



IEEE-488 GPIB Tutorial

What are GPIB cables?

GPIB cables consist of 12 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.

Crosstalk: The coupling of electromagnetic fields from conductors into adjacent conductors. Crosstalk 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.

GPIB: General Purpose Interface Bus. Common name for IEEE-488.

HPIB: Hewlett Packard Interface Bus. Common name for IEEE-488.

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.

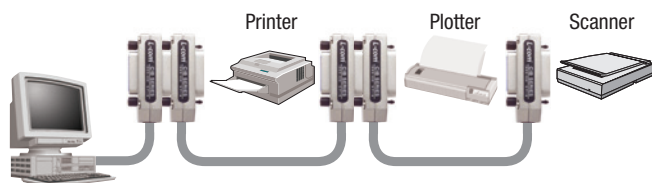
Shielding: A conductive foil or braid that covers insulated wires in a cable. The shield provides electrical grounding and protection from external electromagnetic interference (EMI). Shielding is also used to control internal electromagnetic radiation.

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.

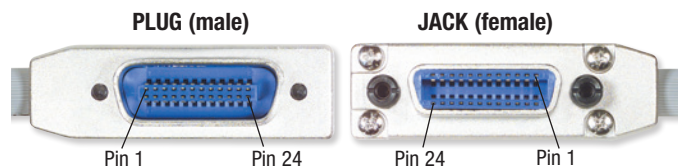
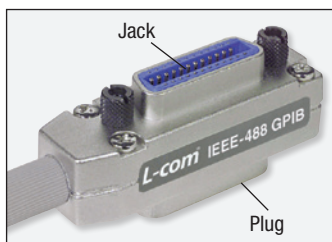
Wire: Conductive material, typically copper, that has been drawn down to a specific size and coated with an insulating material. A "bare wire" utilizes no insulator coating.

In-Line / Linear Configuration

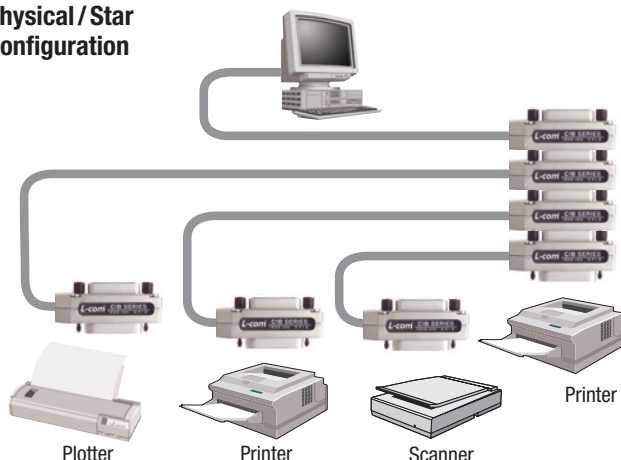


IEEE-488 Connector Specifications

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



Physical / Star Configuration



IEEE-488 Construction

- 24 conductors with twisted pairs
- Braid Shield with a minimum 85% coverage
- Centronics style 24 position male to female piggy back connectors allowing for easy daisy chaining
- Metric mating hardware, M3.5 x 0.6



IEEE-488 GPIB Tutorial

L-com IEEE-488 Cable Assembly Options

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

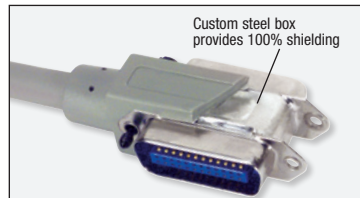
	MOLDED	DELUXE	PREMIUM
Backshell Detail	PVC molded backshell over internal steel shell enclosure	Die cast aluminum, nickel plated backshell	Die cast aluminum, nickel plated backshell
Connector Detail	Stamped steel, nickel plated connectors	Die cast alloy, nickel plated connectors	Die cast alloy, nickel plated connectors
Contact Plating	30 microinch (0.762µm) gold plated contacts	30 microinch (0.762µm) gold plated contacts	30 microinch (0.762µm) gold plated contacts
Cable Shielding	One braid and one foil /mylar overall shield	One braid and one foil /mylar overall shield plus one inner foil /mylar shield	One braid and one foil /mylar overall shield plus one inner braid and one inner foil /mylar shield

