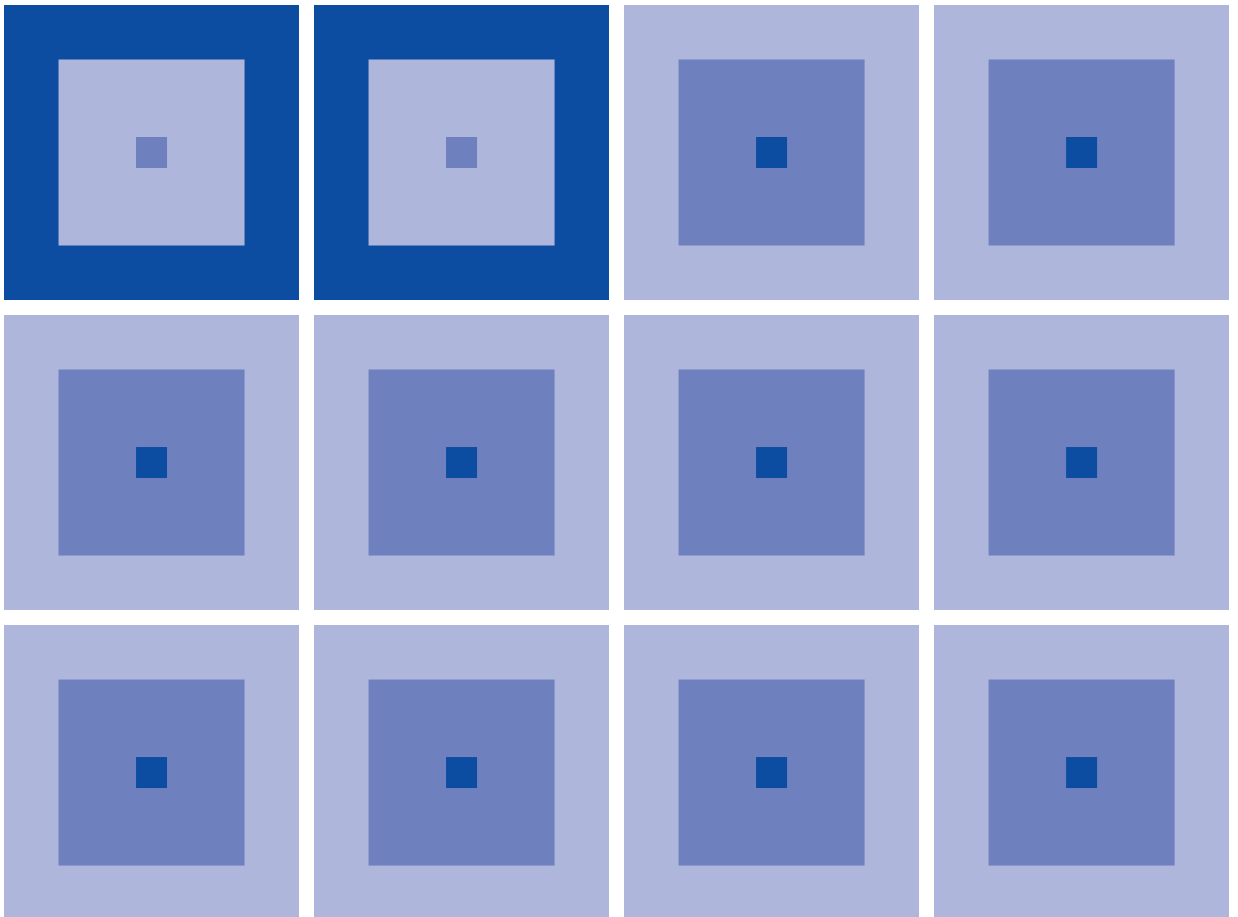


CMOS 4-BIT SINGLE CHIP MICROCOMPUTER
S5U1C62000H Manual
(S1C60/62 Family In-Circuit Emulator)



