
Technical Information

PALMiCE2 / PALMiCE3 H8S-related Target Interface

Mar. 04, 2011
Sixth Edition

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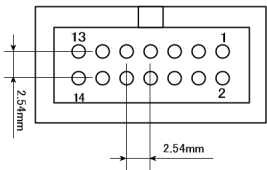
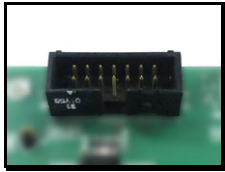
Document change history

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 07, 2008	Deleted the note from the pages on H8S and H8SX family CPU listings.
Fourth Edition	Aug. 08, 2008	<p>Applied PALMiCE3 provision to this document following the release of PALMiCE3-H8S.</p> <p>Added the following CPUs.</p> <ul style="list-style-type: none"> • H8S/2166F, H8S/2167F, H8S/2168F • H8S/2211F, H8S/2211UF, H8S/2212UF, H8S/2218UF • H8S/2360F, H8S/2361F, H8S/2362F, H8S/2364F • H8S/2370F, H8S/2371F, H8S/2372F, H8S/2374F, H8S/2370RF, H8S/2371RF, H8S/2372RF, H8S/2374RF, H8S/2378BF • H8SX/1527RF • H8SX/1543F, H8SX/1544F • H8SX/1622F • H8SX/1632F, H8SX/1634F, H8SX/1638F • H8SX/1642F, H8SX/1644F, H8SX/1648F • H8SX/1653RF, H8SX/1654RF, H8SX/1658RF • H8SX/1663RF, H8SX/1664RF, H8SX/1668RF
Fifth Edition	Nov. 06, 2009	<p>Added the supported CPUs also to this manual as they had been added in CSIDE for PALMiCE3 H8S (Ver.5.07.00).</p> <ul style="list-style-type: none"> • H8S/2462F • H8SX/1662F, H8SX/1665F
Sixth Edition	Mar. 04, 2011	<p>Added pages for description of the following: PALMiCE3 - Supported connectors PALMiCE3 - Target probe specifications</p> <p>Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.</p>

PALMiCE3 - Supported connector

(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

14pin MIL connector



(Top view on the target board)

Recommended connector
Manufacturer: OMRON Corporation
Model : XG4C-1431

PALMiCE3 - Target probe specifications

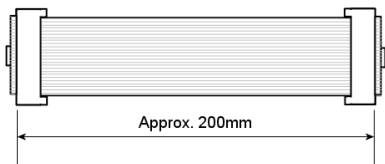
To be used by connecting it to PALMiCE3 main unit.



H-UDI cable

Product : P3-CB-MIL14-MIL14

Probe for connecting PALMiCE3 HUDI141 main unit to 14-pin MIL connector on the target system.



H8S

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- H8S/2166F, H8S/2167F, H8S/2168F
 - H8S/2215RF, H8S/2215RUF, H8S/2215TF, H8S/2215TUF
 - H8S/2211F, H8S/2211UF, H8S/2212F, H8S/2212UF, H8S/2218F, H8S/2218UF
 - H8S/2319EF
 - H8S/2329EF
 - H8S/2339EF
 - H8S/2360F, H8S/2361F, H8S/2362F, H8S/2364F, H8S/2367F, H8S/2368F
 - H8S/2370F, H8S/2371F, H8S/2372F, H8S/2374F, H8S/2377F, H8S/2378F,
H8S/2370RF, H8S/2371RF, H8S/2372RF, H8S/2374RF, H8S/2377RF,
H8S/2378RF, H8S/2378BF
 - H8S/2462F
-

H8S/2166F, H8S/2167F, H8S/2168F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

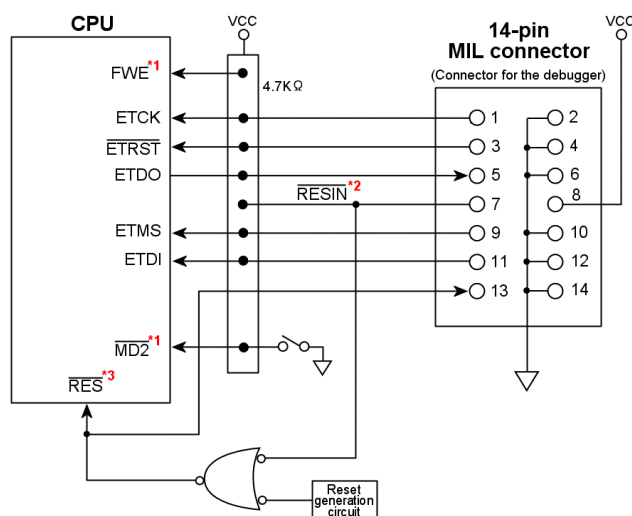
Pin No.	Signal	Input/Output* ¹	CPU Pin No. TFP-144	Pin No.	Signal	Input/Output* ¹	CPU Pin No. TFP-144
1	ETCK	Input	90	2	GND		
3	ETRST	Input	91	4	GND		
5	ETDO	Output	88	6	GND		
7	RESIN* ²	Input		8	VCC* ³	Output	
9	ETMS	Input	87	10	GND		
11	ETDI	Input	89	12	GND		
13	RES	Output	8	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

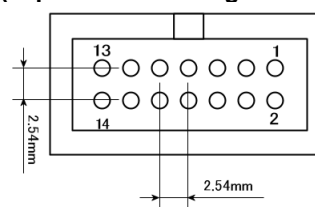


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring MD2 pin to Low state and FWE pin to High state.

Shown in the target connection reference diagram is the circuit that brings MD2 pin to Low state when you turn ON the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2166F, H8S/2167F, H8S/2168F)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2215RF, H8S/2215RUF, H8S/2215TF, H8S/2215TUF

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

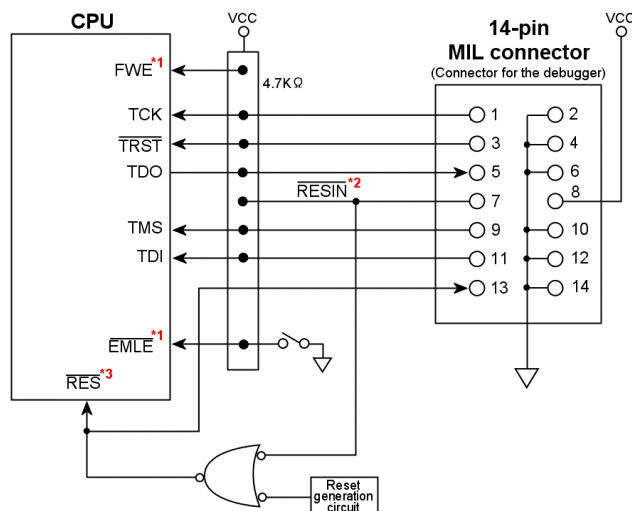
Pin No.	Signal	Input/Output*1	CPU Pin No.		Pin No.	Signal	Input/Output*1	CPU Pin No.	
			TFP-120 /120V	BP-112 /112V				TFP-120 /120V	BP-112 /112V
1	TCK	Input	107	D6	2	GND			
3	TRST	Input	109	B5	4	GND			
5	TDO	Output	106	B6	6	GND			
7	RESIN *2	Input			8	VCC *3	Output		
9	TMS	Input	108	A5	10	GND			
11	TDI	Input	110	C5	12	GND			
13	RES	Output	72	G11	14	GND			

