Hardware & Software User Manual

(April 2017, Rev. 1)

MANUFACTURED and MARKETED

AVG/EZAutomation

4140 Utica Ridge Rd. • Bettendorf, IA 52722-1327

Phone: **1-877-774-3279** • Fax: **1-877-775-3279** • *www.EZAutomtion.net*

WARNING!

Programmable visualization products such as the EZ iMarquee are not fail-safe devices and as such must not be used for stand-alone protection in any application. Any reliance on these devices for equipment or personnel safety is unwarranted.

WARNING: EXPLOSION HAZARD — do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Trademarks

This publication may contain references to products produced and/or offered by other companies. The product and company names may be trademarked and are the sole property of their respective owners. AVG Automation disclaims any proprietary interest in the marks and names of others.

The diagrams and examples in this user manual are included for illustrative purposes only. The manufacturer cannot assume responsibility or liability for actual use based on the diagrams and examples.

Table of Contents

Purpose of this Manual

Manual Title: EZ iMarquee Hardware & Software User Manual

Purpose

This EZ iMarquee User Manual will give you all the information necessary to install the EZ iMarquee in a fixed location in your work environment, and how to wire it to other components in your control system. Included are mounting diagrams and instructions for installation, Connections and Wiring requirements, Maintenance Information, Programming Information, and Troubleshooting.

This manual is a good reference guide for those who install the Marquee, as well as those who program it. If you understand the EZ iMarquee, or Marquees in general, you can find all the information you need to start and maintain your system in this manual.

The following table provides you with updated information. If you call technical support with a question about this manual, please be aware of the revision number and date.

Revision	Author	Date	Pages Effected	Description of Changes
1.0	DI	April 2017	All	Original Release of Manual

Technical Support

If you need assistance, please call our technical support at 1-877-774-3279 (EASY) or **FAX** us at 1-877-775-3279.

You can also email technical at techsupport@ezautomation.net.

Manual Organization

The information below provides an overall description of the topics covered within this manual.

Chapter 1: Getting Started

Provides Manual Organization and lists what you need to get started to display messages. Gives you a quick reference to get familiar with your EZ iMarquee. Discusses how to get help with questions you might encounter and how to contact Technical Support.

Chapter 2: Models and Equipment

Provides you with a table listing the various models, their part numbers and special features. Lists the important features and hardware specifications for different models.

Chapter 3: Installation, Wiring and Connection Information

Provides information about preparing the marquee for operation such as setting the DIP switches, connecting Power and how to interface EZMarquee for Serial communication. Shows the mounting and cutout dimensions for the different models. Explains the different ways to mount the marquee. Shows the setup screens displayed after initial power up of the display.

Chapter 4: EZ iMarquee Editor Software

Provides information about how to download the EZ iMarquee Editor software. Also provides information about how setup a new project, create messages, and download the project to the EZ iMarquee.

Chapter 5: Communication Setup with various PLCs

Quick guide to set up the communication with different PLCs over Ethernet

Allen-Bradley
Koyo by Automation Direct
Siemens
EZ PLC
General Electric (GE)

Chapter 1: Getting Started

1.1 Installing the EZ iMarquee – Overview

This section is designed to take you through a quick start on how to use the EZ iMarquee. It assumes that you are a first-time user of EZ iMarquee. By following the 3 Simple Steps, you will be creating and displaying messages on your EZ iMarquee in no time.

Mounting	The EZ iMarquee is a suspension mount unit. Please refer to the beginning of **Chapter 3: Installation** for environmental factors, hardware requirements and instructions.

Connections & Wiring	Once your EZ iMarquee is mounted, you are ready to connect your unit to the power source, PLC, and other devices. Note that the EZ iMarquee is an AC powered unit (120/240 VAC). For more details, refer to **Chapter 3: Wiring and Connections.**

Connections & Wiring	Download and install the EZ iMarquee Editor software, refer to **Chapter 4**. Connect your EZ iMarquee to a PLC, refer to **Chapter 5**. Have your EZ iMarquee start displaying messages!

1.2 What You Need to Get Started

1.2.1   Hardware

- EZ iMarquee display
- 110/220 VAC input cord with stripped wire on one end
- EZ iMarquee Programming Cable (EZ-PGMCBL) unless you purchase the EZ iMarquee equipped with the exclusive EZWifi Module.
- Ethernet Cable (if applicable)
- Serial (RS232/RS422/RS485) PLC Communication Cable (based on PLC)
- PC requirements:
    - PC with a mouse and serial port (USB port may be used with Serial to USB converter [Aten, Belkin, or Tripp Lite recommended])
    - Standard Windows XP, Windows 7, or Windows 10 operating system.
- User Manual

1.2.2   Software

- EZ iMarquee Editor software (version 1.0 or higher)

The EZ iMarquee programming software, can be downloaded FREE of cost by following these steps:

1. Go to **www.ezautomation.net**.
2. Click on **Downloads** at the top of the page.
3. Scroll down to EZ iMarquee section.
4. Right click on the appropriate software title and save it to your computer.
5. Install the EZ iMarquee Editor software on your computer.

1.3 Need Help?

1.3.1   Tech Support

If you need assistance, please call our technical support at 1-877-774-3279 (EASY) or **FAX** us at 1-877-775-3279.

You can also email technical at techsupport@ezautomation.net. You can also visit our website at www.ezautomation.net.

1.3.2   Documentation

Queries	Information Resource
iMarquee Mounting and Installation	EZ iMarquee Hardware & Software User Manual (this manual)
iMarquee Wiring and Connections	EZ iMarquee Getting Started Guide EZ iMarquee Hardware & Software User Manual (this manual)
iMarquee PLC Connectivity	EZ iMarquee Getting Started Guide EZ iMarquee Hardware & Software User Manual (this manual)
iMarquee Programming	EZ iMarquee Getting Started Guide EZ iMarquee Programming Software Help

Note: The EZ iMarquee Getting Started Guide is a simpler step by step process for setting up the EZ iMarquee. All the information that is in the EZ iMarquee Getting Started Guide is also included in the Hardware User Manual (this manual).

Chapter 2: Models and Equipment

2.1   Product Overview for the EZ iMarquee

The EZ iMarquee (EZ Intelligent Marquee) is a Master Marquee model; it monitors connected devices, such as PLCs, and is capable of issuing string messages or Triggering messages based on external events to other marquees and devices.

The EZ iMarquee is the most sensible marquee for stand-alone and Plant-wide communication displays with large character sizes so that the messages are visible up to 400 feet. Character visibility can be enhanced by scrolling or blinking the message.

The EZ iMarquees are offered in 5 different models, each with Tri-Color LEDs, to suit every application. You can display messages in 2", 4", 6", 8" and 8" Narrow characters. All EZ iMarquee models are capable of communicating over RS-232, RS422, and Ethernet communications.

EZ iMarquees can be interfaced with PLCs, PCs, and embedded controllers. All EZ iMarquees support ASCII protocol. You can also take advantage of EZ iMarquee's International Character Set to display your messages in multiple international languages.

2" characters - readable from 100 feet
4" characters - readable from 200 feet
6" characters - readable from 300 feet
8" characters - readable from 400 feet
8" Narrow characters - readable from 400 feet

1L refers to one line or "row" that equals 20 characters (each 2" high). 20C refers to 20 characters, all of which are 2" high.

EZ iMarquees are available in several sizes. The smallest size is called the 1L20C. The other sizes are multiples of the smallest size, such as the 4L20C (shown above), and the 2L40C (which has two lines of text but is twice the length; thus supporting twice the number of 2" characters per line), etc. See chart on **Page X** for a complete listing of sizes, with their full range of text possibilities.

2.1.1 Physical Characteristics

EZ iMarquees are enclosed in NEMA 12 housing, with NEMA ICS 2-230 level of electrical noise immunity. Three grommets are provided for routing wires through the back access plate. The connectors and set-up switches can be accessed by removing the back access plate.

EZ iMarquee can be mounted in three different ways. It can be mounted on a wall, ceiling or on top of the machine depending upon the application. **Chapter 3** describes the various ways to mount and install the EZ iMarquee.

2.1.2 Messages

How messages look depends on the way they are sent. Messages have options that determine message output and visual appearance. A network of two groups of EZ iMarquees with 8 marquees in each group can be set up. When the message contains group and unit number information, the message can be displayed on one, some, or on all of the EZ iMarquees.

The EZ iMarquee also features International Character Sets. This option is switch-selectable to allow message display in U.S., English, French, Danish, Swedish, German, Cyrillic, or Japanese Kana.

2.1.3 Where to Use EZ iMarquee Display

Using EZ iMarquees is an excellent way to keep workers in touch with the manufacturing process via the following:
- Monitor Productivity of each machine, line, or the whole plant
- Communicate Alarm and Safety Messages
- Provide Continuous Reports on Factory Conditions

2.2 EZ iMarquee Part Numbering System

EZiMT - XLYYC

Size of display:
XLYYC, where "X" = the number of lines of text, and "YY" = the number of characters per line. For example: **4L20C** = 4 lines of text, with a maximum of 20 characters per line. *See chart in section 2.5.2 for a full breakdown of unit sizes, with their display features, dimensions, weights, etc.*

2.3 EZ iMarquee Features

- 2" to 8" Tri-Color characters
- International Character Set
- 5 Available Models (1 Line 10 Char to 4 Line 40 Char)
- NEMA 12
- Pre-Matched LEDs
- 24 hour Burn-in tested

- 110/220 VAC Power Input voltage
- UL, CUL, CE, CSA Approval (pending)
- Stationary, Scrolling and Blinking Messages
- 100,000 Hour rated life
- Mixed Character sizes on one Line

2.4   EZ iMarquee Other Parts

There are replacement parts and other optional equipment available to customize or upgrade the EZ iMarquee to fit your application. The tables below provide you with a list of this equipment. Instructions, if necessary, on how to install this equipment to upgrade your unit are also provided.

Part	Description	Notes
EZ iMarquee Programming Software	Software to program EZ iMarquee	Download at www.ezautomation.net
Grommets	Connectors on the EZ iMarquee back plate	Order by request by calling 1-877-774-3279
Back Plate	EZ iMarquee back plate with grommets	Order by request by calling 1-877-774-3279
Mounting Brackets	Mounting Brackets for the EZ iMarquee	Order by request by calling 1-877-774-3279
Phoenix Connectors	Phoenix connects for plug-in Terminal Block	Order by request by calling 1-877-774-3279

2.5   Unit Specifications

General Specifications for all the EZ iMarquee models are provided in the following pages.

2.5.1   General Specifications for all EZ iMarquees

Enclosure:	NEMA 12 (Indoor Only)
Power Supply:	110 VAC (102-132) 47-63 Hz / 220 VAC (194-250) 47-63 Hz
Power:	28-180 Watts (Depending on size)
Operating Temperature:	0° to 55° C (32° to 131° F)
Storage Temperature:	-40° to 90° C (-4° to 140° F)
Humidity:	10 – 95% RH, non-condensing
Electrical Interference:	NEMA ICS 2-230 Showering Arc Test
Electrical Tolerance:	ANSI C37.90a-1974 (SWC) Surge Withstand Capability Test
Vibration:	5 to 55 Hz 5G for 2 hours in the X, Y, & Z axes
Shock:	20G for under 12 mSec in the X, Y, & Z axes

2.5.2 Marquee Dimensions, Weights, and Display Options by Unit

This table shows the dimensions and weights for each Marquee model, according to the housing material selected. It also shows all standard message text sizes and the maximum number of lines and characters for each character height supported. "N" denotes "Narrow" characters.

Part Number	Dimensions: W x H x D	Weight	Possible Text Configuration (at Uniform Character Height)
2L10C	18.87" x 5.67" x 2.75"	2.8 lbs.	2" char: 2 lines of 10 characters 4" char: 1 line of 5 characters
2L20C	36.04x 5.67" x 2.75"	3.0 lbs.	2" char: 2 lines of 20 characters 4" char: 1 line of 10 characters
4L20C	36.58" x 10.47" x 2.75	5.0 lbs.	2" char: 4 lines of 20 characters 4" char: 2 lines of 10 characters 6" char: 1 line of 6 characters 8" char: 1 line of 5 characters 8N" char: 1 line of 10 characters
2L40C	72.45" x 5.67" x 2.75"	15 lbs.	2" char: 2 lines of 20 characters 4" char: 1 line of 10 characters
4L40C	72.45" x 10.47" x 2.75"	30 lbs.	2" char: 4 lines of 40 characters 4" char: 2 lines of 20 characters 6" char: 1 line of 13 characters 8" char: 1 line of 10 characters 8N" char: 1 line of 20 characters

Chapter 3: Installation

3.1   Installation Considerations

AVG products have been designed and tested for operation in the most demanding industrial environments. Modern solid-state industrial controls are complex electronic equipment that operates at low levels of voltage and current, coexisting with components that operate at much higher levels of power. The difference in operating power characteristics between the high and low power control devices creates the possibility of unwanted signals being generated causing interference. The interference, which is a by-product of electrical noise, is not present at all times. However, it appears at random and during brief periods of time can cause disruptions and errors in the operation of a control system.

Enhancement of a system's noise level immunity, and its tolerance to other environmental hazards can be accomplished by following proper system installation guidelines. The recommendations that follow are of a general nature and constitute good, solid state industrial installation practice.

3.1.1   General Environmental Installation Considerations

Avoid installing your Marquee in areas where the following conditions may exist:
- Environmental temperatures above or below those specified by the system being installed
- Prolonged exposure to humidity and liquids which may be sprayed or splashed on the equipment
- Dusty environments where airborne particles may accumulate on equipment causing reduction of heat dissipation, and reduction in effective electrical spacing between components
- Areas of excessive vibration
- Areas of high-radiated electrical noise, such as near fields of transmitting antennas and areas in close proximity of arc welding stations

3.1.2   Environmental Specifications

The following table lists the environmental specifications that generally apply to the iMarquee. However I/O module operation may fluctuate depending upon the ambient temperature and your application.

Parameter	Ratings
Operating Temperature	0° to 55° C (32° to 131° F)
Storage Temperature	-40° to 90° C (-4° to 140° F)
Humidity	10 – 95% RH, non-condensing
Vibration Resistance	5 to 55 Hz 5G for 2 hours in the X, Y, & Z axes
Shock Resistance	20G for under 12 mSec in the X, Y, & Z axes
Electrical Noise	ANSI C37.90a-1974 (SWC) Surge Withstand Capability Test

3.1.3   AC Line Noise

The AC power available in house outlets and at sub-stations powering industrial and commercial applications is generally generated at a power station miles away from the point of usage. The power is "noise" free at the time it is being generated, and meets all specifications for amplitude, frequency, harmonic distortion and others. However, the same specifications cannot be guaranteed at the point of usage, due to the disruptive factors associated with the transmission from generator to consumer.

While the generated power output starts its journey "clean," and free of noise, it is "polluted" by radio and TV frequencies, spikes from reactive kickbacks due to switching heavy inductive and capacitive loads in transmission lines, and from other interference.

As a result, critical and sophisticated electronic controls may malfunction; false triggering, user program loss and/or modification may occur and even catastrophic failure.

In view of the problems associated with AC power, it is strongly recommended the source, transmission and final end use be given stringent consideration before any commitment to supply the system is given. Some typical problems in power line usage are:

Blackouts: This is the total loss of power. Generally, they are easy to detect and if a situation arises where they cannot be tolerated then an uninterrupted power supply (UPS) should be used.

Brownouts: This occurs when there is a reduction in line voltage amplitude. If this reduction falls within operating limits, no adverse effects will be experienced. However, if they are frequent and severe, a UPS system should be considered.

Voltage Fluctuations: These are amplitude variations (rapid or slow) and can occur above or below the specified limits. Overvoltage conditions may damage equipment if the duration of the voltage condition is lengthy. It may cause disruptions, data loss, and production downtime.

Noise Spikes: Noise spikes and other unwanted signals superimposed on the AC line voltage waveform are the most common problems associated with the distribution of the power from its grid system. The amplitude of these signals can be from several hundred to a few thousand volts and the pulse width from about one to 200 microseconds. Because of their short duration and random occurrences, these harmful signals are difficult to detect.

3.1.4 Dealing with AC Line and Other Electrical Noise

The best option to effectively eliminate or greatly reduce voltage fluctuations, spikes and line noise is through the use of isolation, constant voltage, or power line conditioner transformers.

Isolation transformers are passive devices that do not have DC paths between the circuits they isolate. The transformer provides attenuation to spikes and common mode noise, but has virtually no effect on transverse mode noise and does not provide protection for voltage fluctuations.

Constant voltage transformers are static Ferro-resonant transformers that can accept fluctuating AC voltage input (within a specified range) and maintain a constant voltage output. The transformers provide good attenuation to transverse mode type noise, however, are ineffective for attenuation of common mode type signals.

Power line conditioning transformers provide good line regulation and are effective in providing attenuation to both common and transverse mode types of noise.

All of the mentioned transformer types are available by various manufacturers and they come in different varieties of operating voltages, power ratings, and frequencies.

Make sure that the 110-220VAC Power Source for the Marquee is a clean noise-free power source used for low voltage control systems as described above. It should be isolated from heavy inductive or RF loads such as motors, motor starters, and welding and other RF equipment. Marquee's power source should be either the same as, or of the same quality, as that used to power your PLC.

The power cable and unshielded communication cable must be run in a separate conduit or wiring harness. The shield at both ends should be connected to the Earth Ground Terminals to minimize extraneous electrical noise pick-up.

CAUTION!
Make sure you connect the Earth Ground wire to the Earth Ground Terminal on the Marquee to avoid possible shock.