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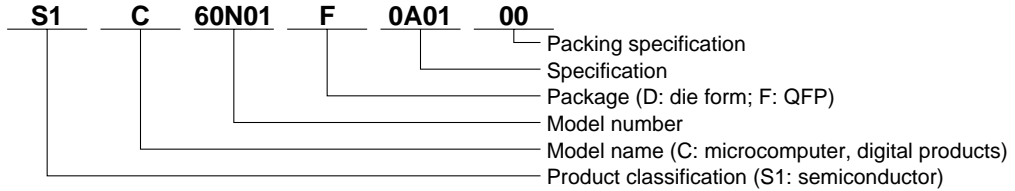
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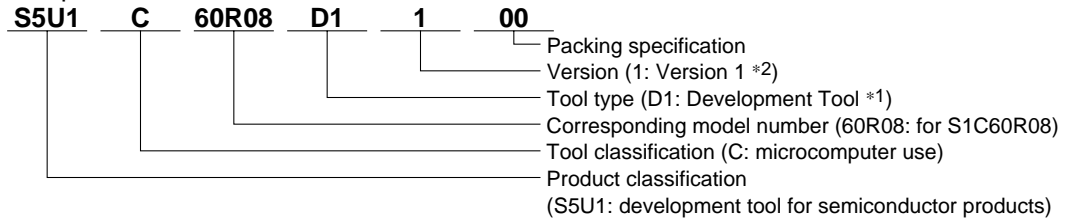
Starting April 1, 2001, the product number will be changed as listed below. To order from April 1, 2001 please use the new product number. For further information, please contact Epson sales representative.

Configuration of product number

Devices



Development tools



*1: For details about tool types, see the tables below. (In some manuals, tool types are represented by one digit.)

*2: Actual versions are not written in the manuals.

Comparison table between new and previous number

S1C60 Family processors

Previous No.	New No.
E0C6001	S1C60N01
E0C6002	S1C60N02
E0C6003	S1C60N03
E0C6004	S1C60N04
E0C6005	S1C60N05
E0C6006	S1C60N06
E0C6007	S1C60N07
E0C6008	S1C60N08
E0C6009	S1C60N09
E0C6011	S1C60N11
E0C6013	S1C60N13
E0C6014	S1C60140
E0C60R08	S1C60R08

S1C62 Family processors

Previous No.	New No.
E0C621A	S1C621A0
E0C6215	S1C62150
E0C621C	S1C621C0
E0C6S27	S1C6S2N7
E0C6S37	S1C6S3N7
E0C623A	S1C6N3A0
E0C623E	S1C6N3E0
E0C6S32	S1C6S3N2
E0C6233	S1C62N33
E0C6235	S1C62N35
E0C623B	S1C6N3B0
E0C6244	S1C62440
E0C624A	S1C624A0
E0C6S46	S1C6S460

Previous No.	New No.
E0C6247	S1C62470
E0C6248	S1C62480
E0C6S48	S1C6S480
E0C624C	S1C624C0
E0C6251	S1C62N51
E0C6256	S1C62560
E0C6292	S1C62920
E0C6262	S1C62N62
E0C6266	S1C62660
E0C6274	S1C62740
E0C6281	S1C62N81
E0C6282	S1C62N82
E0C62M2	S1C62M20
E0C62T3	S1C62T30

Comparison table between new and previous number of development tools

Development tools for the S1C60/62 Family

Previous No.	New No.
ASM62	S5U1C62000A
DEV6001	S5U1C60N01D
DEV6002	S5U1C60N02D
DEV6003	S5U1C60N03D
DEV6004	S5U1C60N04D
DEV6005	S5U1C60N05D
DEV6006	S5U1C60N06D
DEV6007	S5U1C60N07D
DEV6008	S5U1C60N08D
DEV6009	S5U1C60N09D
DEV6011	S5U1C60N11D
DEV60R08	S5U1C60R08D
DEV621A	S5U1C621A0D
DEV621C	S5U1C621C0D
DEV623B	S5U1C623B0D
DEV6244	S5U1C62440D
DEV624A	S5U1C624A0D
DEV624C	S5U1C624C0D
DEV6248	S5U1C62480D
DEV6247	S5U1C62470D

Previous No.	New No.
DEV6262	S5U1C62620D
DEV6266	S5U1C62660D
DEV6274	S5U1C62740D
DEV6292	S5U1C62920D
DEV62M2	S5U1C62M20D
DEV6233	S5U1C62N33D
DEV6235	S5U1C62N35D
DEV6251	S5U1C62N51D
DEV6256	S5U1C62560D
DEV6281	S5U1C62N81D
DEV6282	S5U1C62N82D
DEV6S27	S5U1C6S2N7D
DEV6S32	S5U1C6S3N2D
DEV6S37	S5U1C6S3N7D
EVA6008	S5U1C60N08E
EVA6011	S5U1C60N11E
EVA621AR	S5U1C621A0E2
EVA621C	S5U1C621C0E
EVA6237	S5U1C62N37E
EVA623A	S5U1C623A0E

