Step-By-Step: ATVS Device ethernet board connection

Summary

There are four areas involved in setting up the Ethernet board they are: Ethernet board, ARP (Address Resolution Protocol), Telnet (a text interface used to communicate to TCPIP devices) and finally assigning the IP address to a Location within TruTime. These steps are discussed below with additional information being provided when needed.

Discussion

Ethernet Board

Each board has a sticker containing the AMX-#, followed by the S/N of the board, followed by date code

Each board also has a series of lights and a blue button they are:

Green (D1 Channel 1)	Yellow (D2 Channel 2)	Red (D3 Channel 3)	Gold Button	Green (D4 Channel 4)
ON Indicates power	On	OFF	Rests the Board & Terminal	ON Good link indicator
Blinking, 1 second cycle Good LAN Connection	On	OFF		ON
ON	On	Blinks 1 time EPROM checksum error		OFF
ON	On	Blinks 2 times RAM error		
ON	On	Blinks 4 times EPROM or checksum are bad		
ON	On	Blinks 5 times IP address is already in use on LAN		
		Blinking LAN connection is faulty. Will only appear after reset		

It is also recommended that you determine the IP Configuration of the host PC so the IP Address and Subnet Mask can be obtained

```
C:\>ipconfig

Windows NT IP Configuration

Ethernet adapter Elnk31:

        IP Address. . . . . . . . . : 192.168.3.254
        Subnet Mask . . . . . . . . : 255.255.252.0
        Default Gateway . . . . . . : 192.168.0.1
```

Refer to the chart below to obtain the correct Netmask number to be used during the Telnet setup.

Netmask	Host bits	Netmask	Host bits
255.255.255.252	2	255.255.255.0	8
255.255.255.248	3	255.255.254.0	9
255.255.255.240	4	255.255.252.0	10
255.255.255.224	5	255.255.248.0	11
255.255.255.192	6	255.128.0.0	23
255.255.255.128	7	255.0.0.0	24
255.255.0.0	16		

ARP

ARP is used to add the IP & MAC address of the Ethernet board to the host PC. The static IP address should be obtained from the Network Administrator, the MAC address for all NEW Ethernet boards is 00-20-4a- plus the 6 character Serial Number of the board, for Old boards the number is 00-20-4a-01 plus the 4 character Serial Number of the board. The Serial Number can be found on the Ethernet board below the AMX-#.

ARP is entered by switching to a Dos Command Prompt
Note: The steps for entering Dos vary from operating system to operating system please ask the Network Administer for further assistance
Be sure you are at the C:\> before beginning
Type in ARP –s space the IP Address space and the MAC Address and ENTER
Example: C:\ARP –s 192.168.24.12 00-20-4a-01-db-ab

To display a list of all ARP entries type ARP –a at the command prompt

To display a list of all ARP Commands type ARP -? At the command prompt. The following selections will be displayed for more information on using these commands contact your Network Administrator

```
ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr]

  -a             Displays current ARP entries by interrogating the current
                 protocol data.  If inet_addr is specified, the IP and Physical
                 addresses for only the specified computer are displayed.  If
                 more than one network interface uses ARP, entries for each ARP
                 table are displayed.
  -g             Same as -a.
  inet_addr      Specifies an internet address.
  -N if_addr     Displays the ARP entries for the network interface specified
                 by if_addr.
  -d             Deletes the host specified by inet_addr.
  -s             Adds the host and associates the Internet address inet_addr
                 with the Physical address eth_addr.  The Physical address is
                 given as 6 hexadecimal bytes separated by hyphens. The entry
                 is permanent.
  eth_addr       Specifies a physical address.
  if_addr        If present, this specifies the Internet address of the
                 interface whose address translation table should be modified.
                 If not present, the first applicable interface will be used.
```

Exit DOS

TELNET

Telnet is used to program the Ethernet board from the host PC. There are many ways to start a Telnet session depending on the operating system being used. Because of this TST recommends that you use the Run command line to enter Telnet since it is the most consistent and direct method available to all.

Telnet involves two steps. The first step is used to change the IP address on the Ethernet board using Port 1, the second step is used to configure the board now that the IP address is assigned using port 9999.

From Start\Run type Telnet and the IP address of the clock followed by a space and 1

Example Telnet 191.12.3.77 1

Click OK

This operation sends a packed to the MAC address defined in the APR requesting a connection to a network service on Port 1. The Ethernet board is designed so it will temporarily set its IP address when it receives this special packet. This operation will fail by design, however, the IP address will now be associated to the Ethernet board so the next step can be performed.

Repeat the steps above changing the 1 to 9999
Example: Telnet 191.12.3.77 9999

Click OK

WARNING! This session will time-out! If this occurs it is recommended that you start at the beginning.
TIP: If you are unable establish a connection at this point reboot the PC, reset the Ethernet board & Clock and start at the beginning.

Press Enter to go into setup mode

IT IS IMPORTANT THAT THE STEPS BELOW BE FOLLOWED EXACTLY

Change Setup	Select 0 for Basics	
IP Address	Type the IP address for the clock	Enter

Set Gateway IP Address	N (This only needs to be changed when the Clock is being installed on a different Subnet than the polling PC if this is the case contact the Network Administrator for more information)
Netmask	Type the number that corresponds to the Subnet mask of the host PC (See Netmask Chart) Enter
Change telnet config password	N (If this password is changed you will not be able to access the board DO NOT CHANGE)

TCPIP CONFIGURATION

1. Security Configuration

```
  8 Exit without save
  9 Save and exit              Your choice ? 6

Disable SNMP (N) ? N

SNMP Community Name                 :

Disable Telnet Setup (N) ? N

Disable TFTP Firmware Update (N) ? N

Disable Port 77FEh (N) ? N

Disable Web Server (N) ?

Disable ECHO ports (N) ? N

Enable Enhanced Password (N) ?

Change the Password (N) ?
```

2. Server Configuration

```
  9 Save and exit              Your choice ? 0

IP Address : (000) .(000) .(001) .(000)
Set Gateway IP Address (N) ?
Netmask: Number of Bits for Host Part (0=default) (0)
Change telnet config password (N) ?
Change DHCP device name (not set) ? (N) ?


Change Setup:
  0 Server
  1 Channel 1
```

3. Channel 1 Configuration

```
  9 Save and exit              Your choice ? 1

Baudrate (1200) ? 1200
I/F Mode (FC) ? fc
Flow (00) ? 00
Port No (3001) ? 3001
ConnectMode (C1) ? c1
Auto increment source port  (N) ? N
Remote IP Address : (000) 000.(000) 000.(000) 000.(000) 000
Remote Port  (3001) ? 3001
DisConnMode (01) ? 01
FlushMode   (C4) ? c4
Pack Cntrl  (01) ? 01
DisConnTime (01:00) ?01:00
SendChar 1  (00) ? 00
SendChar 2  (00) ? 00
```