

CodeTEST Probe Interface Port Design Guide

This document describes the requirements for using the CodeTEST interface port to connect the CodeTEST Probe to your target. It contains the following sections:

- [“Interface Description” on page 1](#)
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- [“Probe Configuration” on page 5](#)
- [“Limitations” on page 6](#)

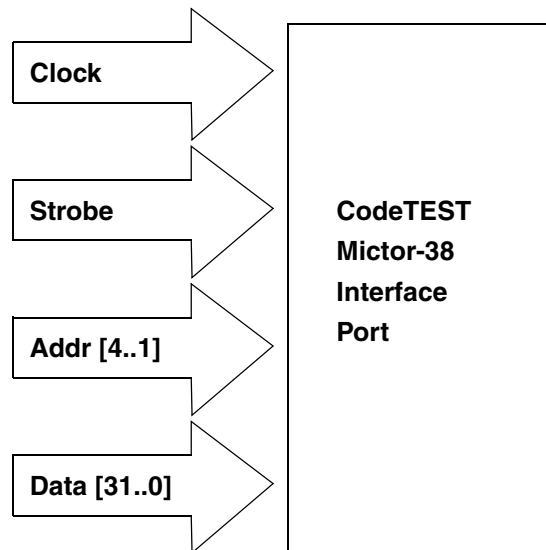
There are multiple ways to connect the CodeTEST Probe to a target system. The *CodeTEST Probe Interface Guide* describes most of them and provides additional information about interface requirements. The CodeTEST interface port requires fewer signals and less board space than some other connection schemes.

Interface Description

The CodeTEST Probe is a write-only synchronous peripheral device. The target must generate a strobe that is asserted only when a write to the Probe occurs. [Figure 1.1](#) shows a block diagram of the CodeTEST interface port. It can be implemented with one Mictor-38 connector.

This specification defines support for 16-, 32-, and 64-bit ports.

Figure 1.1 CodeTEST Interface Port on Target



Signal Descriptions

A general description of the signals required by the CodeTEST Probe follows.

Clock

The Probe uses the target's synchronous bus clock to monitor the target bus. It requires the target clock to be free-running at all times to keep data moving through the Probe's internal data pipeline. This clock is used to continuously sample all signals: address, data, and strobe.

Strobe

The strobe is used to indicate that the current bus cycle is a write cycle to the CodeTEST Probe and that the address and data buses are valid. The Probe uses the assertion of this strobe to latch the address and the de-assertion of this strobe to latch the data.

An exception to this rule is that if **1 Strobe + Internal Data Strobe** is chosen in the CodeTEST Manager Probe Configuration Utility, the data is latched on the clock cycle *after* the de-assertion of this strobe.

The strobe must meet the following requirements:

- Remain asserted for a minimum of one clock cycle at clock speeds up to and including 100 MHz.
- Remain asserted for a minimum of two clock cycles at clock speeds greater than 100 MHz.
- Remain de-asserted for a minimum of one clock cycle between Probe accesses.

Address [4..1]

Address bits Addr [4..1] are used by the Probe to determine which port (Probe control port or data port) has been written to. It is expected that the target will decode the remainder of the address bus in order to generate the strobe described above.

See the *CodeTEST Probe Interface Guide* for more information about the Probe control and data ports.

Data [31..0]

The Probe has a dedicated 32-bit data bus. Instrumentation tags are detected using the strobe and the address bus, and are latched according to the port size definition.

When connecting to a target with a 64-bit data bus, the Mictor-38 connector (Data [31..0]) is connected to the 32 *least-significant* bits of the bus. Systems using 16-bit ports require only the lower bits (Data[15..0]).

Bus Numbering Convention

The CodeTEST Probe uses the convention that bit **n0** is the least significant bit. This is the opposite of the PPC convention, which uses bit **n0** as the most significant bit. In the PPC convention, the target's data and address buses must be bit-wise reversed when connecting to the CodeTEST Probe buses. That is, Data [63..32] from the target would connect to Data [0..31] on the Probe, and Addr [30..27] would connect to Addr [1..4] on the Probe.

Physical Connection

The connection method described here is compatible with the CodeTEST Mictor38 interface cable set. The interface port consists of one Mictor-38 connector, labeled "Data 31...0", which connects to the interface port on the target.

See the *CodeTEST Probe Interface Guide* for the electrical specifications.

Connectors

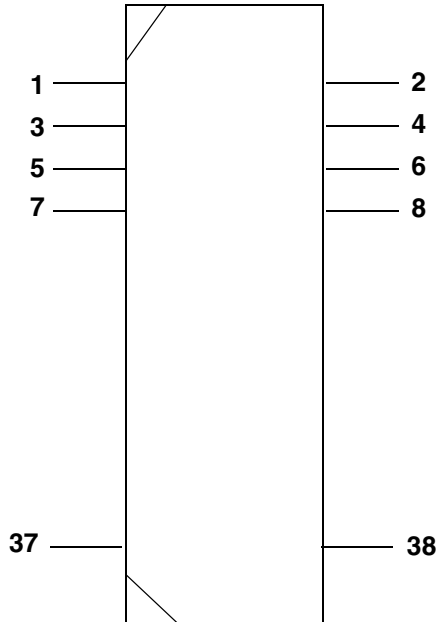
The target system should provide one AMP Mictor-38 connector. The following AMP connectors are compatible with the CodeTEST Mictor-38 connector.

