MS2850A-053
External Interface for High Speed Data Transfer PCIe
MS2850A-054
External Interface for High Speed Data Transfer USB3.0
Operation Manual

Third Edition

- **For safety and warning information, please read this manual before attempting to use the equipment.**
- **Additional safety and warning information is provided within the MS2850A Signal Analyzer Operation Manual Mainframe Operation. Please also refer to it before using the equipment.**
- **Keep this manual with the equipment.**

ANRITSU CORPORATION

Document No.: M-W3950AE-3.0

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.

MS2850A-053 External Interface for High Speed Data Transfer PCIe
MS2850A-054 External Interface for High Speed Data Transfer USB3.0
Operation Manual

19 July 2017 (First Edition)
30 September 2020 (Third Edition)

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- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is 6 months from the purchase date.
- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
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In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.

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2. You and Anritsu may terminate this EULA by a written notice to the other party 30 days in advance.

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If Anritsu suffers any damages or 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.

Article 8. Responsibility after Termination

Upon termination of this EULA in accordance with Article 6, you shall cease all uses 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.

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

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This EULA shall be governed by and interpreted in accordance with the laws of Japan without regard to the principles of the conflict of laws thereof, and any disputes arising from or in relation to this EULA that cannot be resolved by negotiation described in Article 9 shall be subject to and be settled by the exclusive agreed jurisdiction of the Tokyo District Court of Japan.

Revision History:

February 29th, 2020

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 flash drive 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.
- Protection against malware (malicious software such as viruses).
  This equipment runs on Windows Operating System.
  To connect this equipment to network, the following is advised.
  - Activate Firewall.
  - Install important updates of Windows.
  - Use antivirus software.

Protection Against Computer Virus Infections

Prior to the software installation

Before installing this software or any other software recommended or approved by Anritsu, run a virus scan on your computer, including removable media (e.g. USB flash drive and CF memory card) you want to connect to your computer.

When using this software and connecting with the measuring instrument

- Copying files and data
  On your computer, do not save any copies other than the following:
  - Files and data provided by Anritsu
  - Files created by this software
  - Files specified in this document

  Before copying these files and/or data, run a virus scan, including removable media (e.g. USB flash drive and CF memory card).
- Connecting to network
  Connect your computer to the network that provides adequate protection against computer viruses.
- Protection against malware (malicious software such as viruses).
  To connect your computer to network, the following is advised.
  - Activate Firewall.
  - Install important updates of Windows.
  - Use antivirus software.

Cautions on Proper Operation of Software

This software may not operate normally if any of the following operations are performed on your computer:

- Simultaneously running any software other than that recommended or approved by Anritsu
- Closing the lid (Laptop computer)
- Turning on the screen saver function
- Turning on the battery-power saving function (Laptop computer)

