IEEE-488 GPIB Tutorial

What are GPIB cables?
GPIB cables consist of 24 twisted pairs of copper wire and utilize a Centronics 24 style male/female connector.

How are GPIB cables used?
They are used in a bus or star architecture where the connectors “piggy back” each other and then connect primarily test and measurement equipment to PCs and other devices.

Where are GPIB cables used?
GPIB cables are typically used in test and measurement applications and are also used in DAQ (data acquisition) applications.

IEEE-488 Cabling Terms

Adapter: A device used to interconnect two different connector types.

American Wire Gauge (AWG): A U.S. standard set of non-ferrous wire conductor sizes. Typical data wiring is AWG number 24, 26 or 28. The higher the gauge number, the smaller the diameter and thinner the wire.

Backshell (Hood): A mechanical backing that is sometimes put onto a connector. The device protects the conductors and can be assembled or injection molded.

Bus: Also called a "Daisy Chain". A network topology where each node is connected to one another in line. A major disadvantage is that when there is a break in the bus the entire network goes down.

Cable: A set of insulated wires or conductors within an extruded jacket. Many types of cable utilize shielding around the wires and under the cable jacket.

Cable Assembly: A piece of cable that has been terminated with one or more connectors.

Conductor: A metal path, usually copper, that passes electricity. When discussing data cabling, "wire" and "conductor" are synonymous.

Connector: Electromechanical coupling device that provides an electrical interface that can be mated and unmated.

Contact: The specific points of contact within a connector. Contacts can be male (pins) or female (sockets).

Coupler: A device used to connect two similar connector types.

Crossstalk: The coupling of electromagnetic fields from conductors into adjacent conductors. Crossstalk is controlled by twisting the conductors into a pair or by separating/shielding conductors.

Electromagnetic Interference (EMI): Unwanted electromagnetic or electrical energy that causes unwanted responses in electronic equipment.


IEEE-488: Institute of Electrical and Electronics Engineers interface standard number 488.

Injection Molding: The process used to inject molten polymer into a mold. Connector backshells are often injection molded.

Insulation: A material with very high resistivity used to protect conductors. Insulation is usually extruded over the wire or conductor after the drawing process.

Insulation Displacement Contact: A means of terminating wires without the need of stripping down to the bare wire.

Jack: The female receptacle - usually found on equipment.

Plug: Popular term for a male gender connector of varied types.

Shielding: A conductive foil or braid that covers insulated wires in a cable. The shield provides electrical grounding and protection from external electromagnetic interference (EMI). Shielding is also used to control internal electromagnetic radiation.

Strain Relief: A method of protecting the wire to contact point from flexing or pulling.

Twisted Pair: Two insulated conductors twisted at a fixed rate of twists per unit of length, typically used in balanced circuits where nominal impedance and crosstalk are critical characteristics.

Wire: Conductive material, typically copper, that has been drawn down to a specific size and coated with an insulating material. A "bare wire" utilizes no insulator coating.

For more useful information go to....
www.L-com.com/Resources
L-com IEEE-488 Cable Assembly Options

L-com offers three different cable options to best satisfy customer needs and maximize value:

<table>
<thead>
<tr>
<th>MOLDED</th>
<th>DELUXE</th>
<th>PREMIUM</th>
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</thead>
<tbody>
<tr>
<td>Backshell Detail</td>
<td>PVC molded backshell over internal steel shell enclosure</td>
<td>Die cast aluminum, nickel plated backshell</td>
</tr>
<tr>
<td>Connector Detail</td>
<td>Stamped steel, nickel plated connectors</td>
<td>Die cast alloy, nickel plated connectors</td>
</tr>
<tr>
<td>Contact Plating</td>
<td>30 microinch gold plated contacts</td>
<td>30 microinch gold plated contacts</td>
</tr>
<tr>
<td>Cable Shielding</td>
<td>One braid and one foil/mylar overall shield</td>
<td>One braid and one foil/mylar overall shield plus one inner foil/mylar shield</td>
</tr>
</tbody>
</table>

**L-com is the Originator**

L-com was the first to introduce molded, in-line, male only GPIB cables. Acceptance was immediate and soon users demanded upgraded models with metal connector shells and better cable shielding gradations. Now the female version has been added to complete the series.

We complied with your wishes and we’re proud to offer the latest premium and deluxe versions of single ended cables listed as standard items.

We urge you to try this wiring concept and to discover the many real advantages.

**The Industry Standard**

Hewlett Packard set the criteria in the design of optimum IEEE-488 GPIB cables with three shields, twisted pairs and metal shells, offering maximum performance.

L-com agreed with this need and developed a comparable cable type that we call the CIF Series. This family of IEEE-488 GPIB cables is directly interchangeable with HP, AMP and Amphenol.

