

Application Note #1447

Optima Series Interconnect Options

Introduction

This application note details the various methods of available connections for the Optima series motion controllers. These interconnect options also apply to the newer Accelera series and Econo series controllers that use the 100 pin connectors. Interconnect options include the standard ICM modules, custom interconnects, and board-to-board solutions that eliminate the need for the 100-pin cable. Size, cost, and complexity all play a role in the choices presented. By offering numerous solutions, the user can determine the best fit for the application.

Standard Products

Galil offers two standard interconnect solutions for Optima series controllers. The ICM-1900 is a full-sized, enclosed breakout module with all connections clearly marked on the board. Two-tiered screw terminals make for quick, strong connections. The ICM-1900 measures 13.5" x 7.0" x 2.5".

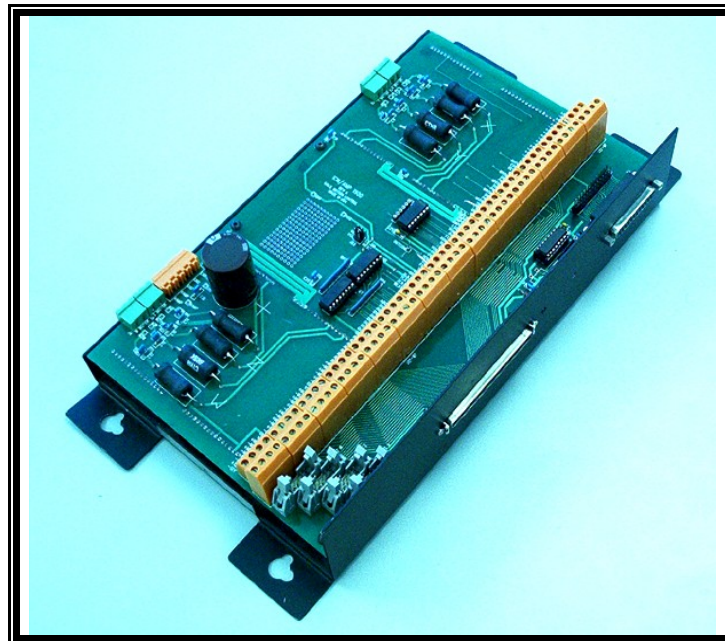


Figure (1) ICM 1900 Interconnect module (cover removed)

Originally designed to mate with bus-based controllers, this interconnect can be used with standalone controllers as well. Connection to the ICM-1900 from a controller uses the CABLE-100-xM ('xM' refers to cable length; 1, 2, or 4 meter for the CABLE-100). To connect the auxiliary encoders, use either the CABLE-26-25 for a bus-based controller, or the CB-36-25 plus CABLE-36-xM combination for standalone controllers. ('xM' refers to cable length; 1 or 3 meter for the CABLE-36)

The ICM-1900 can also be ordered with up to four amplifier modules for brush-type motors. This option is ordered as AMP-19x0 (AMP-1910 for one amp; AMP-1920 for two, etc.)

A similar yet smaller interconnect called the ICM-2900 is also offered. The signals are grouped into 4-pin plug-in screw terminals for quick disconnect and easy wiring. The unit is enclosed in metal, and holes exist for a direct bolt-on to the standalone controllers. The ICM-2900 measures approximately 12" x 2.5" x 2.5".