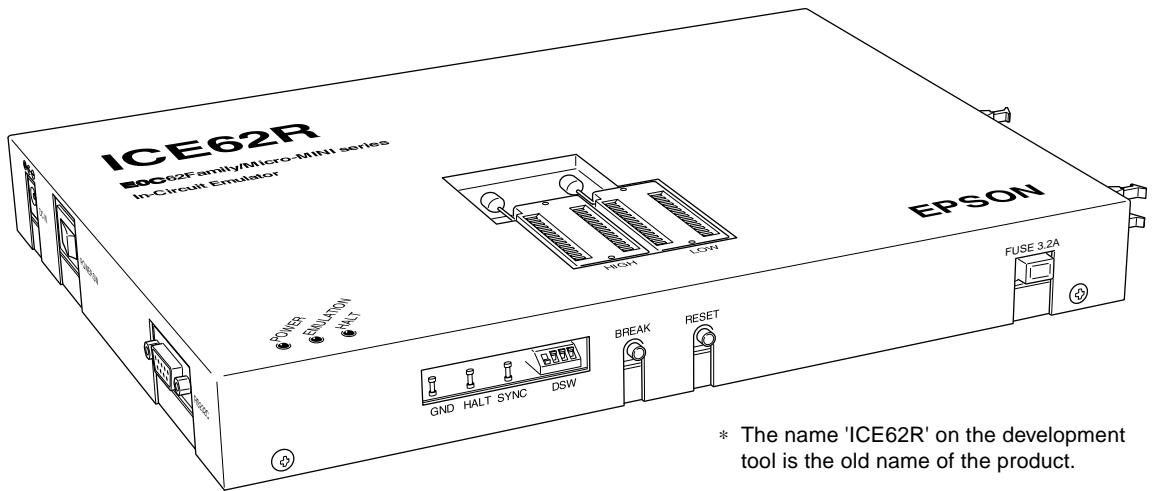
Previous No.	New No.
EVA623B	S5U1C623B0E
EVA623E	S5U1C623E0E
EVA6247	S5U1C62470E
EVA6248	S5U1C62480E
EVA6251R	S5U1C62N51E1
EVA6256	S5U1C62N56E
EVA6262	S5U1C62620E
EVA6266	S5U1C62660E
EVA6274	S5U1C62740E
EVA6281	S5U1C62N81E
EVA6282	S5U1C62N82E
EVA62M1	S5U1C62M10E
EVA62T3	S5U1C62T30E
EVA6S27	S5U1C6S2N7E
EVA6S32R	S5U1C6S3N2E2
ICE62R	S5U1C62000H
KIT6003	S5U1C60N03K
KIT6004	S5U1C60N04K
KIT6007	S5U1C60N07K

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CHAPTER 1 INTRODUCTION

This manual describes how to operate, maintain and connect the in-circuit emulator S5U1C62000H. Refer to the "S5U1C62000A Manual" for details of the S5U1C62000H functions and usage of the commands.



* The name 'ICE62R' on the development tool is the old name of the product.

CHAPTER 2 S5U1C62000H PACKAGE SPECIFICATIONS

2.1 List of Components

Figure 2.1.1 shows the contents of the S5U1C62000H package.

After unpacking, check to see that the following components are all provided.

- (1) S5U1C62000H (main unit) one
- (2) Evaluation Board interface cables two
- (3) 9-pin/9-pin RS232C cable one
- (4) 9-pin/25-pin RS232C cable one
- (5) AC power cable one
- (6) AC adapter one
- (7) Fuse (3.2 A) one
- (8) S5U1C62000H Manual (S1C60/62 Family In-Circuit Emulator) (this manual) .. one
- (9) Warranty registration card one
- (10) Notes on use one

The following items are separately forwarded and are not included in the S5U1C62000H package.