L-com is the Originator

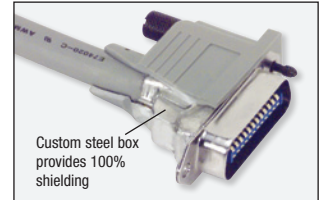
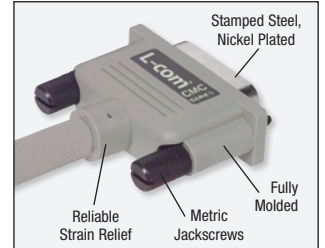
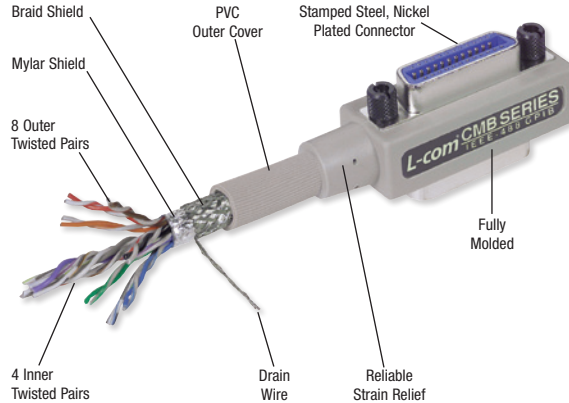
L-com was the first to introduce molded, in-line, male only GPIB cables. Acceptance was immediate and soon users demanded upgraded models with metal connector shells and better cable shielding gradations. Now the female version has been added to complete the series.

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.



Molded Cable Makeup CMB / CIM / CIMB / CMC / CMD Series



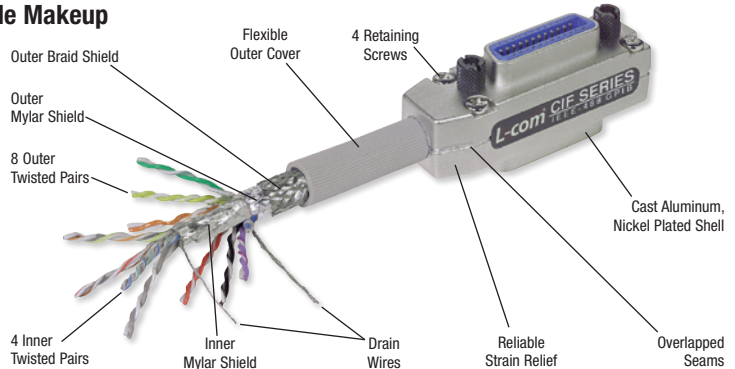
The Industry Standard

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.

Deluxe Cable Makeup CIF Series

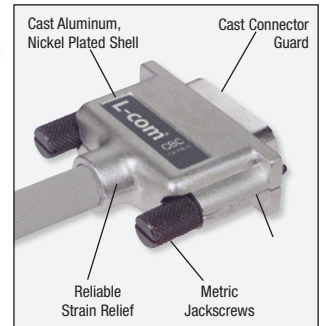
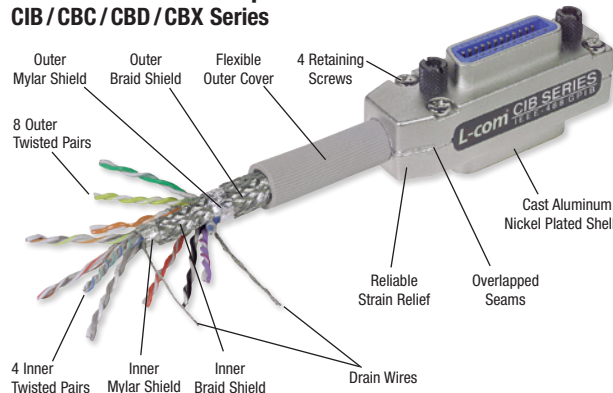


L-com offers the Most Value

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.