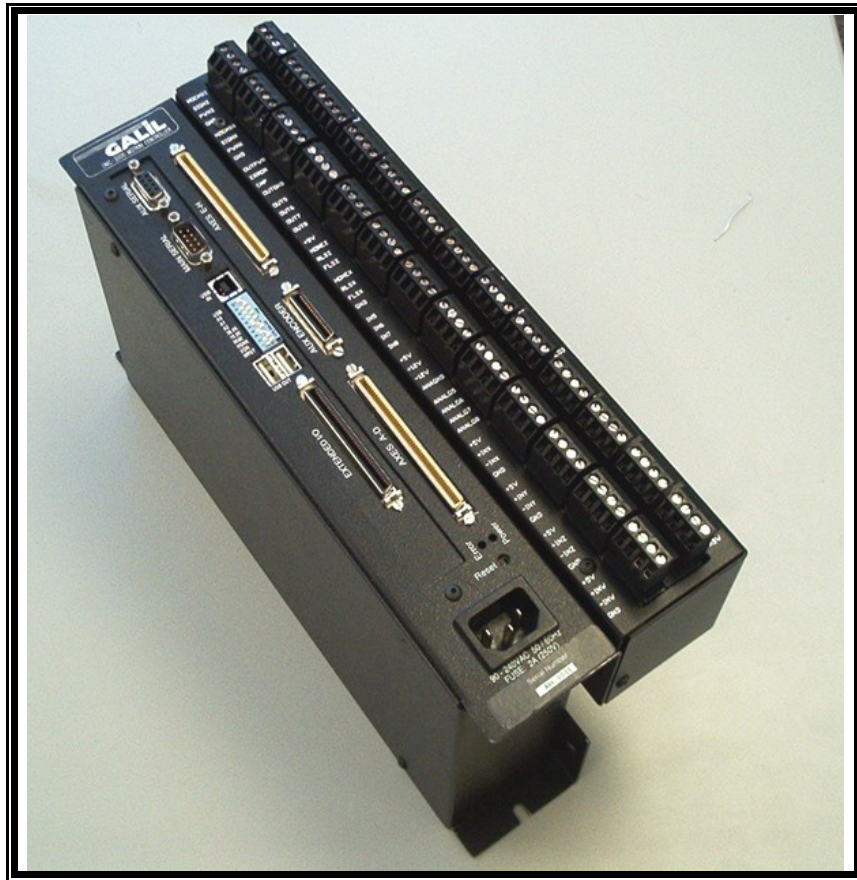


Figure (2) ICM 2900, shown with a DMC 2080

Originally designed to mate with standalone controllers, this interconnect can be used with bus-based controllers as well. Connection to the ICM-2900 from a controller uses the CABLE-100. For Optima bus-based controllers such as the DMC-1800, a flange-mount version of the ICM-2900 is available. The product is denoted ICM-2900-FL.

Auxiliary encoder input signals are not present on the ICM-2900. If auxiliary encoders are required, use the ICM-2908 with the CABLE-36. For auxiliary encoder access with bus-based controllers, add the Cable-20-25 and CB-36-25 to the ICM-2908 and CABLE-36.

For access to extended I/O, Galil offers the IOM-1964, an optically isolated 64-bit input/output module. This unit is the same size as the ICM-1900. To connect to a standalone controller, use the CABLE-80-xM. ('xM' refers to cable length; 1 or 4 meter for the CABLE-80) To connect to the extended I/O of a bus-based controller such as the DB-14064 daughter board (if present), use a combination of the CABLE-80 and the CB-50-80.