3.2 Wiring and Connections

This section of the manual provides information about preparing the marquee for operation, such as setting the DIP Switches, connecting power and preparing to interface the Marquee for serial communication.

3.2.1 Accessing Connectors and Switches

The Marquee has an Access/Cover plate on its backside. This is a gasket cover plate with three sealed grommets for power, serial communication cable, and Ethernet cable. The gasket and the grommet seal must be intact to retain NEMA 12 rating. Once you remove the cover plate by removing the four access screws on the plate, you have access to wiring terminals and 3 different DIP switch banks for marquee parameter selection.
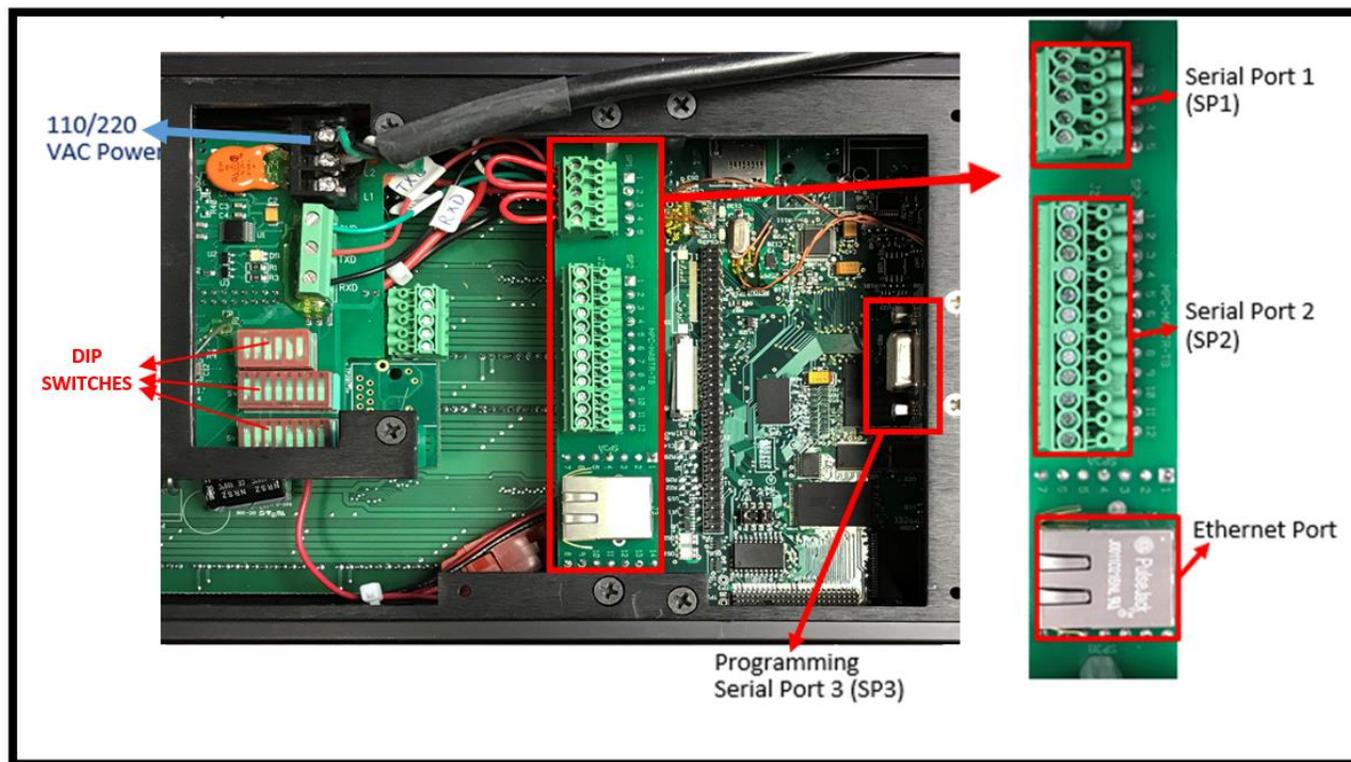
3.2.2 Setting Up DIP Switches

Group and Unit Number: Each EZ Marquee is assigned a unit address. A unit address is programmed into each message to specify which unit or units should display that message. The unit address of an EZ iMarquee is defined by the setting of the Dip Switch located inside the back panel under the access plate. This can be changed at any time to alter the address of the unit. Each unit address consists of two identifiers—a Group and a Unit Number. The unit addresses are divided into Group and Unit Numbers to allow the EZ iMarquee to address selected subsets of all the iMarquee displays connected to it.

NOTE: The Unit Number and Group Number selection is applicable only if you use the RS232 port of the EZ iMarquee. If using Ethernet then each iMarquee has an individual IP Address which is use for the same purpose.

CAUTION!

Please DO NOT TOUCH SW1 (the 6-position DIP switch above the 8-position DIP switches)! SW1 is for factory use only!

3.2.3 DIP Switch 1 (SW1)

DIP Switch 1 is preset from the factory

DO NOT touch DIP Switch 1 under any circumstances!

3.2.4 DIP Switch 2 (SW2)

The diagram below illustrates how to set up DIP Switch 2:

Switches			Unit Number
5	4	3	
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	5
1	0	1	6
1	1	0	7
1	1	1	8
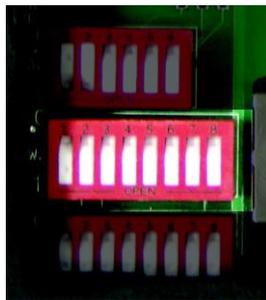
Unit Selector

Baud Rate

Switch 1	Baud
0 =	9600
1 =	38.4K

Character Set

Switches			Char. Set
8	7	6	
0	0	0	U.S.
0	0	1	Cyrillic
0	1	0	French
0	1	1	German
1	0	0	English
1	0	1	Danish
1	1	0	Swedish
1	1	1	Kana

Group Selector

Switch 2	Group #
0 =	1
1 =	2

Open = OFF = 0
Closed = ON = 1

3.2.5 DIP Switch 3 (SW3)

The diagram below illustrates how to set up DIP Switch 3:

Default Character Size

SW2	SW3	Default
1	1	0 = 8 inch
0	1	1 = 6 inch
1	0	2 = 4 inch
0	0	3 = 2 inch
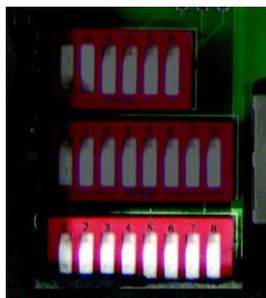
PMD/ASCII Protocol

Default	SW1
0 = PMD	1 = PMD
1 = ASCII	0 = ASCII

Open = OFF = 0
Closed = ON = 1

Not Used

3.3 Serial Communication Ports
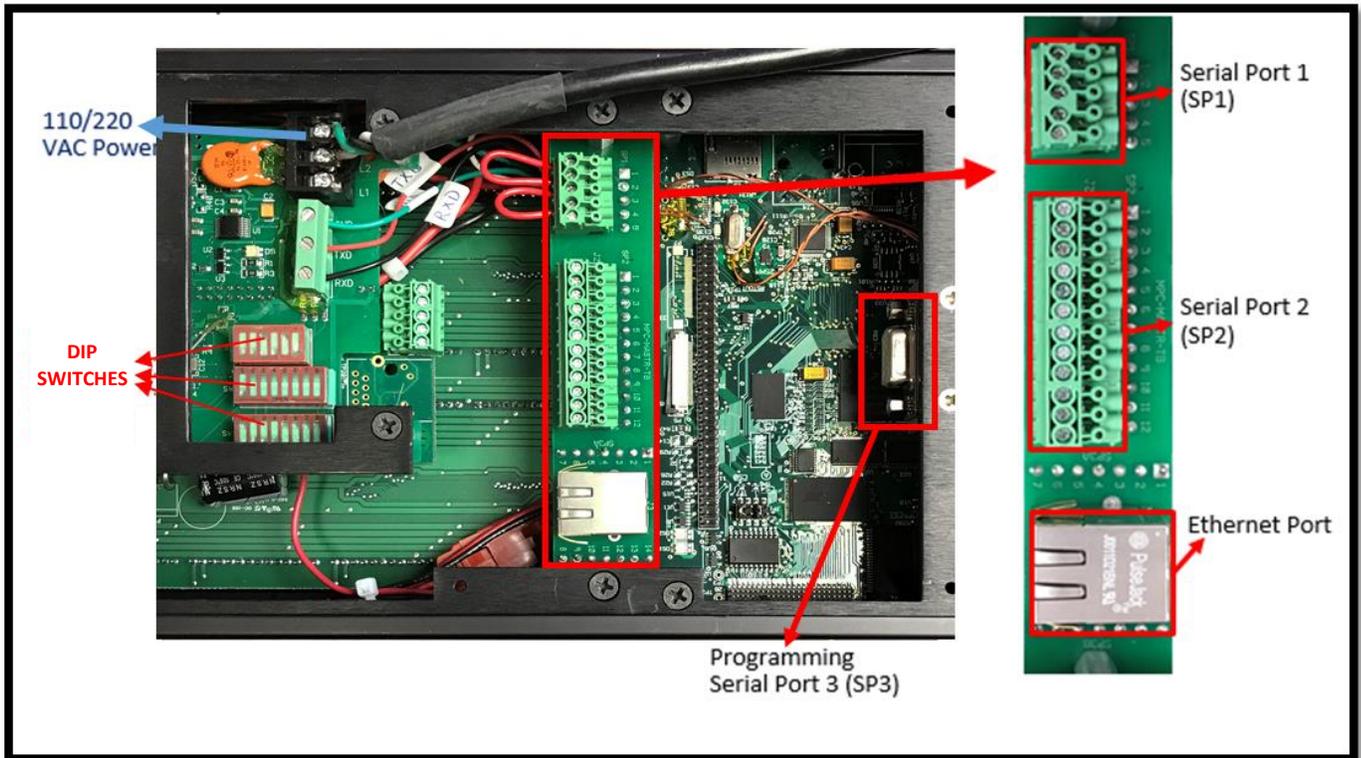
The EZ iMarquee has 3 different serial ports for communication. These 3 different serial ports each have a different functionality. Serial Port 1 (SP1) is used to communicate to iMarquee slaves. Serial Port 2 (SP2) is used to communicate with PLCs serially. And finally Serial Port 3 (SP3) is used to download projects to the EZ iMarquee and to setup the iMarquee IP address. The EZ iMarquee also has an Ethernet Port that can be used for both PLC communication and to download projects to the iMarquee.

3.3.1 Serial Port 1 (SP1)

Serial Port 1 (SP1) is pre-wired in the factory as shown below, i.e. Pins 1-2 on SP1 are jumped together. This jumper connects the serial port on the Message Controller board within the marquee, to the serial port of the Message Display board in the marquee. **The jumper is required for the Marquee to display messages sent from the controller.** This port IS **NOT** used for PLC communication or PC to iMarquee programming. This port can be used to connect a SLAVE marquee to the iMarquee over RS232.

To connect a slave unit to the master iMarquee, please use terminal numbers on SP1:

2 (Tx)
3 (Rx)
5 (GND)
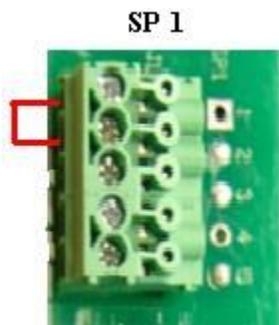
Pin Number	Function
1	RX (Message Display Board)
2	**TXD** (Message Controller Board)
3	**RXD** (Message Controller Board)
4	TXD (Do Not Use)
5	**GND**

3.3.2   Serial Port 2 (SP2)

The SP2 connector is used to connect the iMarquee to the PLC via **RS-232 or RS 422/485** communication. If the user wants to connect the PLC to the iMarquee over Ethernet, no wiring is required to this port.

Pin Number	Pin Function (from the Marquee's perspective)	Marquee serial Communication
1	N.C.	
2	TXD	RS-232
3	RXD	RS-232
4	N.C.	
5	GND	RS-232 / 422 / 485
6	N.C.	
7	N.C.	
8	N.C.	
9	RD+ (Receive Data)	RS-422 / 485
10	RD- (Receive Data)	RS-422 / 485
11	SD+ (Send Data)	RS-422 / 485
12	SD- (Send Data)	RS-422 / 485

Marquee connection to the PLC's RS-232 port (if available)

RS-422 connection between the Marquee and the PLC
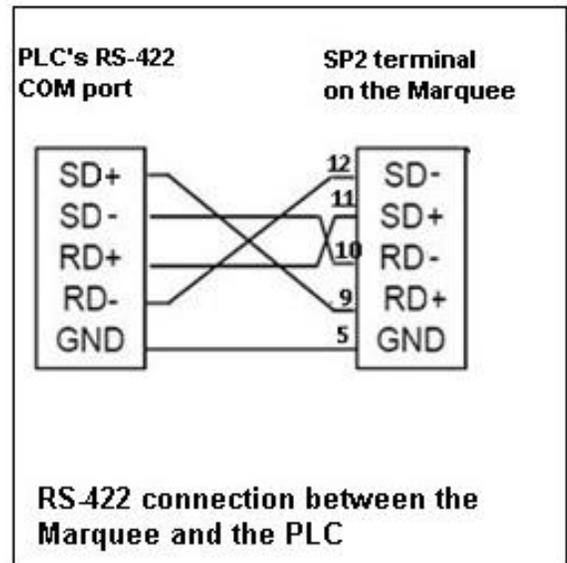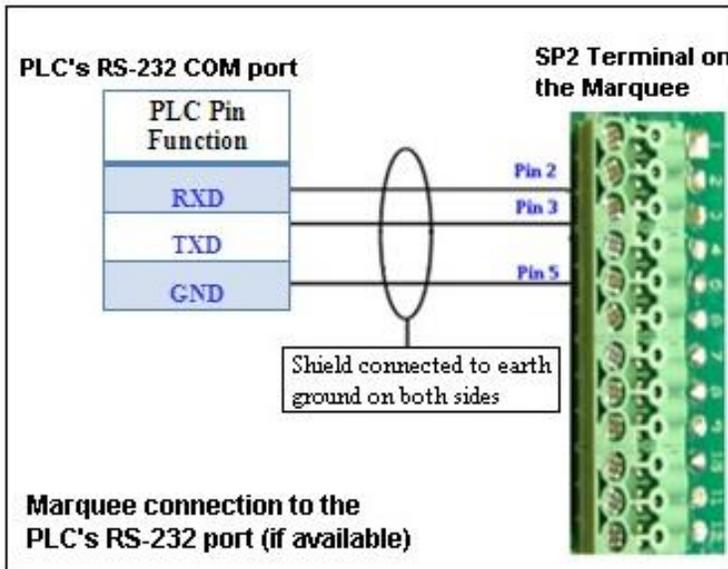
3.3.3   Serial Port 3 (SP3)

The SP3 connector is used to connect the iMarquee to the PC via an iMarquee programming cable (**EZ-PGMCBL) or if ordered with Wi-Fi capability will have the EZ-WiFi Module pre-installed on the unit**. Once the IP address of the iMarquee is set by using the programming software and EZ-PGMCBL or over EZ-WiFi, the user can use an Ethernet cable to transfer the program to the unit.

Connect the EZ-PGMCBL to the SP3 Connector using the female 9-pin D-sub connector. This port allows the user to change the IP address of the unit, download a new user program, or upgrade iMarquee application (firmware) over the serial port

To communicate with the iMarquee using the Programming software running on a PC, follow these steps:

1. Turn off the power to the unit, and connect serial port of PC to the serial port **SP3** on the iMarquee's Controller board using an EZ-PGMCBL.

2. Turn ON the power to iMarquee. Wait until the iMarquee boots up (about 30 seconds).

3. Now you will be able to communicate to the iMarquee from the PC through the programming software. You can check /modify IP parameters, download a new user program, or upgrade the Marquee firmware serially.

4. You can also run the iMarquee while being online with the Programming Software to monitor tags and/or troubleshoot the iMarquee.

Note: If you have purchased an EZ iMarquee with an EZ-WiFi module then the SP3 port is connected directly to the EZ-WiFi module. Therefore to program the unit you only need to turn it on and connect to the EZ-WiFi and download over it. Please see EZ-WiFi manual for steps on how to connect.

3.3.4   Ethernet Port

The iMarquee's Ethernet port can be used to program the unit and also for PLC communication using PLC communication protocols such as Allen-Bradley's Ethernet/IP, Modbus TCP/IP, Siemen's ISO over Ethernet etc.

The Factory default settings are:

IP Address: 192.168.0.1
Subnet Mask: 255.255.255.0

This is displayed on the iMarquee during power up sequence. This can be changed by the user to suit their available IP addresses in their network.

3.4   Power Connection

The EZ iMarquee's power input is 110-220VAC @ 50-60Hz. Three terminals are provided for connecting operating power to the unit. These terminals are located on the Control Board (see the figure 2.2 below). Power Input terminals are labeled L1, L2, and chassis ground (8). Always connect the ground terminal to the safety ground.

Connect the unterminated end of the AC Power Cord to L1, L2, and GND (Black or Brown to L1, White or Blue to L2, Green or Green w. Yellow stripe to GND).

Terminal Block	Pin	Lead	Wire (US)	Wire (European)
		(GND)	Green	Green/Yellow stripe
	L1	Load	Black	Brown
	L2	Neutral	White	Blue

3.5   Mounting Overview

The EZ iMarquee is a panel-mount unit. All units use DIN Clips for mounting to cabinet after cutting out the panel. No through-holes are needed. The diagrams in this chapter provide all the diagrams and dimensions you will need for each model to prepare an enclosure surface prior to mounting the EZ iMarquee using the enclosed DIN Clip hardware.