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

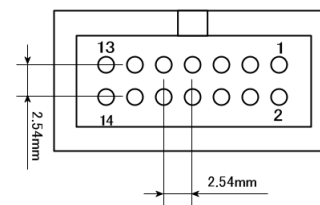


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to Low state and FWE pin to High state

Shown in the target connection reference diagram is the circuit that brings EMLE pin to Low state when you turn ON the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2215RF, H8S/2215RUF, H8S/2215TF, H8S/2215TUF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2211F, H8S/2211UF, H8S/2212F, H8S/2212UF, H8S/2218F, H8S/2218UF

Applicable products ^{*1}	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

^{*1}: In PALMiCE2-H8S, H8S/2211F, H8S/2211UF, H8S/2212UF and H8S/2218UF are not supported.

MIL connector

Signals

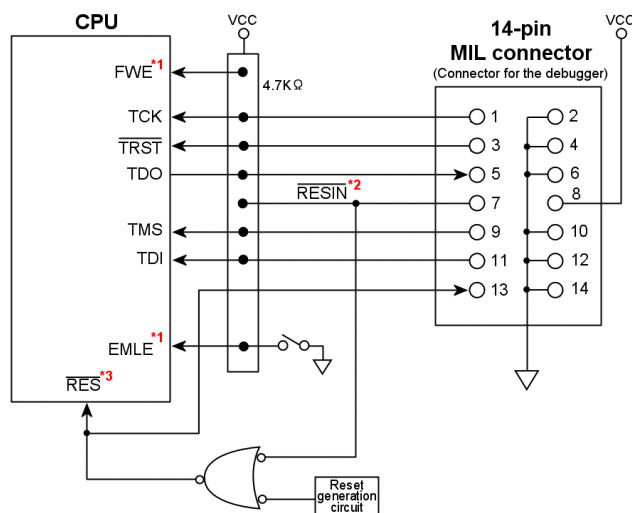
Pin No.	Signal	Input/ Output *1	CPU Pin No.				Pin No.	Signal	Input/ Output *1	CPU Pin No.			
			H8S/2211F, H8S/2211UF, H8S/2212F, H8S/2212UF		H8S/2218F, H8S/2218UF					H8S/2211F, H8S/2211UF, H8S/2212F, H8S/2212UF		H8S/2218F, H8S/18UF	
			FP-64E /64EV	TNP-64B /64BV	TFP-100G /100GV	BP-112 /112V				FP-64E /64EV	TNP-64B /64BV	TFP-100G /100GV	BP-112 /112V
1	TCK	Input	53	53	84	D7	2	GND					
3	TRST	Input	55	55	86	A7	4	GND					
5	TDO	Output	52	52	83	A8	6	GND					
7	RESIN *2	Input					8	VCC *3	Output				
9	TMS	Input	54	54	85	C7	10	GND					
11	TDI	Input	56	56	87	B7	12	GND					
13	RES	Output	36	36	58	G8	14	GND					

^{*1}: Input/output is based on the target system.

^{*2}: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

^{*3}: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

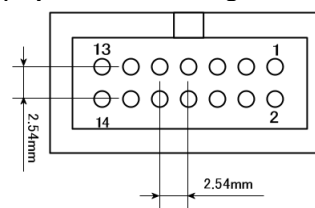


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

^{*1}: When debugging, bring EMLE pin to High state and FWE pin to High state

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

^{*2}: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

^{*3}: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2211F, H8S/2211UF, H8S/2212F, H8S/2212UF, H8S/2218F, H8S/2218UF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	<p>Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.</p> <p>Added the following CPUs. ·H8S/2211F, H8S/2211UF, H8S/2212UF, H8S/2218UF</p>
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2319EF

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

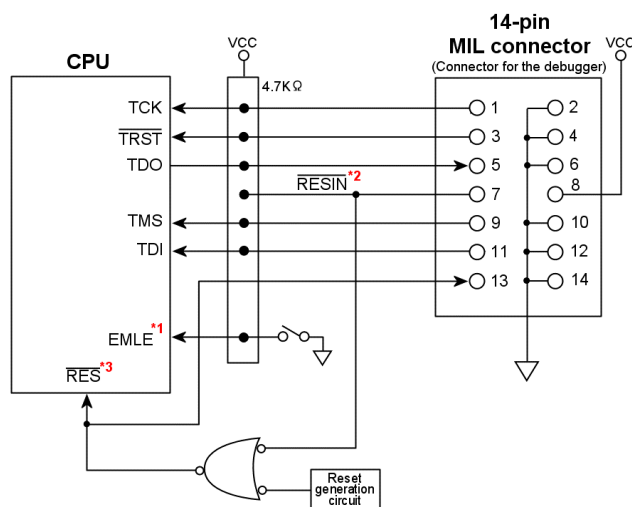
Pin No.	Signal	Input/Output*1	CPU Pin No.		Pin No.	Signal	Input/Output*1	CPU Pin No.	
			TFP-100B	FP-100A				TFP-100B	FP-100A
1	TCK	Input	13	15	2	GND			
3	TRST	Input	55	57	4	GND			
5	TDO	Output	9	11	6	GND			
7	RESIN*2	Input			8	VCC*3	Output		
9	TMS	Input	54	56	10	GND			
11	TDI	Input	11	13	12	GND			
13	RES	Output	62	64	14	GND			

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

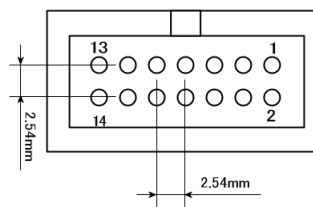


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2319EF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2329EF