- (11) S1C62 Family Assembler Package one

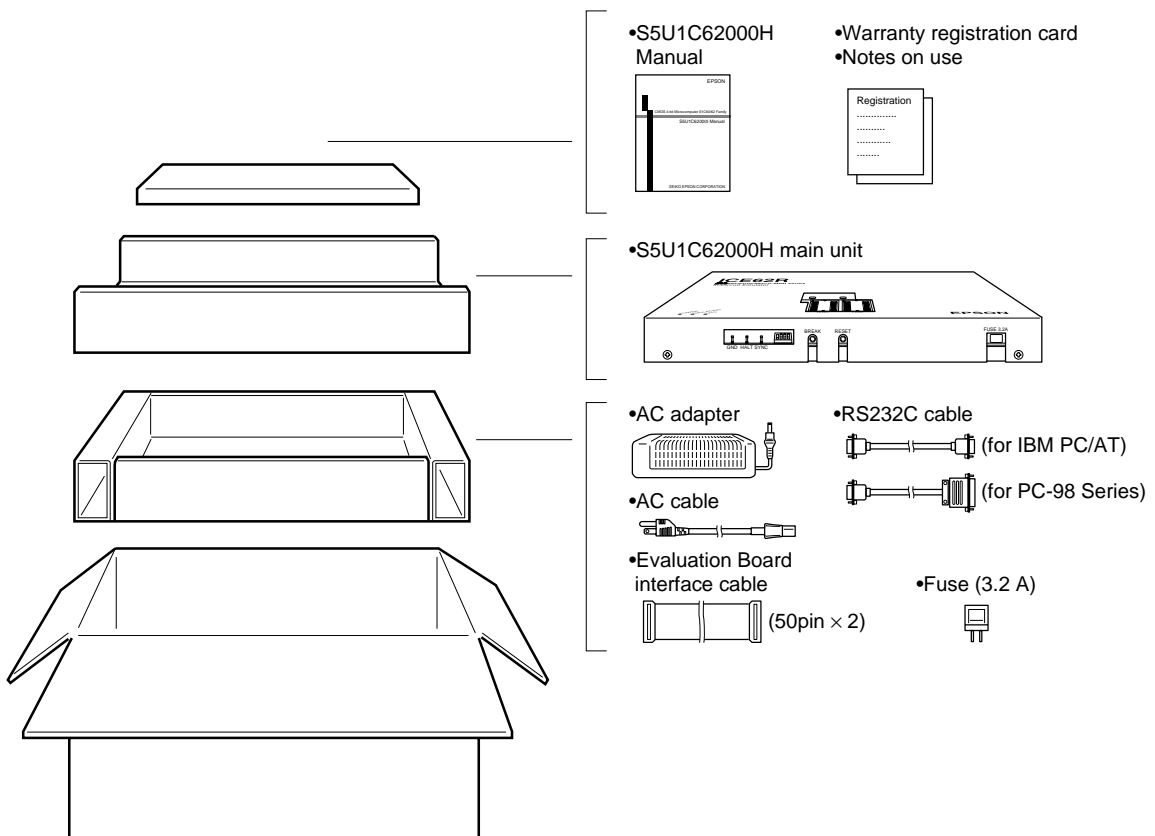


Fig. 2.1.1 Contents of S5U1C62000H package

2.2 Component Specifications

Table 2.2.1 shows the specifications of the components included in the S5U1C62000H Package.

Table 2.2.1 Specifications of S5U1C62000H components

No.	Component	Item	Specification	Remarks
1	S5U1C62000H	Dimensions	275(L) × 195(W) × 40(H) mm	Rubber feet included
		Weight	Approx. 1.7 kg (main unit only)	
		External color	Cygnus white	
		Input voltage	5 V DC	
		Current consumption	2 A Max.	
		Mounted board	One ICE board	
2	Evaluation Board interface cable	Length	50 cm	Same for both
		Interface level	CMOS interface (5 V)	
		Cable	50-pin flat cable	Same for both
		Cable-ended connector	7950-6500SC (3M)	
		Mating connector	3433-6002LCSC (3M)	or equivalent
3	9-pin/9-pin RS232C cable	Length	3 m	
		Interface level	EIA-RS232C level	
		Cable	12-pair shielded cabtyre cable	
		Cable-ended connector	DEU-9S-F0	
		Connector on host side	DEU-9P	or equivalent
4	9-pin/25-pin RS232C cable	Length	3 m	
		Interface level	EIA-RS232C level	
		Cable	12-pair shielded cabtyre cable	
		Cable-ended connector	DBU-25P-F0	
		Connector on host side	DBU-25S	or equivalent
5	AC adapter	Dimensions	160(L) × 80(W) × 60(H) mm	Overcurrent protection function built-in
		Input voltage	90 to 264 V AC	
		Input frequency	47 to 63 Hz	
		Output voltage/current	5 V DC, 5 A	
6	AC power cable	Length	1.8 m	
		Plug type	Bipolar with ground	
7	Package	Dimensions	380(L) × 260(W) × 190(H) mm	
		Materials	W carton, cardboard	
		Total weight of package	Approx. 4.5 kg	
8	Fuse	Type	DM32 (3.2 A)	