The Deluxe Series is by far your best buy compared to any of the GPIB cables on the market today.

**L-com offers the Most Value**

A reminder that the difference in cost between good quality wiring components and the IEEE-488 cables offered by discounters is very little indeed. When you consider the total value of the equipment that will be tied into a system, the cost of cables, adapters and accessories becomes only a small part of the total investment.

In many applications, it is wise to use the premier cables on the market, L-com’s Premium Series. Our cables and accessories are of the highest quality and our prices are realistic. We feel confident that if you compare Quality, Variety, Service and Price you will find that L-com definitely comes out on top on all counts.
**L-com Molded Grade Cable Assemblies**

Cables listed on this page utilize **Two Shields** and a fully molded backshell. They are the most economical choice and are the most common substitute to competitor models.

**Molded Grade IEEE-488 GPIB Cables - Double Shielded with Molded Backshells**

L-com offers many IEEE-488 cable assembly options. The most economical choice uses double shielded cable that is adequate for many applications. Featuring all-molded connector ends which contribute to a long life expectancy and are impervious to breakage at the point where the cable enters the connector housing. A unique stamped steel internal enclosure provides 100% shielding and a robust strain relief. Considerable savings can be realized using this cable, particularly in volume applications.

The CMB Cable Series meets all standards of the IEEE-488 interface, conforms with normal mounting procedures and is directly compatible with HP, AMP, and Amphenol.

**Molded IEEE-488 GPIB Cables - Two Reverse Entry Connectors to Overcome Difficult Mounting**

There are times when the use of a standard GPIB cable is not desirable because of obstructions from other nearby instruments, etc. In some cases it may be more advantageous to have the cable enter the connector housing from the opposite direction. An obvious advantage is when it is used as an extension cable.

**Molded IEEE-488 GPIB Cables - With One Reverse Entry Connector to One Normal Entry**

GPIB users realize the virtues of reverse entry and have asked us to provide half and half types. L-com offers GPIB cables that are useful for connecting rack equipment when GPIB receptacles do not orientate properly to allow shortest distance and an orderly appearance.

**Plenum IEEE-488 GPIB Cables - Double Shielded with CMP Rated Jacket**

Another innovative breakthrough in the IEEE-488 product offering. These cables utilize a CMP rated cable jacket and overmold material. CMP rated material is a fire retardant compound that possesses exceptional self-extinguishing characteristics. Plenum rated cables are necessary when the highest fire resistant assemblies are required. Cable construction features foil/braid shield, 12 FEP insulated 26 AWG twisted pairs and standard male/female connectors. A unique stamped steel internal enclosure provides 100% shielding and a robust strain relief. Custom lengths or cable assemblies with inline or reverse entry connector orientation can be manufactured with modest minimum requirements.

**Tip**

The chart below will help you to find the connector orientation style that you need.

- **Normal Orientation**
- **Reverse Orientation**
- **Inline Orientation**

This is the standard for most GPIB cable assemblies

Great for extending GPIB cable runs

Helpful for connecting to GPIB equipment

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**Item #** | **Description** | **Connector Orientation** | **1-9** | **10-24** | **25-99** | **100-249**
--- | --- | --- | --- | --- | --- | ---
**CMB24-05M** | Molded IEEE-488 Cable, 0.5m | Normal / Normal | 54.00 | 51.84 | 48.68 | 45.52
**CMB24-1M** | Molded IEEE-488 Cable, 1.0m | Normal / Normal | 57.00 | 54.72 | 52.44 | 50.16
**CMB24-2M** | Molded IEEE-488 Cable, 2.0m | Normal / Normal | 63.00 | 60.48 | 57.96 | 55.44
**CMB24-3M** | Molded IEEE-488 Cable, 3.0m | Normal / Normal | 69.00 | 66.24 | 63.48 | 60.72
**CMB24-4M** | Molded IEEE-488 Cable, 4.0m | Normal / Normal | 75.00 | 72.00 | 69.00 | 66.00
**CMB24-5M** | Molded IEEE-488 Cable, 5.0m | Normal / Normal | 80.00 | 76.80 | 73.60 | 70.40
**CMB24-6M** | Molded IEEE-488 Cable, 6.0m | Normal / Normal | 86.00 | 82.56 | 79.12 | 75.68
**CMB24-8M** | Molded IEEE-488 Cable, 8.0m | Normal / Normal | 98.00 | 94.08 | 90.16 | 86.24
---

