User Manual

QuEST RAIL LLC

095-110006-0003
Revision: A05
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Contents

About This Manual

This User Manual provides information to install, configure, and operate the QLCP. This manual assumes the reader has some previous experience with similar systems.

Customer Support

For additional support, please call QuEST Rail LLC at (816) 240-8425 or email waysideproducts@questrail.com

1 Get to Know the QLCP

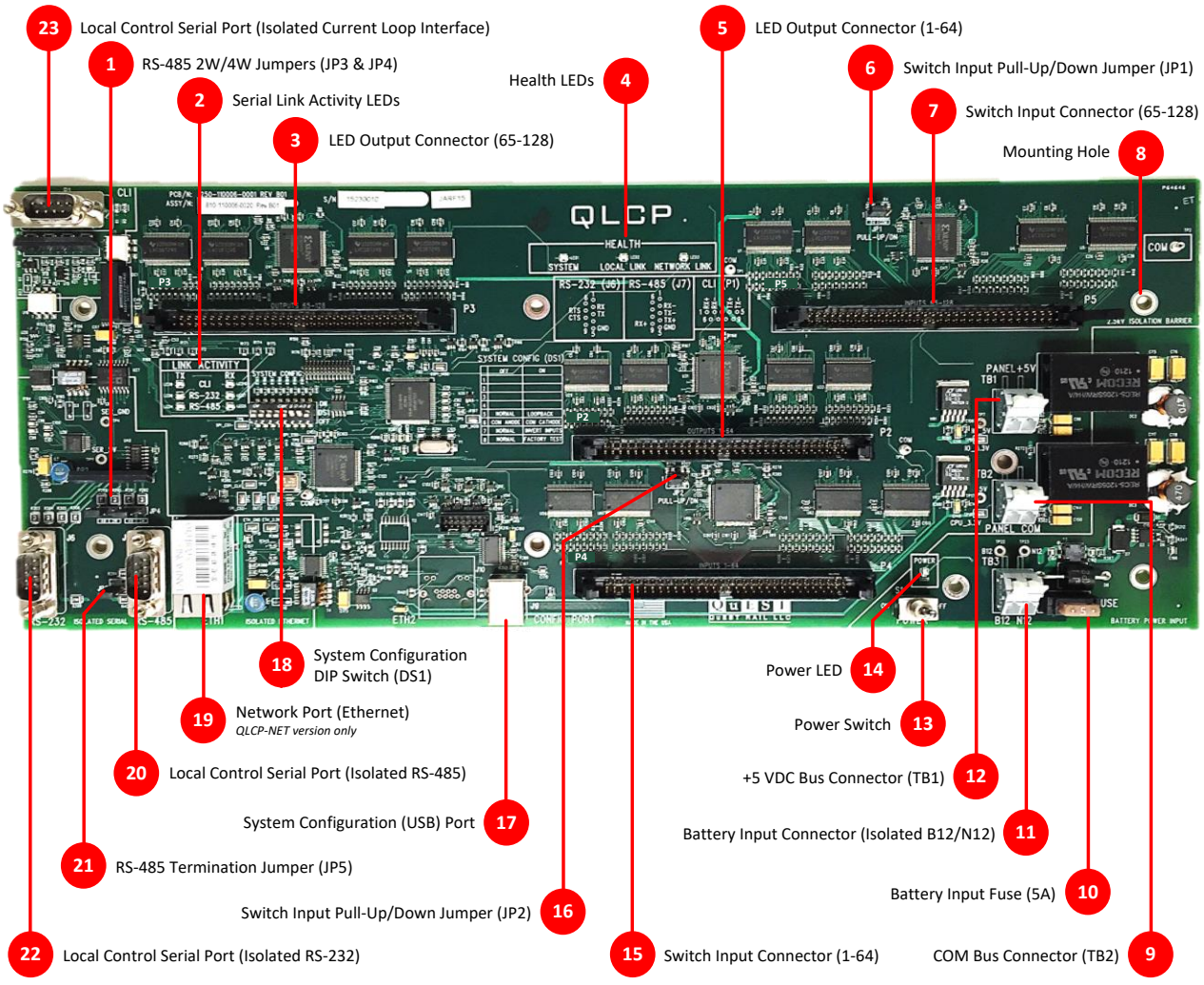


Figure 1

2 Specifications

Power Input	
Voltage Range	10-16V_{DC}
Fuse	Mini Automotive, 5A, Fast Blow – Littelfuse PN 0297005.WXNV or equivalent
Reverse Polarity Protection	Yes
Connector	Spring pressure connections, toolless, 45° Wire Entry
Connector Wire Gauge	14-22AWG
Nominal Power Draw (All inputs and outputs are off)	12V @ 250mA (3W)
Maximum Power Draw (All inputs and outputs active. Assuming an LED voltage drop of 2.1V_{DC})	12V @ 600mA (7.2W)

Serial Communications	
Serial Ports	RS-232 (DB9M, asynchronous DTE), RS-485 (DB9M, 2/4W configurable), and Current Loop Interface (DB9M)
Data Rate	1200 to 38,400 bps
Protocols	Genisys (QLCP as master), Hitachi STS Microlok II Peer, ALSTOM LCP
Application	Use application logic statuses mapped to serial message bits to control outputs and monitor inputs

Network Communications	
Connector	RJ45 Ethernet
Data Rate	10/100 Mbps
Protocols	Genisys and QNET, both over Ethernet, FTP
Application	QNET for expansion, duplication, and soft panel communications Genisys for communications with vital controller FTP for use with QLCP-NET Developer Tool

Diagnostic PCB LEDs	
Power Supply	Green
System Health	Green
Local Link Health	Green
Network Link Health	Green
RS-232 TX/RX Activity	Orange
RS-485 TX/RX Activity	Orange
CLI TX/RX Activity	Orange

Configuration Port 1	
Connector	RJ45 Ethernet
IP Address	Default: 192.168.0.100
Password	Default: password
Protocol	FTP
Application	Configuration

Configuration Port 2	
Connector	USB Type B receptacle
Data Format	57,600 bps, 8-N-1
Protocol	Raw text over virtual serial COM port
Application	Configuration

Mechanical	
Dimensions	15.50 x 6.25 x 0.45 in
Weight	13 oz

Discrete Inputs	
Inputs	128
Voltage Range	0 to $5V_{DC}$
Input Topology	Supports active low or active high inputs. Input pull-up jumpers shall be set accordingly (see Section 3 of this manual)
Input Impedance	3.3kΩ
V_{IH}	$3.55V_{DC}$
V_{IL}	$1.45V_{DC}$
Connectors	Two, 64-pin, Latch-lock Ribbon Style, TE Connectivity 1-5102153-2. Replacement ejector latches: TE Connectivity 102320-1
Ribbon Cable	Cable, 64 Conductor Ribbon, 28AWG, PVC, 300 – Assmann PN AWG28-64/G/300
Expandable	Yes, up to 512
Typical Application	Receive ON/OFF input signals from switches on LCP front panel

Environmental (AREMA Class C Compliant)	
Operating Temperature	-40 to 70° C
Operating Humidity	0 to 95% non-condensing
Isolation	2000 Vrms
Shock and Vibe	Compliant – Test results available upon request
EMI/EMC	Compliant – Test results available upon request

Discrete Outputs	
Outputs	128
Output Voltage and Impedance	$5V_{DC}$ w/ 330Ω Source Impedance
Output Topology	Outputs are intended to drive LEDs. Outputs can be configured as either common-anode or common-cathode. For proper DIP switch configuration, see Section 3 of this manual
Source Current (Max)	15.15mA * Assumes output is shorted to PANEL COM
Sink Current (Max)	15.15mA * Assumes output is shorted to PANEL +5V
Connectors	Two, 64-pin, Latch-lock Ribbon Style, TE Connectivity 1-5102153-2. Replacement ejector latches: TE Connectivity 102320-1
Ribbon Cable	Cable, 64 Conductor Ribbon, 28AWG, PVC, 300 – Assmann PN AWG28-64/G/300
Expandable	Yes, up to 512
Typical Application	Drive LEDs on custom LCP front panel

3 DIP Switch and Jumper Settings

System Configuration DIP Switch

The System Configuration DIP Switch (DS1) provides a means for basic configuration of the QLCP. For applications that use the CLI port with ALSTOM LCP protocol (factory default), the QLCP can be fully configured using the System Configuration DIP Switch (and jumpers). The System Configuration DIP Switch settings are consistent with the ALSTOM CLCP Controller.

Note: Like the ALSTOM CLCP Controller, the DIP Switch settings are also sent as control bits 9 through 15. This allows the QLCP to be a direct replacement for the ALSTOM CLCP.

Figure 2 shows the System Configuration DIP Switch settings.

Test and Config Modes	OFF	ON
Factory Test	1,5	8
Loopback	1.8	5
RS232 Config	5	1,8

I/O Configuration	OFF	ON
Common Anode	6	
Common Cathode		6
Inverted Inputs		7

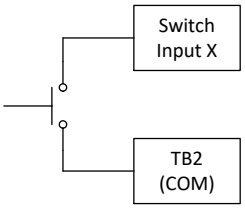
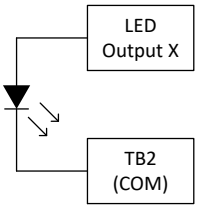
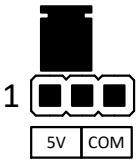
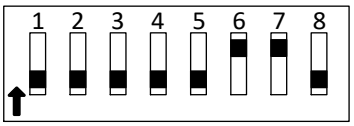
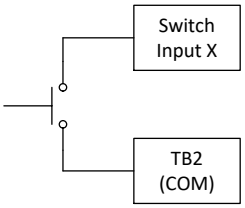
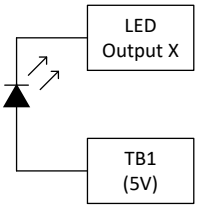
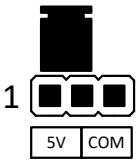
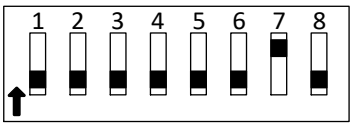
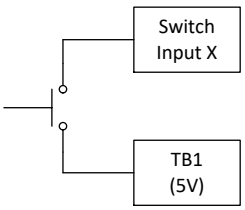
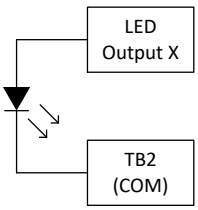
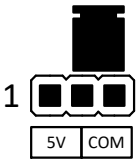
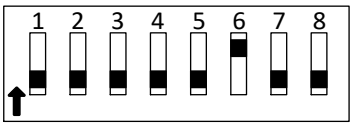
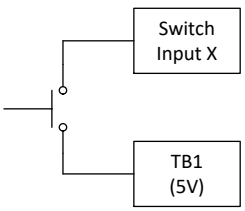
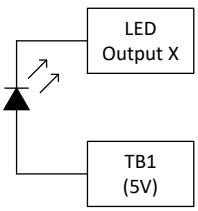
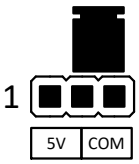
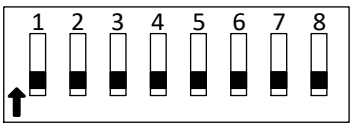
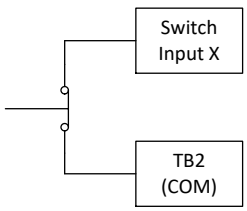
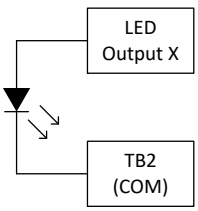
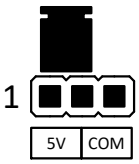
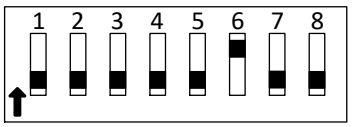
Figure 2

Switch Input and LED Output Configuration

Refer to Section 1 to locate the following configuration interfaces:

- 18 System Configuration DIP Switch (DS1)
- 6 Switch Input Pull Up/Down Jumper (JP1)
- 16 Switch Input Pull Up/Down Jumper (JP2)

Figure 3 shows how to configure the Switch Input Pull Up/Down Jumpers and System Configuration DIP Switch based on the LCP wiring plans. These are the most common configurations with the assumption that the normal switch position results in a logic “0” input state and switch actuation results in a logic “1” input state to the interlocking controller.

