

MODFLEX MINI GATEWAY ETHERNET USER'S GUIDE



Last updated

March 15th, 2012

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1 Introduction

1.1 Purpose & Scope

The purpose of this document is to provide details regarding the use of the Mini Gateway Ethernet (MGE) with the Host Device.

1.2 Applicable Documents

- *MGE Datasheet*
- *MGE Host Protocol User's Guide*

1.3 Revision History

Date	Change Description	Revision
3/15/2012	Initial release.	1.0

Table 1 Revision History

2 General Use

2.1 Ethernet Connections

- The MGE supports one TCP connection at any one time
- The MGE supports multiple UDP connections at any one time
- If a TCP connection is currently in use, a UDP connection cannot be established
- If a UDP connection is currently in use, a TCP connection cannot be established

3 MGE Settings

3.1 Settings Overview

3.1.1 Host Connection Ports

The UDP and TCP connection ports are the ports that are used to communicate to the MGE with the host protocol messages.

Unusable TCP ports: 0 and 80

Unusable UDP ports: 0 and 23

3.1.2 Discovery Message

Each MGE device sends out a broadcast discovery message every five seconds on UDP port 23. This message can be used to discover MGE devices that are on the network. The five second broadcast interval can be changed (see host protocol message Set Discovery Message Interval 0x0A) to various intervals, but the default is five seconds. The structure of the message is shown below.

Byte	Description	Value
1	Start Byte	1
2	Packet Length	86
3	Packet Type	1
4	Board Type	1
5 – 6	Ethernet TCP Connection Port	Two byte value of the current MGE TCP connection port (MSB to LSB). Byte 5: TCP Port High Byte Byte 6: TCP Port Low Byte
7 – 8	Ethernet UDP Connection Port	Two byte value of the current MGE UDP connection port (MSB to LSB). Byte 7: UDP Port High Byte Byte 8: UDP Port Low Byte
9 – 14	MAC Address	Six byte MAC address of the MGE (MSB to LSB).
15 – 19	Firmware Version	Firmware Version number of the MGE. Byte 15: Version Major Byte 16: Version Minor Byte 17: Version Month Byte 18: Version Day Byte 19: Version Year
20 – 83	Gateway Name	64 byte ASCII name of the gateway. Note: Only 50 characters are usable.
84 – 85	Module Type	Two byte identifier for the type of RF module in the MGE. Byte 84: 0x00 Byte 85: Module Type Module type SiFLEX02 = 1 Module type ProFLEX01 = 2 Module type SiFLEX01 = 3
86	Checksum	1 byte summation of all previous bytes in the message

Table 2 MGE UDP Discovery Broadcast Message

Once a host is connected to the MGE, this discovery message will stop being sent at the set interval unless the MGE is set to send the broadcast message even when a host is connected (see host protocol message 0x0A). This is to make the MGE on the network more “invisible” when it is being used by a host. As soon as a host disconnects or a connection timeout is reached, the discovery message will start broadcasting again.

3.1.3 Connection Timeout

The Ethernet connection timeout is to allow the MGE to “clean up” its Ethernet connection if a connection is lost or is idle for an extended period of time. This interval is set to 120 seconds by default and can be configured with host protocol message 0x20. Once the connection timeout is reached, the MGE will close any current connections it has open and will start sending its discovery broadcast message.

3.2 Default Settings

The MGE comes set with the following default settings:

Description	Setting
IP Address Mode	Static
IP Address	192.168.1.100
Default Gateway	0.0.0.0
Subnet Mask	255.255.255.0
UDP Connection Port	64206
TCP Connection Port	48879
Discovery Broadcast Interval	5000 ms
Send Broadcast if host is connected	False
Gateway Name	LS Research ModFLEX Mini Gateway Ethernet
Ethernet Connection Timeout	120000 ms (120 seconds)
Web Interface Username	admin
Web Interface Password	admin

Table 3 MGE Factory Default Settings

3.3 Restoring the MGE Default Settings

The MGE can be restored to factory default settings by physically resetting the MGE. To reset the MGE use the following steps.

1. Remove power from the MGE.
2. Hold down the 'soft reset' button (This button is located to the bottom right of the RJ45 connector through a small hole in the case).
3. While holding the button, apply power to the MGE.
4. Keep holding the button for 5 seconds until all the LEDs on the MGE stay on for 2 seconds and then turn off.
5. The MGE has now been reset to factory default settings.