**CIM24-05M** | Molded IEEE-488 Cable, 0.5m | Reverse / Reverse | 51.00 | 48.96 | 46.92 | 44.88
**CIM24-1M** | Molded IEEE-488 Cable, 1.0m | Reverse / Reverse | 54.00 | 51.84 | 49.68 | 47.52
**CIM24-2M** | Molded IEEE-488 Cable, 2.0m | Reverse / Reverse | 59.00 | 56.64 | 54.28 | 51.92
**CIM24-3M** | Molded IEEE-488 Cable, 3.0m | Reverse / Reverse | 65.00 | 62.40 | 59.80 | 57.20
**CIM24-4M** | Molded IEEE-488 Cable, 4.0m | Reverse / Reverse | 69.00 | 66.24 | 63.48 | 60.72
**CIM24-5M** | Molded IEEE-488 Cable, 5.0m | Reverse / Reverse | 74.00 | 71.04 | 68.08 | 65.12
**CIM24-6M** | Molded IEEE-488 Cable, 6.0m | Reverse / Reverse | 79.00 | 75.84 | 72.68 | 69.52
**CIM24-8M** | Molded IEEE-488 Cable, 8.0m | Reverse / Reverse | 88.00 | 84.48 | 80.96 | 77.44
---

**CIM24-05M** | Molded IEEE-488 Cable, 0.5m | Normal / Reverse | 50.00 | 45.00 | 40.00 | 35.00
**CIM24-1M** | Molded IEEE-488 Cable, 1.0m | Normal / Reverse | 52.00 | 46.80 | 41.60 | 36.40
**CIM24-2M** | Molded IEEE-488 Cable, 2.0m | Normal / Reverse | 55.00 | 49.50 | 44.00 | 38.50
---

**CMP24-05M** | Plenum IEEE-488 Cable, 0.5m | Normal / Normal | 143.00 | 140.14 | 137.28 | 134.42
**CMP24-1M** | Plenum IEEE-488 Cable, 1.0m | Normal / Normal | 198.00 | 194.04 | 186.08 | 186.12
**CMP24-2M** | Plenum IEEE-488 Cable, 2.0m | Normal / Normal | 539.00 | 528.22 | 517.44 | 506.66
**CMP24-5M** | Plenum IEEE-488 Cable, 5.0m | Normal / Normal | 1035.00 | 1014.30 | 993.60 | 972.90
**CMP24-10M** | Plenum IEEE-488 Cable, 10.0m | Normal / Normal | 1530.00 | 1499.40 | 1468.80 | 1438.20
---

**CMP24-1M** | Molded IEEE-488 Cable, 1.0m | Normal / Reverse | 143.00 | 140.14 | 137.28 | 134.42
**CMP24-2M** | Molded IEEE-488 Cable, 2.0m | Normal / Reverse | 198.00 | 194.04 | 186.08 | 186.12
**CMP24-5M** | Molded IEEE-488 Cable, 5.0m | Normal / Reverse | 539.00 | 528.22 | 517.44 | 506.66
---

**CMP24-8M** | Plenum IEEE-488 Cable, 8.0m | Normal / Normal | 1530.00 | 1499.40 | 1468.80 | 1438.20
**CMP24-15M** | Plenum IEEE-488 Cable, 15.0m | Normal / Normal | 1860.00 | 1828.20 | 1796.40 | 1764.60

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**Product wizards**

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These molded GPIB cables are similar in construction and electrical specifications to our popular CMB24 series except that one end terminates to a straight male connector. This is sometimes preferred when there is no apparent need to have the exposed female end, it also eliminates the need for capping the exposed connector. Quite useful when the traditional right angle cable gets in the way of other cables such as in a computer back plane. Both ends of these cables utilize a stamped steel internal closure providing 100% shielding and a robust strain relief.

All this offered at a realistic price. Extensive flexibility that is equipped with a superior strain relief. This prevents the cable from coming apart when it is bent at a sharp angle, which has been a common fault with many IEEE-488 cables on the market today. This is truly the best buy because you get industry standard features at realistic prices. No other IEEE-488 cables of this grade are available and built to handle your system's data rate, up to the 1 Mbyte/s IEEE maximum. All technical features found in our Premium CIB2 4 Series are passed FCC Part 15, MIL-STD-461A, VDE 0871 and VDE 0875. All wires are twisted pairs to maintain a low capacitance within the 150 pF/m IEEE specification. Besides superior electrical characteristics, this cable has been designed to last a very long time. Care has been given to offer a cable with dual shield construction with metal inline and reverse entry backshells. They are available from stock only in standard lengths of eight inches, half and one meter. Longer lengths available on a custom basis.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Connector Orientation</th>
<th>1-9</th>
<th>10-24</th>
<th>25-99</th>
<th>100-249</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIB24-03M</td>
<td>Molded IEEE-488 Cable, 0.3m</td>
<td>Normal / Normal</td>
<td>84.00</td>
<td>82.32</td>
<td>80.64</td>
<td>78.96</td>
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<tr>
<td>CIB24-05M</td>
<td>Molded IEEE-488 Cable, 0.5m</td>
<td>Normal / Normal</td>
<td>85.00</td>
<td>83.30</td>
<td>81.60</td>
<td>79.90</td>
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<tr>
<td>CIF24-03M</td>
<td>Deluxe IEEE-488 Cable, 0.3m</td>
<td>Normal / Normal</td>
<td>81.00</td>
<td>79.68</td>
<td>78.36</td>
<td>76.90</td>
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<tr>
<td>CIF24-05M</td>
<td>Deluxe IEEE-488 Cable, 0.5m</td>
<td>Normal / Normal</td>
<td>102.00</td>
<td>99.80</td>
<td>97.90</td>
<td>96.00</td>
</tr>
</tbody>
</table>

