

## Application Note AN-0003

### Interfacing Quartz Routers and Control Panels To Under Monitor Display Systems

Many third party companies manufacture comprehensive ranges of electronic displays that can be mounted under television picture monitors to identify the signal displayed on the monitor. These displays are usually referred to as Under Monitor Displays (UMDs).

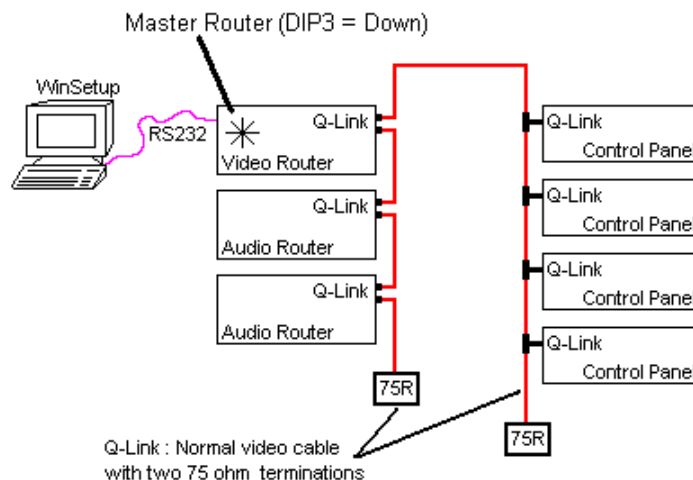
Quartz routers can be connected to these UMD systems to allow the current source selection to be displayed under the picture monitor. Changes made to the routing system from standard Quartz remote control panels or other third party control systems, such as Automation, will cause the UMD system to update its displays. This application note describes the hardware and software capabilities and requirements of the Quartz equipment.

Manufactures of UMD systems are companies such as TSL, Megahertz, and Amazon and in most cases the following notes also apply to all of these products.

#### A Standard Quartz Routing System

It is difficult to define a standard routing system as they can be supplied and configured in many different ways. However it is helpful to divide systems into one of three different control architectures covering small, medium, and large systems.

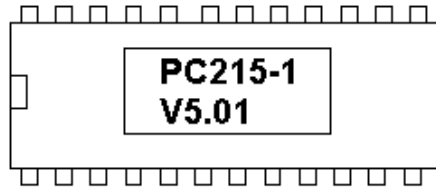
**Small Quartz System:** A small Quartz routing system uses the routers embedded controller and consists of at least one router frame and usually at least one control panel and these are connected together using the Q-Link. The Q-link is the means by which the various units in a routing system communicate with each other and uses standard video cable to achieve this.



One of the routers is set as a master (\*), which means it holds the setup or configuration of the system and controls the Q-link communications. The master has this setup NVRAM in the USER position and DIP3 is set to the DOWN position. All other Q-Link devices are set as slaves.

On all embedded controller products the DIP-2 switch must be set in the down position and reset pressed before the RS232/422 connector will function correctly. The currently installed communications protocol will then be enabled. The vast majority of UMD systems work in RS422 mode. All Quartz products use the same pin-out of the RS232/422 connector.

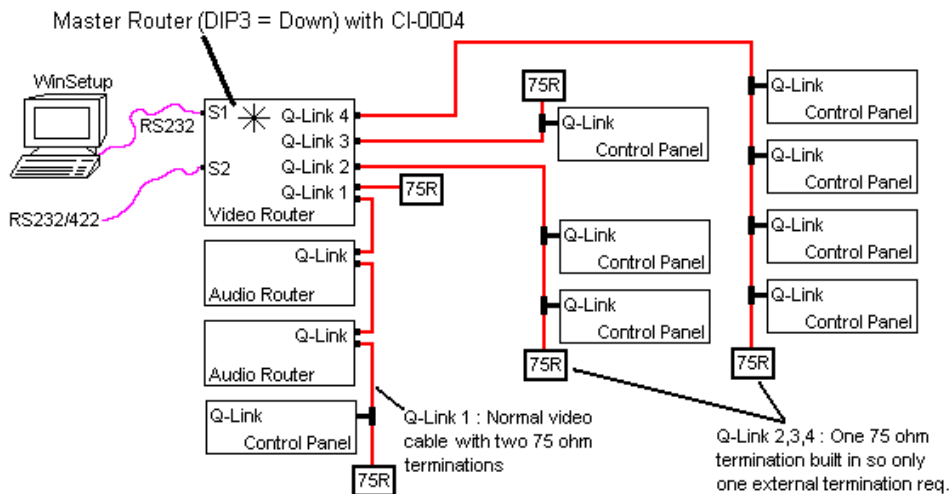
Quartz supports a wide range of remote control protocols but each embedded controller supports only one remote control protocol at a time. Protocols are changed by downloading new firmware, or by fitting a different system EPROM in the router. EPROM's fitted will typically be labelled as:



Where PC215 indicates the system or operating software and the -X indicates the protocol built into the software. The version number e.g. V5.01 will change from time to time as new features are added.

