E2 Ethernet Box-to-Box Setup: Quick Start

E2 Ethernet box-to-box communications allows two or more E2 controllers on an Ethernet network to share data. Communication between E2 controllers version 2.10 or greater may now be implemented through an Ethernet network using TCP/IP protocol.

Echelon

Effective for version 2.10, certain E2 controllers will no longer be shipped with an Echelon card. See the table below for the correct part numbers when ordering an E2 with an Echelon card:

E2 Type	E2 Part Numbers Without Echelon Card	E2 Part Numbers With Echelon Card
RX-300	834-0300	834-0310
RX-400	834-0400	834-0410
RX-300 (blank face)	834-2300	834-2310
RX-400 (blank face)	834-2400	834-2410
BX-300	835-0300	835-0310
BX-400	835-0400	835-0410
BX-300 (blank face)	835-2300	835-2310
BX-400 (blank face)	835-2400	835-2410
CX-300	836-0300	836-0310
CX-400	836-0400	836-0410

Table 1 - E2 Controller Part Numbers With and Without Echelon

Note: An Echelon card may be ordered individually using part number 637-4860.

Prerequisites

To utilize peer connections over Ethernet, the following tasks must be performed:

- Upgrade the E2 controller firmware to version 2.10 or greater.
- Install an industry-standard Ethernet switch(es) or hub(s) in an area or areas nearby the E2 controllers.
- Install Ethernet straight-through cabling at the site from each E2 to the switch or hub. Installation of RJ-45 connectors may be necessary to achieve this goal. The required cabling is CAT 5.

Ethernet IP Configurations

If using an open network layout, (see “Open Network Layout” on page 4) contact your IT Network Administrator for all IP configuration information (IP Address, Subnet Mask, Primary and Default Gateway settings).

Hardware Specifications

Standard industry-accepted practices for wiring of Ethernet networks are expected. E2 controllers use a star topology, identical to PC deployment. This includes a unique “point-to-point” run from a switch or hub to the controller. This is done with Category 5 (or better) cable. Maximum distance for a run of 10BaseT is 328 feet (100 meters) (11.5 dB loss max).

- The maximum number of E2 controllers allowed on an IP subnet is 20. All area controllers that must communicate with each other must be on the same subnet.
- Required Ethernet cabling is CAT 5 (straight-through cable).
- 328 feet (100 meters) is the maximum distance allowed between devices before a switch or hub must be added.

Components

Equipment Type	Specifications
Ethernet Five- or Nine-port Switch (may require an additional power supply)	Industrial grade Operating/storage temp range: -40°F to 185°F (-40°C to 85°C) Vibration: IEC68-2-6 RH: 5 to 95% UL 508A, CE approved Supports 10Base-T crossover cable Supports all IEEE 802.3 protocol Supports Auto Crossover MDI/MDI-X Screw-terminal power connectors
Ethernet Surge and Lightning Protector (recommended)	Industrial grade Surge capacity: 1 kA / line Operating temp range: -40°F to 185°F (-40°C to 85°C) Max frequency: 155 MHz Clamp and rated: 10V and 5V

Table 2 - Equipment for E2 Ethernet Peer Communications

Note: An external power supply may be needed.

Software Specifications

TCP/IP

E2 controller versions 2.10 and later communicate between controllers using the TCP/IP protocol. TCP Port 7238 is the default for connections established between the controllers. All peer communications occur over this port.

Ethernet Network Layouts

The two types of network options for E2 controllers using Ethernet communications are:

1. "Closed Network" - E2 devices are *not connected* to a store's LAN. (The only devices on the network are the E2 controllers themselves.) This network type is used if there is no need to integrate the network into the company's intranet.
2. "Open Network" - E2 devices *are connected* to the store's LAN. (Devices on the network include E2s and other Ethernet-TCP/IP devices.) This network type is used if the network will be connected to the store's LAN.