Adapter/Extension Cable - PC Port Entry and Inline Mating with IEEE-488 GPIB Cables

This dual purpose Adapter/Extension cable has a slim male end that will readily fit through most PC IEEE-488 equipment ports. Very similar in appearance to our standard CMD24 cables except that the single female offset connector has reverse entry allowing GPIB cables to mate in a natural inline direction. Dual shield construction with metal inline and reverse entry backshells. They are available from stock only in standard lengths of eight inches, half and one meter. Longer lengths available on a custom basis.

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<tr>
<th>Item #</th>
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</thead>
<tbody>
<tr>
<td>CMC24A</td>
<td>GPIB Adapter/Extension Cable, 8 inches</td>
<td>Reverse / Inline</td>
<td>43.00</td>
<td>41.28</td>
<td>39.56</td>
<td>37.84</td>
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<tr>
<td>CMC24A-09M</td>
<td>GPIB Adapter/Extension Cable, 9 meters</td>
<td>Reverse / Inline</td>
<td>44.00</td>
<td>42.24</td>
<td>40.48</td>
<td>38.72</td>
</tr>
</tbody>
</table>

Molded CMD Series IEEE-488 GPIB Cables - Have Two Inline GPIB Male Terminations

We’ve gone one step further with these molded CMD series cables and equipped both ends of the cable with a molded single ended connector. This new cable type is not only useful in some applications, but also saves money. They have the same specifications as the basic CMD24 series and are fully shielded and molded to last for years.

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</tr>
</thead>
<tbody>
<tr>
<td>CMD24-03M</td>
<td>Molded IEEE-488 Cable, 0.3m</td>
<td>Inline / Inline</td>
<td>22.00</td>
<td>21.56</td>
<td>21.12</td>
<td>20.68</td>
</tr>
<tr>
<td>CMD24-1M</td>
<td>Molded IEEE-488 Cable, 1.0m</td>
<td>Inline / Inline</td>
<td>27.00</td>
<td>26.46</td>
<td>25.92</td>
<td>25.38</td>
</tr>
<tr>
<td>CMD24-2M</td>
<td>Molded IEEE-488 Cable, 2.0m</td>
<td>Inline / Inline</td>
<td>38.00</td>
<td>37.24</td>
<td>36.48</td>
<td>35.72</td>
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<tr>
<td>CMD24-3M</td>
<td>Molded IEEE-488 Cable, 3.0m</td>
<td>Inline / Inline</td>
<td>49.00</td>
<td>48.02</td>
<td>47.04</td>
<td>46.06</td>
</tr>
</tbody>
</table>

Deluxe Grade IEEE-488 GPIB Cables - Three Shields Plus Cast Aluminum Shells

Two foil shields plus one copper braid shield (over 90% coverage) provide low capacitance to maintain the IEEE specifications of these cables. Designed and built to handle your system’s data rate, up to the 1 Mbyte/s IEEE maximum. All technical features found in our Premium CIB24 Series are incorporated in this series, the only exception is one less shield. This series is as good as, or better than, other name brand IEEE-488 cables on the market today. This is truly the best buy because you get industry standard features at realistic prices. No other IEEE-488 cables of this grade are available at a competitive price. The CIF24 Series IEEE-488 cables may be used to connect two compatible devices such as a personal computer and a plotter. They can be Daisy-Chain'd to several computer peripherals or may be used to integrate a system of programmable test instruments and control devices. Each end of every cable has a male/female connector and readily accepts a male terminated cable.