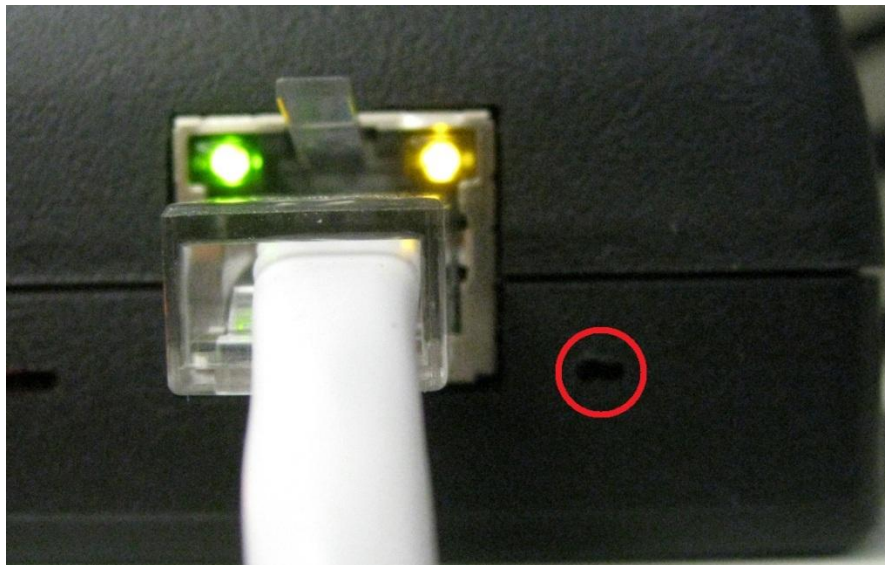


Figure 1 MGE Soft Reset Button

4 MGE and the ModFLEX Test Tool Suite

4.1 Open the ModFLEX Test Tool Suite

Open the ModFLEX Test Tool Suite and select Ethernet, then click connect.

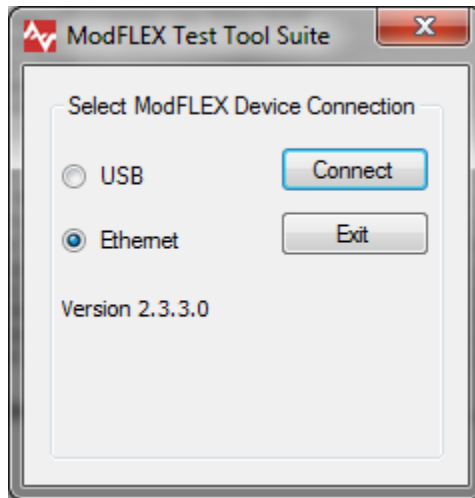


Figure 2 Connect to Ethernet Device

4.2 MGE Discovery

First, the user should verify that the correct Ethernet interface is selected in the “Ethernet Interface” drop down box. When the MGE does not have a host connected it sends a UDP broadcast message on port 23 every 5 seconds. The Ethernet Device Browser listens for these messages to determine what MGEs are on the network. Once an MGE is discovered the user can chose whether to connect with TCP or UDP in the “Connection Type” box, and then double click on the desired MGE or select one and click the “Select” button.