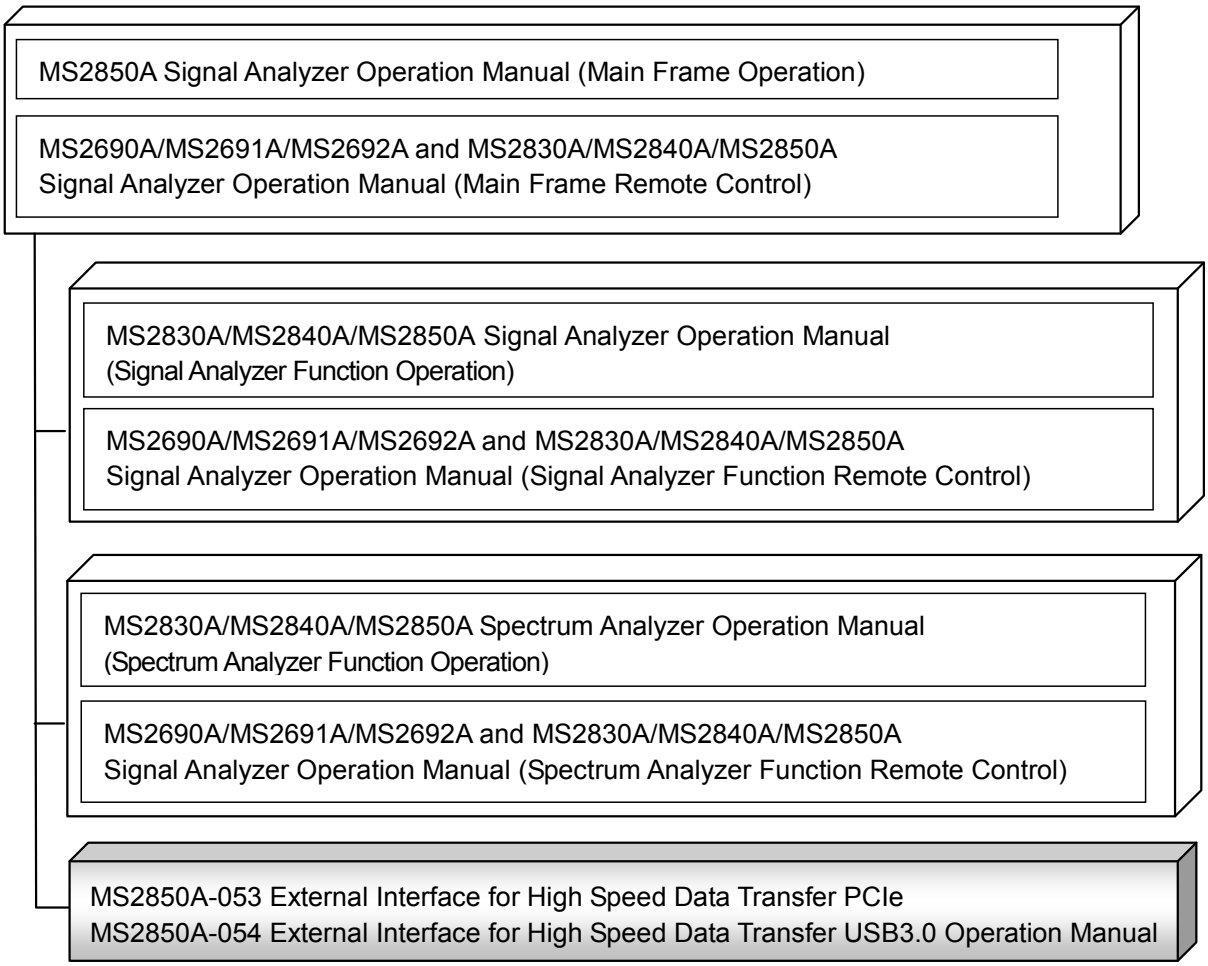
For how to turn off the functions, refer to the operation manual that came with your computer.

About This Manual

This document describes how to operate MS2850A-053 External Interface for High Speed Data Transfer PCIe and MS2850A-054 External Interface for High Speed Data Transfer USB3.0.

■ Associated Documents

The operation manual configuration of the MS2850A Signal Analyzer is shown below.



- Signal Analyzer Operation Manual (Mainframe)
- Signal Analyzer Operation Manual (Mainframe Remote Control)

  Description of basic operations, maintenance procedures, common functions and common remote functions of the mainframe

- Signal Analyzer Operation Manual (Signal Analyzer Function)
- Signal Analyzer Operation Manual (Signal Analyzer Function Remote Control)

  Description of basic operations, common functions and common remote functions of the signal analyzer

- Signal Analyzer Operation Manual (Spectrum Analyzer Function)
- Signal Analyzer Operation Manual (Spectrum Analyzer Function Remote Control)

  Description of basic operations, common functions and common remote functions of the spectrum analyzer

- MS2850A-053 External Interface for High Speed Data Transfer PCIe
  MS2850A-054 External Interface for High Speed Data Transfer USB3.0
  Operation Manual <This document>

  Description of basic operations and common functions of the external interface for high speed data transfer

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IV.

Chapter 1 Overview

This chapter provides an overview of the External Interface for High Speed Data Transfer PCIe/USB3.0.

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1.2 Product Configuration 1-3
1.2.1 Standard configuration 1-3
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1.1 Product Overview

MS2850A-053/153 External Interface for High Speed Data Transfer PCIe (hereinafter, MS2850A-053) and MS2850A-054/154 External Interface for High Speed Data Transfer USB3.0 (hereinafter, MS2850A-054) are the options to transfer the captured data (IQ data), in which the received signals are captured in the MS2850A Signal Analyzer (hereafter, MS2850A), to the external PC at high speed.

The features of these options are listed below.

