TOUGHSMARTMARQUEE SLAVE

Using with Controllogix Ethernet/IP

September 2008

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Introduction

ToughMarquee (firmware revision N or later) now supports connectivity to Controllogix controllers over the Ethernet/IP protocol. User can send messages to display on ToughMarquee from Controllogix or other controllers supporting Ethernet/IP protocol.

(The firmware revision of the marquee is displayed during power up. If your firmware is below N level, you must upgrade to revision N; upgrade instructions are provided later in this document.)

The marquee is a slave on the Ethernet/IP network, and is configured to consume up to 96 words. The Marquee ignores the first two words of the number it is programmed to consume. Thus the user message to be displayed must start after two words.

To use the marquee over Ethernet/IP, certain parameters in Marquee must be set up. In addition the controller must also be configured. Following are the steps/commands for configuring both the marquee and the controller for use over Ethernet/IP.

Marquee Setup

Before the marquee can be used on Ethernet, several Ethernet and Ethernet/IP related parameters must be programmed. There are two ways to set these parameters.

- Use Marquee Command generator utility;
- Use ASCII commands to marquee using a terminal emulator software.

On power-up marquee displays many of its parameters including those related to Ethernet.

The following table summarizes Ethernet related parameters, abbreviation for parameters on marquee display, and default values of these parameters.

Parameter	Abbreviation used on Marquee	Default Value	User Programmable
Mac ID	MC	Unique, Factory Programmed	No
IP Address	IP	192.168.0.1	Yes
Subnet mask	SN	255.255.255.0	Yes
Gateway	GW	0.0.0.0	Yes
Input Assembly instance (Consumed by Marquee)	(N.A.)	150	No
Output Assembly instance (Produced by Marquee)	(N.A.)	100	No
Output size (Produced)	(N.A.)	2	No
Input Size (Consumed by Marquee)	CI	32	Yes
Unit ID (Not use with Ethernet/IP; For Modbus TCP/IP)	UN	255	Yes

For setup of these parameters, marquee should be connected to the PC using serial port. The serial port configurations of the marquee and PC must match to enable communication between them.

Marquee Serial Port Information:

The Marquee serial port uses the following configuration:

Baud rate: 9600 (default) or 38400 (current baud rate is displayed on marquee during power-up)
Data Bits: 8
Parity: None
Stop Bits: 1

Using Utility to Configure Marquee

AVG offers a free utility called ToughMarquee. The utility is freely available on our site. Download and install the utility.

Connect PC and the marquee serially, and use the following steps to setup marquee:

1. Run **ToughMarquee** utility.

2. On the **PC Communication Setup** tab, select the correct Com port in the "Select Communication Setup" drop down menu; change baud rate if necessary to match the baud rate of the marquee.

3. On the **Marquee Communication Setup** tab, select Ethernet for the Network Type.

4. Click on the "Set to Default Values" button. (This step is *REQUIRED* even if your information is different than the default values.). Click OK on the confirming dialog box. This step would enable Ethernet system on marquee if it was disabled.

