



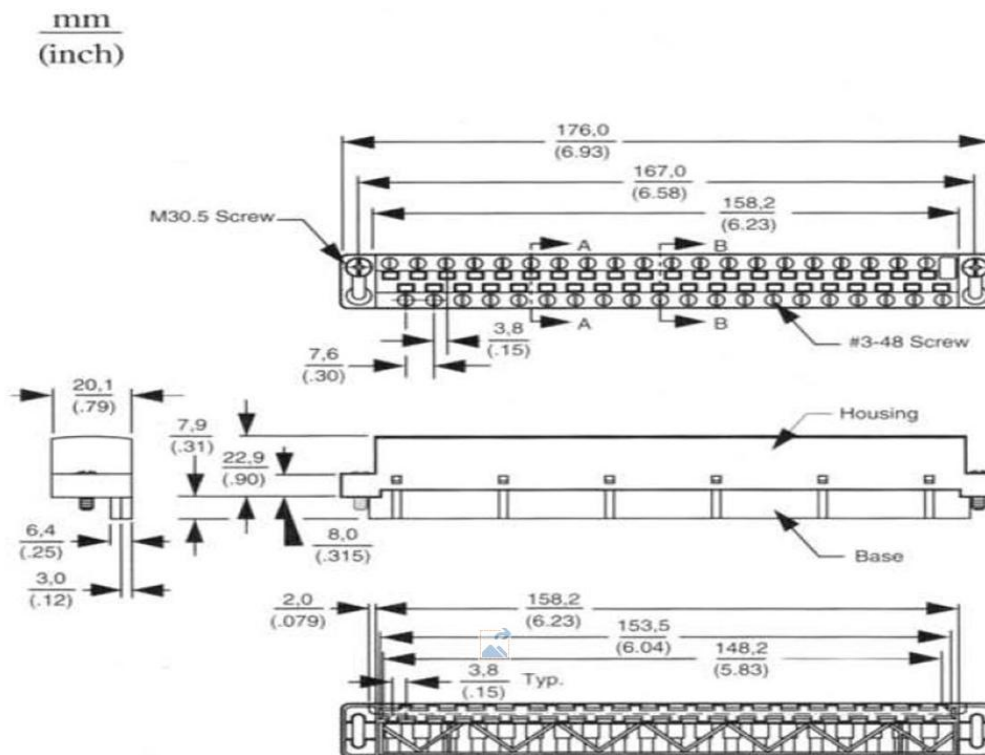
Tips for Wiring and Installing the CTI 2500-40F 40-Pin I/O Connector

1.1 Overview

CTI 2500 Series® Classic I/O modules use the 2500-40F connector for attachment of I/O wiring to the PLC. This Tech Tip explores techniques for improving reliability when wiring the connector.

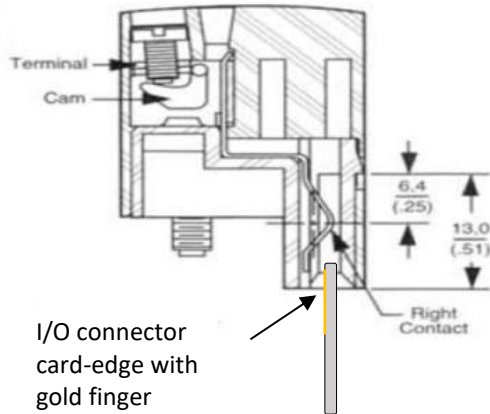
1.2 Connector Construction

The 2500-40F is a card-edge connector constructed from glass-filled polyester, with 94V-0 flammability classification and 130°C maximum operating temperature.



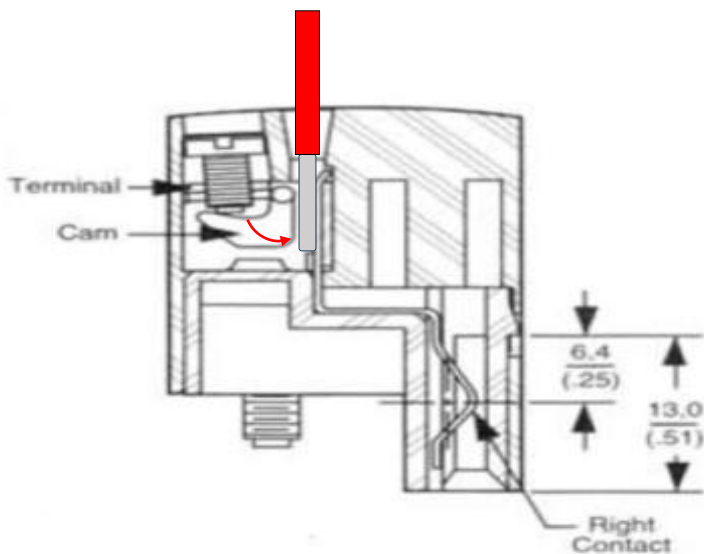
1.3 Cardedge Insertion

The 2500-40F connector contains 40 contacts in an alternating arrangement on both sides of the cavity where the card-edge slides in. This diagram shows how a typical contact engages the gold-plated finger on the card-edge.