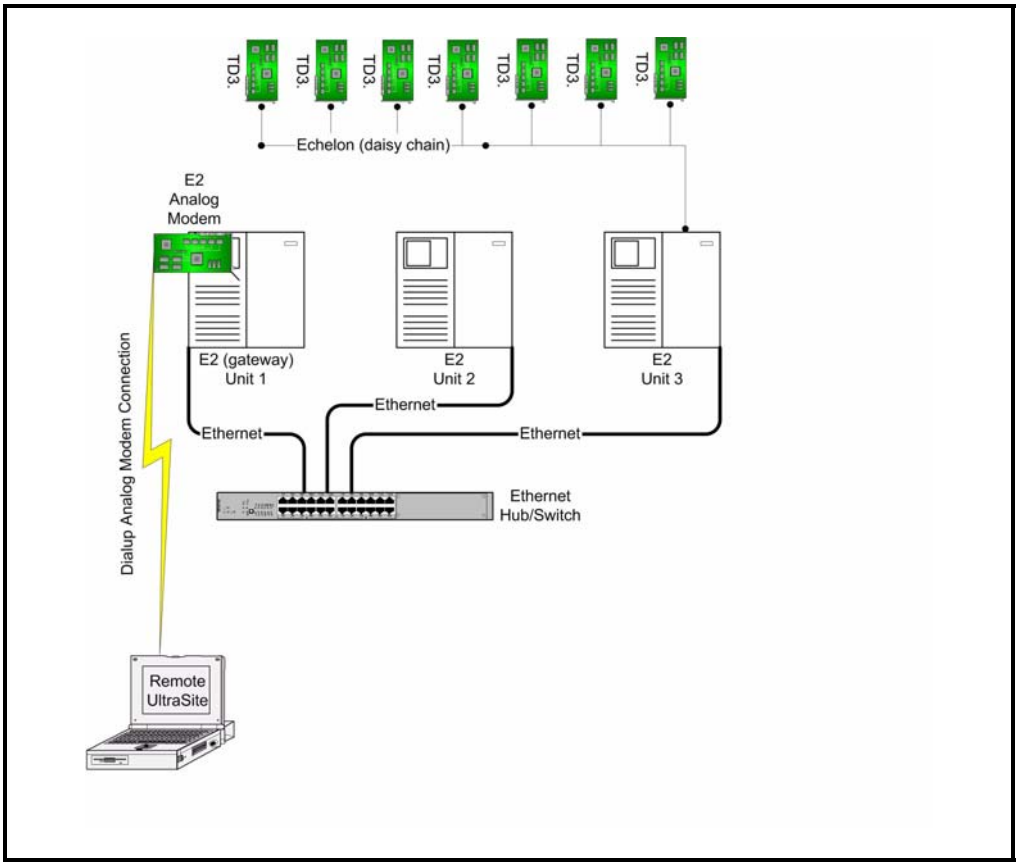
Note: Contact your IT Network Administrator for setup parameters for both closed and open networks.

The E2 peer Ethernet network facilitates communications between E2 controllers. These include at least the following:

- Routing of messages between external entities such as UltraSite, InSite, and non-gateway E2 controllers.
- Distribution of global data and other network variables such as system time, controller identification, etc.
- Communication between E2 controller applications such as Remote Login and Remote File Services.

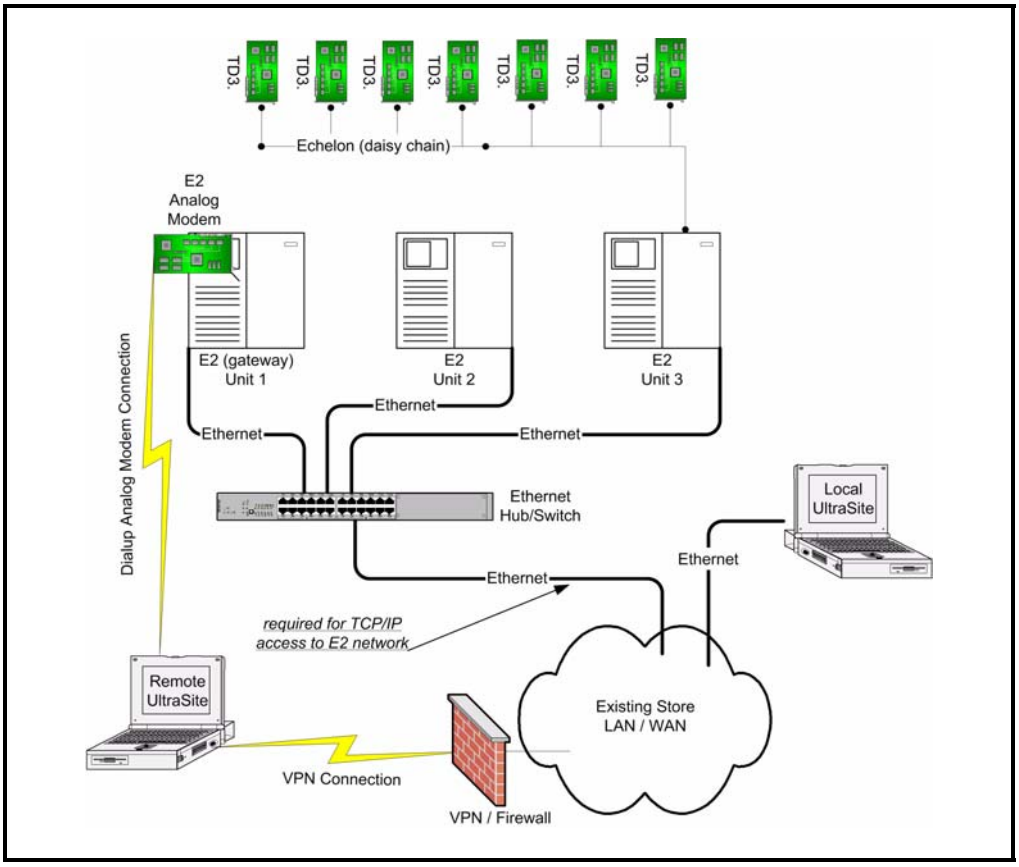
Note: The gateway E2 is the E2 controller at a remote site to which UltraSite directly connects. It is through this E2 that UltraSite communicates with the other controllers (defined as the "non-gateway" E2s and external entities such as UltraSite, InSite, etc.).

