

FR20/30 SERIES
DSU-FR20/30 EMULATOR
MB2197-01
HARDWARE MANUAL

FR20/30 SERIES

DSU-FR20/30 EMULATOR

MB2197-01

HARDWARE MANUAL

PREFACE

■ Using the Emulation Pod Safely

This manual contains important information regarding the safe use of the MB2197-01 Emurator.

Be sure to read this manual before using the MB2197-01 Emurator and use emulator only as described in this manual.

Read “Safety Warnings” at the beginning of this manual and make a careful safety check before using the emulator.

Store this manual in a convenient place so that you can refer to it at any time while you are using the emulator.

■ Purpose of This Manual and Intended Audience

The MB2197-01 Emurator is a development support tool for developing and evaluating application products that use the FR20/30 series of microcontrollers.

This manual explains how to handle and connect the MB2197-01 Emurator. It is intended for engineers who use the MB2197-01 Emurator (hereafter “DSU-FR20/30 Emurator”) to develop application products that use the FR20/30 series devices.

■ Product Environment

The DSU-FR20/30 Emurator operates properly at a temperature of 5 °C to 40 °C and a humidity of 30% to 80%. Do not use in high-temperature and high-humidity environments or in any environment where condensation will form.

Do not put heavy objects on the DSU-FR20/30 Emurator. Since the cabinet is made of plastic, it may break.

When power is turned on, keep the DSU-FR20/30 Emurator away from items that can short-circuit or fire. Keep the DSU-FR20/30 Emurator on as level a surface as possible. Do not operate the DSU-FR20/30 Emurator in a location subject to severe vibration, dust, or explosive gases.

If the DSU-FR20/30 Emurator is not used in the correct environment as described above, injury to the user and nearby persons or damage to the DSU-FR20/30 Emurator or other property may result.

Packing materials used to ship the DSU-FR20/30 Emurator can be reused to transport the DSU-FR20/30 Emurator in the case of a failure. If possible, keep the packing materials.





■ Safety Warnings

Important warnings items are given on the following pages.

Before using the emulation pod, read each warning and make a safety check.




Indicates that improper use may cause death or severe injury.

Warning text/symbol	Warning	page:
Electric shock 	Before connecting or disconnecting any cables, turn off the power to the DSU-FR20/30 Emulator and connected devices, and disconnect the power plug from the receptacle. Failure to do so may cause an electric shock.	11
	Do not put your fingers in the connector inlet. Putting your fingers in the connector inlet can result in an electric shock or failure.	11
Plug 	If an abnormal condition such as heat, smoke, unusual odor, or unusual noise occurs, immediately turn off the power and disconnect the power plug from the receptacle. When the smoke has disappeared, ask the distributor to repair the DSU-FR20/30 Emulator. Never make repairs yourself, since it is very dangerous. Using the DSU-FR20/30 Emulator in an abnormal state may cause a fire or electric shock.	10
	If water or other liquid, a metallic object, or other foreign substance gets inside the DSU-FR20/30 Emulator, immediately turn off the power and disconnect the power plug from the receptacle. Next, contact the distributor. Using the DSU-FR20/30 Emulator in an abnormal state may cause a failure, fire, or electric shock.	10
	If you hear thunder, disconnect the power plug from the receptacle. Using the DSU-FR20/30 Emulator during a thunderstorm can damage the DSU-FR20/30 Emulator or cause a fire.	11
No disassembly 	Never open the DSU-FR20/30 Emulator case. Do not modify the DSU-FR20/30 Emulator without permission. Opening the case or modifying the DSU-FR20/30 Emulator may cause a failure, fire, or electric shock.	11
No moisture 	Do not use the DSU-FR20/30 Emulator in a wet area such as a bathroom or shower room. Using the DSU-FR20/30 Emulator in a wet area may cause a failure, fire, or electric shock.	11



⚠ WARNING

Indicates that improper use may cause death or severe injury.

Warning text/symbol	Warning	page:
<p>Prohibition</p> 	<p>Do not touch the DSU-FR20/30 Emulator with wet hands. Doing so may cause an electric shock.</p>	12
	<p>Do not put the DSU-FR20/30 Emulator in a location with a lot of moisture, dust, or soot or in a location with poor ventilation. Do not place the DSU-FR20/30 Emulator near an open flame. Doing so may cause a failure, fire, or electric shock.</p>	12
	<p>Do not insert or drop any metallic, combustible, or other object through a ventilation or other type of opening in the DSU-FR20/30 Emulator. Doing so may cause a failure, fire, or electric shock.</p>	12
	<p>Do not use a voltage other than the indicated power voltage. Do not connect the power cord in a daisy chain. Doing so may cause a fire or electric shock.</p>	12
	<p>Do not damage or alter any cables. Putting a heavy object on a cable, or pulling, forcibly bending, distorting, or heating a cable may damage the cable and cause a fire or electric shock.</p>	12




⚠ CAUTION

Indicates that improper use may cause minor or moderate injury, or may damage the emulation pod, connected equipment, data or other software resources, or other property.

Warning text/symbol	Warning	page:
<p>Plug</p> 	<p>Before moving the DSU-FR20/30 Emulator, disconnect the power plug from the receptacle. Also, disconnect all other cables. Watch where you step during work. Damaging a cable may cause a fire or electric shock. A falling device may cause injury.</p>	12
	<p>If the DSU-FR20/30 Emulator will not used for a long time, for safety reasons, disconnect the power plug from the receptacle. Failure to do so may cause a fire or electric shock.</p>	12
<p>Prohibition</p> 	<p>Do not block the DSU-FR20/30 Emulator's ventilation openings. Blocking ventilation openings causes heat to accumulate and may cause a fire.</p>	13,14
	<p>Do not put the DSU-FR20/30 Emulator in a location subject to severe vibration or in a location that is not level or stable. Doing so may cause a failure or cause the DSU-FR20/30 Emulator to fall.</p>	13
	<p>When disconnecting the power plug or a cable, hold the power plug or connector itself. Do not pull on the cable. Pulling on a cable may cause the core wire to be exposed or cut, resulting in a failure, fire, or electric shock.</p>	13,14
	<p>Do not put the DSU-FR20/30 Emulator in a location near a speaker or television tuner or in any location subject to a magnetic or electric field. Doing so may cause a failure.</p>	13
	<p>To prevent damage from static electricity, do not let a finger or object contact a connector pin.</p>	14
	<p>Do not subject the DSU-FR20/30 Emulator to a shock. Doing so may cause a failure.</p>	14
	<p>Do not place the DSU-FR20/30 Emulator in direct sunlight, in a high-temperature or high-humidity environment, or in an environment in which condensation can form.</p>	14
	<p>Do not store the DSU-FR20/30 Emulator in a dusty location. Doing so may cause a failure.</p>	14
	<p>Because the DSU-FR20/30 Emulator uses many electronic parts, do not store it in a location subject to strong electric or magnetic fields for a long period. Doing so may cause a failure.</p>	14
	<p>Before connecting or disconnecting a cable, turn off the power. Failure to do so may cause an electric shock.</p>	19,20, 21,22

⚠ CAUTION

Indicates that improper use may cause minor or moderate injury, or may damage the emulation pod, connected equipment, data or other software resources, or other property.