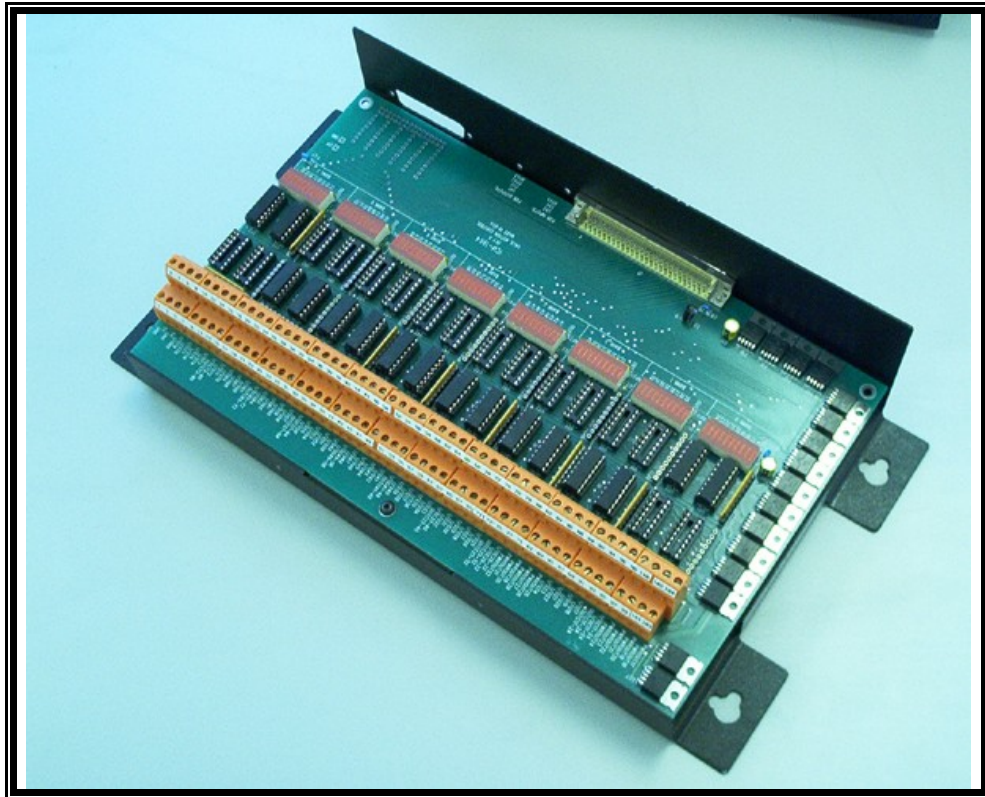


Figure (3) IOM-1964

Cable Adaptors

In some applications, the standard Galil breakout options may not suit all system requirements. To allow for custom breakouts of only the necessary signals, Galil offers three cable adaptors. The CB-50-100, CB-50-80, and CB-36-25.

The CB-50-100 breaks the CABLE-100 high-density cable into two 50- pin IDC ribbon connectors. The CB-50-80 breaks the CABLE-80 high-density cable into two 50- pin IDC ribbon connectors. Figure (4) shows the two connectors.