Closed Network Layout



Closed Network Layout

Open Network Layout



Open Network Layout

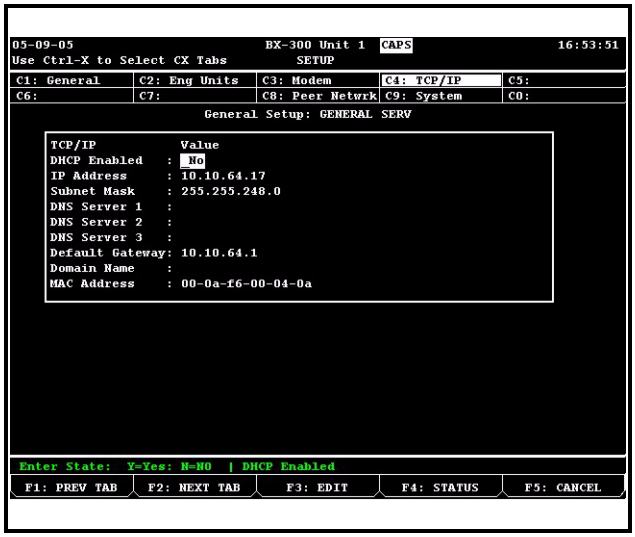
Troubleshooting

Network troubleshooting is outside the scope of this document. Consult your IT Network Administrator for any additional information that is needed.

Software Setup

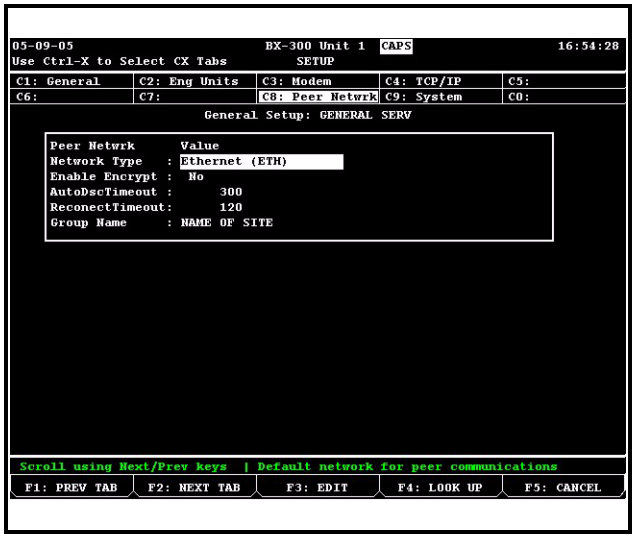
1. Log on to the E2 controller
2. Navigate to the **TCP/IP** setup screen (**Alt** + **T**)

*Note: DHCP does not have to be enabled if you have the IP Address, Subnet Mask, and Primary Gateway settings. (Contact your IT Network Administrator for all IP configuration information.) If you do not have the IP configuration settings, and there is a DHCP server on the network, set **DHCP Enabled** to **Yes** and it will retrieve the information from the server and populate those fields. E2 controllers must also have the same Ethernet Subnet in order to communicate box-to-box.*



TCP/IP Setup Screen

3. Tab over to the **Peer Netwrk** tab:



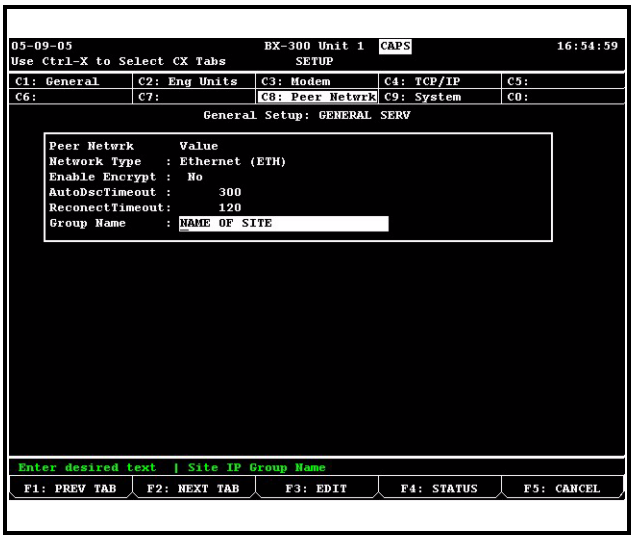
Peer Network Tab - Set Network Type

4. Change **Network Type** to: **Ethernet (ETH)** and press Enter. The **Group Name** field is now visible.

<u>Note</u>: If unsure of any tab settings, it is recommended that the default settings be used.

5. Once the Ethernet network type is enabled, enter a [1]unique site name in the **Group Name** field.

1. The name is the unique identifier for the site that will allow the controllers within the same group to share data.



Peer Network Tab - Set Group Name

All controllers that you would like to appear in this group must all have the same group name and must be using the same network type.