- AMP 2-767004-2
- AMP 767054-1
- AMP 767094-1

Mictor-38 Connector Pin Definition

[Figure 1.2](#) shows the expected pin configuration as seen from the top of the target board. The ground pins, located on the bottom of the connector, are used as the return path for all signals. If you choose to use a different pin configuration, you will also need to get a custom router image from Customer Support.

Figure 1.2 Top View of Mictor-38 Connector on Target



Mictor-38 pinout - standard interface port convention

[Table 1.1](#) shows the pinout of the Mictor-38 interface port using the standard interface port convention, where D0 is the least significant bit and D31 is the most significant bit.

Table 1.1 Connector J1 - Standard Interface Port Convention

Pin	Signal	Pin	Signal
1	A4	2	A3
3	A2	4	A1
5	CLK	6	STROBE (AS)
7	D31	8	D15
9	D30	10	D14
11	D29	12	D13
13	D28	14	D12
15	D27	16	D11
17	D26	18	D10
19	D25	20	D9
21	D24	22	D8
23	D23	24	D7

Table 1.1 Connector J1 - Standard Interface Port Convention

Pin	Signal	Pin	Signal
25	D22	26	D6
27	D21	28	D5
29	D20	30	D4
31	D19	32	D3
33	D18	34	D2
35	D17	36	D1
37	D16	38	D0

The five pins for the ground bus of the Mictor-38 connector must be connected to the target's ground plane.

Mictor-38 pinout - PPC bus convention

[Table 1.2](#) shows the pinout of the Mictor-38 interface port using the PPC bit convention, where D0 is the most significant bit and D31 is the least significant bit.

Table 1.2 Connector J1 - PPC Bus Convention

Pin	Signal	Pin	Signal
1	A27	2	A28
3	A29	4	A30
5	CLK	6	STROBE (AS)
7	D0 or D32	8	D16 or D48
9	D1 or D33	10	D17 or D49
11	D2 or D34	12	D18 or D50
13	D3 or D35	14	D19 or D51
15	D4 or D36	16	D20 or D52
17	D5 or D37	18	D21 or D53
19	D6 or D38	20	D22 or D54
21	D7 or D39	22	D23 or D55
23	D8 or D40	24	D24 or D56
25	D9 or D41	26	D25 or D57
27	D10 or D42	28	D26 or D58
29	D11 or D43	30	D27 or D59
31	D12 or D44	32	D28 or D60
33	D13 or D45	34	D29 or D61
35	D14 or D46	36	D30 or D62
37	D15 or D47	38	D31 or D63

Note that when using a 64-bit data bus, CodeTEST requires the least significant 32 bits of the target's bus. For a PPC bus configured to 64-bits, Data [63..32] will carry the least significant bits.

The five pins for the ground bus of the Mictor-38 connector must be connected to the target's ground plane.

Mictor-38 pinout - compressed 16-bit interface port convention

[Table 1.1](#) shows the pinout of the Mictor-38 interface port using a compressed 16-bit interface port, where D0 is the least significant bit and D15 is the most significant bit.

Table 1.3 Connector J1 - Compressed 16-bit Interface Port Convention

Pin	Signal	Pin	Signal
1	NC	2	NC
3	NC	4	NC
5	CLK	6	STROBE (AS)
7	NC	8	D15
9	NC	10	D14
11	NC	12	D13
13	NC	14	D12
15	NC	16	D11
17	NC	18	D10
19	NC	20	D9
21	NC	22	D8
23	NC	24	D7
25	A6	26	D6
27	A5	28	D5
29	A4	30	D4
31	A3	32	D3
33	A2	34	D2
35	A1	36	D1
37	A0	38	D0

The five pins for the ground bus of the Mictor-38 connector must be connected to the target's ground plane.

Probe Configuration

In the CodeTEST Manager, after defining a hardware Probe data source, in the Probe Config Utility, be sure to select **Interface Port** from the **Probe** menu.

For a standard interface port or PPC bus, for **Router Image**, select the line **any, any, mictor-38, common\interface_port.rti**.

For a compressed 16-bit interface port, for **Router Image**, select the line **any, any, mictor-38, common\interface_port16+6.rti**.



If you are using a pin configuration different from the one described in [“Mictor-38 Connector Pin Definition” on page 3](#), you will need to get a custom router image from Customer Support.

Limitations

The Probe tag ports cannot support:

- Address pipelines (except for supported PPC603 buses)
- Misaligned accesses
- Cache accesses
- DRAM controllers
- 8-bit port sizes
- Asynchronous probing
- Burst cycles

See *CodeTEST Probe Interface Guide* for more information about the limitations.