2.3 Operating Conditions

Table 2.3.1 shows operating conditions for the S5U1C62000H. The S5U1C62000H should be used under the specified conditions.

Table 2.3.1 Operating conditions

No.	Item	Condition	Remarks
1	Operating temperature	5 to 40°C	
2	Storage temperature	-20 to 60°C	
3	Operating humidity	35 to 80%	
4	Storage humidity	20 to 90%	No condensation
5	Resistance to vibration	Operating:	0.25G Max.
		Transportation:	2G Max.
6	Resistance to impulse	Operating:	1G Max.
		Standby:	2G Max.

2.4 Control Unit Specifications

This section describes the operation of the switches and other control units on the S5U1C62000H. Figure 2.4.1 shows the external view of the S5U1C62000H.

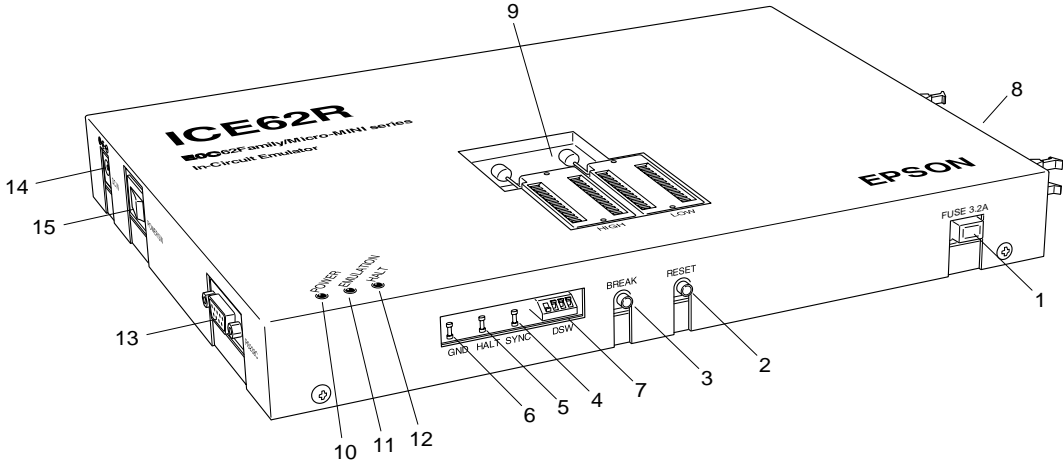


Fig. 2.4.1 S5U1C62000H external view

Table 2.4.1 lists the functions of the control units.

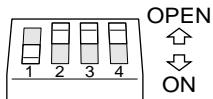
Table 2.4.1 Functions of S5U1C62000H control unit