Warning text/symbol	Warning	page:
Prohibition 	When disconnecting a cable, hold the cable by the connector case. Do not pull on the cable. Doing so may break a wire in the cable.	19,21, 22
	When turning on the power, follow the procedure described in the manual. Failure to do so may cause a device failure.	23
	After the DSU-FR20/30 Emulator power is turned on, do not turn off and turn on the user system power. Doing so may cause a device failure.	23
	When power is on, do not carry the DSU-FR20/30 Emulator, or subject it to shock or vibration. Doing so may cause a device failure.	23
	When turning off the power, follow the procedure described in the manual. Failure to do so may cause a device failure.	24
Attention 	Insert the power plug firmly in the receptacle. Failure to do so may cause a failure or a fire.	13
Caution 	The device can be damaged during transport. Store the packing materials used to ship the DSU-FR20/30 Emulator and use them if you need to transport it.	2
	Using the DSU-FR20/30 Emulator at an ambient temperature or humidity outside the specified range may cause a device failure. Always use the DSU-FR20/30 Emulator within the specified temperature and humidity range.	5

■ Organization of This Manual

This manual consists of following two chapters.

Read the manual completely before using the DSU-FR20/30 Emulator.

CHAPTER 1 PRODUCT HANDLING AND SPECIFICATIONS

This chapter provides information on the handling of the DSU-FR20/30 Emulator, and describes its specifications. Read this chapter before using the emulator, and check your unit against the specifications.

CHAPTER 2 CONNECTIONS

This chapter explains how to connect the DSU-FR20/30 Emulator. It also describes power-on and power-off sequences.

Read this chapter before turning the power on.

In addition, the appendix provides specifications on the DSU cable, user interface connector, and user system emulator interface connectors.

■ Related Manuals

Also refer to the following manuals:

- *DSU-FR20/30 Emulator Debugger Manual*
- *DSU-FR20/30 Emulator Debugger Installation Manual*

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READING THIS MANUAL

■ Page Layout

Each section of this manual has a summary of the section below the section title. You will get an overview of the product by reading only the summaries.

Since the upper-level section title also appears in a lower-level section, you always know which upper-level section your current reading belongs to.

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CHAPTER 1 PRODUCT HANDLING AND SPECIFICATIONS

This chapter provides information on the handling of the DSU-FR20/30 Emulator, and describes its specifications. Read this chapter before using the emulator, and check your unit against the specifications.

- 1.1 Checking the Components
- 1.2 Drawings of DSU-FR20/30 Emulator and Names of Parts
- 1.3 General Specifications
- 1.4 RS232C Circuit Specifications
- 1.5 LAN Circuit Specifications
- 1.6 External Trigger Terminal Specifications
- 1.7 Options
- 1.8 Note on Errors
- 1.9 Notes on Handling the DSU-FR20/30 Emulator
- 1.10 Notes on Use

1.1 Checking the Components

Before using the DSU-FR20/30 Emulator, make sure that no component is missing.

■ Checking the Components



Caution	The device can be damaged during transport. Store the packing materials used to ship the DSU-FR20/30 Emulator and use them if you need to transport it.

Before using the DSU-FR20/30 Emulator, check that the following component has been provided.

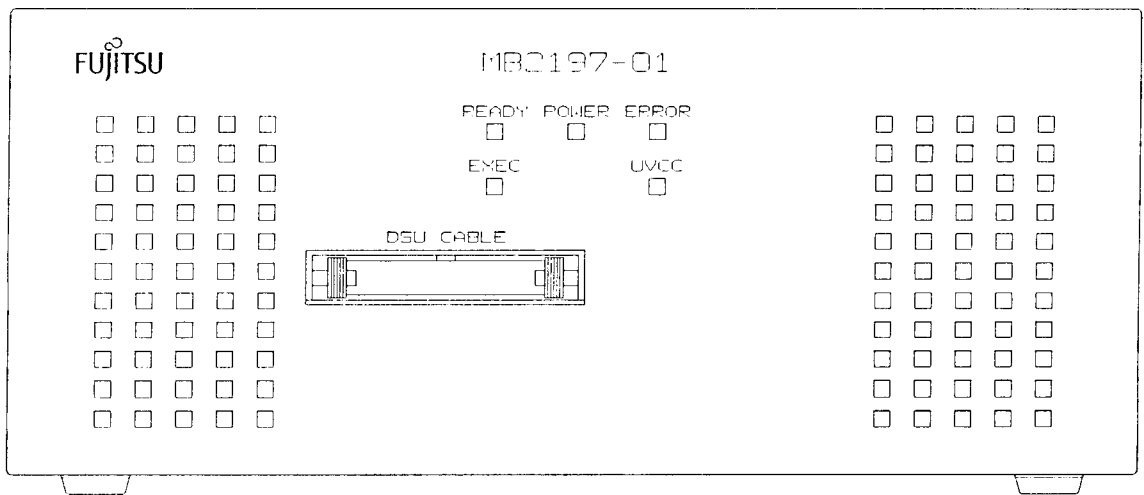
- DSU-FR20/30 Emulator Main Unit: 1
- AC power cord: 1
- FR20/30 DSU Cable: 1

1.2 Drawings of DSU-FR20/30 Emulator and Names of Parts

This section gives the names of the DSU-FR20/30 Emulator parts. For information on connection and settings, refer to Chapter 2, "Connections".

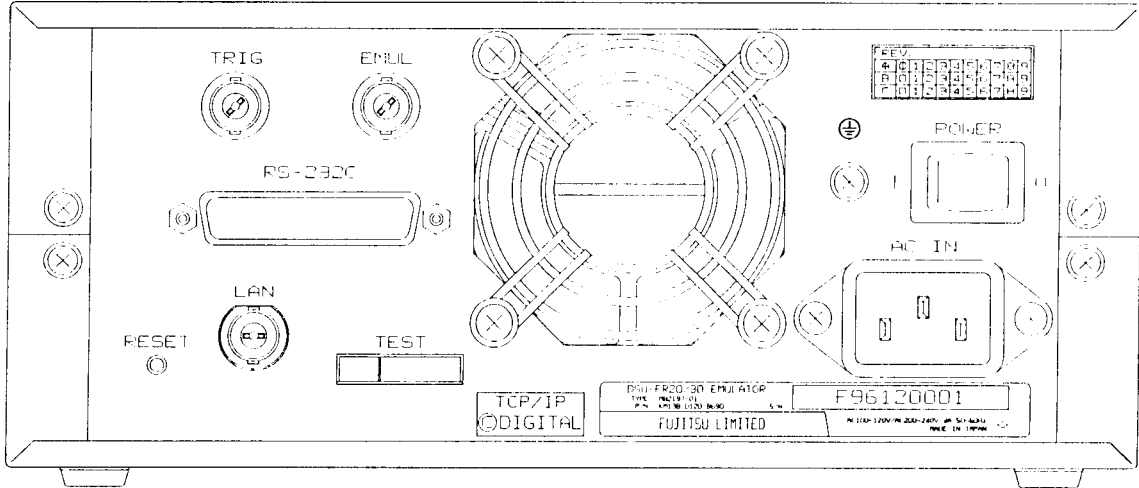
■ Appearance and Part Names

Figure 1.2-1 and Figure 1.2-2 shows views of the DSU-FR20/30 Emulator and names of parts of its various parts.



