CH+ Fixturing Guide

Use this guide to build fixturing to connect your device to the CH+ tester.

Traditional Fixturing

Building Traditional Fixturing

Traditional fixturing is one way to connect the device-under-test to the tester. Four-wire fixturing can also be used. Fixtures can also be built for Fast Attach, see the section below for more information.

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Note the front panel of the CH+ shows which pins on the connector are loaded.

You can purchase the parts and assemblies for making CH+ fixturing from Cirris.

Note that the wiring can be connected back to the tester in any order, and later sorted out using the *easy-wire* software.

Prewired CH+ Interface Cable
6 ft. (182cm)
P/N: AC60-KF

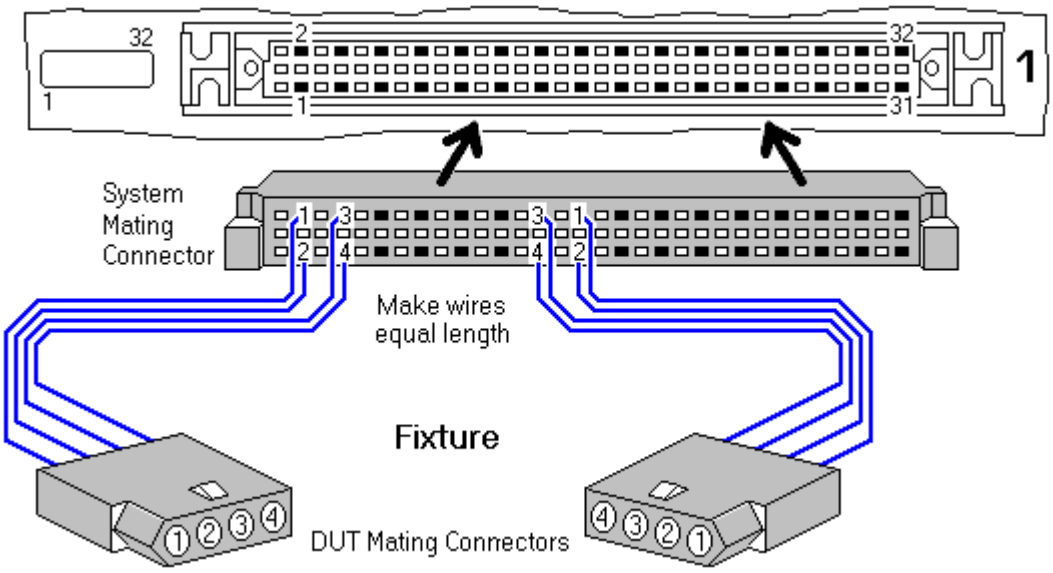
Rated for up to 1500V use.

Two – wire Fixturing

Required items

32 pin male Eurodin connectors with certain pins removed. Cirris offers a six-foot cable with a 32 pin Eurodin connector attached to one end. Ask for part number AC60-KF.

Optional: A variety of transition boards are available. For details, contact your Cirris salesperson.



When to build fixtures

Best practice is to build the mating fixture connecting the device-under-test (DUT) to the tester before creating the Test Program used for the test setup. **Why?** If you use Defined Connectors you can create connector and pin documentation by probing the pins of the fixture's connectors while the fixture is attached to the tester, greatly speeding up test creation.

Wiring order of the mating fixture

While fixturing can be wired to the tester in any pin order, taking the time to wire your fixturing to match the system point order can save time in the long run. During the test program creation process you will "attach" your fixtures so that system points are mapped to the fixture points in the software. If the fixtured points are in the same numeric order as the tester points, attaching can proceed very quickly.

Special requirements:

- Fast Attach Connector Types - all connectors using the same Fast Attach Connector Type must be wired in the same relative pattern to the system pins of the tester.
- Which-end testing (error location) - wires on either side of a connection must be the same length and preferably as short as possible.
- Four-wire - requires connection to specific pins on the tester in a set pattern.
- Label each system mating connector of the fixture with the name of the Scanner Box and the 32-pin connector it plugs into. **Why?** For all test sessions, the connection path of fixture connectors to specific 32 pin connectors on the tester must be the same as when the harness was learned or initially created. If you plug the fixture in differently, you will have to create a new Test Program for that configuration to avoid getting confusing errors.

Building Fixturing for Fast Attach

Fast Attach is a method you can use to attach (map) connectors by just probing the first pin of the mating connector as opposed to all the pins as required by the other attachment methods. All other pins in the connector will be automatically attached so you do not have to probe each one individually.

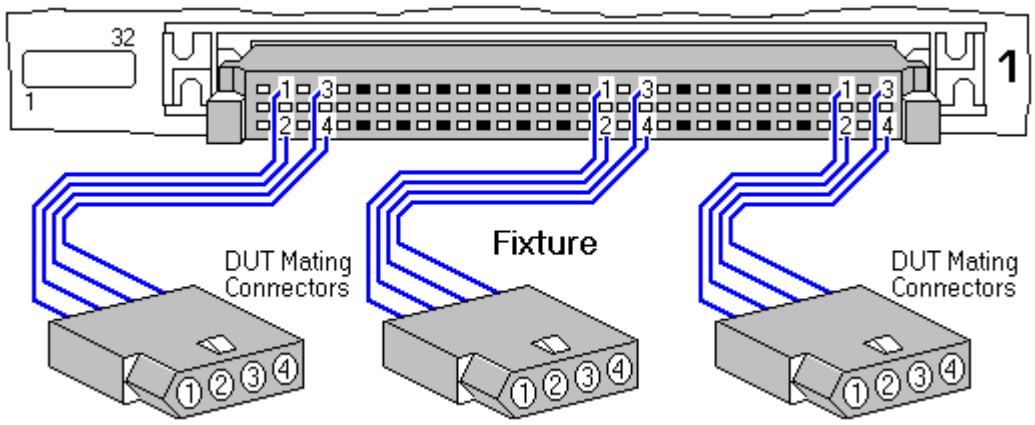
Requirements for using Fast Attach

Fixture connectors that mate to the device-under-test must be wired in the same relative pattern to the system pins of the tester's scanner connectors.

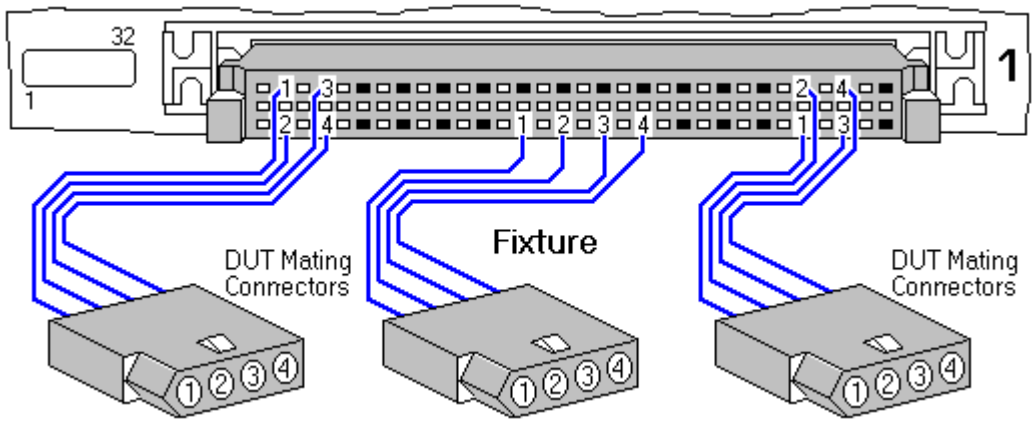
What makes Fast Attach Connector Types different than the others?

A Fast Attach Connector Type requires one more step in its construction, which is to set a wiring pattern describing the relative position of its pins to the pins on the scanner connectors of the tester. You do this by wiring a connector to the tester and then by probing the pins in the counting order of the connector.

The following image shows the proper wiring of several connectors that could be used with Fast Attach:



Example of connectors wired such that they are not suited to the Fast Attach feature:



Fast Attach is a five-step process:

1. Build a fixture containing the connector you are going to set. Connect the fixture to the tester.

2. In the Connector Type Library, create a connector type that matches the connector you are going to configure for Fast Attach. It must be complete and cannot be In Use.

3. While in the Connector Type Library, right-click on the newly created connector type. Select **Wiring Pattern - Set**.

4. Right - click on the same connector type and select **Wiring Pattern – Verify**. Use the probe to verify the wiring order as it is connected to the tester.

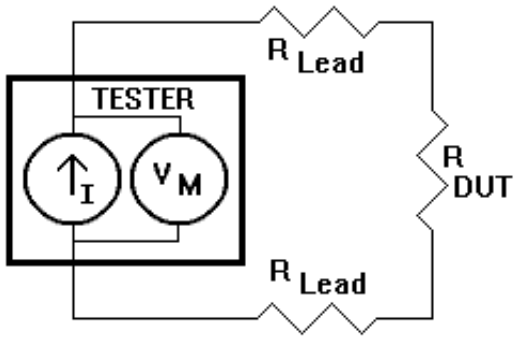
5. In the Editor, when creating a Test Program, after defining connectors, attach connectors by probing the first pin of each Defined Connector described by a Fast Attach Connector Type.

Four - wire Fixturing

Four – wire testing Overview

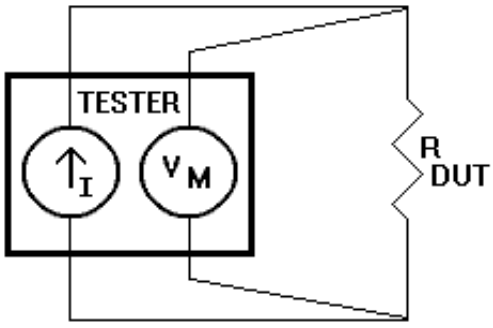
Four – wire testing allows you to extend resistance testing to a 0.005 Ohm resolution, 0.01 Ohm guaranteed. You can remove unwanted lead resistance from testing to meet test specifications below 0.1 ohm.

Two Wire Test



- Two Wire testing measures resistance at the CH+
- Adds Lead resistance (R-Lead) to the resistance of the device-under-test (R-DUT).
- Uses two wires per measurement.
- Tests wires to different resistance values using Wire Instructions.
- Measurement resolution (V-m): 0.1 Ohm, from 0.1 Ohm to 100.0 Ohm

Four Wire Test

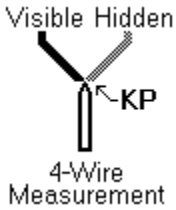


- Four Wire measures resistance away from the CH+ by using separate leads:
- Only measures the resistance of the device-under-test (R-DUT).
- Uses four wires per measurement.
- Tests wires to different resistance values using 4-Wire Instructions.
- Measurement resolution (V-m):
  - 0.001 Ohm +- 0.01 Ohm to 80 Ohms

How to place Kelvin points in four-wire fixturing

A Kelvin point is a place that makes a Y junction by joining three parts:

- One of the end points of the 4-wire measurement.
- Visible point wire of a 4-wire pair.
- Hidden point wire of a 4-wire pair.

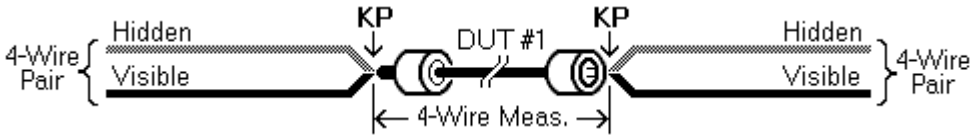


Note: The Y junction can be a solder joint or it can be where a paired wire on one side of the measurement is closest to a paired wire on the other side (see below - DUT #3).

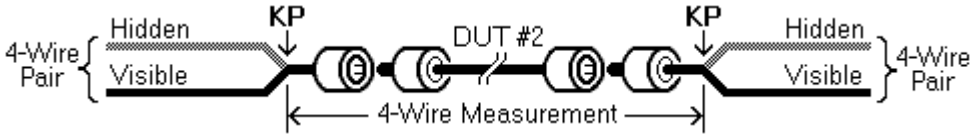
Requirements for Kelvin Points

Each 4-Wire measurement requires two Kelvin points - one at each end. Place Kelvin points as close to the device-under-test as possible. **WHY?** The 4-Wire Test measures from Kelvin point to Kelvin point, so any contact and lead resistance between the Kelvin points is added to the resistance measurement of the device-under-test.

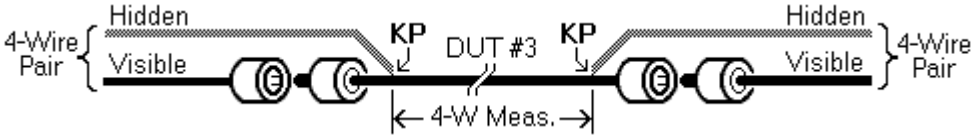
Examples of how Kelvin point placement affects 4-wire measurement:



DUT #1: The measurement is only of the device-under-test. This is the ideal, but in real-world situations it may be nearly impossible to achieve.



DUT #2: The measurement includes part of the fixture. Warning! If a lot of the fixture is between a Kelvin Point and the device-under-test, the 4-Wire Test will be considerably compromised.

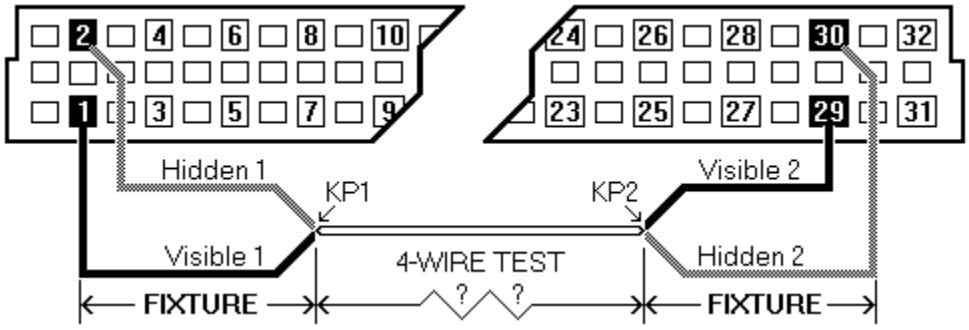


DUT #3: The measurement tests only part of the device-under-test. For example, by using probe pins, you can eliminate the resistance of a connector from the measurement.

Finding Visible and Hidden Point Mates

Unlike conventional fixtures that require two wires per measurement, 4-Wire fixtures require four wires in two pairs per measurement. In order to fixture four-wire to the CH+, the two wires in each 4-Wire Pair must connect to two different kinds of test points called Visible and Hidden. Each Visible point has one specific Hidden mate and the two must go together.

How to - Map the Visible points to Hidden mates



From any visible point, the next vertical point is it's hidden pin mate.

Now that you have built your fixturing, you are ready to Define Four Wire Connectors in the easy-wire software. Refer to the online help system for more information on setting up a four-wire test program.

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