

QD2040b

Ubiquity Cloud Site Gateway

The QD2040b Ubiquity Cloud Site Gateway connects the site controller network with the Ubiquity Cloud™ server.



TCS

Features

- Site gateway to Ubiquity Cloud: enables controller's interoperability with Ubiquity Cloud
- Enables Ubiquity Cloud to maintain controller programming and scheduling
- Compatible with all TCS Basys supported controllers
- Controller protocols supported: TCSbus and Modbus
- Supervisory control routines
- Supervisory override strategy
- Auto discovery of networked controllers
- Two integrated RS-485 serial ports
- Additional serial ports can be added via USB ports
- Integrated Ethernet controller with firewall
- Integrated configuration web page
- User adjustable controller monitoring rate
- Remotely upgradeable gateway software

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Material List

- **QD2040b Ubiquity Cloud Site Gateway**
- **External Power Supply**
- **Wall Mounting Bracket**

Factory IP Network Address Configuration

The QD2040b is typically ordered pre-programmed to customer specific networks and no additional software configuration is required. This is the preferred purchasing method.

If a QD2040b was purchased without pre-programming it will be shipped with DHCP client enabled. The configuration page is available through a browser for additional configuration of the QD2040b local IP address. Contact your network administrator to determine the local IP address (refer to the MAC address available on the product label).

Mounting

The QD2040b is designed to be hung on a wall using the included mounting bracket and mounting screws. It may also be set on a shelf or table. Do not allow the mounting screws to touch the circuit board inside the enclosure.

When selecting a location to mount the QD2040b, be sure to allow space for cable connections. Locate the QD2040b away from excessive dust, heat sources, moisture, or direct sunlight. The ideal environment is a server room. The temperature of the room cannot exceed 77°F (25°C), good ventilation is mandatory.

Connections

COM 1-2: Connect an RS-485 Network (Refer to RS-485 Controller Network Wiring & Setup below)

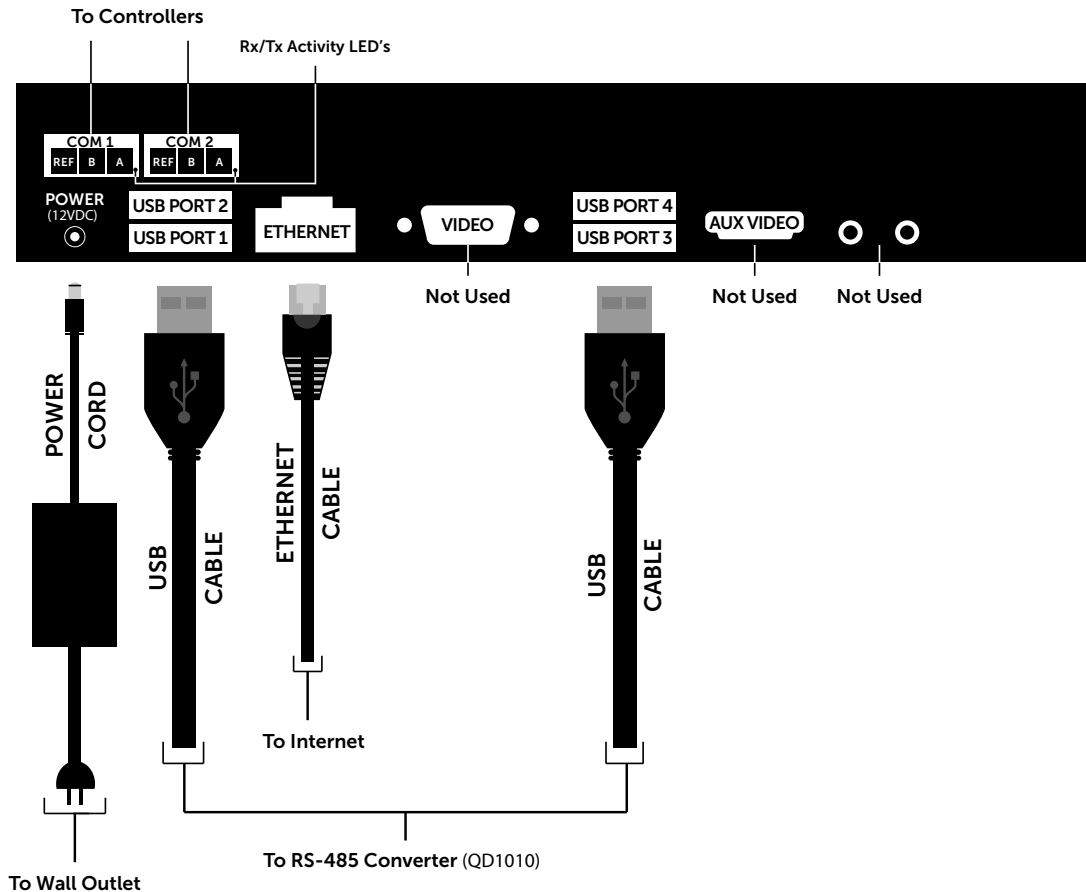
USB PORT 1-4: Connect an RS-485 Network via a USB to RS-485 converter (QD1010), or connect a TCS ZigBee network via a wireless gateway (QW1010). Refer to RS-485 Controller Network Wiring & Setup below.

Power: Attach the included power supply to the back unit and insert the power plug into a 120 VAC socket. Upon connection the unit may power up automatically. If it does not, press the power button.

Ethernet: Connect an Ethernet cable to the specific port on the specified switch on the LAN (this information is determined by your local network administrator or IT department). If a cellular modem is used, connect the Ethernet cable to the Ethernet port on the Cellular Modem.

Remaining connections are unused and should not be plugged in.

QD2040b Connections Diagram



RS485 Controller Network Wiring and Setup

All controls connected to the network will need to be programmed with the same communication baud rate as well as a unique communication address from 0 to 255, excluding 248. On controllers with displays, this can either be done from the face of the controller using the keypad and display, or using TCS Insight software, or by calling TCS Technical Support. TCS Technical Support can access the QD2040b online and change the address of a controller.

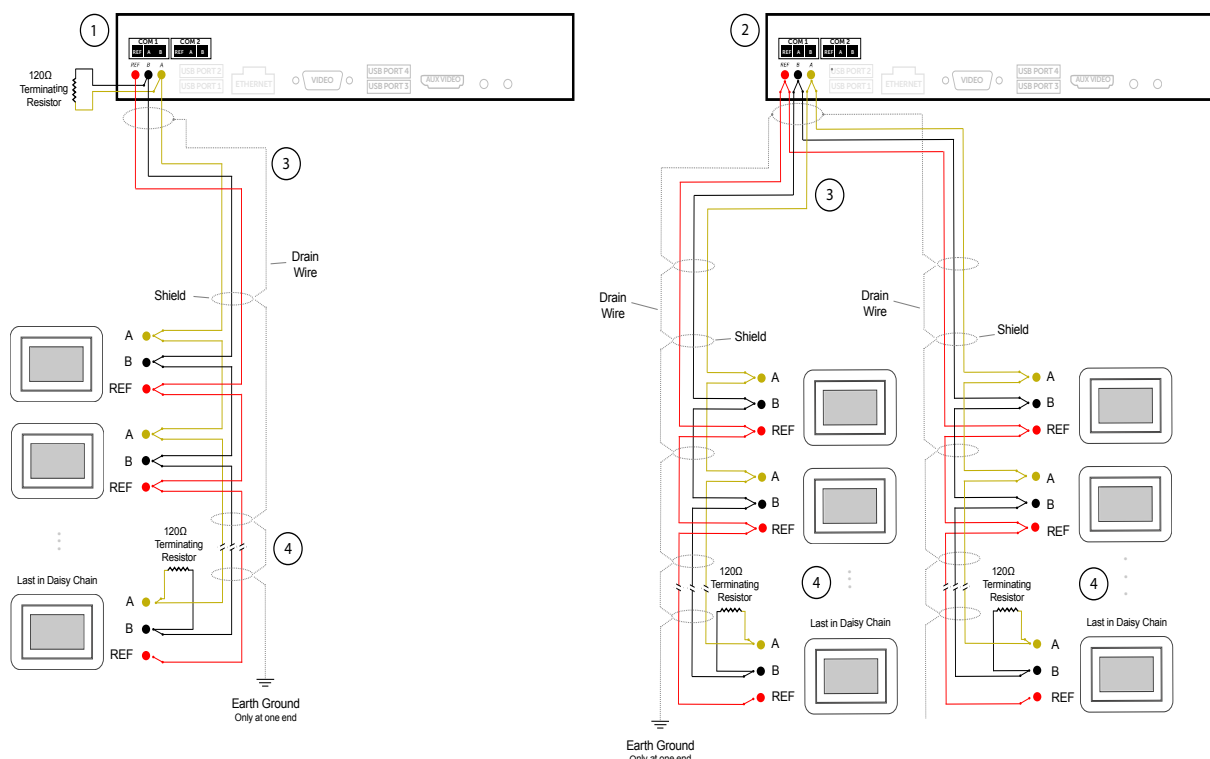
Use 22 AWG, twisted shielded 3-conductor cable for network wiring. Network wiring should start at one controller and go to the next and then go to the next, and so on until the final controller is reached. Wiring is such that all "A" wires are connected to "A" wires, all "B" wires are connected to "B" wires, and all "REF" wires are connected to "REF" wires.

A 120 Ω terminating resistor should be placed at each of the two ends of the network directly across the "A" and "B" wires. If the QD2040b will be at one end of the network, hard wired a 120 Ω terminating resistor across the "A" and "B" terminals at the QD2040b (See 1 below).

If the QD2040b will be in the middle of the network, do not wire in the terminating resistor on the QD2040b terminal block (See 2 below). Finally, connect one end (ideally the furthest end from the QD2040b) of the shield wire of the network wiring to earth ground. TCS recommends a 250 milliseconds time out period for all wired networks, and 1000 milliseconds for wireless networks. If you encounter timeout errors please contact tech support.

NOTE: In the middle of the network, all network wiring shields should be twisted together and taped off to prevent accidental grounding. More than one ground on the network wiring can result in communication failure.

NOTE: A maximum of 2 terminating resistors can be used. See Figure below.



- 1 QD2040b in the end of the network
- 2 QD2040b in the middle of the network
- 3 Shielded, twisted 3-conductor communications wiring with one end earth grounded. (120 Ω balancing resistors provided.)

- 4 Shielded, twisted 3-conductor communications wiring with one end earth grounded. (120 Ω balancing resistors provided.)

NOTES:

1. If using more than 64 controllers, use the second RS-485 port or additional QD1010 adapters.
2. Each controller must use the same baud rate and be assigned a unique address.

Gateway Configuration Page

Once you have made connection and have logged in you are able to configure the operation of the unit by selecting the proper parameters for your application. All Ubiquity Cloud application software and functionality is accessed by logging into the central server (www.ubiquitysystems.net) not by using this configuration page.

INSTALLATION INFORMATION

This section contains installer and site related information. The information entered here is sent to the central server when a site initially comes online to help identify the site to link it to the correct Ubiquity site. For the most part, this information is for reference purposes only, except for the Site Time. The Site Time is used by the local network and the QD2040b until the Ubiquity central server performs a time synchronization with the site.

NOTE: Be sure to set the correct Time zone so that the site will correctly adjust the time during future time synchronizations with the central server.

Once you are finished entering information in this section, click the Update Installation Info button.

The screenshot shows the 'Installation Information' form with the following sections and data:

- Contractor Contact:** Installer Name: Controls Installer; Installer Contact Phone Number: 1-800-288-9383
- Identity:** Model: QD2040; Application Version: 07:05:00; Submodel: QD2040a; Java Version: 1.6.0_75; Hardware Version: AAA; OS: tq0015; MAC: 00:1F:7B:00:09:19; OS Version: 7.0; Serial Number: 049600001000001; Site Name: TCS BasyS Controls
- Location:** Address Line 1: 2800 Laura Lane; Address Line 2: ; Country: UNITED STATES; State: WI; City: Middleton; Zip: 53562
- Site Time:** Wait up to two minutes for the values to change. Current Time: 10:57 AM on January 26, 2015. Timezone: Central Time (US & Canada). A green 'Update Installation Info' button is at the bottom.

APPLICATION INFORMATION

This section contains settings which define how the QD2040b interacts with the controller network, and how it communicates the data to the actual server.

Application Options: You must select a Network Polling Cycle Time for the QD2040b. This is the time interval that the unit will poll the entire network of controllers on all ports. The default setting is 1 minute. You must select whether or not to allow caching the host name via DNS. Typically, this is left unchecked. You must select how often the QD2040b connects to the central server. Typically this is set to "Always On."

The screenshot shows the 'Application Information' form with the following sections and data:

- Application Options:** Controller Network Polling Cycle: 1 Minute; Caching Settings: Enable Cache; Connection Times: Always On, Never On, Specify Times
- RS485 Network - Port Configuration:** Autodetection of Controllers on All Ports: Enabled; All Ports are Automatically Detected Once Hardware is Installed; Device @ PORT1-0: Port 1 (addr 0 to 255); Protocol Support: TCS; Baud Rate: 8000; Time-Out Period: 200 milliseconds; Autodetection Range: 0 to 235. A green 'Update Application Info' button is at the bottom.

RS-485 Network - Port Configuration: Here you will configure each of the COM ports for this site. Typically, you will leave Auto Detection of Controls on All Ports enabled so the QD2040b will find and add the controller as they are included on one of the networks (wired or wireless). If disabled, new controllers must be added manually in Ubiquity.

The communication ports are automatically detected once the QD2040b is powered up. Once detected each COM port needs to be configured to ensure proper functioning of the network on each port. Each port can be enabled or disabled from the drop down menu.

You must also select the proper protocol being used on each port. The current protocol selections from the drop down menu are TCSbus or Modbus. You must also select the communication baud rate for each port. This setting must be the same as all of the controllers on that port. You can also adjust the Time-Out Period for each port. TCS recommends 250ms for wired networks and 1000ms for all wireless networks.

COMMUNICATION INFORMATION

This section contains settings which control how the QD2040b connects out through the LAN or WAN to the Internet. All of these settings are determined by your local network administrator or IT department. The correct settings, network permissions, and port openings (ports 80 and/or 443) need to be verified with them prior to installation and connecting to the local network.

Communications Options: The QD2040b supports both static IP and Dynamic Host Configuration Protocol (DHCP) IP address allocations. Enter the Central Server Location, typically www.ubiquitysystems.net by clicking the "Set Ubiquity Domain Name" button. There are a few special options which can be enabled: TCP window scaling, IPV6 and Secure Sockets Layer (SSL requires port 443 to be open), select whether to enable or disable these special options. Enter host name if needed (typically left blank).

The screenshot shows the 'Communication Information' configuration page. It is divided into two main sections: 'Communication Options' and 'Proxy'.
Communication Options:
- IP Address Allocation: Radio buttons for DHCP (selected) and Static IP.
- Central Server Location: Text field containing 'www.ubiquitysystems.net' and a 'Set Ubiquity Domain Name' button.
- Special Options: Checkboxes for 'Disable TCP Window Scaling' (checked), 'Disable IPV6' (checked), and 'Enable SSL' (checked).
- HostName: Text field containing 'q5-001f7bb00919'.
Proxy:
- Enable Proxy Server Usage: A dropdown menu set to 'Static Proxy'.
- Enable NTLM Authentication: Checkmark for 'Enable'.
- Select NTLM Mode: Radio buttons for 'LM' (selected), 'NT', and 'NT+LM'.
- Proxy Server: Text field containing 'proxy.network.com'.
- Proxy Port: Text field containing '8080'.
- Proxy Username: Text field containing 'proxyuser'.
- Proxy Password: Text field containing 'password'.
At the bottom of the form is a green 'Update Communication Info' button.

Network: Select the desired IP allocation (DHCP or static IP addressing) to be used. When using static IP, it is necessary to enter the IP Address, Gateway, Subnet, DNS1 and DNS2 settings Virtual IP can be used (typically left blank). The IP settings will need to be established by the LAN/WAN network administrator prior to installation. When utilizing DHCP addressing, the IP address settings are automatically assigned when communication is established.

Proxy: If a proxy is required, select Static Proxy from the drop-down and enter all the related details in the fields that appear. Once you are finished entering information in this section, click the Update Commissioning Info button.

SECURITY INFORMATION

This section contains settings which control the security of the gateway within the QD2040b and whether or not it can be accessed through the web interface. Enabling Secure Mode disables all web interfaces including the configuration page, and requires a specially configured USB flash drive or TCS Technical Support access to the QD2040b if it is online with Ubiquity central server to "unlock" it.

Here is where you change the default login credentials used to access the Configuration Page. It is recommended to change these login credentials.

Once you are finished entering information in this section, click the Update Security Info button.

The screenshot shows the 'Security Information' configuration page. It is titled 'Application Security'.
- Secure Mode: A checkbox for 'Enable' which is checked.
- User: Text field containing 'admin'.
- Password: Text field containing 'Strong Password Example C@33n!@#'.
- Retype Password: Text field containing 'Retype Password'.
At the bottom of the form is a green 'Update Security Info' button and a grey 'Commissioning Tools' button.

Commissioning Tools

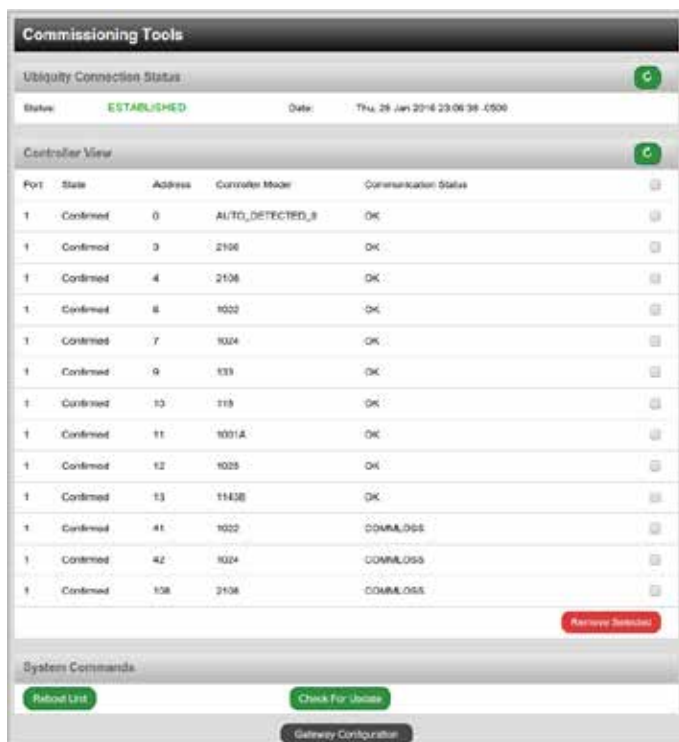
A separate page which contains various commissioning tools can be accessed by clicking the "Commissioning Tools" button at the bottom of the Setup page. This page gives you access to additional information about the connection status of the QD2040b and the controller network connected to it.

UBIQUITY CLOUD CONNECTION STATUS

This section displays the status of the connection between the QD2040b and the central server. You have 3 options for the message that will appear here:

- 1) Error** - No Route to Host -- means the unit does not currently have an Ethernet connection.
- 2) Connected** -- means the unit is able to communicate to the Ubiquity central server BUT is not being matched up with a specific Site, typically this indicates that the site is not initialized on the central server side yet, please contact TCS Basys Controls to assign or initialize the QD2040b to a site
- 3) Established** -- means the unit is communicating with the Ubiquity central server AND is ready to go. All Ubiquity functions (monitoring, programming, alarming, etc.) should be available through the user interface at this point.

Clicking the green button with the arrow on it on the right side of the Ubiquity Connection Status title bar will refresh the connection status.



CONTROLLER VIEW

This section allows you to see what controllers have been found by the QD2040b and view each controller's address, model, and communication status. The state field will show AUTO-DETECTED initially when found by the unit and CONFIRMED once the controller has been recognized by the Ubiquity central server. This information allows the installer to verify that each controller has been found by the QD2040b and is communicating with the local network.

Clicking the green button with the arrow on it on the right side of the Controller View title bar will refresh each controller's status.

SYSTEM COMMANDS

In this section you are able to set a couple of system flags for the QD2040b itself. "Reboot Unit" sets a flag which will shut off and restart the QD2040b within a 5 minute Cycle. "Check for Update" contacts the Ubiquity Central Server for any updates relevant to its particular model number and software version. Once the update has been downloaded, it is automatically applied, and the unit may reboot.

NOTE: The "Check for Update" command requires that the QD2040b have Internet access to retrieve the update patch.

Checkout & Troubleshooting

CHECKOUT

1. Be sure to check and verify all wiring before powering the QD2040b.
2. Apply power. The Power LED will turn on.
3. If the QD2040b has not been pre-programmed, it can be programmed at this time.
4. The unit is now ready for operation.

TROUBLESHOOTING

Power LED does not light up

Be sure that the power supply module, included with the QD2040b, is plugged in to an outlet that has power. This is a 12V, 5A, tip positive power supply.

No Communications with Controllers on the network

Make sure the baud rate selection for the QD2040b is set to match the baud rate of all the controllers on each port network. All controllers on the network must have a unique address, excluding the reserved address '248'. Network wiring should also be checked.

LED Description

The LEDs on the QD2040b indicate the current operating status of the QD2040b.

POWER

This LED will be on when the QD2040b is properly powered.

LAN

The two LEDs on the LAN 10/100/1000 card notes activity on the Ethernet. One light should blink intermittently and the other should remain on all the time. The blinking light represents communications. The other solid light indicates a proper Ethernet connection.

RS-485 PORTS (COM 1 & 2)

A set of LEDs allow the occupant to view operational status of the serial communication integrated board. Each port has two LED's to the right of the terminals:

GREEN – indicates transmitting (Tx)

YELLOW – indicates Receiving (Rx)

Additionally, a single red LED indicating the serial ports are operational, is located inside the enclosure behind the terminals.