MS2850A-053/153 External Interface for High Speed Data Transfer PCIe

- Data transfer rate Max. 4 GB/s
- Standard PCIe (PCIe Gen 2 x8 Link)
- Interface PCIe

Note:

Prepare the PCIe Host adapter and PCIe x8 cable described in 1.2.2, “Applicable parts”, or the equivalent of these to connect MS2850A and the external PC.

MS2850A-054/154 External Interface for High Speed Data Transfer USB3.0

- Data transfer rate Max. 500 MB/s
- Standard USB 3.0
- Interface USB 3.0 Type B

Note:

Prepare the USB3.0 cable to connect MS2850A and the external PC.

1.2 Product Configuration

1.2.1 Standard configuration

Table 1.2.1-1 to Table 1.2.1-4 list the standard configurations of the MS2850A-053 and MS2850A-054.

Table 1.2.1-1 Configuration of Application

Model	Product name	Remarks
MS2850A-053	External Interface for High Speed Data Transfer PCIe	
Accessory	Software for High Speed Data Transfer	Stored in the attached DVD-R.
	Operation Manual	

Table 1.2.1-2 Configuration of Application

Model	Product name	Remarks
MS2850A-153	External Interface for High Speed Data Transfer PCIe, Retrofit	
Accessory	Software for High Speed Data Transfer	Stored in the attached DVD-R.
	Operation Manual	

Table 1.2.1-3 Configuration of Application

Model	Product name	Remarks
MS2850A-054	External Interface for High Speed Data Transfer USB3.0	
Accessory	Software for High Speed Data Transfer	Stored in the attached DVD-R.
	Operation Manual	

Table 1.2.1-4 Configuration of Application

Model	Product name	Remarks
MS2850A-154	External Interface for High Speed Data Transfer USB3.0, Retrofit	
Accessory	Software for High Speed Data Transfer	Stored in the attached DVD-R.
	Operation Manual	

1.2.2 Applicable parts

Table 1.2.2-1 lists the applicable parts for the MS2850A-053/153/054/154. They are sold separately.

Table 1.2.2-1 Applicable parts

Model	Product name	Remarks
W3950AE	MS2850A-053 External Interface for High Speed Data Transfer PCIe MS2850A-054 External Interface for High Speed Data Transfer USB3.0 Operation Manual	Printed version
U0088A	PCIe Host Adapter	for MS2850A-053/153
J1749A	PCIe x8 Cable (2m)	for MS2850A-053/153

1.3 Software

To use MS2850A-053 and MS2850A-054, install the following software to the external PC. Refer to chapter 3, "Install Procedure".

Table 1.3-1 High Speed Data Transfer software

Product name	Remarks
Software for High Speed Data Transfer	Composed of the API libraries and sample software for high speed data transfer.

The maximum value of the time to transfer the data varies depending on the IQ data capture time of MS2850A. Refer to "Table 2.4.1-1 Frequency span, resolution, and setting range when Capture Time is Manual (Cont'd)" in the *MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Signal Analyzer Function Operation* for setting MS2850A.

Table 1.3-2 Transferable IQ data

Item	Transferable IQ data				
Received signal Bandwidth (MHz)	50 / 62.5	100 / 125	250	510	1000
Sampling rate (MHz)	81.25	162.5	325	650	1300
Maximum IQ data size	32 GBytes				
Recorded data format	Refer to 5.1.2, "Format of data file" in the *MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Signal Analyzer Function Operation.*				

1.4 Performance of Applicable Parts

The performances of applicable parts to use MS2850A-053 are listed below. Refer to the following table when using a replacement.

Table 1.4-1 Performance of Applicable Parts

Model	Product name	Performance
U0088A	PCIe Host Adapter	ADLINK PCIe-8638 (PCI Express x8 host adapter for extension kit) • Operation Temp.: 0 to 55°C • Storage Temp.: –20 to 70°C • Humidity: 10 to 90% (No condensation) • PCI Express Base Specifications Rev. 1.0a compliant • PCI Express Gen2 x8 (Data throughput: 4 GB/s) • Low-profile PCI Express card: 142 (W) × 69 (H)
J1749A	PCIe x8 Cable (2m)	ADLINK ACL-PCIEX8-2-2 meter cable • PCI Express External Cabling Specification Rev. 2.0 compliant

Chapter 2 Preparation

This chapter describes the preparations required for using MS2850A-053 and MS2850A-054. Refer to the *MS2850A Signal Analyzer Operation Manual (Mainframe Operation)* for common features not included in this manual.