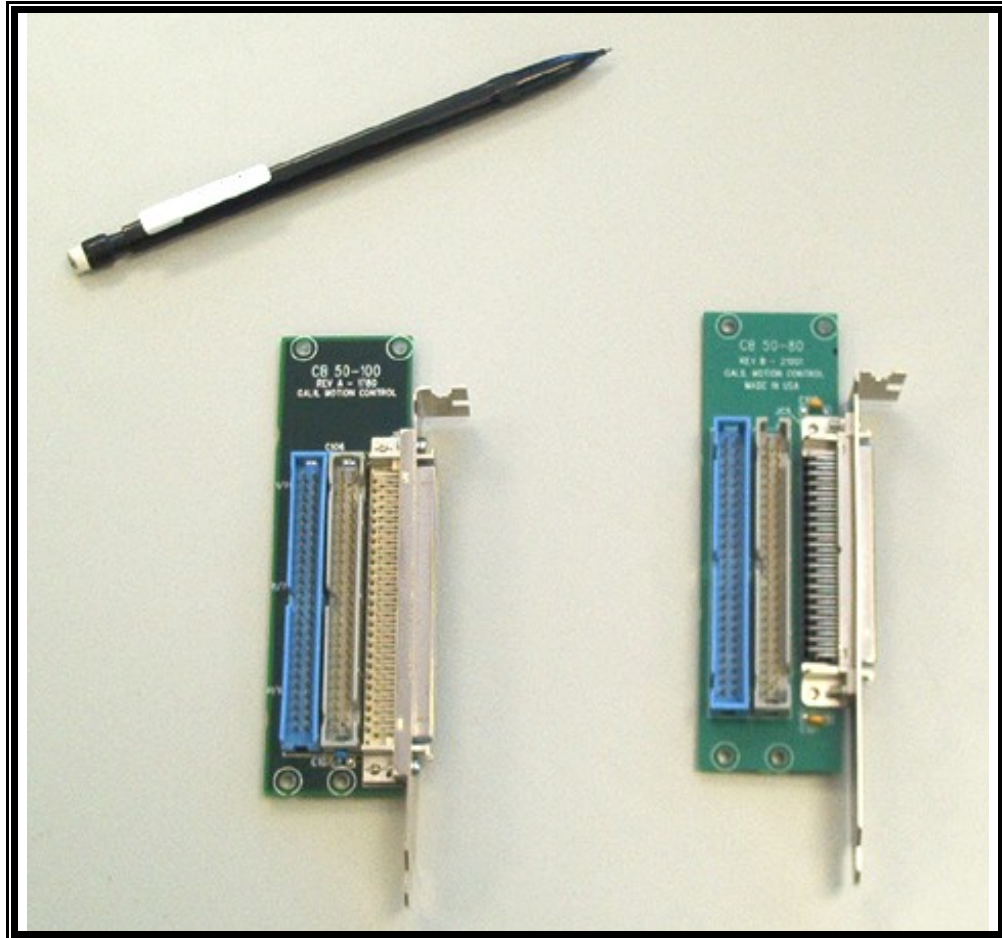


Figure (4) CB-50-100 (left) and CB-50-80

Using these adaptors, the signals are accessed on shrouded 0.100" IDC ribbon cable headers, allowing a custom breakout scheme by the user. Figure (5) shows a DMC-2080 with the Axis A-D main signals broken out into two 50-pin ribbon cables by the CB-50-100, with the extended I/O signals broken out by the CB-50-80.

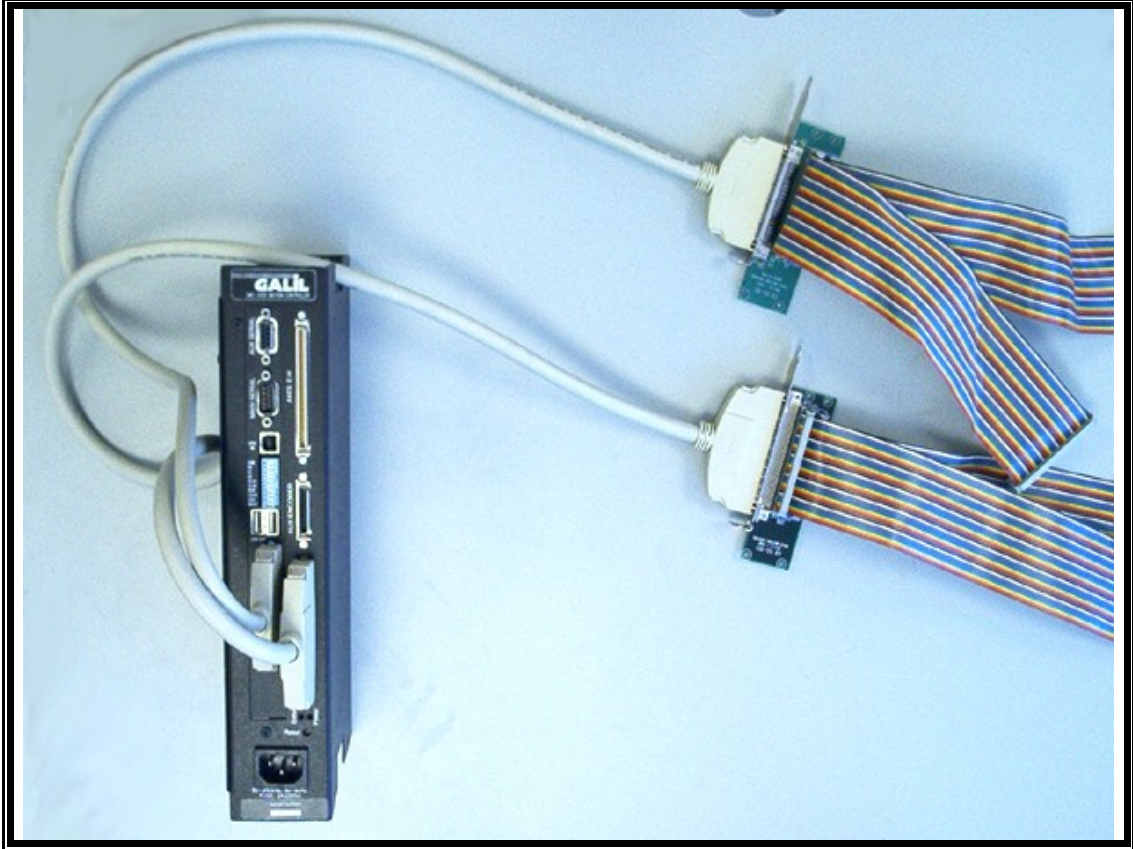


Figure (5) DMC 2080 with CABLE-100, CB-50-100, CABLE-80, and CB-50-80

Care must be taken by the designer to understand that noise, input circuit sensitivity, and improper labeling could all lead to serious system faults.