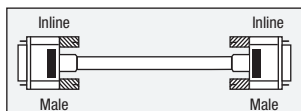
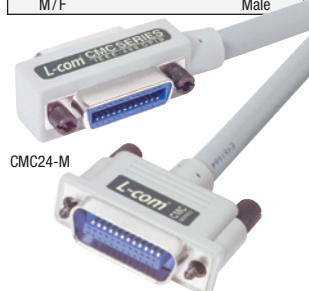
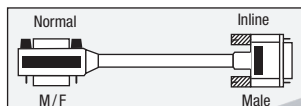
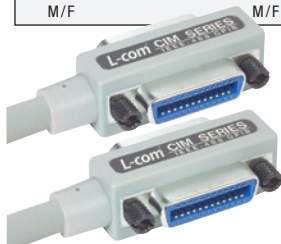
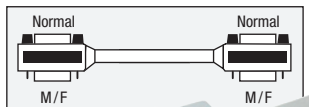
In many applications, it is wise to use the premier cables on the market, L-com's Premium Series. Our cables and accessories are of the highest quality and our prices are realistic. We feel confident that if you compare Quality, Variety, Service and Price you will find that L-com definitely comes out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

Premium Cable Makeup CIB / CBC / CBD / CBX Series



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.



Item #	Description	Connector Orientation	1-9	10-24	25-99	100+
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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.

CMB24-05M	Molded IEEE-488 Cable, 0.5m	Normal / Normal	73.54	72.07	69.13	CALL
CMB24-1M	Molded IEEE-488 Cable, 1.0m	Normal / Normal	77.89	76.33	73.22	CALL
CMB24-2M	Molded IEEE-488 Cable, 2.0m	Normal / Normal	86.70	84.97	81.50	CALL
CMB24-3M	Molded IEEE-488 Cable, 3.0m	Normal / Normal	95.52	93.61	89.79	CALL
CMB24-4M	Molded IEEE-488 Cable, 4.0m	Normal / Normal	104.33	102.24	98.07	CALL
CMB24-5M	Molded IEEE-488 Cable, 5.0m	Normal / Normal	113.14	110.88	106.35	CALL
CMB24-6M	Molded IEEE-488 Cable, 6.0m	Normal / Normal	121.96	119.52	114.64	CALL
CMB24-8M	Molded IEEE-488 Cable, 8.0m	Normal / Normal	139.47	136.68	131.10	CALL

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.

CIM24-05M	Molded IEEE-488 Cable, 0.5m	Reverse / Reverse	76.91	72.30	67.68	CALL
CIM24-1M	Molded IEEE-488 Cable, 1.0m	Reverse / Reverse	81.48	76.59	71.70	CALL
CIM24-2M	Molded IEEE-488 Cable, 2.0m	Reverse / Reverse	90.62	85.18	79.75	CALL
CIM24-3M	Molded IEEE-488 Cable, 3.0m	Reverse / Reverse	99.87	93.88	87.88	CALL
CIM24-4M	Molded IEEE-488 Cable, 4.0m	Reverse / Reverse	109.01	102.47	95.93	CALL
CIM24-5M	Molded IEEE-488 Cable, 5.0m	Reverse / Reverse	118.26	111.16	104.07	CALL
CIM24-6M	Molded IEEE-488 Cable, 6.0m	Reverse / Reverse	127.50	119.85	112.20	CALL
CIM24-8M	Molded IEEE-488 Cable, 8.0m	Reverse / Reverse	145.89	137.14	128.38	CALL

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.

CIMB24-03M	Molded IEEE-488 Cable, 0.3m	Normal / Reverse	75.06	70.56	66.05	CALL
CIMB24-05M	Molded IEEE-488 Cable, 0.5m	Normal / Reverse	76.91	72.30	67.68	CALL
CIMB24-1M	Molded IEEE-488 Cable, 1.0m	Normal / Reverse	81.48	76.59	71.70	CALL

Molded CMC Series IEEE-488 GPIB Cables - Feature One Inline GPIB Male Termination

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.

CMC24-05M	Molded IEEE-488 Cable, 0.5m	Normal / Inline	63.53	59.72	55.91	CALL
CMC24-1M	Molded IEEE-488 Cable, 1.0m	Normal / Inline	67.88	63.81	59.74	CALL
CMC24-2M	Molded IEEE-488 Cable, 2.0m	Normal / Inline	75.39	70.86	66.34	CALL
CMC24-3M	Molded IEEE-488 Cable, 3.0m	Normal / Inline	84.20	79.15	74.10	CALL
CMC24-4M	Molded IEEE-488 Cable, 4.0m	Normal / Inline	91.71	86.21	80.70	CALL
CMC24-5M	Molded IEEE-488 Cable, 5.0m	Normal / Inline	100.52	94.49	88.46	CALL
CMC24-10M	Molded IEEE-488 Cable, 10.0m	Normal / Inline	140.78	132.33	123.88	CALL

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 GPIB connector.