> **CAUTION!**
> To ensure proper cooling of the EZ iMarquee:
> - Mount on a VERTICAL SURFACE ONLY
> - Allow 1-inch clearance between rear of panel and enclosure
> - Allow 4-inches for panel X-Y clearance

EZ iMarquee models are mounted using several different methods, depending on the size and weight of the unit. Due to their size, and the need for visibility, most will be suspended from above. But smaller units can be mounted onto a surface. A variety of suspension rigs and mounting brackets are available with the units.

3.5.1   Mounting and Dimensions

2 Lines, 10 Characters

2.750
[69.85]

5.670
[144.02]

6.147
[156.13]

1.750
[44.45]

Ø0.201
[Ø5.11]

18.868
[479.25]

18.451
[468.67]

18.036
[458.12]

MOUNTING HOLE CENTERS

2 Lines 20 Characters

2.750
[69.85]

5.670
[144.02]

6.147
[156.13]

1.750
[44.45]

Ø0.201
[Ø5.11]

36.868
[936.44]

36.451
[925.86]

36.036
[915.31]

MOUNTING HOLE CENTERS

4 Lines 20 Characters

2.750
[69.85]

11.095
[281.81]

11.720
[297.69]

36.100
[916.94]

N/A

10.470
[265.94]

36.577
[929.06]
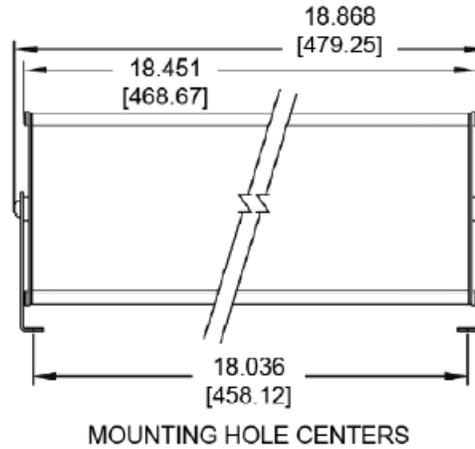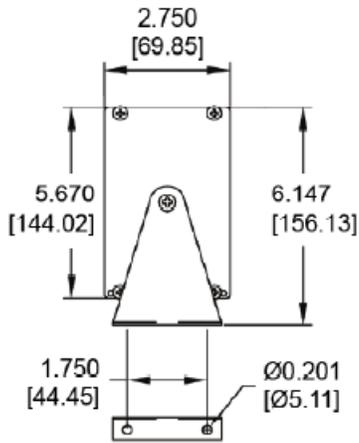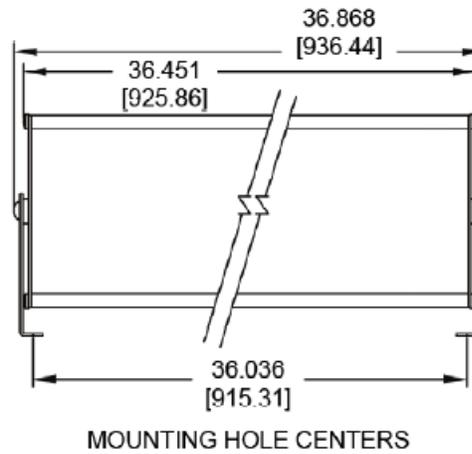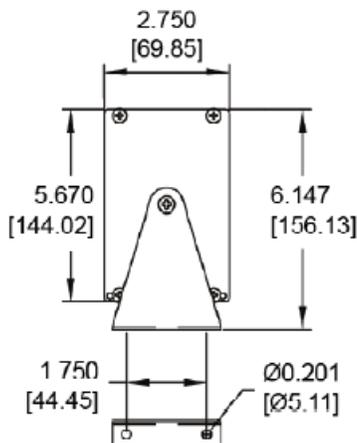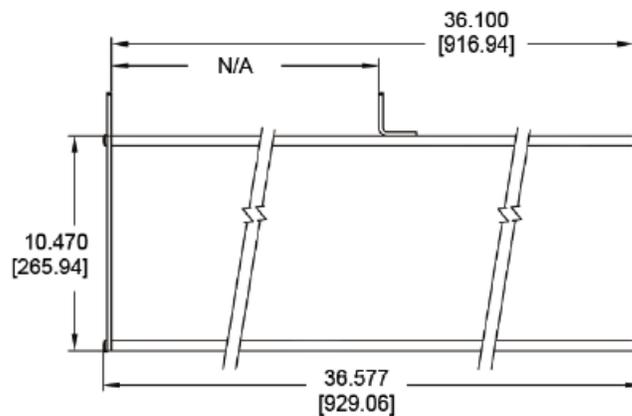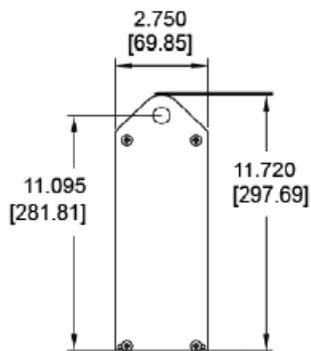
2 Lines 40 Characters
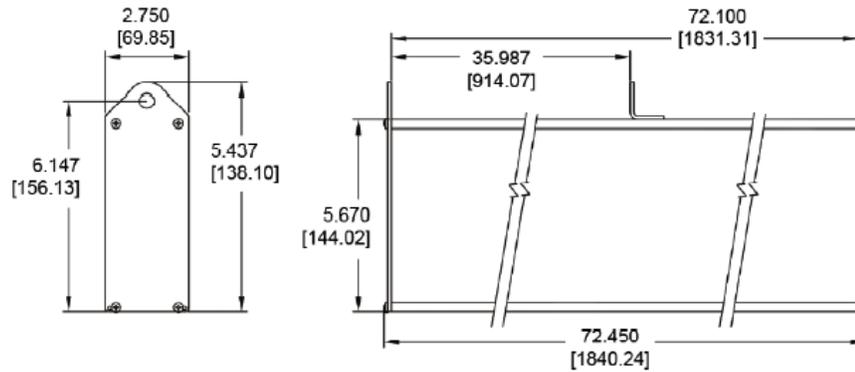
4 Lines 40 Characters
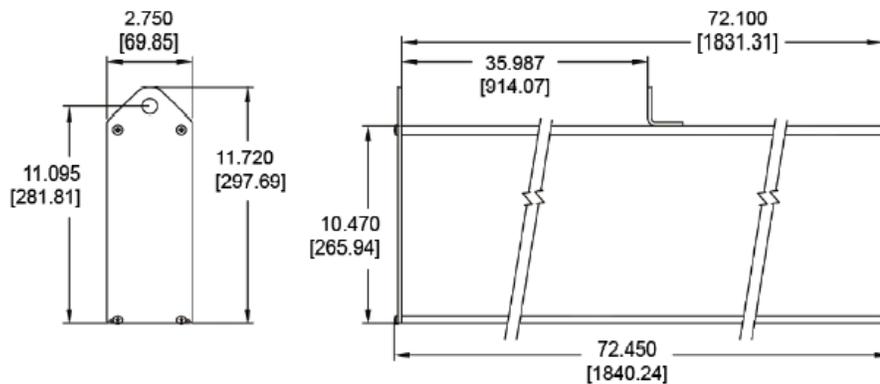
3.6   Power Up Messages

When the Marquee is initially powered up, it automatically displays a series of Messages; mainly the Marquee attributes (Baud rate, Group #, Unit #, etc.) as shown below:

REVISION O	(Firmware Revision)
GROUP 01	(Group Number)
UNIT 0001	(Unit Number)
BAUD 38400	(COM port Baud rate)
CHAR 2"	(Character size)

Once the controller board is activated, a scrolling message appears displaying the EZ iMarquee's IP address. Example:

CONTROLLER STATIC IP 192.168.0.1

After the IP address appears, the programmed messages (Power Up messages followed by PLC Messages) are displayed based on the PLC tag status and control parameters.

POWER UP MESSAGE 1

PLC MESSAGE

Chapter 4: EZ iMarquee Editor Software

4.1   System Overview

A typical Marquee control system comprises of a PLC (Programmable Logic Controller) to drive the logic and a Master/Slave Marquee to display the messages based on the PLC logic. The EZ iMarquee itself can drive a network of several Slaves.

Note: A PC is only required to initially program the Marquee with various messages and to import the tag database from a respective PLC (if applicable)
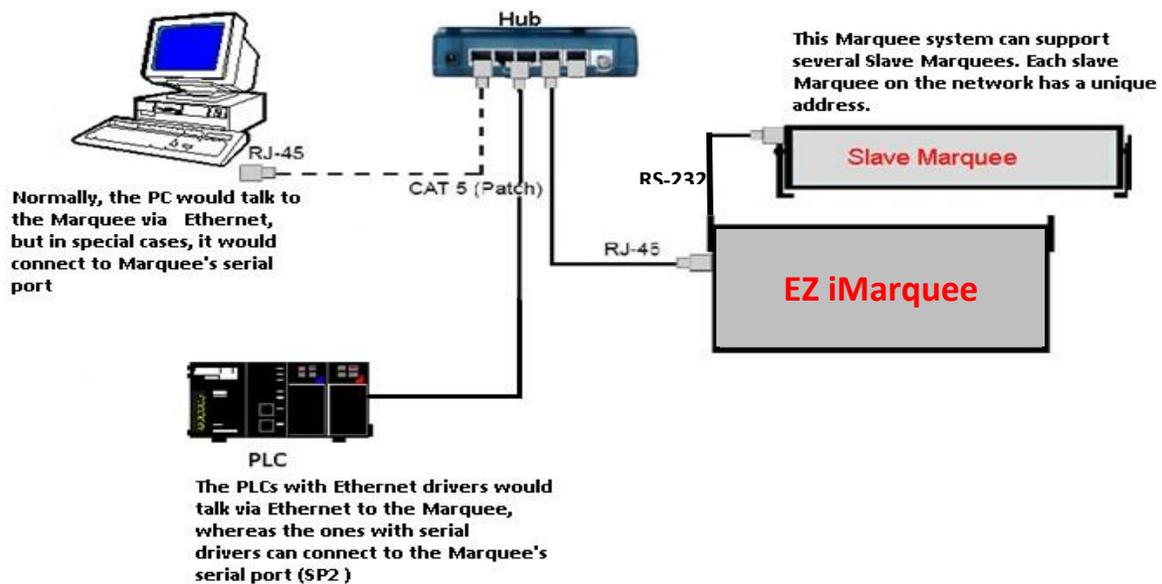
4.2   EZ iMarquee Programming Software

The EZ iMarquee programming software (version 1.0 or higher) is the software in which you create the messages that will be displayed on the iMarquee. The EZ iMarquee is programmed with as many messages as you would like. The iMarquee then based on tag conditions read from the PLC displays those messages. There are different types of messages ranging from start-up messages, normal messages, and priority messages (alarm messages).

The EZ iMarquee programming software, can be downloaded FREE of cost by following these steps:

1. Go to **www.ezautomation.net**.
2. Click on **Downloads** at the top of the page.
3. Scroll down to EZ iMarquee section.
4. Right click on the appropriate software title and save it to your computer.
5. Install the EZ iMarquee Editor software on your computer.

4.3 Creating a new Project

The following example demonstrates how to start a new project using the EZ iMarquee programming software.

Launch the EZ iMarquee programming software and you will see the "PROJECT INFORMATION" window.
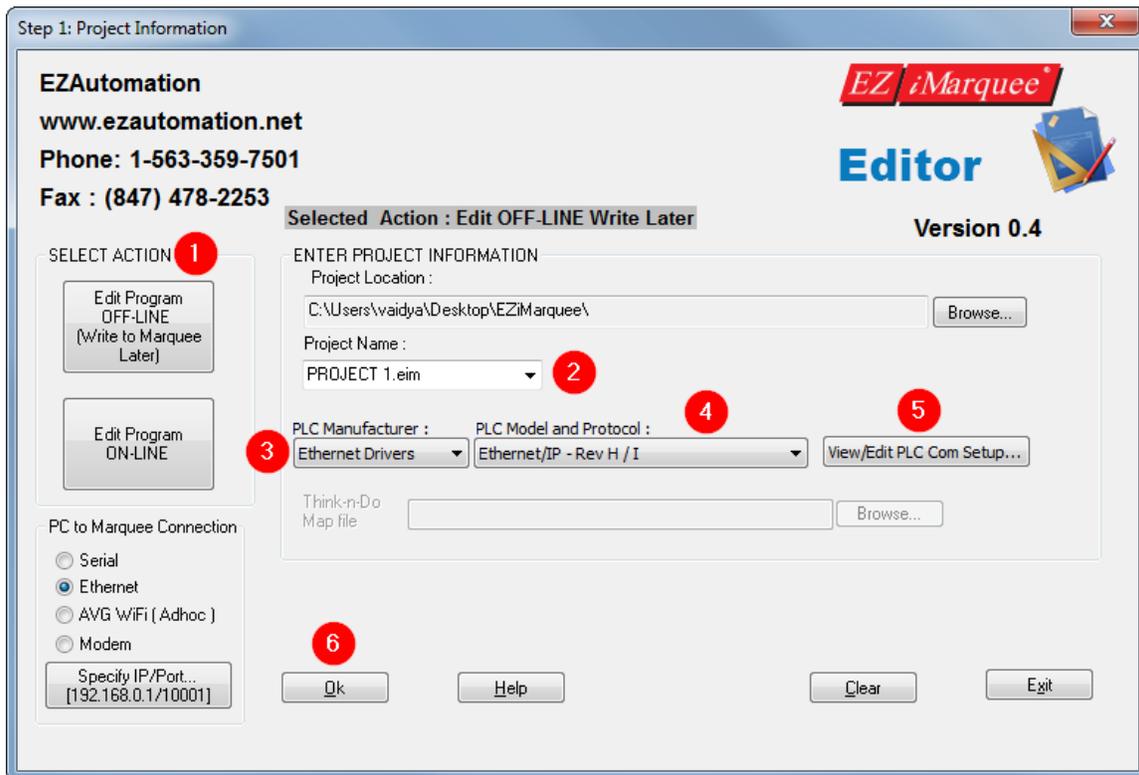
1) Click on "Edit Program OFF-LINE" button. (This is to create a project while being offline, iMarquee need not be connected to your computer).

2) Enter a project name and click on the "Enter" key on your keyboard.

3) Select your PLC manufacturer. If you are connecting your PLC to the EZ iMarquee over Ethernet, select "Ethernet Drivers" or find the equivalent driver under the specific PLC Manufacturer. For simplicity all PLC's Ethernet drivers are grouped under "Ethernet Drivers".
If you want to connect iMarquee to your PLC via serial COMs, please select the respective PLC manufacturer from the drop down menu.

4) Select the PLC Model and protocol. If you have selected Ethernet communication between PLC and iMarquee, please enter the PLC's IP address under "View/Edit PLC Com Setup"

5) Click on "OK" button at the bottom of the window. This will open the main programming window, where you can start creating messages to be displayed on the iMarquee.

4.4   Creating Messages

In the main programming window, there are two sections. Top section is where you will start adding messages by right clicking. These messages will be displayed on the iMarquee when the PLC tags change state.
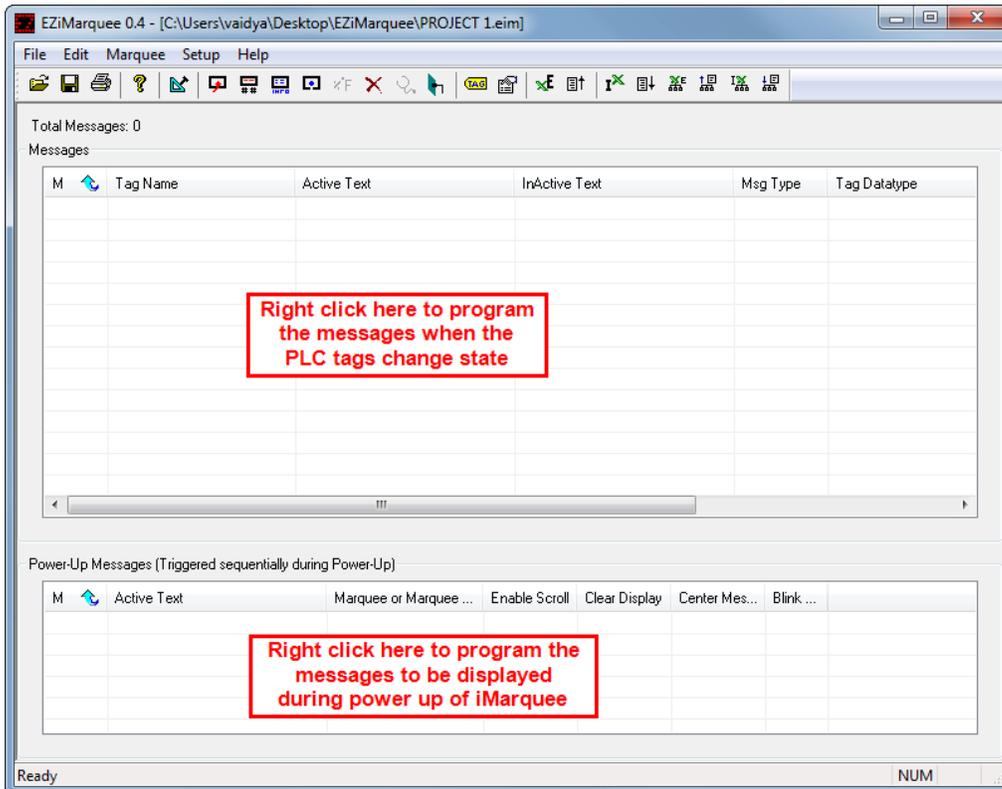
Bottom section is where you add messages to be displayed on the iMarquee during power up.