Name	Description
READY LED	Lights when the DSU-FR20/30 Emulator is ready to communicate with the host machine.
POWER LED	Lights when power is applied to the Emulator.
ERROR LED	Lights when a fault condition occurs.
EXEC LED	Lights when the user program is executing.
UVCC LED	Lights when user-supplied Vcc is applied.
DSU CABLE Connector	Connector for DSU cable.

Figure 1.2-1 Exterior View (Front View) of DSU-FR20/30 Emulator



name	description
Power Switch	Switch for applying power to the DSU-FR20/30 Emulator
AC IN Connector	Connector for AC power cord
Blower Fan	Unit cooling fan.
TRIG Connector	Trigger signal input connector
EMUL Connector	Output connector for “user program executing” signal
RS232C Connector	Connector for RS232C interface cable
LAN Connector	Connector for LAN cable
RESET Switch	System reset switch
TEST Terminal	For factory test only. May not be used.

Figure 1.2-2 Exterior View (Rear View) of DSU-FR20/30 Emulator

1.3 General Specifications

Table 1.3-1 lists the general specifications of the DSU-FR20/30 Emulator.

■ General Specifications of the DSU-FR20/30 Emulator

CAUTION

Caution



Using the DSU-FR20/30 Emulator at an ambient temperature or humidity outside the specified range may cause a device failure. Always use the DSU-FR20/30 Emulator within the specified temperature and humidity range.

Table 1.3-1 DSU-FR20/30 Emulator General Specifications

Item	Specification	
Name	DS-FR20/30 Emulator	
Model No.	MB2197-01	
Power Source	Tool Power Source	Input Voltage: 85 to 132 or 170-246 V AC (switched automatically) Frequency: 47 to 63 Hz Current: 2.4/1.4 A Max. (100/200 V AC)
	User Supply Voltage*1	Voltage: + 2.7 to 5.5 V Load Current: 15 mA (max.)
Operating Frequency	1 to 50 MHz	
Operating Temperature	5 to 40 °C	
Operating Humidity	30 to 80% (and no condensation)	
Exterior Dimensions	210 mm (W) × 297 mm (D) × 87 mm (H) *2	
Weight	2.7 kg	

*1 User supply voltage is supplied by the user system.

*2 Excluding protrusions

1.4 RS232C Circuit Specifications

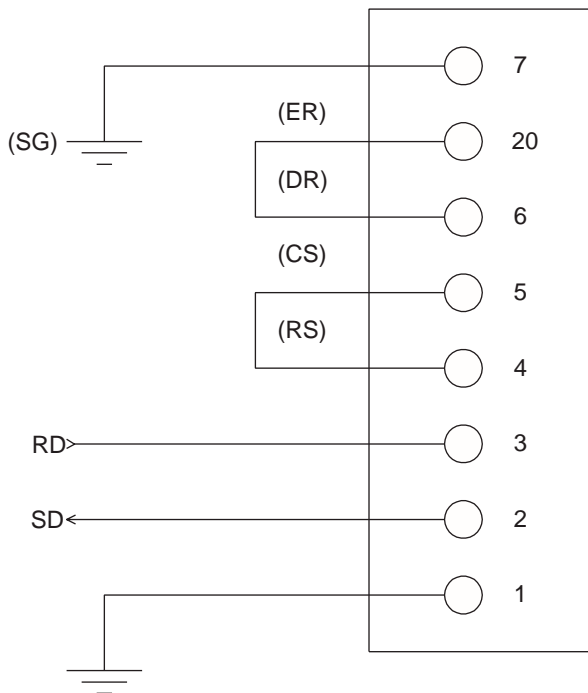
The DSU-FR20/30 Emulator has one RS232C interface.

■ RS232C Circuit Specifications

The RS232C circuit specifications are listed in Table 1.4-1, and the connector circuit connections are shown in Figure 1.4-1.

Table 1.4-1 RS232C Circuit Specifications

Item	Description
Signal definitions	DCE (same as modem).
Baud rates	4800, 9600, or 19200 bps
Data bit-length	8 bits
Parity bits	None
Stop bits	1 bit
X control	None



Note: The DSU-FR20/30 Emulator uses no signal lines other than those shown in the diagram.

Figure 1.4-1 RS232C Connector Circuit Diagram

1.5 LAN Circuit Specifications

One LAN circuit (10BASE2) is provided in the DSU- FR20/30 Emulator.

■ Lan circuit Specifications

The LAN circuit specifications are listed in Table 1.5-1.

Table 1.5-1 LAN Circuit Specifications

Item	Description
Communications protocol	TCP/IP
IP address	Can be changed.
Port address	Can be changed.
Ethernet address	Global address/local address
Ethernet global address	Fixed (registered with IEEE).
Ethernet local address	Can be changed.

The IP address, port address, and Ethernet local address settings are made from the host machine via the RS232C interface. The settings are made by the LAN address write program supplied with the emulator debugger.

For more information on this, please refer to the emulator debugger installation manual.

1.6 External Trigger Terminal Specifications

The DSU-FR20/30 Emulator has two "external trigger" terminals: the TRIG and EMUL connectors.

External Trigger Terminal Specifications

The external trigger terminal specifications are listed in Table 1.6-1, and the associated I/O circuits are shown in Figure 1.6-1.

Table 1.6-1 External Trigger Terminal Specifications

Terminal	Input/Output	Description
TRIG	Input	Input terminal for an external trigger signal used for break control. Break is effected by taking this input HIGH.
EMUL	Output	Output terminal for "user program executing" signal. This terminal is HIGH when the user program is executing.

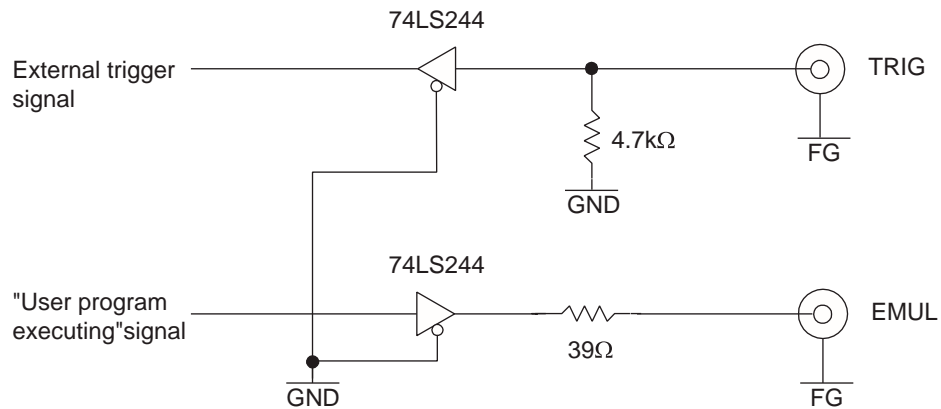


Figure 1.6-1 External Trigger Terminal Input and Output Circuits

1.7 Options

The cables listed in Table 1.7-1 are used during operation of the DSU-FR20/30 Emulator. Please purchase these cables separately, as required.