CMD24-05M	Molded IEEE-488 Cable, 0.5m	Inline / Inline	44.05	41.41	38.77	CALL
CMD24-1M	Molded IEEE-488 Cable, 1.0m	Inline / Inline	48.62	45.71	42.79	CALL
CMD24-2M	Molded IEEE-488 Cable, 2.0m	Inline / Inline	64.40	60.54	56.67	CALL
CMD24-3M	Molded IEEE-488 Cable, 3.0m	Inline / Inline	73.54	69.13	64.71	CALL
CMD24-4M	Molded IEEE-488 Cable, 4.0m	Inline / Inline	82.79	77.82	72.85	CALL
CMD24-5M	Molded IEEE-488 Cable, 5.0m	Inline / Inline	92.03	86.51	80.99	CALL
CMD24-10M	Molded IEEE-488 Cable, 10.0m	Inline / Inline	137.95	129.67	121.39	CALL

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

Normal Orientation



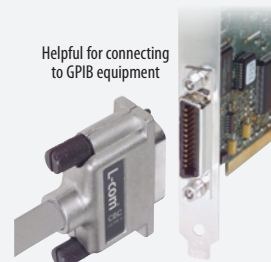
This is the standard for most GPIB cable assemblies

Reverse Orientation



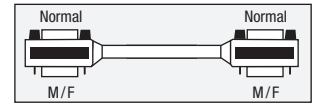
Great for extending GPIB cable runs

Inline Orientation



Helpful for connecting to GPIB equipment

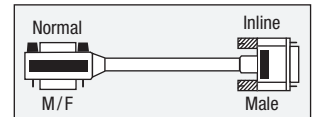
Item #	Description	Connector Orientation	1-9	10-24	25-99	100+
Deluxe Grade IEEE-488 GPIB Cables - Three Shields Plus Cast Aluminum Shells						
Two foil shields plus one copper braid shield (over 90% coverage) provide low capacitance to maintain the IEEE specifications of these cables. Designed and built 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-Chained 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.						
CIF24-03M	Deluxe IEEE-488 Cable, 0.3m	Normal/Normal	103.89	101.82	97.66	CALL
CIF24-05M	Deluxe IEEE-488 Cable, 0.5m	Normal/Normal	105.96	103.84	99.60	CALL
CIF24-1M	Deluxe IEEE-488 Cable, 1.0m	Normal/Normal	110.97	108.75	104.31	CALL
CIF24-2M	Deluxe IEEE-488 Cable, 2.0m	Normal/Normal	121.08	118.66	113.82	CALL
CIF24-3M	Deluxe IEEE-488 Cable, 3.0m	Normal/Normal	134.47	131.78	126.40	CALL
CIF24-4M	Deluxe IEEE-488 Cable, 4.0m	Normal/Normal	144.59	141.69	135.91	CALL
CIF24-5M	Deluxe IEEE-488 Cable, 5.0m	Normal/Normal	154.70	151.61	145.42	CALL
CIF24-6M	Deluxe IEEE-488 Cable, 6.0m	Normal/Normal	164.71	161.42	154.83	CALL
CIF24-8M	Deluxe IEEE-488 Cable, 8.0m	Normal/Normal	184.95	181.25	173.85	CALL



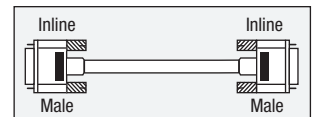
CIF24-M



CIB24-M



CBC24-M



CBD24-M

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.

CIB24-03M	Premium IEEE-488 Cable, 0.3m	Normal/Normal	111.18	108.96	104.51	CALL
CIB24-05M	Premium IEEE-488 Cable, 0.5m	Normal/Normal	114.34	112.05	107.48	CALL
CIB24-1M	Premium IEEE-488 Cable, 1.0m	Normal/Normal	122.17	119.73	114.84	CALL
CIB24-2M	Premium IEEE-488 Cable, 2.0m	Normal/Normal	137.84	135.08	129.57	CALL
CIB24-2.5M	Premium IEEE-488 Cable, 2.5m	Normal/Normal	145.67	142.76	136.93	CALL
CIB24-3M	Premium IEEE-488 Cable, 3.0m	Normal/Normal	164.71	161.42	154.83	CALL
CIB24-4M	Premium IEEE-488 Cable, 4.0m	Normal/Normal	180.49	176.88	169.66	CALL
CIB24-5M	Premium IEEE-488 Cable, 5.0m	Normal/Normal	196.16	192.23	184.39	CALL
CIB24-6M	Premium IEEE-488 Cable, 6.0m	Normal/Normal	205.08	200.98	192.77	CALL
CIB24-8M	Premium IEEE-488 Cable, 8.0m	Normal/Normal	234.24	229.55	220.18	CALL
CIB24-10M	Premium IEEE-488 Cable, 10.0m	Normal/Normal	263.40	258.13	247.59	CALL
CIB24-12M	Premium IEEE-488 Cable, 12.0m	Normal/Normal	292.56	286.70	275.00	CALL
CIB24-15M	Premium IEEE-488 Cable, 15.0m	Normal/Normal	336.18	329.46	316.01	CALL
CIB24-18M	Premium IEEE-488 Cable, 18.0m	Normal/Normal	379.92	372.32	357.13	CALL