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

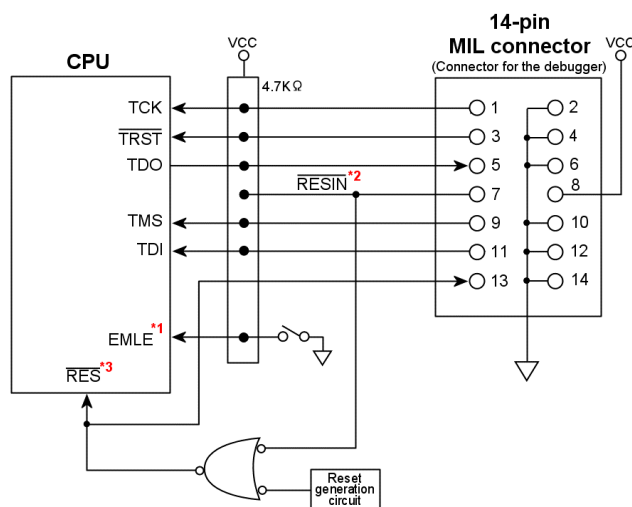
Pin No.	Signal	Input/Output*1	CPU Pin No.		Pin No.	Signal	Input/Output*1	CPU Pin No.	
			TFP-120	FP-128B				TFP-120	FP-128B
1	TCK	Input	61	69	2	GND			
3	TRST	Input	57	63	4	GND			
5	TDO	Output	63	71	6	GND			
7	RESIN*2	Input			8	VCC*3	Output		
9	TMS	Input	60	66	10	GND			
11	TDI	Input	62	70	12	GND			
13	RES	Output	73	81	14	GND			

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

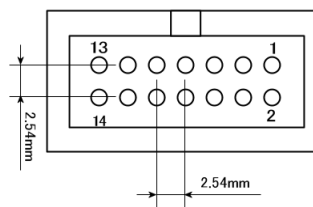


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2329EF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2339EF

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

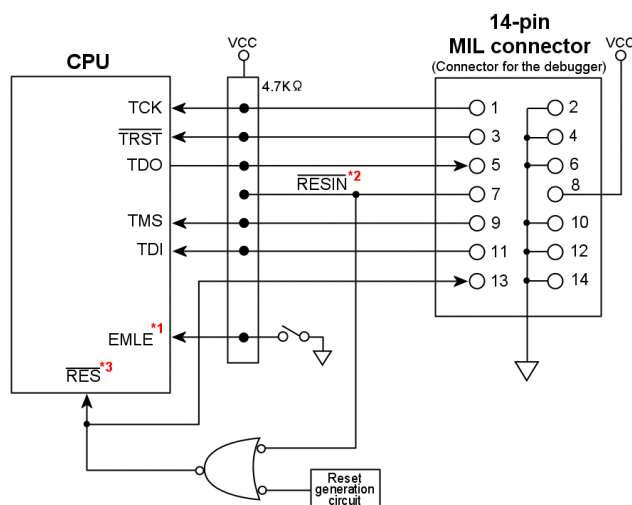
Pin No.	Signal	Input/Output* ¹	CPU Pin No. FP-144G	Pin No.	Signal	Input/Output* ¹	CPU Pin No. FP-144G
1	TCK	Input	138	2	GND		
3	$\overline{\text{TRST}}$	Input	66	4	GND		
5	TDO	Output	139	6	GND		
7	$\overline{\text{RESIN}}$ * ²	Input		8	VCC * ³	Output	
9	TMS	Input	133	10	GND		
11	TDI	Input	134	12	GND		
13	RES	Output	88	14	GND		

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

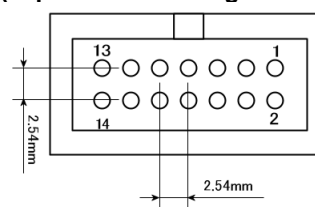


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8S/2339EF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2360F, H8S/2361F, H8S/2362F, H8S/2364F, H8S/2367F, H8S/2368F

Applicable products ^{*1}	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

^{*1}: In PALMiCE2-H8S, H8S/2360F, H8S/2361F, H8S/2362F and H8S/2364F are not supported.

MIL connector

Signals

Pin No.	Signal	Input/Output ^{*1}	CPU Pin No.		Pin No.	Signal	Input/Output ^{*1}	CPU Pin No.	
			2360F, 2361F, 2362F, 2364F, 2367F, 2368F	2367F				2360F, 2361F, 2362F, 2364F, 2367F, 2368F	2367F
			TFP-120/120V	FP-128/128BV				TFP-120/120V	FP-128/128BV
1	PG4 ^{*4}	Input	106	116	2	GND			
3	P53 ^{*4}	Input	112	122	4	GND			
5	WDTOVF ^{*4}	Output	31	37	6	GND			
7	RESIN ^{*2}	Input			8	VCC ^{*3}	Output		
9	PG5 ^{*4}	Input	107	117	10	GND			
11	PG6 ^{*4}	Input	108	118	12	GND			
13	RES ^{*3}	Output	77	85	14	GND			

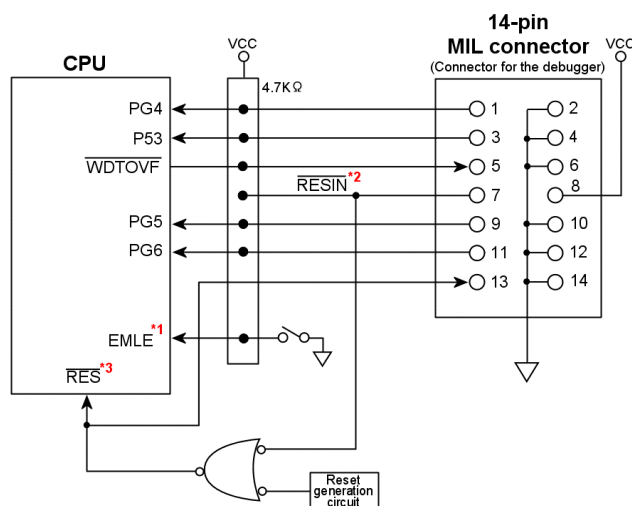
^{*1}: Input/output is based on the target system.

^{*2}: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

^{*3}: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

^{*4}: PG4, PG5, PG6, P53 port functionality, other functionalities multiplexed in those pins, and functionalities of WDTOVF pin will not be available since those pins are occupied by the debugger.

Target connection reference diagram

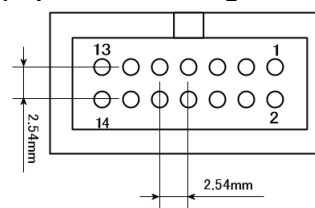


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

^{*1}: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

^{*2}: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

^{*3}: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2360F, H8S/2361F, H8S/2362F, H8S/2364F, H8S/2367F, H8S/2368F)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	<p>Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.</p> <p>Added the following CPUs. ·H8S/2360F, H8S/2361F, H8S/2362F, H8S/2364F</p>
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2370F, H8S/2371F, H8S/2372F, H8S/2374F, H8S/2377F, H8S/2378F, H8S/2370RF, H8S/2371RF, H8S/2372RF, H8S/2374RF, H8S/2377RF, H8S/2378RF, H8S/2378BF

Applicable products ^{*1}	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

^{*1}: In PALMiCE2-H8S, H8S/2370F, H8S/2371F, H8S/2372F, H8S/2374F, H8S/2370RF, H8S/2371RF, H8S/2372RF, H8S/2374RF and H8S/2378BF are not supported.