Switch Input Wiring	LED Output Wiring	JP1 & JP2	System Configuration DIP Switch
Normally Open Switches 	*Common Cathode LEDs* 		
Normally Open Switches 	*Common Anode LEDs* 		
Normally Open Switches 	*Common Cathode LEDs* 		
Normally Open Switches 	*Common Anode LEDs* 		
Normally Closed Switches 	*Common Cathode LEDs* 		

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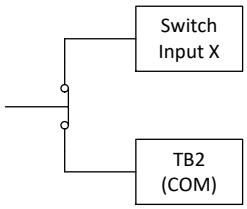
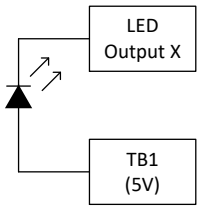
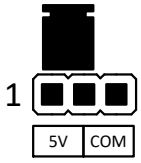
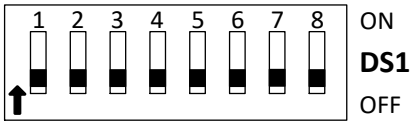
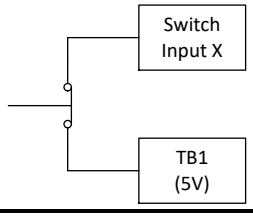
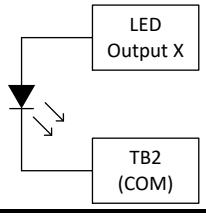
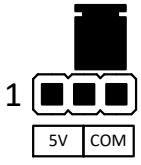
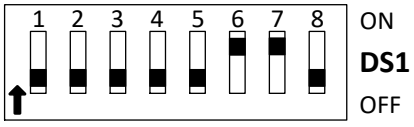
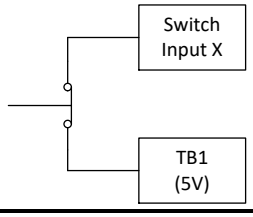
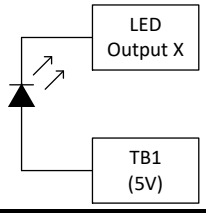
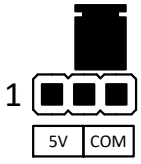
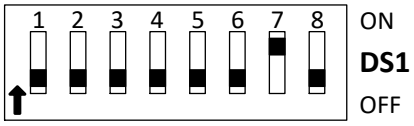
Normally Closed Switches 	*Common Anode LEDs* 		
Normally Closed Switches 	*Common Cathode LEDs* 		
Normally Closed Switches 	*Common Anode LEDs* 		

Figure 3

RS-485 Serial Port Jumpers

Refer to Section 1 to locate the following configuration interfaces:

1. RS-485 2W/4W Jumpers (JP3 & JP4)
2. RS-485 Termination Jumper (JP5)

If the QLCP will be communicating with a MicroLok II or Alstom controller using RS-485 with a QuEST-supplied serial cable, ensure the jumpers are configured for a terminated 4-wire interface as shown below in Figure 4.

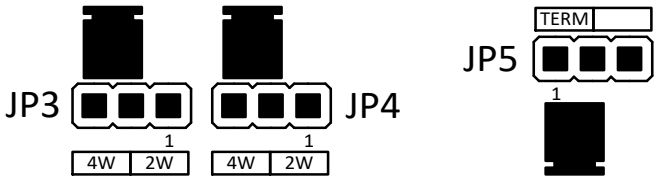


Figure 4

4 Installation

Install the QLCP in the LCP cabinet using the mounting hardware provided. It is not necessary to install a separate power supply. The QLCP's isolated power supply is an integrated feature.

Connect the Switches and LEDs

Refer to Section 1 to locate the following interfaces:

- 15 Switch Input Connector (1-64)
- 5 LED Output Connector (1-64)
- 7 Switch Input Connector (65-128)
- 3 LED Output Connector (65-128)
- 12 +5 VDC Bus Connector (TB1)
- 9 COM Bus Connector (TB2)

Connect the switch input and LED output connectors to their proper locations. Be sure the connectors are inserted far enough to latch on both sides.

Next, connect the common side of the switches and LEDs to TB1 or TB2 based on the LCP wiring plans.

Connect the Serial Cable

Refer to Section 1 to locate the following interfaces:

- 22 Local Control Serial Port (Isolated RS-232)
- 23 Local Control Serial Port (Isolated Current Loop Interface – CLI)
- 20 Local Control Serial Port (Isolated RS-485)

If using the serial interface and a QuEST-supplied serial cable (with or without a QLCP Bulkhead Kit), simply connect the cable to the CLI, RS-232, or RS-485 port based on the LCP wiring plans. Secure the cable to the serial port using the screws on the cable connector.

Connect the Network Cable

If using the Network Port for QLCP panel duplication or I/O expansion (QLCP-NET only), refer to Section 1 to locate the following interface:

19 Network Port (Ethernet)

Two QLCPs can be directly connected together using a single Ethernet cable. This would most likely be used for an expansion application (without duplication), where the two QLCPs are co-located in the same LCP cabinet to provide 256 I/256 O.

For networking more than two QLCPs, additional equipment is required, such as an Ethernet switch. If a QLCP Bulkhead Kit is installed in your LCP cabinet, an Ethernet cable was supplied with the bulkhead kit. Connect this cable between the QLCP Network Port and the bulkhead.

Connect the Battery Input

Refer to Section 1 to locate the following interface:

11 Battery Input Connector (Isolated B12/N12)

Connect a power source in the range of 10 to 16 VDC to the Battery Input Connector. The QLCP Battery Input provides 2000 Vrms isolation from the LCP cabinet and other QLCP interfaces. The QLCP Battery Input has built-in secondary surge protection; however, primary surge protection must be provided by an external device.

5 Configuring a QLCP using the System Configuration Port

If the QLCP is not a QLCP-NET, not network enabled, any additional configurations must be done using the QLCP System Configuration Port. **If the QLCP is a QLCP-NET (has a RJ-45 network connector) this method for configuration is still available, but using the QLCP-NET Developer Tool (Section 6) is suggested.**

Connect a PC to the System Configuration Port using a USB cable. The QLCP accepts a standard "B" type male USB connector.

Note: For the QLCP-NET, configuration may be simpler through the Ethernet Port using the QLCP-NET Developer Tool depending on your configuration scenario. See the following section for more information.

To access the QLCP configuration menu, use a terminal program like Tera Term or HyperTerminal. The QLCP will show up as a virtual serial port on your PC. Open the port and configure it as follows:

- Baud rate = 57600
- Data Bits = 8
- Parity = None
- Stop Bits = 1

Hit the enter key. You will be prompted for a password as shown below. The default password is "password".

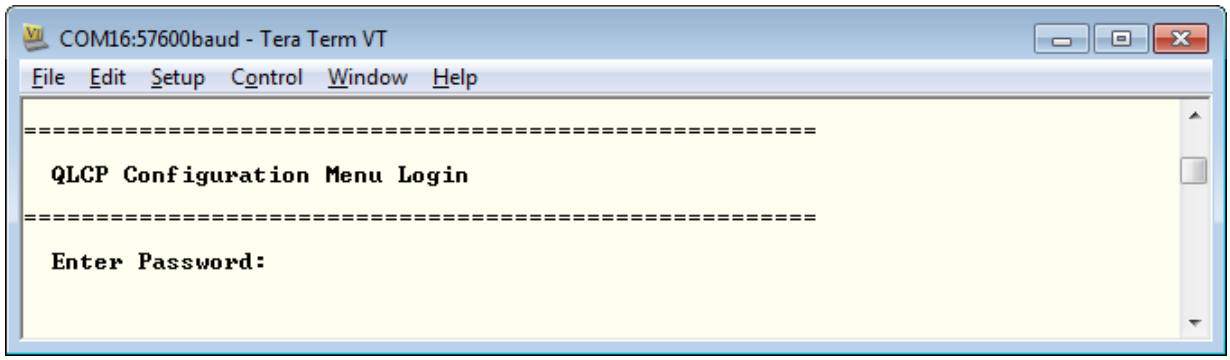


Figure 5

After entering a valid password, the main menu will be displayed as shown below.