No.	Position	Silk screen	Name	Function
1	Front	FUSE 3.2A	Fuse	This fuse protects power surge on the VDD line to be supplied to the S1C62 Family Evaluation Board. It is cutoff if 3.2 A or more current flows.
2	Front	RESET	Reset switch	Resets the S5U1C62000H.
3	Front	BREAK	Break switch	Forcibly breaks the program being executed.
4	Front	SYNC	Synchronous output terminal	Used in the BSYN mode. This terminal outputs a pulse at the break point.
5	Front	HALT	HALT signal output terminal	This terminal goes to a low level when the Evaluation Board CPU enters the HALT status. Used to measure CPU running effect.
6	Front	GND	Ground for oscilloscope	Connected to the GND clip of an oscilloscope.
7	Front	DSW	Dip switch	Used for setting the communication interface between the host computer. The default baud rate has been set to 9600 bps. See Section 2.5 for details.
8	Right side	F1, F5	Evaluation Board cable connectors	Used to connect the Evaluation Board interface cables.
9	Top	LOW, HIGH	ROM sockets	Target program ROMs are mounted. The LOW socket is for the ROM that contains the low-order 8 bits (I7–I0) of the instructions and the HIGH socket is for the ROM that contains the high-order 4 bits (IB–I8).
10	Top	POWER	Power-on LED	Lit in red while the S5U1C62000H is on.
11	Top	EMULATION	Emulation LED	Lit while the target program is running.
12	Top	HALT	HALT LED	Lit while the Evaluation Board CPU is in the HALT status. (Also lights at power-on.)
13	Left side	RS232C	RS232C cable connector	Used to connect the RS232C cable. The cable connector should be attached with the screws.
14	Left side	DC 5V	DC input connector	Used to connect the AC adapter.
15	Left side	POWER SW	Power switch	Turns the S5U1C62000H on and off. Pressing the switch to I side turns the power on and O side turns the power off.

2.5 Dip Switch Setting

The S5U1C62000H can be controlled by a host computer (NEC PC-98 Series, IBM PC/AT or its compatible machine). To communicate between the S5U1C62000H and the host computer, it is necessary to set the same baud rate and transfer data specifications in both. For the S5U1C62000H, the baud rate can be set by a dip switch.

Figure 2.5.1 shows the settings with the dip switch.



1	2	3	4	Setting
ON	OPEN	OPEN	OPEN	9600 bps, 8-bit character, 1 stop bit, no parity (factory setting)*1
OPEN	ON	OPEN	ON	4800 bps, 8-bit character, 1 stop bit, no parity
ON	ON	OPEN	OPEN	1200 bps, 8-bit character, 1 stop bit, no parity
Other settings				Reserved for testing. (Do not set.)

*1 Set the serial port of the host computer to 9,600 bps, 8-bit character, 1 stop bit and no parity as much as possible.

Fig. 2.5.1 Dip switch setting

CHAPTER 3 CONNECTIONS

This chapter describes connecting the S5U1C62000H with the host computer and the Evaluation Board (S5U1C62xxxE).

3.1 Connecting AC Adapter

The S5U1C62000H package includes a dedicated AC adapter and an AC power cable (bipolar, with ground). Connect the DC cable of the AC adapter to the DC IN terminal (5 V DC input terminal) of the S5U1C62000H, and the AC power cable to the AC inlet of the AC adapter. The common ground frame line should be used for connecting the S5U1C62000H and the host computer as shown in Figure 3.1.1.

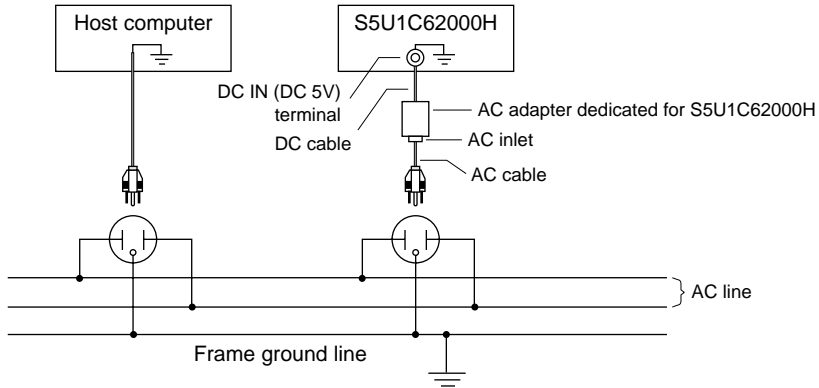


Fig. 3.1.1 Connection of AC line

3.2 Connecting Host Computer

<Connection between S5U1C62000H and IBM-PC/AT>

Figure 3.2.1 shows the external view of the 9-pin/9-pin RS232C cable connector and Table 3.2.1 shows the signal specifications.