■ Options

Table 1.7-1 Options

Name	Part number
RS232C cable	— *
LAN cable	— *

*Provide cables compatible with the host machine being used.

1.8 Note on Errors

If an error occurs while you are using the DSU-FR20/30 Emulator, read the warning below.

■ Note on Errors

WARNING

Plug



If an abnormal condition such as heat, smoke, unusual odor, or unusual noise occurs, immediately turn off the power and disconnect the power plug from the receptacle.

When the smoke has disappeared, ask the distributor to repair the DSU-FR20/30 Emulator. Never make repairs yourself, since it is very dangerous.

Using the DSU-FR20/30 Emulator in an abnormal state may cause a fire or electric shock.

If water or other liquid, a metallic object, or other foreign substance gets inside the DSU-FR20/30 Emulator, immediately turn off the power and disconnect the power plug from the receptacle.

Next, contact the distributor.

Using the DSU-FR20/30 Emulator in an abnormal state may cause a failure, fire, or electric shock.

1.9 Notes on Handling the DSU-FR20/30 Emulator

When handling the product, observe the precautions below.

■ Notes on Handling the DSU-FR20/30 Emulator

WARNING

Electric shock



Before connecting or disconnecting any cables, turn off the power to the DSU-FR20/30 Emulator and connected devices, and disconnect the power plug from the receptacle. Failure to do so may cause an electric shock.

Do not put your fingers in the connector inlet. Putting your fingers in the connector inlet can result in an electric shock or failure.

Plug



If you hear thunder, disconnect the power plug from the receptacle. Using the DSU-FR20/30 Emulator during a thunderstorm can damage the DSU-FR20/30 Emulator or cause a fire.

No disassembly



Never open the DSU-FR20/30 Emulator case. Do not modify the DSU-FR20/30 Emulator without permission. Opening the case or modifying the DSU-FR20/30 Emulator may cause a failure, fire, or electric shock.

No moisture



Do not use the DSU-FR20/30 Emulator in a wet area such as a bathroom or shower room. Using the DSU-FR20/30 Emulator in a wet area may cause a failure, fire, or electric shock.

 **WARNING**

Prohibition



Do not touch the DSU-FR20/30 Emulator with wet hands. Doing so may cause an electric shock.

Do not put the DSU-FR20/30 Emulator in a location with a lot of moisture, dust, or soot or in a location with poor ventilation. Do not place the DSU-FR20/30 Emulator near an open flame. Doing so may cause a failure, fire, or electric shock.

Do not insert or drop any metallic, combustible, or other object through a ventilation or other type of opening in the DSU-FR20/30 Emulator. Doing so may cause a failure, fire, or electric shock.

Do not use a voltage other than the indicated power voltage. Do not connect the power cord in a daisy chain. Doing so may cause a fire or electric shock.

Do not damage or alter any cables. Putting a heavy object on a cable, or pulling, forcibly bending, distorting, or heating a cable may damage the cable and cause a fire or electric shock.

 **CAUTION**

Plug



Before moving the DSU-FR20/30 Emulator, disconnect the power plug from the receptacle. Also, disconnect all other cables. Watch where you step during work. Damaging a cable may cause a fire or electric shock. A falling device may cause injury.

If the DSU-FR20/30 Emulator will not be used for a long time, for safety reasons, disconnect the power plug from the receptacle. Failure to do so may cause a fire or electric shock.

 **CAUTION**

Prohibition



Do not block the DSU-FR20/30 Emulator's ventilation openings. Blocking ventilation openings causes heat to accumulate and may cause a fire.

Do not put the DSU-FR20/30 Emulator in a location subject to severe vibration or in a location that is not level or stable. Doing so may cause a failure or cause the DSU-FR20/30 Emulator to fall.

When disconnecting the power plug or a cable, hold the power plug or connector itself. Do not pull on the cable. Pulling on a cable may cause the core wire to be exposed or cut, resulting in a failure, fire, or electric shock.

Do not put the DSU-FR20/30 Emulator in a location near a speaker or television tuner or in any location subject to a magnetic or electric field. Doing so may cause a failure.

Attention



Insert the power plug firmly in the receptacle. Failure to do so may cause a failure or a fire.

1.10 Notes on Use

When using the DSU-FR20/30 Emulator, observe the precautions below.

■ Notes on Use

CAUTION

Prohibition



When disconnecting the power plug or a cable, hold the power plug or connector itself. Do not pull on the cable. Pulling on a cable may cause the core wire to be exposed or cut, resulting in a failure, fire, or electric shock.

To prevent damage from static electricity, do not let a finger or object contact a connector pin.

Do not block the DSU-FR20/30 Emulator's ventilation openings. Blocking ventilation openings causes heat to accumulate and may cause a fire.

Note: Observe setting procedures and other procedures on using the DSU-FR20/30 Emulator contained in this manual.

■ Notes on Storing

CAUTION

Prohibition



Do not subject the DSU-FR20/30 Emulator to a shock. Doing so may cause a failure.

Do not place the DSU-FR20/30 Emulator in direct sunlight, in a high-temperature or high-humidity environment, or in an environment in which condensation can form.

Do not store the DSU-FR20/30 Emulator in a dusty location. Doing so may cause a failure.

Because the DSU-FR20/30 Emulator uses many electronic parts, do not store it in a location subject to strong electric or magnetic fields for a long period. Doing so may cause a failure.

Table 1.10-1 shows the ambient operating and storage temperature and humidity.

Table 1.10-1 Ambient Operating and Storage Temperature and Humidity for DSU-FR20/30 Emulator

	Temperature	Humidity
During operation	5°C to 40°C	30% to 80% (no condensation)
In storage	-20°C to 70°C	20% to 90% (no condensation)

CHAPTER 2 CONNECTIONS

This chapter explains how to connect the DSU-FR20/30 Emulator. It also describes power-on and power-off sequences.

Read this chapter before turning the power on.

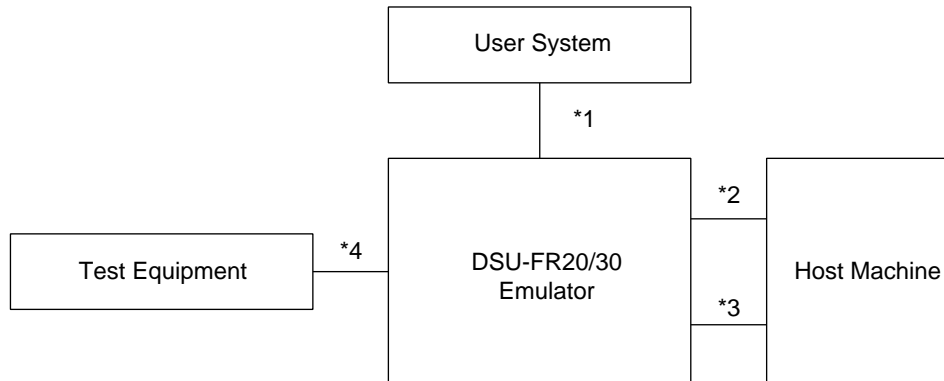
- 2.1 System Configuration
- 2.2 Connecting the DSU Cable
- 2.3 Connecting the DSU-FR20/30 Emulator to the User System
- 2.4 Connection to the Host Machine
- 2.5 Connection to a Test Instrument
- 2.6 Power-on Sequence
- 2.7 Power-off Sequence

2.1 System Configuration

The DSU-FR20/30 Emulator is designed to be connected to (and be controlled from) a host machine.