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<tr>
<th>Item #</th>
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<th>Connector Orientation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CIF24-03M</td>
<td>Deluxe IEEE-488 Cable, 0.3m</td>
<td>Normal / Normal</td>
<td>77.00</td>
<td>76.84</td>
<td>76.68</td>
<td>76.64</td>
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<tr>
<td>CIF24-05M</td>
<td>Deluxe IEEE-488 Cable, 0.5m</td>
<td>Normal / Normal</td>
<td>90.00</td>
<td>89.80</td>
<td>89.60</td>
<td>89.40</td>
</tr>
</tbody>
</table>

Premium Grade IEEE-488 GPIB Cables - 4 Shields, Aluminum Nickel Plated Shells

These cables have two copper braid shields coupled with two foil shields to work to reduce the amount of radiated emissions. This helps many systems to pass FCC Part 15, MIL-STD-461A, VDE 0871 and VDE 0875. All wires are twisted pairs to maintain a low capacitance within the 150 pF/m IEEE specification. Besides superior electrical characteristics, this cable has been designed to last a very long time. Care has been given to offer a cable with extreme flexibility that is equipped with a superior strain relief. This prevents the cable from coming apart when it is bent at a sharp angle, which has been a common fault with many IEEE-488 cables on the market today. Cast aluminum, nickel plated shells are used to prevent corrosion and have overlapping seams rather than being butt-jointed. One could hope for nothing else in the makeup of the best IEEE-488 cable. All this offered at a realistic price.

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</thead>
<tbody>
<tr>
<td>CIB24-20M</td>
<td>Premium IEEE-488 Cable, 2.0m</td>
<td>Normal / Normal</td>
<td>103.00</td>
<td>102.00</td>
<td>101.00</td>
<td>99.90</td>
</tr>
</tbody>
</table>
Premium Inline IEEE-488 GPIB Cables - 4 Shields Plus Cast Aluminum Shells

Added versatility is offered by these three series of premium IEEE-488 GPIB cables. They are the industry’s first male or female only terminations with many advantages while never posing a problem with cable entry direction. Their natural slim inline design makes these cables ideal for use on PC ports with limited entry access.

The cable makeup of the CBC, CBD and CBX families is identical to our very popular and well accepted CIB24 series. All wires are twisted pairs to maintain low capacitance within the 150 pF/m IEEE specification. Besides superior electrical characteristics, this cable is extremely flexible. Cast aluminum, nickel plated shells are offered for corrosion resistance, strength and maximum RFI/EMI shielding protection.

**L-com Premium Grade CBC24 Series IEEE-488 GPIB Cables - With One Inline GPIB Male Termination**

This premium series has one conventional male-female connector. The other end terminates to a straight male-only connector, a feature sometimes preferred when there is no need to have a female end exposed. This cable is most useful when the dual-right angle connectors get in the way of other system cables and particularly in a computer back plane.

**CBC24-05M**
- Premium IEEE-488 Cable, 0.5m
- Normal / Inline
- 71.00
- CALL

**CBC24-1M**
- Premium IEEE-488 Cable, 1.0m
- Normal / Inline
- 75.00
- CALL

**CBC24-2M**
- Premium IEEE-488 Cable, 2.0m
- Normal / Inline
- 83.00
- CALL

**CBC24-3M**
- Premium IEEE-488 Cable, 3.0m
- Normal / Inline
- 91.00
- CALL

**CBC24-4M**
- Premium IEEE-488 Cable, 4.0m
- Normal / Inline
- 107.00
- CALL

**CBC24-8M**
- Premium IEEE-488 Cable, 8.0m
- Normal / Inline
- 137.00
- CALL

**L-com Premium Grade CBD24 Series IEEE-488 GPIB Cables - With Two Inline GPIB Male Terminations**

We’ve also provided this premium series IEEE-488 cable equipped with two single ended male ends. This cable type is not only useful in many applications, but also saves money. It has the same specifications as the basic CIB24 series. All connector guards are cast metal, not stamped metal.

**CBD24-05M**
- Premium IEEE-488 Cable, 0.5m
- Inline / Inline
- 71.00
- CALL

**CBD24-1M**
- Premium IEEE-488 Cable, 1.0m
- Inline / Inline
- 75.00
- CALL

**CBD24-2M**
- Premium IEEE-488 Cable, 2.0m
- Inline / Inline
- 83.00
- CALL

**CBD24-3M**
- Premium IEEE-488 Cable, 3.0m
- Inline / Inline
- 91.00
- CALL

**CBD24-4M**
- Premium IEEE-488 Cable, 4.0m
- Inline / Inline
- 99.00
- CALL

**CBD24-5M**
- Premium IEEE-488 Cable, 5.0m
- Inline / Inline
- 107.00
- CALL

**CBD24-8M**
- Premium IEEE-488 Cable, 8.0m
- Inline / Inline
- 131.00
- CALL

**L-com Premium Grade CBX24 IEEE-488 GPIB Extension Cables - One Inline Male to One Inline Female Connector**

The world’s first true IEEE-488 extension cable adds versatility to the inline series as an everyday means of interconnection. A useful cable for those situations which require a longer cable.

**CBX24-1M**
- Premium IEEE-488 Extension Cable, 1.0m
- Inline / Inline
- 75.00
- CALL

**CBX24-2M**
- Premium IEEE-488 Extension Cable, 2.0m
- Inline / Inline
- 83.00
- CALL

**CBX24-3M**
- Premium IEEE-488 Extension Cable, 3.0m
- Inline / Inline
- 91.00
- CALL

**Connector Pinouts for All IEEE-488 Cables and Adapters**

All IEEE-488 cables and connectors are wired straight thru.

Data Input/Output 1 — Dio1
Data Input/Output 2 — Dio2
Data Input/Output 3 — Dio3
Data Input/Output 4 — Dio4
Remote Enable — REN
Ground return lines for message and control lines.

IEEE-488 Hardware Specifications

The IEEE-488 GPIB standard dictated the use of metric thumbscrews for mounting.
IEEE-488 GPIB Bulkhead Adapters - The Easiest Way to Feed GPIB Cables Through Panels

IEEE-488 bulkhead adapters originated because of a need by design and test engineers. These adapters provide the only means of passing an IEEE-488 cable through common cabinet walls and will also provide access to a console work table when mounted on a panel.

Two basic models are available. The BA model has the conventional male-female entry, where the BF model has two female entries. The BF model allows more than one cable to be mounted piggy-back on both sides of the panel.

Because of user concerns for ground loops, we now offer another version of the popular CIB24BF with an insulated mounting bracket rather than a metal one. Model CIB24BF-I features a fiberglass mounting bracket.

### IEEE-488 GPIB Bulkhead Adapters
- **Item #**
- **Description**
- **Connector Orientation**
- **1-9**
- **10-24**
- **25-99**
- **100-249**

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>CIB24BA</td>
<td>IEEE-488 Bulkhead Adapter, Male / Female</td>
<td>Normal</td>
<td>32.00</td>
<td>29.44</td>
<td>26.88</td>
<td>24.32</td>
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<tr>
<td>CIB24BF</td>
<td>IEEE-488 Bulkhead Adapter, Female / Female</td>
<td>Normal</td>
<td>34.00</td>
<td>31.28</td>
<td>28.56</td>
<td>25.84</td>
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<tr>
<td>CIB24BF-I</td>
<td>IEEE-488 Bulkhead Adapter, Insulated, Female / Female</td>
<td>Normal</td>
<td>35.00</td>
<td>32.20</td>
<td>29.40</td>
<td>26.60</td>
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</tbody>
</table>

### IEEE-488 GPIB Reverse Entry Adapters - The Ultimate Solution for Many Difficult Situations

A new twist has been added to IEEE-488 networking by the introduction of reverse entry adapters. Very similar to the model CIB24BF except that the cables exit in opposite directions. This feature is sometimes desirable and necessary to avoid nearby obstructions. We also offer this reverse entry adapter with an insulated mounting bracket made of fiberglass.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Connector Orientation</th>
<th>1-9</th>
<th>10-24</th>
<th>25-99</th>
<th>100-249</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIB24BFR</td>
<td>Reverse Entry IEEE-488 Bulkhead Adapter, Female / Female</td>
<td>Reverse</td>
<td>34.00</td>
<td>31.28</td>
<td>28.56</td>
<td>25.84</td>
</tr>
<tr>
<td>CIB24BFR-I</td>
<td>Reverse Entry IEEE-488 Bulkhead Adapter, Insulated, Female / Female</td>
<td>Reverse</td>
<td>35.00</td>
<td>32.20</td>
<td>29.40</td>
<td>26.60</td>
</tr>
</tbody>
</table>

### IEEE-488 GPIB Reverse GPIB Adapter - For Easy Extension of Two Standard IEEE-488 Cables

Normally when an attempt is made to mate and extend two standard IEEE-488 cables, the result is that the cables tend to go in the same direction as shown in Entry A in the Tip below. The XFR reverse adapter will properly orient the two cables so they are in line as shown in Entry B. The double female entry makes it easy to assemble. Made of cast aluminum for light weight and durability.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Connector Orientation</th>
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<th>10-24</th>
<th>25-99</th>
<th>100-249</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIB24XFR</td>
<td>180° Reverse IEEE-488 Adapter, Female / Female</td>
<td>Reverse</td>
<td>26.00</td>
<td>23.92</td>
<td>21.84</td>
<td>19.76</td>
</tr>
</tbody>
</table>

### IEEE-488 GPIB Reverse Extender - Changes Cable Direction 180° and Extends Port

This is probably the most versatile extension adapter to have in case an IEEE-488 cable exit interferes with other equipment on the same rack. Simply install the Reverse Extender between the receptacle and GPIB cable.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Description</th>
<th>Connector Orientation</th>
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<th>10-24</th>
<th>25-99</th>
<th>100-249</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIB24XR</td>
<td>180° Reverse IEEE-488 Extender, Male / Female</td>
<td>Reverse</td>
<td>26.00</td>
<td>23.92</td>
<td>21.84</td>
<td>19.76</td>
</tr>
</tbody>
</table>

### IEEE-488 GPIB Connector Specifications

The IEEE-488 GPIB connector utilizes 24 contacts in a parallel configuration.