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2.2.1 Connection between MS2850A and External PC 2-3
2.2.2 Power-on 2-4
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2.3 Preparation for MS2850A-054 2-5
2.3.1 Connection between MS2850A-054 and External PC 2-5

2.1 Part Names

This section describes the connectors for connecting the external PC and MS2850A used for MS2850A-053 or MS2850A-054. Refer to the *MS2850A Signal Analyzer Operation Manual (Mainframe Operation)* for the items not described in this section and the general notes for using connectors.

2.1.1 Rear Panel

This section describes the rear-panel connectors.

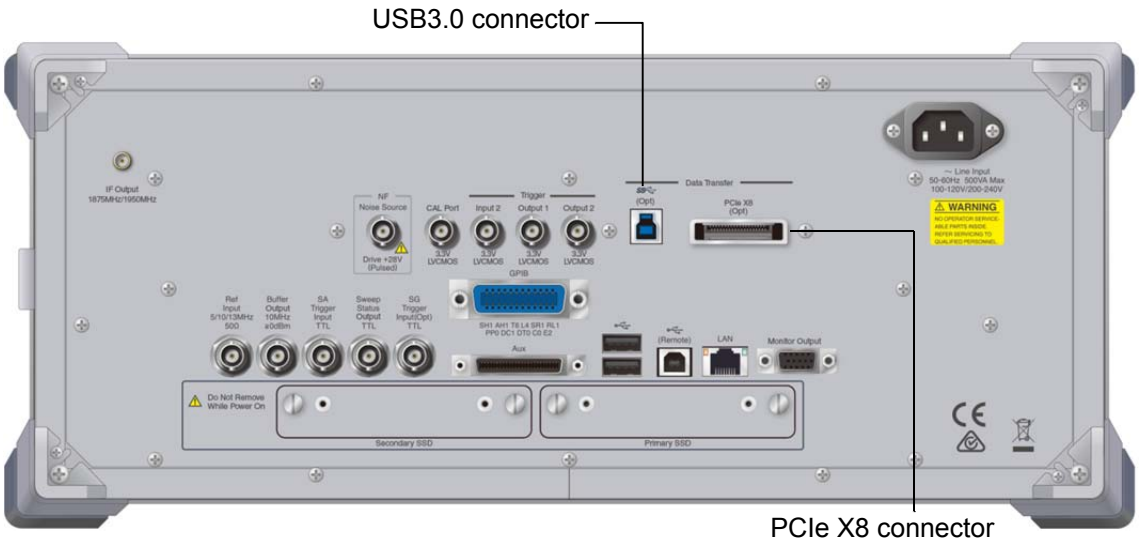

Figure 2.1.1-1 MS2850A rear panel

Table 2.1.1-1 Connectors for MS2850A-053 and MS2850A-054

Display	Name	Function
	USB3.0 connector	Connector for connecting the external PC and MS2850A using the USB cable (connector type: B). This connector is used for the data transfer between the external PC and MS2850A. This is a connector for MS2850A-054 only.
	PCIe X8 connector	Connector for connecting the external PC and MS2850A using the PCIe cable. This connector is used for the data transfer between the external PC and MS2850A. This is a connector for MS2850A-053 only.

2.2 Preparation for MS2850A-053

Start and close MS2850A and the external PC correctly to use MS2850A-053. This section describes the power-on and power-off procedures of MS2850A and the external PC.

2.2.1 Connection between MS2850A and External PC

Connect the PCIe cable to the PCIe X8 connector on the rear panel to transfer the data from MS2850A to the external PC using MS2850A-053.

Install the PCIe host adapter based on the PCI Express standards to the external PC before the connection. Additionally, use the PCIe cable based on the PCI Express standards for the connection between the external PC and MS2850A.

Refer to the operation manual of the PCIe host adapter for the setup procedure of the PCIe host adapter for the external PC.

Note:

MS2850A-053 transfers the captured data from MS2850A to the external PC at high speed via the PCIe cable. MS2850A cannot be controlled remotely via the PCIe cable.
To control MS2850A remotely, connect the interface for remote control by referring to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Mainframe Remote Control*.