■ System Configuration

Figure 2.1-1 shows the DSU-FR20/30 Emulator system configuration.



- *1: DSU cable
- *2: RS232C cable (provided by user)
- *3: LAN cable (provided by user)
- *4: Test equipment BNC cable (provided by user)

Figure 2.1-1 System Configuration

2.2 Connecting the DSU Cable

Connect the DSU cable to the DSU cable connector on the DSU-FR20/30 Emulator front panel in accordance with Fig. 2.2-1. For DSU cable specifications, refer to the appendix.

■ Connecting the DSU Cable

⚠ CAUTION

Prohibition



Before connecting or disconnecting a cable, turn off the power. Failure to do so may cause an electric shock.

When disconnecting a cable, hold the cable by the connector case. Do not pull on the cable. Doing so may break s wire in the cable.

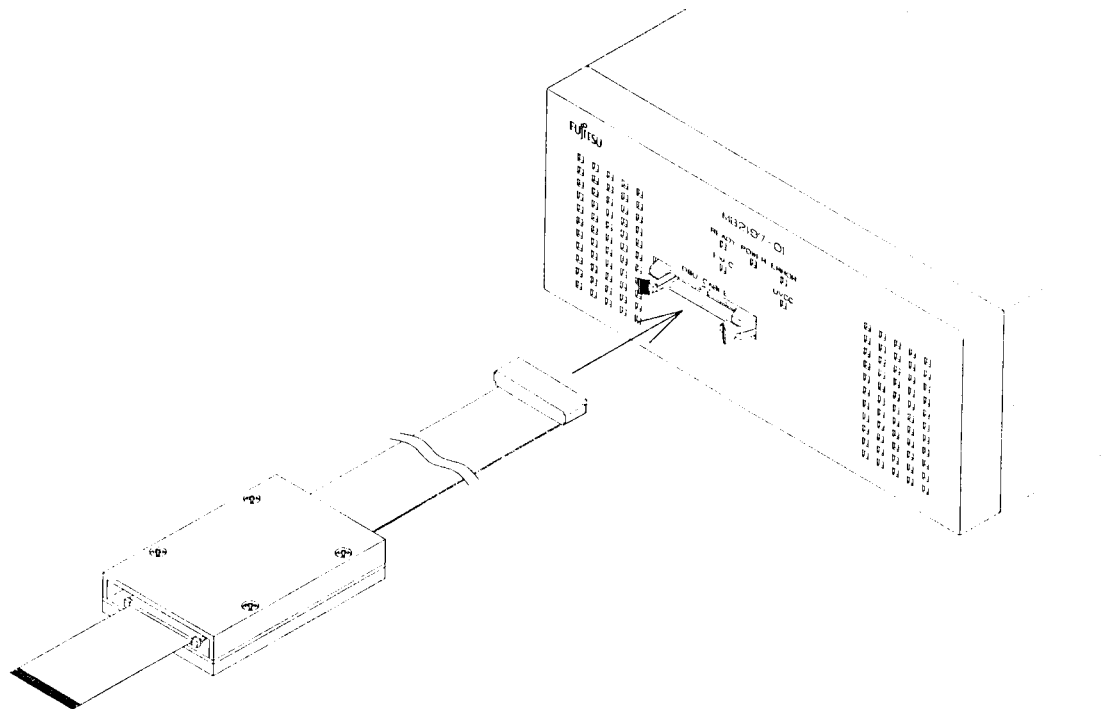


Figure 2.2-1 Connecting the Dsu Cable

2.3 Connecting the DSU-FR20/30 Emulator to the User System

In accordance with Figure 2.3-1, connect the user interface connector of the DSU cable to the emulator interface connector of the user system. For emulator interface connector specifications, refer to the appendix.

■ Connecting the DSU-FR20/30 Emulator to the User System

 **CAUTION**

Prohibition



Before connecting or disconnecting a cable, turn off the power. Failure to do so may cause an electric shock.

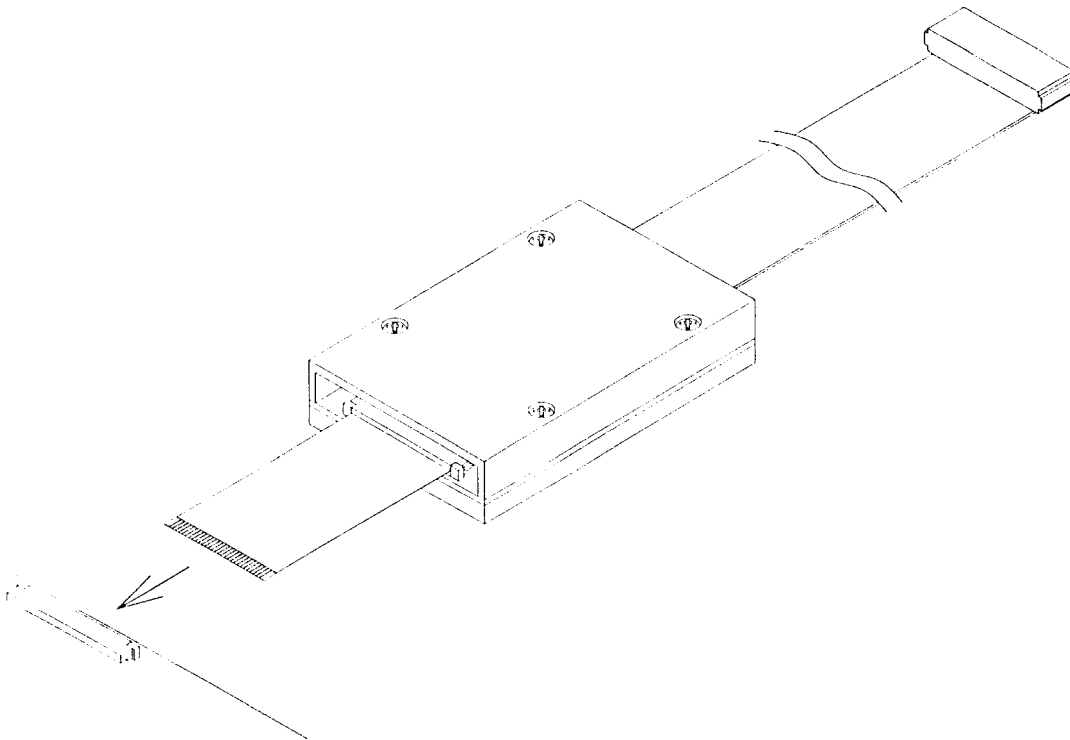


Figure 2.3-1 Connecting the DSU-FR20/30 Emulator to the User System

2.4 Connection to the Host Machine

In accordance with Figure 2.4-1, connect the RS-232C cable or the LAN cable between the host machine and the DSU-FR20/30 Emulator. To make an initial LAN address setting, both the RS232C and LAN cables must be connected.