Below is a quick guide on how to create a message. More detailed instructions about message options are in the section 4.5.

1. Right click in the top window and select Add Message.
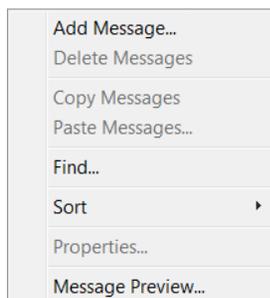
2. After clicking Add Message the following window will appear. This window is used to setup all normal and priority messages.

3. In the windows please enter the number of the message in the message field. It has to be entered sequentially. You MUST not program message # 5 before message # 1.

4. Next choose whether the message is a normal message or priority message (alarm message). If both the messages are triggered at the same time, iMarquee will only display the "Priority Message" till the priority message trigger goes away.

5. Now select the Message Display Condition tag. These tags can be either Numeric or Discrete. Depending on what type of tag you enter, the Display condition changes. For example, when you choose a discrete tag, Display Condition will change to "ON" or "OFF". When Numeric Tag is selected, user can choose to display the message if the tag is "In the Range" or "Out of Range" etc.
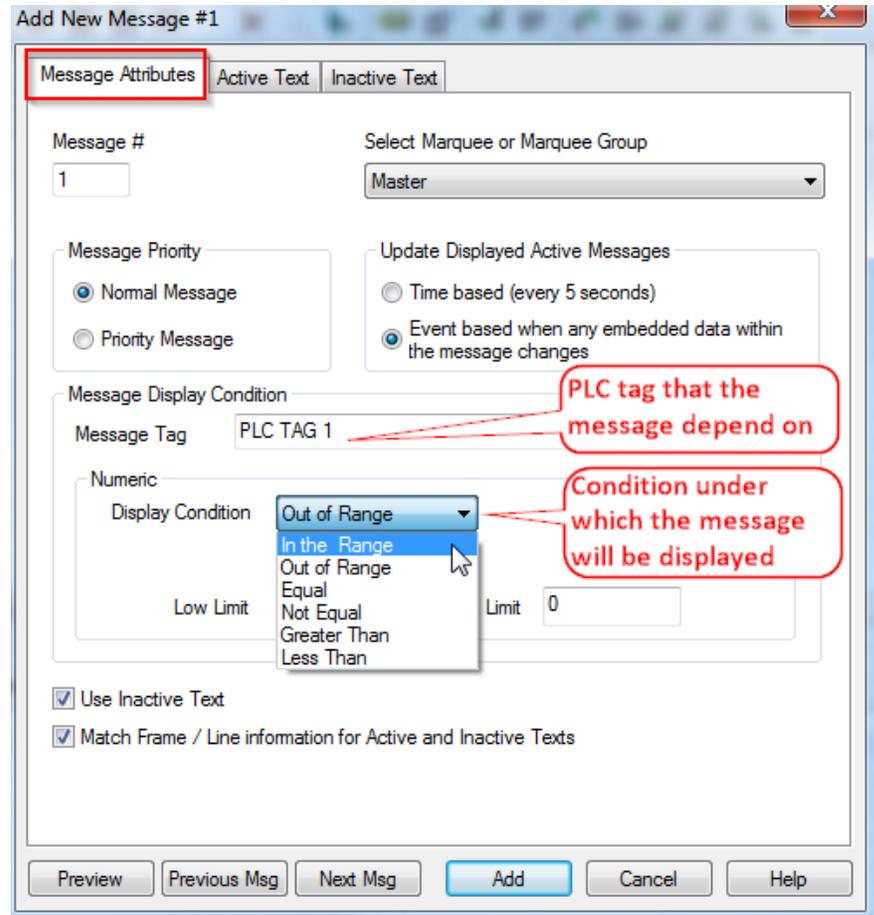
6. Finally select whether to use Inactive Text and Match Frame.

   a. If you choose to use inactive text, you can enter message text that will be displayed when the message is inactive (has not been triggered) under the Inactive Text tab. If you deselect it, here, the Inactive Text dialog will be unavailable (grayed out) and no message will be displayed when the message has not been triggered.

   b. Select Match Frame/Line Information for Active and Inactive Texts if you want the inactive and active messages to display in the same frame and on the same line.

7. Now click on the "Active Text" tab to enter the message to be displayed when the Message condition is fulfilled, and choose from the following options.

8. In this window type in the Message Text that you want to display when the Message Trigger Condition is TRUE (message is active).

   a. Place your cursor anywhere in the Message Text field and right click your mouse button to access a menu that will allow you to change the color or size of the text, or change it to blinking text. Highlight the text you want to change, right click, and select the color, character size, or blink attribute for that text.

   b. If you want to embed a Real Time Data Value, right click in the position you want the data value to appear and select Embed Tags from the popup menu.
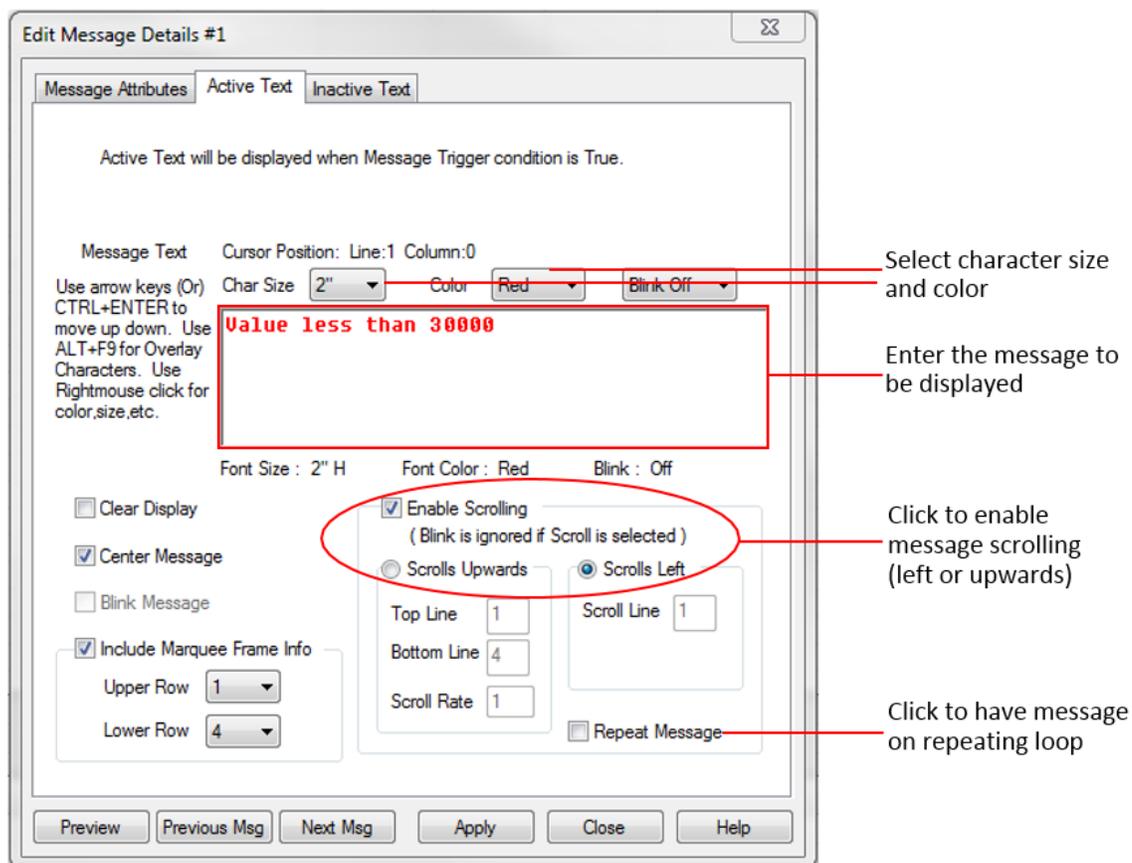
9. Now you can choose how you want your message to appear on the iMarquee. Click in the box in front of Clear Display if you want the previous message to be erased from the display. If left unchecked, the previously displayed characters will remain on the display where this message does not overlay them.

For example:	Previous Message	New Message	Result
Checked	1234567890 2nd LINE	ABC	ABC
Not Checked	1234567890 2nd LINE	ABC	ABC4567890 2nd LINE
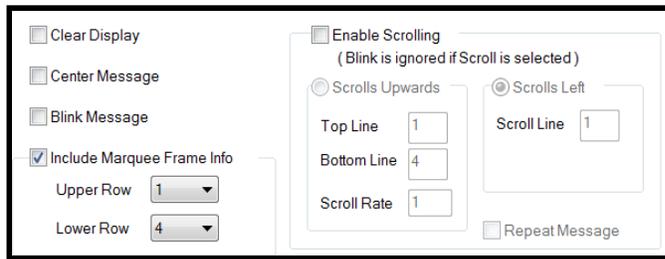
10. Finally you can select some message effects including messages position (Center Message option, Marquee Frame Info option) and message emphasis (Blink Message, Message Scrolling)

   a. **Center Message:** if you want the message to be centered on all lines of the display. If left unchecked, the text will be displayed as entered in the message. Please note that left-scrolling messages cannot be centered.

   b. **Blink Message:** if you want the message to blink. The entire message (including time, date and variable data) will blink ON and OFF when displayed. Characters that remain on the display from the previous message will also blink.

   c. **Marquee Frame Info**: this sets the default state for the EZ iMarquee Frame Upper Row (or top) and Lower Row (or bottom) attributes on this message. The Upper Row attribute sets the top stick that will be used to display as a message. The Lower Row sets the bottom stick that will be used to display a message. To use different size character sizes you need to use Marquee Frame Info. Enter a number between 0 and 8 for the Upper Row and the Lower Row.

   d. **Enable Scrolling**: if you want the message to scroll on the display. Please be aware that If you have selected to Include Marquee Frame Info, you will not be able to select the lines that where you want the message to scroll (they will be grayed out), it will scroll on the lines selected under Include Marquee Frame Info.
      i. **Scroll Upwards**: if selected than the message lines will scroll up from a lower line of the display to the next line up of the display. If you have selected Scroll Upwards, select the Top Line (from 1 to 4) and the Bottom Line (from 1 to 4) where you want the message to scroll. The bottom line value must be equal to or greater than the top line value.
      ii. **Scroll Rate**: the value you enter here will determine the rate at which this particular message will scroll. The range for the Scroll Rate is 1 to 99 (0.1 to 9.9 seconds and the default is set at 1 second). Click in the box to enter a value for this option.

   e. **Repeat Message**: if you want the scrolling message to keep repeating until a new message is selected. If you leave this check box empty, the scrolling message will be displayed only once.

11. Select the Inactive Text tab to program the inactive text message. Inactive text will be displayed when the Message Trigger condition is False. Inactive Text is programmed with the same options as Active Text. If you did not select the Use Inactive Text option under the Message Attributes tab, you will see the following dialog when you click on the Inactive Text.

You have chosen not to include Inactive Text in this message.

If you want to add Inactive Text, you must choose 'Use Inactive Text Details' under Message Attributes Page.

4.5   Message Options

When creating messages it is important to consider how messages behave and what options are available based on the type of iMarquee purchased. For example you cannot use 8" Characters on a 2L20C iMarquee. This section will go over all the available options and restrictions for the different message options.

4.5.1 Power Up Messages

Power Up Messages are unique message only visible upon startup of the iMarquee. Each message is visible for a set amount of time. Message display time is set in the **Setup > Project Attributes**, and can be set from .1 to 25.5 seconds (at 1/10 second intervals). Each Power Up Message is only displayed one time. Once all Power Up Messages have been displayed then the iMarquee will go to standby mode and will monitor tags and display the setup Normal and Priority Messages.

Power Up Messages have same message options as Normal and Priority Messages

4.5.2 Normal Messages
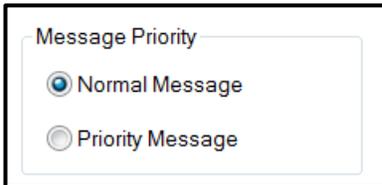
Normal Messages are your basic message which you use to display the information you are monitoring for. Each message is created with a trigger condition which when true will cause the message to be displayed on the iMarquee. These messages can also have embedded data values. They can typically be used for displaying information such as production data, temperature, etc. Each normal message will continue to display in the order in which it was triggered and for as long as the trigger is active. Message display time is set in **Setup > Project Attributes**. Up to 99 Messages can be stored in the Queue. When the queue is full (99), the 100th message will write over the first message in queue.

4.5.3 Priority Messages
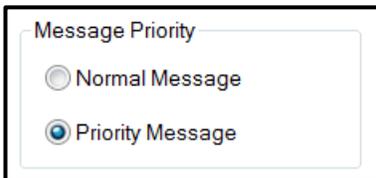
Priority Messages are also queued messages, but when the message trigger is active no normal messages will be updated or processed. Priority Messages might be used to display critical information. For example, if an iMarquee is routinely displaying Data Messages that provide pressure readings for Valve #1, you may want to program a Priority Message to display if Valve #1 pressure exceeds a maximum point. Priority Message could read "WARNING: Valve #1 pressure exceeds maximum. Shut down System XYZ."

Multiple Priority Messages can be triggered at the same time and they then behave like Normal Messages in that each message is displayed for a set amount of time. Priority Message display time is also set in **Setup > Project Attributes**. Priority Messages also have 99 message queue which behaves like the Normal Message queue.

4.5.4 Message Display Conditions
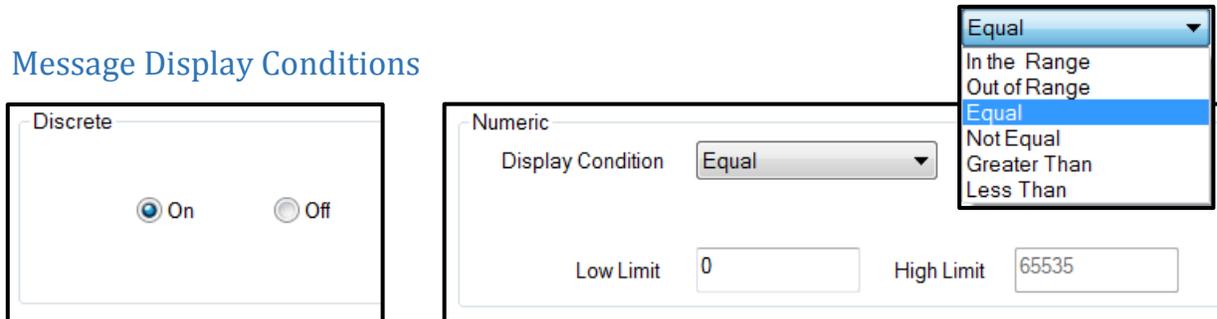
Based on selected trigger tag the message display conditions change. If the selected tag is a discrete then you can select whether to trigger the message when the tag is On or Off.

If the selected tag is a numeric tag (any datatype) then you can choose form the conditions of In the Range, Out of Range, Equal, Not Equal, Less Than, or Greater Than. Out of Range or In the Range will leave both the Low Limit and High Limit fields available. Enter your selected range in those fields. Make sure that the Low Limit is less than the High Limit or you will receive an error message. If the value of the tag falls in or out of the range you have entered, the message will be triggered based on the condition.

For Equal, Not Equal, Less Than, or Greater Than, you will only need to enter the Low Limit. This is the value that will trigger the message based on the condition you have selected.

4.5.5 Message Character Size
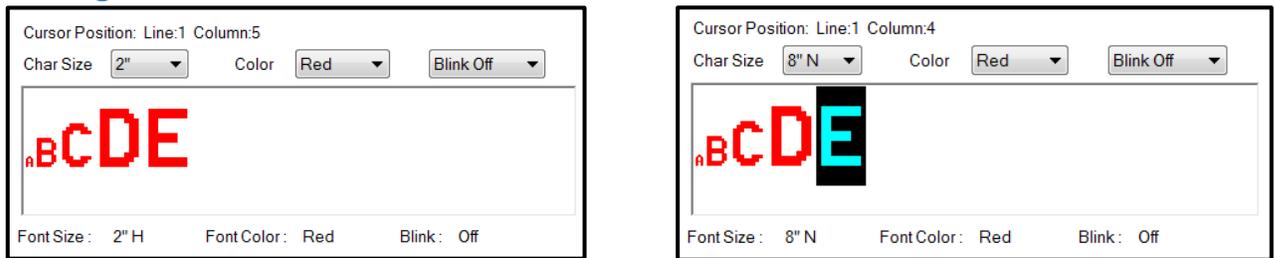
The EZ iMarquee can display characters of differing sizes. Character sizes possible are 2", 4", 6", 8" and 8" narrow. Please note that 6" and 8" characters cannot be used on a 2 Line iMarquee (a 4 Line is needed). To change the display size of characters select the ones you wish to change then choose the needed size in Char Size dropdown menu. Different character sizes are possible on the same line, therefore you can emphasize certain messages (for example: ABCDE).

When changing characters it is important to include the Marquee Frame Info. This setup determines what lines the Marquee can use to display the message. The upper and lower row determines which line is used on the Marquee. This frame info changes based on Marquee size. On a 2 Line Marquee Row 1 & 2 refers to Line 1; Row 3 & 4 refers to Line 2. On a 4 Line Marquee Row 1 refers to Line 1, Row 2 refers to Line 2, Row 3 refers to Line 3, and finally Row 4 refers to Line 4.
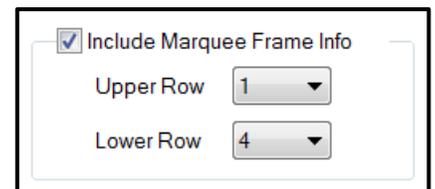
4.5.6 Message Color
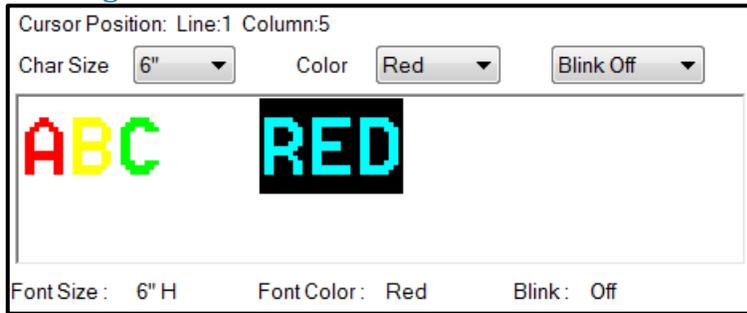
All EZ iMarquee are tri-color marquees. This means that all messages can be different colors. Also a message can change colors from letter to letter and/or line to line. The Color option dropdown list at the top of the text box is where you select the color. Default color is red. Once a color selected then the message will be displayed in that color in the text box. The color of embedded tags can also be changed. You can also select color using the right click menu in the text box.

Color can be modified by highlighting the text you want to change and then changing the Color option. The bottom row provides information about the current highlighted text. For example above the text "RED" is red in color with 6" character size.

4.5.7 Embedding Variables

All message can have any tag embedded in them. This includes discrete, numeric, string, time and date tags and even expression tags. Variables are embedded by right clicking in the text box and selecting embed variables. The following dialogue box appears and based on the selected tag data type you can select display options.
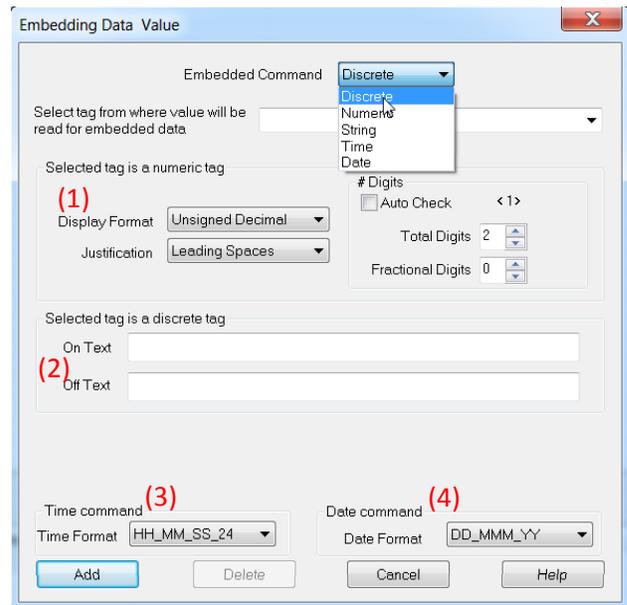
In the embed data value dialogue use the embedded command drop down menu to select the type of tag. Then you can select any already created tags in the drop down tag selection. You can also at that point create any new tags in that same area.

Numeric Tags (1): Numeric tags have the option of the display format, justification and # digits to display. You can also auto detect if you would like.

Discrete Tags (2): Discrete tags have the option of displaying a specific On Text and a specific off text.

Time (3): If the type of embedded value selected is time than the only option you can select is the display format.

Date (4): If the type of embedded value selected is date than the only option you can select is the display format.

String Tags: String tags can also be embedded. There are no other options available for embed strings, they are displayed in full.

4.5.8 Other Message Options

Clear Display: When this option is checked then the message will clear the display before it is shown.

Center Message: If this option is checked then the message will be centered on the EZ iMarquee.

Blink Message (Can be selected in the text box as well): If this option is checked then the message will blink.

Marquee Frame Info: Important for different character size. **NOT FINISHED**

Scrolling Upwards: When scrolling is checked you can have the message scroll upwards. For upward scrolling only you can select the speed of the scrolling the range is 1 to 99 (0.1 to 9.9 seconds and the default is set at .1 seconds). If you do not use Marquee Frame Info then you can select from which row to which row it will scroll. For both options you can select to have the message scroll repeatedly

Scrolls Left: When scrolling is checked you can have the message scroll left. This scrolling does not have a settable speed. It will scroll left at a consistent speed. If you do not use Marquee Frame Info then you can select from on which row the message will scroll. For both options you can select to have the message scroll repeatedly.

4.5.9 Inactive Text Options

Unless the Use Inactive Text is checked then you will see the following message on the Inactive text page.

You have chosen not to include Inactive Text in this message.

If you want to add Inactive Text, you must choose 'Use Inactive Text Details' under Message Attributes Page.

☑ Use Inactive Text

☑ Match Frame / Line information for Active and Inactive Texts

If the Inactive Text is checked then the Inactive Text Tab will look exactly like the Active text Tab. For formatting if you do not want to deal with it then you can just select the Match Frame and Active and Inactive Text will match.

4.5.10 Importing / Exporting Messages

Exporting Messages: All message can be exported. If you would like to export Power Up Messages go to *Setup > Export Power-Up Messages.* For normal and priority messages you use the *Setup > Export Messages* option. The messages can be exported as either a CSV file or Excel file. It is sometimes useful to export messages and then modify them in Excel. Then if formatted correctly they can be imported back into the EZ iMarquee Editor software.

Importing Messages: To import messages use the *Setup > Import Messages* option (or *Import Power-Up Messages*). Messages can be imported from a correctly formatted CSV file or Excel file. To see how to format messages it is recommended to export an example message. Please note that messages will not be imported if the corresponding tags used in the messages do not exist. Therefore it is recommended that you either import or create the relevant tags before importing Messages. If any message is not imported the software will give you a list and reason why it was not imported.

4.6 Tags

The EZ iMarquee behaves like an HMI in that it monitors PLC tags. For the iMarquee to be able to Monitor PLC tags the tags need to be created and correctly formatted. All PLC manufacturers have different PLC tag mapping therefore please consult EZ iMarquee Editor software Help file for more information.

4.6.1 Creating Tags

Tags can be created either individually in each new message or multiple tags can be created in the tag database. Tags can also be imported, please see directions in section 4.6.3.Direction below describe how to create tags in both cases.

Individual Tags

1. Tags can be created right when you are creating new messages. To do just input the new tag name in Message Tag Area. This can also be done when embedding a tag in a message.

Message Display Condition

Message Tag   New Tag

2. Now click enter and the following dialogue will appear in which you will setup the tag itself.

3. For the tag you can select either that it will be a PLC tag, Internal tag, or an Expression. PLC tags are tags which the EZ iMarquee monitors on the PLC. Internal tags are tags which are only in the EZ iMarquee. Finally expressions are short code snippets that allow you to perform a math or logic operation on PLC register data values. More information in section 4.6.2.

4. Next in the Address String you need to input the correct address format for the Tag (please consult the Help file for the correct PLC tag mapping information).

5. Next you need to select the Data Type of the tag. The Data Type dropdown menu gives you all the available data types.
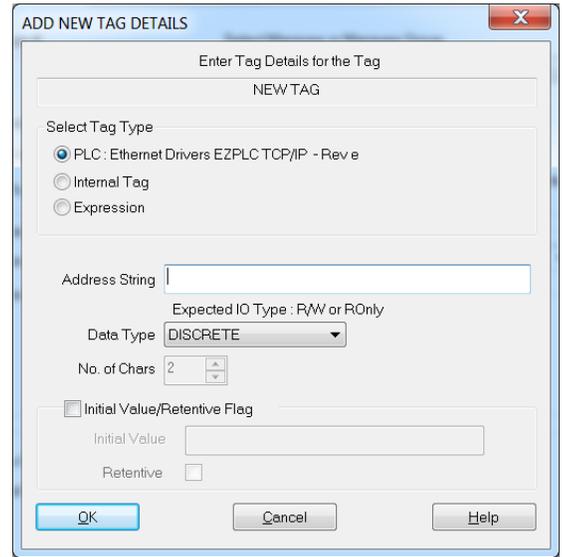
6. For String tags you can select the number of characters (in multiples of 2) to a maximum of 40 characters possible.

7. Finally you have some Initial Value and Retentive options. If you check the Initial Value/Retentive Flag then you can input an Initial Value into the text box. Then if you want the value to be retentive you have to check the retentive check box.

Tag Database

1. To create multiple tags at once go to **Setup > Tag**
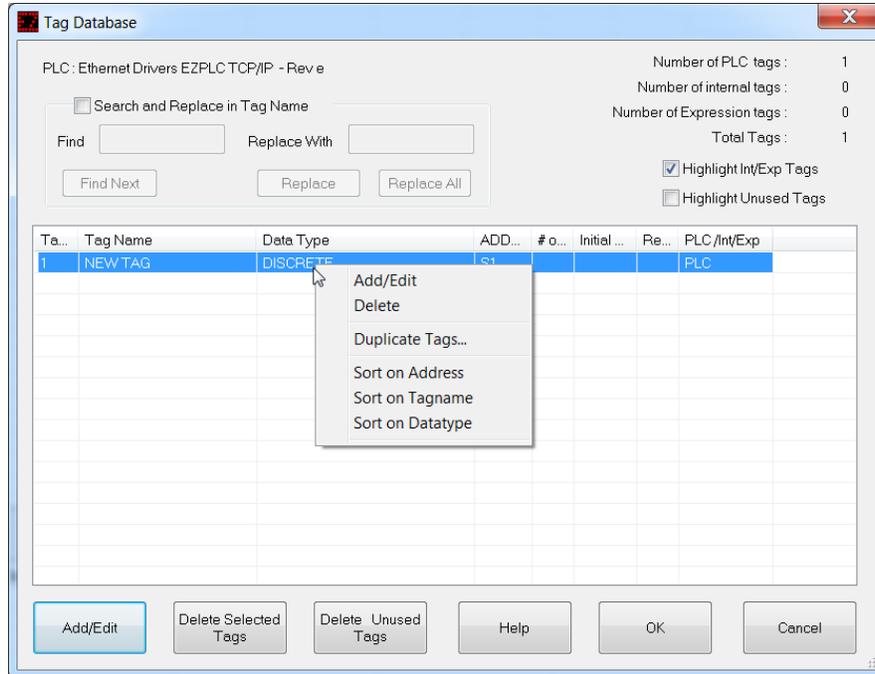
Database. The following dialogue will appear.

2. In the Tag Database to create new tags use the Add/Edit button. This brings up the Add New Tag Details dialogue box.

3. This dialogue box behaves exactly like the individual tag setup dialogue except you can change the Tag Name in this box as well.

4. Once you create a new tag you can duplicate this tag when you right click on the tag itself. This can therefore be used to create multiple tags of the same type.

5. Note all tags can be imported or exported. To do so look at section 4.6.3.

4.6.2 Expression Tags

Expression Tags are tags comprised of a constant and /or operands and/or predefined tags. This type of tag allows you to perform a math or logic operation on PLC register data values and access and/or store the results in another tag (register). Complex math or logic operations can be performed with PLC register values without having to change the PLC ladder logic. Expression tags are display only tags, not Read/Write tags. To create an expression tag follow the directions below:

1. In the Add New Tag dialogue box select the Expression option. Then click on Define Expression ... option.
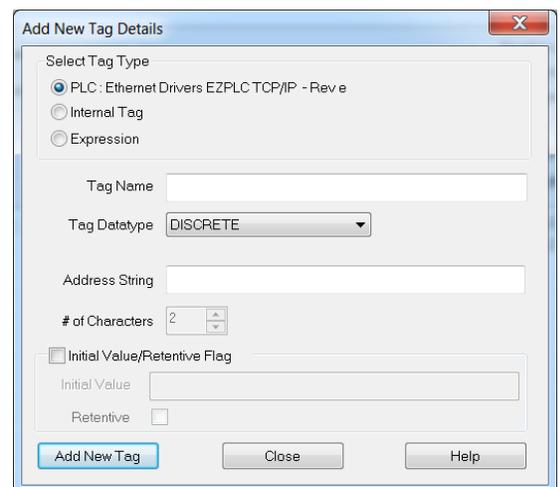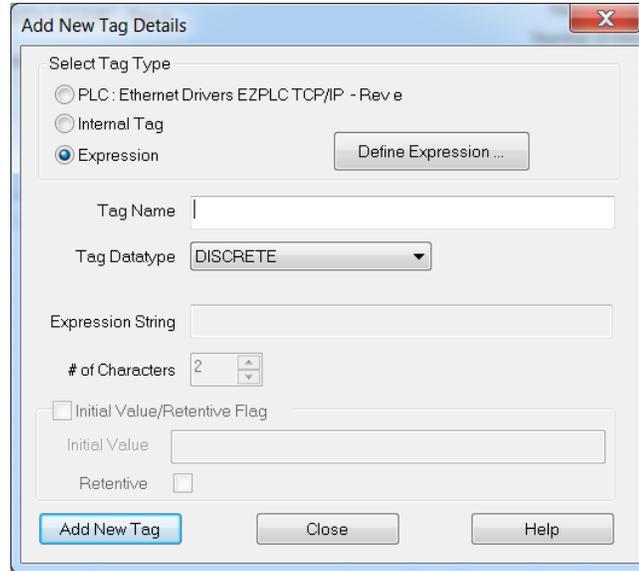
2. This will bring up the Define Display Expression dialogue box. Here is where you define the expression itself.
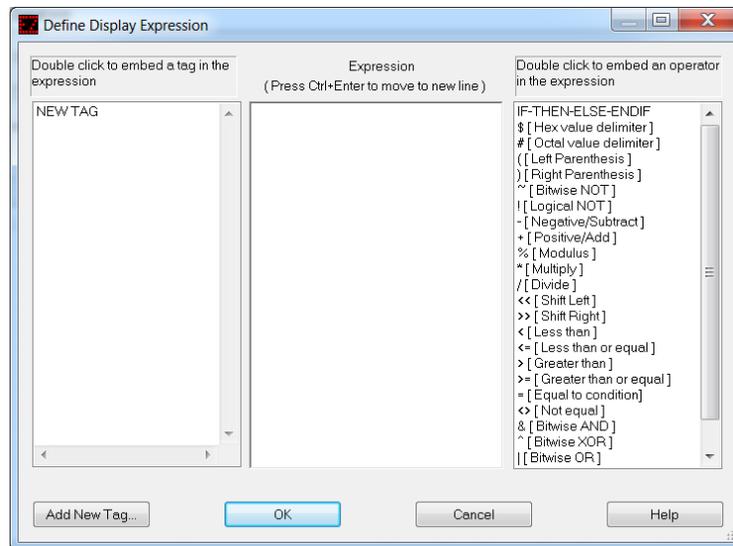
3. To put in a constant, type it in the center box.

4. To insert a tag into the expression select it from the column on the left and double click on it. The tag will appear in the center column.

5. To insert an operator into the expression select (double click) it in the right hand column to insert into the Expression.

6. Now when the Expression Tag is triggered, the operation that is expressed in the tag will be performed and the result will be displayed in this expression. These expressions can be assigned as either display message condition tags or embedded tags in the message itself.

Example (Allen Bradley RSLogix 500 tag addressing):

N7:10 Tag Value = 1
Operator = + [Positive/Add]

N7:11 Tag Value = 3
1 + 3 = 4

Expression Tag Display Value = 4

This is a very simple example of the complex computations that can be accomplished with Expression tags.
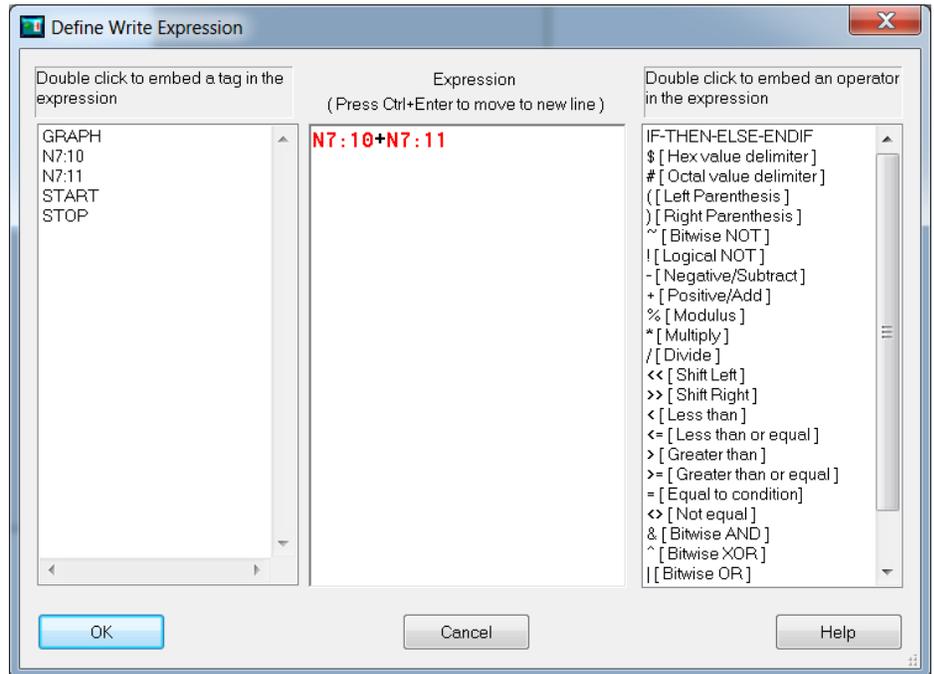
 NOTE: please be aware that Expression Tags are limited to a maximum of 40 operands per tag. Complex operands may use more memory and may further limit the number of operands per expression.   In order to avoid errors when trying to use the tag, avoid using too many operands per expression.