MIL connector

Signals

Pin No.	Signal	Input/ Output ^{*1}	CPU Pin No.		Pin No.	Signal	Input/ Output ^{*1}	CPU Pin No.	
			H8S/2370(R)F, H8S/2371(R)F, H8S/2372(R)F, H8S/2374(R)F, H8S/2378(R)F, H8S/2378BF	H8S/2370(R)F, H8S/2371(R)F, H8S/2372(R)F, H8S/2374(R)F, H8S/2377(R)F, H8S/2378(R)F				H8S/2370(R)F, H8S/2371(R)F, H8S/2372(R)F, H8S/2374(R)F, H8S/2378(R)F, H8S/2378BF	H8S/2370(R)F, H8S/2371(R)F, H8S/2372(R)F, H8S/2374(R)F, H8S/2377(R)F, H8S/2378(R)F
			LGA-145	LQFP-144				LGA-145	LQFP-144
1	PG4 ^{*4}	Input	B6	130	2	GND			
3	P53 ^{*4}	Input	D4	136	4	GND			
5	WDTOVF ^{*4}	Output	M3	39	6	GND			
7	RESIN ^{*2}	Input			8	VCC ^{*3}	Output		
9	PG5 ^{*4}	Input	C7	131	10	GND			
11	PG6 ^{*4}	Input	D5	132	12	GND			
13	RES ^{*3}	Output	F12	92	14	GND			

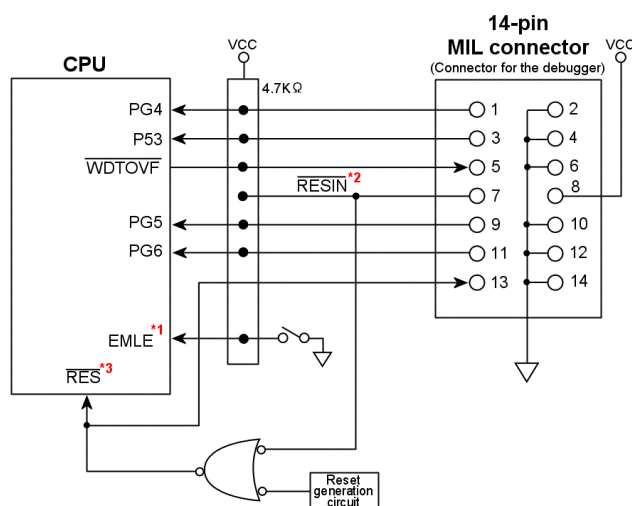
^{*1}: Input/output is based on the target system.

^{*2}: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

^{*3}: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

^{*4}: PG4, PG5, PG6, P53 port functionality, other functionalities multiplexed in those pins, and functionalities of WDTOVF pin will not be available since those pins are occupied by the debugger.

Target connection reference diagram

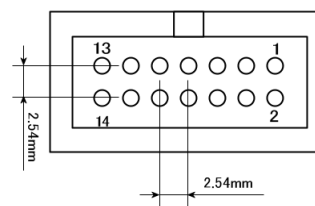


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

^{*1}: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

^{*2}: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

^{*3}: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history

(H8S/2370(R)F, H8S/2371(R)F, H8S/2372(R)F, H8S/2374(R)F, H8S/2377(R)F, H8S/2378(R)F, H8S/2378BF)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	<p>Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.</p> <p>Added the following CPUs. · H8S/2370F, H8S/2371F, H8S/2372F, H8S/2374F, H8S/2370RF, H8S/2371RF, H8S/2372RF, H8S/2374RF, H8S/2378BF</p>
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8S/2462F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

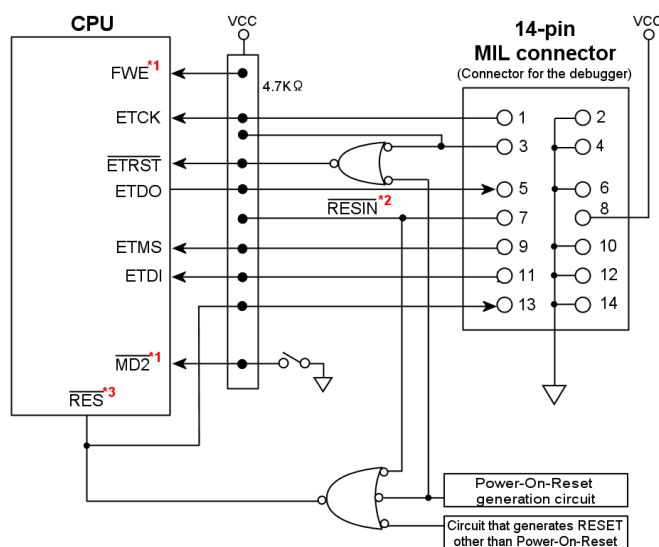
Pin No.	Signal	Input/Output ^{*1}	CPU Pin No. PLQP0144KA-A	Pin No.	Signal	Input/Output ^{*1}	CPU Pin No. PLQP0144KA-A
1	ETCK	Input	90	2	GND		
3	ETRST	Input	91	4	GND		
5	ETDO	Output	88	6	GND		
7	RESIN ^{*2}	Input		8	VCC ^{*3}	Output	
9	ETMS	Input	87	10	GND		
11	ETDI	Input	89	12	GND		
13	RES	Output	8	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

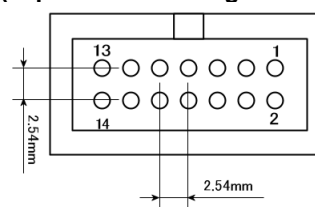


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring MD2 pin to Low state and FWE pin to High state.