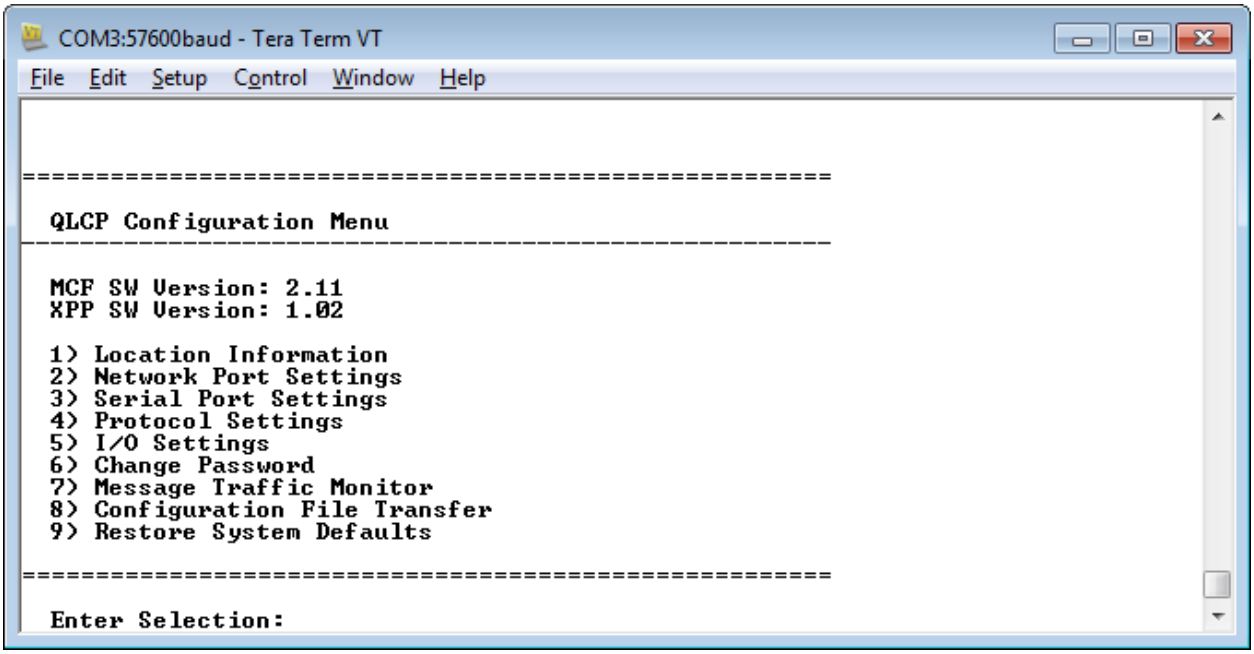


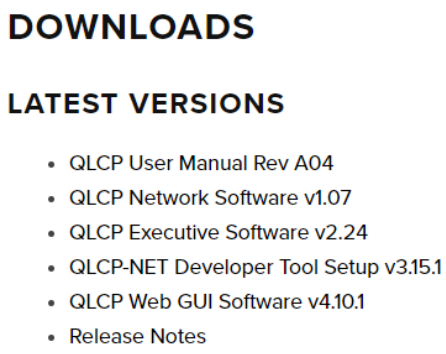
Figure 6

Using the hierarchical menu system of the QLCP, configure the settings to be consistent with your particular application. When a change is made to the configuration settings, you must save the settings. An additional menu option (10) will be provided for saving your settings if changes have been made. After saving changes, the QLCP will reset itself in order for the changes to take effect.

For more information on the configurable settings, see the following section.

6 Configuring a QLCP-NET using the QLCP-NET Developer Tool

The QLCP-NET Developer Tool is a free download available at http://www.questrail.com/qlcp under the “DOWNLOADS” section as shown below. “QLCP-NET Developer Tool Setup”



To install the QLCP-NET Developer Tool, double-click on the “QLCP-NET_Dev_Tool_Setup.exe” file. The following dialog box will appear and the installer program will walk you through the installation process.

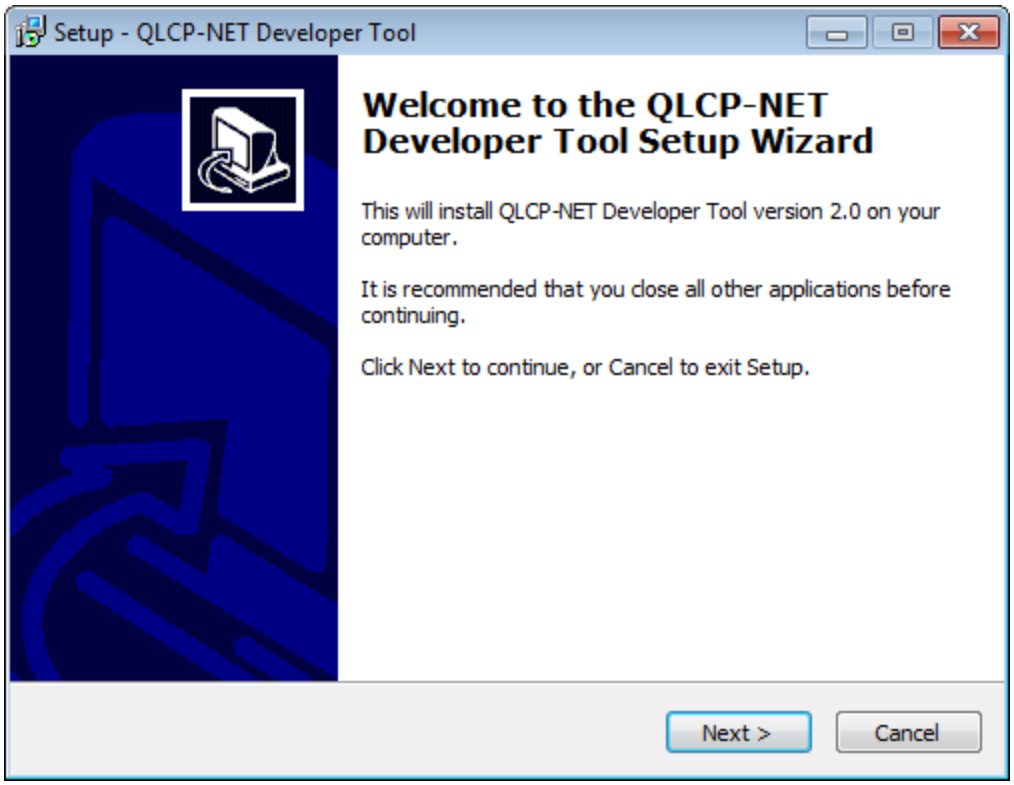


Figure 7

The QLCP-NET Developer Tool requires Microsoft .NET Framework 4 to be installed on your computer. The installer program will automatically detect and install .NET Framework 4 if it is not already installed.

Connect an Ethernet cable between the PC and the QLCP-NET and configure the computer's network adapter to be compatible with the QLCP's network settings (i.e. a static IP address on the same subnet as the QLCP). When you launch the QLCP-NET Developer Tool, you will see the following user interface.

Note: The QLCP-NET Developer Tool can be used offline for many of its features. Features that require connection to the QLCP-NET will be disabled when there is no established connection.

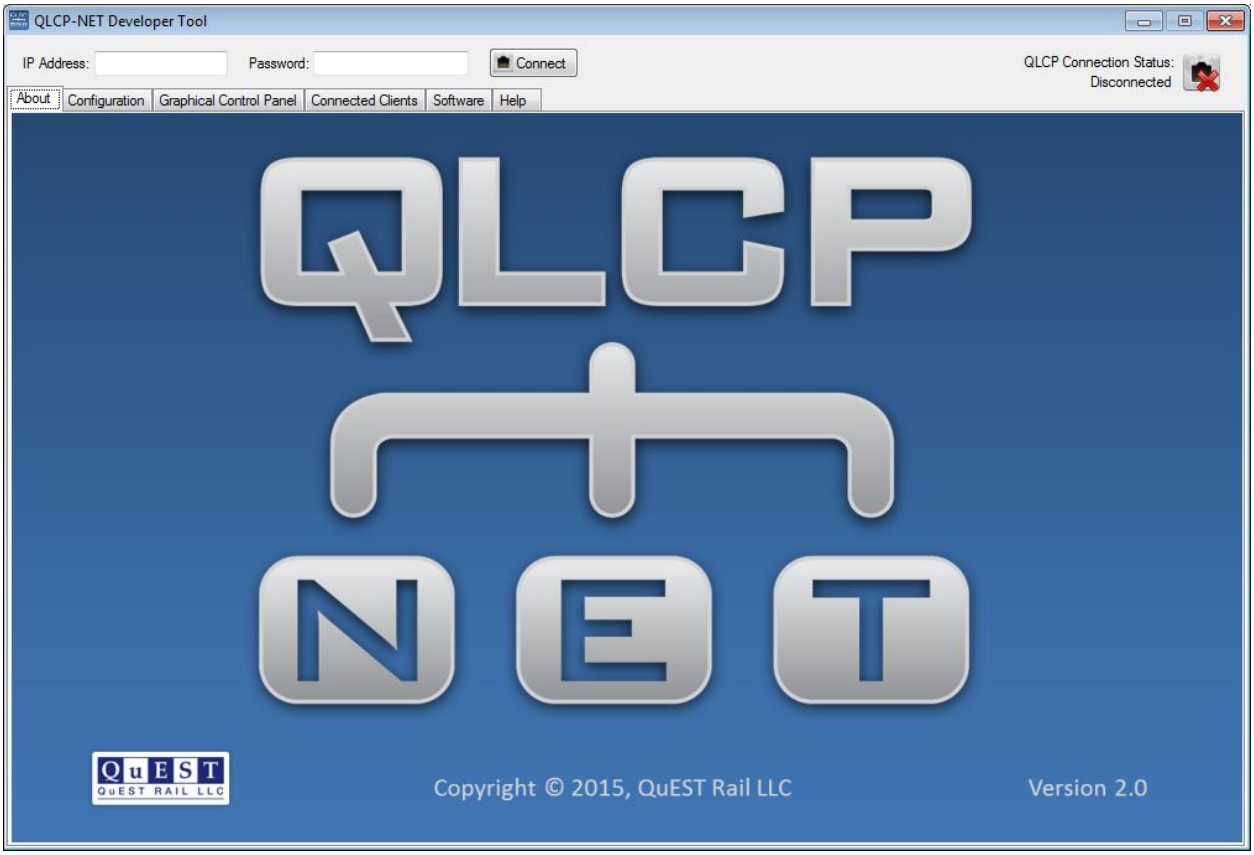


Figure 8

Enter the IP Address and Password of the QLCP and then click on the Connect button. The default password is "password". You should see the connection status change to a green checkmark with ping information as shown below. *Note: If you don't know the IP address of your QLCP, you will have to use the System Configuration Port terminal interface to find out what it is. The default IP address is 192.168.0.100.*

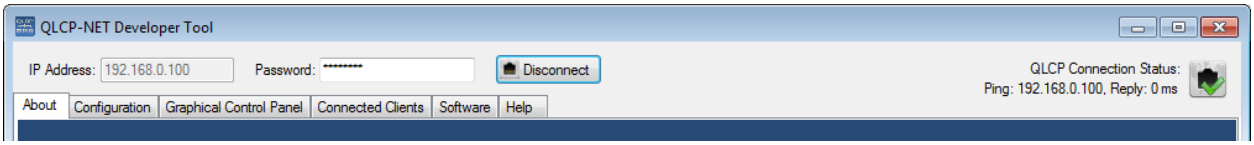


Figure 9

Note: If you cannot establish a connection, disable your Windows firewall and/or check the Windows rules for incoming/outgoing messages. Also, try to run the QLCP-NET Developer Tool application as administrator (right-click on the desktop icon and select "Run as administrator").

Click on the Configuration tab and you should see the current settings for the QLCP as shown in the example below. When a configuration file is loaded and/or created using the tool, differences will be highlighted.