Conditional Expressions

The format for the conditional is:

IF <expression> THEN <expression> ELSE <expression> ENDIF

The ELSE and ENDIF are required. All expressions require at least one operand. The conditional can be used as an operand.

For example: tag1 * IF(tag2)THEN(tag3 + 10)ELSE(5)ENDIF

The following table provides a list of the Operators, their Symbol, order of Precedence, and Direction. See below for more examples

Operators	Symbol	Precedence	Direction
End of expression	none	13	Left to right

Operator	Symbol	Precedence	Associativity
Left parenthesis	(	13	Left to right
Right parenthesis	)	13	Left to right
Bitwise NOT	~	12	Right to left
Logical NOT	!	12	Right to left
Negative	-	12	Right to left
Positive	+	12	Right to left
Modulus	%	11	Left to right
Multiply	*	11	Left to right
Divide	/	11	Left to right
Add	+	10	Left to right
Subtract	-	10	Left to right
Shift left	<<	9	Left to right
Shift right	>>	9	Left to right
Less than	<	8	Left to right
Less than or equal	<=	8	Left to right
Greater than	>	8	Left to right
Greater than or equal	>=	8	Left to right
Equal	=	7	Left to right
Not equal	<>	7	Left to right
Bitwise AND	&	6	Left to right
Bitwise XOR	^	5	Left to right
Bitwise OR	|	4	Left to right
Logical AND	&&	3	Left to right
Logical OR	||	2	Left to right
Assignment		1	Right to left

Special Symbols

Hex constant	$	Used to indicate a hexadecimal constant i.e. $3F
Octal constant	#	Used to indicate a octal constant i.e. #377
Accumulator	?	Used in entry expressions to represent the user-entered value

Example 1 (Conditional Expressions):
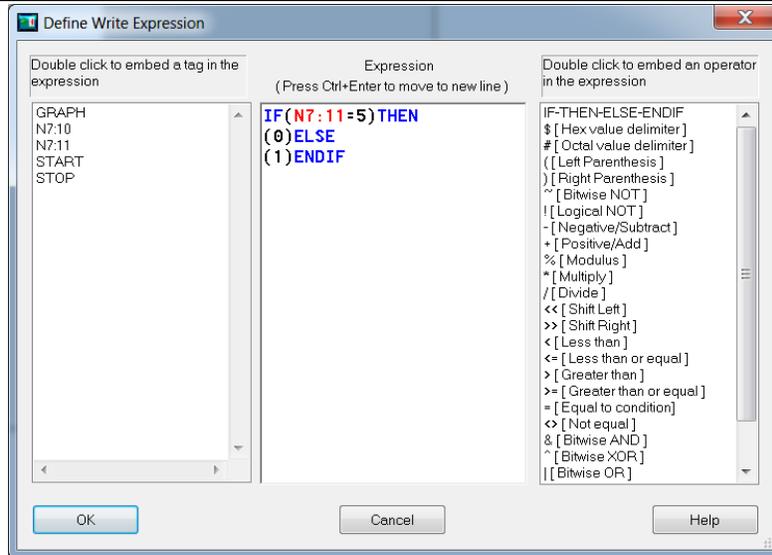
The format is as follows where if N7:11 is equal to 5 then will evaluate 0. If not equal will evaluate to 1.

N7:11 Tag Value = 5 -> N7:12 Tag Value = 0
N7:11 Tag Value != 5 -> N7:12 Tag Value = 1

Example 2 (Nested Conditional Expressions):
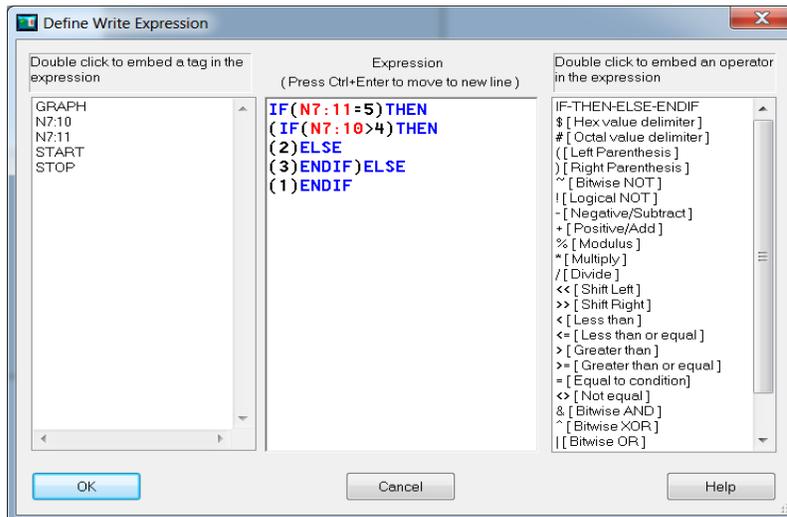
` The format is as follows where if N7:11 is equal to 5 then will evaluate second If-Then statement. If not equal will evaluate to 1. The second If-Then statement checks if N7:10 is greater than 4. If so it will evaluate to 2. If not true then will evaluate to 3.

N7:11 Tag Value = 5 -> Will check N7:11 value
N7:11 Tag Value != 5 -> N7:12 Tag Value = 1
N7:10 Tag Value > 4 -> N7:12 Tag Value = 2
N7:10 Tag Value < 4 -> N7:12 Tag Value = 3
Note: You can max nest 4 If-Then statements in 1 expression.

Exporting Tags: All Tags can be exported (even expressions). To export tags you use the *Setup > Export Tags* option. The tags can be exported as either a CSV file or Excel file. It is sometimes useful to export tags and then modify them in Excel. Then if formatted correctly they can be imported back into the EZ iMarquee Editor software.

Importing Tags: To import messages use the *Setup > Import Tags* option. Tags can be imported from a correctly formatted CSV file or Excel file. To see how to format the tags it is recommended to export an example tag. You can import all tag data types including expressions. Note for expressions any tag used in them needs to exist for the expression to be imported. If any tag is not imported the software will give you a list and reason why it was not imported.

4.7   Marquee Serial Network Setup

Each EZ iMarquee is assigned a unit address. A unit address is programmed into each message to specify which unit or units should display that message. By default an iMarquee's Unit and Group Number is 1. You do not have to change this if using just one single unit per application.

Each unit address consists of two identifiers—a **Group** and **a Unit Number**. A group may contain up to 4095 slave units, connected serially to the Master marquee. The unit addresses allow the EZ iMarquee message controller to select and send messages to select slave Marquee units.

The slave Marquees can be assigned the Group numbers and the Unit number using the Marquee software. Click on menu *Setup > Marquee Database.* A dialog box pops up, where you can set up the iMarquee's unit and group number.
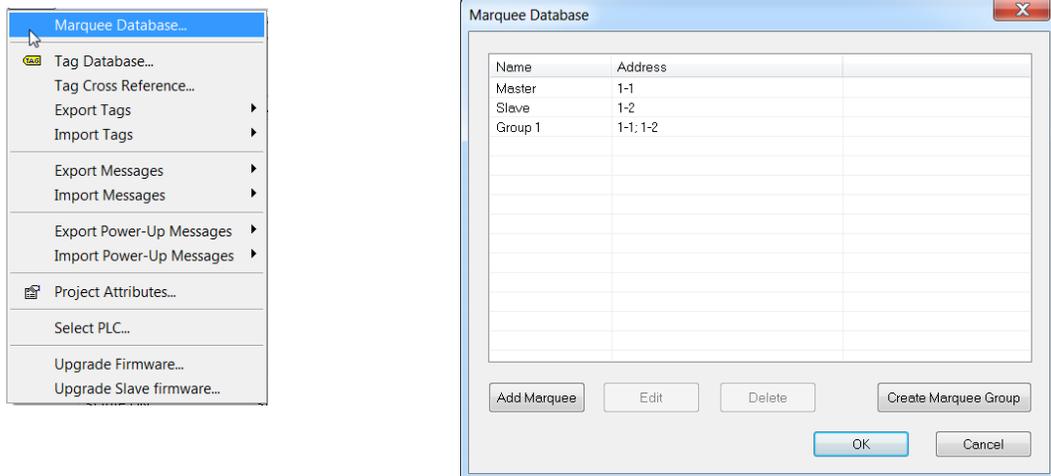
To connect a slave unit to the master iMarquee, please use terminal numbers on SP1:

2 (Tx)
3 (Rx)
5 (GND)
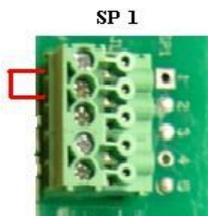
Pin Number	Function
1	RX (Message Display Board)
2	**TXD (Message Controller Board)**
3	**RXD (Message Controller Board)**
4	TXD (Do Not Use)
5	**GND**

The iMarquee's Ethernet parameters can generally be programmed through the PC using the Serial Programming Port (SP3) or over the EZ-WiFi Module:

1.   In the Marquee software's Main programming window, Click on menu *Marquee > Ethernet Setup*

2.   This will read the current Ethernet settings from the Marquee.

3.   You can then configure the following Ethernet Parameters: IP Address, Subnet Mask, and Gateway Address and write them to the Marquee.
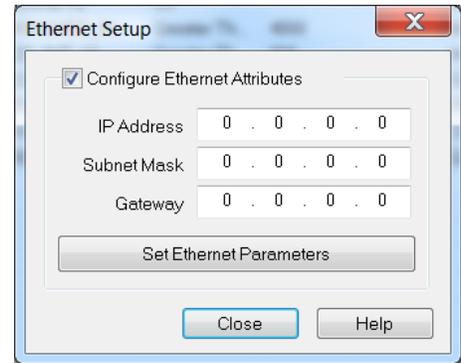
4.9   Project Attributes

The Project Attributes screen contains setup options for message display times, EZ iMarquee errors, and some basic project based tags. To access the Project Attributes go to **Setup > Project Attributes.**

General tab
The General tab of Project Attributes has settings for the display time of Priority, Normal and Power-Up Messages. The default display time is 5 seconds for Normal/Priority messages and 1 sec for Power-Up messages.

You can also decrease the amount of messages stored in the message lists for Priority and Normal messages (max/default is 99).

Finally there you can set the blink times on this page as well.
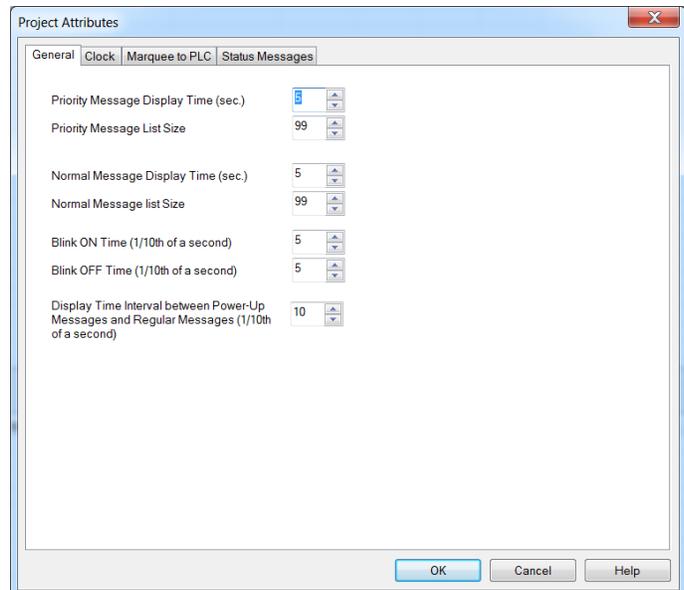
Status Message
The Status Messages tab controls where the EZ iMarquee errors are displayed. These messages are for example if the EZ iMarquee is not connected to the PLC (PLC: timeout). This message can be displayed on any slave Marquee but default displays on the EZ iMarquee itself.
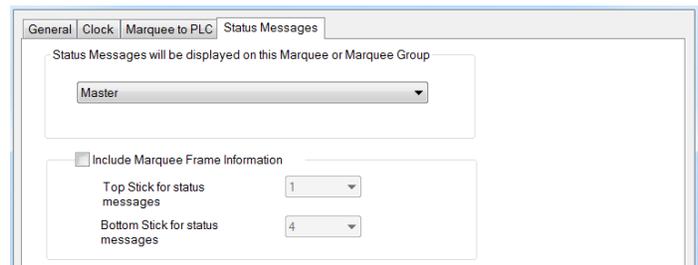
Also on this page you control where on the iMarquee it displays through the Marquee Frame Information settings.

Clock

The Clock tab is the location where you need to provide tag information if you want the EZ iMarquee to display time.

Time for the EZ iMarquee is provided from the PLC. So if you want to display either time or date then the PLC needs to have tags which contain that information. These tags are then input here on this tab and the EZ iMarquee will then display time and date.
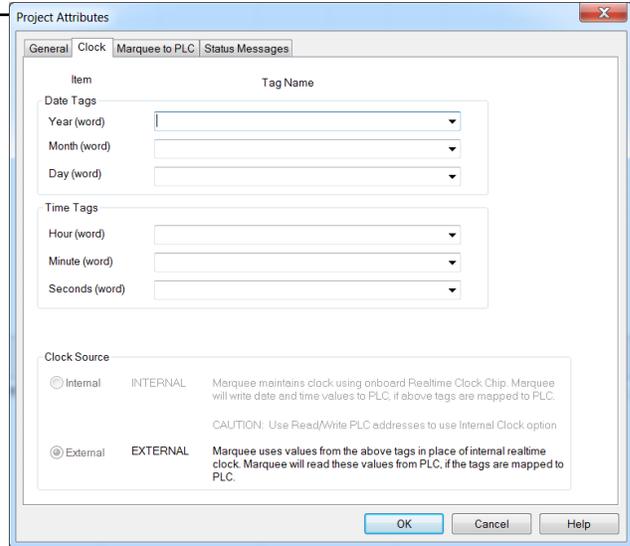
Marquee to PLC

The Marquee to PLC tab is where you provide a tag which can indicate when you have lost communication with the PLC.
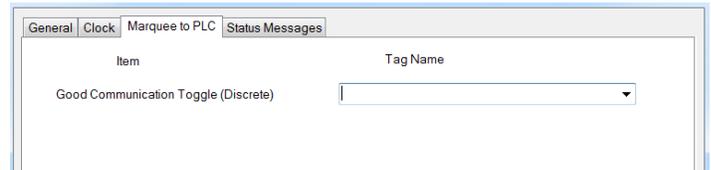
4.10   Transferring Project to iMarquee

In the Main programming window, Click on the menu, **File >Transfer to Marquee.** You will see the below window.
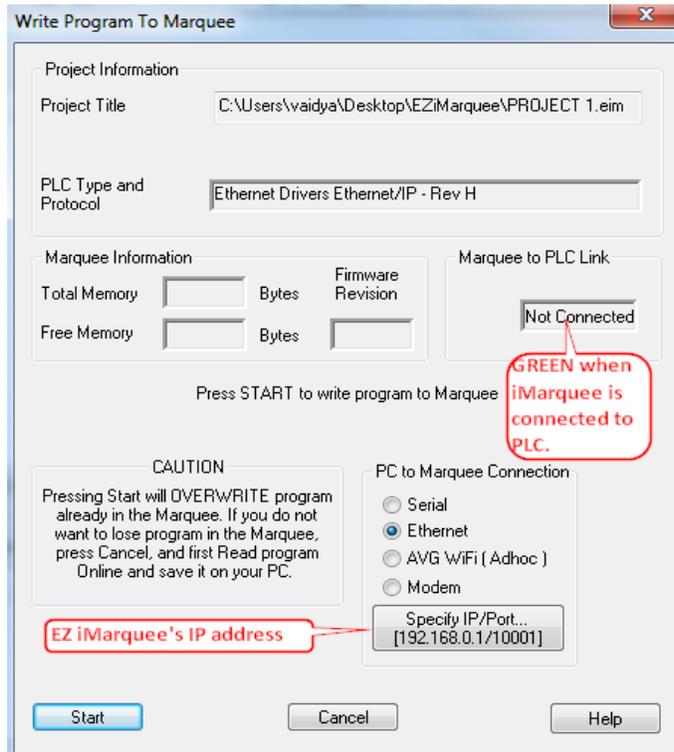
Please check or verify how you want to send / transfer the project to iMarquee by selecting either Serial or Ethernet under PC to Marquee connection.

Click on "Start" button to transfer the project to iMarquee.