1.4 Wire Clamping Mechanism

The 2500-40F uses a cam arrangement to clamp the wire against the contact inside the connector body. The cam position is driven by a screw as shown below.

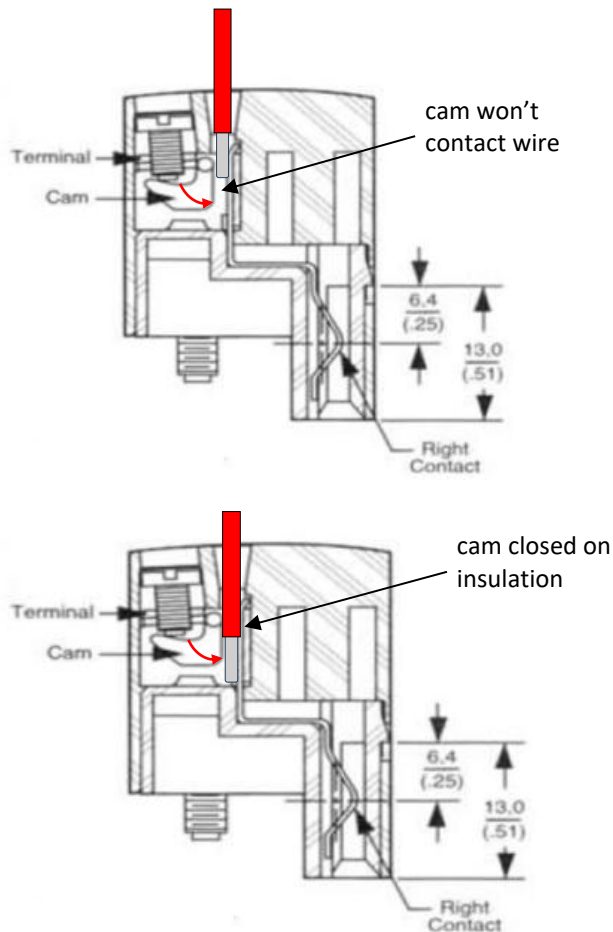


1.5 “Best-Practices” Wiring Tips

Based on the cam mechanism of operation, there are several “best practices” tips which can improve the connector wiring experience and reliability.

1.5.1 *Strip Wire to the Proper Length*

Minimum strip length is 0.375 inches, or 9.5mm. However, best results can often be obtained by stripping a little longer – about 11mm or 0.430 inches. If the wire is stripped too short, the wire insulation will prevent proper cam operation against the wire. Depending on the thickness of the insulation, either of the two faulty connection types shown below can occur. In these situations, it is also possible to damage the screw or cam, as the user is more likely to overtighten the screw in an attempt to get the wire clamped snugly.



1.5.2 *Ensure Screw is Fully Reversed Before Inserting Wire*

If the screw isn't fully in the “up” position before inserting the wire, the cam may be partly engaged, resulting in failure of the wire to fully seat in the bottom of the cavity. Before inserting the wire, turn the screw in reverse a few turns to ensure it is in the correct position.



1.5.3 Use Proper Torque on the Screw

Rated tightening torque for the screw is 4.55 in-lb (72.8 in-oz) or 0.508 N-m. Here is an example insulated torque screwdriver which can be ordered in several in-oz or N-m ranges.

<https://www.wihatools.com/products/torque-screwdrivers?variant=43073110081792>

If the wire does not feel tight, start the process over:

1. Fully reverse the screw
2. Remove the wire
3. Verify no loose copper strands
4. Verify proper strip length
5. Fully insert the wire until it can no longer be pushed inside
6. Tighten the screw to rated torque

1.6 Installing the 2500-40F Connector on a Module

New connectors can sometimes be difficult to install the first few times they are plugged onto a module. If you encounter this difficulty, you can use the “rolling” technique shown in the pictures below to attach the connector gradually from top to bottom.

Step 1: Starting at the top insert the connector part of the way and start rolling the connector keeping the top inserted.



Step 2: Once the connector is inserted at the top roll the connector down while pushing the connector in to completely insert it on the board.



Step 3: Once you have rolled the connector all the way down and fully inserted onto the PCB you can finish the installation by screwing the Thumb Screws down. Do not overtighten.