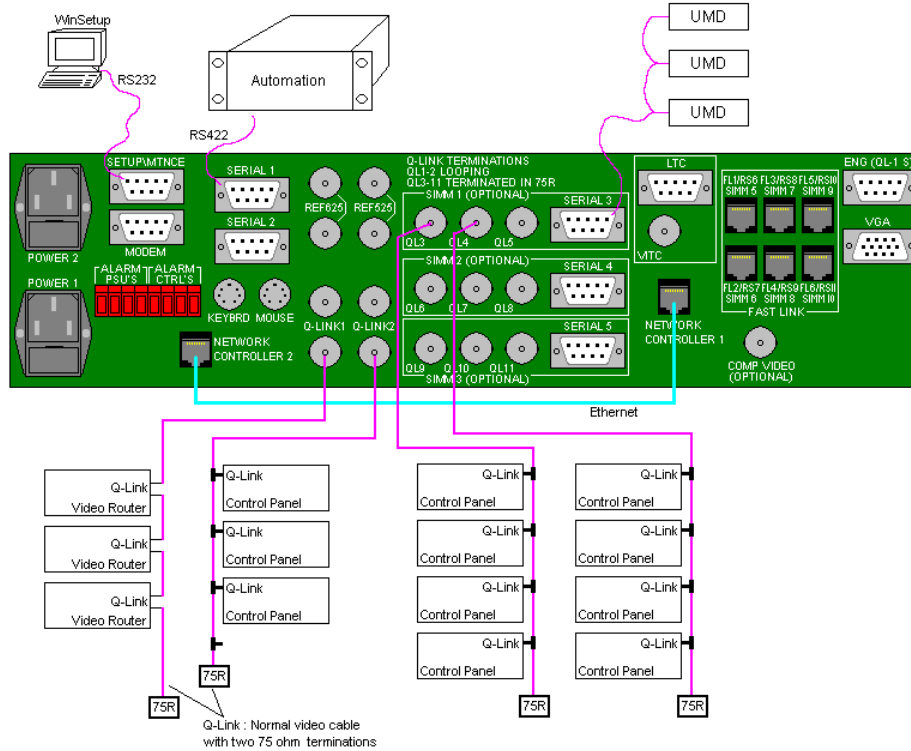
Routing systems can be connected to computers and automation systems etc. via an RS232/422 connector on the rear of each router. Most Quartz routers use the FU-0003 embedded controller card and this has built in RS232/422 drivers. For older products see the section 'Older Routers' at the end of this document.

**Medium Quartz System:** A medium Quartz routing system uses the routers embedded controller but with the addition of the CI-0004 communications module to add more Q-Links. The system will generally have multiple router frames and multiple control panels; all connected together using the four Q-Links.



One of the routers is set as a master (\*), which means it holds the Setup or configuration of the system and controls the Q-link communications. The master has this Setup NVRAM in the USER position and DIP3 is set to the DOWN position. All other Q-Link devices are set as slaves.

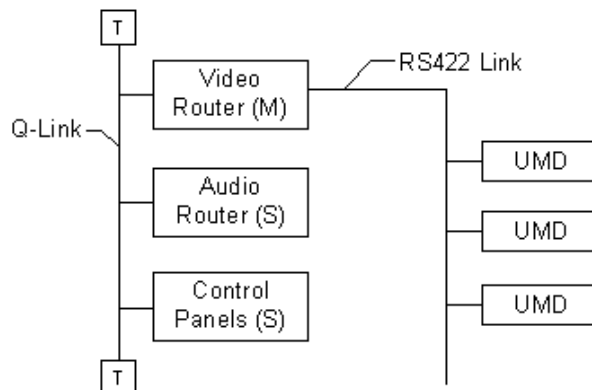
**Large Quartz System:** A large Quartz routing system uses a separate system controller, the SC-1000. This can support multiple QLinks and RS232/422 serial ports. The system will generally have multiple large router frames and multiple control panels; all connected together using Q-Link.



The SC-1000 system controller can drive UMD systems directly and performs most of the functions of a typical UMD system controller.