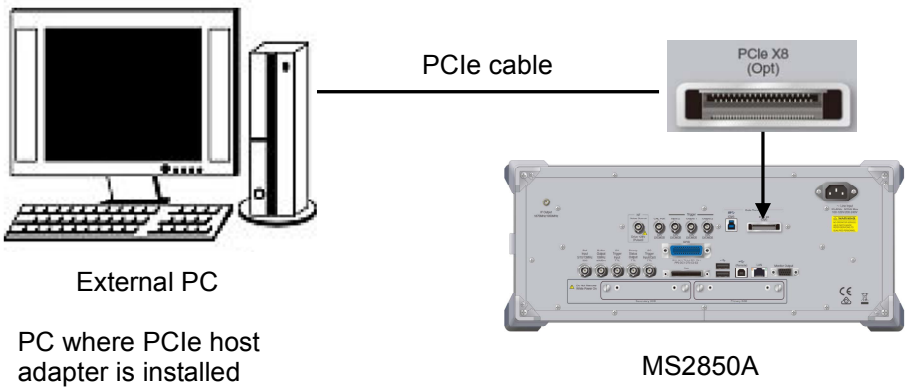

Figure 2.2.1-1 Example of Connection with External PC (PCIe)

2.2.2 Power-on

The power-on procedure is described below.

<Procedure>

1. Check that the PCIe cable is connected to the external PC and MS2850A correctly.
2. Power on MS2850A.
3. Power on the external PC after starting MS2850A normally.

Note:

Some external PCs may not recognize MS2850A even when the external PC is powered on after starting MS2850A normally. In this case, reboot the external PC.

⚠ CAUTION

Do not remove the cable while MS2850A and the external PC are powered on. Otherwise, unexpected system errors and system crashes may occur.

2.2.3 Power-off

The power-off procedure is described below.

<Procedure>

1. Power off the external PC.
2. Power off MS2850A after powering off the external PC.

⚠ CAUTION

Do not power off MS2850A before powering off the external PC. Otherwise, the external PC may hang up or crash.

2.3 Preparation for MS2850A-054

The preparations required for using MS2850A-054 are described below.

1. Connect MS2850A and the external PC.

2. Power on MS2850A and the external PC.
   When MS2850A-054 is used, the power-on and power-off procedures for MS2850A and the external PC can be performed in any order.

2.3.1 Connection between MS2850A-054 and External PC

Connect the USB cable to the USB3.0 connector on the rear panel to transfer the data from MS2850A to the external PC using MS2850A-054.

Use the USB cable based on the standards. MS2850A-054 can be used even when the standards of the USB cable or the connector at the external PC side are USB2.0 or USB1.1. In this case, the data rate is based on the standards at the external PC side.

Note:

MS2850A-054 transfers the captured data from MS2850A to the external PC at high speed via the USB3.0 cable. MS2850A cannot be controlled remotely via the USB3.0 cable.
To control MS2850A remotely, connect the interface for remote control by referring to the *MS2690A/MS2691A/MS2692A and MS2830A/MS2840A/MS2850A Signal Analyzer Operation Manual Mainframe Remote Control*.

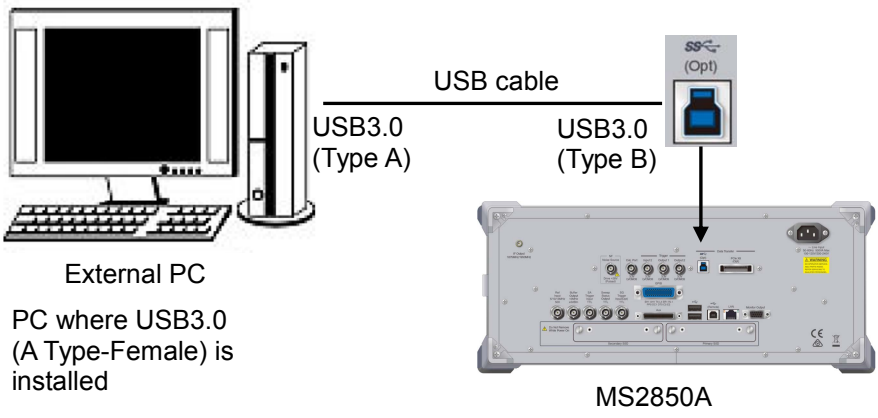

Figure 2.3.1-1 Example of Connection with External PC (USB)

Chapter 3 Install Procedure

This chapter describes how to install and uninstall the Windows version, and how to setup SDK for Linux version of Software for High Speed Data Transfer (hereafter, this software) to the external PC for using MS2850A-053/054.

