

Network Wiring and Setup

Network Wiring

To access your controllers through Revelation PC software or Ubiquity browser software, you will need to create an "RS485" network by connecting all of the controllers "A" terminals together, "B" terminals together and REF together, using 18 or 20 AWG twisted, shielded 3 conductor (triple) wire. If your network is longer than 32 Controllers or longer than 4000 Ft., you will need a bus repeater, QD1011a. You will need a bus repeater for each group of 32 units. For more information refer to the section on Configurations for large networks.

When connecting controllers on a network, you may use any one of a number of wiring configurations, such as "daisy chain", "star", etc., as long as all "A" terminals are connected to a common wire all "B" terminals are connected to a different, yet common wire and all "Ref" terminals connected to a third wire.

The integrity of the "A", "B" and "REF" wiring runs must be maintained or the network will not communicate properly.

CAUTION: You must maintain proper polarity of A, B and REF connections (see figure). All shields must be tied together, taped off to prevent any accidental connections then grounded at one end of the network. Caution should be taken to avoid running wire near power



wires, frequency drives, fluorescent lights, ballasts, etc., which can all compromise the communications signal. Care should also be taken to leave as little wire exposed as possible.

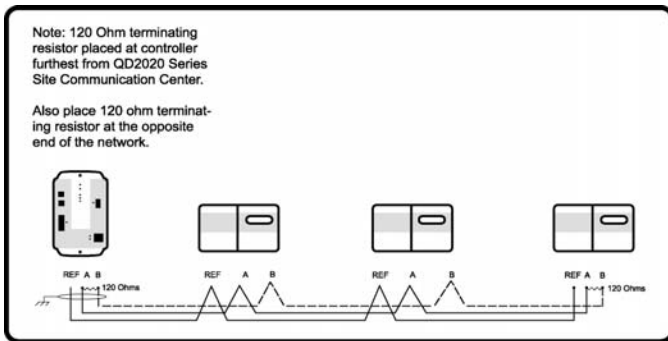
Critical: Avoid noise on the communications line by grounding the shield. The signal that passes information is 1 to 5 V. If you measure across A and B, you should get 0 VAC, and 1 to 4 VDC. There should be 0 VAC and 0 VDC between either A or B and the shield. If you are getting more than this, check for runs against high voltage, for exposed wires, to see if grounding at only one side, or that you have used dedicated power for the controllers or if you have reversed power on a Controller(s).

Note: By using wire cable consisting of one triple of twisted shielded wire and one pair of unshielded wire, you can run power to controllers and run communications wire in the same cable.

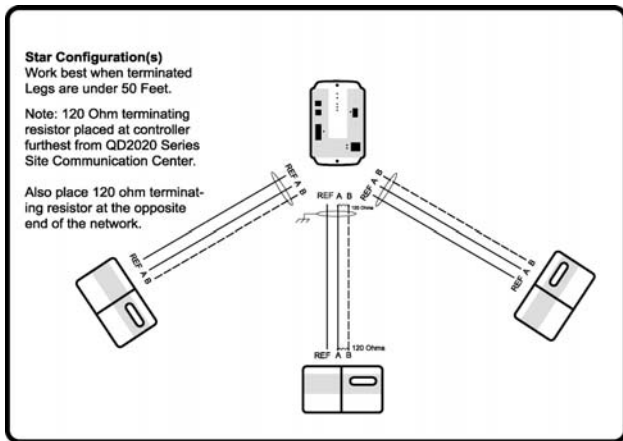
Typical cable is: #W20185C-2816TCS (PM2000)

Note, be sure to check any local codes to confirm the wire choice meets the code.

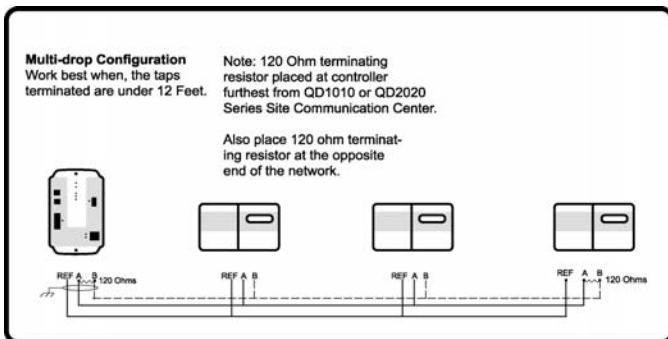
Daisy Chain



Star



Multi-Drop T-Tap



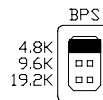
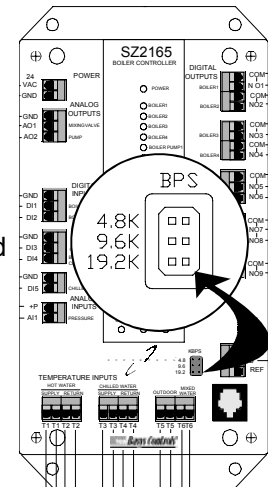
Controller Setup

CONTROLLER SETUP OR INITIALIZATION FOR UNITS WITHOUT DISPLAY

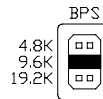
You will need to connect each individual controller to a QD2040 or a PC through the QD1010.

BAUD RATE SELECTION

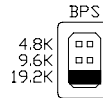
The SZ1025A, SL2108, SZ2161, SZ2165 and SZ2166 must be programmed using a PC and TCS/Basys Controls software. A communication baud rate must be set by placing one jumper in the area shown. This baud rate must be the same for all devices. Each controller must be assigned a unique address between 0 and 255, excluding 248.



For a 4.8K baud rate.



For a 9.6K baud rate.



For a 19.2K baud rate.

SETUP OR INITIALIZATION FOR SUPERSTATS

The Superstats; SZ1009, SZ1017a, SZ1022, SZ1024, SZ1031, SZ1033, SZ1035, SZ1041, SZ1051, SZ1053 and SZ1060 Series may be programmed through the keypad on the face, through a QD2040 or with a PC using TCS/Basys Controls software and QD1010.

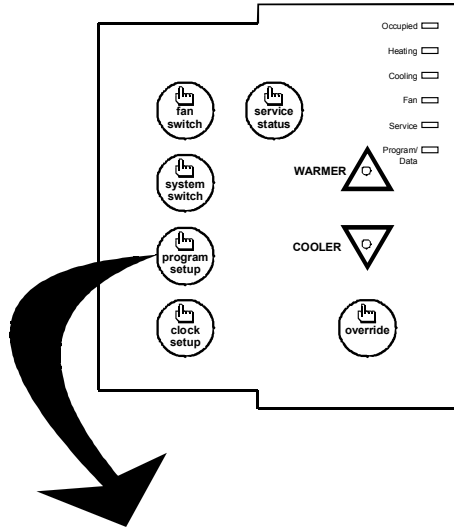
If programming with a PC, the following must be set via the display and keypad **prior** to programming:

- Address (step #2)
- Baud rate (step #3)
- Temperature scale (step #4)

For more information on programming through the PC, consult your TCS software manual.

PROGRAMMING THROUGH THE KEYPAD

To access the programming screens, press the program setup button. To make changes, use the warmer and cooler keys. Access may be locked out with dipswitches, or an access code may be required.



CONTROLLER SETUP OR INITIALIZATION FOR UNITS WITH DISPLAYS

The SL1001a, SZ1143b, SZ1144 and SZ1145 may be programmed through the display and keypad, through a QD2040 or with a PC using TCS/Basys Controls software with a QD1010 or QD2020.

If programming with a PC, the following must be set through the keypad prior to programming:

- Address (step #2)
- Baud rate (step #3)

For more information on programming through the PC, consult your TCS software manual.

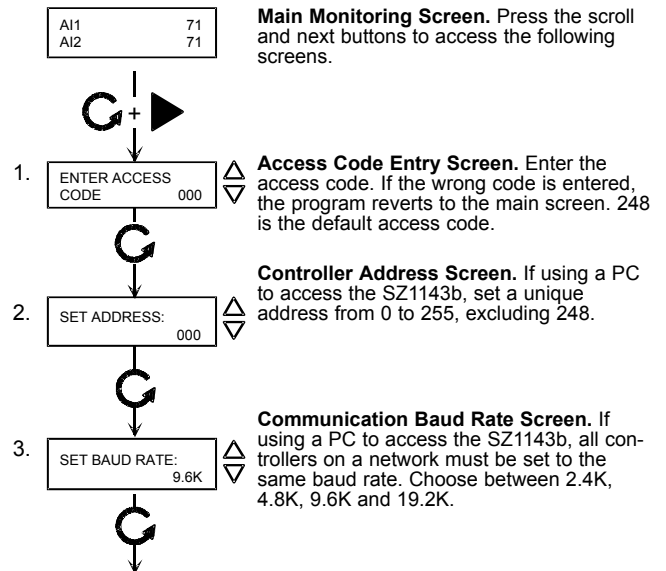
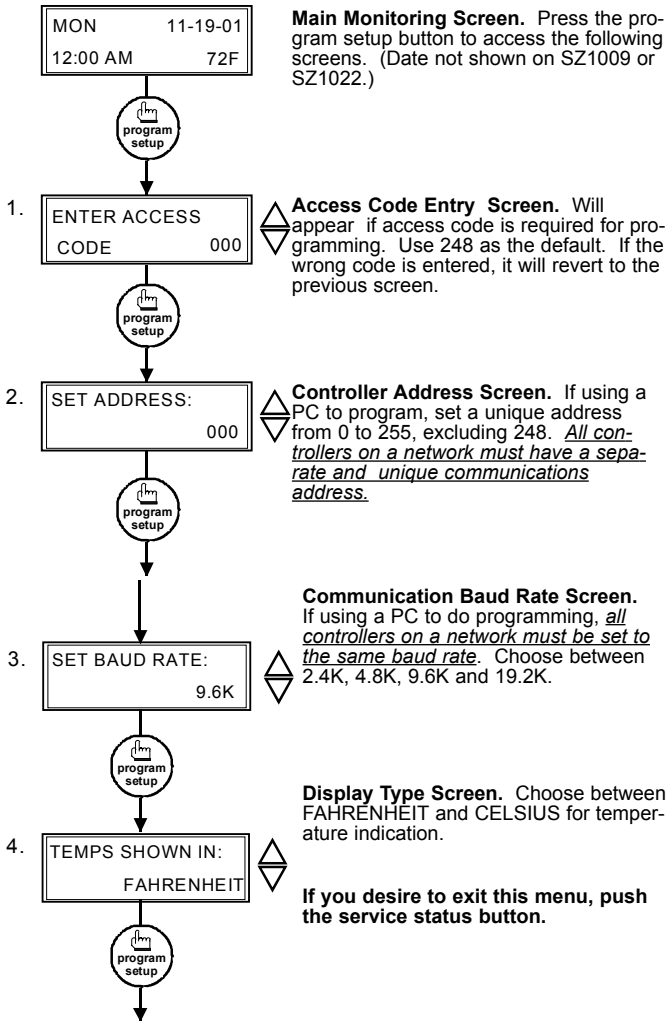
PROGRAMMING THROUGH THE KEYPAD

To access the programming screens, press both the "Scroll" and "Next" keys simultaneously.

Scroll Key - The "Scroll" key is also used to save any changes to the "current" screen and advance to the next screen while programming. The "Scroll" key is used to enter the Programming Mode when pressed with the "Next" key.

Next Key - Used to enter Programming Mode when pressed with the "Scroll" key. Also used to exit programming without saving changes to the current screen. In monitoring mode, the "Next" key is used to scroll backwards.

Increment/Decrement Keys - Used to select the desired value.



Network Interface Setup

WIRING TO A SITE COMMUNICATION DEVICE

Wire the QD2020 Series as shown. Plug the included power module to the QD2020 and to a single phase 120 VAC @ 60 Hz power source. The QD2020i and QD2020ie may also be powered directly from a 24VAC transformer.

- Superstats (models SZ1009-SZ1064) must each be programmed through the keypad with the same baud rate as the QD2020. Each thermostat must have a separate, unique address.
- All other controllers, where applicable, must be set to "NW" (network mode), must be set to the same baud rate as the QD2020 and must have a separate, unique address.

Note: Do not use a network address of 248 because all controllers will respond to this address.

Connect the "A" and "B" network wires to the "A" and "B" terminal on the QD2020. The "A" wire must be connected only to "A" terminals, and the "B" wire must be connected only to "B" terminals. If a 3rd "REF" wire is used, connect all "REF" terminals. At the QD2020 the REF wire may be connected to AUX Power- (left most terminal viewed from the front of the unit).

REMOTE CONNECTION TO THE QD2020, QD2020I OR QD2020IE

Connect one end of a phone cord, (purchased separately) into the phone jack of the QD2020 or QD2020i. Plug the other end of the phone cable to a phone jack.

Note: The QD2020i will not operate on 4-wire PBX phone systems.

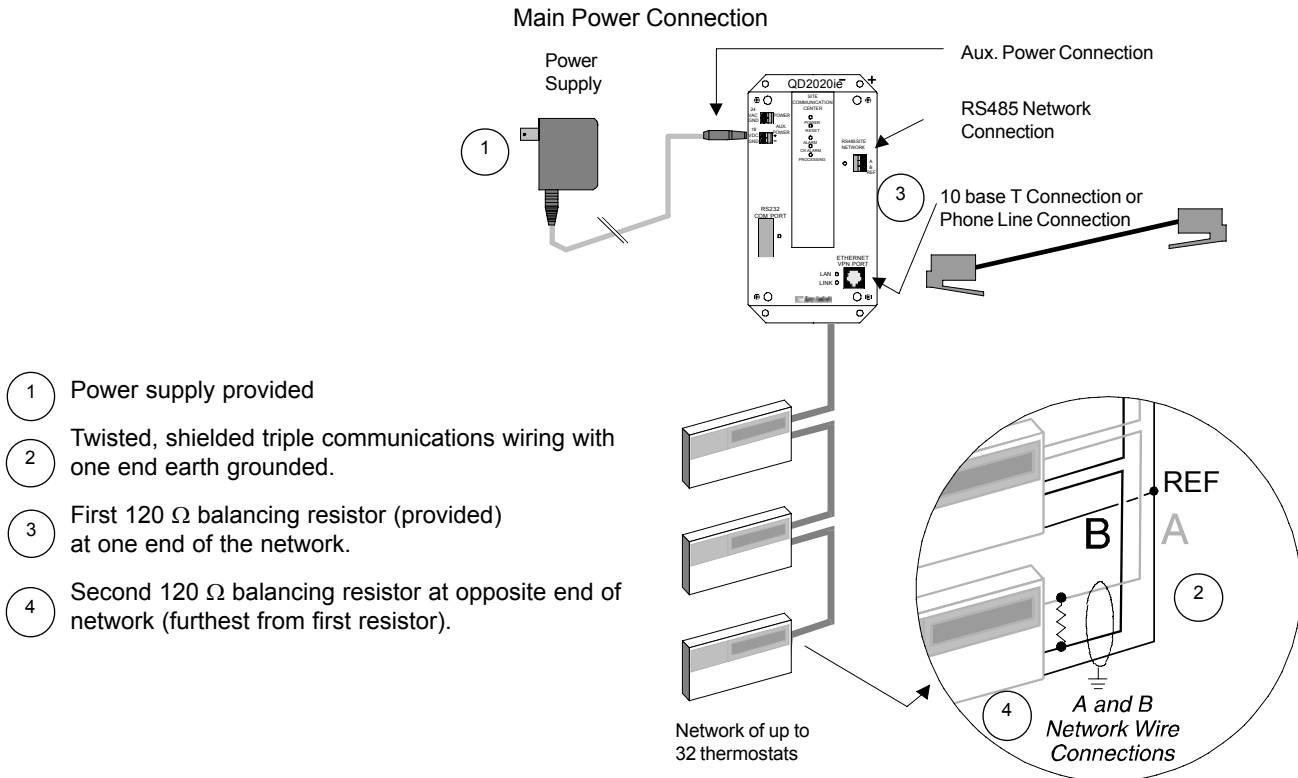
Note: The QD2020i connects to the internet via dial-up ISP utilizing a local phone number. When selecting a local calling plan, choose a plan that is based on the number of calls made, not duration of call.

Connect one end of a 10 base T, RJ 45 connector to the ethernet port of the QD2020ie and the other end to an ethernet port.

Set the network baud rate/bps on the QD2020 Series to match the thermostats/controllers on the network. Connect the included 120 Ω resistors across the "A" and "B" network terminals at the two ends of the network. One end of the network may be at the QD2020 Series. Finally connect one end of the shield wire of the network wiring to earth ground.

Note: 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.

QD2020 Series network wiring diagram.



- 1 Power supply provided
- 2 Twisted, shielded triple communications wiring with one end earth grounded.
- 3 First 120 Ω balancing resistor (provided) at one end of the network.
- 4 Second 120 Ω balancing resistor at opposite end of network (furthest from first resistor).

Larger Networks Setup

For larger networks (>32 controls), review your network's best layout. If the QD1011a bus repeater can be at the end of a network, you can use one of its built in 120 ohm terminating resistors by placing a jumper on "120 Ω" for either the "In" or the "Out" side, or one can be hard wired across the "A" and "B" terminals of the "In" or the "Out" side.

Note: A maximum of 2 terminating resistors can be used per side. See Figure 1.

If the QD1011a will be in the middle of the network, or if an external terminating, "balancing" resistor is used, the jumper on "120 Ω" for either the "In" or the "Out" side **must** be removed. See Figure 2.

On small, short networks, no terminating also referred to as "balancing" resistors may be needed. If they are not needed, the jumper on "120 Ω" for either the "In" or the "Out" side **should** be removed.

Figure 3 illustrates large network (<64) configuration with multiple QD1011a's.

Figure 1. Communications with a network of thermostats / controllers, QD1011a at end of network.

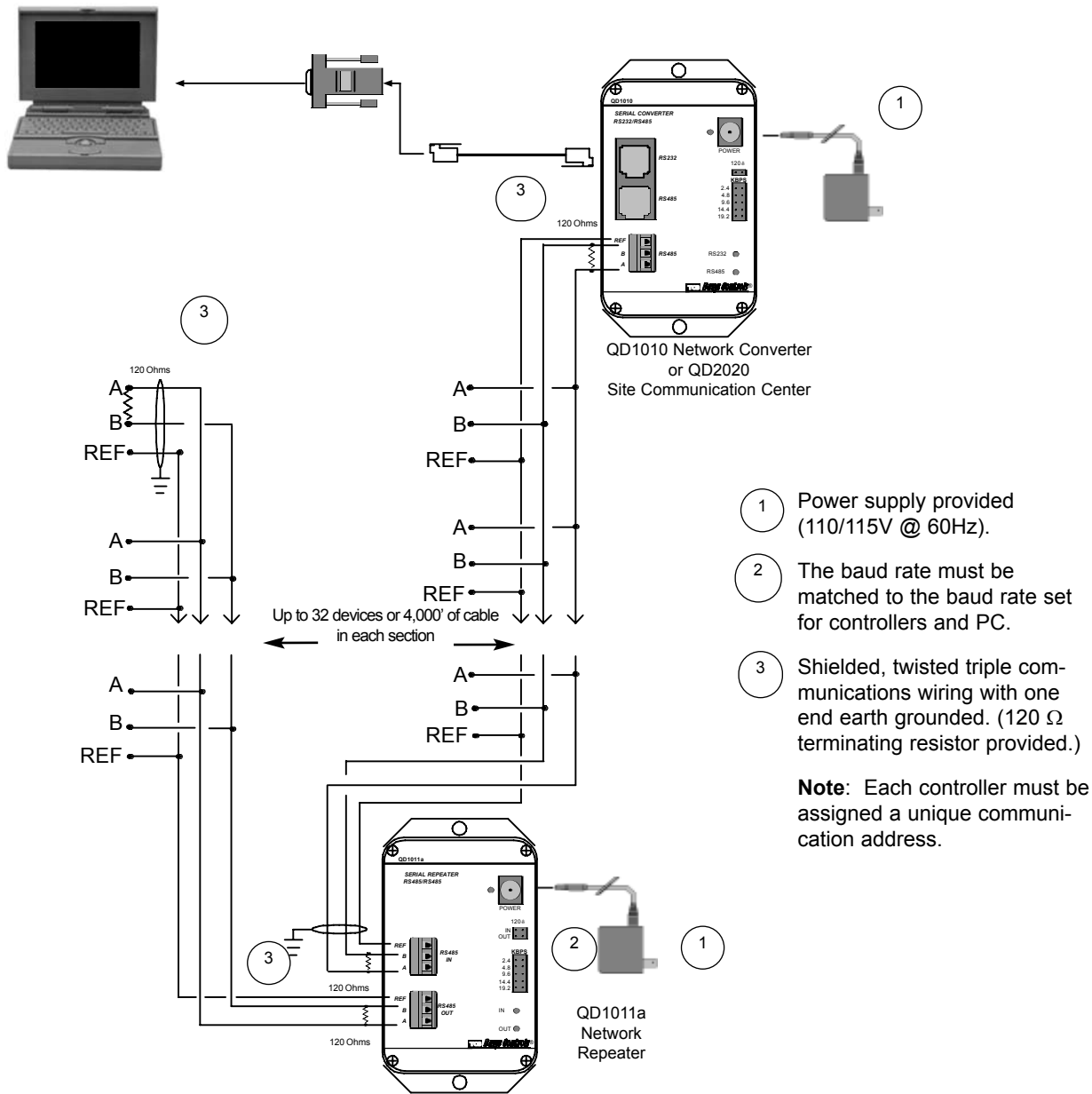


Figure 2. Communications with a network of thermostats / controllers, QD1011a in middle of network. (a network of >32 controls or > 4000' of Cable).

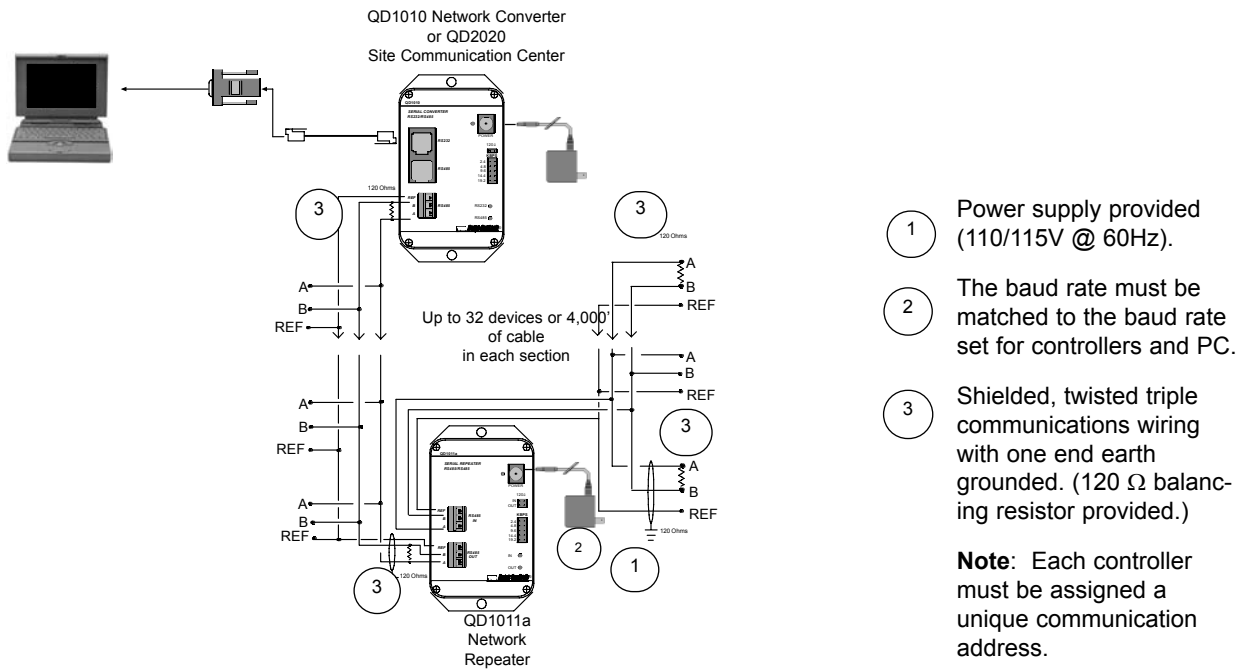


Figure 3. Communications with Large or widely dispersed networks (>64) of thermostats/controllers using multiple QD1011a's.

