EtherNet/IP

(Arlyn UpScale Touchscreen Display)

EtherNet/IP Compatibility Addendum

(SST Configurator)

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1 OVERVIEW

1.1 What is EtherNet/IP?

EtherNet/IP (Industrial Protocol) is an industrial network protocol that adapts the Common Industrial Protocol (CIP) to standard Ethernet. It is widely used in various industries, including factories, hybrid systems, and process automation

Being an open standard, EtherNet/IP has sparked the development of a plethora of products by numerous manufacturers, spanning PLCs, PACs, Drives, Robots, Proxies, IOs, and diagnostic tools.

EtherNet/IP facilitates both cyclic and acyclic communication among components, encompassing functionalities like diagnostics, functional safety, alarms, and additional data exchange. This protocol leverages standard Ethernet as its communication medium, with Ethernet cables interconnecting EtherNet/IP components in a network, accommodating the coexistence of various Ethernet protocols within the same infrastructure.
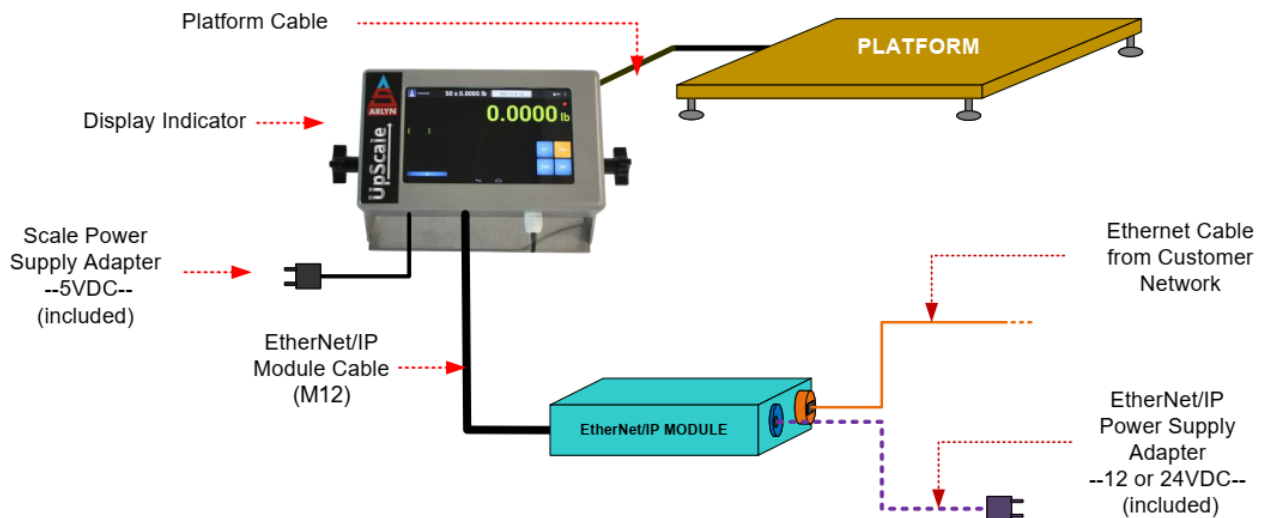
1.2 Purpose of this Document

This addendum will go through the process of setting up your EtherNet/IP add-on to the scale and help you configure the module to fit your network environment.

2 COMPONENT SETUP

2.1 Wiring

Platform Cable – Connects the PLATFORM to the INDICATOR through an M12 Cable.

Indicator & Platform – Components that make up your scale.

Scale Power Supply – Connects the INDICATOR to your power outlet at 5VDC. Supplies power to the Scale (Display & Platform),

EtherNet/IP Module – EtherNet/IP box that converts weight data from the scale to EtherNet/IP Protocol,

EtherNet/IP Power Supply – Powers up the EtherNet/IP Module at separately.

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EtherNet/IP Module – EtherNet/IP box that converts weight data from the scale to EtherNet/IP Protocol,

EtherNet/IP Power Supply – Powers up the EtherNet/IP Module at 12-24VDC separately.

2.2 Setup

The system is designed in such a way so that it is "plug and play" in terms of wiring. Before connecting the scale to your PLC or HMI to communicate in EtherNet/IP, it must be setup to be recognized by your network. The module only accepts Static IP and it needs to be configured accordingly.

1) Follow the instructions in the Arlyn UpScale QuickStart and the User Manual to set your scale up accordingly.
2) Connect the EtherNet/IP module to the display as shown in the wiring diagram above.
3) Connect the included power supply to the EtherNet/IP module.
4) Connect the module to your LAN Network first to configure Static IP as instructed in the following sections.

3 STATIC IP CONFIGURATION

Follow the instructions below to setup the software to interact with your EtherNet/IP module for Static IP. NOTE: Follow only the instructions below. Do not touch any configuration variables that has been previously setup. These are critical parameters for EtherNet/IP operation.

3.1 SST Software Installation

SST Software is a PC application that is used to interact with and configure the EtherNet/IP module that came with the scale. The software can be downloaded at the following link: https://www.sstautomation.com/DownloadData/Software/SST-MI-CFG_V3.2.8.zip
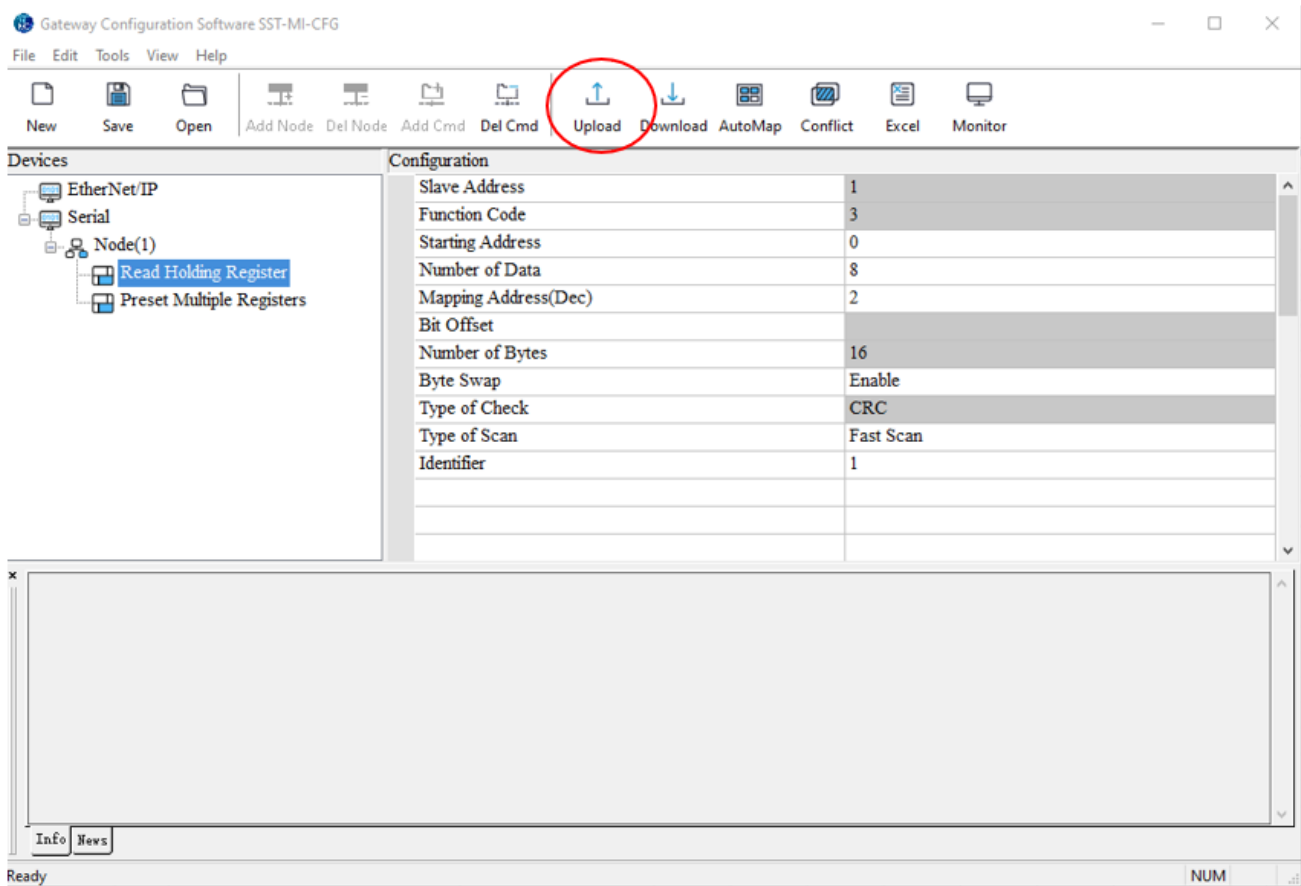
Once the software is installed, running the software will have the following desktop view:
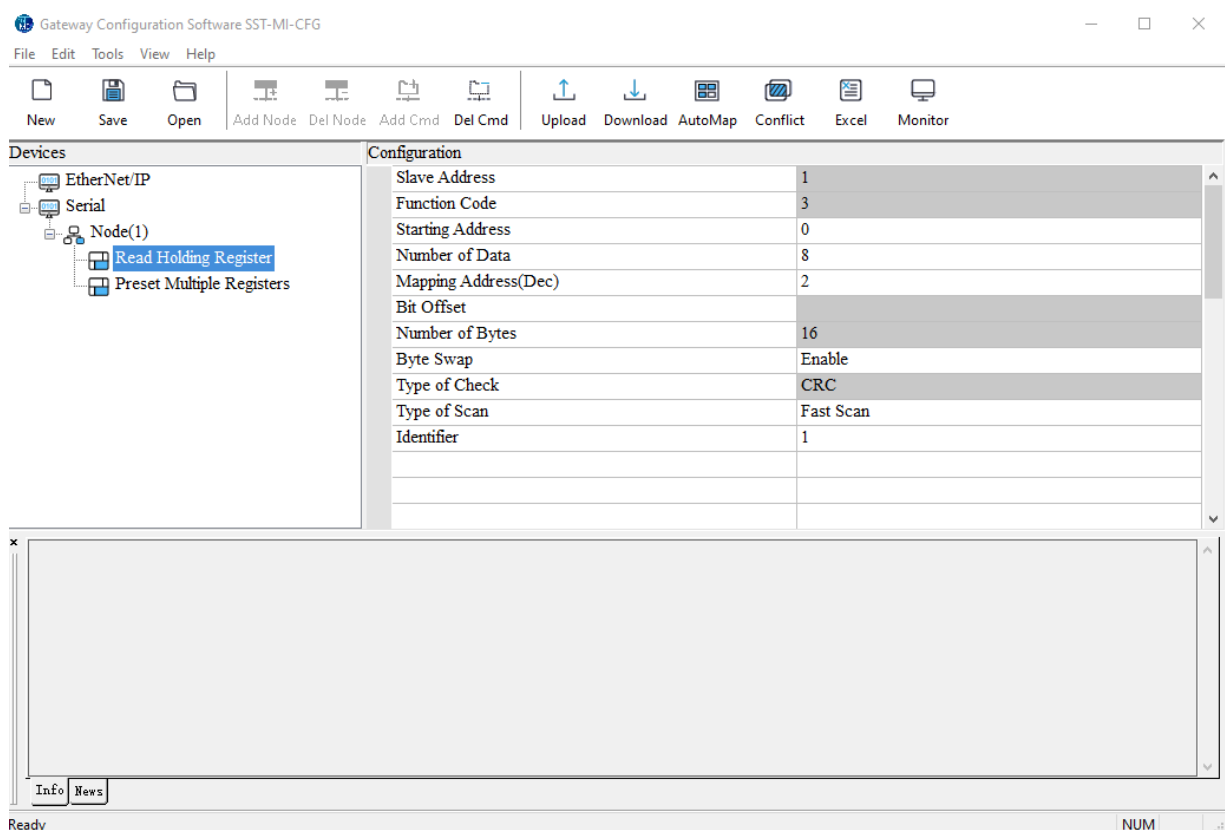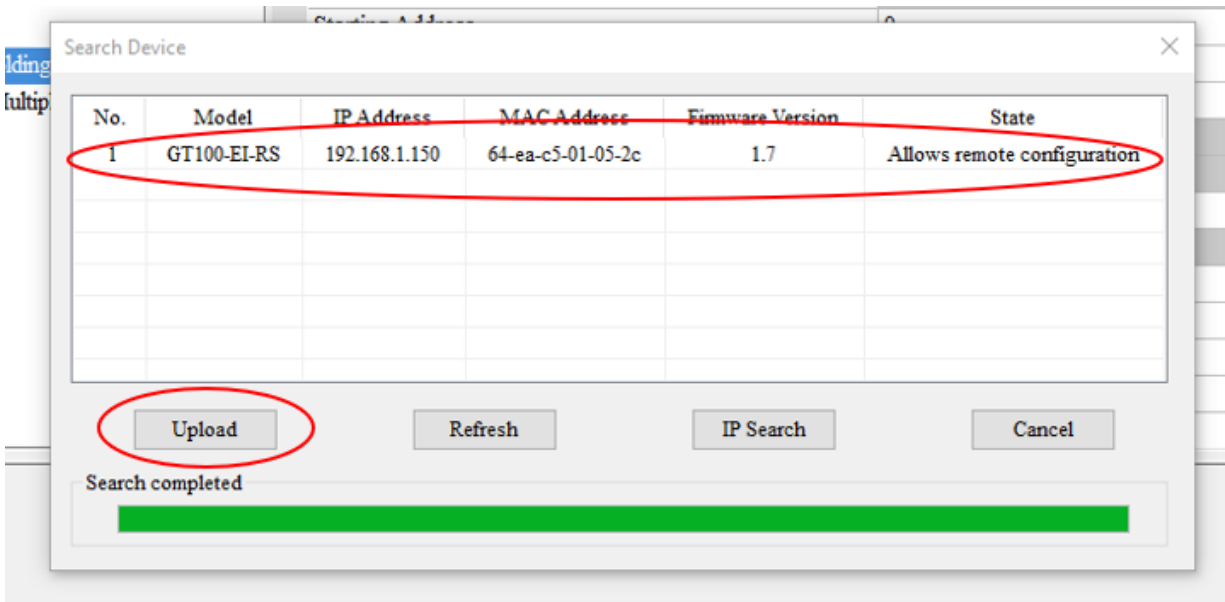
3.2 Assign Static IP & Device Name to EtherNet/IP Module

3.2.1 Procedure
1) Once everything is connected:
    a. Click on the **Upload** button.

A dialog box will show to pick your EtherNet/IP module.

b. Select your EtherNet/IP adapter. NOTE: If you do not see the adapter here, it means the EtherNet/IP module has a different subnet IP address compared to your PC. Please call 1-800-645-4301 for further Technical Support

Click on **Upload** button the dialog box.

c. A new dialog box appears, prompting you once again to click on the **Upload** button.
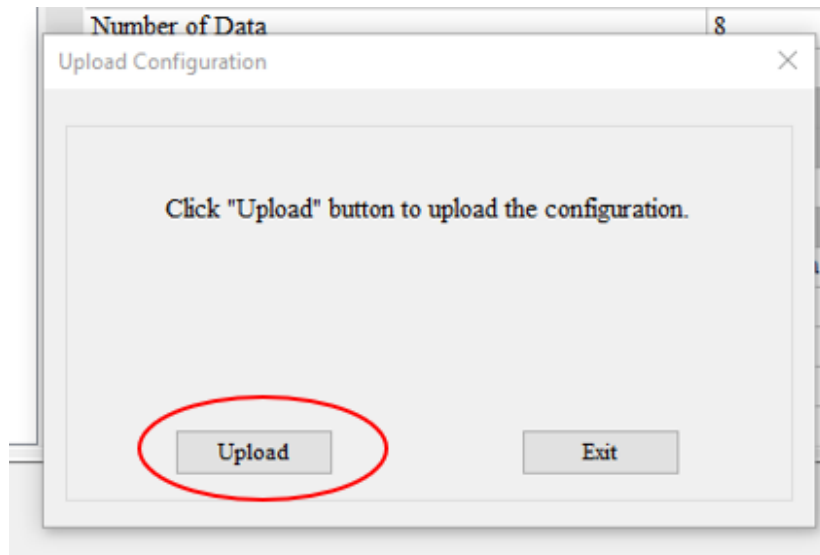
a. Once uploaded is completed, click on Exit
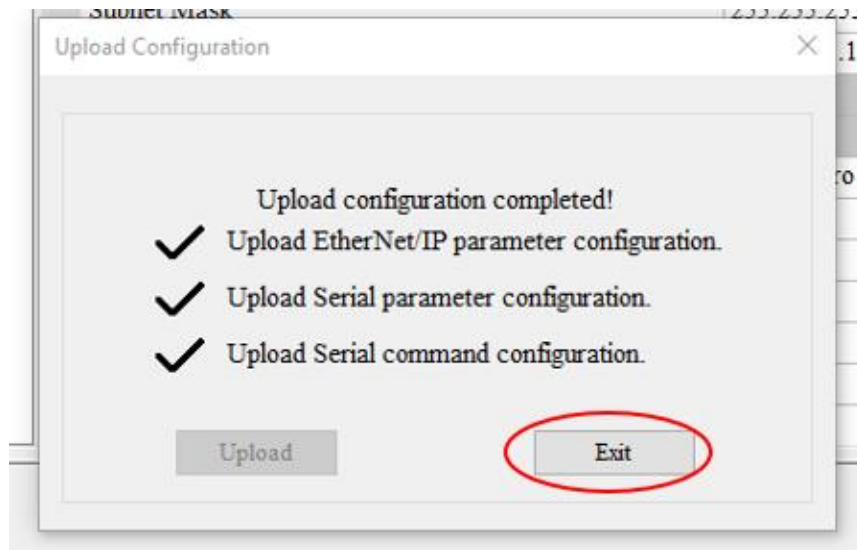
b. Once the upload is successful, you should see the EtherNet/IP adapter configuration shown in the SST Software. This is apparent by looking at the left panel to see the "Force Single Coil" mappings.
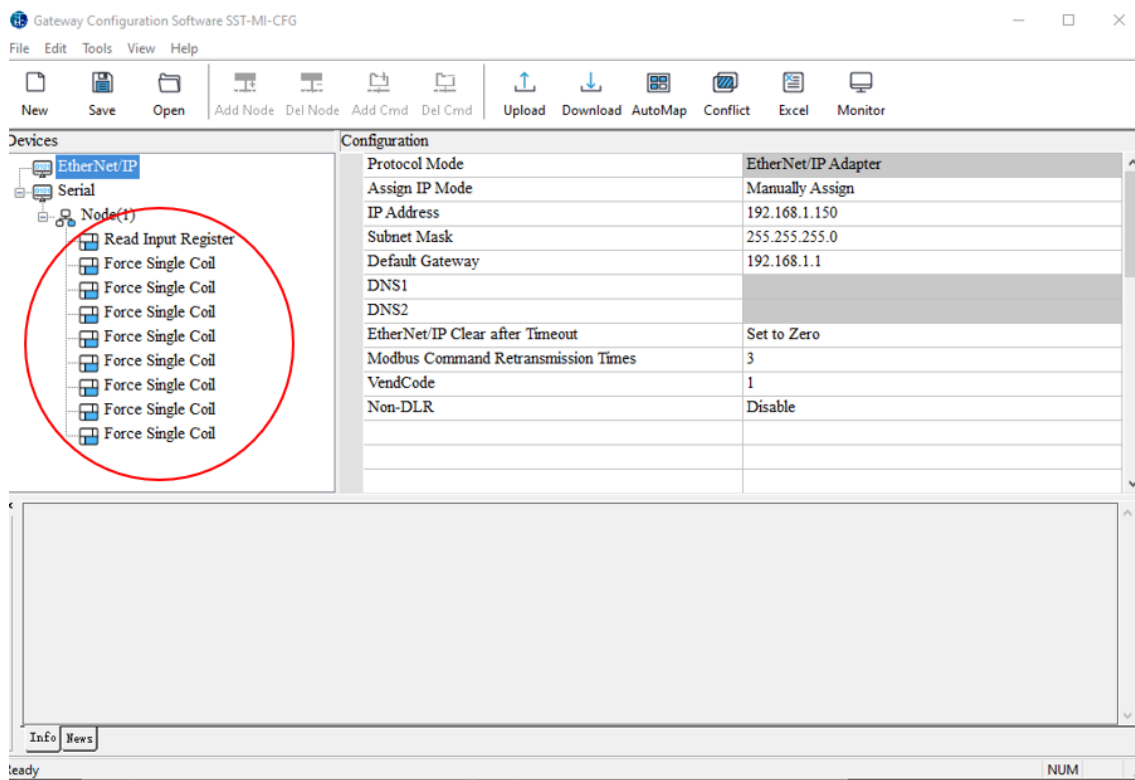
2) On the SST Software, click on the **EtherNet/IP** on the top right corner under devices.
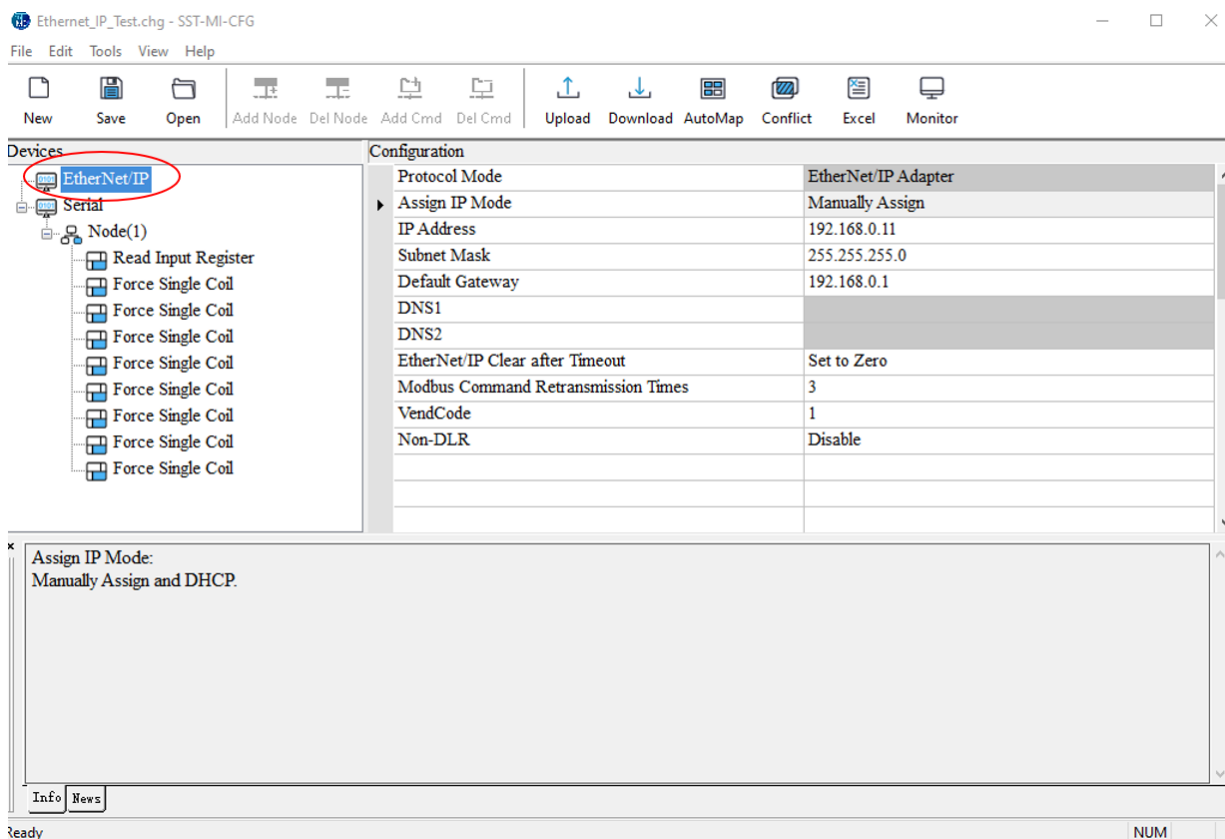
3) In the **Assign IP Mode** (on the right panel, 2nd row), select the dropdown to "Manually Assign". Then set your Static IP information as desired.
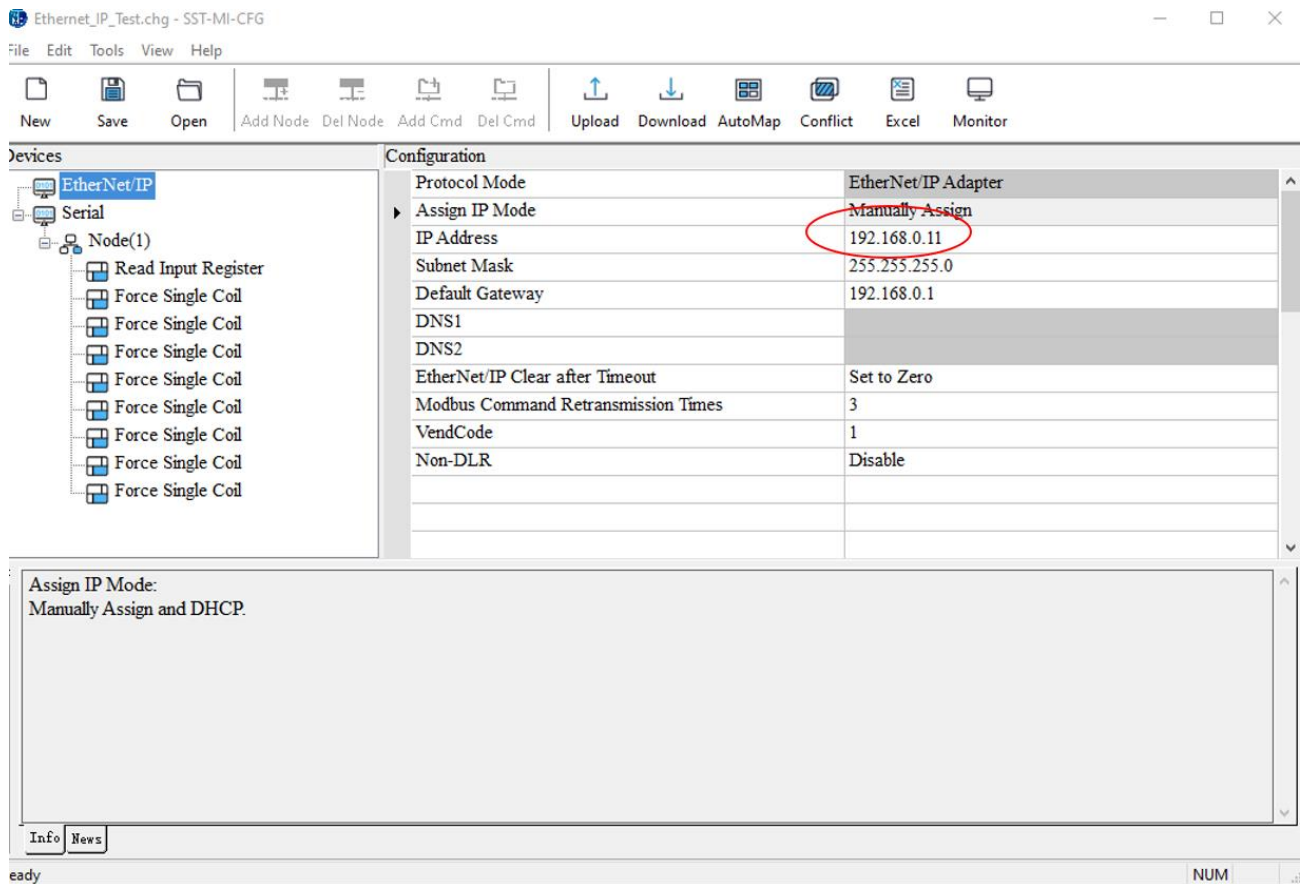
IMPORTANT NOTES:

- The initial IP address set for the EtherNet/IP module is set on DHCP Mode. It is possible you may not be able to detect the device if it is not on the same subnet as has been set by our Factory.
- Please make sure your IP address, Gateway Address and Subnet Mask are compatible with each other. For more information on this, ask your IT Personnel.
- All fields must be completed.
- Once everything has been filled, click on "Save" which is found top right-hand corner of the screen.

3.2.2 IP Address Conflict Resolution

As an EtherNet/IP Device, there can't be more than one EtherNet/IP device which has the same IP address and name on the same LAN when connecting many EtherNet/IP devices.

If there are conflictions of IP address and device name, users can change IP address according to the steps outlined above and ensure that others IP address are different.

4 DATA AREAS – ETHERNET/IP ADDRESS MAP

EtherNet/IP Addresses for the Input and Output Buffers as related to the scale data are listed live on this link: https://t.ly/Ztd-H

The scale has two data areas:

Input Buffer (Address Region 0) [Read Only]

Output Buffer (Address Region 0) [Write Only]

A third section (Weight Status Bitwise Map) below shows the bit mapping for address for Input Buffer addresses 0x0010 (Status 1), 0x0016 (Status 2) and 0x0018 (Status 3).

The next sections are a capture of the link at the time of the printing of this addendum. It may not reflect new updates to the address map.

4.1 Input Buffer (Address 0x0000)

The Input Buffer addresses are read by the EtherNet/IP Master (such as a PLC). They are continuously used for "reading" information from the scale through the EtherNet/IP protocol.

KIND	Address	ITEM	DESCRIPTION	NOTES
		EtherNet/IP: INPUT BUFFER [LITTLE ENDIAN]		
		TOP PLATFORM		
	0x0000	Reserved for EtherNet/IP		
	0x0001	Reserved for EtherNet/IP		
	0x0002	Reserved for EtherNet/IP		
	0x0003	Reserved for EtherNet/IP		
	0x0004	Unit (Top Platform)	byte (0)	0: lb, 1: kg, 2: g, 3: oz, etc.
	0x0005		byte (1)	
	0x0006	Reserved		
	0x0007	Reserved		
	0x0008	Gross Weight value (Top Platform)	byte (2)	
	0x0009		byte (3)	
	0x000A	Gross Weight value (Top Platform)	byte (0)	
	0x000B		byte (1)	
Input Buffer 0x0000 to 0x0019 (IO-DEVICE -> IO-CONTROLLER) LITTLE ENDIAN	0x000C	Net Weight Value (Top Platform)	byte (2)	
	0x000D		byte (3)	
	0x000E	Net Weight Value (Top Platform)	byte (0)	
	0x000F		byte (1)	
	0x0010	Tare Weight Value (Top Platform)	byte (2)	
	0x0011		byte (3)	
	0x0012	Tare Weight Value (Top Platform)	byte (0)	
	0x0013		byte (1)	
	0x0014	Status 1 (Top Platform)	byte (0)	Data 8-bit "Weight Status", Ref 10001 to 10008
	0x0015		byte (1)	Data 8-bit "Weight Status", Ref 10009 to 10016
	0x0016	Displayed value (Top Platform)	byte (2)	
	0x0017		byte (3)	
	0x0018	Displayed value (Top Platform)	byte (0)	
	0x0019		byte (1)	
		Status 2 (Top Platform)	byte (0)	Data 8-bit "Weight Status", Ref 10017 to 10024
			byte (1)	Data 8-bit "Weight Status", Ref 10024 to 10032
		Status 3 (Top Platform)	byte (0)	Data 8-bit "Weight Status", Ref 10033 to 10040
			byte (1)	Data 8-bit "Weight Status", Ref 10041 to 10048
TOTALS				

Format of GROSS WEIGHT, NET WEIGHT, TARE WEIGHT and DISPLAYED WEIGHT values
These values are presented in 4-byte Floating Point value. To read the whole weight, the 4 bytes presented must be arranged in order (i.e. byte 0, byte 1, byte 2, byte 3) and interpreted as "floating point".

Format of WEIGHT STATUS Addresses
The "Weight Status" registers are further expanded in the Weight Status Bitwise Map section.

4.2 Output Buffer (Address 0x0000)

These addresses are used for sending commands to the scale through the EtherNet/IP protocol. For example, if you want to ZERO the scale from the EtherNet/IP Master (e.g. PLC), send ON (or 1) to address 0x0000 and the scale will zero out. Similarly, the same can be said about changing units, or taring, etc.

Please note that you must **clear** the address after sending the ON bit. This is done by sending OFF (or 0) to the address. If you don't perform this action, the scale will not respond to another ON command.

EtherNet/IP: OUTPUT BUFFER

KIND	Address	ITEM		DESCRIPTION		NOTES
		TOP PLATFORM				
	0x0000	Zero	Bit 0	1: Execute		
	0x0001	Reserved	Bit 0	Future expansion for Zero operation		
	0x0002	Tare	Bit 0	1: Execute		
	0x0003	Clear Tare Value	Bit 0	1: Execute		
Output Buffer 0x0000 to 0x000F	0x0004	Change Unit	Bit 0	1: Toggle to next active unit		
	0x0005	Net / Gross Display	Bit 0	1: Net	0: Gross	1: Toggle Net/Gross
(IO-COINTROLLER -> IO-DEVICE)	0x0006	Cycle	Bit 0	1: Toggle Cycle (Abort Cycle)		1: Toggle
	0x0007	Average Weight & Hold	Bit 0	1: Start	0: Stop	1: Toggle
	0x0008	Flow Rate	Bit 0	1: Start	0: Stop	1: Toggle
BIG ENDIAN	0x0009	Log Weight	Bit 0	1: Start	0: Stop	1: Toggle
	0x000A		Bit 0			
Set "Bit 0" on Each Byte to Execute Function	0x000B		Bit 0			
	0x000C		Bit 0			
	0x000D	User Output 1	Bit 0	1: ON	0: OFF	NA
	0x000E	User Output 2	Bit 0	1: ON	0: OFF	NA
	0x000F	User Output 3	Bit 0	1: ON	0: OFF	NA
TOTALS						

4.3 Weight Status Bitwise Map

EtherNet/IP: WEIGHT STATUS (0x0010, 0x0016, 0x0018)

KIND	Ref No	ITEM		DESCRIPTION	NOTES
		TOP PLATFORM			
	010016		Bit 15		
	010015	Error	Bit 14	1: Error	
	010014	Weighing Failure	Bit 13	1: Weight cannot be shown for some reason.	
Status 1 - Top Platform	010013	Overload	Bit 12	1: Overload 0: Normal	
(Byte 1)	010012	Stability Control	Bit 11	1: Stable 0: Unstable	
(Input Buffer Address 0x0010)	010011	Motion Detect	Bit 10	1: Motion 0: No Motion	
	010010	Zero Tracking	Bit 9	1: "Zero Tracking" in progress	
	010009	Hold	Bit 8	1: Weight Hold 0: Normal	
	010008	Average & Hold in Progress	Bit 7	1: Average & Hold in Progress	
	010007	Tare in Progress	Bit 6	1: Tare in Progress	
	010006	Zero in Progress	Bit 5	1: Zero in Progress	
Status 1 - Top Platform	010005	Gross Display	Bit 4	1: Display Showing Gross	
(Byte 0)	010004	Net Display	Bit 3	1: Display Showing Net	
(Input Buffer Address 0x0011)	010003	Gross Center of Zero	Bit 2	1: "zr" indicator in Gross mode	w/ Motion/Detect Enabled
	010002	Net Center of Zero	Bit 1	1: "zr" indicator in Net mode	w/ Motion/Detect Enabled
	010001	Stable	Bit 0	1: Green 0: Red	

	010032		Bit 15		
	010031	User input 3	Bit 14		
	010030	User input 2	Bit 13		
Status 2 - Top Platform	010029	User input 1	Bit 12		
(Byte 1)	010028	LO Output	Bit 11	(Weight or Parts Comparator)	
(Input Buffer Address 0x0016)	010027	OK Output	Bit 10	(Weight or Parts Comparator)	
	010026	HI Output	Bit 9	(Weight or Parts Comparator)	
	010025		Bit 8		
	010024	Setpoint 8	Bit 7	1: On 0: Off	
	010023	Setpoint 7	Bit 6	1: On 0: Off	
	010022	Setpoint 6	Bit 5	1: On 0: Off	
Status 2 - Top Platform	010021	Setpoint 5	Bit 4	1: On 0: Off	
(Byte 0)	010020	Setpoint 4	Bit 3	1: On 0: Off	
(Input Buffer Address 0x0017)	010019	Setpoint 3	Bit 2	1: On 0: Off	
	010018	Setpoint 2	Bit 1	1: On 0: Off	
	010017	Setpoint 1	Bit 0	1: On 0: Off	

	010048	Mode error	Bit 15		
	010047	Calibration error	Bit 14		
	010046	FRAM error	Bit 13		
Status 3 - Top Platform	010045	A/D error	Bit 12		
(Byte 1)	010044	Checksum error	Bit 11		
(Input Buffer Address 0x0018)	010043		Bit 10		
	010042		Bit 9		
	010041	Net display error	Bit 8		
	010040	Tare error	Bit 7		
	010039	Zero correction error	Bit 6		
	010038	Input (A/D) under	Bit 5		
Status 3 - Top Platform	010037	Input (A/D) over	Bit 4		
(Byte 0)	010036	Gross Under	Bit 3		
(Input Buffer Address 0x0019)	010035	Gross Over	Bit 2		
	010034	Net under	Bit 1		
	010033	Net over	Bit 0		

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