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3.2 Installation and Uninstallation Procedures (Windows version) 3-3
3.2.1 Installation procedure 3-3
3.2.2 Uninstallation procedure 3-4
3.3 SDK Setup (Linux version) 3-6
3.3.1 Setup procedure 3-6

3.1 Operating Environment

This software requires the following environment.

Table 3.1-1 Operating Environment

External PC	
OS	Windows: Windows 7 (64/32-bit) Professional/Enterprise/Ultimate Windows 10 (64/32-bit) Linux: CentOS 7
CPU	Above 1 GHz
Memory	2 GB or more
Storage media	5 GB or more free space on the drive where this software is to be installed.

3.2 Installation and Uninstallation Procedures (Windows version)

The Windows version of this software can be installed interactively by activating the setup program.
Stop any anti-virus software before running the software setup program. In addition, quit all other running Windows applications before installing this software.
Power off MS2850A when it is connected to the external PC using a PCIe cable. Refer to 2.2.3 "Power-off" for the power-off procedure. Power on only the external PC after disconnecting MS2850A from it.

3.2.1 Installation procedure

Install the Windows version of this software on the external PC's hard disk using the following procedure.

The procedure for upgrading this software is the same as the installation procedure.

<Procedure>

1. Double-click the "setup_x86_vX.X.exe" file for 32-bit or the "setup_x64_vX.X.exe" file for 64-bit in the folder where this software is stored. When installing this software using the setup disk, double-click the "setup_x86_vX.X.exe" file for 32-bit or the "setup_x64_vX.X.exe" file for 64-bit stored in the **\High Speed Data Transfer\Windows** folder on the setup disk.
2. After the setup program for this software starts, the "Welcome to the InstallShield Wizard for Software for High Speed Data Transfer." message is displayed. Click **Next>**.
3. The License Agreement screen is displayed. Read the license agreement terms, and click **Yes** to accept the license agreement. The installation procedure does not proceed without accepting the license agreement.
4. The path to the directory where the software will be installed is displayed in Destination Folder. Click **Change...** to change the path and specify the installation directory in the directory change dialog box. Ensure that there is sufficient free space on the drive holding the specified directory. Refer to 3.1 "Operating Environment" for the free-space requirements. This software generates temporary data in the installation folder. Click **Next>**.
5. Click **Install** to start installation.
6. Click **Finish** after the "InstallShield Wizard Completed" message dialog is displayed.

3.2.2 Uninstallation procedure

Uninstall the Windows version of this software from the external PC's hard disk using the following procedure.

For Windows 7

<Procedure>

1. Click **Start** on the Windows task bar, and click **Control Panel**.
2. Click **Uninstall a program**.
3. Click **Software for High Speed Data Transfer** in the **Currently Installed Programs** list so that it is highlighted.
4. Click **Uninstall**.
5. During uninstallation, sometimes messages about removing shared files are displayed. Select **NO** unless the indicated file is certainly not shared by any other program. Some programs may not function correctly if a necessary shared file is removed accidentally.

Notes:

- Removing a shared file may cause other application programs to not function. If you are in any doubt, do not remove a shared file.
- If a shared file is removed accidentally, it may be restored by reinstalling this software.

For Windows 10

<Procedure>

1. Click **Start** on the Windows task bar, point to **Setting**, and click **System**.
2. Click **Apps & features**.
3. Click **Software for High Speed Data Transfer** in the **Currently Installed Programs** list.
4. Click **Uninstall**.
5. During uninstallation, sometimes messages about removing shared files are displayed. Select **NO** unless the indicated file is certainly not shared by any other program. Some programs may not function correctly if a necessary shared file is removed accidentally.

Notes:

- Removing a shared file may cause other application programs to not function. If you are in any doubt, do not remove a shared file.
- If a shared file is removed accidentally, it may be restored by reinstalling this software.

