UTICOR LITE MARQUEE ASCII PROTOCOL AND SOFTWARE

5.1 Introduction to ASCII Protocol

Uticor Marquee's ASCII protocol transmits information using ASCII characters only and uses ASCII control codes. Using this ASCII protocol, an intelligent device like a computer, a controller, or a PLC can formulate messages and their appearance (scrolling, blinking, character size, color, etc.) to display on a Uticor Marquee.

When a message comprising of ASCII commands is sent to a ToughMarquee, it is displayed only if interpreted properly. If the message sent does not comply with ToughMarquee's ASCII protocol, ToughMarquee might not react properly. Also, ASCII commands sent to ToughMarquee are case sensitive. There is no handshaking with a master device. Therefore, it is recommended that you take advantage of our Free ToughMarquee Software Utility for creating ASCII strings with proper ASCII commands. Once you are done creating ASCII strings through the String Generator software, you can paste the created ASCII strings in PLC instructions or any other intelligent device that you might be using RS-232, RS-422/485 to send messages to the ToughMarquee.

All ToughMarquees have two built-in communication ports (RS232 and RS422/485) both of which can be used to receive ASCII command strings. ToughMarquees can ONLY interpret messages sent in ASCII format. Therefore, it is important to understand how ToughMarquee interprets ASCII strings. This chapter will describe in detail how to formulate messages using ASCII protocol that can be sent to a ToughMarquee.

Note: It is recommended that you take advantage of our FREE ToughMarquee Software Utility for creating ASCII strings with proper ASCII commands.

5.2 ToughMarquee Software

ToughMarquee Software for ToughMarquee is an available tool which can be utilized to generate messages in ASCII protocol along with the necessary commands. The software is easy to use and will allow you to create messages (along with the information needed for scrolling, blinking etc) without knowing anything specific about ASCII protocol. If you are not familiar with ToughMarquee ASCII protocol, we recommend that you take advantage of this tool. The ToughMarquee software is available as a FREE download from the Uticor website **www.uticor.com**

The ToughMarquee software can be used to configure a ToughMarquee, preview messages, and generate ASCII strings. These strings can be simply copied and pasted in any PLC'S ladder logic or any other intelligent device being used to send messages to your ToughMarquee. Once you've downloaded the free ToughMarquee Software, perform the following Three Simple Steps to configure your ToughMarquee:

1. Configure ToughMarquee to Set Up Communication Parameters along with Group and Unit Number if a network of marquees is present.

2. Type in Your Message along with its attributes (character size, color, and effects like scrolling or blinking).

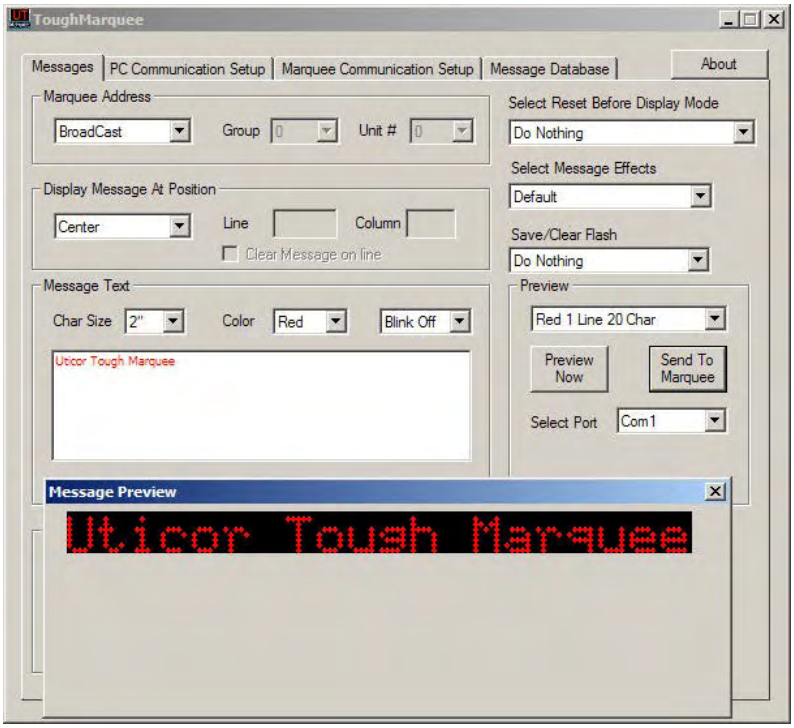
3. Preview the Message to make sure it appears as you want it to and then just copy the generated ASCII string using the Windows copy feature and paste the string into your desired controller's logic.