4.11   Upgrading Firmware

iMarquee Firmware

1. To upgrade Master Firmware please connect serially to the Serial Port 3 (SP3) using the EZ-PGMCBL.
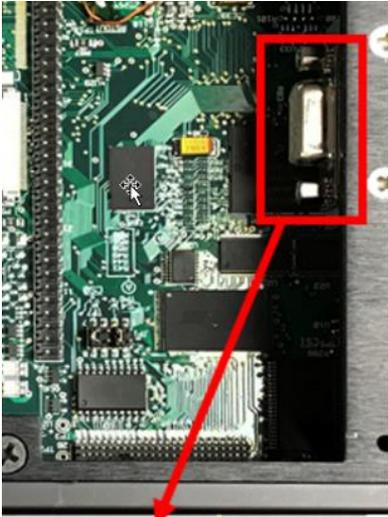
Programming
Serial Port 3 (SP3)
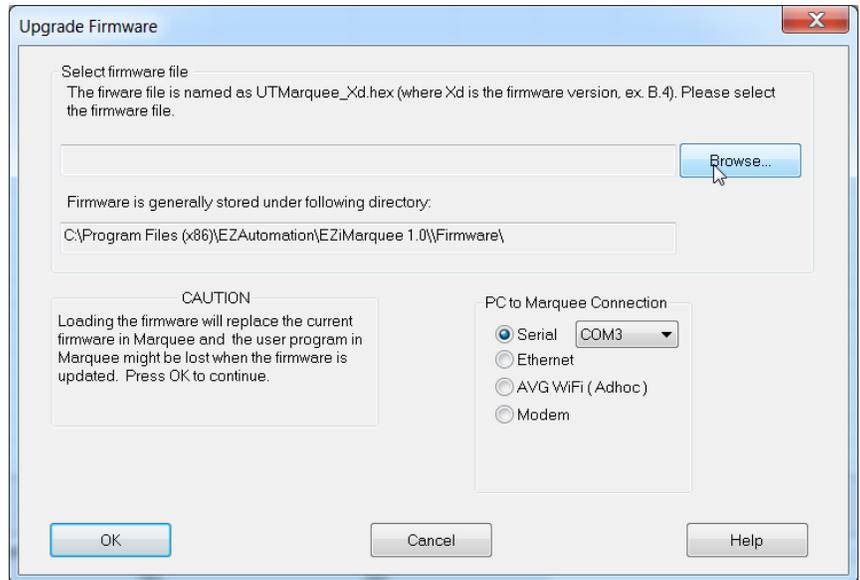
2. Next go to **Setup > Upgrade Firmware...** and the above dialogue will appear.
3. Browse to the location of the firmware.
4. Next make sure that PC to Marquee Connection is Serial and the correct Com port is selected.
5. Make sure the EZ iMarquee is ON and then click OK. The following dialogue box should appear.
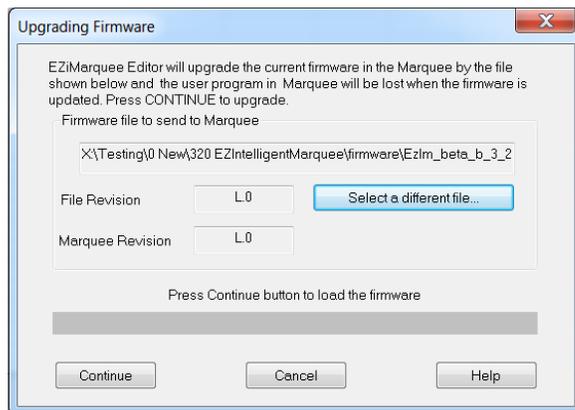
6. Now click Continue and the Firmware of the iMarquee will now update. Wait till finished then click OK.

Slave Marquee Firmware
Each EZ iMarquee has a slave included in itself. If you ever need to upgrade firmware on the slave Marquee follow the directions below:

1. Connect the Serial Port 1 (SP1) to the PC using a serial RS232 cable (DB9 on one end, wires on other end to connect to SP1 based on pinout below)
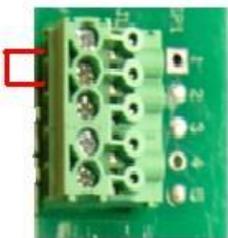
2. Next go to **Setup > Upgrade Slave Firmware…** and the following dialogue will appear.

3. Now please select the Communication Serial Port. Then make sure the Baud Rate is equal to the EZ iMarquee Baud Rate (default is 38400). Finally please select PMD for Protocol.
4. In the Select Marquee Firmware File browse to the Slave Marquee firmware.
5. Make sure the EZ iMarquee is ON and then click Upgrade. The Slave Marquee will now be upgraded.

Chapter 5: PLC Communication Setup

5.1 Basic PLC Setup

The EZ iMarquee can communicate with all different types of PLCs. To configure the PLC Communication protocol you select the PLC Manufacture and PLC type when creating a project.

Current Supported PLCs for the EZ iMarquee:

Allen Bradley: A-B DF1 Half and Full Duplex A-B MicroLogix 800 CIP Protocol A-B Ethernet I/P A-B DF1 over Ethernet	Automation Direct: ADC K-Sequence (Direct Logic PLCs) DirectNET (Direct Logic PLCs) Do-More PLC (Serial & Ethernet) Modbus ECOM Ethernet (Direct Logic PLCs) Entivity Think & Do Productivity Driver (Serial & Ethernet)
All Motion: (EZ Stepper)	Animatics: (Smart Motor)
Applied Motion: (SCL series)	Aromat: (Mewtocol)
AVG / EZAutomation: EZPLC EZ Ethernet	Baldor: Host Comms
Bristol Babcock: (BSAP Native)	Control Technology Corp (CTC): (CTC Binary)
GE: GE Fanuc SNPX (90/30, 90/70) GE SRTP over Ethernet	IDEC: Computer Link
Keyence: (CV 5000)	Modicon / Schneider: Modbus RTU Modbus TCP/IP Uni-Telway
Mitsubishi: FX Series CPU (Computer Link) Mitsubishi CC Link Melsec FX	Omron: Host Link Adaptor
Siemens: S7 (Serial:PPI) Siemens Ethernet ISO over TCP/IP	Texas Instruments (TI): TI 5x5 series, TI 505, TI 545-1102, TI 545-1104
Yaskawa: Memobus Native Addressing Memo-bus RTU	

The type of PLC communication used is selected in the project information screen. Each time you start a new project select the PLC manufacturer and PLC Communication Protocol in the Project Information Screen. Then to edit the PLC Communication Setup use the View/Edit PLC Com Setup… button.
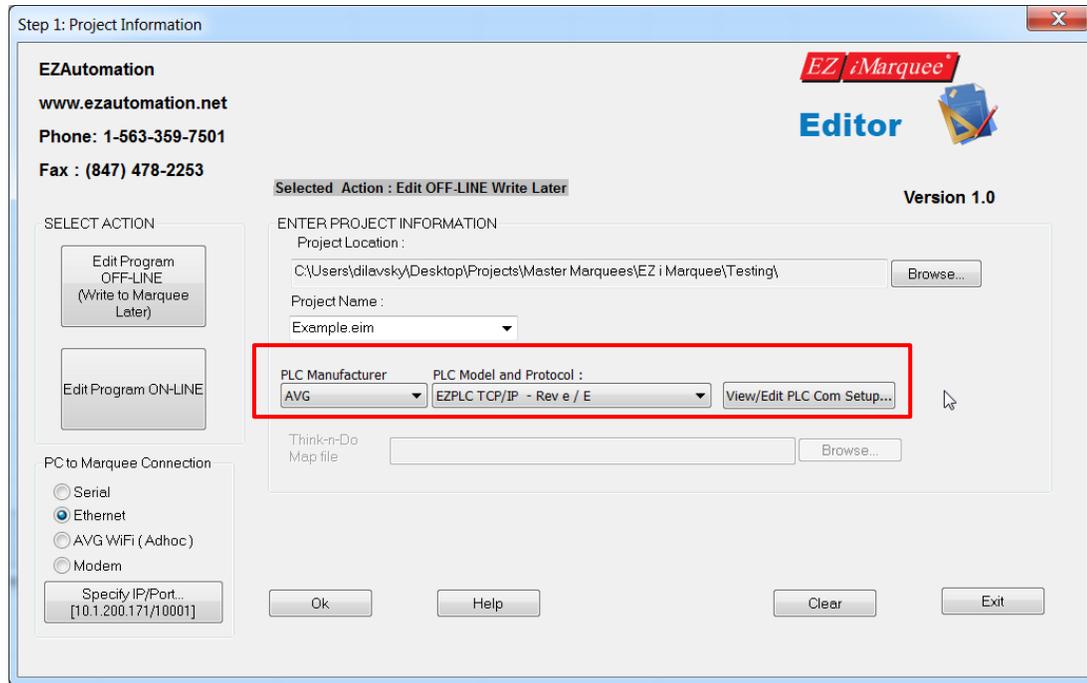
5.2   PLC Serial Communication Setup

When setting up PLC Serial Communication please use the View/Edit PLC Com Setup… to modify any settings that might be needed. For example for Modbus RTU you have settings ranging from Baud Rate to PLC Slave Station Number. All serial communication have similar settings and they should be set based of the configuration of the PLC.
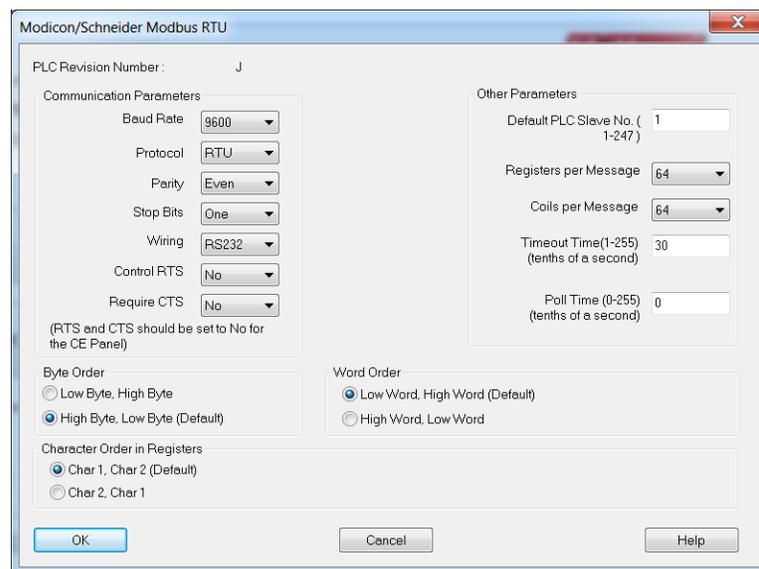
5.2.1 RS232 Setup

If your PLC to EZ iMarquee communication is going to be serial RS232, first make sure the correct settings are set in the software on View/Edit PLC Com Setup… screen. Next make sure to connect the PLC to the EZ iMarquee using the Serial Port 2. Wiring diagram is below
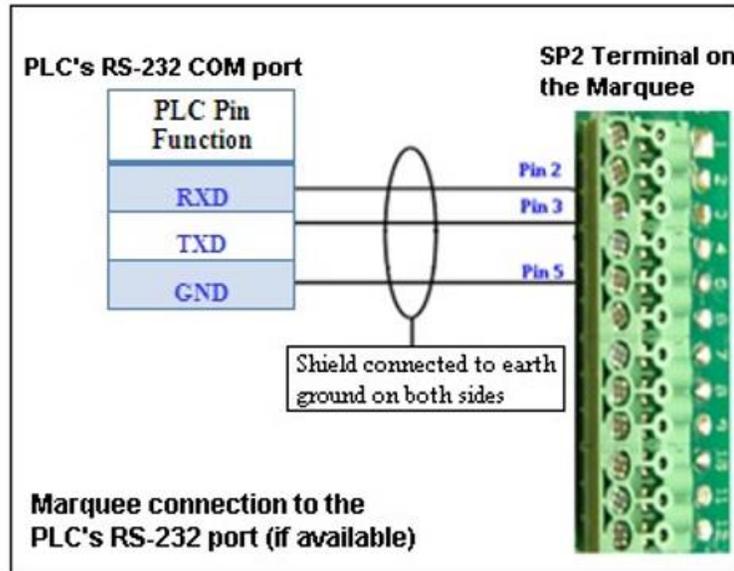
5.2.2 RS422/RS485 Setup

If your PLC to EZ iMarquee communication is going to be serial RS422/RS485, first make sure the correct settings are set in the software on View/Edit PLC Com Setup… screen. Next make sure to connect the PLC to the EZ iMarquee using the Serial Port 2. Wiring diagram is below
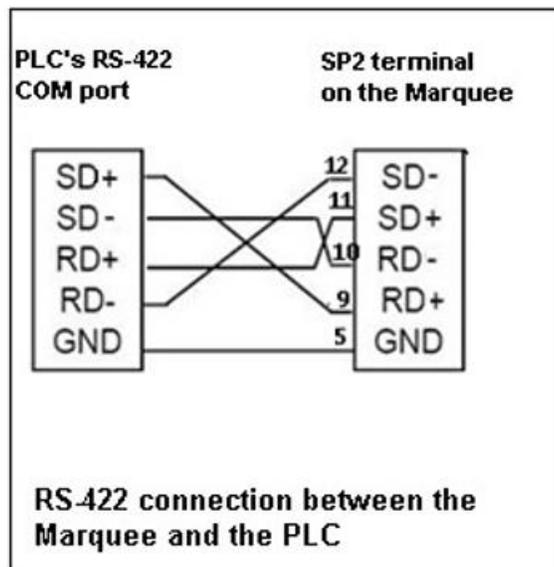
5.3   PLC Ethernet Communication Setup

If your PLC to EZ iMarquee communication is going to be over Ethernet, first make sure the correct settings are set in the software on View/Edit PLC Com Setup... screen. All Ethernet Communication PLC Setups require the IP address of the PLC. You can add up to 4 PLC IP address for the EZ iMarquee to communicate to. Then with multiple PLC you can have the same tag address for those PLC but differentiated by the PLC ID.

Next make sure to connect the EZ iMarquee to your network using the Ethernet Port. Finally make sure to have setup the EZ iMarquee IP address (directions in section 4.8).
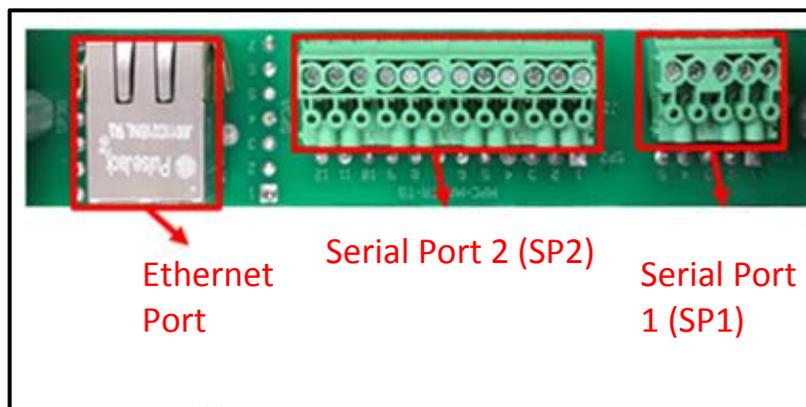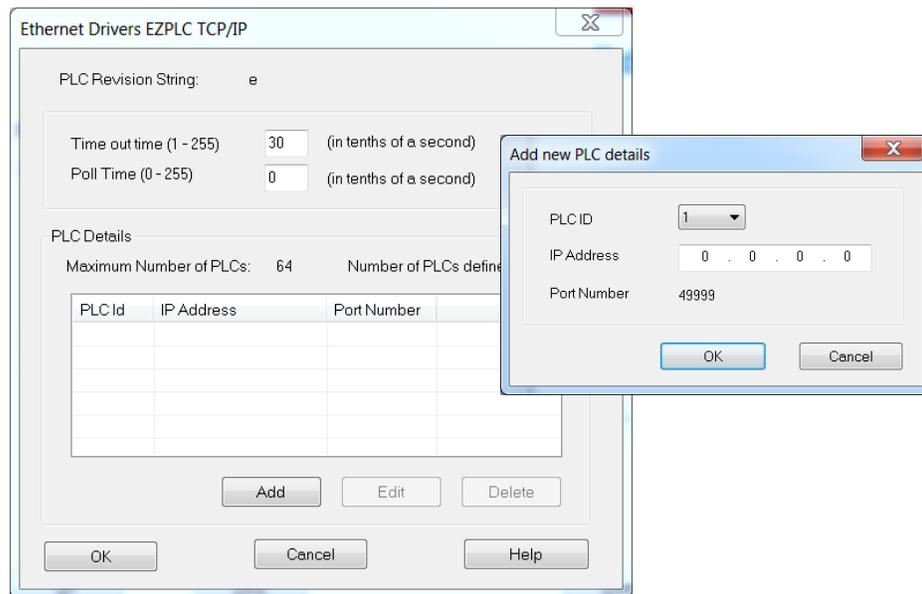
5.4 Allen-Bradley Ethernet IP Setup

When we first launch the EZ iMarquee programming software to create a project offline, you will see the below window. To configure your iMarquee to talk Ethernet IP, Select "Ethernet Drivers" under the PLC Manufacturer drop down list and select "Ethernet/IP" under PLC Model and Protocol. Click on "View Edit PLC Com Setup"
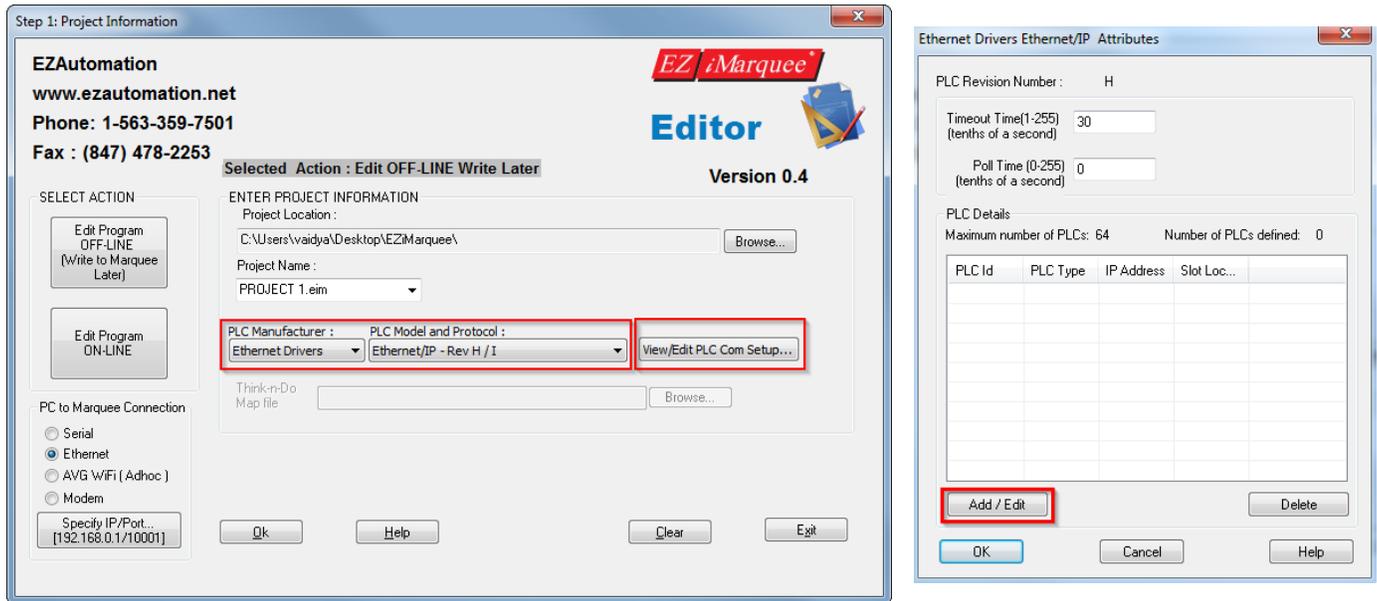
Click "Add/Edit" button. Select PLC type.