5. Now select in Protocol group, the Ethernet/IP radio button. Enter the desired IP Address, Subnet Mask Gateway information, in Input size in the respective fields. Once you have desired And then click on "Program Marquee" button. This should program IP address as well as Ethernet/IP parameters in the marquee.
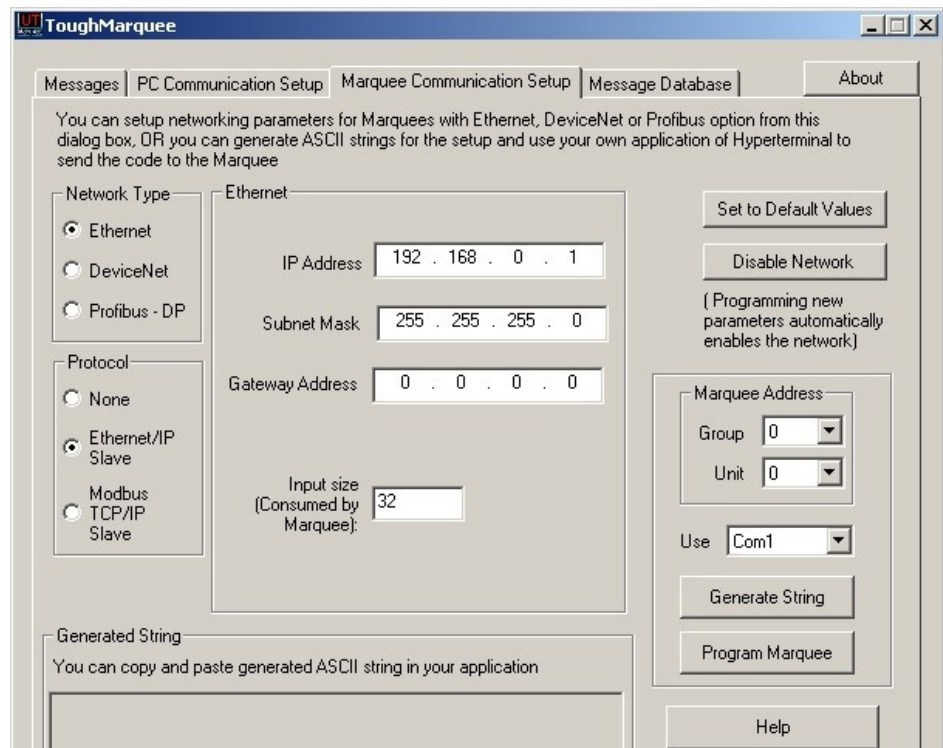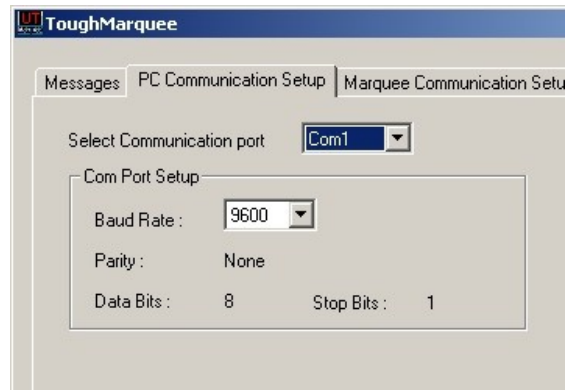
Using ASCII commands with Terminal Emulator

These parameters are set up using ASCII commands sent over the serial port to the marquee. A terminal emulator program, such as HyperTerminal or TeraTerm, can be used to send commands to marquee.

Once the PC is connected to the marquee, run your terminal emulator program and set serial parameters to match those of the marquee serial port. Then follow the instructions below to set up the parameters.

TCP/IP Settings

CAUTION: ASCII commands are case-sensitive. Incorrect commands may not be recognized or may be interpreted incorrectly.

You must program the IP address and Subnet mask. If you are on the same network, you may not need to program the Gateway address. But it may be desirable to find out your Gateway address and program it, to be certain.

The Gateway address and DNS Servers are all defaulted to 0.0.0.0, and need not be changed unless your network requires you to change one or more of these addresses.

Item	ASCII String	Example
Defaults	**^P1L**	Use this command to enable Ethernet network and set certain default parameters
IP Address	**^P1A**www.xxx.yyy.zzz	To set IP address of 192.168.0.1, send ASCII command as follows: **^P1A192.168.000.001** (*Note that you need to use 3 digits for each field, e.g., the 1 must be sent as "001"*)
Subnet Mask	**^P1M**www.xxx.yyy.zzz	To set Subnet Mask of 255.255.255.0, send ASCII command as: **^P1M255.255.255.000**
Gateway address (*default: 0.0.0.0*)	**^P1G**www.xxx.yyy.zzz	To set Gateway address of 192.168. 0.2, send ASCII command as: **^P1G192.168.000.002**

Ethernet/IP specific settings

The Marquee uses I/O messaging and is a slave on the Ethernet/IP network. The marquee uses the following parameters:

Output (produced by Marquee): Assembly instance = 100, Size = 2 (fixed, need not program)

*Input (consumed by Marquee):* Assembly instance = 150, Size = User programmable, 2 to 96 (default=32)

| Item	ASCII Command	Comment
Consumer Instance Size	**^P1c**zzzz (default value 32)	E.g., **^P1c0032** sets the size of the consumer instance to 32 words. The units are 16 bit words, so this example defines a 64 byte buffer. The first two words (4 bytes) of data are ignored by the marquee. You can skip this command if the default value of a 32 word size meets your needs.