**Plug (male)**
- Pin 1
- Pin 24

**Jack (female)**
- Pin 1
- Pin 24

**Tip**

L-com reverse entry adapters solve cable extension problems in the field.

**Before:**
- Typical GPIB cables with normal entry are difficult to extend.

**After:**
- A reverse entry adapter solves the problem.

Same day shipping
Orders placed before 4:00 EST ship the same day.

Shop at L-com.com or call 1-800-343-1455 • E-mail: sales@L-com.com • Fax: 978-689-9484
IEEE-488 GPIB > Adapters, Connectors and Accessories

<table>
<thead>
<tr>
<th>Item #</th>
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<th>10-24</th>
<th>25-99</th>
<th>100-249</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIB24X</td>
<td>IEEE-488 GPIB Right Angle Adapter - Used to Change Direction and Avoid Tight Cable Bending</td>
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<td></td>
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<tr>
<td>CIB24Y</td>
<td>IEEE-488 GPIB Extender - This Handy Device Provides a One Inch Added Clearance</td>
<td></td>
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<tr>
<td>CIB24Z</td>
<td>IEEE-488 GPIB Extender - With Modified Male Guard Eliminates Thick Panel Interference</td>
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<tr>
<td>CIB24A</td>
<td>IEEE-488 GPIB Slim-line Extenders - Provide One Inch Additional Clearance, Fits Narrow PC Ports</td>
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<tr>
<td>CIB24B</td>
<td>IEEE-488 GPIB Ultra Slim-line Extenders - No Frills, Fully Shielded, Cast or Stamped Bodies</td>
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<tr>
<td>CIB24C</td>
<td>IEEE-488 GPIB Connector Shielding Covers - Protect Against Contamination, Physical Damage &amp; RFI</td>
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<tr>
<td>CIB24D</td>
<td>IEEE-488 GPIB Inline Connector Kit - A Good Way to Retrofit Defective Cables</td>
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</tr>
<tr>
<td>CIB24E</td>
<td>IEEE-488 GPIB Thumbscrews</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CIB24F</td>
<td>GPIB Nuts - Steel Construction for Durability</td>
<td></td>
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</tbody>
</table>

**IEEE-488 GPIB Right Angle Adapter**
This right angle adapter is handy to use whenever cable direction needs to be turned 90° to avoid obstacles that would require sharp bends in cable placement, possibly causing cable damage. All molded construction.

**IEEE-488 GPIB Extender**
Our GPIB extender is sometimes used to provide a one inch extension allowing right angle cables that extra margin to clear adjoining obstacles. It is a very handy item to have on hand in case of an emergency situation. Made of cast aluminum.

**IEEE-488 GPIB Slim-line Extenders**
These handy, hard to find extenders are normally used to provide an inch extension allowing right angle cables that extra margin to clear nearby obstacles. Special 0.73” height allows for use with computers having narrow port openings. These extenders can also be used as socket savers for expensive cables and ports by taking the abuse of frequently mated connectors. Connectors are male to female and feature UL94V-0 flammability requirements. Quantity pricing is available, please contact your L-com Sales Representative.

**IEEE-488 GPIB Connector Shielding Covers**
These covers are ideal for production, replacement and retrofit use and meet the highest quality standards. Contacts are gold plated for the best connectivity, mating hardware is plated with Black oxide. All plastic materials are UL94V-0 flammability rated. Quantity pricing is available upon request.

**IEEE-488 GPIB Inline Connector Kit**
This unique GPIB inline connector kit allows the user to assemble their own inline IEEE-488 connectors. This handy connector kit includes a solder style male connector, two piece cast aluminum housing, two thumbscrews and a cable clamp. By using this inline connector kit, fast field cable terminations can be realized.

**IEEE-488 GPIB Thumbscrews**
These handy GPIB thumbscrews are available in packages of 20 and can be used with L-com’s Molded, Deluxe and Premium GPIB cable assemblies. GPIB-TMBS-14 is used with Molded, Normal and Reverse style connectors. GPIB-TMBS-15 is used with Assembled Inline connectors. GPIB-TMBS-16 is used with Molded, Inline style connectors and GPIB-TMBS-17 can be used with Assembled, Normal style connectors.

**GPIB Nuts**
These handy GPIB nuts come in packages of 50 and can be used with many GPIB thumbscrews. These nuts feature M3.5 X 0.6 threads and are constructed of durable steel.