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	106.51	100.11	93.72	CALL
CBC24-1M	Premium IEEE-488 Cable, 1.0m	Normal/Inline	112.05	105.33	98.61	CALL
CBC24-2M	Premium IEEE-488 Cable, 2.0m	Normal/Inline	123.26	115.87	108.47	CALL
CBC24-3M	Premium IEEE-488 Cable, 3.0m	Normal/Inline	134.47	126.40	118.33	CALL
CBC24-4M	Premium IEEE-488 Cable, 4.0m	Normal/Inline	145.67	136.93	128.19	CALL
CBC24-5M	Premium IEEE-488 Cable, 5.0m	Normal/Inline	156.88	147.47	138.05	CALL
CBC24-8M	Premium IEEE-488 Cable, 8.0m	Normal/Inline	190.50	179.07	167.64	CALL

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

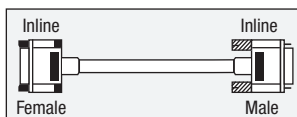
We've also provided this premium series IEEE-488 cable equipped with two single ended male ends. This cable type is not only useful in many applications, but also saves money. It has the same specifications as the basic CIB24 series. All connector guards are cast metal, not stamped metal.

CBD24-05M	Premium IEEE-488 Cable, 0.5m	Inline/Inline	100.85	94.80	88.75	CALL
CBD24-1M	Premium IEEE-488 Cable, 1.0m	Inline/Inline	106.51	100.11	93.72	CALL
CBD24-2M	Premium IEEE-488 Cable, 2.0m	Inline/Inline	117.71	110.65	103.59	CALL
CBD24-3M	Premium IEEE-488 Cable, 3.0m	Inline/Inline	128.92	121.18	113.45	CALL
CBD24-4M	Premium IEEE-488 Cable, 4.0m	Inline/Inline	140.12	131.72	123.31	CALL
CBD24-5M	Premium IEEE-488 Cable, 5.0m	Inline/Inline	151.33	142.25	133.17	CALL
CBD24-8M	Premium IEEE-488 Cable, 8.0m	Inline/Inline	184.95	173.85	162.76	CALL

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.

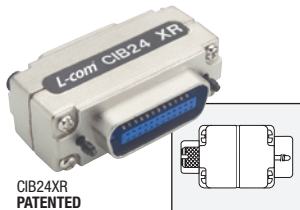
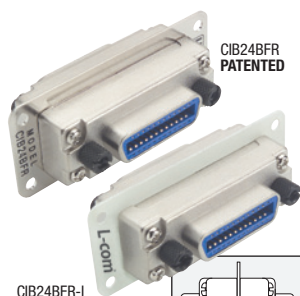
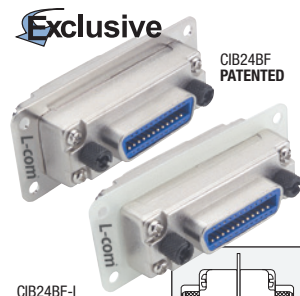
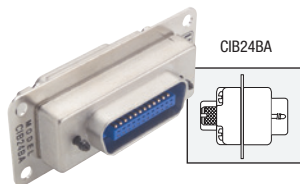
CBX24-1M	Premium IEEE-488 Extension Cable, 1.0m	Inline/Inline	106.51	100.11	93.72	CALL
CBX24-2M	Premium IEEE-488 Extension Cable, 2.0m	Inline/Inline	117.71	110.65	103.59	CALL
CBX24-3M	Premium IEEE-488 Extension Cable, 3.0m	Inline/Inline	128.92	121.18	113.45	CALL