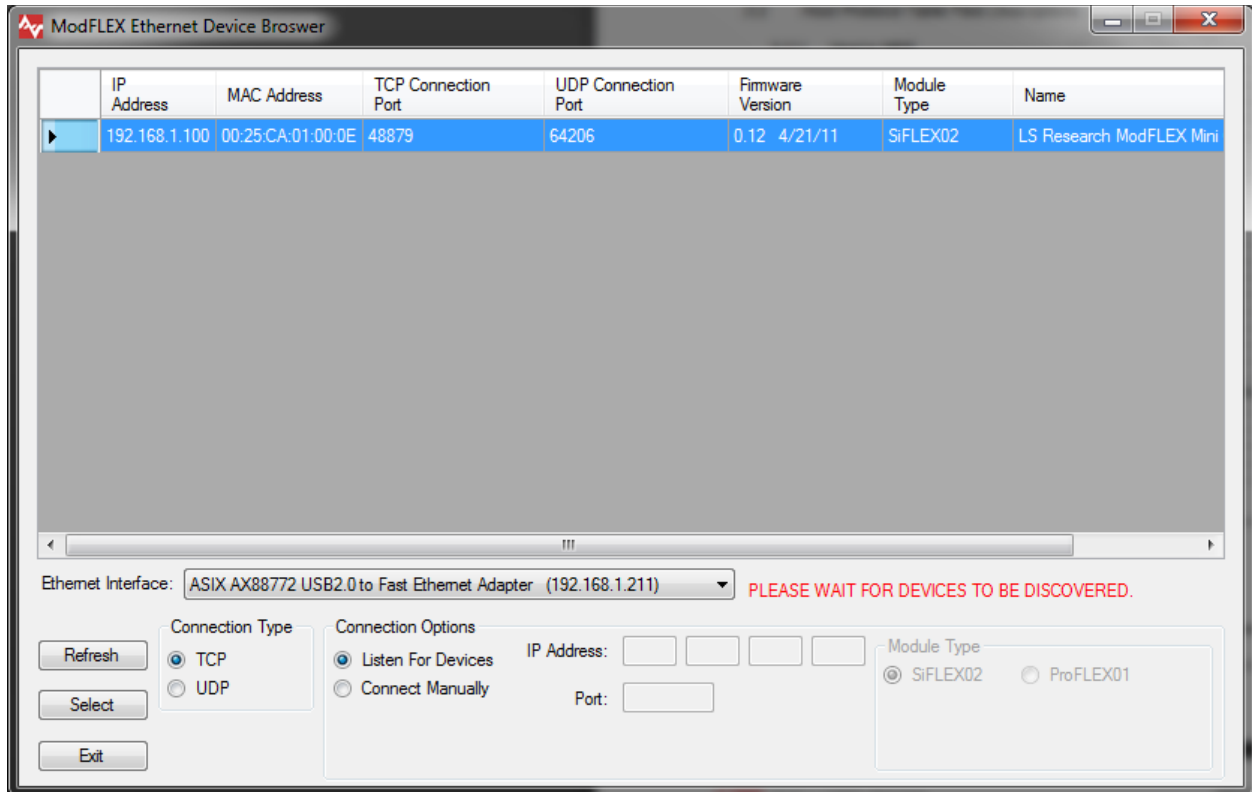


Figure 3 Connect to Discovered MGE

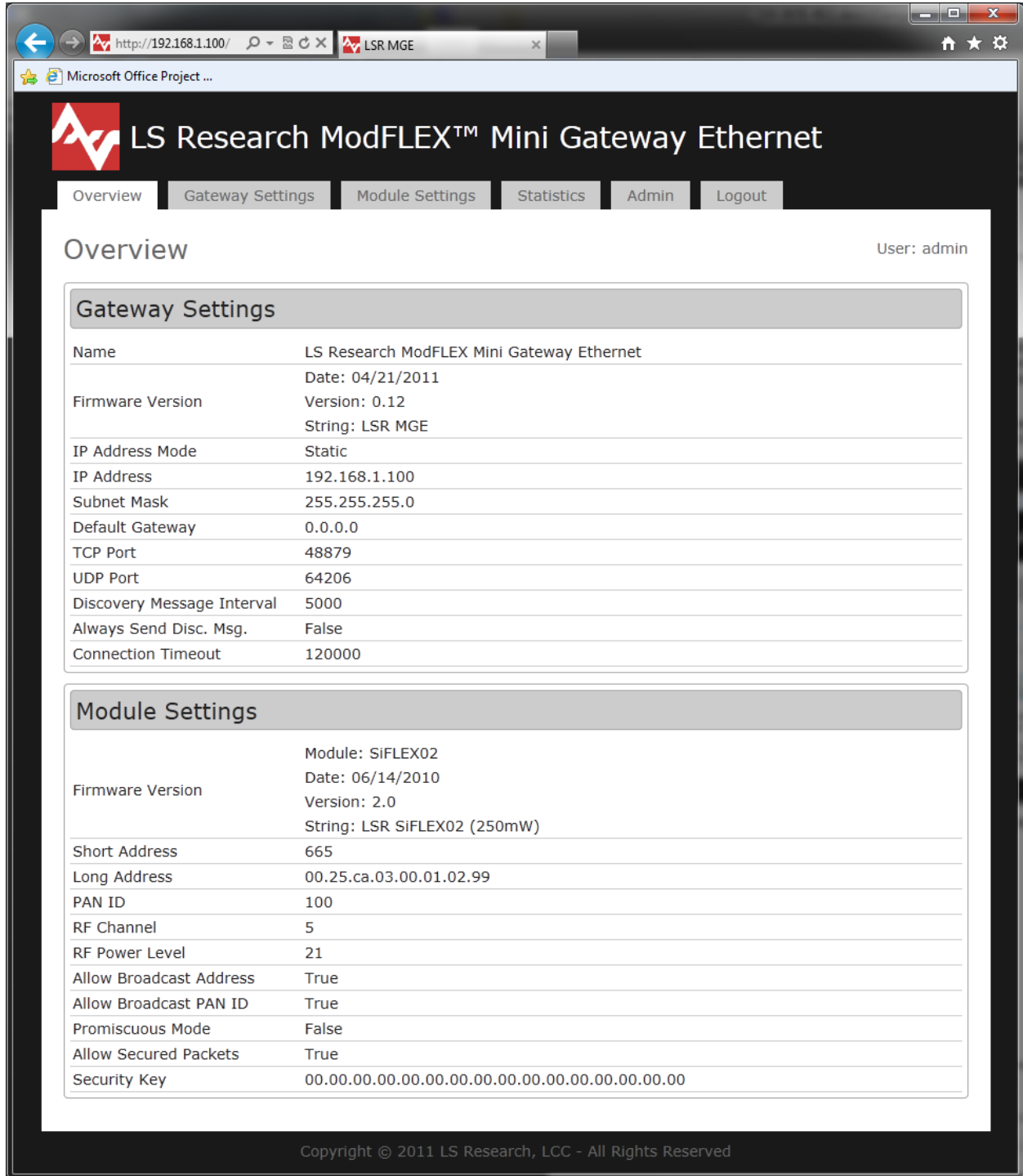
5 MGE Web Interface

The user can type the IP address of any MGE into a web browser to access the web interface. Only one user can be logged on the web interface at a time. If the web interface is left idle for more than 5 minutes the connection will expire and the user will have to log back in.

The web interface provides the user easy access to changing MGE settings, or basic settings of the RF™ module on the MGE without the need to use any external software.



Figure 4 MGE Web Interface Login Page



Overview User: admin

Gateway Settings

Name	LS Research ModFLEX Mini Gateway Ethernet
Date:	04/21/2011
Firmware Version	Version: 0.12 String: LSR MGE
IP Address Mode	Static
IP Address	192.168.1.100
Subnet Mask	255.255.255.0
Default Gateway	0.0.0.0
TCP Port	48879
UDP Port	64206
Discovery Message Interval	5000
Always Send Disc. Msg.	False
Connection Timeout	120000

Module Settings

Module:	SiFLEX02
Date:	06/14/2010
Firmware Version	Version: 2.0 String: LSR SiFLEX02 (250mW)
Short Address	665
Long Address	00.25.ca.03.00.01.02.99
PAN ID	100
RF Channel	5
RF Power Level	21
Allow Broadcast Address	True
Allow Broadcast PAN ID	True
Promiscuous Mode	False
Allow Secured Packets	True
Security Key	00.00.00.00.00.00.00.00.00.00.00.00.00.00.00.00