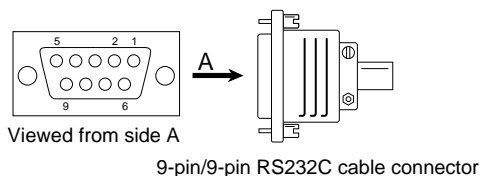


Fig. 3.2.1 9-pin/9-pin RS232C cable connector

Table 3.2.1 Signal specifications

Pin No.	Signal name	Signal meaning	Remarks
3	TXD	Transmit data from HOST to ICE	
2	RXD	Receive data from ICE to HOST	
7	RTS	Request to send from HOST	Normally used as ON
8	CTS	Clear to send from ICE	Normally used as ON
5	SG	Signal ground	

IBM-PC/AT or compatible machine can be connected with the 9-pin/9-pin RS232C cable. The 9-pin/9-pin RS232C cable has a male-pin connector and a female pin connector. Connect the male-pin connector to the S5U1C62000H and the female-pin connector to the host computer. Tightening the connectors with the screws is strongly recommended after the connection.

<Connection between S5U1C62000H and NEC PC-98 Series>

Figure 3.2.2 shows the external view of the 9-pin/25-pin RS232C cable connector and Table 3.2.2 shows the signal specifications.

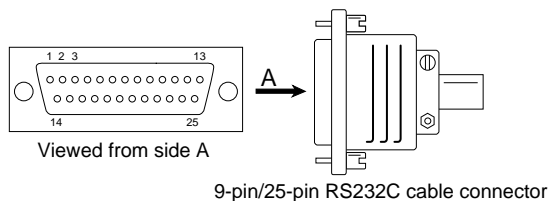


Fig. 3.2.2 9-pin/25-pin RS232C cable connector

Table 3.2.2 Signal specifications

Pin No.	Signal name	Signal meaning	Remarks
2	TXD	Transmit data from HOST to ICE	
3	RXD	Receive data from ICE to HOST	
4	RTS	Request to send from HOST	Normally used as ON
5	CTS	Clear to send from ICE	Normally used as ON
7	SG	Signal ground	

Use the 9-pin/25-pin RS232C cable for connecting the S5U1C62000H to the NEC PC-98 Series. Tightening the connectors with the screws is strongly recommended after the connection.

3.3 Connecting Evaluation Board

Figure 3.3.1 shows the external view of the Evaluation Board interface cable.

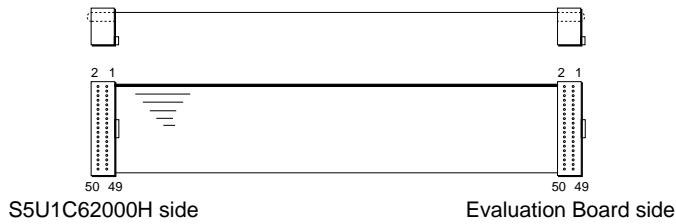


Fig. 3.3.1 External view of Evaluation Board interface cable

<Connection between S5U1C62000H and Evaluation Board>

The Evaluation Board interface cables are connected to the F1 and F5 connectors of the S5U1C62000H with its projections (to prevent wrong insertion) inside (cable side). Likewise, they are connected to the Evaluation Board with its projections outside.

The F1 and F5 connectors are lined up vertically on the side panel of the S5U1C62000H. Connect the F1 cable to the upper connector and the F5 cable to the lower connector.

Figure 3.3.2 shows the cable connection diagram.

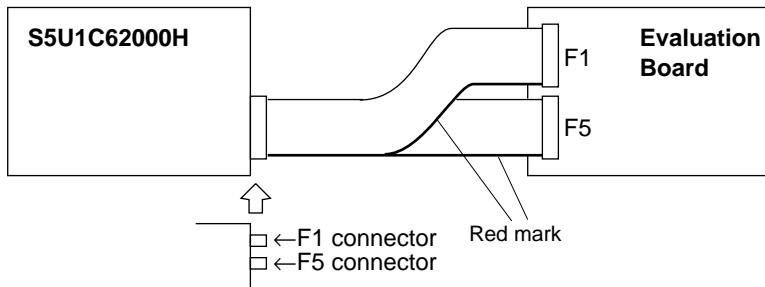


Fig. 3.3.2 Cable connection between S5U1C62000H and Evaluation Board

Note: The Evaluation Board has the VDD and VSS terminals used when operating by itself. Do not connect to these terminals when connecting to the S5U1C62000H. Power for the Evaluation Board is supplied from the S5U1C62000H through the F1 and F5 cables.

<Connection between S5U1C62000H and small-sized Evaluation Board>

The interface cables and connection to the F1 and F5 connectors of the S5U1C62000H are the same as the Evaluation Board described above.