The ToughMarquee software can also be used for testing ToughMarquees. Just simply connect a ToughMarquee to your computer's serial port (See Chapter 3 for wiring details) and you will be directly connected to the ToughMarquee for sending messages.

5.3 Simple Steps to Get Familiar with ToughMarquee

Step 1:

Set Up Communications Parameters



Step 2:

Type In Your Message

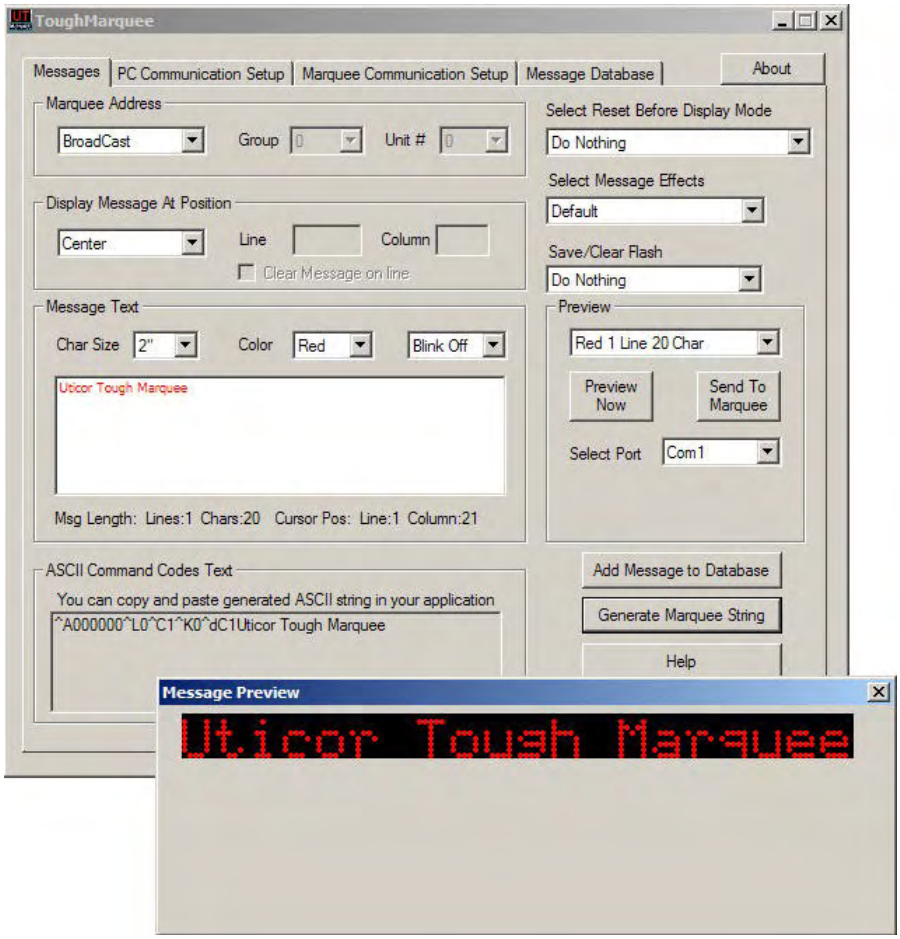
Step 3:

Preview the Message

5.4 e Software to Configure ToughMarquee

To configure your ToughMarquee using the Free ToughMarquee Software, perform the following 3 Simple Steps:

1. Configure ToughMarquee to set up communication parameters and addresses if it is in a network of marquees.
2. Type in your message along with its attributes like character size, color, and effects like scrolling or blinking. Preview the message to edit any changes.
3. Copy the ASCII string and paste to the appropriate line in your ladder logic.



We make it EASY to generate ASCII Strings

The Message Preview window shows you instantly how your message will look

5.5 Cursor Positioning For Messages

Before we introduce the ToughMarquee's ASCII command set, it is important to understand how the positioning of messages works. Understanding this properly will allow proper operation and positioning of messages on a ToughMarquee.