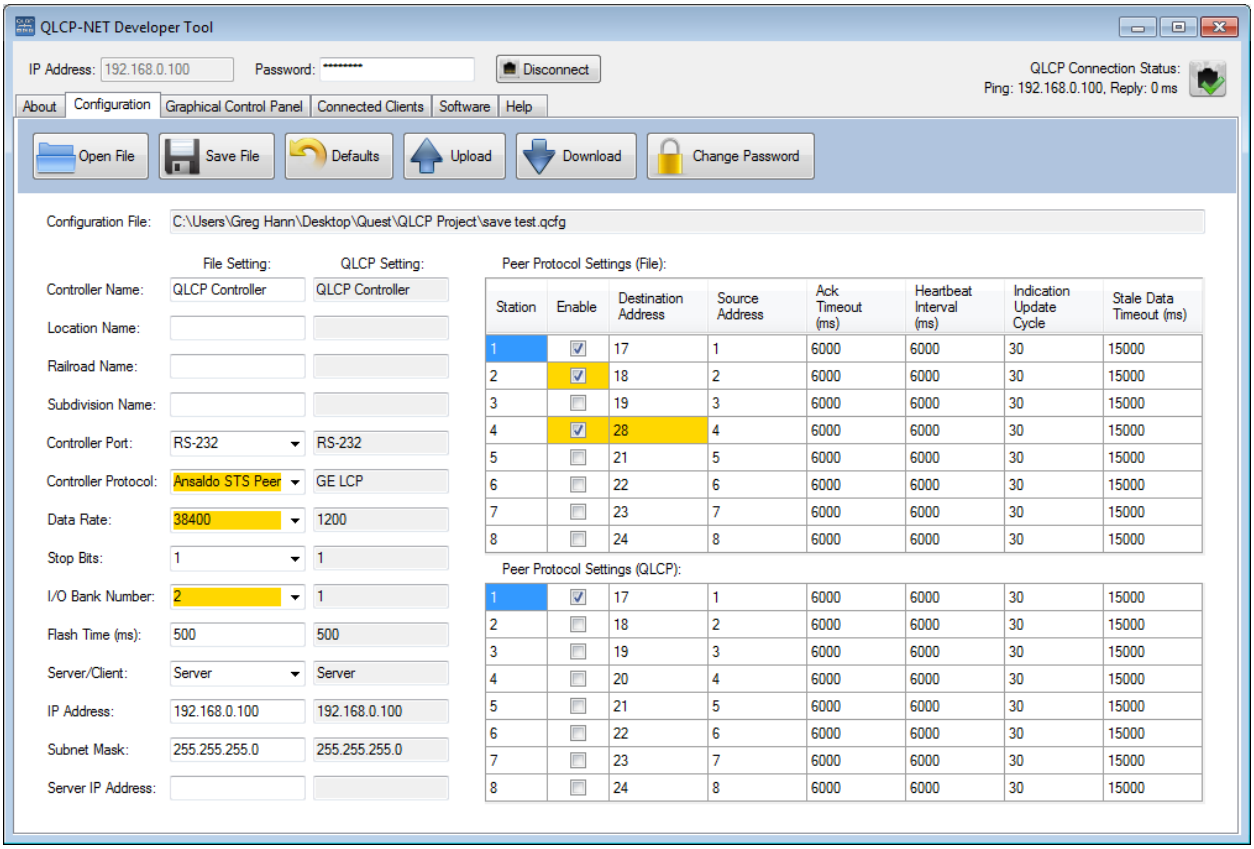


Figure 10

Changing settings starting with defaults:

- Click on the Defaults button to load the default values
- Modify File Setting values
- Click on the Save File button to save the configuration file
- Click on the Upload button to upload the saved configuration file to the QLCP

Changing settings starting with the current QLCP settings:

- Click on the Download button to download the current settings and save them to a file
- Click on the Open File button to load the current values for modification

- Modify File Setting values
- Click on the Save File button to save the configuration file
- Click on the Upload button to upload the saved configuration file to the QLCP

Changing settings using an existing (saved) configuration file:

- Click Open Settings button to locate and open the saved QLCP Config File (*.qcfg)
- The configuration file location and name will be shown in the Configuration File section below the Buttons section
- Click on the Upload button to upload the saved configuration file to the QLCP

Changing settings by modifying an existing (saved) configuration file:

- Click on the Open File button to load a saved configuration file
- Modify File Setting values
- Click on the Save File button to save the configuration file
- Click on the Upload button to upload the saved configuration file to the QLCP

To change the QLCP-NET password, click on the Change Password button. Enter the current password, the new password, and a confirmation of the new password.

Location Information

Location information is optional text that can be entered for the purposes of more easily identifying a QLCP, particularly when accessing its Graphical Control Panel via a web browser.

Location information includes the following:

- Controller Name
- Location Name
- Railroad Name
- Subdivision Name

Serial Port Settings

Setting Name	Possible Values	Default Value	Description
Controller Port	RS-232, RS-485, CLI, Disabled	CLI	The physical interface of the QLCP that is used for communications with the interlocking controller.
Controller Protocol	Alstom LCP, Hitachi STS Peer, Genisys, Genisys-UDP, None	Alstom LCP	The protocol that is used for communications with the interlocking controller. When set to “None”, the Controller port is automatically set to “Disabled”.
Data Rate	1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600	1200	Data rate (bits per second) of communications with the interlocking controller
Stop Bits	1, 2	1	The number of stop bits appended to the end of each transmitted byte

Figure 11

I/O Settings

Setting Name	Possible Values	Default Value	Description
I/O Bank Number	1, 2, 3, or 4	1	The QLCP's internal memory map is divided into 4 banks to support 512 inputs and 512 outputs; however, there are only 128 physical inputs and 128 physical outputs on the QLCP. The remaining inputs and outputs are used for expansion (QLCP-NET Only). The QLCP will read its 128 physical switch inputs and store them in this Bank Number. The QLCP will drive its 128 physical LED outputs to the states stored in this Bank Number. Bank Numbers are defined as follows: Bank 1 = bits 1 to 128 Bank 2 = bits 129 to 256 Bank 3 = bits 257 to 384 Bank 4 = bits 385 to 512
Flash Time (ms)	100 – 5000	500	The on/off time for flashing outputs. This feature is only available when using Peer protocol. See Peer Protocol Settings below.

Figure 12

Network Settings (QLCP-NET Only)

To configure the QLCP network settings, first select the role of the QLCP (Server or Client). Then enter the QLCP's IP Address and Subnet Mask values. If the QLCP is a Client, enter the Server IP Address.

Setting Name	Possible Values	Default Value	Description
Server/Client	Server, Client	Server	Defines the role of the QLCP Controller (Server or Client)
IP Address	Any valid IP address	192.168.0.100	The IP Address for this QLCP Controller
Network Subnet Mask	Any valid subnet mask	255.255.255.0	The Subnet Mask for this QLCP Controller
Server IP Address	Any valid IP address	N/A	The IP Address for the Server QLCP Controller (if applicable)

Figure 13

Peer Protocol Settings

Up to eight Peer stations can be configured for the QLCP. The first four Peer stations are mapped to internal I/O Bank Numbers 1 through 4, respectively. Peer stations 5 through 8 are flash enable states for the LED outputs of Bank Numbers 1 through 4, respectively. The following table shows the bit mapping for Peer Stations.

Peer Station	Bank Number	Internal Bit Numbers (QLCP Memory Map)
1	1	1 – 128 In (local and/or client switch inputs)
1	1	1 – 128 Out (local and/or client LED outputs)
5	1	1 – 128 Out Flash Enable (local and/or client LED outputs)
2	2	129 – 256 In (local and/or client switch inputs)
2	2	129 – 256 Out (local and/or client LED outputs)
6	2	129 – 256 Out Flash Enable (local and/or client LED outputs)
3	3	257 – 384 In (local and/or client switch inputs)
3	3	257 – 384 Out (local and/or client LED outputs)
7	3	257 – 384 Out Flash Enable (local and/or client LED outputs)
4	4	385 – 512 In (local and/or client switch inputs)
4	4	385 – 512 Out (local and/or client LED outputs)
8	4	385 – 512 Out Flash Enable (local and/or client LED outputs)

Figure 14

Flash Feature

Use Peer stations 5 through 8 if you would like the QLCP to handle flashing instead of the interlocking controller's application logic. For these Peer stations, when the QLCP receives a bit equal to one, it flashes the associated LED bit, if it is also equal to one, at the configured flash rate (see Flash Time in I/O Settings).

Example: If Peer station 1, bit 1 is true and Peer station 5, bit 1 is true, LED output 1 will flash.

The following table describes the configurable settings for each of the eight Peer stations.

Setting Name	Possible Values	Default Value	Description
Enable	Enabled or Disabled	Station 1 = Enabled Station 2 = Disabled Station 3 = Disabled Station 4 = Disabled Station 5 = Disabled Station 6 = Disabled Station 7 = Disabled Station 8 = Disabled	Setting to enable or disable the use of the Peer Station
Destination Address	0 – 65535	Station 1 = 17 Station 2 = 18 Station 3 = 19 Station 4 = 20 Station 5 = 21 Station 6 = 22 Station 7 = 23 Station 8 = 24	The destination address of the Station
Source Address	0 – 65535	Station 1 = 1 Station 2 = 2 Station 3 = 3 Station 4 = 4 Station 5 = 5 Station 6 = 6 Station 7 = 7 Station 8 = 8	The source address of the Station
Acknowledge Timeout (ms)	50 – 60,000	6,000 (all stations)	The time in milliseconds that a sending peer protocol station will wait for an acknowledgement after sending a message that requires acknowledgement
Heartbeat Interval (ms)	100 – 600,000	6,000 (all stations)	The rate at which a peer protocol station attempts to communicate with its peer when no changes are occurring in its serial output bits
Indication Update Cycle	1 – 100	30 (all stations)	The rate at which a peer protocol station sends indication update messages to its peer when no changes are occurring in the serial outputs for the station; this rate is defined in

Setting Name	Possible Values	Default Value	Description
			terms of Heartbeat Intervals. For example, the default is 30 x 6,000 ms = 180 s. On the other 29 Heartbeat Intervals, status messages with no indication data are sent.
Stale Data Timeout	500 – 600,000	15,000 (all stations)	The time interval after which a communication failure is declared when a peer protocol station receives no indication data or status messages from its peer

Figure 15

Genisys Protocol Settings

Up to 512 Genisys control bits (64 control words) and 512 Genisys indication bits (64 indication words) can be used with the QLCP. These bits are mapped to internal I/O Bank Numbers 1 through 4 as shown in the table below.

Bank Number	Internal Bit Numbers (QLCP Memory Map)
1	1 – 128 In (local and/or client switch inputs)
1	1 – 128 Out (local and/or client LED outputs)
2	129 – 256 In (local and/or client switch inputs)
2	129 – 256 Out (local and/or client LED outputs)
3	257 – 384 In (local and/or client switch inputs)
3	257 – 384 Out (local and/or client LED outputs)
4	385 – 512 In (local and/or client switch inputs)
4	385 – 512 Out (local and/or client LED outputs)

Figure 16

The following table describes the configurable settings for Genisys.

Setting Name	Possible Values	Default Value	Description
Slave Address	1-255	1	The unit address of the interlocking controller. *Note that the QLCP is the Genisys master and the interlocking controller is the Genisys slave.*
Control Words	1-64	16	The number of 8-bit control words that are sent in a full control message from the QLCP to the interlocking controller.
Poll Interval (ms)	200-5000	500	The time between poll messages continually sent from the QLCP to the interlocking controller.