■ Connection to the Host Machine

CAUTION

Prohibition



Before connecting or disconnecting a cable, turn off the power. Failure to do so may cause an electric shock.

When disconnecting a cable, hold the cable by the connector case. Do not pull on the cable. Doing so may break s wire in the cable.

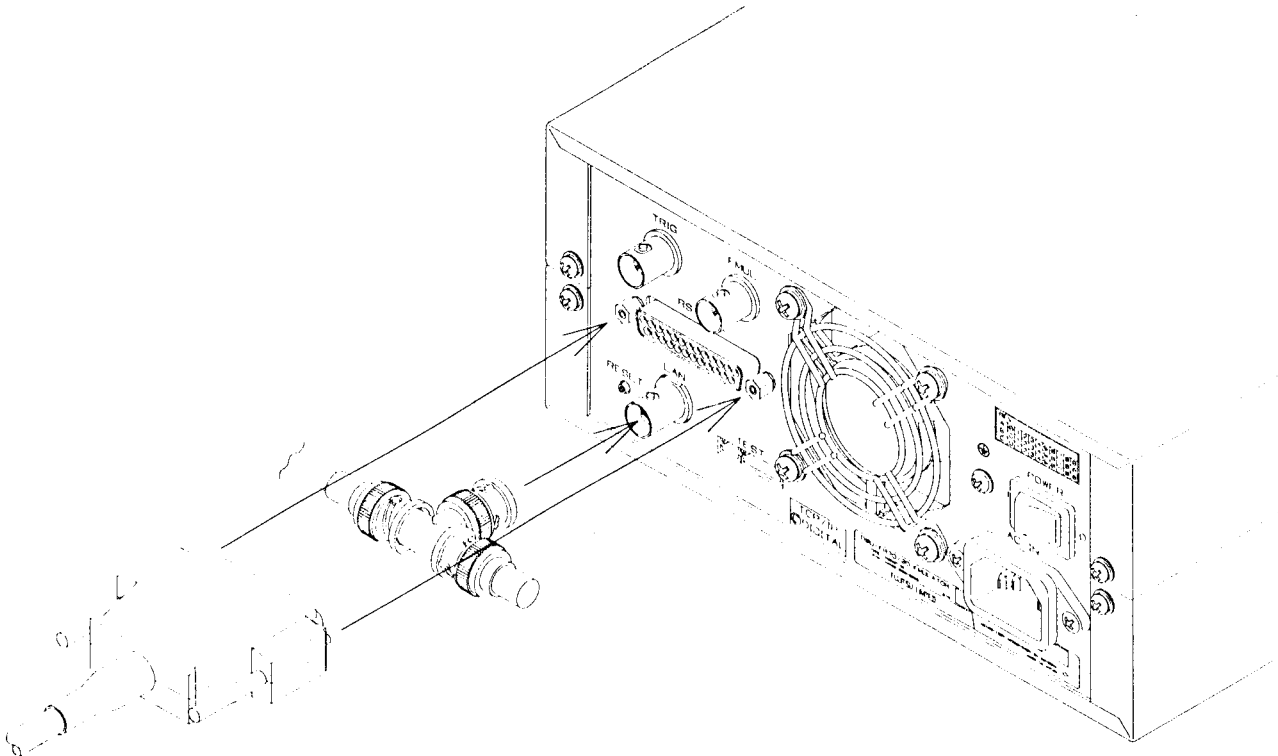


Figure 2.4-1 Connection to the Host Machine

2.5 Connection to a Test Instrument

To monitor emulator internal signals, an external trigger from the test equipment is applied via the DSU-FR20/30 Emulator external trigger input terminal (TRIG connector). Connect the DSU-FR20/30 Emulator to the test equipment in accordance with Figure 2.5-1.

■ Connection to a Test Instrument

⚠ CAUTION

Prohibition



Before connecting or disconnecting a cable, turn off the power. Failure to do so may cause an electric shock.

When disconnecting a cable, hold the cable by the connector case. Do not pull on the cable. Doing so may break a wire in the cable.

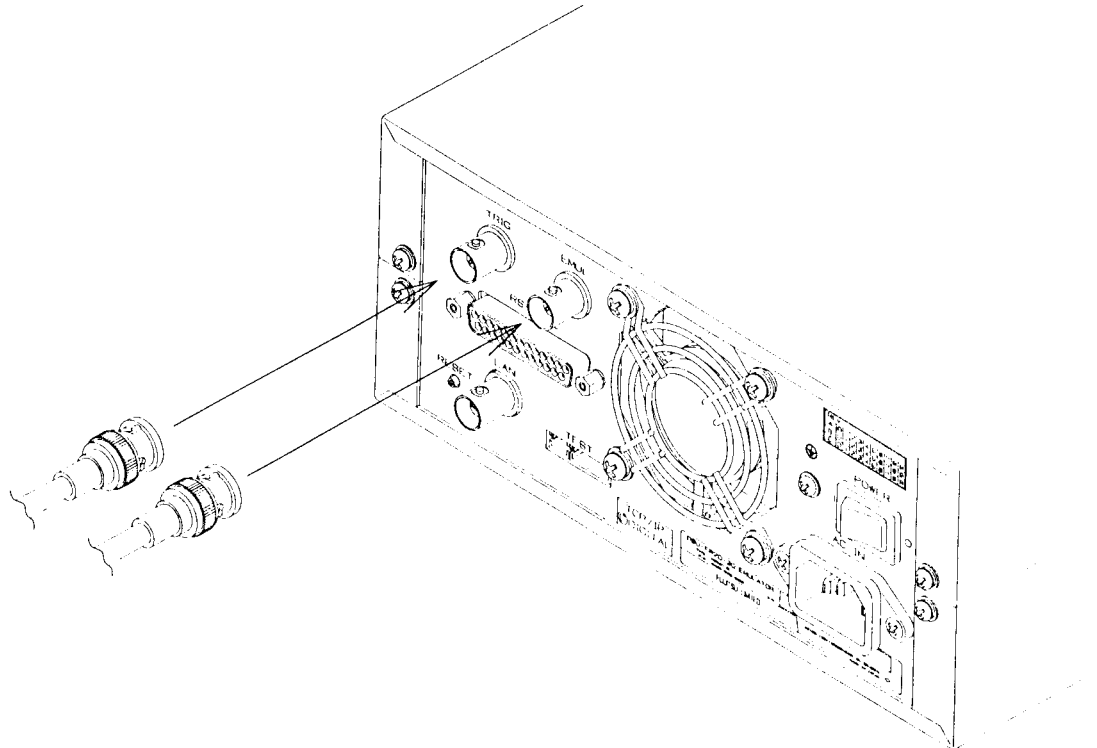


Figure 2.5-1 Connection to a Test Instrument

2.6 Power-on Sequence

When all connections and settings have been completed, turn on the power of the host machine, DSU-FR20/30 Emulator, and user system in this sequence.