The CB-36-25 breaks the CABLE-36 high-density cable into shrouded 26 pin 0.100" IDC Ribbon headers, as well as Male & Female 25 pin DSUB connectors. This allows the designer to access the auxiliary encoder connections of any Optima controller on an ICM-1900, ICM-2900, or externally.

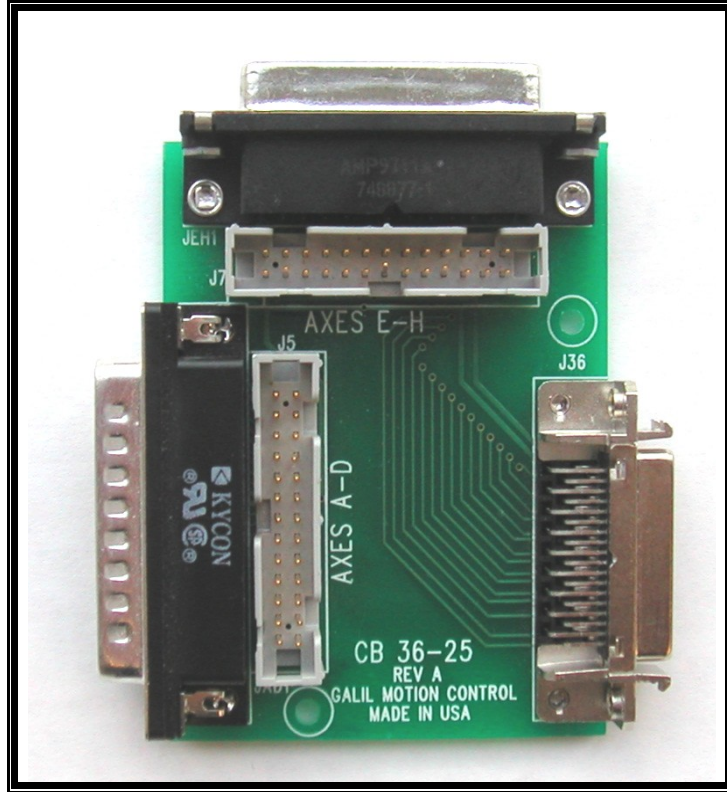


Figure (6) CB-36-25

Complete System Example

The following figure illustrates a complete DMC-2080 Galil solution with all standard interconnect options.