Figure 17

7 Genisys Flash Feature

Background

When using Genisys protocol and physical LEDs for indications, it was possible for the flash rates for individual indications to be out of sync. This feature utilizes the QLCP software to meter the rate of the flashing indications instead of the Genisys message.

Enabling the Flash Bits

To enable the QLCP flash bit control. Enable the "Use Flash Bit" setting in the QLCP-NET Development Tool configuration as shown below. The flash enable is stored in the .qcfg configuration file.

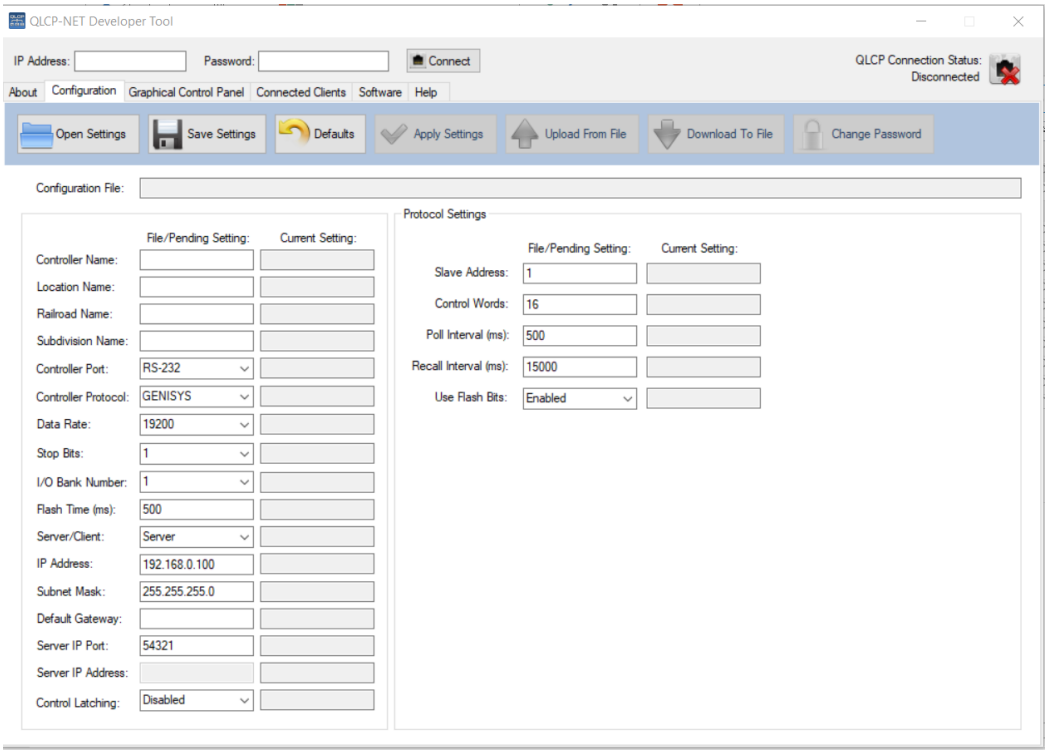


Figure 18

QLCP Genisys Flash Bit Operation

When this “Flash Bit” feature is enabled, the QLCP will use bits 513-1024 as the flash enable bits.

Example – LED1 is wired to QLCP output 1, to turn LED1 on solid, indication 1 must be true. To flash LED1, indication 1 and indication 513 must be true. The flash rate is as configured in the “Flash Time” setting in the configuration. Default is 500ms.

Note: This changes the flash operation only for physical indications. Graphical Control Panel flash rates are configured and controlled in the .cpf file.

To flash QLCP output 2, indication 2 and indication 514 must be true, etc.

8 Graphical Control Panel

The QLCP-NET provides the option to interface to its internal I/O map (512 inputs and 512 outputs) through a web-based graphical panel. This feature is only supported when the QLCP is configured as a Server. Use the QLCP-NET Developer Tool to create a custom graphical control panel to upload to the QLCP. Using a web browser, enter the QLCP’s IP address as the URL, and the QLCP will serve the panel page.

For more information on the QLCP-NET Graphical Control Panel, refer to the QLCP-NET Graphical Control Panel User Manual (095-110006-0004). www.questrail.com/qlcp

9 Genisys over Ethernet (UDP)

Background

This feature allows for Genisys protocol communication over a UDP Ethernet connection, eliminating the need for the serial connection between the QLCP-NET board and the vital controller.

Configuring the QLCP-NET for Genisys over Ethernet (UDP)

To enable the Genisys over Ethernet, choose GENISYS-UDP in the Controller Protocol setting using the QLCP-NET Development Tool as shown below in Figure 1.

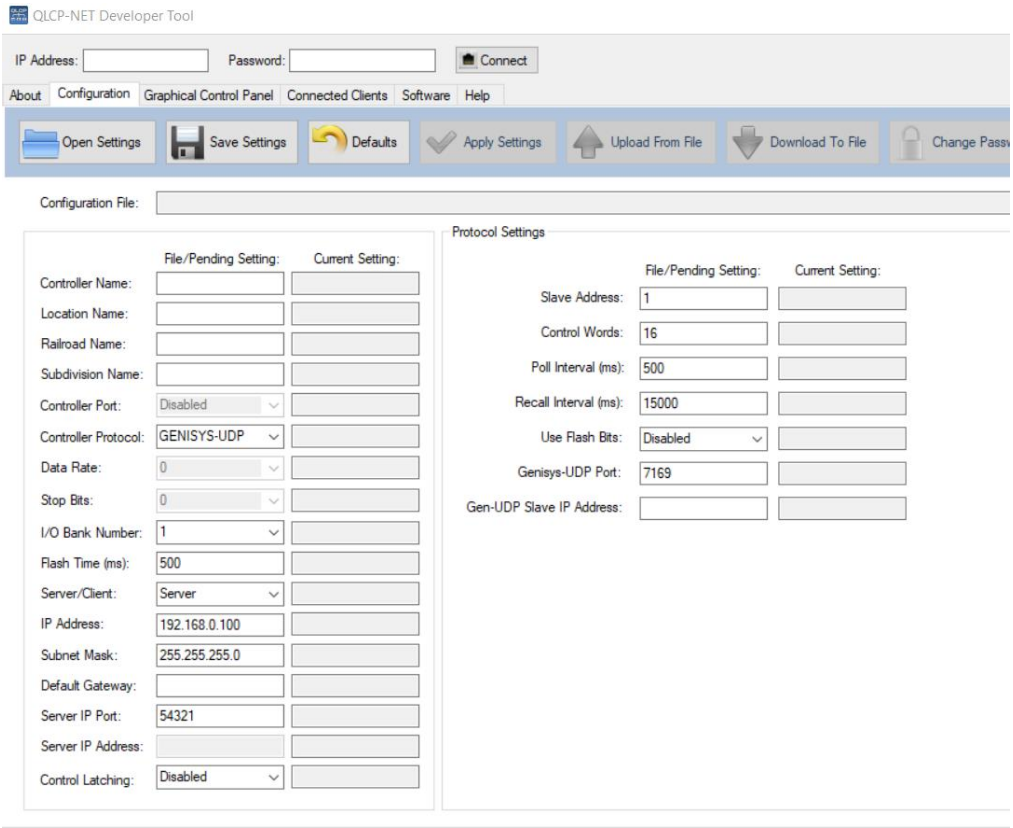


Figure 19

Notice the Controller Port is now disabled. Connect the QLCP-NET to the Vital Processor using a standard Ethernet cable.

Enter the IP address of the Vital Processor in the Gen-UDP Slave IP Address section of the Protocol Settings as shown below in Figure 2.

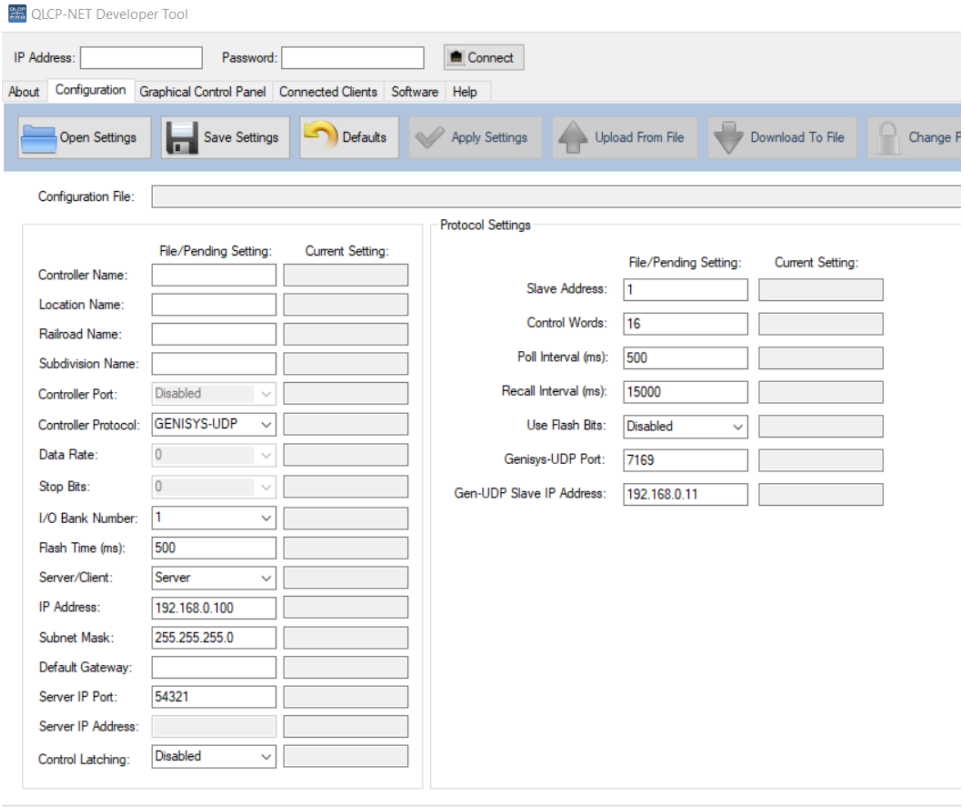


Figure 20

Application Example - LCP for the Alstom ElectroLogIXS

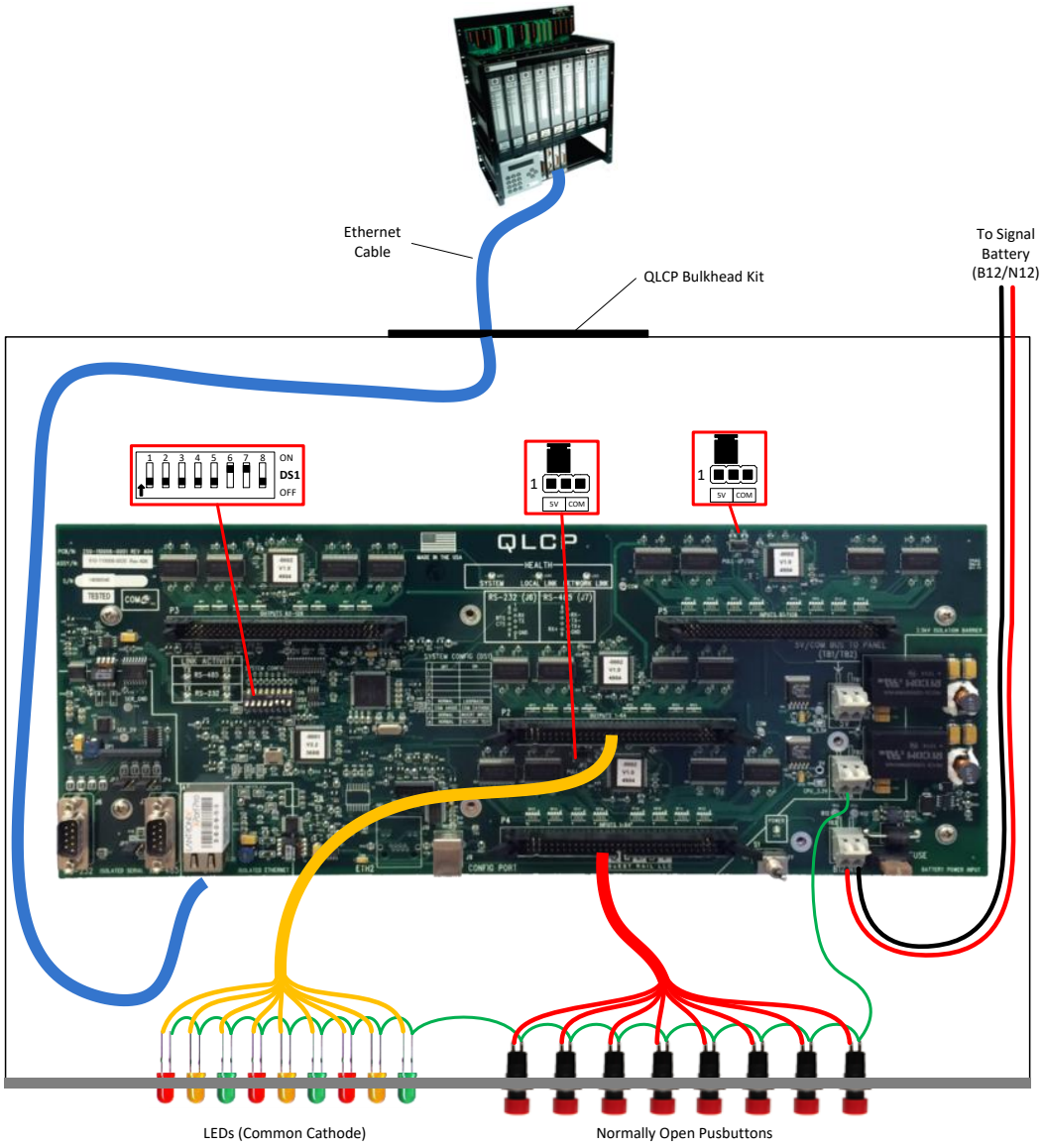


Figure 32

Gen-UPD Software Version Requirements

Updated QLCP Executive, Network, and QLCP-NET Developer Tool software is required for this feature to be functional. Software later than the below versions support this feature.

Visit www.questrail.com/qlcp to download the latest software.

- QLCP Network Software v1.08
- QLCP Executive Software v2.28
- QLCP-NET Developer Tool v3.21

QLCP-NET Software Version Notes

NOTE: If using a QLCP-NET Developer Tool version before 3.21, GENISYS-UDP will not be available in the Controller Protocol drop down window.

NOTE: If using QLCP-NET Developer Tool version 3.21 or later on a QLCP-NET board with software before QLCP Network SW v1.08 or QLCP Executive SW v2.28, the GENISYS-UDP will not be available in the Controller Protocol drop down window and the below will be displayed after connecting the QLCP-NET Developer Tool to the QLCP-NET.

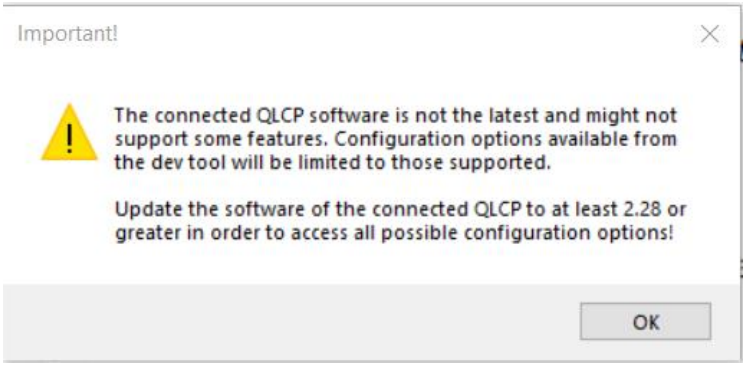


Figure 21

10 Application Examples

LCP for the Alstom ElectroLogIXS

Note that an older QLCP version without the CLI is shown. The CLI can also be used for this application.

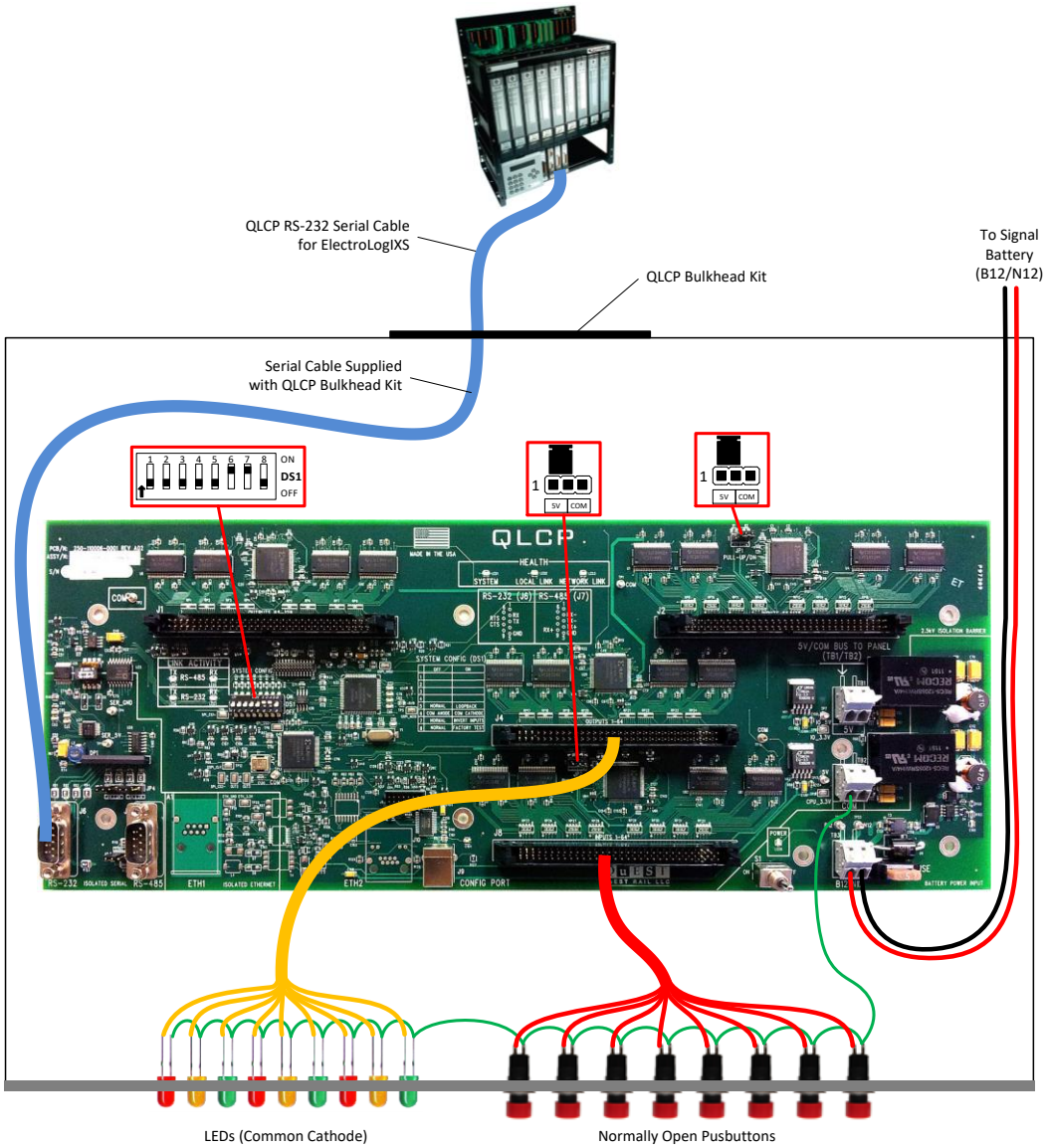


Figure 22

LCP for the Alstom ElectroLogIXS with Duplication

Note that an older QLCP version without the CLI is shown. The CLI can also be used for this application.

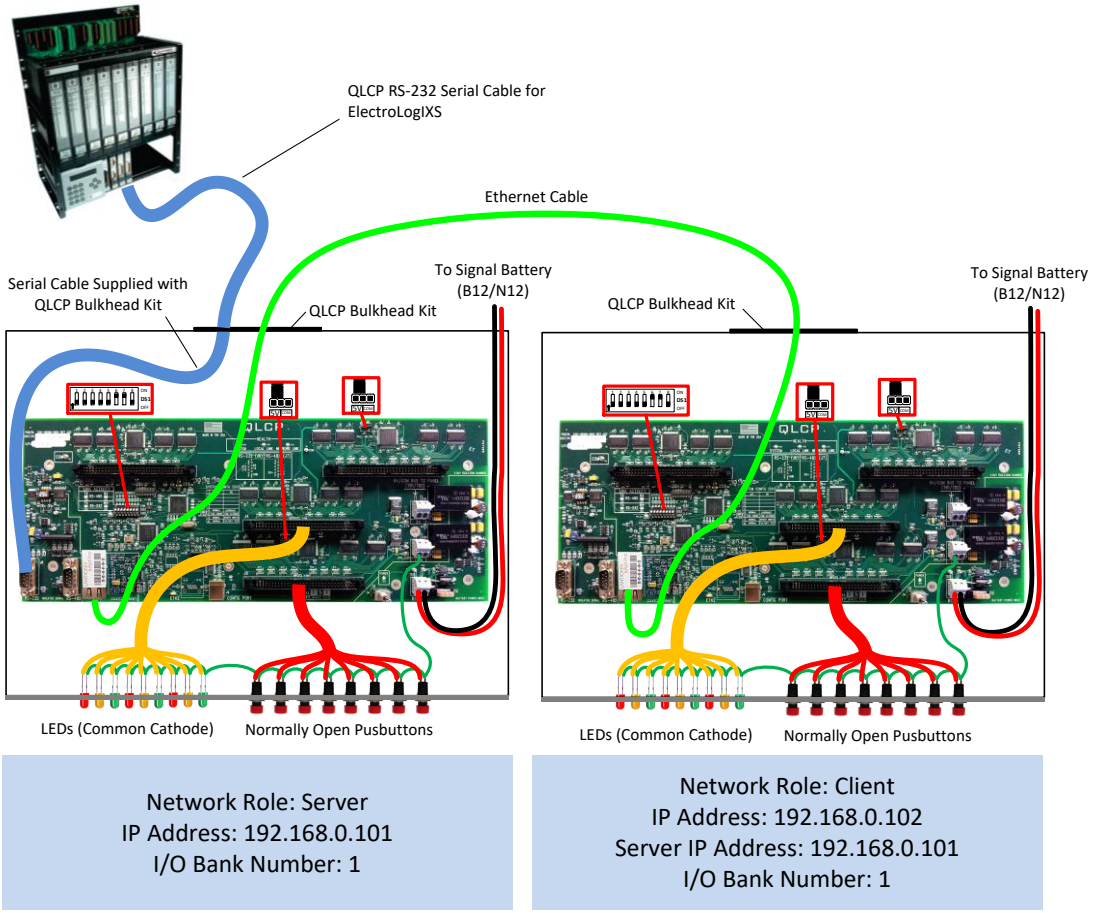


Figure 23

LCP for the Hitachi STS MicroLok II

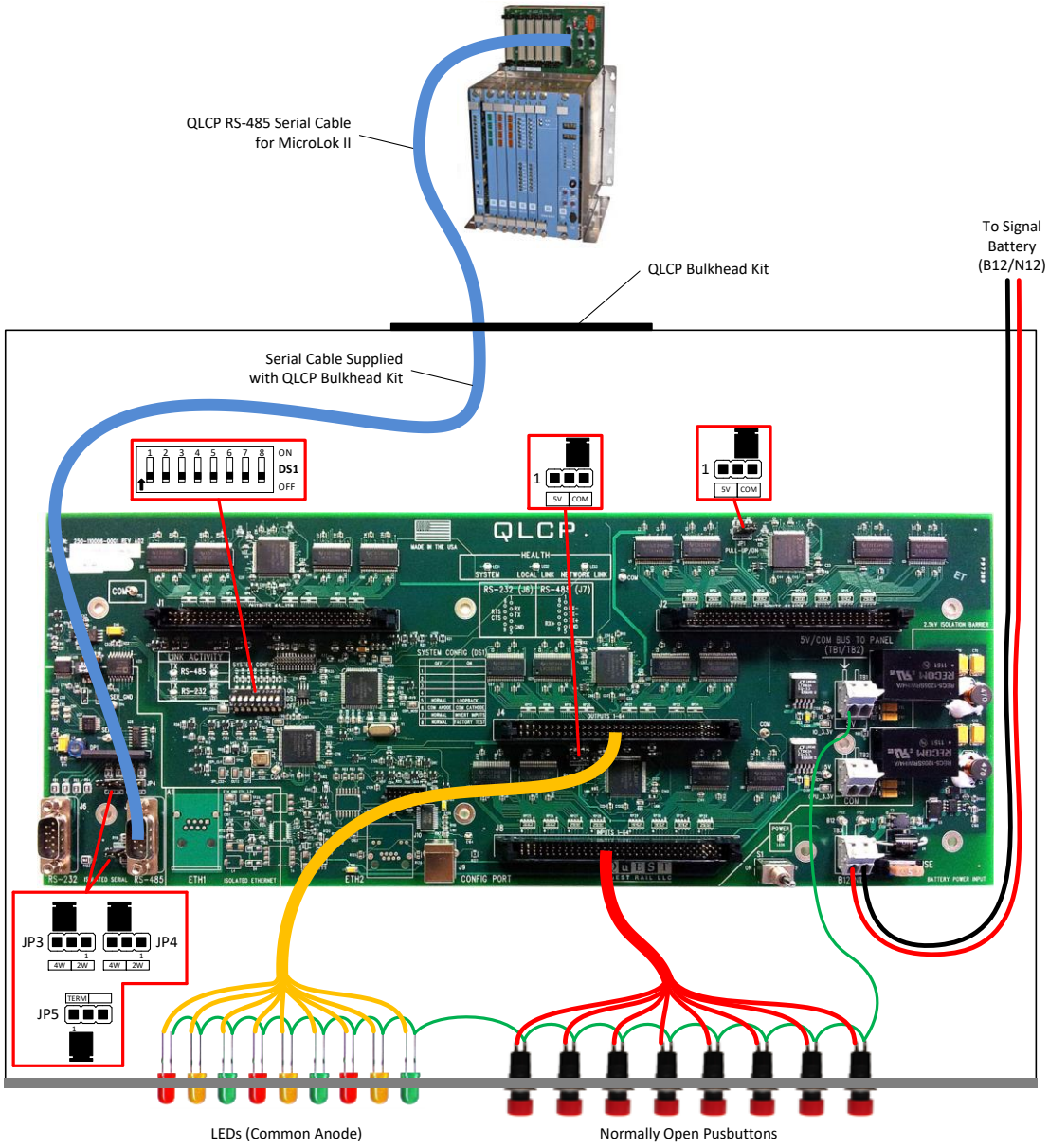


Figure 24

LCP for the Hitachi STS MicroLok II with Expansion and Duplication

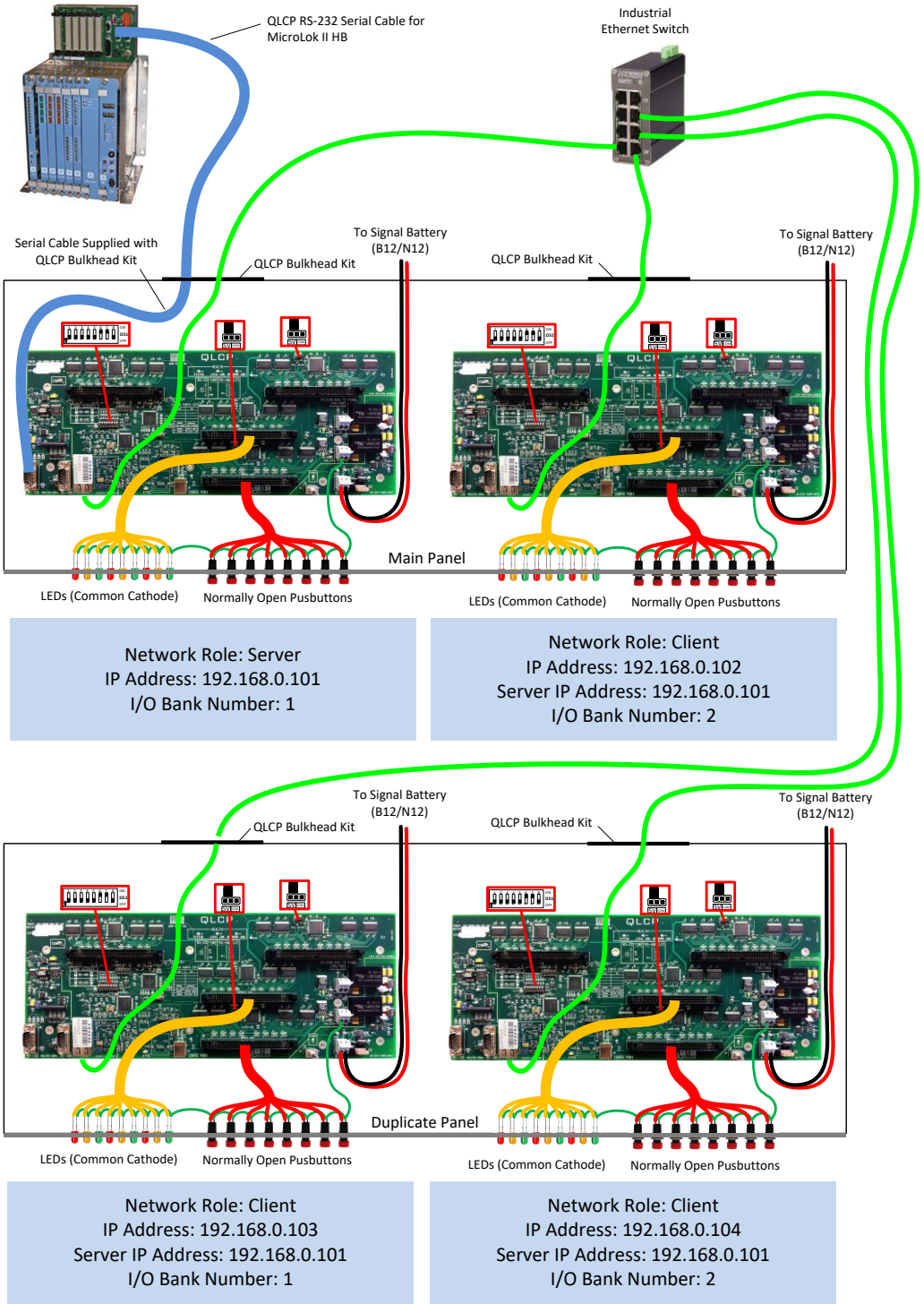


Figure 25

LCP for the Alstom VHLC

The application of the QLCP when used with an Alstom VHLC is very similar to the application examples shown above for the ALSTOM ElectroLogIXS.

To interface the QLCP with a VHLC, you may use the Current Loop Adapter (CLA), RS-232 or RS-485 serial port module on Port E of the VHLC. There is no special software configuration/setting required by the VHLC for any of those interfaces. In fact, it is completely transparent to the VHLC as to whether a CLA, RS-232, or RS-485 module is installed on port E.

11 Updating QLCP Software

Update the QLCP software using the QLCP-NET Developer Tool. The Software interface is shown below. There are three buttons for updating the software:

- Update Executive SW (QLCP and QLCP-NET)
- Update Network SW (QLCP-NET only)
- Update Web GUI SW (QLCP-NET only)

The current versions of the Executive Software and Network Software are shown in the button bar of the Software tab (shown below). The current version of the Web GUI Software is shown in the footer of the web page when the Graphical Control Panel is displayed in a web browser.

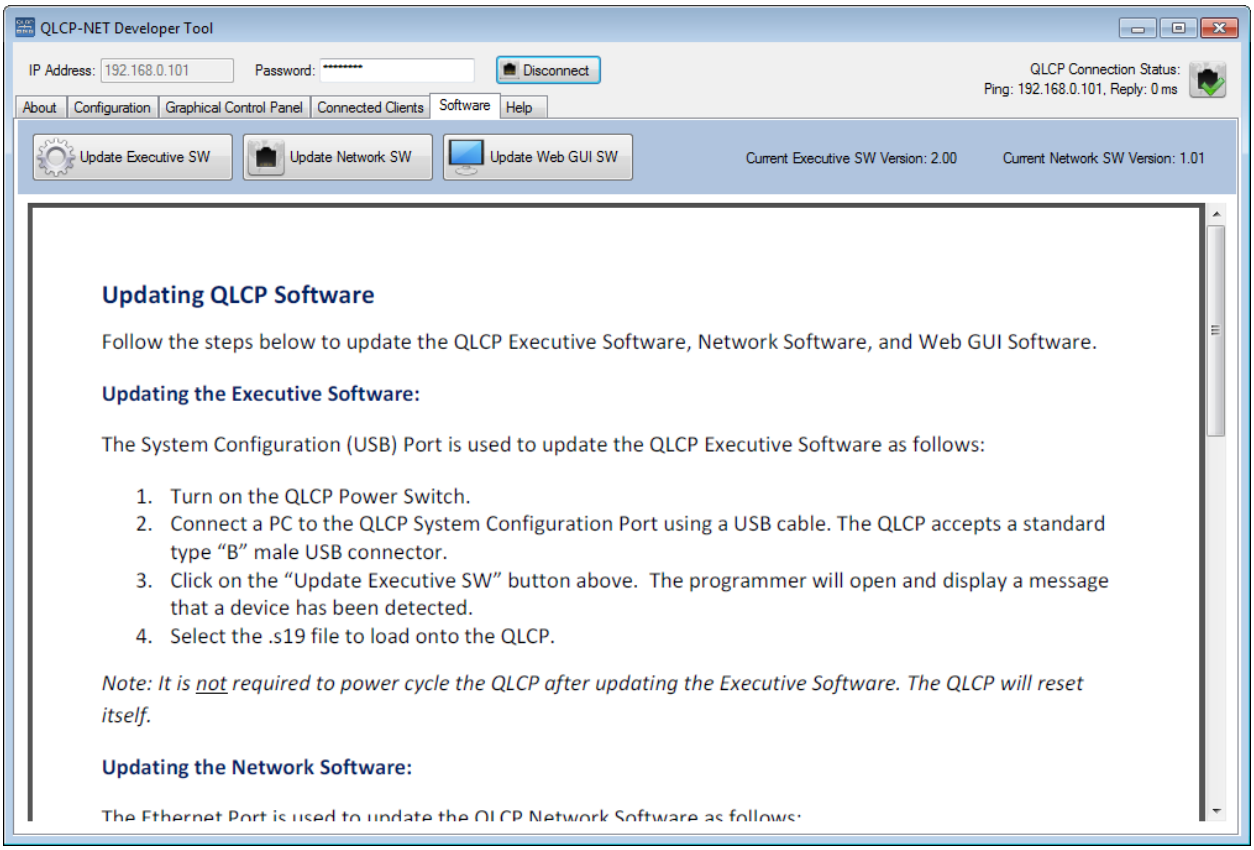


Figure 26

Follow the steps below (which are also provided in the tool interface) to update the QLCP Executive Software, Network Software, and Web GUI Software.

Warning! *If it is required to update both the Executive and Network software, update the Network software first.*

Updating the Executive Software:

The System Configuration (USB) Port is used to update the QLCP Executive Software as follows:

1. Turn on the QLCP Power Switch.
2. Connect a PC to the QLCP System Configuration Port using a USB cable. The QLCP accepts a standard type "B" male USB connector.
3. Click on the "Update Executive SW" button. The programmer will open and display a message that a device has been detected.
4. Select the .s19 file to load onto the QLCP.

Note: It is not required to power cycle the QLCP after updating the Executive Software. The QLCP will reset itself.

Updating the Network Software:

The Ethernet Port is used to update the QLCP Network Software as follows:

1. Turn on the QLCP Power Switch.
2. Connect a PC to the QLCP-NET Ethernet Port using an Ethernet cable (*Note: It is recommended to perform this update through a direct connection to ensure a successful, uninterrupted transfer of the image*).
3. Enter the QLCP's IP address and password and then click on the "Connect" button.
4. Click on the "Update Network SW" button.
5. Select the .img file to upload to the QLCP-NET.

Note: It is required to power cycle the QLCP after updating the Network Software.

Updating the Web GUI Software:

The Ethernet Port is used to update the QLCP Web GUI Software as follows:

1. Turn on the QLCP Power Switch.

2. Connect a PC to the QLCP-NET Ethernet Port or network using an Ethernet cable.
3. Enter the QLCP's IP address and password and then click on the "Connect" button.
4. Click on the "Update Web GUI SW" button.
5. Select the .zip file to upload to the QLCP-NET.

Note: It is not required to power cycle the QLCP after updating the Web GUI Software.

12 Troubleshooting

For troubleshooting purposes, the QLCP offers the following:

- Message Traffic Monitor (in the System Configuration Port Terminal Interface)
- Connected Clients Tab (in the QLCP-NET Developer Tool)
- Status LEDs
- Help Tab (in the QLCP-NET Developer Tool)

Message Traffic Monitor

The Message Traffic Monitor is an option in the System Configuration Port Terminal Interface menu that displays serial message traffic between the QLCP and the interlocking controller. This feature can be used to determine whether communications between the QLCP and the interlocking controller is functioning correctly.

Connected Clients Tab

For a QLCP-NET configured as a Server, this tab in the QLCP-NET Developer Tool displays the connected Client QLCPs. This can be helpful in troubleshooting connectivity issues between QLCP Clients and their Server.

Status LEDs

The QLCP has several status LEDs that provide status information. The following LEDs can be used for troubleshooting:

- Power LED
- System Health LED
- Local Link Health LED
- Network Link Health LED
- Link Activity TX and RX LEDs for CLI, RS-232, and RS-485
- Network Port LEDs

Help Tab

In the QLCP-NET Developer Tool Help tab, you can mouse over the QLCP image to identify user interfaces and other points of interest. Tool tips pop up providing brief descriptions. To learn more, click on the point of interest.

Click on the User Manual button to access this manual.

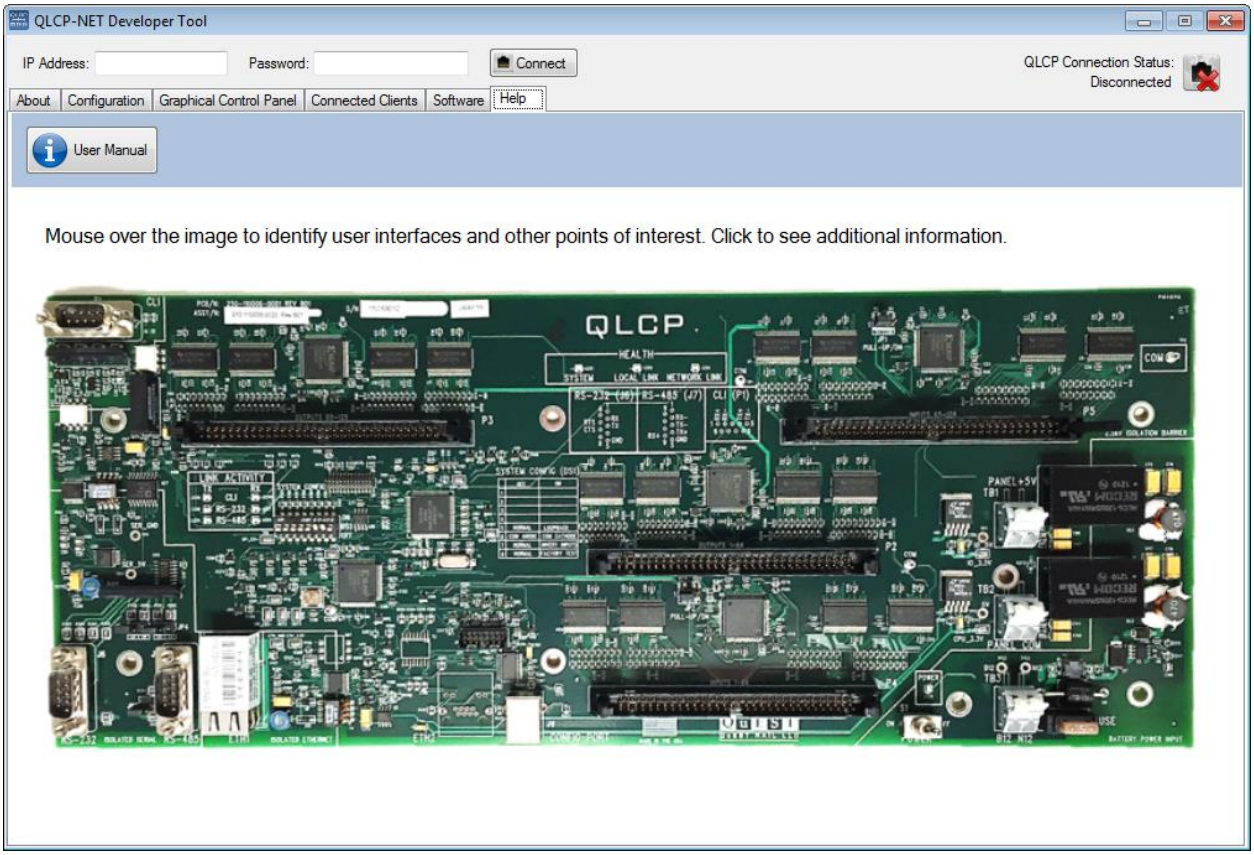


Figure 27

13 For Reference

Local Control Serial Port (Isolated Current Loop Interface)

The CLI serial interface (DB9 male connector P1) pin-out is shown below.

Pin	Signal
1	RXD+
2	RXD-
4	TXD+
5	TXD-

Figure 28

Local Control Serial Port (Isolated RS-232)

The RS-232 serial interface (DB9 male connector J6) conforms to the standard as called out for DTE (Data Terminal Equipment) devices. The pin-out for this connector is shown below. *Note: Flow control is currently not implemented.*

Pin	Signal
2	RXD
3	TXD
5	GND
7	RTS
8	CTS

Figure 29

Local Control Serial Port (Isolated RS-485)

The RS-485 serial interface (DB9 male connector J7) can operate in two-wire mode (half-duplex) or four-wire mode (full-duplex). The RS-485 interface is asynchronous, meaning that no clock is present. The pin-out for this connector is shown below. *Note: The RS-485 interface must be configured for four-wire mode for ALSTOM LCP and PEER protocols.*

Pin	Signal
2	RX-
3	TX-
4	TX+
5	SR
9	RX+

Figure 30

Bit Mapping

Bit Name (To Interlocking Controller)	QLCP/QLCP-NET		Bit Name (To Interlocking Controller)	QLCP/QLCP-NET
Control 1	Unassigned		Indication 1	Unassigned
Control 2	Unassigned		Indication 2	Unassigned
Control 3	Unassigned		Indication 3	Unassigned
Control 4	Unassigned		Indication 4	Unassigned
Control 5	Unassigned		Indication 5	Unassigned
Control 6	Unassigned		Indication 6	Unassigned
Control 7	Unassigned		Indication 7	Unassigned
Control 8	Unassigned		Indication 8	Unassigned
Control 9	Dip 1*	*LCP Protocol Only / Unassigned others	Indication 9	Unassigned
Control 10	Dip 2*		Indication 10	Unassigned
Control 11	Dip 3*		Indication 11	Unassigned
Control 12	Dip 4*		Indication 12	Unassigned
Control 13	Dip 5*		Indication 13	Unassigned
Control 14	Dip 6*		Indication 14	Unassigned
Control 15	Dip 7*		Indication 15	Unassigned
Control 16	LCP Health*		Indication 16	Unassigned
Control 17-512	Unassigned		Indication 17-512	Unassigned
			513-1024	Genisys Flash Feature

Figure 31