PLC Setup

The example below is for setting up a Controllogix processor using **RSLogix5000**.

1. In RSLogix5000, start a new project or open an existing project.

2. Add an Ethernet communication module to the project, if one is not already present, as follows:
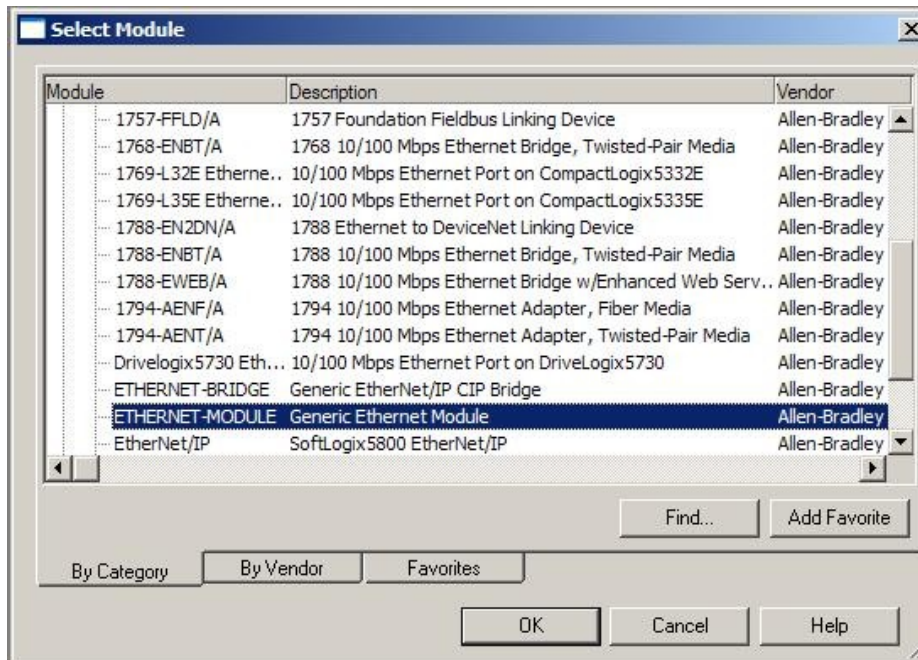
   *In this example we have used the 1756-ENET/B module.*
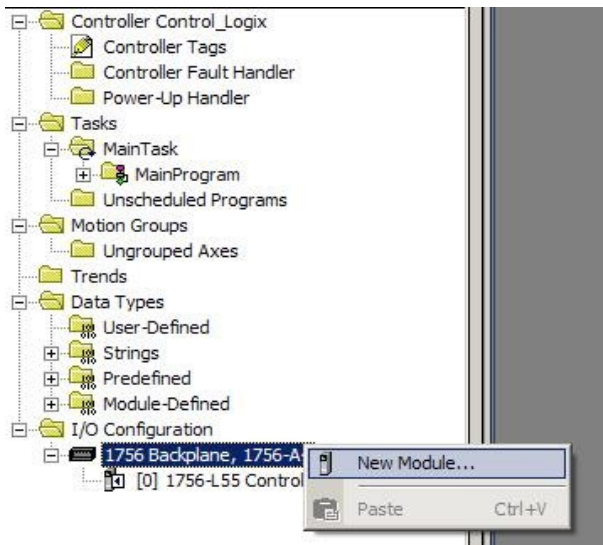
3. After adding the PLC communication module, add the new Ethernet module to it, as shown below:
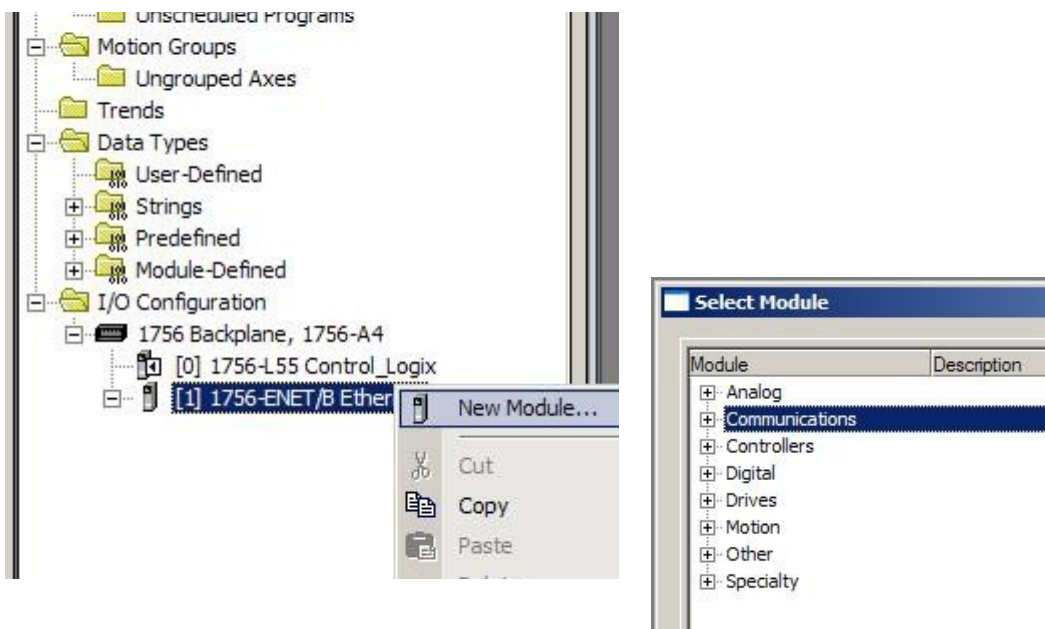
4. Select ETHERNET MODULE- Generic Ethernet Module.

5. Configure the added Generic Ethernet Module. Enter the name, Comm Format, IP address, and connection parameters. Use 100 for Input Assembly Instance, 150 for the Output Assembly Instance, 2 for Input Size. The output size is user programmable and should be between 2-96 words.
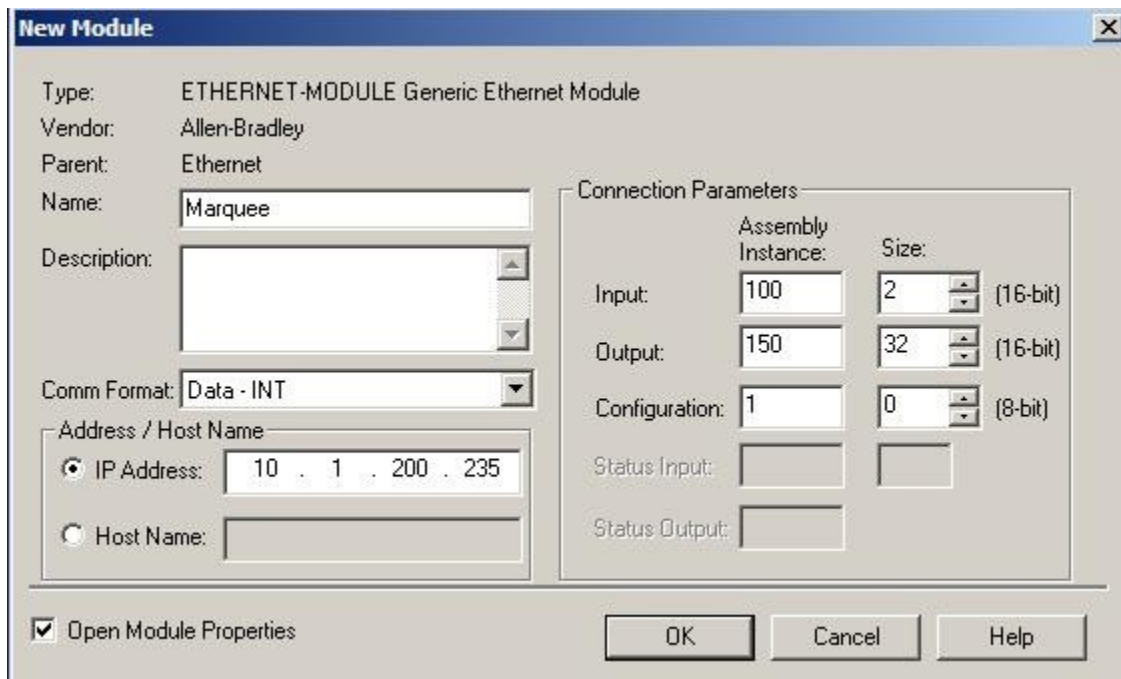
6. After the configuration, you will see the module added to the project tree.
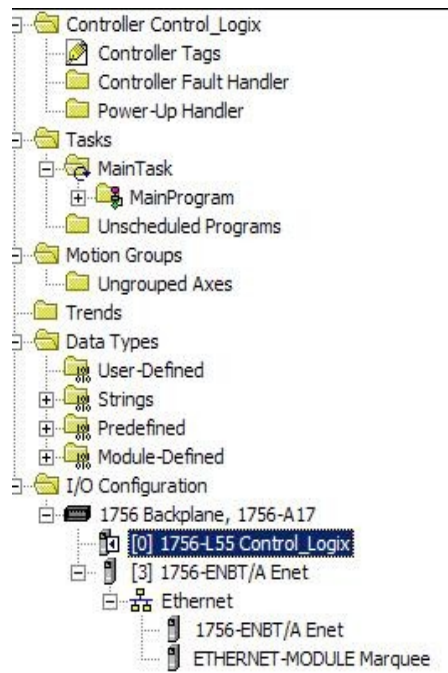
7. Now right click on the Marquee module and go to its properties. On the Connection tab, make sure that the requested packet interval is set to more than, or equal to1000 ms.
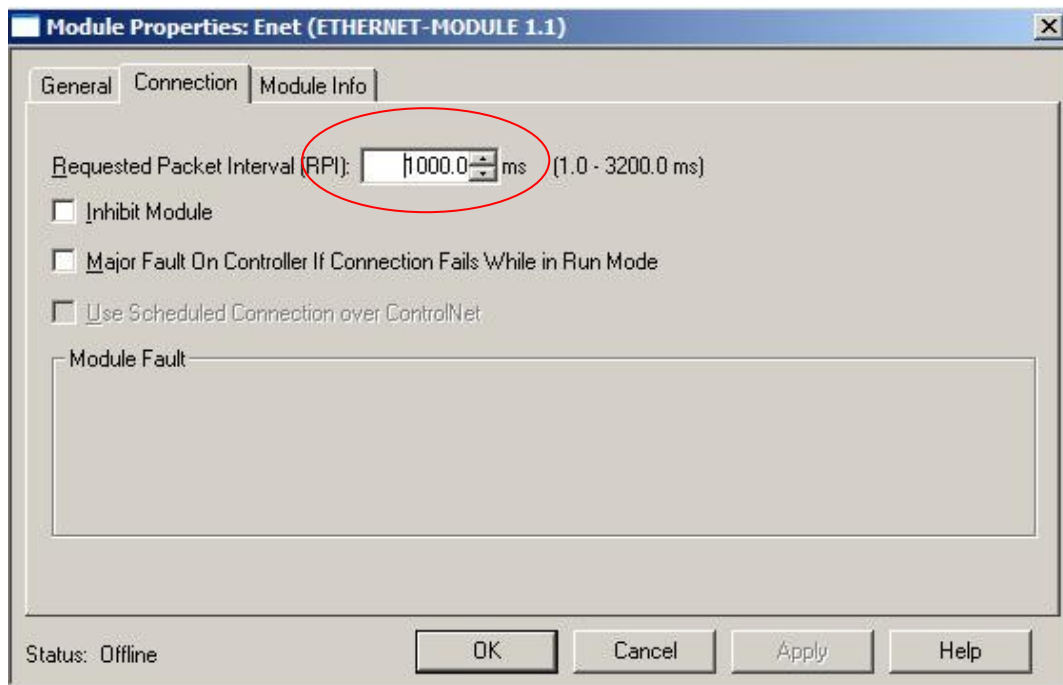
Example PLC Logic

Once the PLC is configured for the marquee, all the user needs to do is move messages to be sent to the marquee in the output area defined for the marquee. Copy File instruction can be used to move data. The example below shows that when the marquee_bit is closed and power flows to the Copy File (COP) instruction we move the data from the source "Marquee" string to the output words of the Marquee device:

(*For details of the message commands, please see the Marquee ASCII commands in the Marquee manual, or use ToughMarquee software Message tab to generate strings for your messages*)
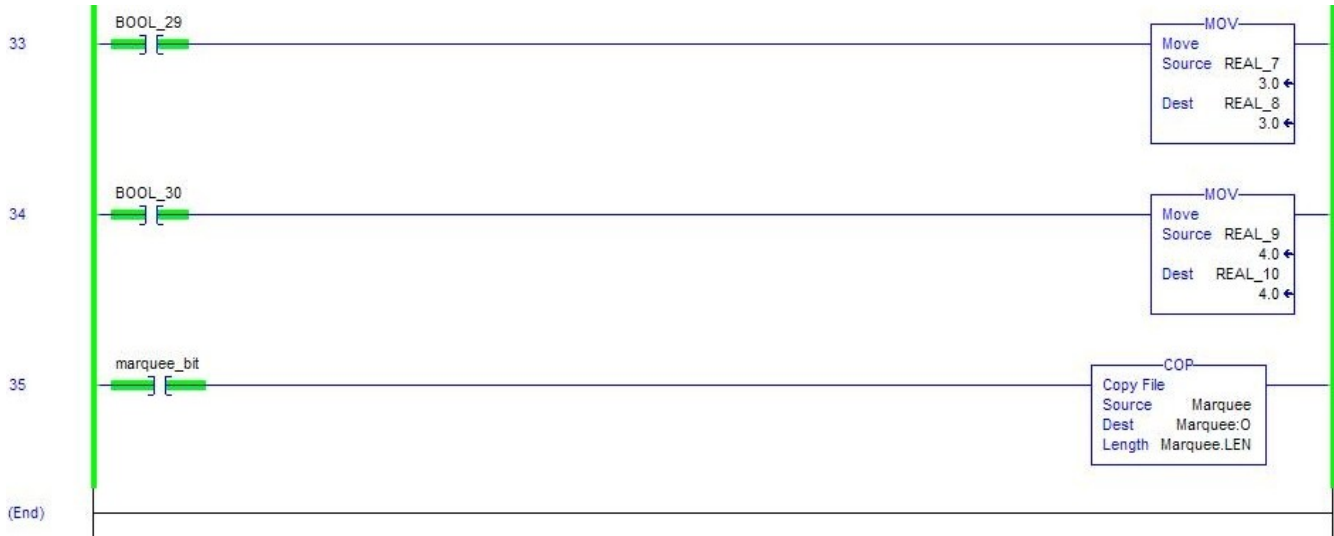
Once this data has been moved into the output words for the Marquee the Marquee will automatically update with the new message. Below shows how this data moved from the string into the output words of Marquee the device. It should be kept in mind that we are moving the data from STRING data-type to the INT type. This means that any value written to this area will be interpreted as ASCII and not an integer.

How to upgrade firmware?

To upgrade the firmware AVG provides a Marquee Firmware Upgrade utility. This utility should have been installed when you installed the ToughMarquee software. (If you followed typical installation, you can run it using Start > All Programs > Uticor >ToughMarquee> MarqueeFirmwareUpgrade.)