Let's take the example of a 2 Line, 20 characters per line ToughMarquee (model# TSM-2L-20C). This ToughMarquee is capable of displaying 20, 2-inch (2") characters per line max and has 2 lines total. If we send a message "Oven Temp: 189F" to this marquee, in its default mode after power-up, it will show as follows:

Now if we send another message "212" without specifying cursor position (ASCII Command: ^Mrrcc; will be described in detail later in this section), it will be displayed as follows:

Now if we take a step back and send the message with cursor positioning command; we can display the message “212” as follows:

Or we can display another message “Temp Over Shoot” on the next line using ‘Select New Line’ (ASCII Command: ^In) as follows:

Whenever a character is sent to ToughMarquee it is written to the current “cursor position”, which is the very next character space on a ToughMarquee after a message is displayed, unless specified by an ASCII command to do otherwise. Once a new character is sent to ToughMarquee, the current “cursor position” is advanced. All subsequent characters are written on the right side after each other unless specified otherwise via an ASCII command.

There are many ASCII commands to position the cursor properly, which will be described in the next section in detail, including “Reset Display, Position Cursor, Select New Line, Select Wrap, Select Number of sticks per line, and Position Cursor without Clearing the Line”.

5.6 Valid ASCII Commands Accepted by ToughMarquee

Valid ASCII Commands	
^Agguuuu	Selecting Unit and Group Number
^En	Resetting Display
^Hnncc	Cursor Positioning With Line Clearing
^Mnncc	Cursor Positioning Without Line Clearing
^In	Cursor Positioning at Carriage Return
^Jn	Selecting Text Wrap
^Cn	Selecting Center Mode
^dCc	Selecting Character Color
^Ln	Selecting Number of Sticks per Line*
^Kn	Selecting Character Size
^Bn	Selecting Blink mode
^Xn	Selecting Blink Delimiters On/Off

^Gbbcc	Selecting Blink On/Off Rate
^Dn<message text>^N	Displaying Scrolling Text
These, and all ASCII Commands, are Case Sensitive!	

***Note: Selecting Number of Sticks per Line Command** – This ASCII command is used to select the number of physical lines (sticks) on a ToughMarquee to be utilized as one display line. This allows you to allocate multiple lines (sticks) to be used as a single line when using 4", 6", 8", and 8" narrow font sizes.

5.7 ASCII Command Interpretation

As mentioned earlier, ToughMarquees only accept ASCII protocol for receiving messages. ASCII protocol consists of ASCII characters only along with ASCII commands which always start with a "^" (circumflex) symbol followed by the command to perform a special function on subsequent messages to be displayed on the ToughMarquee.

Let's take the example of the "Select Unit" ASCII command which has the following syntax:

^Agguuuu

If using multiple ToughMarquees, this ASCII command selects an ToughMarquee based on its assigned Group and Unit Number. In order to get familiarized with ASCII commands it is important to know how these commands are formulated.

^	Lets ToughMarquee look for an ASCII command right after this symbol
A	ASCII command to perform necessary function
gg	User Specified Parameter
uuuu	User Specified Parameter

Thus, when the ASCII String "^A010001HELLO" is sent, the only message that will be displayed by an ToughMarquee with pre-assigned Group Number of "01" and Unit Number of "0001" will be ")366A ". Also note that that the character "A" and the digits "010001" are not displayed because they are part of the ASCII command syntax. For proper formulation of messages to be displayed on a ToughMarquee, it is important to pay attention to the syntax of every ASCII command.

Note: Current ToughMarquee models have only two groups and 8 unit numbers per group. Two digit group numbers and four-digit unit numbers will be available in future expansions.

5.8 Examples

In this section we will provide some examples to get you familiarized with ToughMarquee's ASCII protocol. As mentioned earlier, you can take advantage of our FREE String Generator software available at the Uticor website: **www.uticor.com**.

For simplicity, let's take a 2 Line, 10 characters per line, ToughMarquee. We'll further assume that this ToughMarquee is connected to an intelligent device, e.g. a computer from whence these ASCII strings are being sent.. In the case of a computer, the String Generator Software or Hyper Terminal can be used to send messages. All of the following examples will be based on this size.

