO. 50, DATED JUNE 24, 2007	Fig. 1, B	MP1800A
3	Identification	IDENTIFICATION LABEL ANRITSU CORP. 5-1-1,ONNA,ATSUGI-SHI KANAGAWA 243-8555,JAPAN MANUFACTURED AT:TOHOKU ANRITSU CO., LTD KORIYAMA PLANT, _____ .20_	Fig. 1, C	MP1800A
4	Explanation	⚠ CLASS 1 LASER PRODUCT IEC 60825-1:2007	Fig. 2, A Fig. 3, A	MU181600A MU181601A
5	Explanation	⚠ CLASS 1 LASER PRODUCT IEC 60825-1:2007	Fig. 4, A	MU181620A

Laser Radiation Markings

A

C   B

Figure 1   MP1800A Exterior

For Safety

Laser Radiation Markings

[1]   A
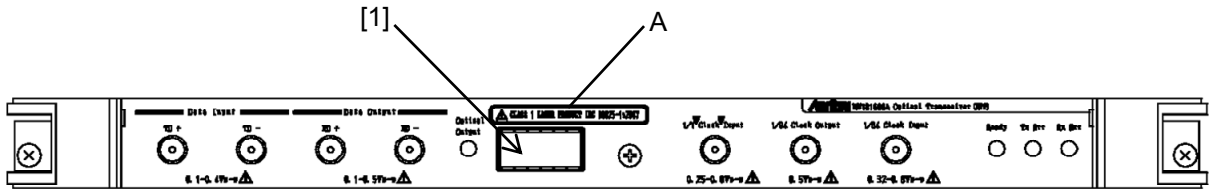
Figure 2   Front Panel of MU181600A Module

[1]   A

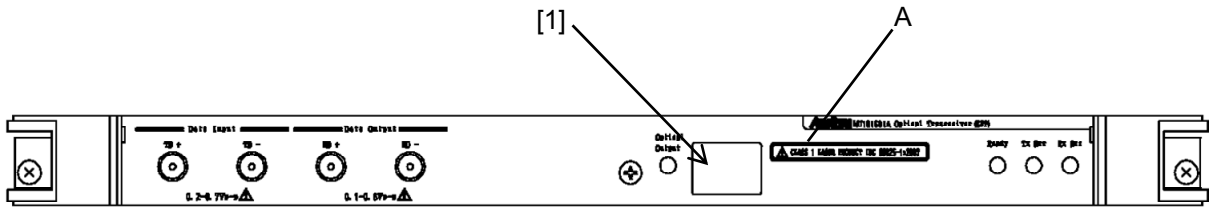Figure 3   Front Panel of MU181601A Module
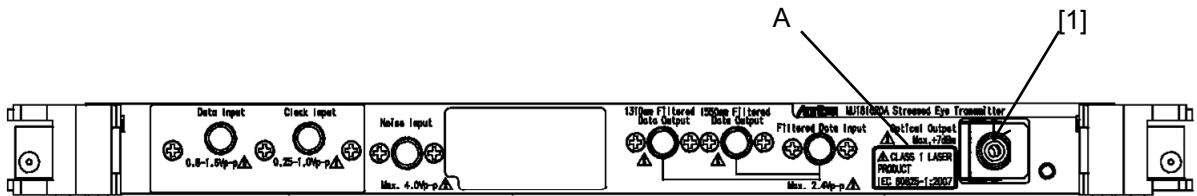
A   [1]

Figure 4   Front Panel of MU181620A Module

For Safety

⚠ CAUTION

Replacing Memory Back-up Battery

This equipment uses a Poly-carbomonofluoride lithium battery to backup the memory. This battery must be replaced by service personnel when it has reached the end of its useful life; contact the Anritsu sales section or your nearest representative.

Note: The battery used in this equipment has a maximum useful life of 7 years. It should be replaced before this period has elapsed.

External Storage Media

This instrument uses a USB memory as external storage media for storing data and programs.

If this media is mishandled or becomes faulty, important data may be lost. To prevent this chance occurrence, all important data and programs should be backed-up.

Anritsu will not be held responsible for lost data.

Pay careful attention to the following points.
- Never remove the USB memory from the instrument while it is being accessed.
- The USB memory may be damaged by static electric charges.
- The external storage media shipped with the instrument has been thoroughly tested. Users should note that since all other devices have not been tested in this manner, Anritsu is unable to guarantee their performance or suitability.

For Safety

⚠ CAUTION

Hard disk

The instrument is equipped with an internal hard disk from which, as with any hard disk, data may be lost under certain conditions. Anritsu can take no responsibility for lost data, and users are recommended to always back up important data at regular intervals. To reduce the possibility of data loss, particular attention should be given to the following points.

- The instrument should only be used within the recommend temperature range, and should not be used in locations where the temperature may fluctuate suddenly.
- Always follow the guidelines to ensure that the instrument is set up in the specified manner.
- Always ensure that the fans at the rear and side of the instrument are not blocked or obstructed in any way.
- Exercise care not to bang or shake the instrument whilst the power is on.
- Never disconnect the mains power at the plug or cut the power at the breaker with the instrument turned on.

Lifetime of Parts

The life span of certain parts used in this instrument is determined by the operating time or the power-on time. Due consideration should be given to the life spans of these parts when performing continuous operation over an extended period. The safety of the instrument cannot be guaranteed if component parts are used beyond their life spans. These parts must be replaced at the customer's expense even if within the guaranteed period described in Warranty at the beginning of this manual. Parts with operating time-dependent life span: LCD backlight

(50,000 hours)

Use in a residential environment

This instrument is designed for an industrial environment.
In a residential environment this instrument may cause radio interference in which case the user may be required to take adequate measures.

Use in Corrosive Atmospheres

Exposure to corrosive gases such as hydrogen sulfide, sulfurous acid, and hydrogen chloride will cause faults and failures.
Note that some organic solvents release corrosive gases.

Equipment Certificate

Anritsu Corporation certifies that this equipment was tested before shipment using calibrated measuring instruments with direct traceability to public testing organizations recognized by national research laboratories, including the National Institute of Advanced Industrial Science and Technology, and the National Institute of Information and Communications Technology, and was found to meet the published specifications.

Anritsu Warranty

Anritsu Corporation will repair this equipment free-of-charge if a malfunction occurs within one year after shipment due to a manufacturing fault. However, software fixes will be made in accordance with the separate Software End-User License Agreement. Moreover, Anritsu Corporation will deem that this warranty void when:

- The fault is outside the scope of the warranty conditions separately described in the operation manual.
- The fault is due to mishandling, misuse, or unauthorized modification or repair of the equipment by the customer.
- The fault is due to severe usage clearly exceeding normal usage.
- The fault is due to improper or insufficient maintenance by the customer.
- The fault is due to natural disaster, including fire, wind, flooding, earthquake, lightning strike, or volcanic ash, etc.
- The fault is due to damage caused by acts of destruction, including civil disturbance, riot, or war, etc.
- The fault is due to explosion, accident, or breakdown of any other machinery, facility, or plant, etc.
- The fault is due to use of non-specified peripheral or applied equipment or parts, or consumables, etc.
- The fault is due to use of a non-specified power supply or in a non-specified installation location.
- The fault is due to use in unusual environments[(Note)].
- The fault is due to activities or ingress of living organisms, such as insects, spiders, fungus, pollen, or seeds.

In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

Anritsu Corporation shall assume no liability for injury or financial loss of the customer due to the use of or a failure to be able to use this equipment.

Note:

For the purpose of this Warranty, "unusual environment" means use:

- In places of direct sunlight
- In dusty places
- Outdoors
- In liquids, such as water, oil, or organic solvents, and medical fluids, or places where these liquids may adhere
- In salty air or in places where chemically active gases (sulfur dioxide, hydrogen sulfide, chlorine, ammonia, nitrogen dioxide, or hydrogen chloride, etc.) are present
- In places where high-intensity static electric charges or electromagnetic fields are present
- In places where abnormal power voltages (high or low) or instantaneous power failures occur
- In places where condensation occurs
- In the presence of lubricating oil mists
- In places at an altitude of more than 2,000 m
- In the presence of frequent vibration or mechanical shock, such as in cars, ships, or airplanes

Anritsu Corporation Contact

In the event that this equipment malfunctions, contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

Software End-User License Agreement (EULA)

Please read this Software End-User License Agreement (hereafter this EULA) carefully before using (includes executing, copying, registering, etc.) this software (includes programs, databases, scenarios, etc., used to operate, set, etc., Anritsu electronic equipment). By reading this EULA and using this software, you are agreeing to be bound by the terms of its contents and Anritsu Corporation (hereafter Anritsu) hereby grants you the right to use this Software with the Anritsu-specified equipment (hereafter Equipment) for the purposes set out in this EULA.

1. Grant of License and Limitations

1. Regardless of whether this Software was purchased from or provided free-of-charge by Anritsu, you agree not to rent, lease, lend, or otherwise distribute this Software to third parties and further agree not to disassemble, recompile, reverse engineer, modify, or create derivative works of this Software.
2. You may make one copy of this Software for backup purposes only.
3. You are not permitted to reverse engineer this software.
4. This EULA allows you to install one copy of this Software on one piece of Equipment.

2. Disclaimers

To the extent not prohibited by law, in no event shall Anritsu be liable for personal injury, or any incidental, special, indirect or consequential damages whatsoever, including, without limitation, damages for loss of profits, loss of data, business interruption or any other commercial damages or losses, arising out of or related to your use or inability to use this Software.

3. Limitation of Liability

a. If a fault (bug) is discovered in this Software, preventing operation as described in the operation manual or specifications whether or not the customer uses this software as described in the manual, Anritsu shall at its own discretion, fix the bug, or exchange the software, or suggest a workaround, free-of-charge. However, notwithstanding the above, the following items shall be excluded from repair and warranty.
   i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.
   ii) If this Software is used in conjunction with other non-Anritsu-approved software.
   iii) Recovery of lost or damaged data.
   iv) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
   v) For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, etc.
b. Expenses incurred for transport, hotel, daily allowance, etc., for on-site repairs by Anritsu engineers necessitated by the above faults shall be borne by you.
c. The warranty period for faults listed in article 3a above covered by this EULA shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair, whichever is longer.

4. Export Restrictions

You may not use or otherwise export or re-export directly or indirectly this Software except as authorized by Japanese and United States law. In particular, this software may not be exported or re-exported (a) into any Japanese or US embargoed countries or (b) to anyone on the Japanese or US Treasury Department's list of Specially Designated Nationals or the US Department of Commerce Denied Persons List or Entity List. By using this Software, you warrant that you are not located in any such country or on any such list. You also agree that you will not use this Software for any purposes prohibited by Japanese and US law, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction.

5. Termination

Anritsu shall deem this EULA terminated if you violate any conditions described herein. This EULA shall also be terminated if the conditions herein cannot be continued for any good reason, such as violation of copyrights, patents, or other laws and ordinances.

6. Reparations

If Anritsu suffers any loss, financial or otherwise, due to your violation of the terms of this EULA, Anritsu shall have the right to seek proportional damages from you.

7. Responsibility after Termination

Upon termination of this EULA in accordance with item 5, you shall cease all use of this Software immediately and shall as directed by Anritsu either destroy or return this Software and any backup copies, full or partial, to Anritsu.

8. Dispute Resolution

If matters of dispute or items not covered by this EULA arise, they shall be resolved by negotiations in good faith between you and Anritsu.

9. Court of Jurisdiction

This EULA shall be interpreted in accordance with Japanese law and any disputes that cannot be resolved by negotiation described in Article 8 shall be settled by the Japanese courts.

Notes On Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.

Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.

When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.

Trademark and Registered Trademark

Windows® is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Notice

The following actions are strictly prohibited for all of the software installed in this product or otherwise provided by Anritsu:

1. Copying, except for archival purposes.
2. Transferring to a third party separately from this product.
3. Analyzing the incorporated software including but not limited to modifying, decompiling, disassembling, and reverse engineering.

Cautions against computer virus infection

- Copying files and data
  Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument.
  All other required files should be transferred by means of USB or CompactFlash media after undergoing a thorough virus check.
- Adding software
  Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections
  Ensure that the network has sufficient anti-virus security protection in place.

Crossed-out Wheeled Bin Symbol

Equipment marked with the Crossed-out Wheeled Bin Symbol complies with council directive 2012/19/EC (the "WEEE Directive") in European Union.

For Products placed on the EU market after August 13, 2005, please contact your local Anritsu representative at the end of the product's useful life to arrange disposal in accordance with your initial contract and the local law.

CE Conformity Marking

Anritsu affixes the CE conformity marking on the following product(s) in accordance with the Council Directive 93/68/EEC to indicate that they conform to the EMC and LVD directive of the European Union (EU).

CE marking

C E

1. Product Model

Model: MP1800A Signal Quality Analyzer

2. Applied Directive

EMC: Directive 2004/108/EC

LVD: Directive 2006/95/EC

3. Applied Standards

● EMC: Emission: EN 61326-1: 2013 (Class A)

Immunity: EN 61326-1: 2013 (Table 2)

	Performance Criteria*
IEC 61000-4-2 (ESD)	B
IEC 61000-4-3 (EMF)	A
IEC 61000-4-4 (Burst)	B
IEC 61000-4-5 (Surge)	B
IEC 61000-4-6 (CRF)	A
IEC 61000-4-8 (RPFMF)	A
IEC 61000-4-11 (V dip/short)	B, C

*: Performance Criteria

A: The equipment shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

B: The equipment shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

Harmonic current emissions:
EN 61000-3-2: 2006 +A1:2009 A2:2009
(Class A equipment)
- LVD: EN 61010-1: 2010 (Pollution Degree 2)

4. Authorized representative

Name:	Murray Coleman
	Head of Customer Service EMEA
	ANRITSU EMEA Ltd.
Address, city:	200 Capability Green, Luton
	Bedfordshire, LU1 3LU
Country:	United Kingdom

C-tick Conformity Marking

Anritsu affixes the C-tick mark on the following product(s) in accordance with the regulation to indicate that they conform to the EMC framework of Australia/New Zealand.

C-tick marking

N274

1. Product Model

Model: MP1800A Signal Quality Analyzer

2. Applied Standards

EMC: Emission: EN 61326-1: 2013 (Class A equipment)

About Eco label

Excellent Eco Product
Lightweight
Power saving
Small size

The label shown on the left is attached to Anritsu products meeting our environmental standards.

Details about this label and the environmental standards are available on the Anritsu website at http://www.anritsu.com

About This Manual

A testing system combining an MP1800A Signal Quality Analyzer or MT1810A 4 Slot Chassis mainframe, module(s), and control software is called the Signal Quality Analyzer Series. The operation manuals of the Signal Quality Analyzer Series consist of separate documents for the installation guide, the mainframe, remote control operation, module(s), and control software, as shown below.

Configuration of Signal Quality Analyzer Series Operation Manual

▭ indicates this document.

Installation Guide

Installation guide, from module installation to the start of use. The Installation Guide varies depending on the mainframe used.

MP1800A Signal Quality Analyzer Installation Guide

Installation Guide of the MP1800A

Mainframe Operation Manual

Describes basic operations of the mainframe. The Mainframe Operation Manual varies depending on the mainframe used.

Remote Control Operation Manual

Describes remote control using the GPIB interface and LAN interface.

Module Operation Manual

Operation manual for the module. The Module Operation Manual varies depending on the module(s) used.

Control Software Operation Manual

Operation manual of the software that controls the Signal Quality Analyzer Series.

This document provides usage of the MP1800A for the first time, as well as module composition change, remote control or software update procedures.

- Read all the sections in this document when using the MP1800A for the first time.
- To change module composition, refer to Section 2.3 "Installing and Removing Modules."
- To perform remote control, refer to Chapter 4 "Remote Control."
- To update the software, refer to Chapter 5 "Other Functions."
- When an abnormality occurs during operation, refer to Chapter 8 "Troubleshooting."

Table of Contents

Chapter 1 Overview

This chapter provides an overview of the MP1800A Signal Quality Analyzer (hereinafter, referred to as "MP1800A").

1.1 Product Overview

Various plug-in modules (hereinafter, referred to as "module") can be installed into the MP1800A, to support research, development and production of module devices for the optical communication market or interconnection within a Gbit/s class high-speed device. The MP1800A is also useful for research and development for the next-generation communication market, including optical packet transmission.

A maximum of six modules can be installed in this equipment.

Two, four, or six of the following modules installed in this equipment can be controlled by selecting options matching the application.

- MU181020A 12.5 Gbit/s Pulse Pattern Generator
- MU181020B 14 Gbit/s Pulse Pattern Generator
- MU181040A 12.5 Gbit/s Error Detector
- MU181040B 14 Gbit/s Error Detector

(In this manual, the above modules are described as the MU181020A, MU181020B, MU181040A, and MU181040B.)
When multiple units of the MU181020A, MU181020B, MU181040A, or MU181040B are installed, Multi-Channel operation is supported. 40G and PON applications can be supported by using the Combination and Channel Synchronization functions to perform pattern generation sync and receive sync between each module.

In addition, the MP1800A is equipped with LCDs, keys and a rotary encoder for easy operation. Remote control can also be performed by adding the GPIB or LAN options.

1.2 Product Composition

1.2.1 Mainframe

The MP1800A can operate alone, without an external control PC.
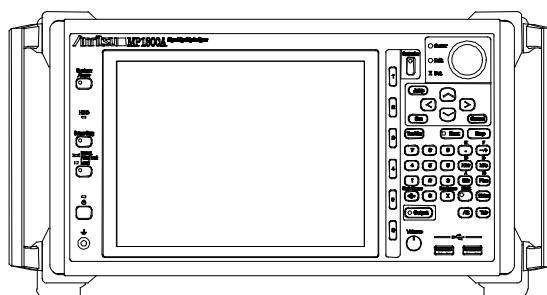
Figure 1.2.1-1   MP1800A appearance

The standard composition of the MP1800A is shown in the table below.
See the MP1800A Signal Quality Analyzer Operation Manual for options,
application parts, and specifications.

Table 1.2.1-1   Standard composition

Item	Model	Product	Q'ty	Remarks
Mainframe	MP1800A	Signal Quality Analyzer	1	
Accessories	Z0306A	Wrist strap	1	
	Z0897A	Operation Manual	1	CD-ROM
	-	Power cord (13A)	1	
	B0329G	Front cover (3/4MW4U)	1	
	B0574A	MP1800A protective cover	1	
	Z0541A	USB mouse	1	
	Z0918A	MX180000A Software CD	1	CD-ROM
	G0342A	ESD Discharger	1	
	J1627A	GND connection cable	1	

■ Module insertion slots

The MP1800A is equipped with slots for installing up to 6 modules into the side panel.

Figure 1.2.1-2   MP1800A side panel

When installing the MU181020A, MU181020B, MU181040A, and/or MU181040B, the installation position and installed number of boards vary according to the options being added.   The installation position and number of boards are limited by the added options.

For details, refer to the release note included in this equipment or refer to the Anritsu homepage (http://www.anritsu.com).

1.2.2 Module

When installing the MU181020A, MU181020B, MU181040A, and/or MU181040B, the installation position and installed number of boards vary according to the options being added.   See the release notes attached to the MP1800A for details on the possible location and quantity of modules that can be installed for operation.
Modules that are not correctly installed become invalid and fail to operate.   In this event, the port icons of the invalid modules are disabled in the Tree View.   For details on the Tree View and port icon, refer to Section 4.3 "Tree View" in the MX180000A Signal Quality Analyzer Control Software Operation Manual.

For the latest information on the modules that can be mounted on the main unit, refer to the Anritsu homepage (http://www.anritsu.com).   For specifications and how to operate each module, see the corresponding operation manual.

1.2.3 Restrictions on operations when multiple modules are mounted

This section describes the restrictions on operations for executing the Independent function when two or more MU181020A/B and MU181040A/B modules are mounted on the MP1800A. These restrictions apply only when generating Data, Zero-substitution, Mixed, or Sequence patterns, and do not apply when generating PRBS patterns.

Restrictions on Independent function operations

- When two or more MU181020A/B and/or MU181040A/B modules are mounted on the MP1800A unit, two frequency bands of 0.1 to 6 Gbit/s and 6 to 12.5 Gbit/s must not be mixed between MU181020A/B modules and between MU181040A/B modules. However, the frequency band for the MU181020A/B modules and that for the MU18040A/B modules can exist within the MP1800A. Operations at different frequencies are allowed as long as the frequencies fall within the same frequency band.

- When two or more MU181020A/B and/or MU181040A/B modules are mounted onto one MP1800A unit, the module inserted in the following slot is recognized as the master module. Be sure to input a clock signal to the master module.

  > Master module of MP1800A-016
  > MU181020A, MU181020B: Slot1
  > MU181040A, MU181040B: Slot6
  > Master module of MP1800A-015
  > MU181020A, MU181020B: Slot1
  > MU181040A, MU181040B: Slot1

  However, the following modules become the master module, when the MU181020A/B is installed in Slot1 and 2 and when the MU181040A/B is installed in Slot 3 and 4. (Refer to Fig. 1.2.3-3 Example restrictions in c.)

  > MU181020A, MU181020B: Slot1
  > MU181040A, MU181040B: Slot3

  > Master module of MP1800A-014
  > MU181020A, MU181020B: Slot3

- When the module configuration is reconfigured or when the MU181020A/B or MU181040A/B is retrofitted, input the clock signal in the master module of the MU181020A/B and MU18040A/B.
- If the MU181040A-x20 and MU181040B-x20 Clock Recovery option is mounted and selected on an MU181040A/B module, adjust the clock recovery setting bit rate according to the frequency band for the other MU181040A/B modules.

a)   MP1800A-016 with four MU181020A and two MU181040A
modules mounted

Example:

MP1800A-016

Master module of MU181020A modules

Slot1	MU181020A
Slot2	MU181020A
Slot3	MU181020A
Slot4	MU181020A
Slot5	MU181040A
Slot6	MU181040A

- Operate in the same frequency band.
- Input a clock signal to the master module inserted into Slot1.

- Operate in the same frequency band.
- Input a clock signal to the master module inserted into Slot6.

Master module of MU181040A modules
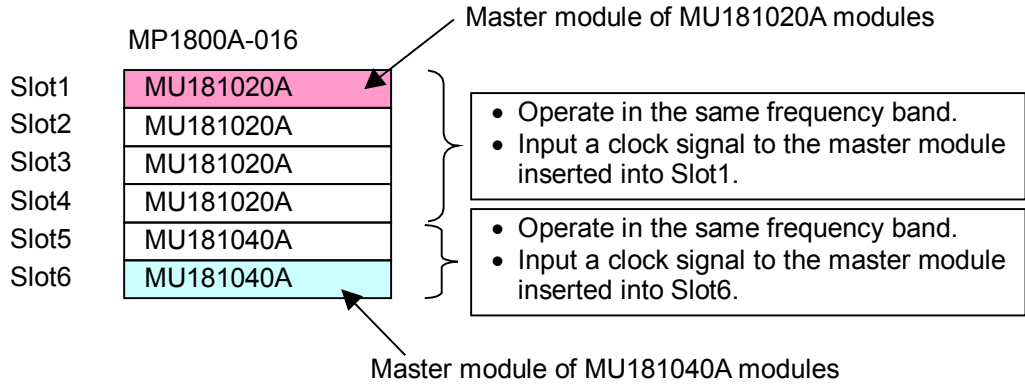
Figure 1.2.3-1   Example restrictions in a

b)   MP1800A-016 with two MU181020A and four MU181040A
modules mounted

Example:

MP1800A-016

Master module of MU181020A modules

Slot1	MU181020A
Slot2	MU181020A
Slot3	MU181040A
Slot4	MU181040A
Slot5	MU181040A
Slot6	MU181040A

- Operate in the same frequency band.
- Input a clock signal to the master module inserted into Slot1.

- Operate in the same frequency band.
- Input a clock signal to the master module inserted into Slot6.

Master module of MU181040A modules
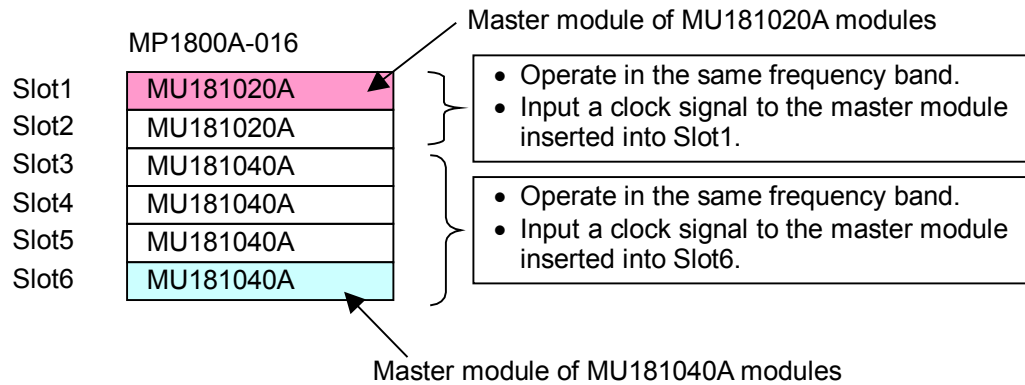
Figure 1.2.3-2   Example restrictions in b

c) MP1800A-015 with two MU181020A and two MU181040A modules mounted
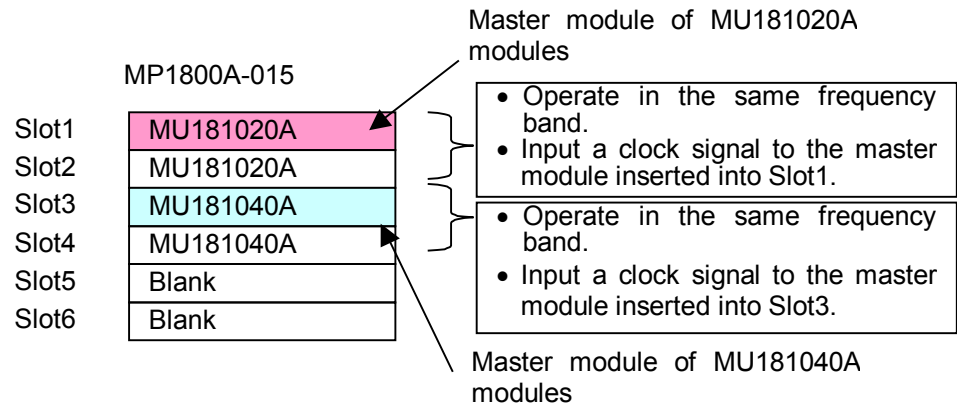
Example:

Figure 1.2.3-3 Example restrictions in c

When mounting MU181020A/B or MU181040A/B modules onto the MP1800A, the installation position and installed number of boards vary according to the options being added.

For details, refer to the release note included in this equipment or refer to the Anritsu homepage (http://www.anritsu.com).

1.2.4 Software

The MX180000A Signal Quality Analyzer Control Software used for controlling the MP1800A comes preinstalled in the MP1800A. See Section 3.1 "Start Procedure" for the startup procedure.

Chapter 2   Preparation before Use

This chapter describes preparations required before starting measurements with the MP1800A.

2.1 Environmental Conditions of Installation Site

The MP1800A operates in the temperature range from 5 to 40°C. Avoid using it under any of the following environment conditions which may cause failure.

- Strong vibrations
- High humidity or dust
- Direct sunlight
- Chemically active gases
- Substantial temperature changes

Note:

Dew may form inside of the MP1800A if it is moved to a warm location after operating for a long time in a cool location. In such a case, be sure to wait until the MP1800A becomes completely dry before turning on the power switch. Doing so with condensation present may cause a short circuit and damage the MP1800A.

Install the MT1810A horizontally as shown in Figure 2.1-1.
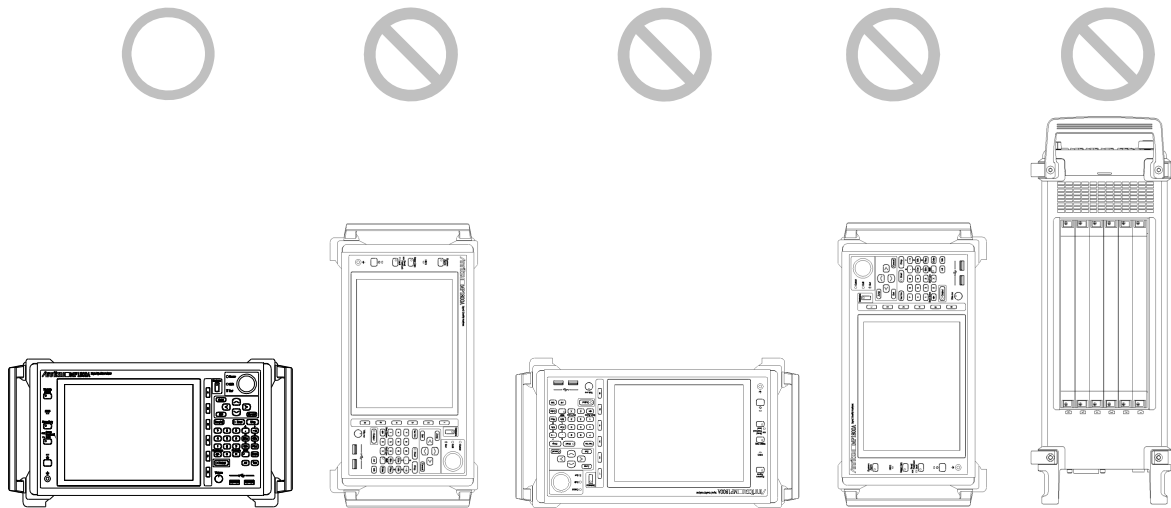
Figure 2.1-1   Installation Orientation

⚠ CAUTION

If the MP1800A is not installed in a "good" direction as above, a small shock may turn it over and harm the user.

2.2 Distance from Fan

A cooling fan is provided at the rear of the MP1800A.   Install the MP1800A at least 10 cm away from walls, peripheral devices, or the like to prevent blockage of ventilation.   Insufficient ventilation may cause the internal temperature to rise, resulting in failure.
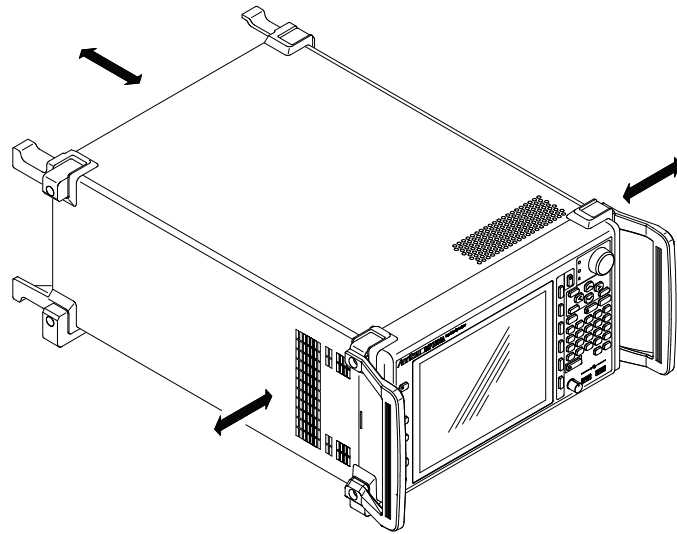
Figure 2.2-1   Distance from fan

2.3 Installing and Removing Modules

Slots for the modules are numbered 1 to 6, from the top.
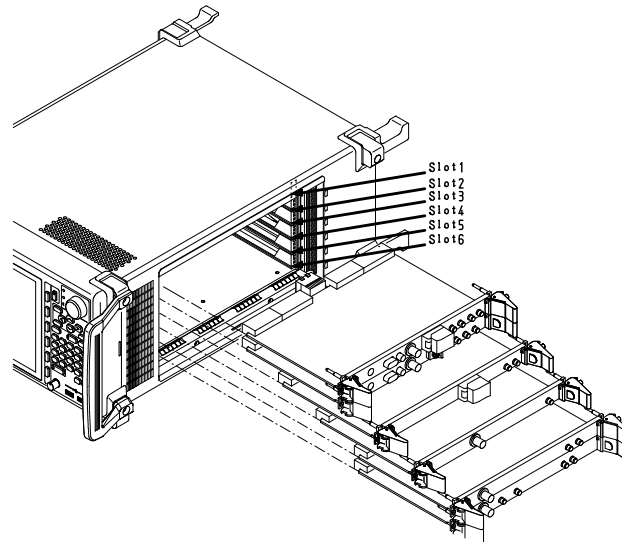
Figure 2.3-1   MP1800A and modules

2.3.1 Installing modules

1. Disconnect the power cord.

2. Fully insert a module, sliding along the grooves.

3. Check that the module ejectors are set facing out. Fit the hooks into holes on the chassis.
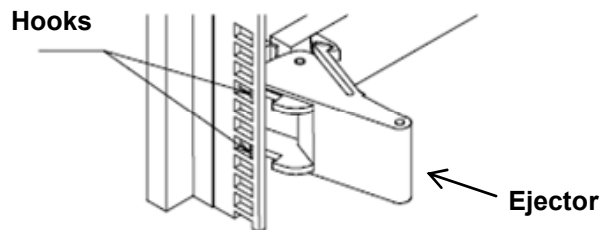
Figure 2.3.1-1   Module hooks

4. Upon insertion, use a Phillips screwdriver to tighten the screws on both the left and right sides of the module.
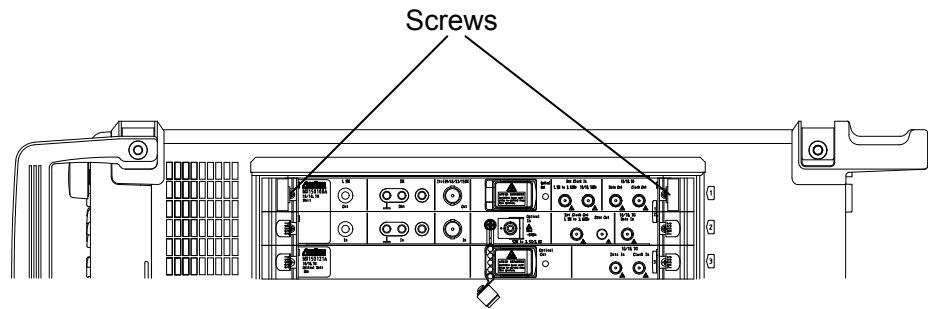
Screws

Figure 2.3.1-2   Modules screws

⚠ CAUTION

- **Be sure to check that the power cord of the MP1800A is disconnected before installing the modules. Installing modules with the power cord connected may result in failure.**

- **Take countermeasures against static electricity (ESD) when installing modules. Failure to do so may result in failure.**

⚠ **CAUTION**

- **Insert the modules such that they are parallel to the grooves, without tilting them (see the figure below). Failure to do so may deform the metal spring on top of the modules.**
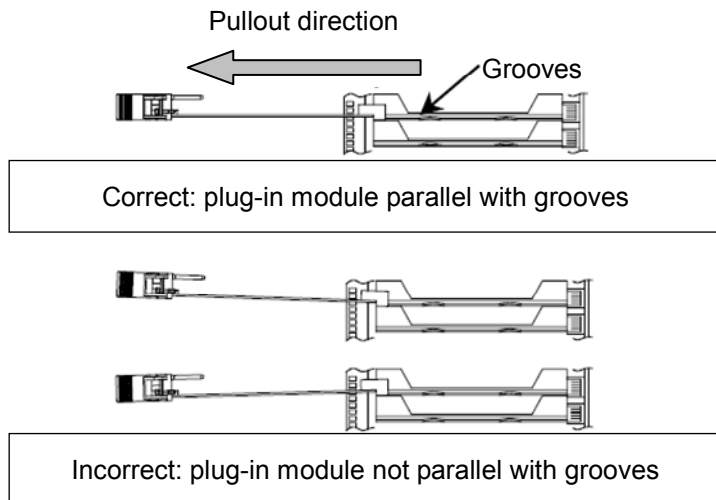
Insertion direction

Groove

Correct: plug-in module parallel with grooves

Incorrect: plug-in module not parallel with grooves
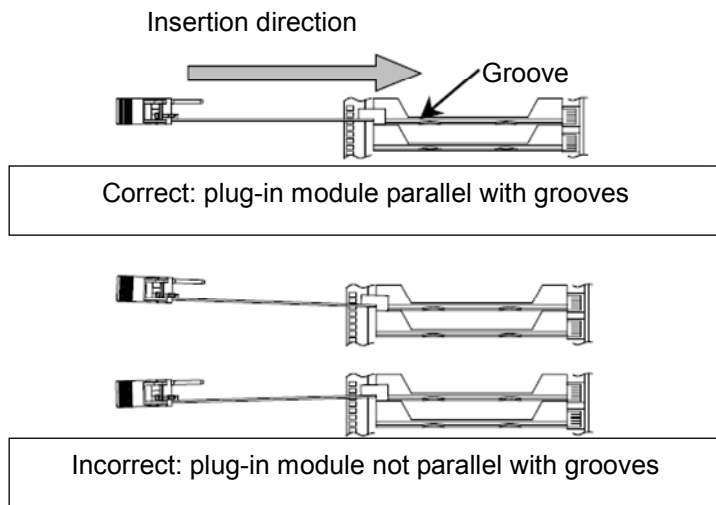
Figure 2.3.1-3   Module insertion

- **Do not touch any electric component mounting surface. Doing so may damage the components.**

- **Be careful not to catch your fingers when manipulating the ejector. Doing so may cause injury.**

- **Tighten the left and right screws after inserting a module. Failure to do so may cause malfunction or failure of the module, or allow it to drop out when transported.**

- **Do not touch any part of the module's optical fiber. Doing so may change the optical characteristics or damage the cord.**

- **Attach a blank panel to every slot where no module is installed. Not attaching blank panels may result in failure due to air currents or internal temperature rise.**

2.3.2 Removing modules

1. Disconnect the power cord.

2. Loosen the left and right screws on the module to be removed.
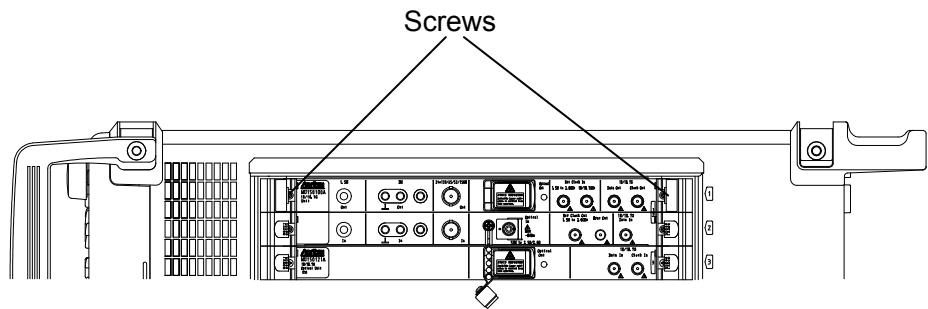
Screws

Figure 2.3.2-1   Modules screws

3. Press the red ejector lock buttons on both sides of the module to unlock the ejector.

4. Set the ejectors to the outside.

5. Hold the ejectors and gently pull out the module.
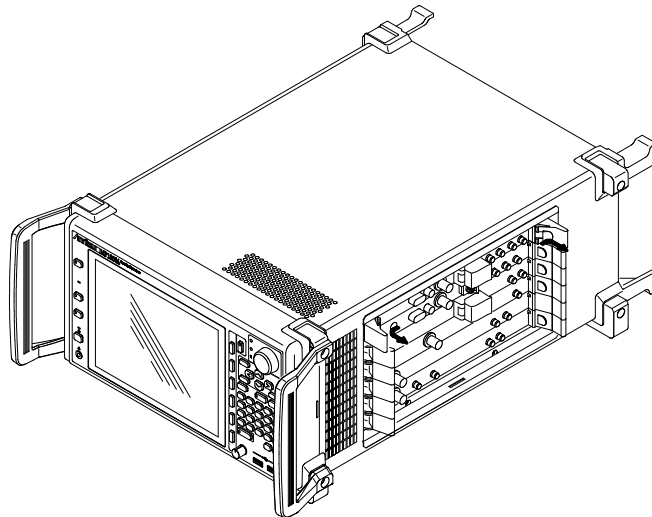
Figure 2.3.2-2   Modules ejectors

⚠ **CAUTION**

- **Be sure to check that the power cord of the MP1800A is disconnected before pulling out the modules. Pulling out modules with the power cord connected may result in failure.**

- **Take countermeasures against static electricity (ESD) when pulling out modules. Failure to do so may result in failure.**

- **Pull out the modules such that they are parallel to the grooves, without tilting them (see the figure below). Failure to do so may deform the metal spring on top of the modules.**

Pullout direction

Grooves

Correct: plug-in module parallel with grooves

Incorrect: plug-in module not parallel with grooves

Figure 2.3.2-3 Module pullout

- **Do not touch any electric component mounting surface. Doing so may damage the components.**

- **Be careful not to catch your fingers when manipulating the ejector. Doing so may cause injury.**

- **Be sure to loosen the left and right screws on the module and to release the ejector lock before setting the ejector outside. Failure to do so may damage the ejector.**

- **Do not touch any part of the module's optical fiber. Doing so may change the optical characteristics or damage the cable.**

2.4 Power Connection

This section describes the procedures for supplying power.

2.4.1 Power Requirements

For normal operation of the MP1800A, observe the power voltage range described below.

Power source	Voltage range	Frequency
100 Vac system	100 to 120 V	50 to 60 Hz
200 Vac system	200 to 240 V	50 to 60 Hz

Changeover between 100 and 200 V systems is made automatically.

⚠ CAUTION

Supplying power exceeding the above range may result in electrical shock, fire, failure, or malfunction.

2.4.2 Connecting the Power Cord

Insert the power plug into an outlet, and connect the other end to the power inlet on the rear panel.   To ensure that the MP1800A is earthed, always use the supplied 3-pin power cord, and insert the plug into an outlet with an earth terminal.   Connecting the power cord starts the MP1800A.

⚠ WARNING

Always connect the MP1800A to a properly grounded outlet. Do not use the instrument with an extension cord or transformer that does not have a ground wire.

If the MP1800A is connected to an ungrounded outlet, there is a risk of receiving a fatal electric shock. In addition, the peripheral devices connected to the instrument may be damaged.

⚠ **WARNING**

Unless otherwise specified, the signal-connector ground terminal, like an external conductor of the coaxial connector, of the instrument is properly grounded when connecting the power cord to a grounded outlet. Connect the ground terminal of DUT to a ground having the same potential before connecting with the instrument. Failure to do so may result in an electric shock, fire, failure, or malfunction.

⚠ **CAUTION**

If an emergency arises causing the MP1800A to fail or malfunction, disconnect the MP1800A from the power supply by disconnecting either end of the power cord.
When installing the MP1800A, arrange the power inlet and outlet so that an operator may easily connect or disconnect the power cord. Moreover, DO NOT fix the power cord around the plug and the power inlet with a holding clamp or similar device.
If the MP1800A is mounted in a rack, a power switch for the rack or a circuit breaker may be used for power disconnection.
It should be noted that, the power switch on the front panel of the MP1800A is a standby switch, and cannot be used to cut the main power.

The MP1800A has an internal hard disk drive. Do not remove the power cord during startup of the MP1800A, except for an emergency.

2.5 Measures Against EOS and ESD

This section describes how to prevent MP1800A from being damaged by electrical over-stress (EOS) or electrostatic discharge (ESD).

2.5.1 How to use the GND connection cable

There is a risk of damaging MP1800A due to EOS if MP1800A and other peripheral equipment (including experimental circuits) are not connected to the common ground.
When connecting MP1800A and other peripheral (including experimental circuits), connect other peripheral equipment to the ground terminal of MP1800A's chassis with the GND connection cable before connecting the I/O connectors.
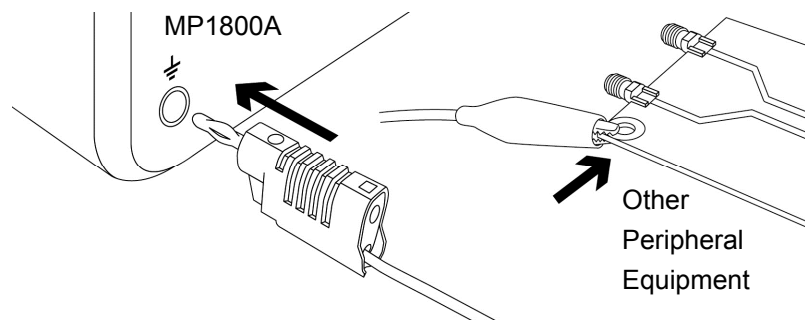
Figure 2.5.1-1   How to Use the GND Connection Cable

2.5.2 How to use the ESD Discharger

There is a risk of damaging MP1800A if the coaxial cable you connect to MP1800A is charged electrostatically.

To prevent MP1800A from being damaged by ESD, remove electrostatic charges from the cable by using the ESD Discharger before cabling the connectors.

The ESD Discharger can be used with one of SMA connector (and its compatible connector) and V connector (and its compatible connector).
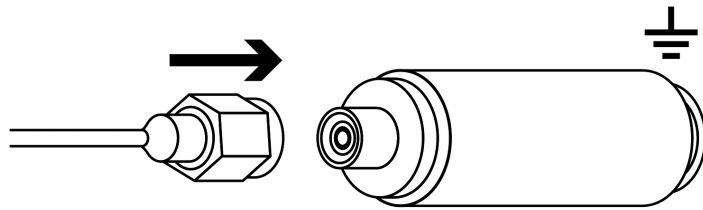
Figure 2.5.2-1   How to Use the ESD Discharger

2.6 Connecting with Peripheral Devices

1. USB mouse, keyboard and other USB devices
   Connect a cable with a Type A connector to the USB port on the front or rear panel.   Turn off the connected devices before turning off the MP1800A.

2 ports   1 port
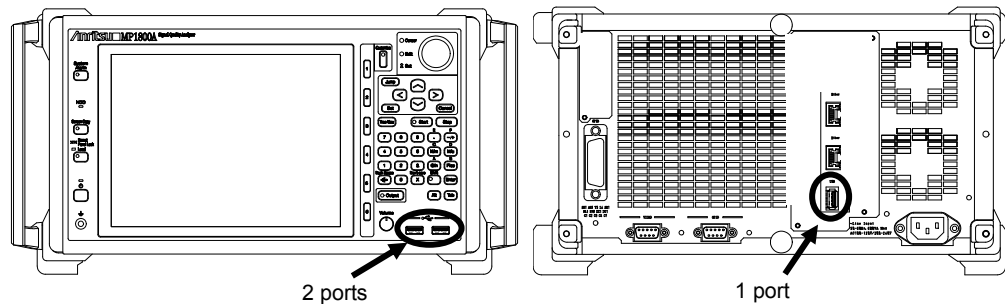
Figure 2.6-1   USB interfaces

2. The MP1800A has USB interface ports (Revision 1.1), two ports on the front panel and one port on the rear panel as standard.   Use the USB ports to connect the USB mouse or a keyboard.

3. Ethernet
   Connect the RJ modular plug of a 10 BASE-T or 100 BASE-TX cable to the RJ45 modular jack on the rear panel.   Refer to Section 4.2 "Using Ethernet" for details.

4. External display
   Before turning on the MP1800A, connect the display cable to the Video connector on the rear panel.   The external display can be used when the MP1800A is turned on.   Connecting after the MP1800A has been turned on may cause failure.   Turn off the display before turning off the MP1800A.
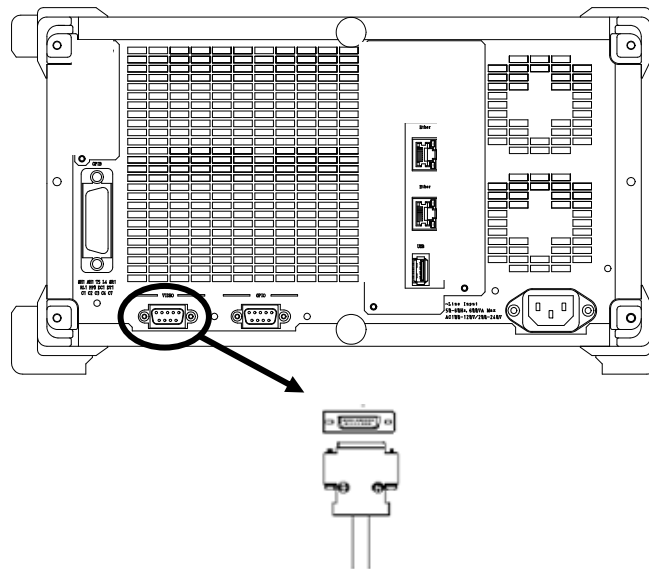
Figure 2.6-2   CRT interface

5.   A CRT interface to enable VGA output to an external CRT is
      provided on the rear panel of the MP1800A as a standard feature.
      It uses a D-SUB 15-pin connector.   When the resolution is set to
      800×600 pixels, simultaneous display on the CRT and the built-in
      LCD of the MP1800A can be performed.

6.   GPIB
      Connect a cable to the GPIB connector on the rear of the MP1800A
      before turning on the MP1800A.   Connecting after the MP1800A
      has been turned on may cause failure.   Refer to Section 4.3 "Using
      GPIB" for details.

2.7 Connecting to Network

When connecting the MP1800A to a network, be sure to set the IP address using the setup utility, so as not to conflict with the IP address of any other device on the network. Consult your network administrator for available IP address. Refer to Section 4.2 "Using Ethernet" for the IP address setting procedure. Do not connect the MP1800A to a network which has possibly been invaded by a virus.

Chapter 3   Start/Stop Procedures

This chapter describes the start and stop procedures of the application software for using the MP1800A.

3.1   Start Procedure

At non-standby status (when Standby LED is off)

1. Connect the power cord to turn on the MP1800A.

2. The Power lamp turns on.   The selector screen opens automatically after startup of Windows.

Standby LED

Inlet
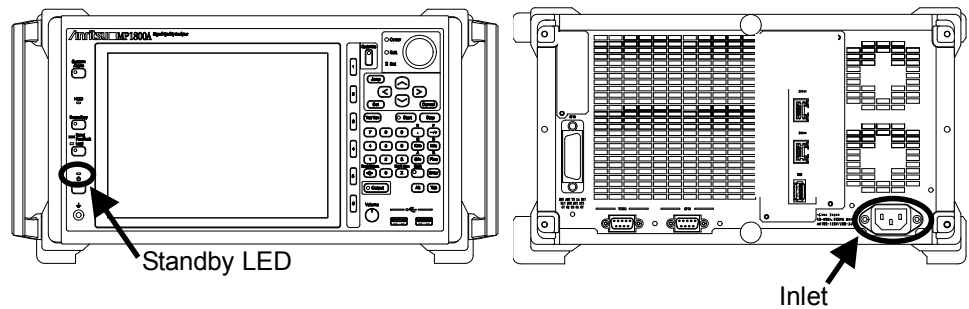
Figure 3.1-1   Front and rear panels

At standby status (when Standby LED is on)

1. Turn on the power switch of the MP1800A.
   The Power lamp lights up.   The selector screen opens automatically after startup of Windows.
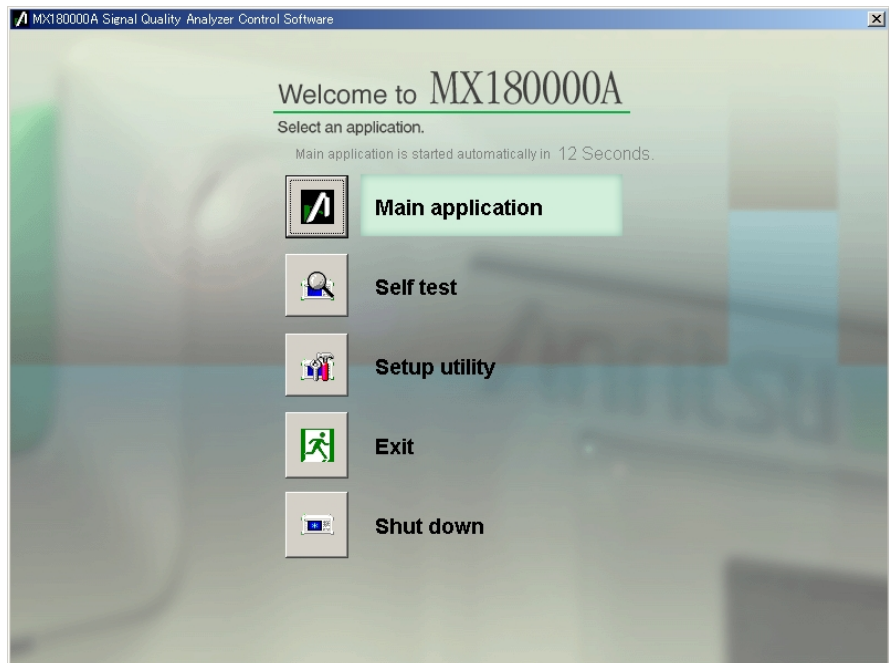
Figure 3.1-2   Selector screen

2. Click an icon button on this screen to start application.   If no icon button is clicked within 15 seconds, the main application activates automatically.

- Main application
  Starts the MX180000A measurement application.   If the module configuration has changed from that at the last termination of the application, the internal software corresponding to the new configuration may be downloaded.   Do not power off the MP1800A during downloading, or the MP1800A may be damaged
- Self test
  Starts a self-test.
  Refer to Chapter 7 "Self-Test" for details.
- Setup utility
  Starts the setup utility.   The setup utility can be used to set remote functions, display option installation information and software versions, and update internal software (firmware) of the MP1800A and each module.   Refer to Chapter 5 "Other Functions" for details.
- Exit
  Closes the selector screen and opens the Tool button screen.
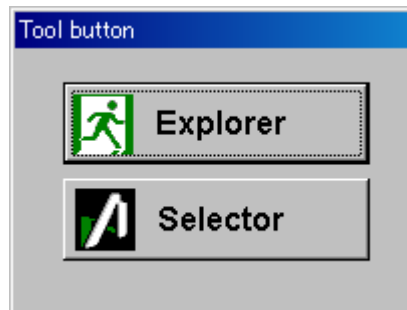
Figure 3.1-3   Tool button screen

Click [Explorer] to start Windows Explorer.   Click [Selector] to return to the selector screen.

- Shut down
  Click this button to close the selector screen and turn off the MP1800A.

3.2 Stop Procedure

The following two methods are available:

1. Press and hold the power switch on the front panel. The Power lamp goes off, and then the Standby LED lights up (enters standby status).

2. Click the [Shut down] button on the selector screen. The Power lamp goes off, and then the Standby LED lights up (enters the standby status).

⚠ **CAUTION**

The MP1800A has an internal hard disk drive. Do not remove the power cord during startup of the MP1800A, except for an emergency.

Chapter 4 Remote Control

Remote control of the MP1800A can be performed via Ethernet or GPIB interface.   This chapter describes the remote control procedure.

4.1   Selecting Remote Interface

To perform remote control of the MP1800A via the remote interface, select the interface to be used, from the setup utility.   Click [Setup utility] from the selector screen displayed after power-on of the MP1800A or after exiting an application.
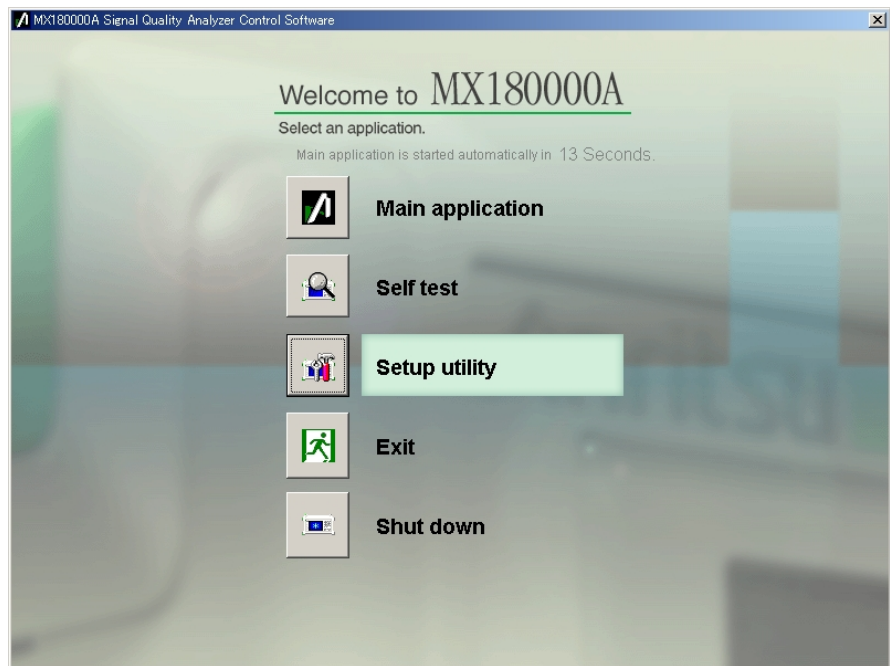
Figure 4.1-1   Selector screen

Clicking [Setup utility] opens the Setup Utility Login screen.   Select [User] and click [OK] button.
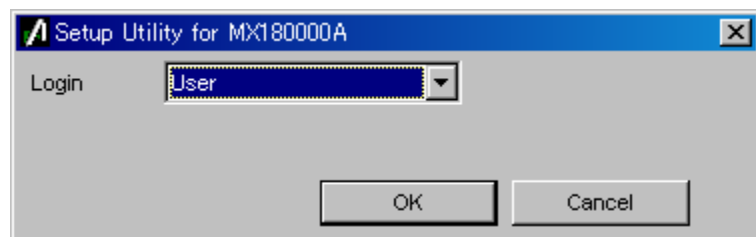
Figure 4.1-2   Setup Utility Login screen

Click the [Remote Control] tab to open the remote control setting screen, select the remote interface used for the MP1800A, and set the operating environment for each interface.

Note:

> When a remote control option (MP1800A-x01 and MP1800A-x02) is not installed, settings on the screen cannot be performed.
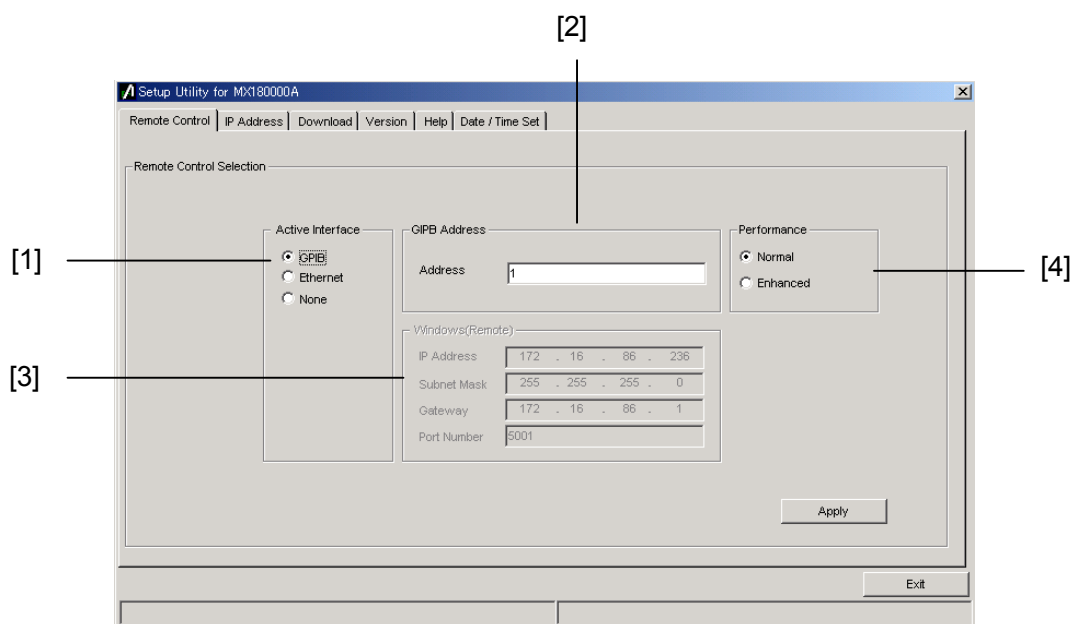
Figure 4.1-3   Remote Control setting screen

Table 4.1-1   Items in Remote Control tab window

No.	Type	Function/operation
[1]	Active Interface	Set the remote interface used for the MP1800A. Select [GPIB], [Ethernet] or [None] if no remote interface is used.
[2]	GPIB Address	Set the [GPIB] device address of the MP1800A used when GPIB is selected for the active interface.
[3]	Windows (Remote)	Set the IP address, subnet mask, gateway address, and port number when the [Ethernet] is selected for the active interface.
[4]	Performance	When [GPIB] is selected for Active Interface, the setting area is displayed. Set the GPIB remote command processing mode Normal: To use commands and responses including binary data, the EOI terminator is required. Enhanced: Remote processing speed increases. The EOI terminator is required for all commands and responses.

Refer to the MX180000A Signal Quality Analyzer Control Software Remote Control Operation Manual for details on remote control.

Table 4.1-2   Remote interface

Interface	Setting item	Initial value
GPIB	Active Interface	None
	GPIB Address (Device)	1
Ethernet	Active Interface	None
	Port Number	5001

4.2 Using Ethernet

Select [Ethernet] referring to Section 4.1 Selecting Remote Interface, and set IP address, subnet mask, and gateway address for the MP1800A. The controller must be connected to the MP1800A with the IP address and ports displayed here.
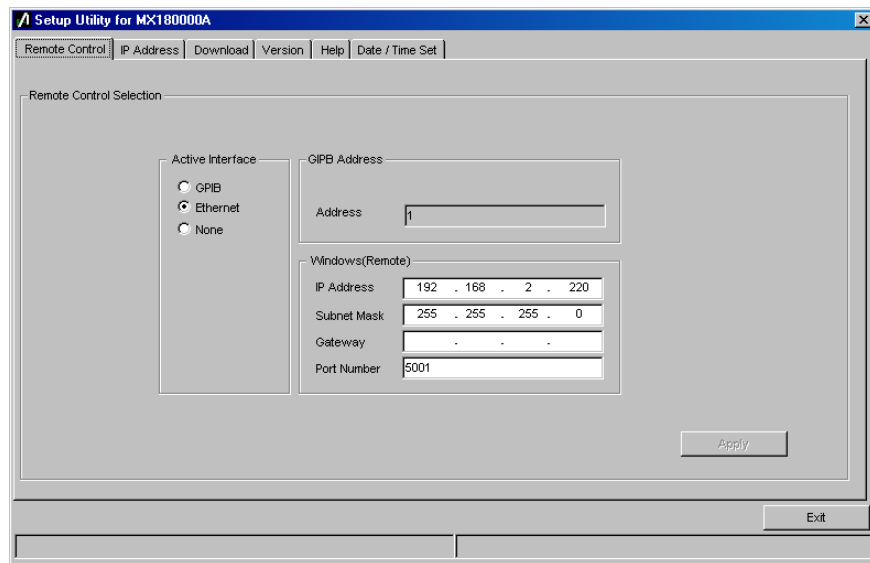
Figure 4.2-1 IP address check

For details about the setting restrictions, refer to "MX180000A Signal Quality Analyzer Control Software Remote Control Operation Manual". Two connectors for 10 BASE-T/100 BASE-TX cables are provided on the rear panel. The two connectors are internally connected via a HUB, so they have the same function. Use a cable of category 5 or higher.
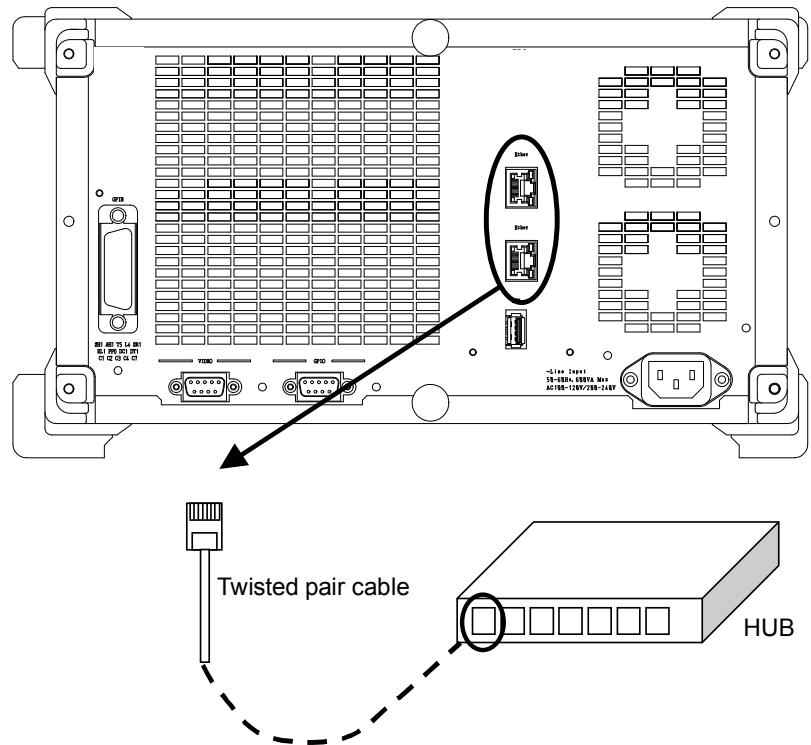
Figure 4.2-2   Ethernet cable connection

4.3 Using GPIB

Select [GPIB] and set the GPIB address in Section 4.1 "Selecting Remote Interface" to use a GPIB.   A connector for the GPIB cable is provided on the rear panel.   Be sure to connect the GPIB cable before turning on the MP1800A.   Up to 15 devices, including the controller, can be connected in one GPIB system.   Note that the cable length is limited, as shown below.

- Total cable length: ≤20 m
- Cable length between devices: ≤4 m
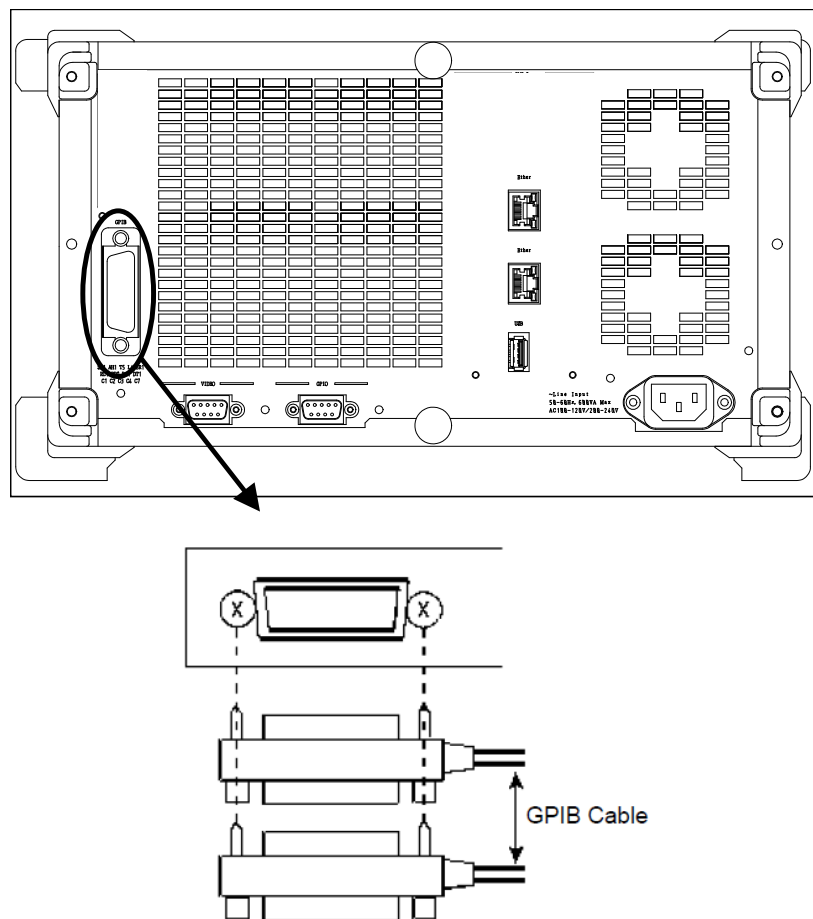
Figure 4.3-1   GPIB cable connection

4.4   Exiting Remote Control

There are two ways to exit.

(1)   Press the power switch on the front panel. The power lamp goes off, Standby LED will lit (Changing to Standby status).

(2)   Click [Shut down] on the selector screen. The power lamp goes off, Standby LED will lit (Changing to Standby status).

⚠ **CAUTION**

Do not pull out the power code when booting MP1800A except emargency stiuation because the MP1800A has built-in HDD.

Chapter 5   Other Functions

This chapter describes the procedure for checking software versions of the MP1800A and modules installed in it, and procedures for updating, setting initialization, and adding options later.

5.1   Checking Installed Software Version

The version of the software installed to the MP1800A can be checked by using [Help] on the menu bar of the main application or from the setup utility.

Select [Help] – [Version] on the menu bar of the main application.   The screen shown below displaying the currently installed software version opens.

Figure 5.1-1   Version display screen

An object displayed with a yellow background on the Version display screen indicates that its version does not match with the installed one. In this case, update the internal software by referring to Section 5.2 "Updating Software."   Using the MP1800A while the internal software versions mismatch may result in abnormal operation.

Click [Setup utility] from the selector screen displayed after power-on of the MP1800A or after exiting an application.

Figure 5.1-2   Selector screen

Clicking [Setup utility] opens the Setup Utility Login screen.   Click [OK] in the status shown above.
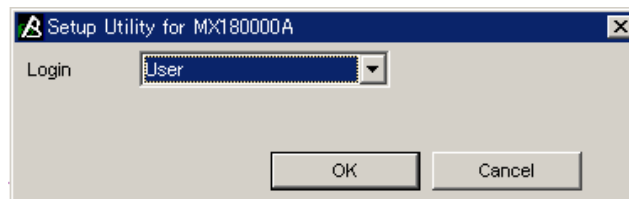

Figure 5.1-3   Setup Utility Login screen

Click the [Version] tab to open the software version display screen.   The software version and serial number of the MP1800A can be checked on this screen.
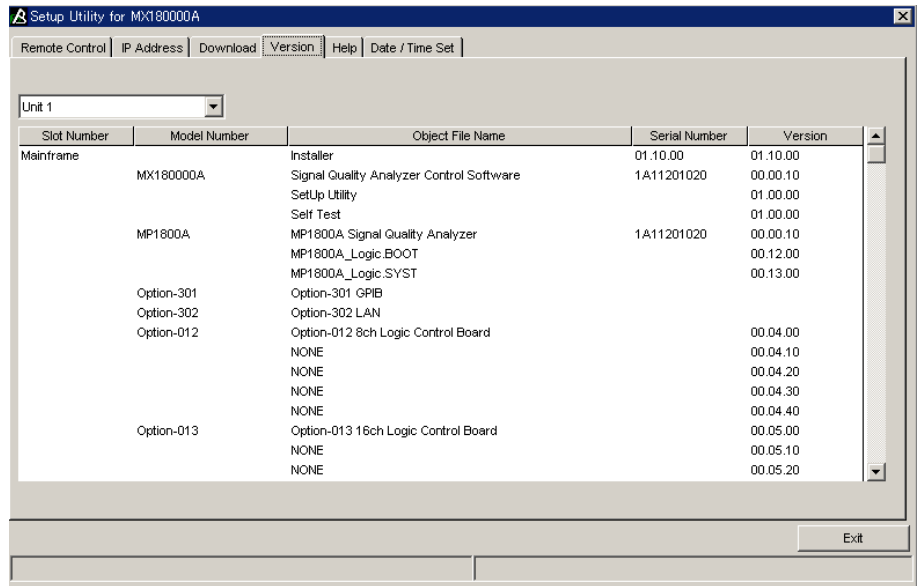
Figure 5.1-4   Software version display screen

An object displayed with a yellow background on the Software version display screen indicates that its version does not match with the installed one.   In this case, update the internal software by referring to Section 5.2 "Updating Software."   Using the MP1800A while the internal software versions mismatch may result in abnormal operation.

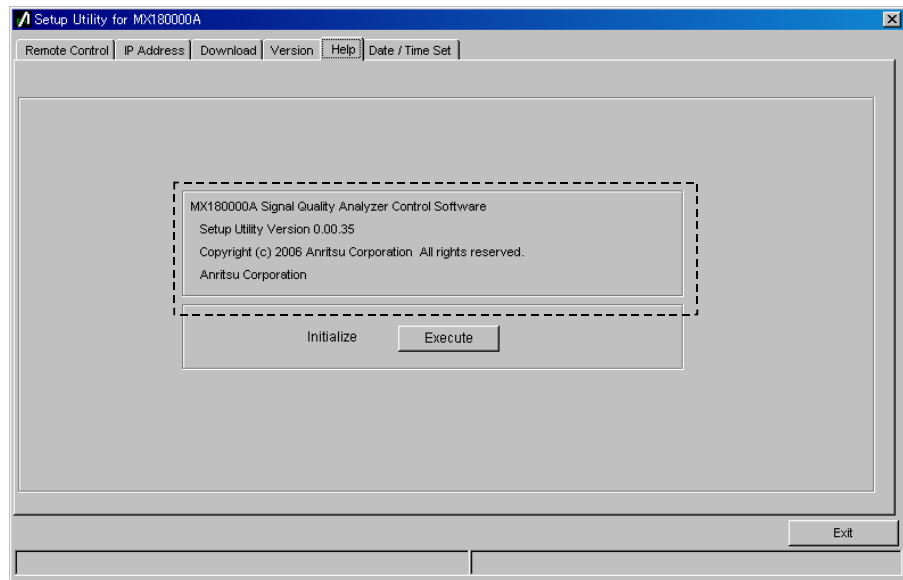The setup utility version can also be checked by clicking the [Help] tab.

Figure 5.1-5   Setup utility version display

5.2 Updating Software

Software of the MP1800A and each module can be updated from the setup utility screen.

When a new version of the software is installed, a version mismatch may occur between the new-version software and the MP1800A internal software. Operations are not guaranteed in the version mismatch state. The version mismatch can be solved from the setup utility screen. When the setup utility is started up, click the [Download] tab. Object files that can be downloaded are listed in the download file display area. Select the checkbox for the files to be updated (downloaded), then click [Load] to start file download. When all the selected files are downloaded, the MP1800A internal software is updated. The MP1800A internal software can usually be updated to the latest version just by clicking [Load].
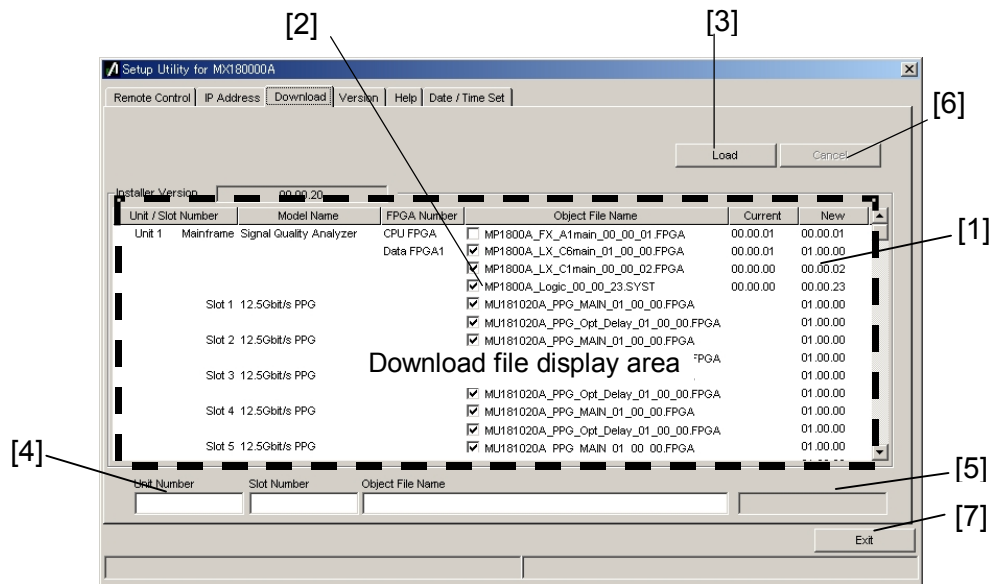

Figure 5.2-1 Download tab window

Table 5.2-1   Items in Download tab window

No.	Function/operation
[1]	Shows the files that can be downloaded.
	The versions displayed in the New column are those of the object files that can be provided by the installed MX180000A Signal Quality Analyzer Control Software.
	The versions displayed in the Current column are those of the internal software that has already been installed in the MP1800A.
	If the versions in the New and Current columns do not match, select the checkbox for that object file and download it.
[2]	Select the checkbox for the file to be downloaded.
	The checkbox is initially selected for the object files that need to be downloaded (i.e., the versions in the New and Current columns do not match).
[3]	Execute downloading. The file versions stored in the internal HDD by the MX180000A installer are compared with the file versions downloaded in the MP1800A and each module, and if they differ, downloading of files is executed.
[4]	Shows slot number and file name for downloading.
[5]	Shows download progress.
[6]	Stops downloading.
[7]	Exits the setup utility.

Notes:

1. If the version is not displayed in the Current column and the checkbox is cleared, select the checkbox and execute download.

2. When one of the following FPGA is downloaded, the MP1800A must be turned off and then on again in order to enable the updated information.   It takes 10 minutes per file.   Follow the procedure described in Section 3.2 "Stop Procedure" when turning off the MP1800A.
   MU181020A_PPG_MAIN_xx_xx_xx.FPGA
   MU181020A_PPG_Opt_Delay_xx_xx_xx.FPGA
   MU181020B_PPG_MAIN_xx_xx_xx.FPGA
   MU181020B_PPG_Opt_Delay_xx_xx_xx.FPGA
   MU181040A_ED_MAIN_xx_xx_xx.FPGA
   MU181040A_ED_Opt_Delay_xx_xx_xx.FPGA
   MU181040B_ED_MAIN_xx_xx_xx.FPGA
   MU181040B_ED_Opt_Delay_xx_xx_xx.FPGA
   MU182020A_Mux_Delay_xx_xx_xx.FPGA
   MU182021A_Mux_Delay1_xx_xx_xx.FPGA
   MU182021A_Mux_Delay2_xx_xx_xx.FPGA
   MU182040A_Demux_Delay_xx_xx_xx.FPGA
   MU182041A_Demux_Delay1_xx_xx_xx.FPGA
   MU182041A_Demux_Delay2_xx_xx_xx.FPGA
   xx indicates the file name version.

5.3 Initializing Settings

The MP1800A can be initialized to the factory settings by clicking [Initialize] in the MX180000A Signal Quality Analyzer Control Software File menu.   It can also be initialized to the factory settings, using the setup utility.   Start the setup utility and click the [Help] tab.
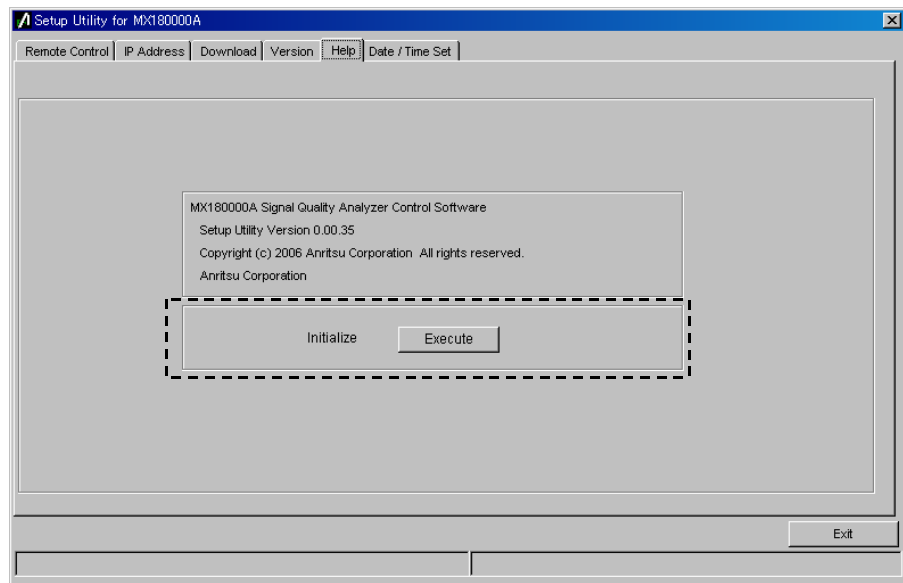

Figure 5.3-1   Initialization of settings

Click [Execute] in the [Initialize] group box to initialize the MP1800A to the factory settings.

Note:

The IP address setting is not initialized.

5.4 Adding Options

After purchasing the MP1800A, its option can be added just by entering the option key. Inform Anritsu of your MP1800A serial number when purchasing an option. An "Option Key License Certificate" will be sent to you. Add an option by using the setup utility. Select [Setup utility] on the selector screen.
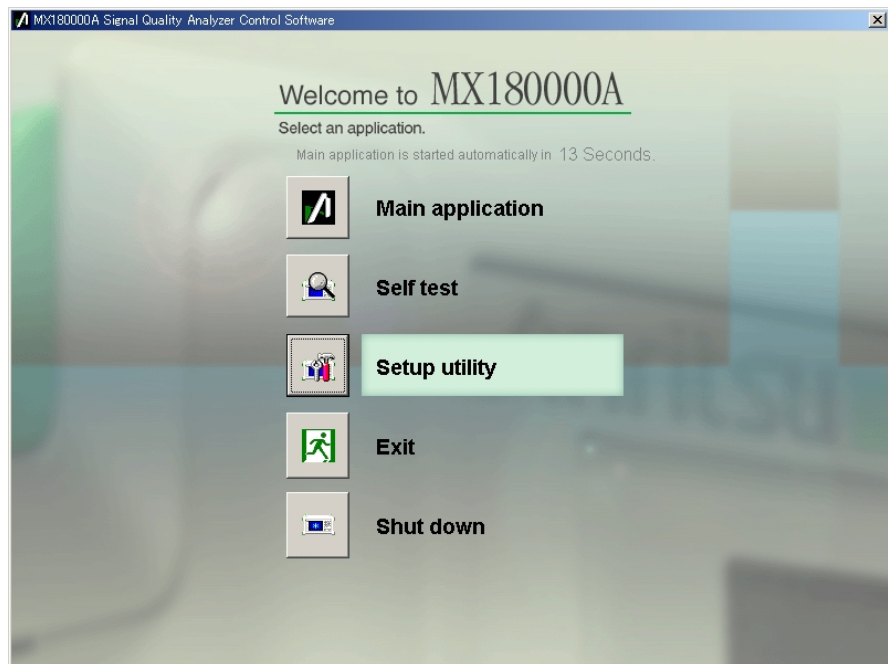

Figure 5.4-1 Selector screen

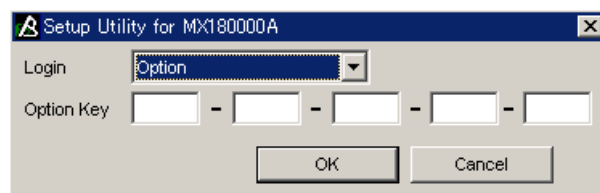Clicking [Setup utility] opens the Setup Utility Login screen.

Figure 5.4-2 Setup Utility Login screen

Select "Option" in the Login list box to display the Option Key input boxes. Enter the key code provided in the "Option Key License Certificate" into the Option Key input boxes. Next, click [OK] to display the option addition/deletion screen.
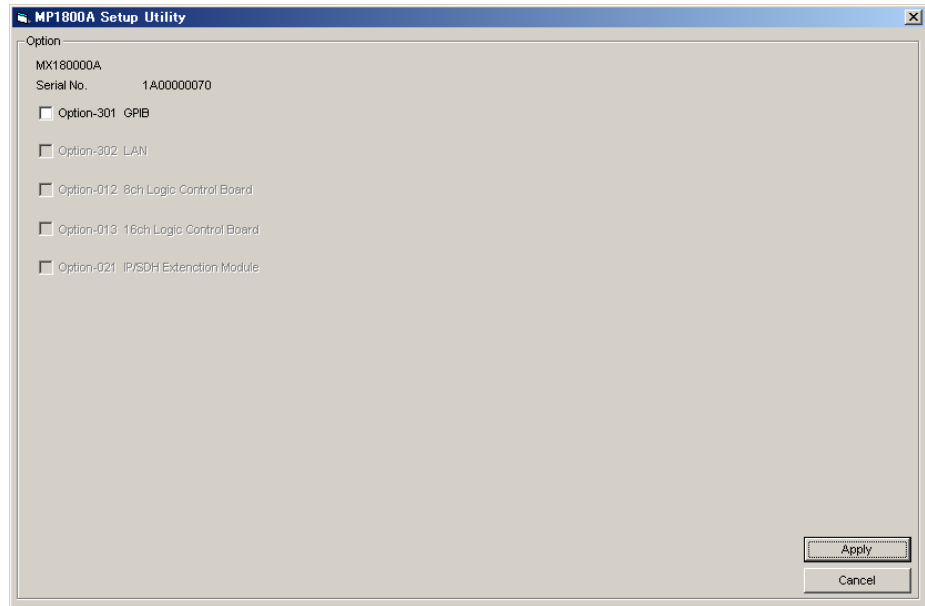
Figure 5.4-3   Option addition/deletion screen

A list of options that can be added by the entered key code is displayed. Select the checkbox corresponding to the option to be added, and then click [Apply].   The selected option is then added.   To check if the option has been added, use the [Version] tab on the Setup Utility screen.

Clicking [Cancel] closes this screen and returns to the Setup Utility Login screen.

Notes:

1. The option key can only be used for the MP1800A, the serial number for which is shown in the "Option Key License Certificate."

2. The option key provided in the "Option Key License Certificate" includes information of any pre-installed options, in addition to the one to be added.   When adding multiple options, only one option key, including information for multiple options, is provided.

3. If an option is purchased together with the MP1800A, the "Option Key License Certificate" is not provided.

4. Keep the "Option Key License Certificate" for future support.

5.5 Deleting Files

Before disposing of MP1800A, erase all data created on drives C and D by operation of Windows.

Chapter 6 Installing MX180000A

This chapter describes how to install the MX180000A Signal Quality Analyzer Control Software (hereinafter, referred to as "MX180000A"), when reinstalling or upgrading MX180000A is required.

6.1 Installing MX180000A

The MP1800A comes with MX180000A.   When reinstalling or upgrading MX180000A is required, follow the installation procedure described below. The status at delivery cannot be restored even by re-installing the OS using the accompanying Windows CD-ROM.   Do not perform re-installation of the OS.

To re-install the MX180000A, use the MX180000A CD-ROM supplied with the MP1800A.   If the MX180000A is updated, the firmware of the MP1800A and each module should also be updated.   Refer to Section 5.2 "Updating Software" for the updating procedure.

1. Copy the MX180000A installation execution files into a USB memory device via a PC.   Files to be copied are stored in the following folder in the CD-ROM supplied with the MX180000A: \Installer\MX180000A_VER_x_xx_xx.exe

    x_xx_xx above indicates the software version.

2. Insert the USB memory into the MP1800A to copy the files to the internal HDD.   Use a USB memory device with at least 512 MB of memory available.

3. Execute "MX180000A_VER_x_xx_xx.exe" to start installation.

    When overwriting a version of MX18000A that has already been installed in the MP1800A (e.g., when upgrading the version), a message dialog box "Reinstall all program features installed by the previous setup." is displayed.   Click [Yes] to continue the installation.   In this event, Steps 4 (this step) to 8 are omitted. Proceed with Step 9.

4.   The MX180000A installer starts up and the MX180000A installation
wizard window (MX180000A - InstallShield Wizard) is displayed.
Click [Next].
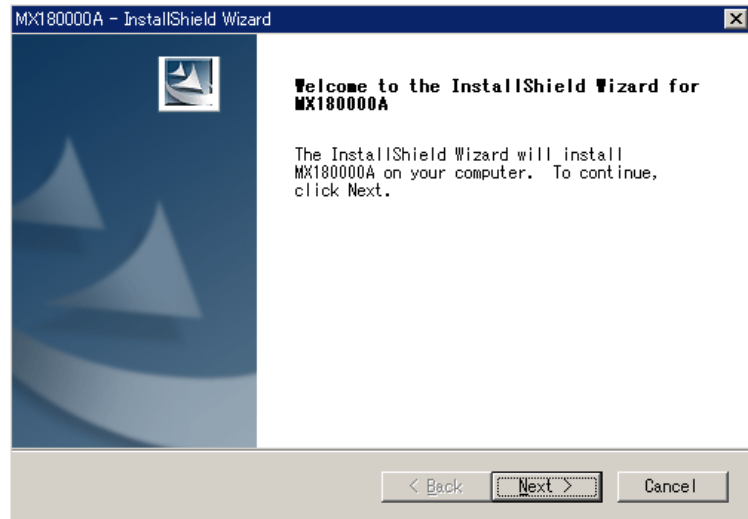
5.   A list of products is displayed for selecting the target to be controlled
by MX180000A.   Select MP1800A and click [Next].
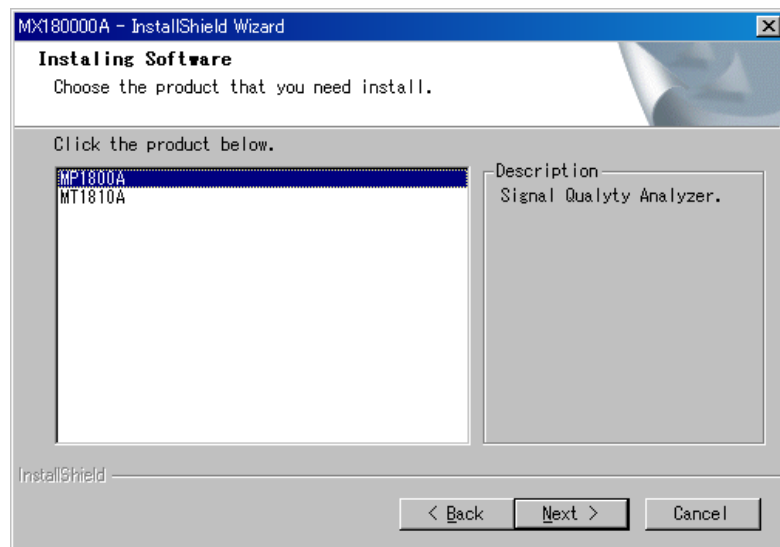
6. The Customer Information window is displayed. Enter a user name, a company name, and the serial number into the respective textbox, and then click [Next].
For the serial number, enter the 10-digit serial number of the MP1800A that is to be controlled by MX180000A.
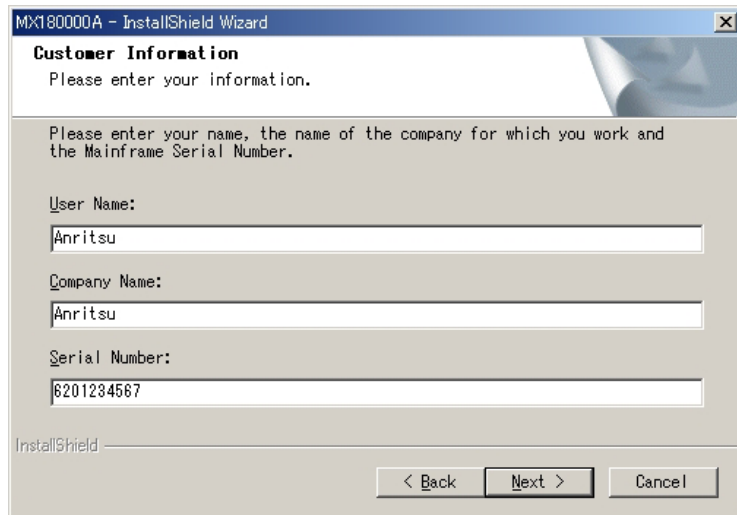

7. The error message shown below will be displayed if an incorrect serial number is entered and [Next] is clicked. Click [OK] to close the error message, and then enter the correct serial number.

8. When installation is ready (the following window is displayed), click [Install] to start installation.
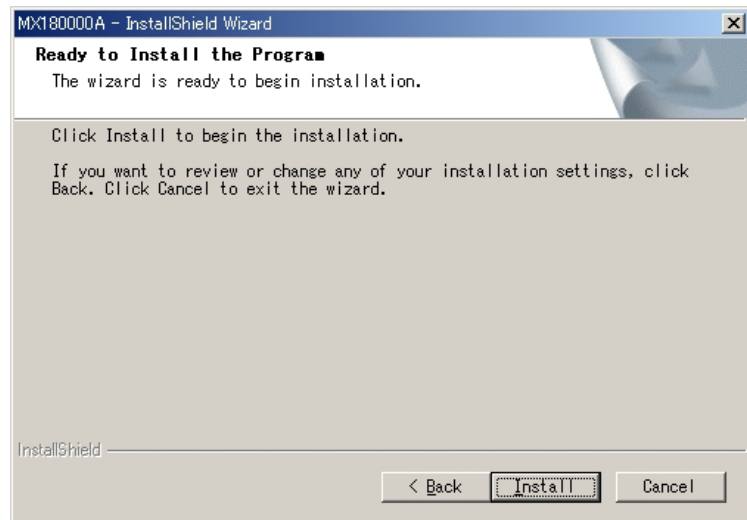
9. If MP1800A-x07 is installed, you will see the following warning. Click [Install this driver software anyway] to continue the installation.
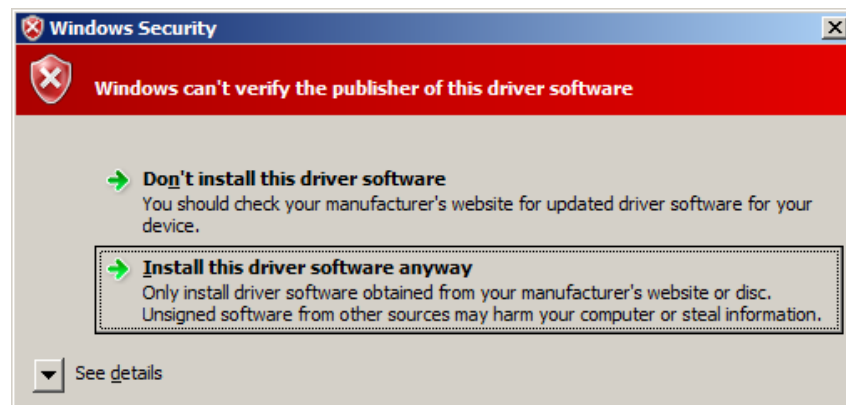
10. The following window is displayed when the installation completes
normally.   Click [Finish] to end the installation procedure.
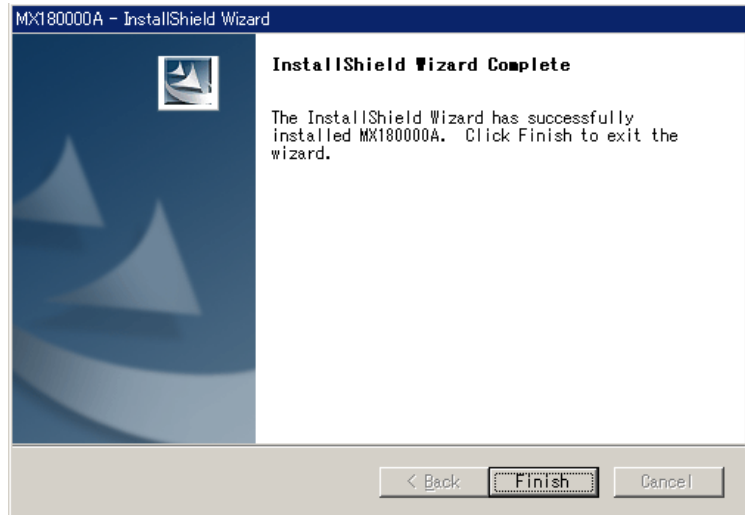
11. Be sure to check the software version of the MP1800A after
installing MX180000A.   If the firmware version is not the latest,
necessary files must be downloaded.   See Chapter 5 "Other
Functions" for details on how to check the version and how to
upgrade the software.

6.2   Installing USB Driver

When reinstalling or upgrading MX180000A is required, it is necessary
to install the USB driver in the controller.

1. When the general procedures are followed by the installer, the
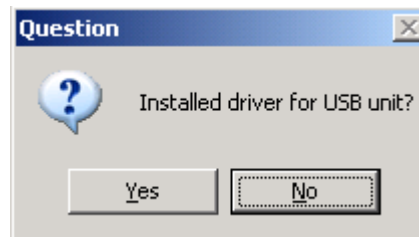   confirmation dialog is displayed. Click [Yes] to start installation.

Figure 6.2-1   Confirmation Dialog of USB Driver Installation (1)

2. Figure 6.2-2 is displayed when the installation is in progress.
    Click [Continue Anyway] to continue the installation procedures.

Figure 6.2-2   Confirmation Dialog of USB Driver Installation (2)

3. If MP1800A-x07 is installed, you will see the confirmation message shown in Figure 6.2-3.
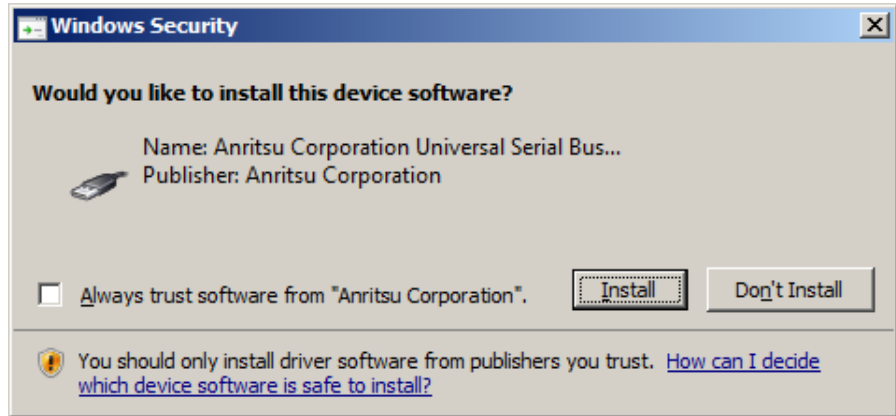   Click [Install] to continue the installation.

Figure 6.2-3   Confirmation Dialog of USB Driver Installation (3)

Note

The screens shown in Figure 6.2-2 and Figure 6.2-3 may not be displayed on the front page.   If software installations take a long time, check that these screens are is hidden at the back of the other screen.

4. The following window is displayed when the installation completes normally.
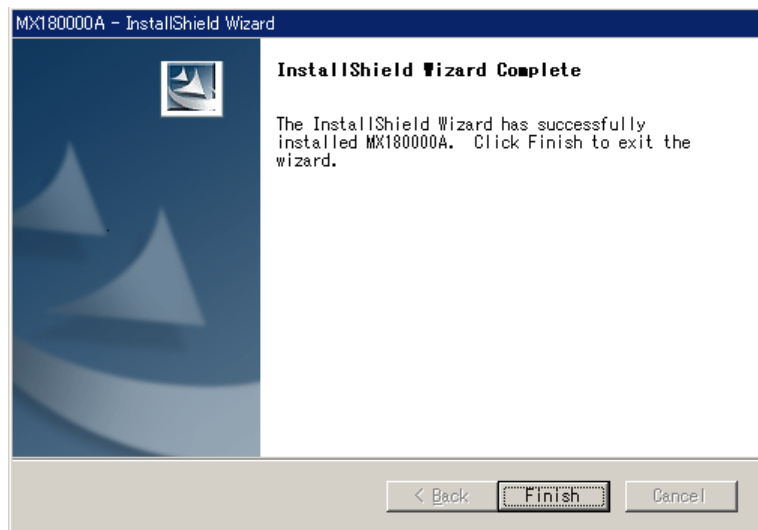   Click [Finish] to end the installation procedure.

Figure 6.2-4   Screen when Installation Finished

When initially connecting the USB device such as the MP1821A or MP1825B to the MP1800A after installing software, install the driver using the following procedures.

1. Connect the MP1800A and USB device using an USB cable.

2. The Found New Hardware Wizard screen is displayed to confirm windows update. Select [No, not this time] and click [Next].

Figure 6.2-5   Confirmation of Windows Update

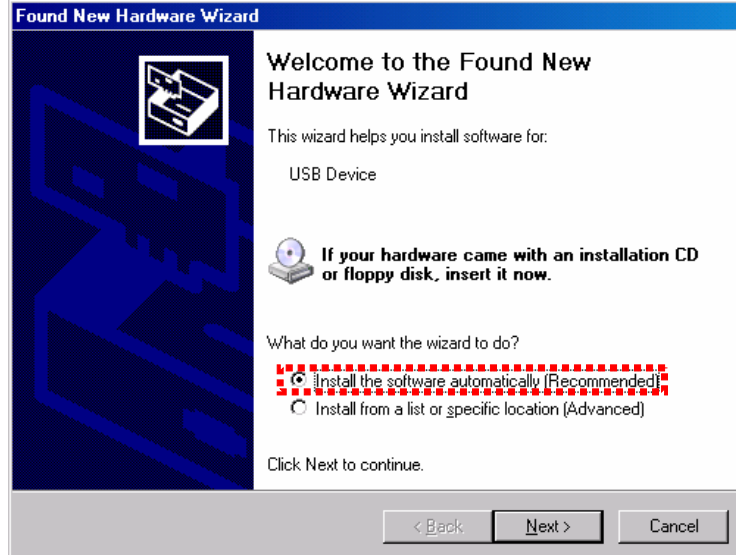3. Select [Install the software automatically] and click [Next].

Figure 6.2-6　Installing software

4. The following screen is displayed when the hardware is found. Click [Continue Anyway] to continue the installation procedures.
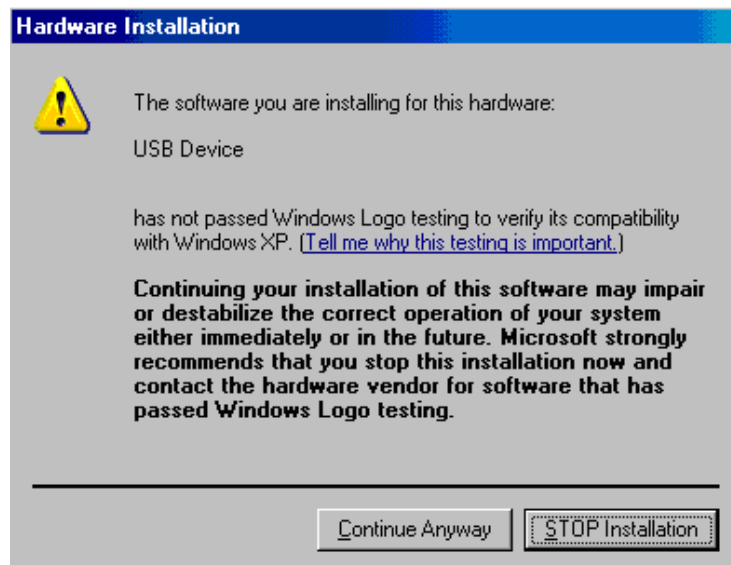

Figure 6.2-7　Installing hardware

5. Click [Finish] to end the installation procedure.
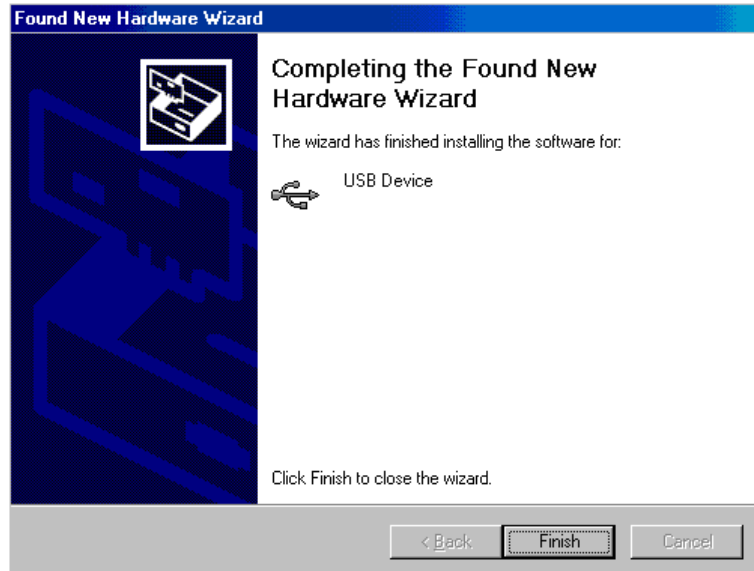
Figure 6.2-8 Completion of Installation

If the installed driver is no longer needed, uninstall it as follows.

1. Select [Start] menu → [Control Panel], and then open the Control Panel.

2. Double-click [Add/Remove Programs in the Control Panel. If MP1800A-x07 is installed, click [Programs and Features] in Control Panel.

3. Select [Anritsu USB Device Driver] from the list and click [Remove] to start the uninstallation. If MP1800A-x07 is installed, select [Anritsu USB Device Driver], and then click [Change/Remove].
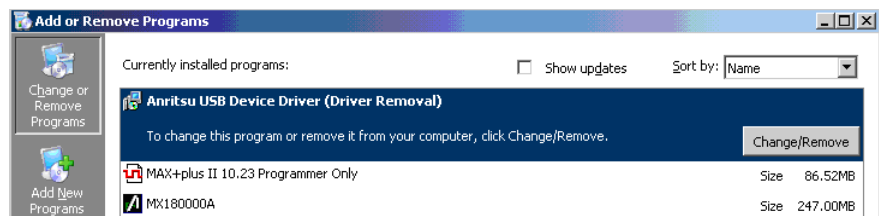
Figure 6.2-9 Removing USB Driver

Chapter 7 Self-Test

The MP1800A has a self-test function to check if the installed modules operate normally.   This chapter describes the self-test procedure.