■ Power-on Sequence

⚠ CAUTION

Prohibition



When turning on the power, follow the procedure described in the manual.

Failure to do so may cause a device failure.

After the DSU-FR20/30 Emulator power is turned on, do not turn off and turn on the user system power.

Doing so may cause a device failure.

When power is on, do not carry the DSU-FR20/30 Emulator, or subject it to shock or vibration.

Doing so may cause a device failure.

Turn on the power after completing all connections and settings in the sequence shown in Figure 2.6-1.

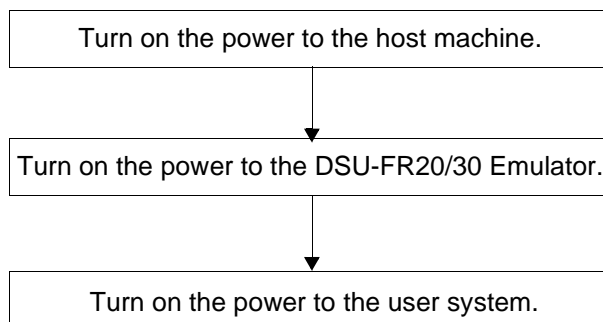


Figure 2.6-1 Power-on Sequence


To turn on the power to the DSU-FR20/30 Emulator, press the POWER switch on the rear of the emulator (see Figure 1.2-2) toward the “ON” side.

2.7 Power-off Sequence

Turn off the power of the user system, DSU-FR20/30 Emulator, and host machine in this sequence.

■ Power-off Sequence



Prohibition 	When turning off the power, follow the procedure described in the manual. Failure to do so may cause a device failure.
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Turn off the power using the sequence shown in Figure 2.7-1.

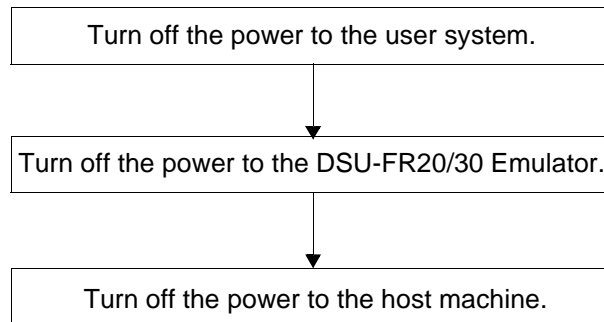


Figure 2.7-1 Power-down Sequence

To turn off the power to the DSU-FR20/30 Emulator, press the POWER switch on the rear of the emulator (see Figure 1.2-2) toward the “OFF” side.

APPENDIX

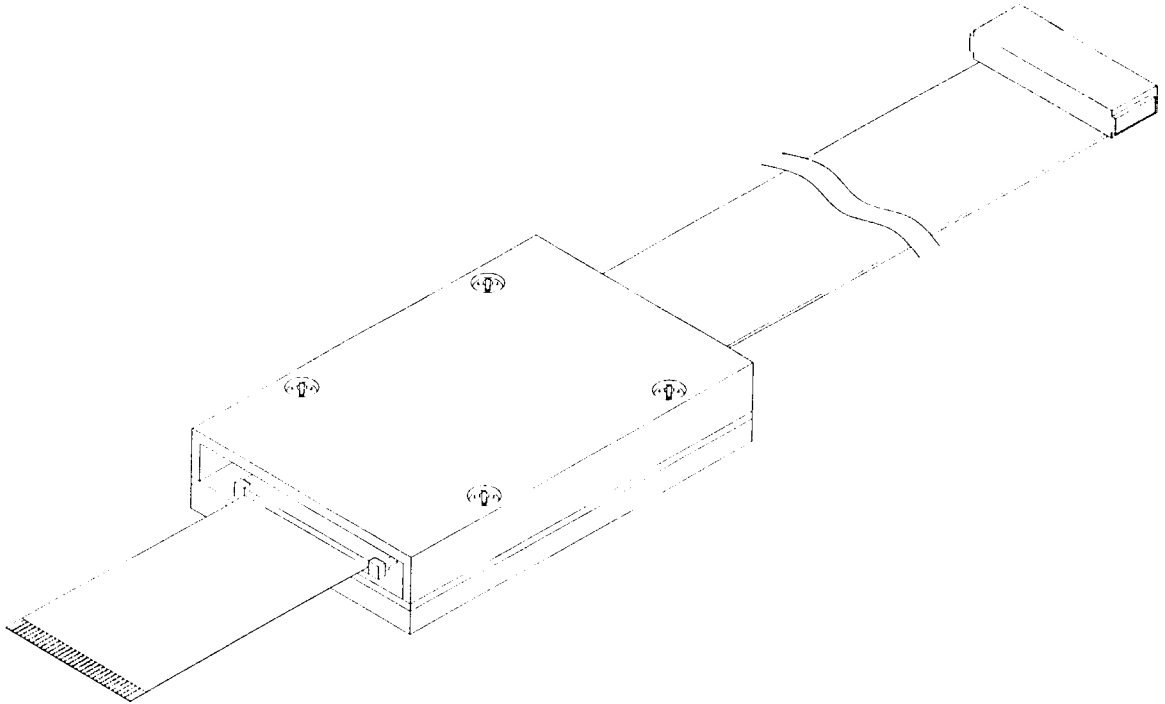
This appendix provides specifications for the DSU cable, the user interface connector, and the emulator interface connector of the user system.

- Appendix A DSU Cable Specification
- Appendix B User Interface FPC Specification
- Appendix c Emulator Interface Specification

Appendix A DSU Cable Specification

The DSU cable specifications and an exterior view of the cable are shown in Figure A-1.

■ DSU Cable Specification



Item	Specification
Name	FR20/30 DSU Cable
Model No.	MB2197-10
Cable Length	660 mm
Cable Width	55 mm

Figure A-1 Exterior View and Specifications of DSU Cable

Appendix B User Interface FPC Specifications

Figure Ba shows exterior views and pin numbering of the user interface FPC.