3.3 SDK Setup (Linux version)

The Software Driver Kit (hereafter, SDK) for Linux version of this software can be setup by extracting compressed file.

Power off MS2850A when it is connected to the external PC using a PCIe cable. Refer to 2.2.3 “Power-off” for the power-off procedure. Power on only the external PC after disconnecting MS2850A from it.

3.3.1 Setup procedure

Following the procedure below, install SDK for Linux version of this software to the hard disk of the external PC with Linux CentOS.

The procedure for upgrading this software is the same as the installation procedure.

<Procedure>

1. Select the “DataTransfer_Linux_vX.X.tar.gz” file in the folder where this software is stored, and extract using “tar –zxvf DataTransfer_Linux_vX.X.tar.gz” input command. When installing this software using the setup disk, double-click the “DataTransfer_Linux_vX.X.tar.gz” file stored in the **\High Speed Data Transfer\Linux** folder on the setup disk.
2. For detailed explanations regarding this software, refer to “datatransfer_linux_user_guide.pdf” or to “datatransfer_linux_programmer_guide.pdf” included with SDK.

Chapter 4 Sample Software

This chapter describes Streaming Demo (hereafter, sample software) attached to MS2850A-053 and MS2850A-054 and runs on Windows. For software besides Streaming Demo, refer to the Readme document file included with SDK.

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4.1 Starting and Exiting Sample Software

This section describes how to start and exit the sample software.

4.1.1 Starting sample software

Start the sample software as follows.

<Procedure>

1. Start StreamingDemo.exe located in the folder of the sample software installation destination.
   When the setting of installation destination is changed during installation, the path is changed.
   When the folder configuration of the installation destination is default:
   "C:\Anritsu\Data Transfer\Demo\StreamingDemo.exe"

2. When the sample software is started, the window shown in Figure 4.1.1-1 is displayed.

Note:

The window display may vary depending on the version of the sample software.

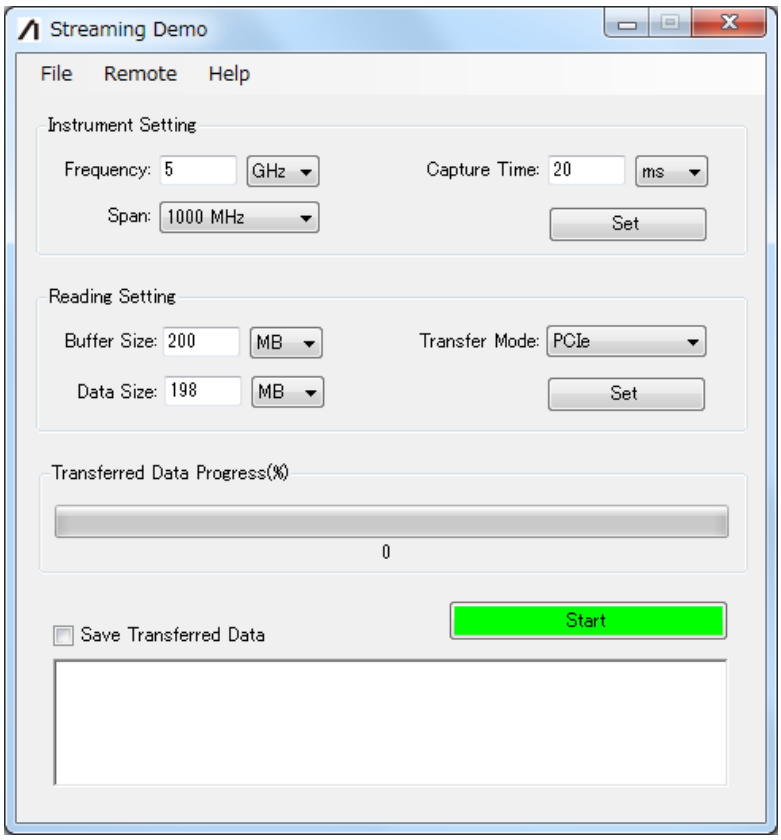

Figure 4.1.1-1 Streaming Demo Window

4.1.2 Exiting sample software

Exit the sample software by clicking in the upper right of the window.