To upgrade the firmware, the marquee should be connected to the PC over serial port. After connecting the marquee, run the utility **MarqueeFirmwareUpgrade.exe**, which will display the dialog box shown below:
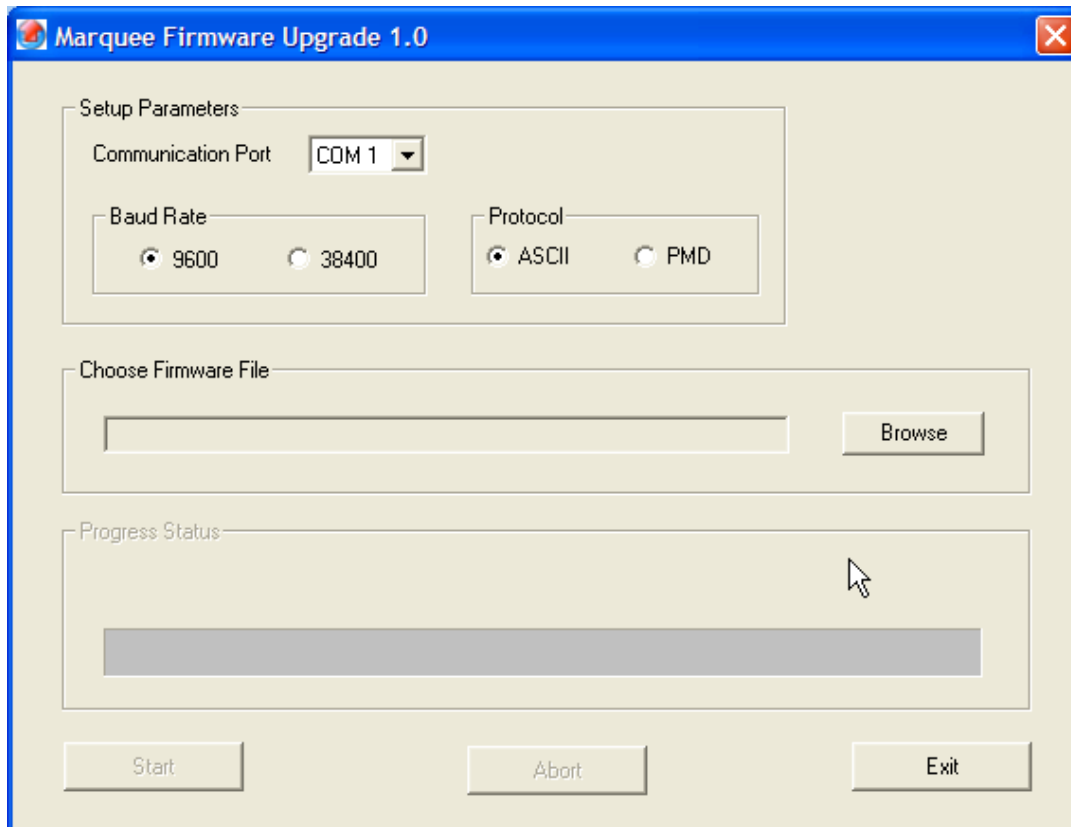
On Power up, Marquee displays its firmware revision (as a single letter), baud rate and protocol mode among many other items. The protocol mode is displayed only if the marquee is in ASCII mode. So absence of "ASCII MODE" on power up messages implies that the marquee is in PMD mode.

In this utility, take the following steps:

1. Select the protocol. If on power up, the marquee displayed ASCII mode, select ASCII, otherwise select PMD.
2. Select baud rate to match that of Marquee. Again, the marquee displays its baud rate on power-up.
3. On your programming PC, select the Com Port that is connected to the marquee.
4. Browse to find the file **MarqueeFirmware_Rev_x.hex**, where x stands for the revision letter (e.g. N) (typically installed in c:\program files\Uticor\ToughMarquee\Firmware)
5. Select that file to open, then click on "Start" to upgrade the firmware in the marquee.
6. Once the firmware upgrade is complete, recycle power to marquee.