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Figure 5 MGE Main Page

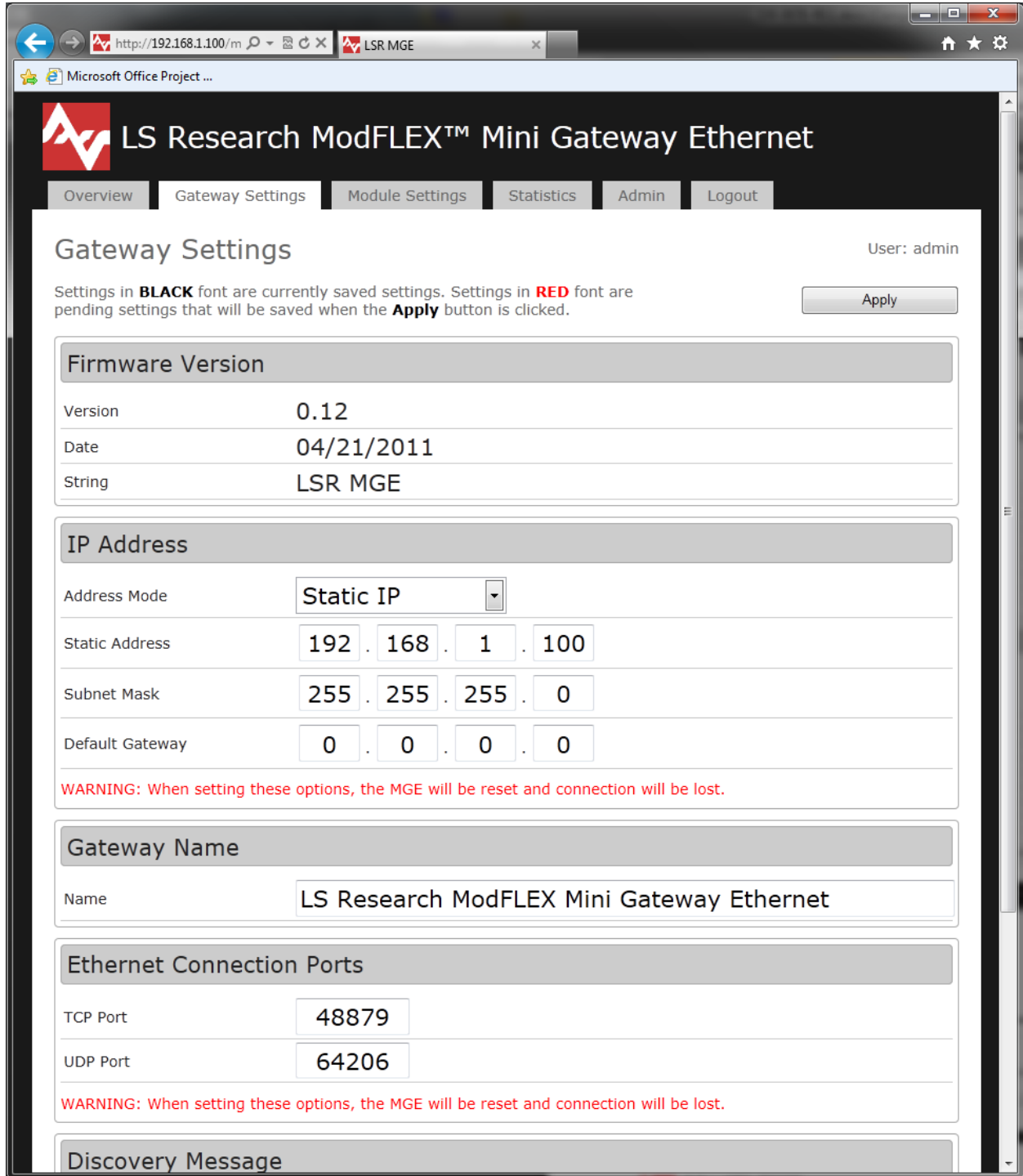


Figure 6 Gateway Settings Page

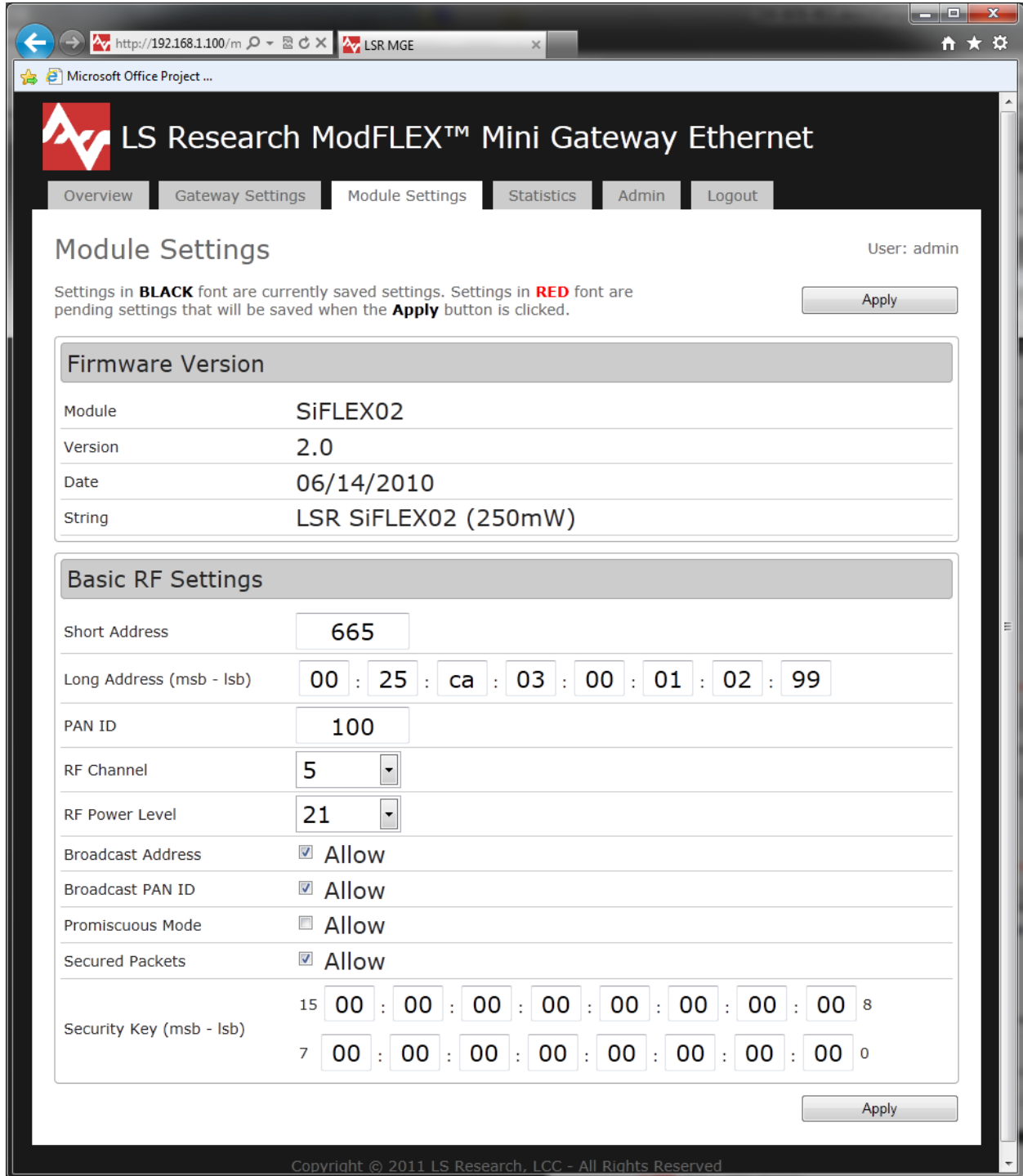


Figure 7 Module Settings Page

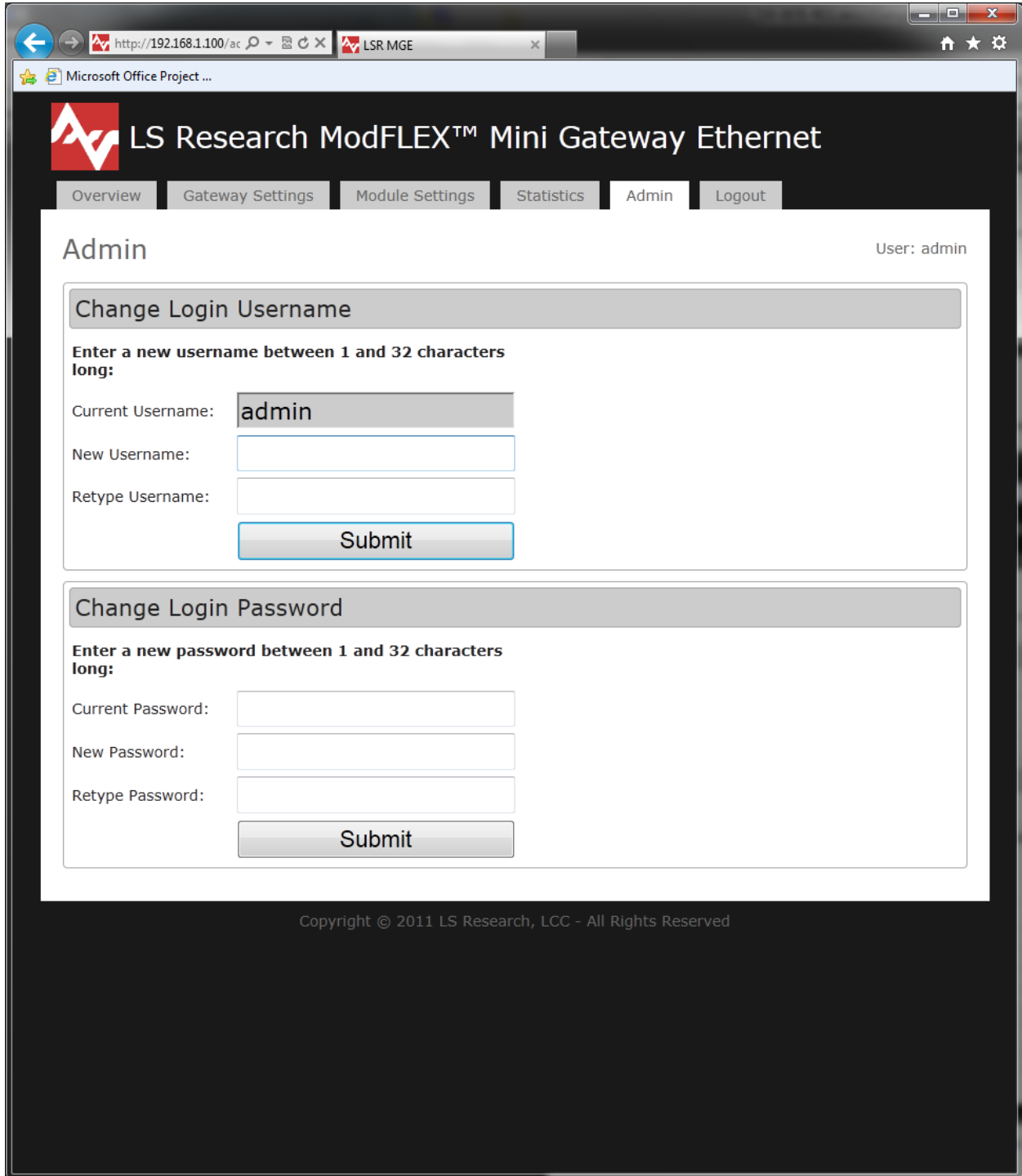


Figure 8 Admin Page

6 MGE Boot Loader

6.1 MGE Boot Loader Network Requirements

The MGE boot loader uses BOOTP and TFTP to function. This means that all messaging is done with UDP. In order for the boot loader to function properly, the network the MGE resides on must:

1. Allow UDP broadcast messages
2. Allow traffic on UDP ports 9, 67, 68, and 69

6.2 Open the ModFLEX Test Tool Suite

Open the ModFLEX Test Tool Suite and select Ethernet, then click connect.

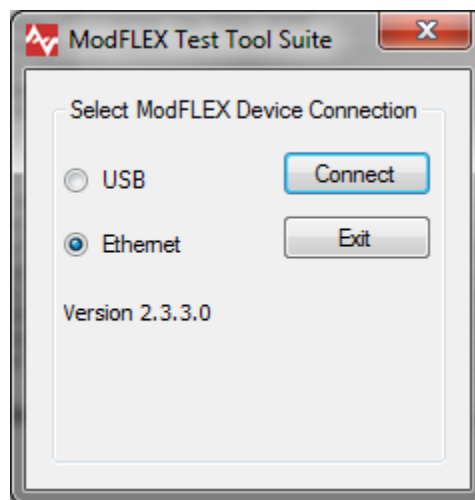


Figure 9 Connect to Ethernet Device

6.3 Select MGE to Update

In the Ethernet Device Browser right click on the device you wish to update and select 'Load New Firmware'.

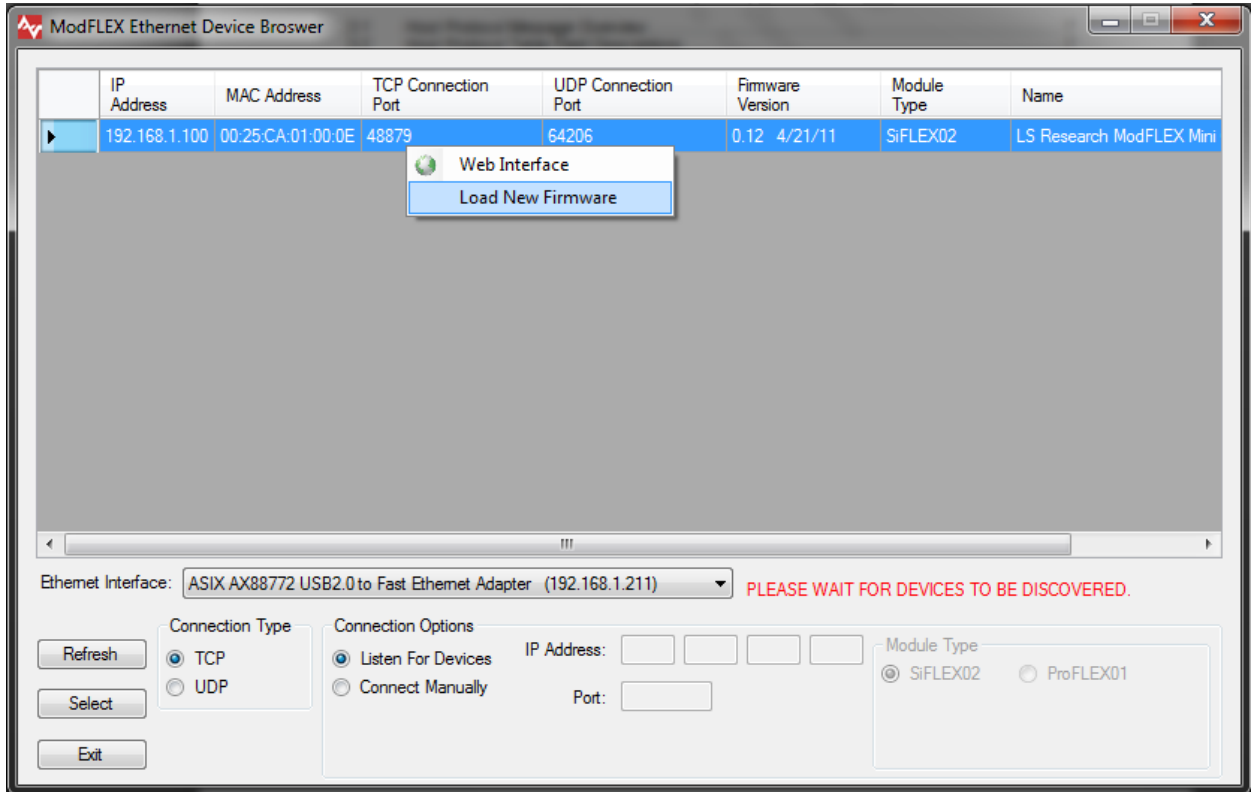


Figure 10 Select Load New Firmware in the Ethernet Device Browser

Clicking the “Load New Firmware” menu item will start the MGE Firmware Loader application. The MGE Firmware Loader can also be accessed by going to Start -> Programs -> LS Research -> MGE Firmware Loader.

6.4 Using the MGE Firmware Loader

When the Firmware Loader window is displayed, the user must type in the IP address and MAC address of the MGE to be updated. Then the user must select the Ethernet adapter that will be communicating to the MGE. Finally a firmware image needs to be selected and then the program button can be pressed.

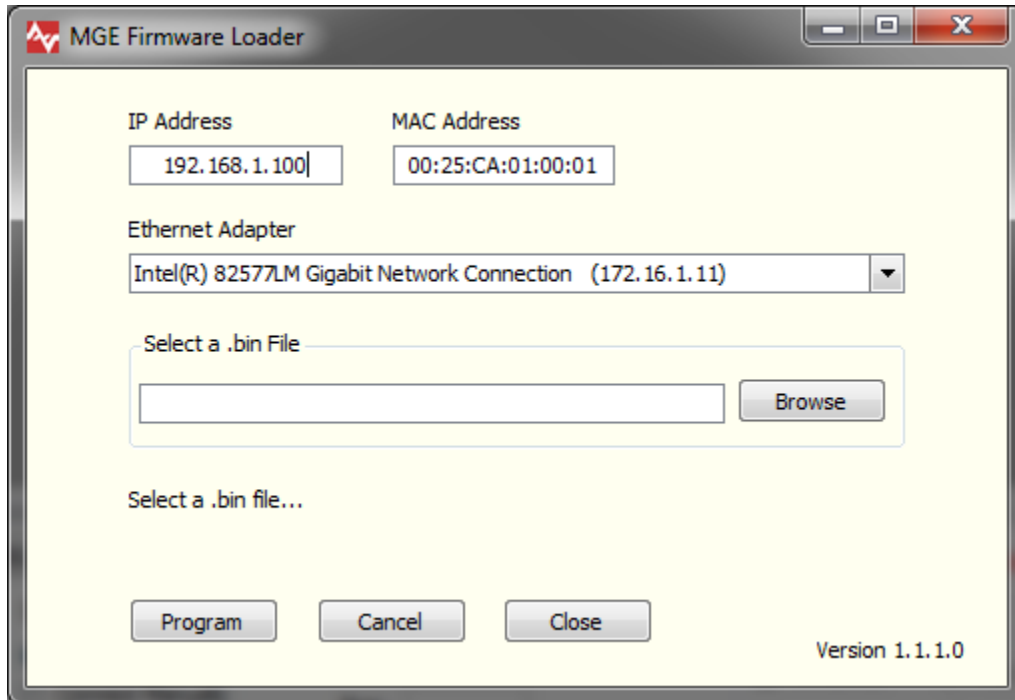


Figure 11 MGE Firmware Loader Program

7 Contacting LS Research

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