The F1 and F5 connectors of the small-sized Evaluation Board are lined up the same as the S5U1C62000H. Connect the F1 cable to the upper connector and the F5 cable to the lower connector.

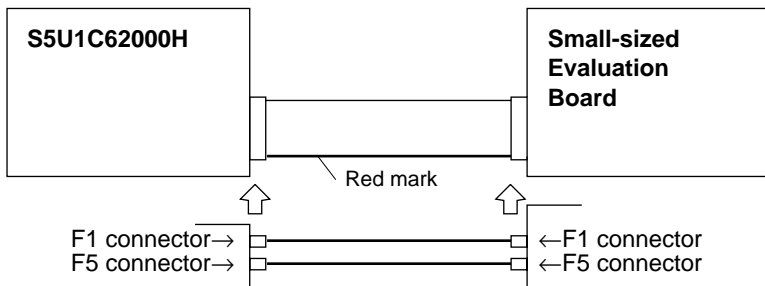


Fig. 3.3.3 Cable connection between S5U1C62000H and small-sized Evaluation Board

Note: The small-sized Evaluation Board has the DC IN (5V DC input terminal), GND and 5V terminals used when operating by itself. Do not connect to these terminals when connecting to the S5U1C62000H. Power for the small-sized Evaluation Board is supplied from the S5U1C62000H through the F1 and F5 cables.

CHAPTER 4 PRECAUTIONS

To use S5U1C62000H properly, observe the following precautions:

- Turn off the S5U1C62000H and the host computer before connecting or removing the cables. Especially take care of the connection or removal of the Evaluation Board interface cable. Since the interface is CMOS level, connection/removal when the S5U1C62000H is on may break internal integrated circuits permanently.
- Do not turn the S5U1C62000H on again immediately after power-off. Wait for at least 10 seconds before power-on; otherwise the LCA configuration of the Evaluation Board may be made improperly, causing abnormal operation, or the fuse of the S5U1C62000H may be cut off.
- Leave the LOW and HIGH levers of the ROM sockets in a horizontal position. Leave these levers in vertical position only when mounting or removing ROMs. Note that leaving them vertical for a long period of time may cause an improper connection.

CHAPTER 5 MAINTENANCE AND WARRANTY

5.1 Diagnostic Test

The S5U1C62000H performs a self diagnostic test after power on.
The following messages show that the hardware has no problem.

```
<start-up message>  
* ICE POWER ON RESET *  
* DIAGNOSTIC TEST OK *    ...(1)  
#
```

When an error occurs in the self diagnostic test, an error message appears instead of the message (1) below.

Examples of error messages:

```
* ROM CHECK ERROR 5=>FF *  
* ROM CHECK ERROR 001111 55=> *
```

In these cases, the S5U1C62000H hardware has problems. Do not try to use further.

5.2 Warranty

Refer to the attached warranty card.

CHAPTER 6 TROUBLESHOOTING

This chapter summarizes possible errors related with system operation, along with possible solutions for them.

- **Debugger cannot be loaded.**
Be sure that the host computer has a satisfactory memory capacity.
(See "S5U1C62000A Manual".)
Be sure that the software is loaded in a proper operating system.
(See "S5U1C62000A Manual".)
- **Debugger can be loaded, without prompt for command entry.**
Be sure that the RS232C cable is connected properly.
Be sure that the S5U1C62000H dip switch is set properly.
- **Communication error is displayed with a prompt for command entry.**
Be sure that the baud rate of the host computer is the same as the S5U1C62000H.
Be sure that the S5U1C62000H is turned on.
- **The fuse (FUSE 3.2A) cuts off when S5U1C62000H is turned on.**
Be sure that the F1 and F5 connectors are hooked up properly.
Be sure that the power input terminals (VDD, VSS, etc.) of the Evaluation Board are open.
Be sure that there is no problem in the user I/O section connected to the Evaluation Board.
Before replacing the fuse with a spare, make sure the above conditions are met. The fuse can be removed from its holder by pulling it towards the front.
- **After the S5U1C62000H system has been loaded, the message * TARGET DOWN * is displayed with a prompt for command entry.**
Be sure that the F1 and F5 connectors are connected properly.
Be sure that the fuse (FUSE 3.2A) is not cut.

For errors which may occur with other commands, see "S5U1C62000A Manual" for proper key operations.

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