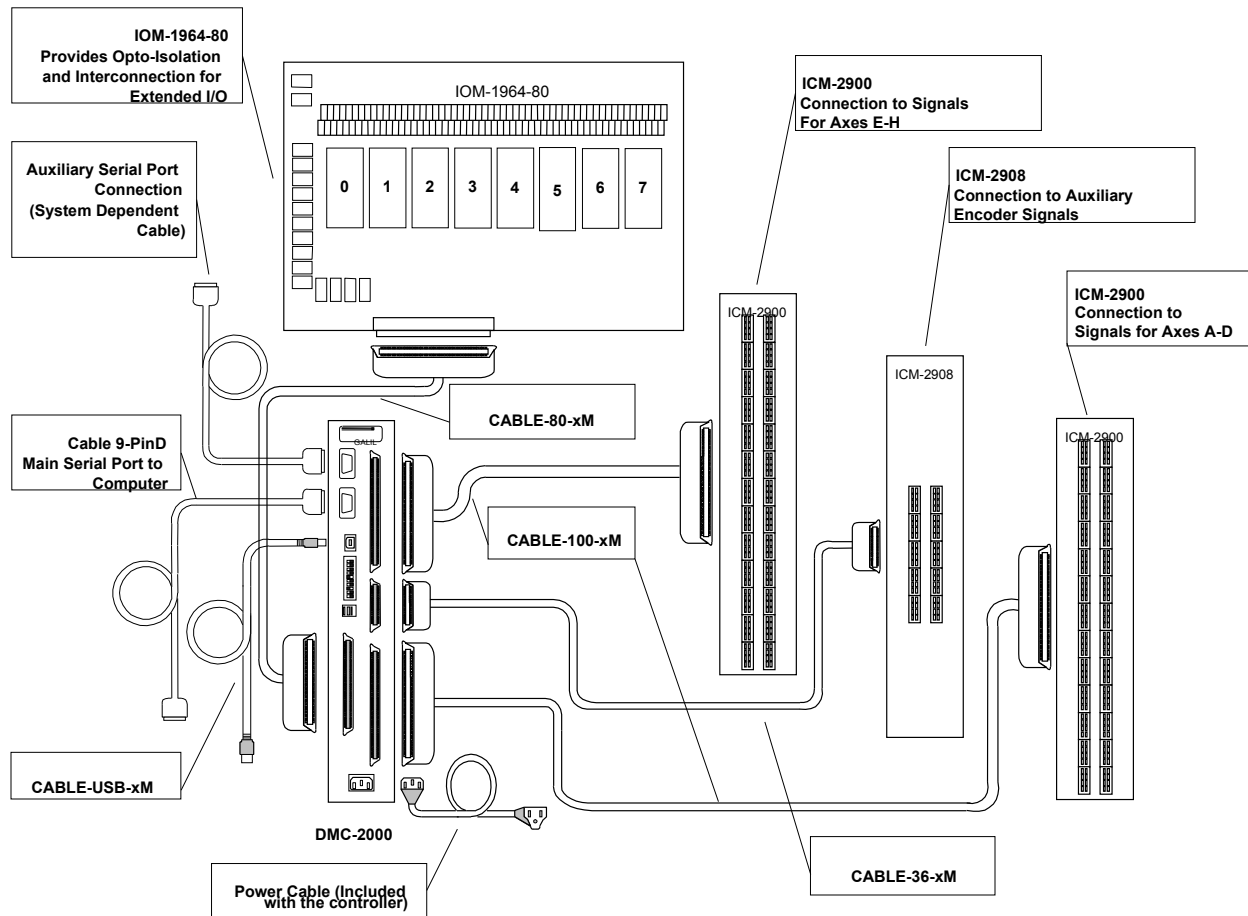


Figure (7) A Complete Standalone System

Custom Solutions

Board-level Connectors

Upon customer request, Galil can assist in the design of a custom interconnect module that can be directly connected to the Galil controller. For this purpose, Galil sells the bare 100-pin female PC board-mount connector shown in Figure (8). Both vertical and horizontal versions are available. Mechanical dimensions and pin layout can be found at the manufacturer site:

<http://catalog.tycoelectronics.com>

100-Pin SCSI-1 High Density Female Connector: AMP #2-175677-9



Figure (8) PCB-mount 100 Pin Connector

Eliminating the 100-Pin Cable

If the system designer is using a board-level, standalone controller such as the DMC-2000-CARD or the econo-series DMC-21x2, Galil can assist in designing an interconnect module that bolts directly on to the side of the controller, thereby eliminating the need for the cable altogether.

This solution involves a male “straddle-mount” (same gender as the cable) connector. At this point, the designer can route the necessary signals as required. Figure (9) illustrates the mechanical specifications for such a connector. For more information on this straddle-mount-style connector, visit the manufacturer’s website:

<http://products.3m.com>

Straddle-Mount 100pin SCSI-1 High Density Connector: 3M #101XX-900AJL

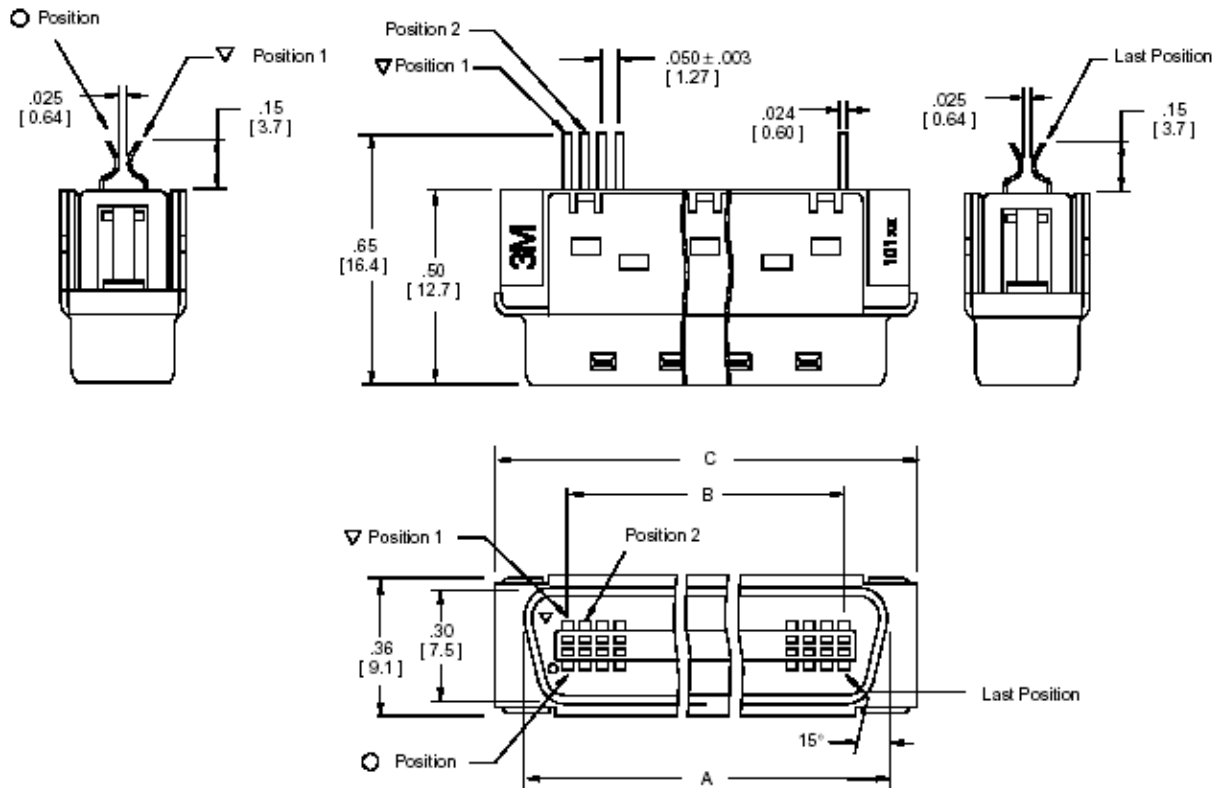


Figure (9) Overall Dimensions of Straddle-Mount Connector

Custom Interconnect Options

Galil also offers OEMs the opportunity to design a custom breakout module that accesses only the necessary signals. Footprint, style of connection, and mounting options are all customizable. In addition, Galil can integrate on-board servo or stepper drives. For more information, please contact the Applications department at Galil with the contact information provided below.

Third-Party Interconnect Modules

Phoenix Contact Corporation offers economical, compact interconnect solutions for Galil's Optima series motion controllers. Three versions of their OPTIMA MD interconnect module are available: The OPTIMA MD/100 which breaks out the 100-pin cable, the OPTIMA MD/80 which breaks out the 80-pin cable for extended I/O and the OPTIMA MD/36 which interfaces to the 36-pin cable for the auxiliary encoders.

Each OPTIMA MD module provides labeled screw terminals for easy connection to signals and DIN rails for convenient mounting.

Features

- Three versions which separate Optima Series Main 100-pin cable, 80-pin I/O cable and 36-pin auxiliary encoder cable into individual screw-type terminals
- Screw terminals are labeled for easy, error-free connections
- OPTIMA MD/100 includes configurable amplifier enable circuit for active high or active low amplifier enable
- DIN rails for mounting. Panel mount option
- Compact size: MD/100 8.492" x 3.543"; MD/80 5.092" x 3.543"; MD/36 5.692" x 3.543"

Part Number	Description
5602077	OPTIMA MD/100-MKDS 3 (available from Phoenix Contact)
5602078	OPTIMA MD/80-MKDS 3 (available from Phoenix Contact)
5602079	OPTIMA MD/36-MKDS 3 (available from Phoenix Contact)

The actual breakout modules provided by Phoenix Contact can be seen in the picture below. Call Phoenix Contact Technical Services at 800-322-3225 for more information.