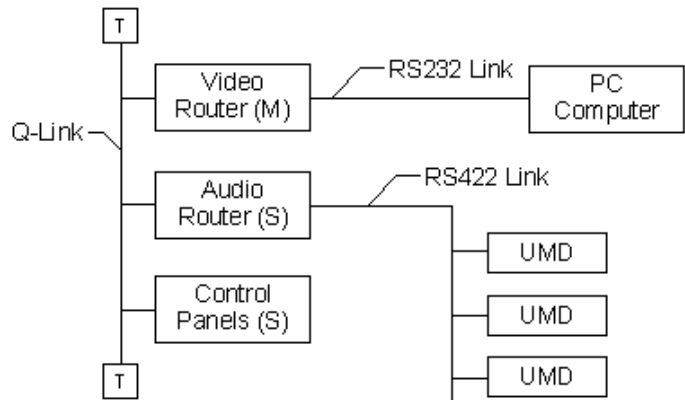
**A simple Quartz Embedded Controller to Third Party UMD system**

This is shown below. The video router is the system master (third DIP switch in the down position) with the audio routers slaved from it. The names to be displayed are stored in the router SETUP and can only be changed using the WinSetup software (see below)



The router is any standard router with a few minor changes. The system software has to be replaced with PC215-2 (PC150-2 or SYS-2 on older products) to control the UMD, the RS232/422 interface is set to RS422 mode, and DIP-2 on the router card must be set to the DOWN position.

The names to be displayed are stored in the router SETUP and can only be changed using the Quartz WinSetup software. New set-up information is downloaded in to the router using WinSetup. As this needs two serial connections, the system would be organised as follows:

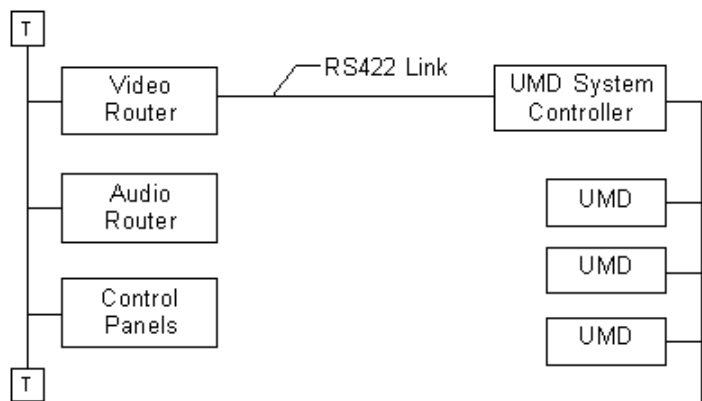


This arrangement allows the SETUP Program to talk directly to the master router. The UMDs connect to the slave router. The system software copies the source names to the slave router so that these can be used to update the UMD displays.

Tally lamps within the UMDs usually indicate On-Air status and are not supported on the Quartz-UMD RS422 link, but may be supported by wiring the UMD external tally connections to the Quartz TR-3200 tally router.

**A standard Quartz Embedded Controller to Third Party UMD system**

This is shown below. The video router is the router system master (third DIP switch in the down position) with the audio routers slaved from it. The names to be displayed are stored in the UMD controller.

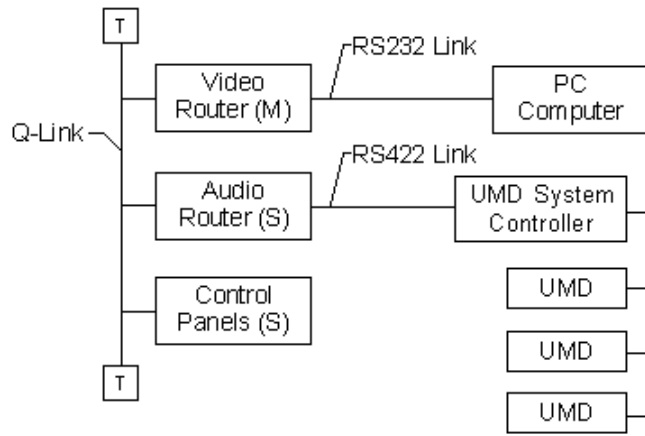


This arrangement has a number of advantages over the simple system, the main ones being:

- UMD names can be different from the router names
- UMD names can be longer to support displays with more than 8 characters
- Tally information can be inserted into the UMD serial data

The router is any standard router with a few minor changes, the RS232/422 interface is set to RS422 mode, and DIP-2 on the router card must be set to the DOWN position. The system software has to be PC215-1 (PC150-1 or SYS-1 on older products), which is fitted as standard.

The names to be displayed on the Quartz control panels are stored in the router SETUP and can only be changed using the WinSetup software. The names to be displayed on the UMDs are stored in the UMD Controller. If WinSetup is used to download Setup information then the system needs two serial connections, organised as shown.