7.1   Self-Test

The MP1800A has a self-test function (self-test application).   This
function detects module abnormalities.

Be sure to exit the main application software before starting the self-test
application.   Next, select [Self Test] on the selector screen to display the
Self-test main screen.   If the module for self-test is not installed in the
mainframe, the error message "No Module!" will be displayed.

Figure 7.1-1　Self-test main screen

Table 7.1-1　Explanation of　Self-test main screen

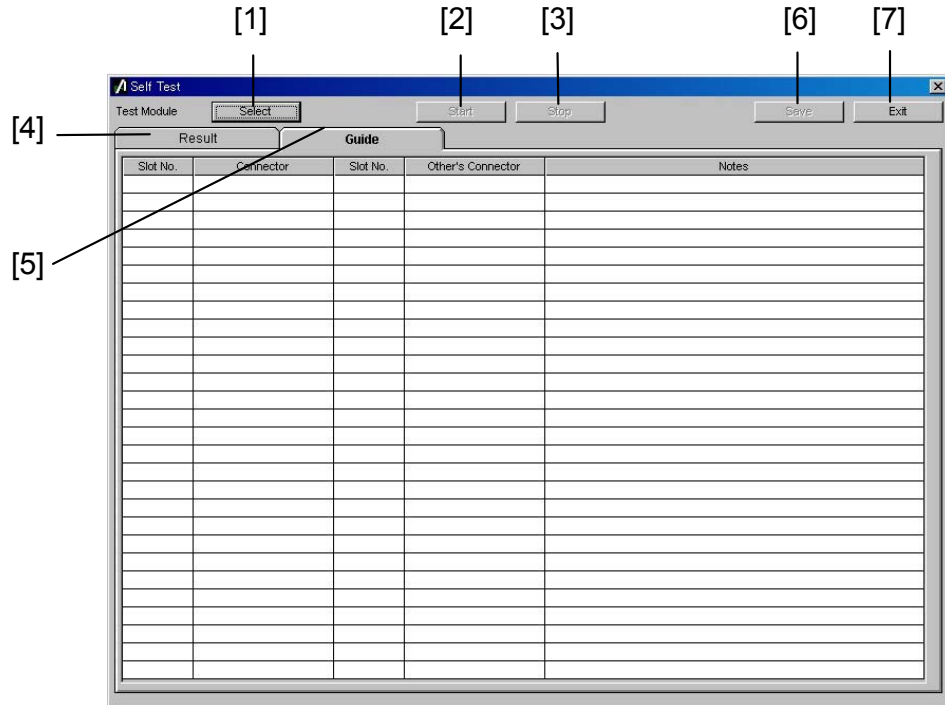| No.	Name	Function
[1]	Select	Opens the selection screen for the module on which self-test is performed.
[2]	Start	Click to start the self-test.　The [Start] button is disabled when no test module is selected.
[3]	Stop	Click to stop the self-test.
[4]	Result tab	Displays self-test results.　Nothing is displayed (blank) immediately after the application is started up.
[5]	Guide tab	Displays the self-test target module connection guide. Nothing is displayed (blank) immediately after the application is started up.
[6]	Save	Click to open the self-test result saving screen in which the self-test results can be saved.　Disabled when no self-test result data exists or during self-test execution.
[7]	Exit	Exits the self-test application and returns to the self-test selector screen.　Disabled during self-test execution.

When [Select] is clicked on the Self-test main screen, the Test Module Select screen shown below is displayed for selecting a self-test target module. In this screen, a combination of modules for which the self-test is executed can be automatically selected by clicking [Auto]. Clicking [OK] closes the Test Module Select screen.
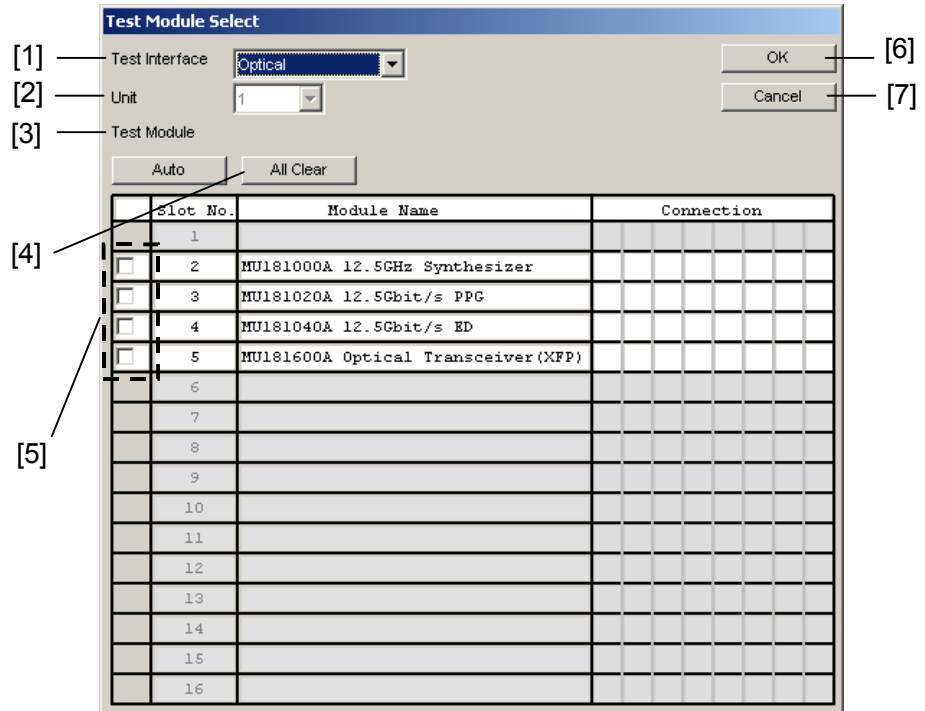

Figure 7.1-2   Test module select screen

Table 7.1-2   Explanation of Test module select screen

No.	Name	Function
[1]	Test Interface	Sets the self-test interface to [Electrical] or [Optical]. The initial value is [Electrical].
[2]	Unit	Displays the mainframe number (1).
[3]	Auto	Automatically selects the combination of modules for which the self-test is executed.
[4]	All Clear	Clears selection of all modules.
[5]	Module selection check box	Display the modules inserted into the mainframe. Select modules to be tested. Combinations of selected modules are also displayed.
[6]	OK	Reflects module selection and moves to the self-test main screen.
[7]	Cancel	Discards module selection and moves to the self-test main screen.

Notes:

1. For the combination of modules and options available for self-testing, access to the "MP1800 Series Signal Quality" on your Web site (http://www.anritsu.com).   Right-click the "MP1800 Series Signal Quality" and you can access to your area website.

2. Refer to the MX180000A Signal Quality Analyzer Control Software Operation Manual for details on the self-test.

A self-test may not be executed, depending on the conditions of the installed modules, such as the following:

1. No combination of valid PPG and ED modules exists.
2. When ED module option is MU181040A-002 0.1 to 12.5 Gbit/s or MU181040B-002 0.1 to 14 Gbit/s and MU181040A-x30 Variable Clock Phase or MU181040B-x30 Variable Clock Phase not installed
3. When PPG module option is MU181020A-002 0.1 to 12.5 Gbit/s or MU181020B-002 0.1 to 14 Gbit/s and MU181000A 12.5 GHz Synthesizer or MU181000B 12.5 GHz 4-Port Synthesizer not installed

The connection guides are displayed in the [Guide] tab window.   Connect the modules, referring to these guides.   When the modules are connected completely, click [Start] to start a self-test.
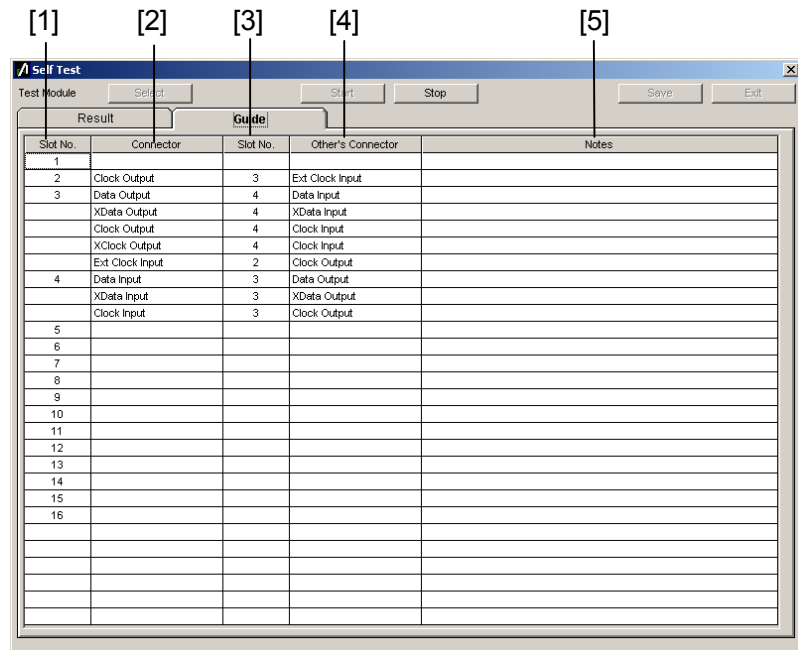
[1]   [2]   [3]   [4]   [5]

Figure 7.1-3   Connection guides screen

Table 7.1-3   Explanation of connection guides screen

No.	Type	Function
[1]	Slot No.	Displays the slot numbers of the connection source modules.
[2]	Connector	Displays the connector names of the connection source modules. (The connector names are printed on the panel.)
[3]	Slot No.	Displays the slot numbers of the connection destination modules.
[4]	Other's Connector	Displays the connector names of the connection destination modules.
[5]	Note	Displays cautions on connection. Perform connections following the displayed message. A message will also be displayed when connection is not required, according to the options installed. Example: Please Insert 6 dB ATT.

⚠ **CAUTION**

Modules may be damaged if they are connected without following Notes on the screen.

Notes:

1. Handle connectors that are not used in a self-test properly, using processes such as termination and open following the description in each module's operation manual.

2. In self-tests, optical I/O signals of the XFP and/or SFP modules should be connected via a loopback connection.

The [Result] tab window that displays the self-test results for the test modules is shown below.   When the self-test is completed, the self-test results are displayed in the Result tab window.   The item is left blank if a self-test is not executed for that item.
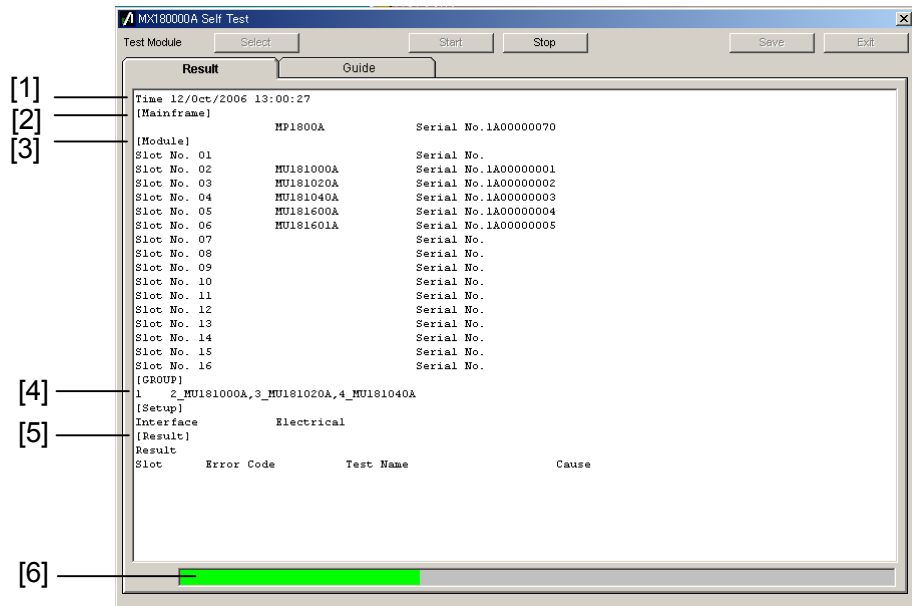

Figure 7.1-4   Result display screen

Table 7.1-4   Explanation of result display screen

No.	Type	Function/operation
[1]	Time	Displays the self-test start time.
[2]	Mainframe	Displays the model name and serial number of the mainframe.
[3]	Module	Displays the slot number, model name, and serial number of the modules inserted into the mainframe.
[4]	GROUP	Displays the combination of the modules for which the self-test has been executed.
[5]	Result	Displays the self-test results. Pass: Indicates that no error has occurred for all the self-test items. Fail: Indicates that an error has occurred for a self-test item(s). Abort: Indicates that the Stop button is clicked during self-test execution and the self-test is stopped.
	Slot	Displays the slot number.
	Error Code	Displays the error code for each self-test item. The error codes are displayed regardless of whether an error occurs. See the MX180000A Signal Quality Analyzer Control Software Operation Manual for details.
	Test Name	Displays the self-test item names. See the MX180000A Signal Quality Analyzer Control Software Operation Manual for details.
	Cause	Displays the cause of the error if it occurs, for each self-test item.
[6]	–	Displays the self-test progress state.

Chapter 8   Troubleshooting

This chapter describes the procedures to check if a failure has occurred during abnormal operation of the MP1800A.

8.1 Problems upon Power-on

Table 8.1-1 Remedies for problems upon power-on

Symptom	Location to Check	Remedy
The MP1800A cannot be turned on.	Is the power cord loose?	Fully connect the cable.
	Is the Standby LED is turned on?	If the power cord is removed and inserted during startup of the MP1800A, the MP1800A may not be turned on by pressing the power switch on the front panel. In this event, take either of these actions: 1. Remove the power cord and connect it again after 5 seconds. 2. Press and hold the power switch for at least 5 seconds, release the power switch, and then press the power switch again.
		Check if the power is being supplied to the power cord. If the MP1800A cannot be turned on even when the power is being supplied, the MP1800A may have failed. Contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

8.2 Problems upon Module Replacement

Table 8.2-1 Remedies for problems upon module replacement

Symptom	Location to Check	Remedy
A module is not recognized after starting application.	Is the module installed properly?	Install the module again by referring to Section 2.3 "Installing and Removing Modules."
	Are the appropriate modules installed?	To check the appropriate modules and software version, access to "MP1800 Series Signal Quality" on your Web site (http://www.anritsu.com). Right-click the "MP1800 Series Signal Quality" and you can access to your area website. If the appropriate modulus are not recognized, it may have failed. Contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

8.3 Software Problems

Table 8.3-1   Remedies for software problems

Symptom	Location to Check	Remedy
The selector screen does not appear after turning on the MP1800A.	Is the selector registered to Windows Startup menu?	Register the selector to the Startup menu according to Windows instruction.
		Refer to Chapter 6 "Installing of MX180000A" to re-install the MX180000A Control Software.
Windows does not start.	–	The hard disk may have failed. Contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.

If a problem cannot be solved using any of the items listed above, perform initialization and check the items again.   If the problem still occurs, contact an Anritsu Service and Sales office.   Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the CD version.