Enter IP Address of the PLC. If you do not know the IP address of the PLC, please enter some random numbers and you can edit it later.

DO NOT LEAVE THE IP ADDRESS FIELD BLANK.

Click on "Add PLC Details" and

Click on "Close"
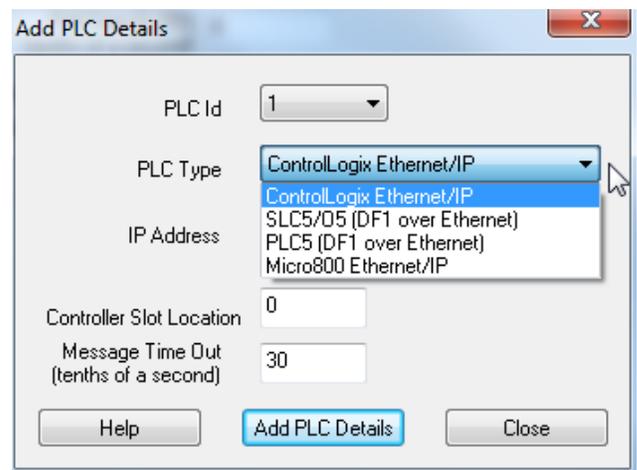
- Select "ControlLogix Ethernet/IP" under PLC Type for ControlLogix or CompactLogix PLC.
- Select SLC/05 (DF1 over Ethernet) under PLC Type for SLC or Micrologix PLC.

5.5 Automation Direct Productivity / Direct Logic / Do-More Setup

When we first launch the EZ iMarquee programming software to create a project offline, you will see the below window. To configure your iMarquee to talk to any of the above mentioned PLC's, Select "Ethernet Drivers" under the PLC Manufacturer drop down list and under PLC Model and Protocol, select "ADC Productivity" or "Directlogic ECOM" or "DoMore Ethernet".
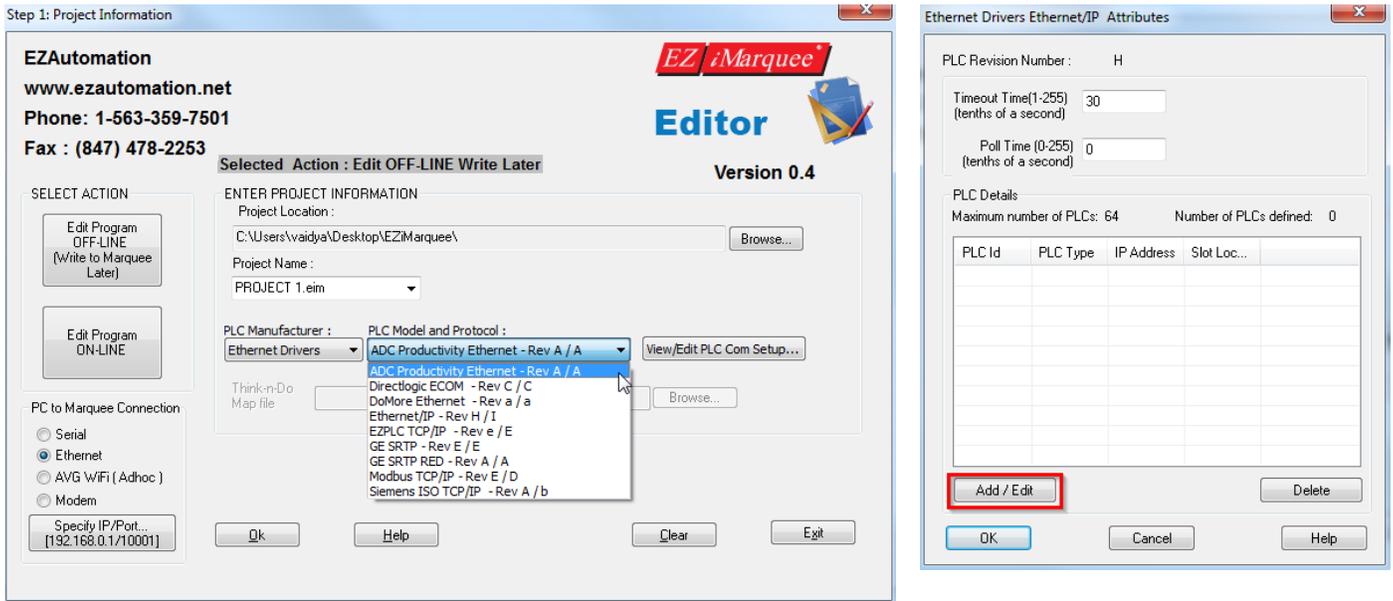
Click on "View Edit PLC Com Setup" and Click "Add/Edit" button.

Enter IP Address of the PLC. If you do not know the IP address of the PLC, please enter some random numbers and you can edit it later.

DO NOT LEAVE THE IP ADDRESS FIELD BLANK.

Click on "Add PLC Details" and

Click on "Close"
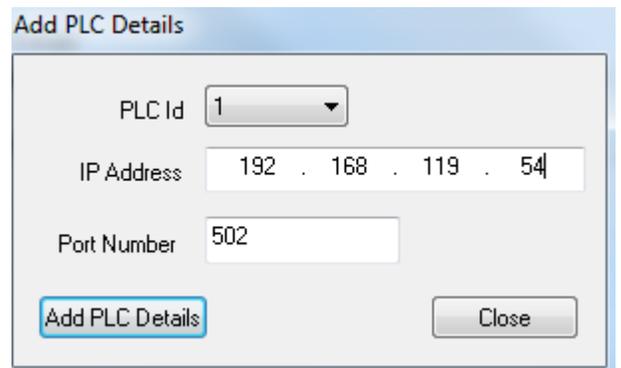
5.6   Siemens S7 ISO Setup

When we first launch the EZ iMarquee programming software to create a project offline, you will see the below window. To configure your iMarquee to talk to any of the above mentioned PLC's, Select "Ethernet Drivers" under the PLC Manufacturer drop down list and under PLC Model and Protocol, select "Siemens ISO TCP/IP". Click on "View Edit PLC Com Setup"
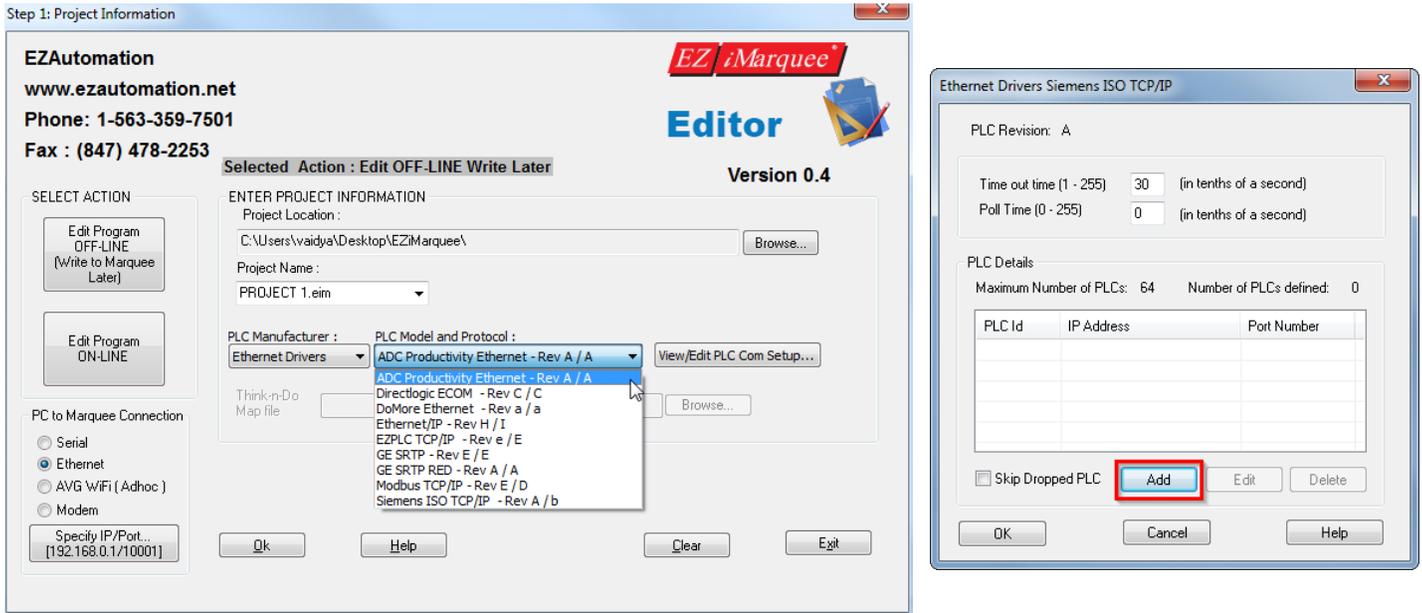
Click "Add" button.

Enter IP Address of the PLC. If you do not know the IP address of the PLC, please enter some random numbers and you can edit it later. Also make sure the selected slot number is 1.

DO NOT LEAVE THE IP ADDRESS FIELD BLANK.

Click on "OK"
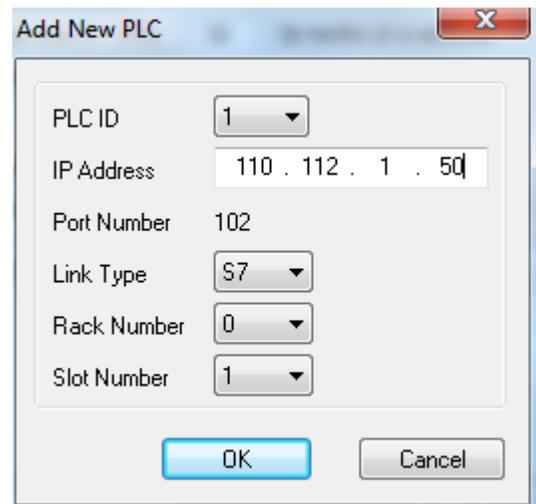
5.7   Modbus TCP/IP Setup

When we first launch the EZ iMarquee programming software to create a project offline, you will see the below window. To configure your iMarquee to talk to any of the above mentioned PLC's, Select "Ethernet Drivers" under the PLC Manufacturer drop down list and under PLC Model and Protocol, select "Modbus TCP/IP" and Click on "View Edit PLC Com Setup".
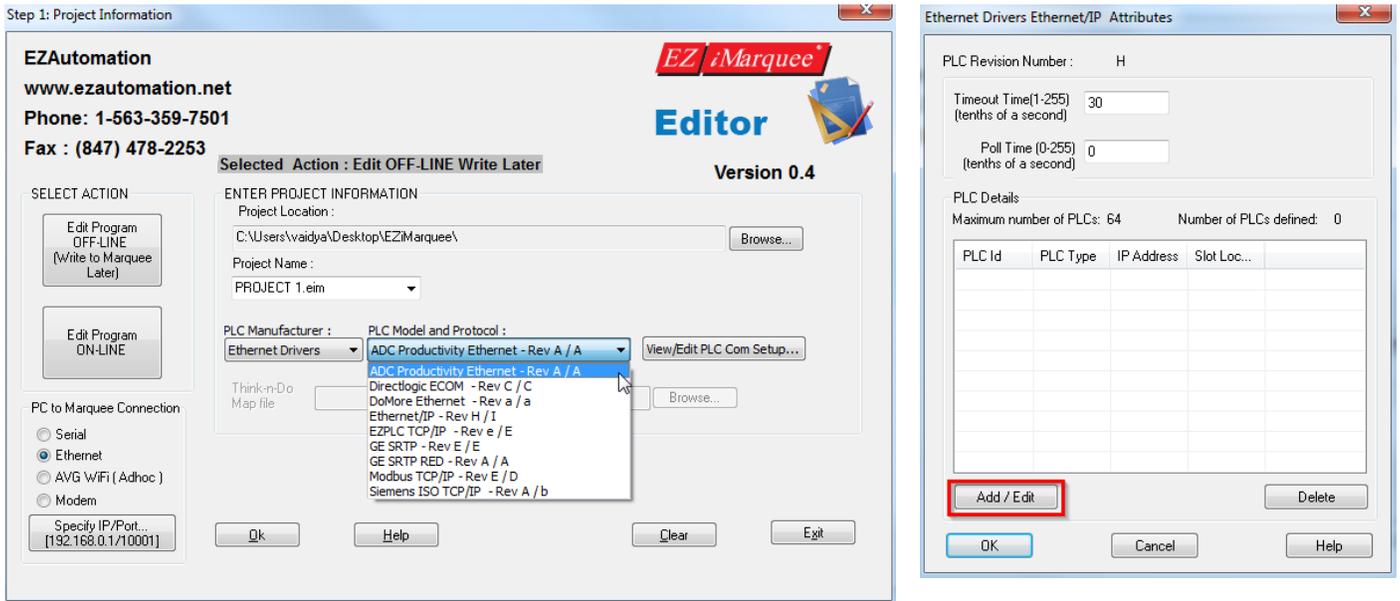
Click "Add/Edit" button.

Enter IP Address of the PLC. If you do not know the IP address of the PLC, please enter some random numbers and you can edit it later.

DO NOT LEAVE THE IP ADDRESS FIELD BLANK.

Click on "Add PLC Details" and

Click on "Close"
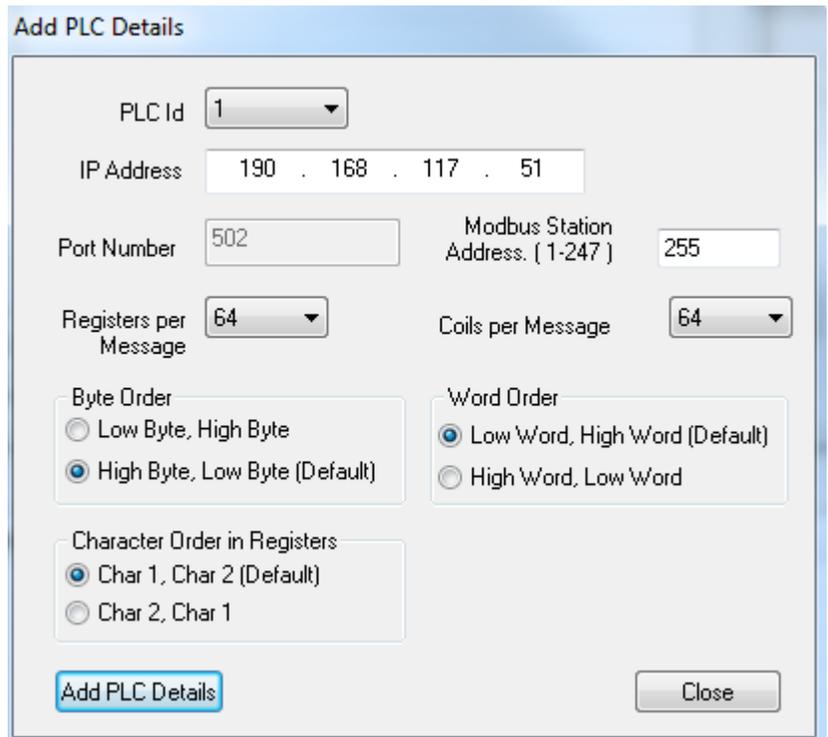
5.8   GE PLC Communication Setup

When we first launch the EZ iMarquee programming software to create a project offline, you will see the below window. To configure your iMarquee to talk to any of the above mentioned PLC's, Select "Ethernet Drivers" under the PLC Manufacturer drop down list and under PLC Model and Protocol, select "GE SRTP" and Click on "View Edit PLC Com Setup"

Click "Add/Edit" button.

Enter IP Address of the PLC. If you do not know the IP address of the PLC, please enter some random numbers and you can edit it later.

DO NOT LEAVE THE IP ADDRESS FIELD BLANK.

Click on "Add PLC Details" and

Click on "Close"