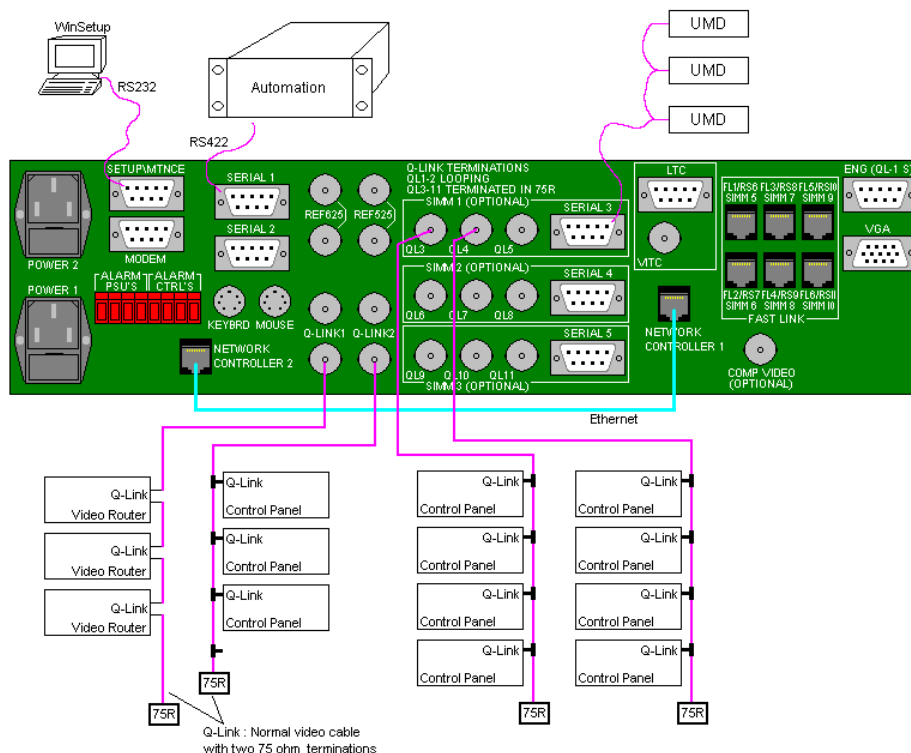


As a compromise, the UMD system can share the same serial connector as WinSetup but it will have to be changed from RS422 to RS232 mode while WinSetup is in use.

Tally lamps within the UMDs usually indicate On-Air status are controlled by the UMD System Controller, or by the wiring the UMD external tally connections to the Quartz TR-3200 tally router.

### A standard Quartz SC-1000 to Third Party UMD system

This is shown below. The SC-1000 is the router system master with the routers slaved from it. The names to be displayed are stored in the SC-1000.



Tally lamps within the UMDs usually indicate On-Air status and are controlled by the SC-1000, or by the wiring the UMD external tally connections to the Quartz TR-3200 tally router.

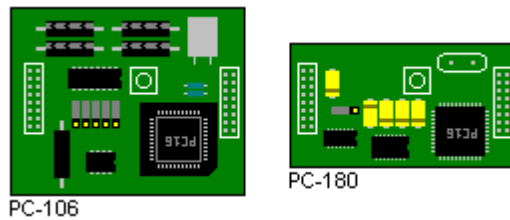
## Appendix A: Older Quartz Routers

September 1998 : Routers supplied before this date normally had the master router fitted with an EPROM to hold the system setup. Setup EPROM's supplied by Quartz are labelled with the job number (J0123) and its version. These are stored at Quartz on our file server so copies and updates can be sent out at any time. The original of the setup was generated by the DOS setup or WinSetup software.



To re-configure one of these systems required the optional DOS setup or WinSetup programs, an NVRAM to replace the EPROM, and a CI-0001 RS232/422 module. After this date all router systems have been supplied with WinSetup.

August 1998 : Routers supplied before this date do not have a built in RS232/422 interface and require the optional CI-0001 module. This is a small daughter card that fits onto one of the main router cards, normally in the master router. There are two versions of this module.



When installing a CI-0001 module take care to align the pins with the sockets. Also check that the central mounting hole lines up with the hole in the main PCB. If removing a CI-0001 take care not to bend the pins.

## Appendix B: TSL UMD Connector schedules

<b>D15 Connector</b>	<b>Name</b>	<b>D9 Connector</b>	<b>Name</b>
Pin 1	RXA	Pin 1	Chassis ground
Pin 2	RXB	Pin 2	TXA
Pin 3	Not used	Pin 3	RXB
Pin 4	Not used	Pin 4	0v
Pin 5	Not used	Pin 5	Not used
Pin 6	+ve (12 to 24v)	Pin 6	0v
Pin 7	+ve	Pin 7	TXB
Pin 8	+ve	Pin 8	RXA
Pin 9	0v	Pin 9	Chassis ground
Pin 10	0v		
Pin 11	0v		
Pin 12	Not used		
Pin 13	Not used		
Pin 14	Not used		
Pin 15	Chassis ground		

At 24v the supply current is 125mA.