CBX24-M

Female

Male



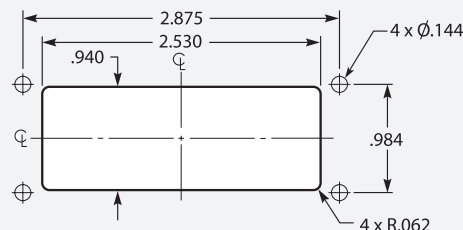
Item #	Description	Connector Orientation	1-9	10-24	25-99	100+
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IEEE-488 GPIB Bulkhead Adapters - The Easiest Way to Feed GPIB Cables Through Panels

IEEE-488 bulkhead adapters originated because of a need by design and test engineers. Because of user concerns for ground loops, we 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.

CIB24BA	IEEE-488 Bulkhead Adapter, Male/Female	Normal	41.95	38.59	35.23	CALL
CIB24BF	IEEE-488 Bulkhead Adapter, Female/Female	Normal	44.57	41.00	37.44	CALL
CIB24BF-I	IEEE-488 Bulkhead Adapter, Insulated, Female/Female	Normal	45.88	42.21	38.54	CALL

Recommended Panel Openings for IEEE-488 GPIB Bulkhead Adapters



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

Before:

Typical GPIB cables with normal entry are difficult to extend.

A



After:

A reverse entry adapter solves the problem.

B



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

A twist has been added to IEEE-488 networking by the introduction of reverse entry adapters.

CIB24BFR	Reverse Entry IEEE-488 Bulkhead Adapter, Female/Female	Reverse	44.57	41.00	37.44	CALL
CIB24BFR-I	Reverse Entry IEEE-488 Bulkhead Adapter, Insulated, Female/Female	Reverse	45.88	42.21	38.54	CALL

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

CIB24XFR	180° Reverse IEEE-488 Adapter, Female/Female	Reverse	34.08	31.35	28.63	CALL
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IEEE-488 GPIB Reverse Extender - Changes Cable Direction 180° and Extends Port

CIB24XR	180° Reverse IEEE-488 Extender, Male/Female	Reverse	34.08	31.35	28.63	CALL
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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.

CTS1224GAB	2 Way IEEE-488 Switch Box, A or B to I/O	123.21	115.82	108.43	CALL
CTS2424-4GPN	4 Way IEEE-488 Switch Box, A, B, C or D to I/O	137.63	129.38	121.12	CALL

Item #	Description	List Price
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USB-488 USB to GPIB Converter Cable

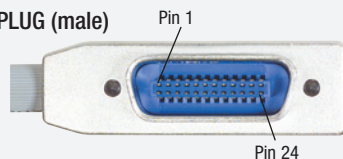
The USB-488 is a USB to GPIB Controller Module that converts any PC with a USB interface into a full-function, IEEE 488.2 Bus Controller.

USB-488	USB to GPIB Converter Cable	533.62
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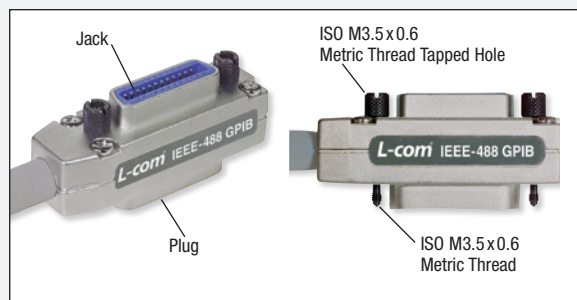
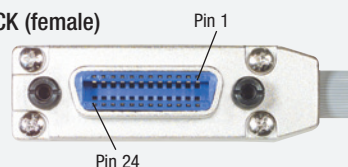
IEEE-488 GPIB Connector Specifications

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

PLUG (male)



JACK (female)



Item #	Description	Connector Orientation	1-9	10-24	25-99	100+
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IEEE-488 GPIB Extender - This Handy Device Provides a One Inch Added Clearance

Our GPIB extender is sometimes used to provide a one inch extension allowing right angle cables that extra margin to clear adjoining obstacles.

CIB24X	IEEE-488 Extension Adapter, Male / Female	Normal	31.46	28.94	26.43	CALL
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IEEE-488 GPIB Extender -With Modified Male Guard, Eliminates Thick Panel Interference

This unique extender has a modified male connector flange that is intentionally made shorter. This shorter flange prevents problems in applications requiring plugging into a receptacle that is mounted on a thick panel that interferes and will not allow the connector to seat properly.

CIB24XM	Modified IEEE-488 Extender, Male / Female	Normal	34.08	31.35	28.63	CALL
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IEEE-488 GPIB Slim-line Extenders - Provide One Inch Additional Clearance, Fits Narrow PC Ports

These handy, hard to find extenders are normally used to provide a one inch extension allowing right angle cables that extra margin to clear nearby obstacles. Special 0.73" (1.9cm) height allows for use with computers having narrow port openings.

CIB24XC	Slim-line IEEE-488 Extender, Male / Female	Normal	35.39	32.56	29.73	CALL
CIB24XCR	Reverse Entry IEEE-488 Slim-line Extender, Male / Female	Reverse	39.32	36.18	33.03	CALL

IEEE-488 GPIB Ultra Slim-line Extender - No Frills, Fully Shielded, Cast Body

There's a growing need for a slimmer IEEE-488 extender that will clear narrow PC port openings. The CIB24XE slimline extender fills that need with an overall width of 0.62 inches (1.6cm). Connectors are cast aluminum with nickel plating and shielding is maintained with copper foil.

CIB24XE	IEEE-488 Ultra Slim-line Extender-Cast, Male / Female	Normal	24.91	22.91	20.92	CALL
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IEEE-488 GPIB Socket / Connectors - Standard 24 Pin, Mates with all IEEE-488 Interfaces

These GPIB socket/connectors are ideal for production or replacement 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.

CIB24S	Female IEEE-488 Connector, Solder Lug Terminals		8.31	7.64	6.98	CALL
CIB24SPC	Female IEEE-488 Connector, Straight PC Terminals		8.31	7.64	6.98	CALL
CIB24SRA	Female IEEE-488 Connector, Right Angle PC Terminals		8.31	7.64	6.98	CALL

IEEE-488 GPIB Connector Shielding Covers - Protect Against Contamination, Physical Damage & RFI

L-com offers two cast aluminum covers that mate to the exposed end of the GPIB cable connector. These covers have many uses such as in production or shipping to protect against dirt or damage to the exposed connector.

CIB24C	IEEE-488 Connector Cover, Mates Female GPIB Connectors		8.31	7.64	6.98	CALL
CIB24CB	IEEE-488 Connector Cover, As Above but Black Anodized Finish		8.31	7.64	6.98	CALL
CIB24CM	IEEE-488 Connector Cover, Mates Male GPIB Connectors		8.31	7.64	6.98	CALL

IEEE-488 GPIB Inline Connector Kit - A Good Way to Retrofit Defective Cables

This unique GPIB inline connector kit allows the user to assemble their own inline IEEE-488 connectors. It 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.

CB24SM	IEEE-488 Inline Male Connector Kit		17.88	16.45	15.02	CALL
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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-TMBSC-14	IEEE-488 GPIB Thumbscrew, Molded Normal and Reverse Connectors, Pkg/20		14.42	13.84	13.27	CALL
GPIB-TMBSC-15	IEEE-488 GPIB Thumbscrew, Assembled Inline Connectors, Pkg/20		14.42	13.84	13.27	CALL
GPIB-TMBSC-16	IEEE-488 GPIB Thumbscrew, Molded Inline Connectors, Pkg/20		14.42	13.84	13.27	CALL
GPIB-TMBSC-18	IEEE-488 GPIB Thumbscrew, Assembled Normal Connectors, Pkg/20		14.42	13.84	13.27	CALL

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 BFB model will accept a male terminated cable on each side with normal orientation. The BFRB version reverses cable direction. (See page 136 for further explanation).

USP24BFB	Universal Sub-Panel, IEEE-488 Bulkhead Adapter, Normal Entry		40.36	38.75	37.13	CALL
USP24BFRB	Universal Sub-Panel, IEEE-488 Bulkhead Adapter, Reverse Entry		40.36	38.75	37.13	CALL
UPR35-6B	Universal Master Rack Panel with 6 Openings, Black Color		28.96	27.80	26.64	CALL

IEEE-488 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.

CIB24MT	Multi-Tap Bus Strip with 4 IEEE-488 Receptacles		45.59	45.14	44.68	CALL
CIB24MT2	Multi-Tap Bus Strip with 8 IEEE-488 Receptacles		101.55	100.53	99.52	CALL