www.phoenixcontact.com

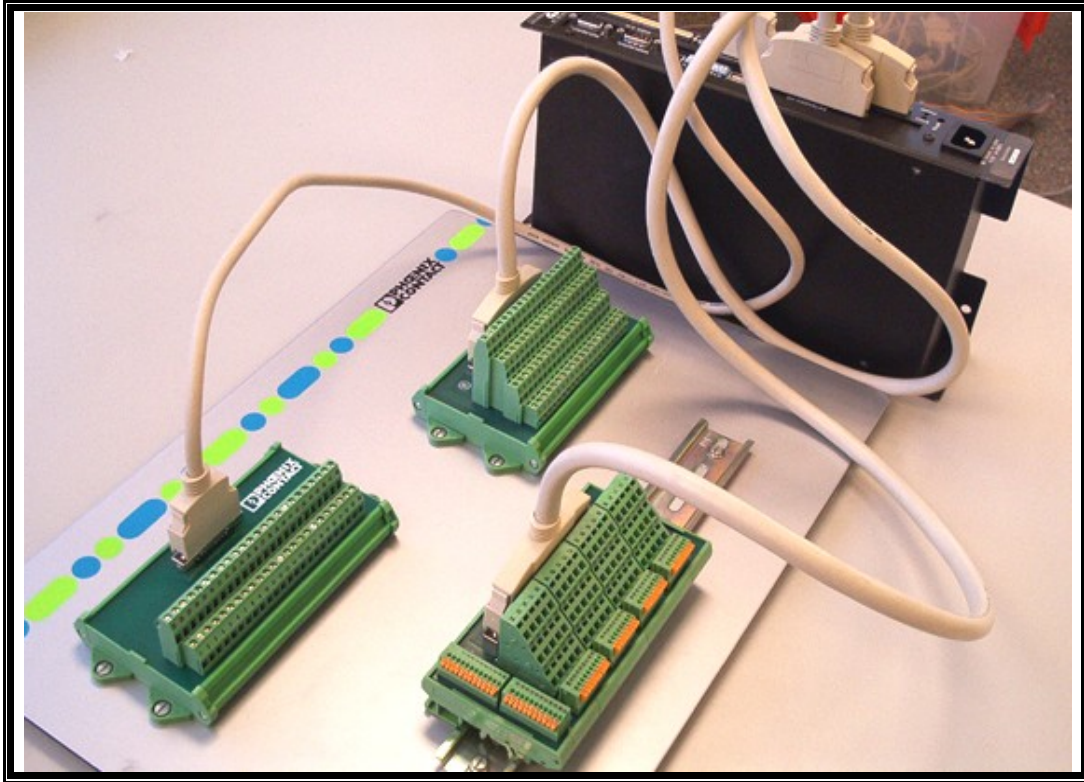


Figure (10) Phoenix Interconnect Modules

Conclusion

Galil Motion Control is committed to providing a wide range of interconnect solutions to OEMs and end-users. Beyond offering out-of-the-box solutions, board-mount connectors, and third-party solutions, Galil's experienced Applications Engineering department can provide in-depth technical support for a world on the move. Feel free to call at 800.377.6329 or email at support@galilmc.com

Additional References

The following Application Notes are also available at

<http://www.galilmc.com/support/application-notes.php>

Application note 1410: Cables & Interconnections for DMC-1200

Application note 1411: Cables & Interconnections for DMC-1600

Application note 1412: Cables & Interconnections for DMC-1700

Application note 1413: Cables & Interconnections for DMC-1800

Application note 1414: Cables & Interconnections for DMC-2000, 2100, 2200

Application note 1424: Description of the ICM-2900

Application note 1425: Description of the ICM-1900

Application note 1426: Description of the AMP-1900

Application note 1428: Description of the ICM-2908

Application note 1429: Description of the CB-50-100

Application note 1430: Description of the CB-50-80

Application note 1431: Description of the CB-36-25

Application note 1432: Description of the 100 Pin H.D. Connector

Application note 1433: Description of the 80 Pin H.D. Connector

Application note 1434: Description of the 36 Pin H.D. Connector

Application note 1437: Cables & Interconnection for DMC-13x8

Application note 1438: Description of the IOM-1964