Shown in the target connection reference diagram is the circuit that brings MD2 pin to Low state when you turn ON the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8S/2462F)

First Edition	Nov. 06, 2009	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX

-
- H8SX/1525F, H8SX/1527F
 - H8SX/1527RF
 - H8SX/1582F
 - H8SX/1543F, H8SX/1544F
 - H8SX/1622F
 - H8SX/1632F, H8SX/1634F, H8SX/1638F
 - H8SX/1642F, H8SX/1644F, H8SX/1648F
 - H8SX/1651
 - H8SX/1653F, H8SX/1654F
 - H8SX/1653RF, H8SX/1654RF, H8SX/1658RF
 - H8SX/1663F, H8SX/1664F
 - H8SX/1663RF, H8SX/1664RF, H8SX/1668RF
 - H8SX/1662F, H8SX/1665F
-

H8SX/1525F, H8SX/1527F

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

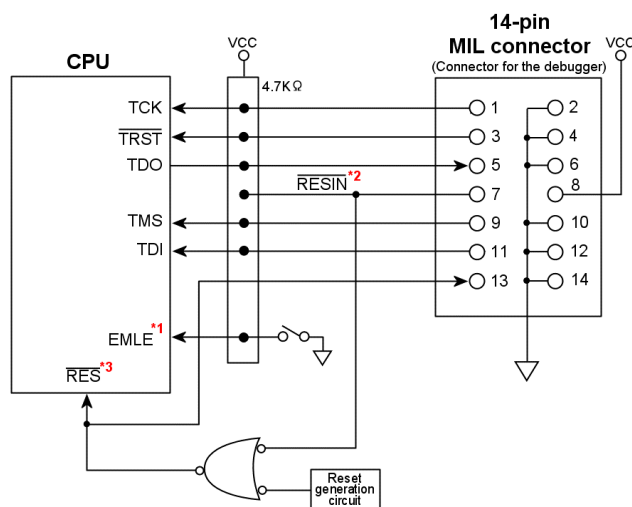
Pin No.	Signal	Input/ Output*1	CPU Pin No. QFP-100	Pin No.	Signal	Input/ Output*1	CPU Pin No. QFP-100
1	TCK	Input	65	2	GND		
3	TRST	Input	62	4	GND		
5	TDO	Output	8	6	GND		
7	RESIN*2	Input		8	VCC*3	Output	
9	TMS	Input	63	10	GND		
11	TDI	Input	64	12	GND		
13	RES	Output	66	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

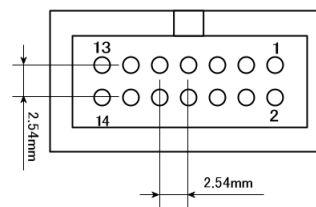


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1525F, H8SX/1527F)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1527RF

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

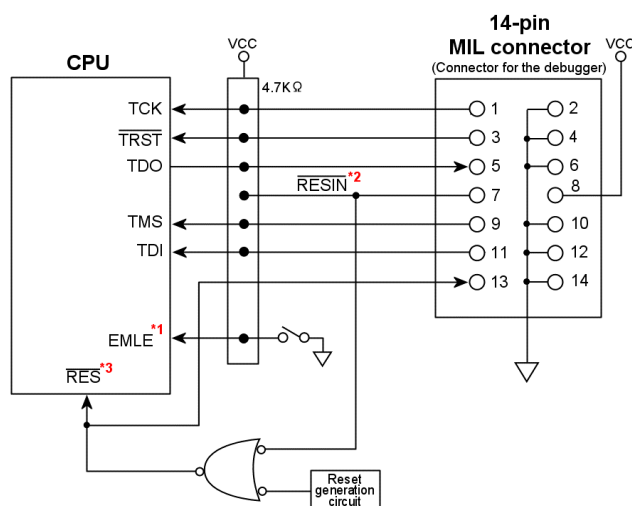
Pin No.	Signal	Input/ Output*1	CPU Pin No. QFP-100	Pin No.	Signal	Input/ Output*1	CPU Pin No. QFP-100
1	TCK	Input	65	2	GND		
3	TRST	Input	62	4	GND		
5	TDO	Output	8	6	GND		
7	RESIN*2	Input		8	VCC*3	Output	
9	TMS	Input	63	10	GND		
11	TDI	Input	64	12	GND		
13	RES	Output	66	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

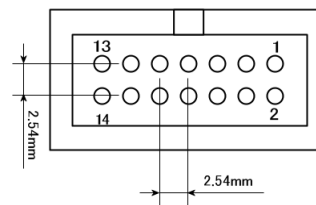


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1527RF)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1582F

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

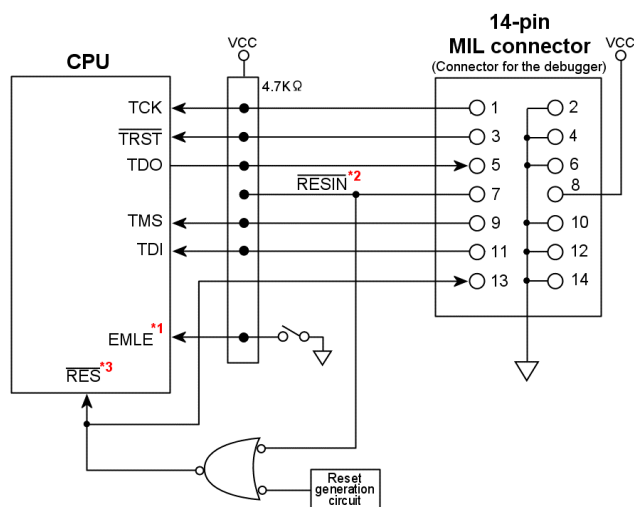
Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP1414-120	Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP1414-120
1	TCK	Input	77	2	GND		
3	TRST	Input	74	4	GND		
5	TDO	Output	9	6	GND		
7	RESIN *2	Input		8	VCC *3	Output	
9	TMS	Input	75	10	GND		
11	TDI	Input	76	12	GND		
13	RES	Output	79	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

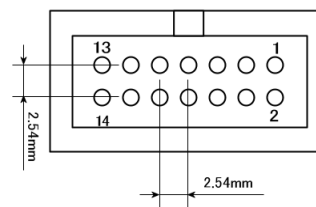


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1582F)

First Edition	Mar. 03, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1543F, H8SX/1544F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

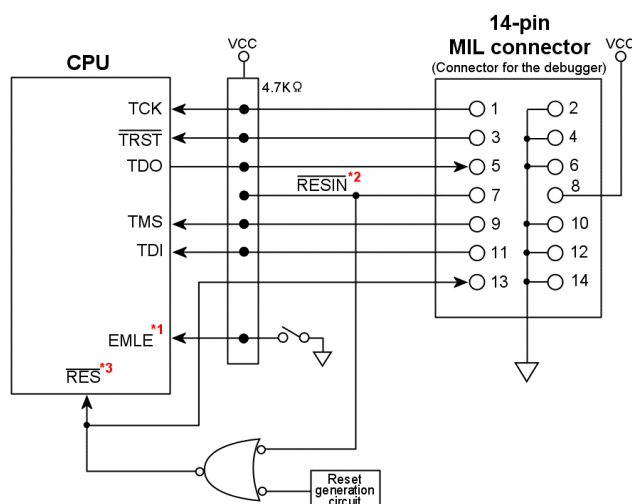
Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP-144	Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP-144
1	TCK	Input	65	2	GND		
3	TRST	Input	76	4	GND		
5	TDO	Output	63	6	GND		
7	RESIN *2	Input		8	VCC *3	Output	
9	TMS	Input	66	10	GND		
11	TDI	Input	64	12	GND		
13	RES	Output	99	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