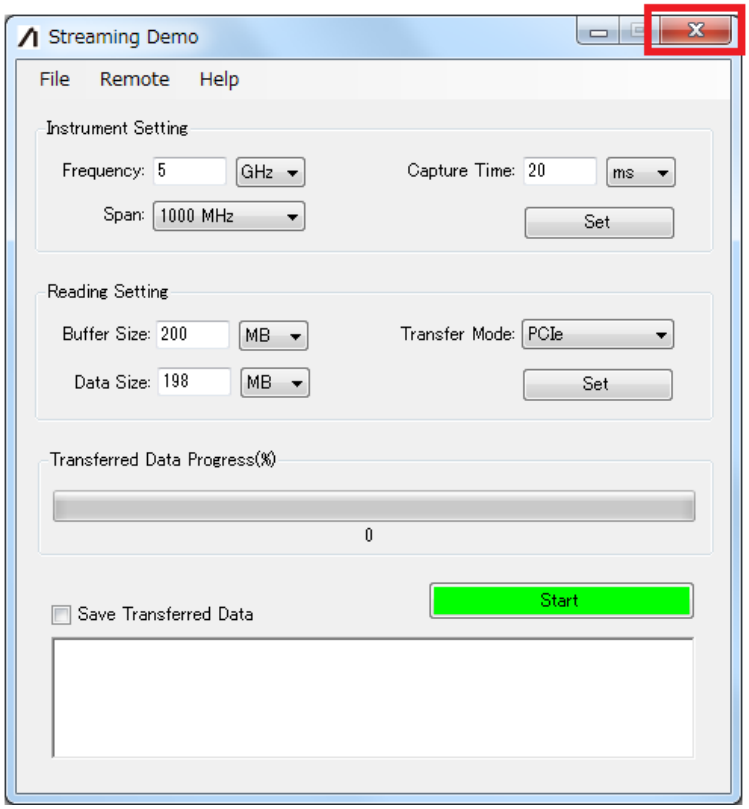

Figure 4.1.2-1 Steaming Demo Window (Exit Operation)

4.2 Help Function

This section describes how to use the help function.

Usage of sample software can be checked from the help function.

<Procedure>

1. Click the **Help** tab in the Streaming Demo window.
2. Click **Documentation** and then click **Streaming Demo Manual**.

Note:

The window display may vary depending on the version of the sample software.

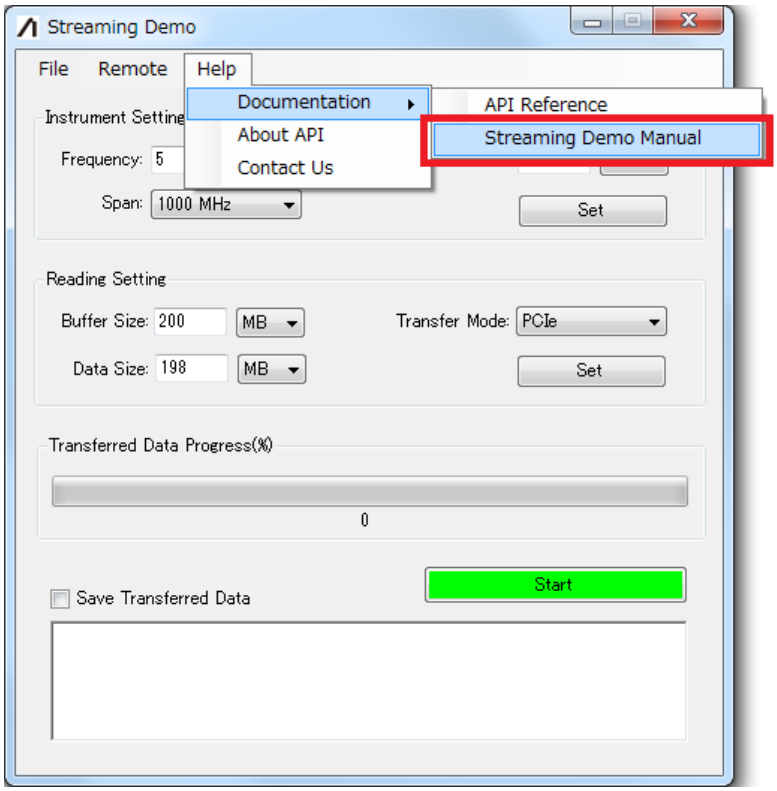

Figure 4.2-1 Steaming Demo Window (When Operating Help Function)