---

"I’m a graduate student in physical chemistry and have encountered various coaxial, D-sub, and GPIB cables in scientific instruments over the past five years. I’ve learned as much about the cables in the twenty minutes spent leafing through your catalog as I had in my previous graduate school career. Very impressive. Thank you."  - Tony M., University of Chicago
Universal IEEE-488 GPIB Transfer Switch Boxes - Allow a Quick Change of Signal Paths

These compact IEEE-488 transfer switch boxes measure only 5.5"W x 3.25"H x 4.35"D. Constructed of heavy gauge steel to withstand abuse and afford maximum RFI/EMI protection. Our most common switch box variations are listed below; others are shown on page 202 of the Rack Panel section. These switch boxes can be used independently or will readily mount in two openings on the L-com Universal panels.

**Universal Series Steel 3½” x 19” Rack Panel has Six Openings for Customizations**

This rack panel has heavy gauge steel construction with a baked-on enamel finish. Color choice is PC Bone, popular in computerized equipment design, or Black. Six punched rectangular openings accept any of the numerous sub-panels shown in this catalog. Please note that two openings need to be allocated for IEEE-488 and D-Sub switch boxes. Sub-panel openings are 2.20” x 2.75”.

**Universal Series Sub-Panel with IEEE-488 GPIB Feed-Thru**

This is the most efficient way of passing an IEEE-488 cable through a panel to provide access from outside the console. There are two basic feed-thru models available. The BF model will accept a male terminated cable on each side with normal orientation. The BFR version reverses cable direction. (See page 99 for further explanation).

**IEEE-488 GPIB Transfer Switches - Compact Metal Construction and Rotary Switching**

An economy transfer switch that is fully shielded to afford maximum RFI/EMI protection. Two models are offered, the traditional A-B two position type and an A-B-C-D switch box.

**19” Patch Panels - With IEEE-488 GPIB Feed-Thru Bulkhead Adapters and Insulated Panel**

L-com offers 3 1/2” x 19” rack panels to complement the IEEE-488 system. Use as patch or junction panels to simplify the connection of instruments equipped with a GPIB interface. Patch panels provide a centralized point to organize and provide flexibility to quickly change access ports. All panels are made of heavy gauge steel and finished with a Bone colored baked enamel finish. These panels are equipped with CIB24BF female/female bulkhead adapters. The blank insulated sub-panel allows you to customize to your own needs.

**IEEE-488 GPIB Multi-Tap Bus Strips - Four or Eight GPIB Receptacles with Optional Mounting Brackets**

Our multi-tap bus strips simplify and expedite instrument relocations and changeovers by eliminating bulky cable assembly piggy-backing. Four or eight female connectors wired in parallel with locking standoffs accept GPIB cables in a single plane. Built of heavy chrome plated steel and fully shielded to minimize RFI/EMI disturbances. Supplied with rubber feet that rest on any flat surface and optional mounting brackets.

**IEEE-488 GPIB Multi-Tap Bus Strip with I/O Provision - Up to 3 Units on Universal Rack Panel**

Another multi-tap unit has been added to the line. This adds further versatility in the interconnection of IEEE-488 components. This MTU’s primary difference is the additional input receptacle. The four output receptacles are located on the outside of the console panel. Up to three MTUs may be installed on one 3 1/2” x 19” Universal rack panel. Installation is easily accomplished by using four mounting screws, provided. It’s recommended that inline type cables be used on the input side to avoid any mounting interference. Universal rack panels are purchased separately. Additional blank subpanels or singly mounted CIB24BF feed-thru adapters are found in the Universal 19” Rack Panel section, page 202.

**Rack Mounted IEEE-488 GPIB Multi-Tap Bus Strip - Brings Order to Multiple Interconnections**

This is a standard 3 1/2” x 19” rack panel containing an eight outlet IEEE-488 distribution panel. This eliminates tangled interconnection cabling so common in GPIB bus systems. Minimizes the need to piggyback IEEE-488 connectors and prevents breakage due to leveraging. Other benefits include: improved cabling, easy tracing of cables and simplified instrument relocation or changeovers. All receptacles are parallel. Note: All wiring is done on the inside of the console. Supplied with rack panel attached.

**USB-488 GPIB USB to GPIB Converter Box**

The USB-488 is a USB to GPIB Controller Module that converts any PC with a USB interface into a full-function, IEEE 488.2 Bus Controller. The unit performs all of the basic IEEE-488.1 functions such as talker, listener and system controller. Its IEEE-488.2 controller routines make it fully compliant with the IEEE 488.2 specification. The USB-488 module is a Plug & Play USB peripheral that includes GPIB-488 software library for Windows XP, Windows 2000, and LabVIEW™. The driver includes National Instruments’ style 486.1 ‘ib’ and 486.2 command Sets. Additionally the driver provides support for Visual Basic and C++ language programs and is 16/32 bit compatible with National Instruments’ VISA and LabView.

**USB-488 USB to GPIB Converter**

USB-488 to GPIB Converter. 495.00 CALL CALL CALL