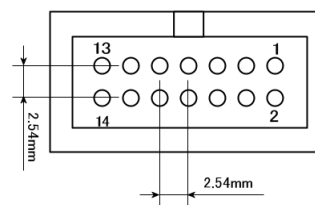


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1543F, H8SX/1544F)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1622F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

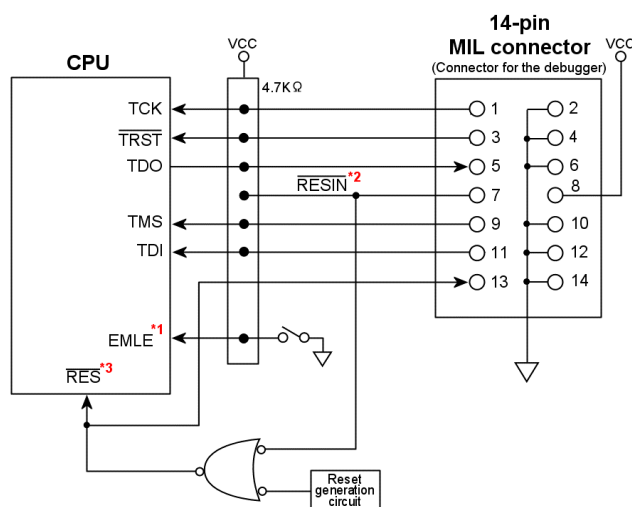
Pin No.	Signal	Input/Output*1	CPU Pin No.		Pin No.	Signal	Input/Output*1	CPU Pin No.	
			LGA-145	LQFP-144				LGA-145	LQFP-144
1	TCK	Input	C11	114	2	GND			
3	$\overline{\text{TRST}}$	Input	A12	109	4	GND			
5	TDO	Output	D10	104	6	GND			
7	$\overline{\text{RESIN}}$ *2	Input			8	VCC*3	Output		
9	TMS	Input	B11	111	10	GND			
11	TDI	Input	A11	113	12	GND			
13	RES	Output	H13	91	14	GND			

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

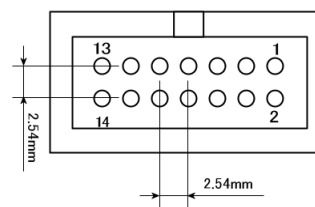
Target connection reference diagram



MIL connector specifications

Recommended connector
 Manufacturer Omron Corporation
 Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: $\overline{\text{RES}}$, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1622F)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1632F, H8SX/1634F, H8SX/1638F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

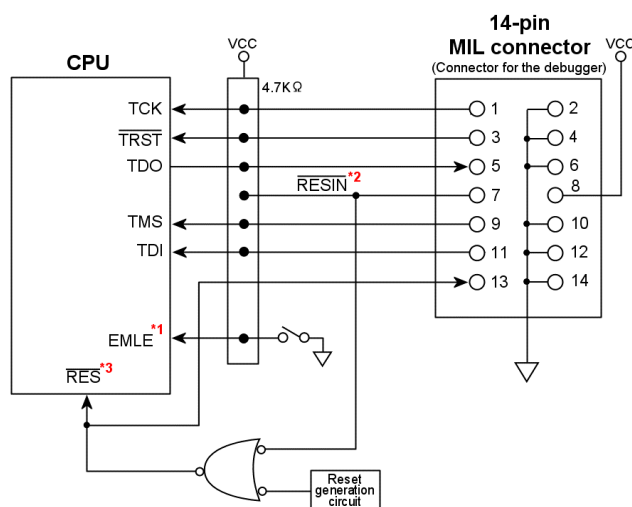
Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-120	Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-120
1	TCK	Input	96	2	GND		
3	$\overline{\text{TRST}}$	Input	91	4	GND		
5	TDO	Output	81	6	GND		
7	$\overline{\text{RESIN}}$ * ²	Input		8	VCC * ³	Output	
9	TMS	Input	93	10	GND		
11	TDI	Input	95	12	GND		
13	RES	Output	77	14	GND		

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

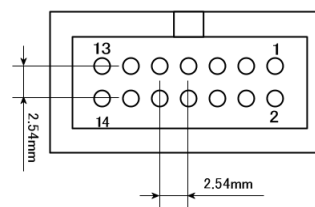


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: $\overline{\text{RES}}$, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1632F, H8SX/1634F, H8SX/1638F)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1642F, H8SX/1644F, H8SX/1648F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

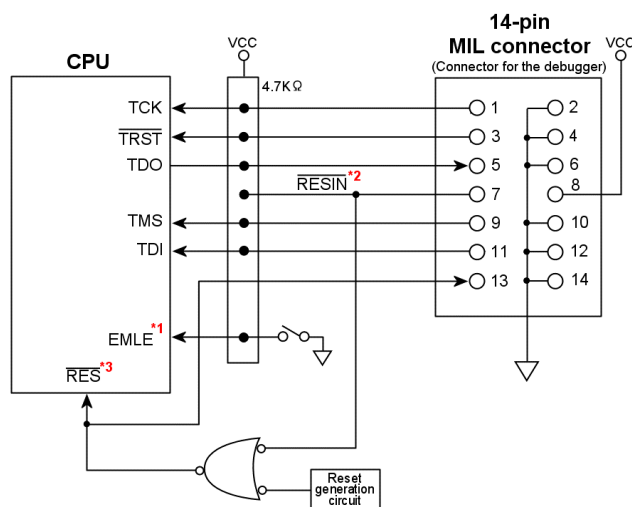
Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP-144	Pin No.	Signal	Input/ Output*1	CPU Pin No. LQFP-144
1	TCK	Input	114	2	GND		
3	TRST	Input	109	4	GND		
5	TDO	Output	95	6	GND		
7	RESIN *2	Input		8	VCC *3	Output	
9	TMS	Input	111	10	GND		
11	TDI	Input	113	12	GND		
13	RES	Output	91	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

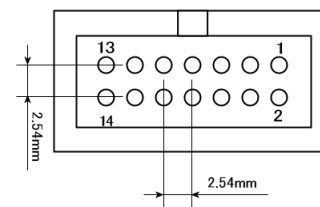


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1642F, H8SX/1644F, H8SX/1648F)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1651