1. ^E1Test 123

   On power-up all ToughMarquees assume themselves to be the only ToughMarquee present and automatically process any commands sent to them unless a message is sent with Group and Unit Numbers. When a message with Group and Unit Numbers is sent, a ToughMarquee will only respond to messages which are specifically addressed to it according to its assigned Group and Unit Number.. In this example, "^E1" clears the display, homes the cursor, and resets all parameters modified by ASCII protocol. Once the display is cleared, it will show "Test 123" on the first line of the display.:

2. ^E1^M0201Test 123

^E1 will clear the whole display, home the cursor, and reset all the parameters modified by ASCII protocol; and ^M0201 will position the cursor on Line 2 Column 1. "Test123" will appear on the very first column of Line 2.

3. ^A000000^E0^l1^C1This is^NTest Msg

^A000000 Selects all the units in every Group (broadcast); **^E0** clears the whole display and homes the cursor; **^l1** sets the cursor to advance to the next line when **^N** (carriage return) is entered; and **^C1** turns the centering mode on for all of the following messages.

"**This is**" will be centered on line 1 and "**Test Msg**" will be centered on Line 2 of all the ToughMarquees connected on the network.

4. ^A020007^E0Oven: 01^NTemp: 199

^A020007 Selects a ToughMarquee with Group #02 and Unit #07; **^E0** clears the display and homes the cursor; and **^N** is carriage return. "**Oven: 01**" will be displayed on line 1 and "**Temp: 199**" will be displayed on Line 2.

Note: Messages that require constant updating of certain segments of a ToughMarquee display can be sent independently by utilizing different ASCII commands as follows:

^Mrrcc: Cursor positioning without line clearing

This command can be used to update/overwrite only a certain segment of the display instead of

resending the same message over and over again. e.g. if you want to update just the temp as displayed in example 4 you could send the following ASCII message:

^M0208200

When the above message is sent, it will overwrite 199 with 200 (present on line=02 and column=08).

UTICOR LITE MARQUEE CONNECTIVITY TO PLCS

6.1 Connecting Uticor Lite Marquee to Different PLCs

Most PLCs have a serial communication port. Based on the type of PLC, it either allows RS232 or RS422/485 type of communication interface. PLCs which have any one of these serial ports and is capable of sending ASCII type messages can be easily used to connect to a ToughMarquee.

Uticor Marquees come equipped with two serial communication ports, RS232 port and RS422/485 port. The RS232 port can be used to establish a point-to-point communication interface with a PLC. On the other hand, the RS422/485 port of an ToughMarquee can be used to integrate multiple ToughMarquees on a single network.

The following Chapter will describe in detail how to connect the Uticor Marquee to the EZ PLC and other major brand of PLCs, such as Allen-Bradley, Siemens, Mitsubishi, & Direct Logic. For connectivity to Ethernet, DeviceNet, and Profibus, refer to the appropriate section of Chapter 3 (3.3.x), which describes in detail the steps necessary to connect the Marquee to these networks.

6.2 EZ PLC

6.2.1 Integrating Uticor Marquee with EZ PLC

As mentioned earlier, a Uticor Marquee can be connected to any PLC capable of sending messages over a serial port. However, when using a PLC other than EZPLC, you can use our Uticor Marquee software to generate ASCII strings which can be pasted in a PLC's ladder logic. Using this method is fairly simple to implement, but EZPLC has a special "Marquee Instruction" which makes Uticor Marquee implementation a lot simpler and faster than any other PLC.

EZPLC's "Marquee Instruction" allows you to create a massage database especially for Uticor Marquees. When populating this database, you can specify all the necessary information along with message attributes such as color, character height, flashing, scrolling, etc. without ever having to worry about generating ASCII strings and copying and pasting them in a PLC's ladder logic.

Every EZPLC has an RS422/485 port which can be used to plug-n-play with a Uticor Marquee using the extremely simple to use Marquee Instruction. EZPLC's Ethernet-enabled models can also be used to send messages to a ToughMarquee over the corresponding Ethernet port of a UticorMarquee.

6.2.2 Sending Messages to Uticor Marquee from EZ PLC

EZPLC has an RS-422/485 port and an Ethernet port that can be connected to the corresponding port on the Uticor Marquee. In addition, message programming and storage is much easier as EZPLC has been designed from the ground up to easily communicate with marquees.

To configure and send messages to the ToughMarquee from EZPLC, perform the following 3 Simple Steps: