

# QUICKLINK

*A Line of External Fixed-Port Active Hubs for ARCNET® Local Area Networks*

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## INSTALLATION GUIDE

### INTRODUCTION

The QuickLink (QL) Series of external fixed port hubs provides a low cost method of expanding ARCNET local area networks. These eight-port hubs provide the ultimate in reliability and flexibility for cabling ARCNET networks. A hub allows for the addition of a segment and support for distributed star topologies. The QL utilizes the same robust hub timing electronics found in the Contemporary Controls (CC) MODHUB series for modular active hubs. This includes precision delay line timing, digitally controlled timers for dependable operation and reduced bit jitter. Also, a watchdog timer is included to prevent hub lockup — eliminating the need to recycle hub power in the event of extraordinary electrical disturbance.

The QL operates from low-voltage AC, requiring a power voltage source in the range of 8 to 24 volts.

Active hubs increase the robustness of ARCNET networks. They maximize the distance that can be achieved on each cable segment — up to 2000 feet (610 m) feet on coaxial segments. They prevent interference to the network by squelching reflections caused by open or shorted cable segments attached to the hub. Unused hub ports need not be terminated. Active hubs allow for a distributed star topology, thereby minimizing the cabling required in a facility. Two or more QL hubs may be cascaded.

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## SPECIFICATIONS

### *Environmental*

Operating temperature: 0°C to +60°C  
Storage temperature: -40°C to +85°C  
Relative humidity: 10 to 95%, non-condensing

### *Regulatory Compliance*

CE Mark  
CFR 47, Part 15 Class A

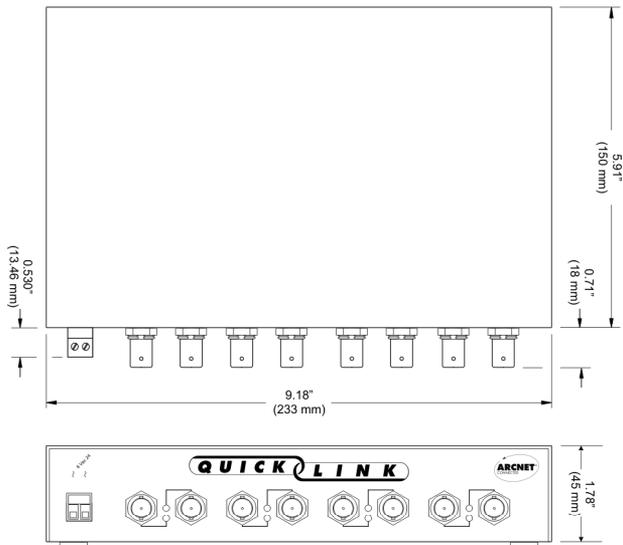
### *Functional*

Compliance: ANSI/ATA 878.1  
Hub delay: 300 ns max @ 2.5 Mbps  
Unlatch delay time: 5.9  $\mu$ s max @ 2.5 Mbps  
LED Indicators: ACTIVITY — green

### *Power Requirements*

AC  
Input voltage: 8–24 Volts  
Input power: 6 VA  
Input frequency: 47–63 Hz

### *Mechanical*



## INSTALLATION

The QL was designed as a desktop unit and should be installed on a stable surface in a horizontal plane. Four rubber feet protect the mounting surface. Power is derived from a nominal 24 VAC source, either a local power supply or the wall-mounted transformer provided with the QL. This transformer is normally for a 120 VAC mains, but (-E) models are supplied with a 230 VAC transformer.

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Each transformer comes with a 6-foot cord molded into the transformer. The other end is stripped and tinned and must be secured to the two-position removable connector located on the QL. With power removed from the transformer, attach one wire to one of the terminals and the other wire to the remaining terminal. Polarity of the wires is of no concern. Once wired, plug the transformer into the appropriate wall socket to power up the QL.

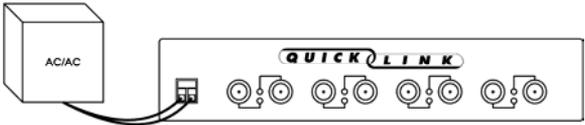


Figure 1 — The QL can be powered by an external low-voltage transformer.

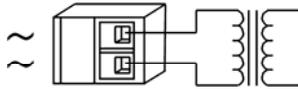


Figure 2 — The QL must have its companion transformer secondary leads attached to its two-position removable connector.

The QL supports two transceiver types which are described below:

### **-CXS Coaxial Star**

Typically, ARCNET is cabled with RG-62/u coaxial cable (with BNC connectors) in a star topology. Each network interface module (NIM) connects directly to a port on the QL hub. The coaxial star configuration provides the longest coaxial distance and simplified troubleshooting. A -CXS port effectively terminates the end of a coaxial bus segment without the need of a passive terminator. With this configuration, the bus segment can support up to eight NIMs with a maximum segment length of 1000 feet (305 m).

### **-TPS Twisted-Pair Star**

Unshielded or shielded twisted-pair wiring such as IBM Type 3 (#24 or #22 AWG solid copper twisted-pair cable or telephone wiring) can be used. External BALUNS are not required since CC's twisted-pair NIMs and hubs have internal BALUNS. Twisted-pair is convenient to install; however, its attenuation exceeds coaxial, its noise immunity is less, and its maximum length between a node and a hub is lower. RJ-11 connectors are used with this cable. A -TPS port effectively terminates the end of a twisted-pair bus segment without the need of a passive terminator. With this configuration, the bus segment can support up to eight NIMs with a maximum segment length of 330 feet (100 m).

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## FIELD CONNECTIONS

The QL is available with two transceiver options. Each transceiver, which is matched to a particular cable type, is identified by a three-character suffix appended to the model numbers. The capabilities of each transceiver differs. The QL is equipped with either the -CXS or -TPS option, however, support for systems with either -CXB or -TPB is possible.

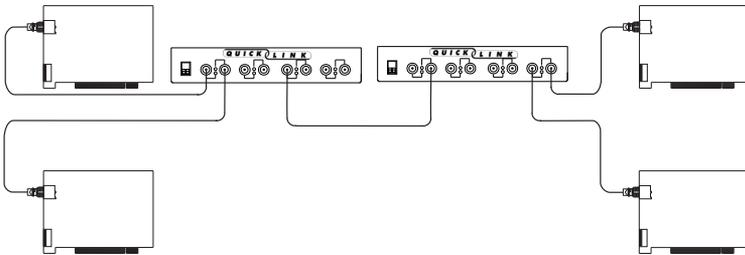
### -CXS Coaxial Star

In a coaxial star system, NIMs and hubs are interconnected in a point-to-point fashion using coaxial cable. A NIM can connect to one other NIM or can connect to an unused port on a hub. Hub-to-hub connections are allowed.

In a two-node system, simply connect the two -CXS NIMs together using RG-62/u coaxial cable. The length of cable cannot exceed 2000 feet.

If more than two NIMs are used on a network, either an active or passive hub is required. With passive hubs, a maximum of four NIMs can be interconnected. Unused ports on the passive hub must be terminated with a 93 ohm (nominal) resistor. The maximum length between a passive hub port and a NIM is 100 feet.

Active hubs provide overall better performance than passive hubs since greater distances can be achieved along with a degree of isolation. Connect each NIM to a port on the hub using RG-62/u coaxial cable. This length of cable cannot exceed 2000 feet nor can the length of cable between two cascaded hubs exceed 2000 feet. However, up to ten hubs can be cascaded, thereby providing an overall cable length of 22,000 feet. Unused ports on active hubs need not be terminated.



*Figure 3 — Point-to-point connections are required between -CXS NIMs and hubs.*

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## -CXB Coaxial Bus

For hub-less systems, the -CXB transceiver can be used. NIMs are interconnected with RG-62/u cables and BNC Tee connectors. Each -CXB NIM represents a high-impedance connection in both the powered and unpowered states. Therefore, passive termination must be applied to both ends of a bus segment. Use BNC style 93 (nominal) ohm resistors at each end. The maximum segment length is 1000 feet and the maximum number of NIMs that can be connected to a segment is eight.

To extend a bus segment beyond 1000 feet, an active hub is required. If the hub port is of the -CXS type, connection can be made if a few simple rules are followed. Only connect this bus segment at the end of a segment. Do not connect the hub to the middle of a segment since the hub port is not of the high-impedance type. Do not terminate the end which attaches to the hub port since a -CXS port effectively terminates the end of a bus segment. Simply remove the BNC Tee connector and terminator from the segment end and attach the cable directly to the hub port. The opposite segment end still requires termination if no hub connection is being made.

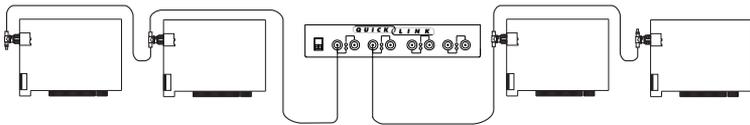


Figure 4 — A hub is required to extend bus segments.

## -TPS Twisted-Pair Star

In a twisted-pair star system NIMs and hubs are interconnected in a point-to-point fashion using either shielded or unshielded twisted-pair cable. A NIM can connect to another NIM or to an unused port on a hub. Hub-to-hub connections are allowed. A NIM such as the PCX-TPS can connect directly to a QL-TPS port directly using a non-inverting cable.

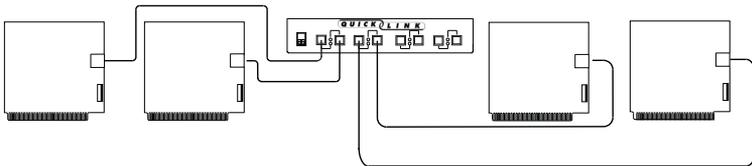


Figure 5 — QL-TPS connected in a star configuration.

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## -TPB Twisted-Pair Bus

Like the -CXB transceiver, a hub-less cabling segment is possible. The -TPB transceiver allows a total of eight -TPB NIMs to share a common bus segment for up to 400 feet. These types of segments can be expanded using the QL-TPS. Only connect this bus segment at the end of a segment. Do not connect the hub to the middle of a segment since the hub port is not of the high-impedance type. Do not terminate the end which attaches to the hub port since a -TPS port effectively terminates the ends of a bus segment. Simply remove the terminator from the segment end and attach the cable directly to the hub port. The opposite segment end still requires termination if no hub connection is being made.

*Issue:* the -TPS incorporates built-in BALUNs requiring a phase reversal of the signals from the -TPB port. Therefore, the use of inverting cable is required.

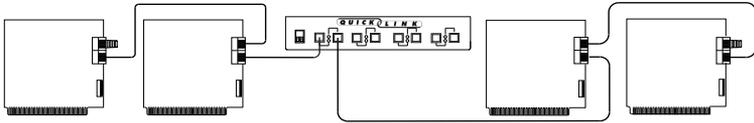
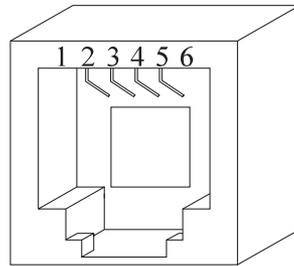


Figure 6 — A -TPB segment can be expanded using -TPS ports on a hub.

Wiring Chart RJ-11 Connector		
PIN	-TPS	-TPB
1	—	—
2	N/C	N/C
3	LINE+	LINE-
4	LINE-	LINE+
5	N/C	N/C
6	—	—



## Electromagnetic Compatibility

The QL series complies with Class A radiated and conducted emissions as defined by CFR 47, Part 15 and EN55022. This equipment is intended for use in non-residential areas.

### Warning

This is a Class A product as defined in EN55022. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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## DECLARATION OF CONFORMITY

### Applied Council Directives:

Electromagnetic Compatibility Directive, 89/336/EEC Council Directive as amended by Council Directive 92/31/EEC & Council Directive 93/68/EEC; General Product Safety Directive 92/59/EEC

### Standard to which Conformity is Declared

EN 55022:1995 CISPR22: 1993, Class A, Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment

EN 55024:1998, ITE — Immunity — Limits and Methods

### Manufacturer:

Contemporary Control Systems, Inc.  
2431 Curtiss Street  
Downers Grove, IL 60515 USA

### Authorized Representative:

Contemporary Controls Ltd  
Sovereign Court Two  
University of Warwick Science Park  
Sir William Lyons Road  
Coventry CV4 7EZ  
UNITED KINGDOM

### Type of Equipment:

External fixed-port active hub

Model	Directive
	EMC
QL-CXS	Yes
QL-TPS	Yes
QL-CXS-E	Yes
QL-TPS-E	Yes

I, the undersigned, hereby declare that the products specified above conform to the listed directives and standards.

### Manufacturer

Full Name            George M. Thomas  
Position             President  
Date                  December 21, 2004

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## NEED MORE HELP INSTALLING THIS PRODUCT?

More comprehensive information can be found on our web site at [www.ccontrols.com](http://www.ccontrols.com). Browse the Technical Support section of our site for a look at our interactive on-line technical manuals, downloadable software drivers and utility programs that can test the product. When contacting one of our offices, just ask for technical support.

### Warranty

Contemporary Controls (CC) warrants its new product to the original purchaser for two years from the product shipping date. Product returned to CC for repair is warranted for one year from the date that the repaired product is shipped back to the purchaser or for the remainder of the original warranty period, whichever is longer.

If a CC product fails to operate in compliance with its specification during the warranty period, CC will, at its option, repair or replace the product at no charge. The customer is, however, responsible for shipping the product; CC assumes no responsibility for the product until it is received.

CC's limited warranty covers products only as delivered and does not cover repair of products that have been damaged by abuse, accident, disaster, misuse, or incorrect installation. User modification may void the warranty if the product is damaged by the modification, in which case this warranty does not cover repair or replacement.

This warranty in no way warrants suitability of the product for any specific application. IN NO EVENT WILL CC BE LIABLE FOR ANY DAMAGES INCLUDING LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT EVEN IF CC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY PARTY OTHER THAN THE PURCHASER.

THE ABOVE WARRANTY IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR USE, TITLE AND NONINFRINGEMENT.

### Returning Products for Repair

Before returning a product for repair, contact Customer Service. A representative will instruct you on our returns procedure.

Contemporary Control Systems, Inc.	Contemporary Controls Ltd
2431 Curtiss Street	Sovereign Court Two
Downers Grove, Illinois 60515 USA	University of Warwick Science Park
Tel: +1-630-963-7070	Sir William Lyons Road
Fax: +1-630-963-0109	Coventry CV4 7EZ UK
E-mail: <a href="mailto:info@ccontrols.com">info@ccontrols.com</a>	Tel: +44 (0)24 7641 3786
WWW: <a href="http://www.ccontrols.com">http://www.ccontrols.com</a>	Fax: +44 (0)24 7641 3923
	E-mail: <a href="mailto:info@ccontrols.co.uk">info@ccontrols.co.uk</a>