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

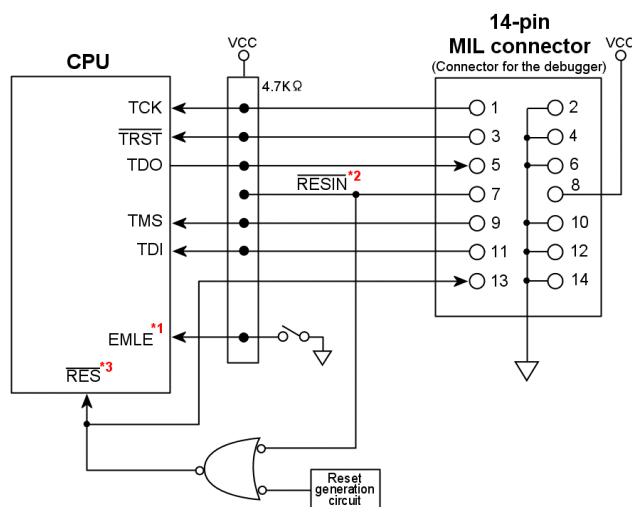
Pin No.	Signal	Input/Output ^{*1}	CPU Pin No. LQFP-120	Pin No.	Signal	Input/Output ^{*1}	CPU Pin No. LQFP-120
1	TCK	Input	96	2	GND		
3	TRST	Input	91	4	GND		
5	TDO	Output	81	6	GND		
7	RESIN ^{*2}	Input		8	VCC ^{*3}	Output	
9	TMS	Input	93	10	GND		
11	TDI	Input	95	12	GND		
13	RES	Output	77	14	GND		

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

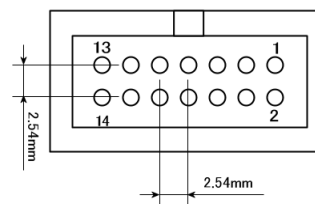


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1651)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1653F, H8SX/1654F

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

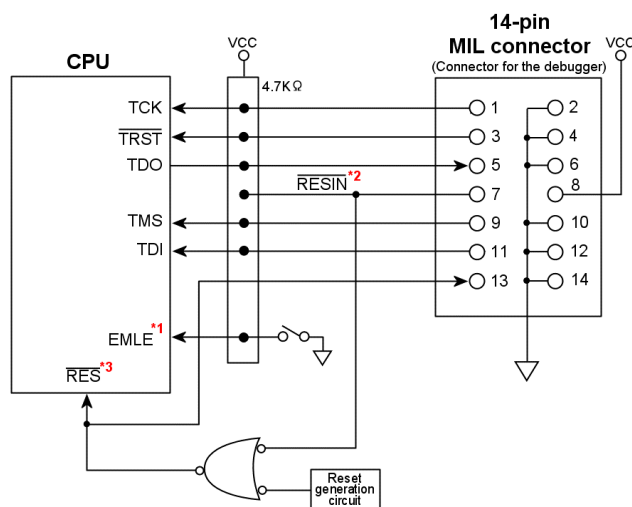
Pin No.	Signal	Input/ Output*1	CPU Pin No. TQFP-120	Pin No.	Signal	Input/ Output*1	CPU Pin No. TQFP-120
1	TCK	Input	96	2	GND		
3	$\overline{\text{TRST}}$	Input	91	4	GND		
5	TDO	Output	81	6	GND		
7	$\overline{\text{RESIN}}$ *2	Input		8	VCC *3	Output	
9	TMS	Input	93	10	GND		
11	TDI	Input	95	12	GND		
13	RES	Output	77	14	GND		

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

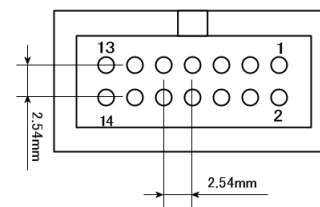


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1653F, H8SX/1654F)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1653RF, H8SX/1654RF, H8SX/1658RF

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

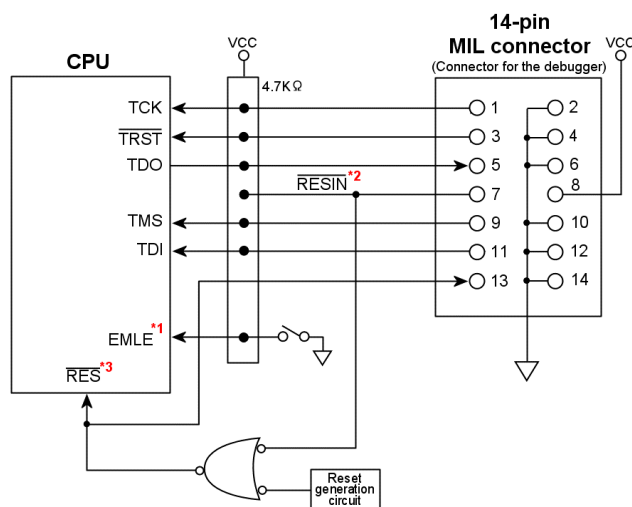
Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-120	Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-120
1	TCK	Input	96	2	GND		
3	$\overline{\text{TRST}}$	Input	91	4	GND		
5	TDO	Output	81	6	GND		
7	$\overline{\text{RESIN}}$ * ²	Input		8	VCC * ³	Output	
9	TMS	Input	93	10	GND		
11	TDI	Input	95	12	GND		
13	RES	Output	77	14	GND		

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

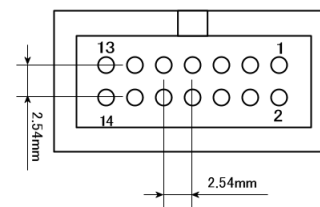


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1653RF, H8SX/1654RF, H8SX/1658RF)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1663F, H8SX/1664F

Applicable products	PALMiCE3-H8S / PALMiCE2-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

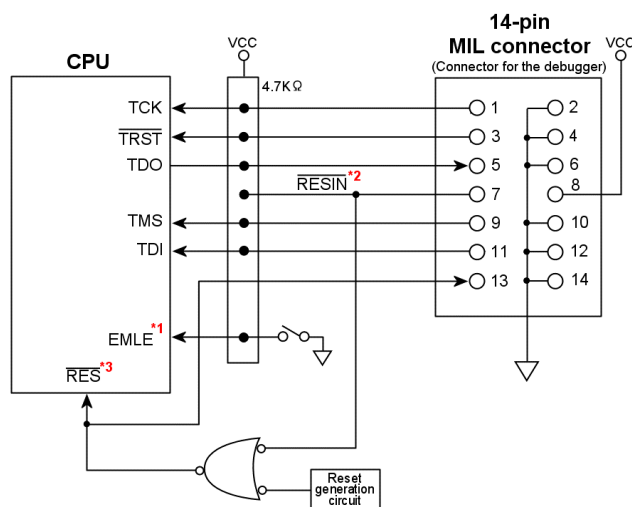
Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-144	Pin No.	Signal	Input/Output* ¹	CPU Pin No. LQFP-144
1	TCK	Input	114	2	GND		
3	$\overline{\text{TRST}}$	Input	109	4	GND		
5	TDO	Output	95	6	GND		
7	$\overline{\text{RESIN}}$ * ²	Input		8	VCC * ³	Output	
9	TMS	Input	111	10	GND		
11	TDI	Input	113	12	GND		
13	RES	Output	91	14	GND		