■ User Interface FPC Specifications

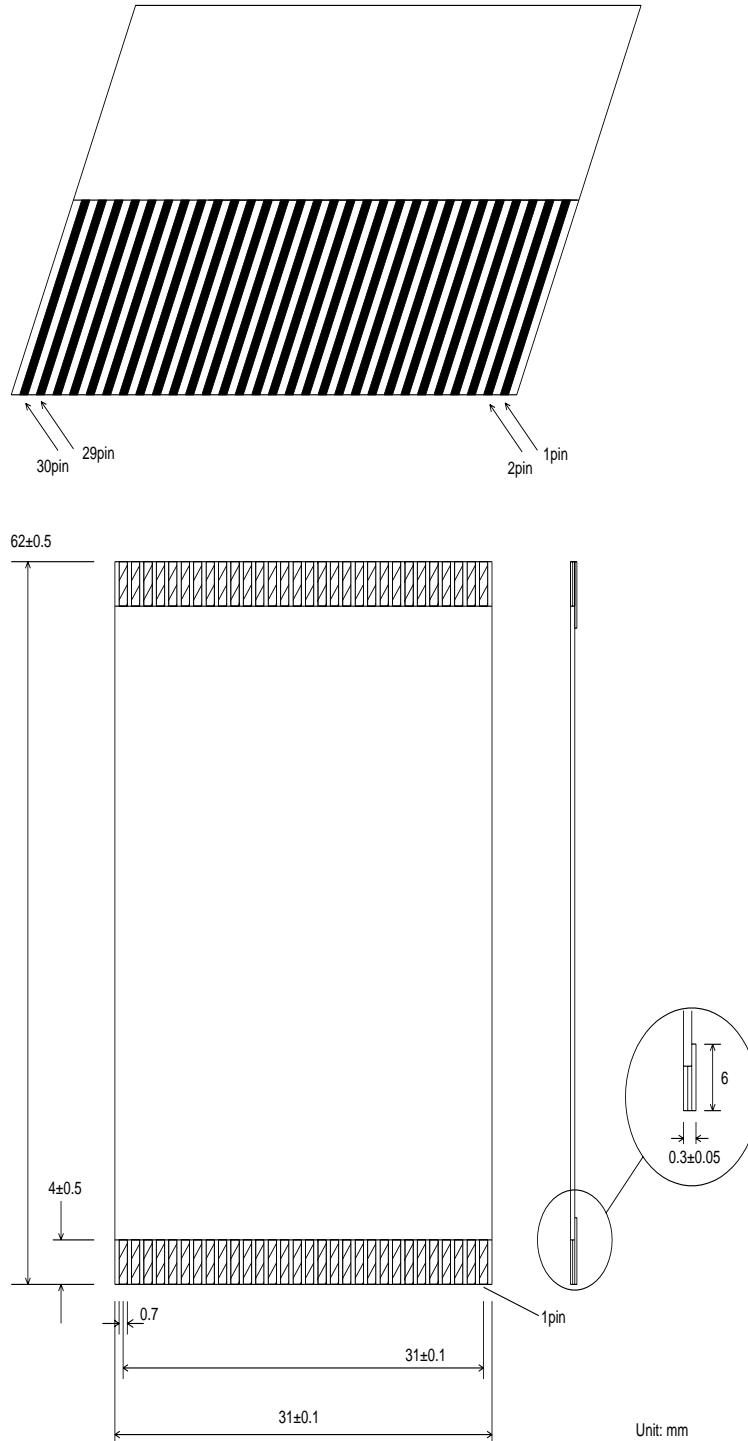


Figure B-1 Exterior Views of User Interface FPC

Appendix C Emulator Interface Specifications

Signal line definitions for the user-system-mounted emulator interface connector are provided in Table C-1, recommended connector types are listed in Table C-2, and a peripheral circuit diagram is shown in Figure C-1.

■ Emulator Interface Specifications

Table C-1 Emulator Interface Connector Signal Line Definitions

Pin No.	Signal	I/O	Description	Connection Conditions
3	ICCLK	Input	Emulator control signals	Connect directly to same-named pins of the chip. Damping resistors, etc. must not be inserted. Maximum wire length: 50 mm.
5	ICS0	Input		
7	ICS1	Input		
9	ICS2	Input		
11	ICD0	Input/Output		
13	ICD1	Input/Output		
15	ICD2	Input/Output		
17	ICD3	Input/Output		
19	ICBRK	Output		
21	RSTX	Output	Reset Output	Connect to chip reset pin. During emulator use, wire between user system reset output circuit and chip reset pin must be disconnected. Asserted LOW Open drain output. Has internal 470Ω pull-up resistor used for UVcc pin. Vol: Max 0.5 V (Iol = 16 mA)
23	*RSTIN	Input	Reset Input	Connect to user system reset output circuit. Asserted LOW Ioh: Min 2.0 V (Iih = 100 μA) Iol: Min 0.8 V (Iil = -100 μA)
25	FR20	Input	Mode Input	Left open when DSU-FR20/30 Emulator is in use.
27,29	UVCC	Input	Supply Voltage Input	Connect to chip supply voltage pin (3 to 5 V).
1, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30	GND	Input	Ground	Connect to chip ground pin.

Table C-2 Recommended Connectors

Type	Construction	Boss	Pin Shape
FH10A-30S-1SH	ZIF	None	Right angle
FH10A-30S-1SHB		Provided	Right angle

Manufacturer: Hirose Denki K.K

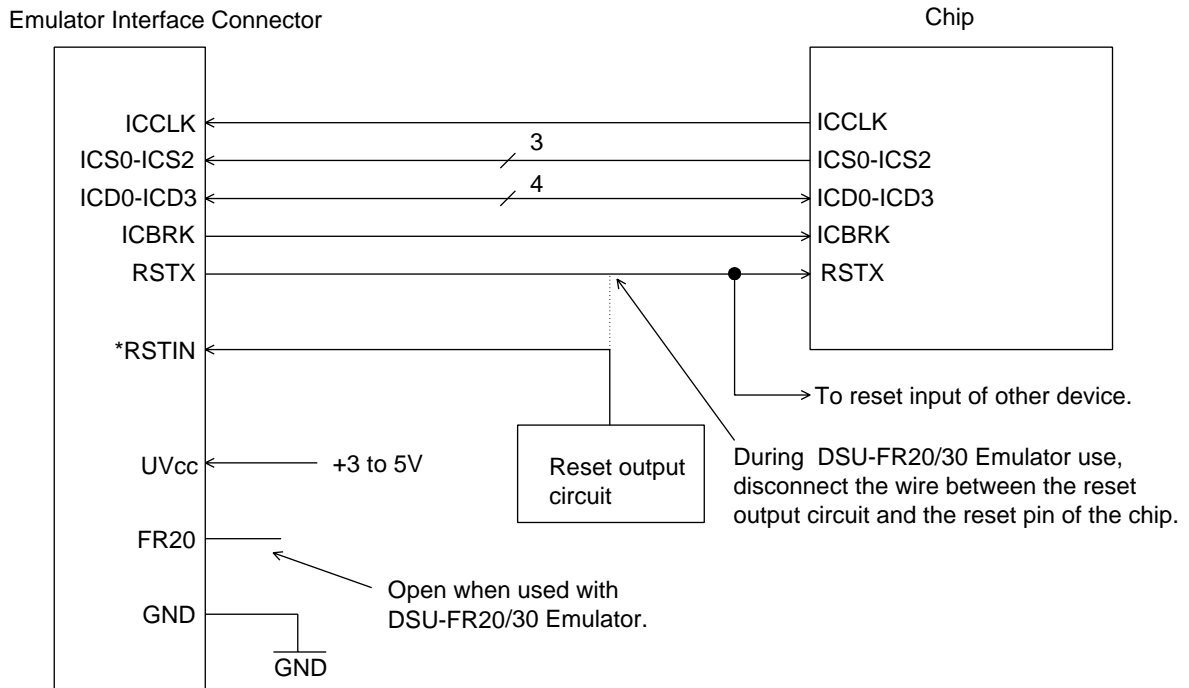


Figure C-1 Peripheral Circuit Connections

CM71-00402-1E

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