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

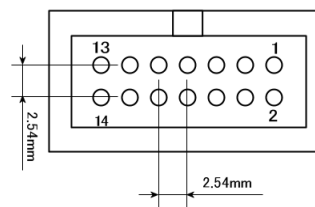


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1663F, H8SX/1664F)

First Edition	Feb. 18, 2008	Initial edition
Second Edition	Mar. 03, 2008	<p>Edited the note on Pin No.8 of signal table as follows:</p> <p><Before editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-5V range."</p> <p><After editing> "For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF and adaptation to power 1.8V-3.6V range."</p> <p>Added the following description for Pin No.8 to the note on signal table. "However, for input, it is 5V-tolerant. If optional conversion adapter (ADP-HUDI-5V) is used, 5V is supported for output."</p>
Third Edition	Aug. 08, 2008	Added PALMiCE3-H8S to Applicable products following the release of PALMiCE3-H8S.
Forth Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1663RF, H8SX/1664RF, H8SX/1668RF

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

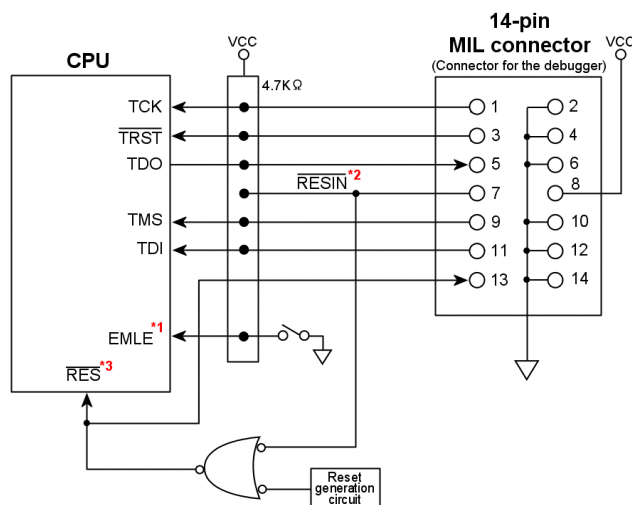
Pin No.	Signal	Input/Output *1	CPU Pin No.		Pin No.	Signal	Input/Output *1	CPU Pin No.	
			LQFP-144	LFBGA-176				LQFP-144	LFBGA-176
1	TCK	Input	114	A13	2	GND			
3	TRST	Input	109	B14	4	GND			
5	TDO	Output	95	F12	6	GND			
7	RESIN *2	Input			8	VCC *3	Output		
9	TMS	Input	111	C13	10	GND			
11	TDI	Input	113	C12	12	GND			
13	RES	Output	91	G12	14	GND			

*1: Input/output is based on the target system.

*2: RESIN is not a name of CPU pin. RESIN signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

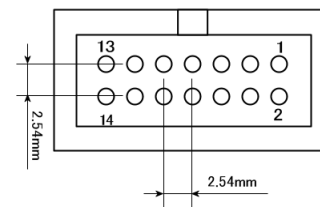


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: RESIN, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of RES pin of CPU.

Document change history (H8SX/1663RF, H8SX/1664RF, H8SX/1668RF)

First Edition	Aug. 08, 2008	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.

H8SX/1662F, H8SX/1665F

Applicable product	PALMiCE3-H8S
Applicable connector (Connector for debugger)	MIL connector (14-pin design)

MIL connector

Signals

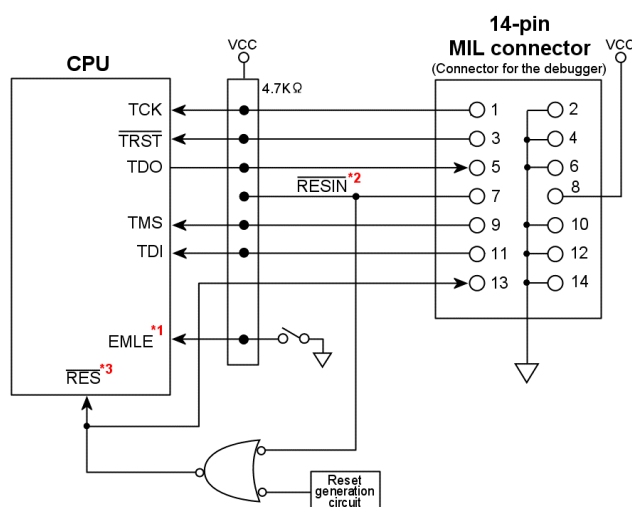
Pin No.	Signal	Input/Output *1	CPU Pin No.		Pin No.	Signal	Input/Output *1	CPU Pin No.	
			LQFP-144	LGA-145				LQFP-144	LGA-145
1	TCK	Input	114	A10	2	GND			
3	$\overline{\text{TRST}}$	Input	109	B12	4	GND			
5	TDO	Output	95	F13	6	GND			
7	$\overline{\text{RESIN}}$ *2	Input			8	VCC *3	Output		
9	TMS	Input	111	C11	10	GND			
11	TDI	Input	113	B11	12	GND			
13	RES	Output	91	G13	14	GND			

*1: Input/output is based on the target system.

*2: $\overline{\text{RESIN}}$ is not a name of CPU pin. $\overline{\text{RESIN}}$ signal cannot be directly connected to CPU pin. For connection, consult the target connection reference diagram.

*3: For VCC, connect I/O power of CPU. Debugging can be performed even if the signal is N.C., however, if you connect I/O power, it will allow prevention of leak during the target system power OFF.

Target connection reference diagram

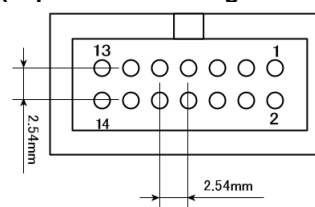


MIL connector specifications

Recommended connector

Manufacturer Omron Corporation
Model XG4C-1431

(Top view on the target board)



(For detailed dimensions of the connector, refer to the documentation by manufacturer of the connector.)

*1: When debugging, bring EMLE pin to High state.

Shown in the target connection reference diagram is the circuit that brings EMLE pin to High state when you turn OFF the switch.

*2: $\overline{\text{RESIN}}$, which is connected to Pin No.7 of the connector for debugger, is the signal that the debugger outputs to CPU. Connect the signal to CPU by using user logic reset circuit with reference to the logic shown in the target connection reference diagram.

*3: RES, which is connected to Pin No. 13 of the connector for debugger, is the signal that debugger uses for monitoring the state of $\overline{\text{RES}}$ pin of CPU.

Document change history (H8SX/1662F, H8SX/1665F)

First Edition	Nov. 06, 2009	Initial edition
Second Edition	Mar. 04, 2011	Deleted the specifications of the debugger described in the note on "VCC". Refer to the Product Summary.