Electronic Displays, Inc.
ED2xx, ED4xx Numeric Series LED Signs
Allen Bradley
AOI (Add on Instruction)
Software Manual

Version Control

Version	Date	Author	Change Description
1.0	5/28/2013	c.elston	Initial release
1.1	8/30/2013	Szukewich	Modifications

TABLE OF CONTENTS

1 INTRODUCTION

This manual is provided as a guide for using ED2xx and ED4xx Numeric Series LED Signs with RS Logix 5000 software by Allen Bradley. This manual provides detailed configuration instructions to configure Ethernet/IP and importing AOIs (add-on-instructions) to RS Logix 5000 software projects.

1.1 Supported PLC Controllers

At this time only Allen Bradley CompactLogix and ControlLogix PLC CPUs that use RS Logix 5000 software are supported. Sample projects can be downloaded from the Electronic Displays, Inc. website.

Allen Bradley Micrologix, SLC500 or PLC5 PLC CPUs are **NOT supported** using RS Logix 500 software. Please refer to the ASCII protocol manual for examples. Typically, you will need to connect the serial port from the PLC directly to the LED sign using the DF1 channel 0 port with these types of PLCs.

1.2 Add-On Instructions

Add-on instructions provided in this manual are used to make ladder logic based programming very easy. These set of AOIs can be imported into your project and reused in ladder flow.

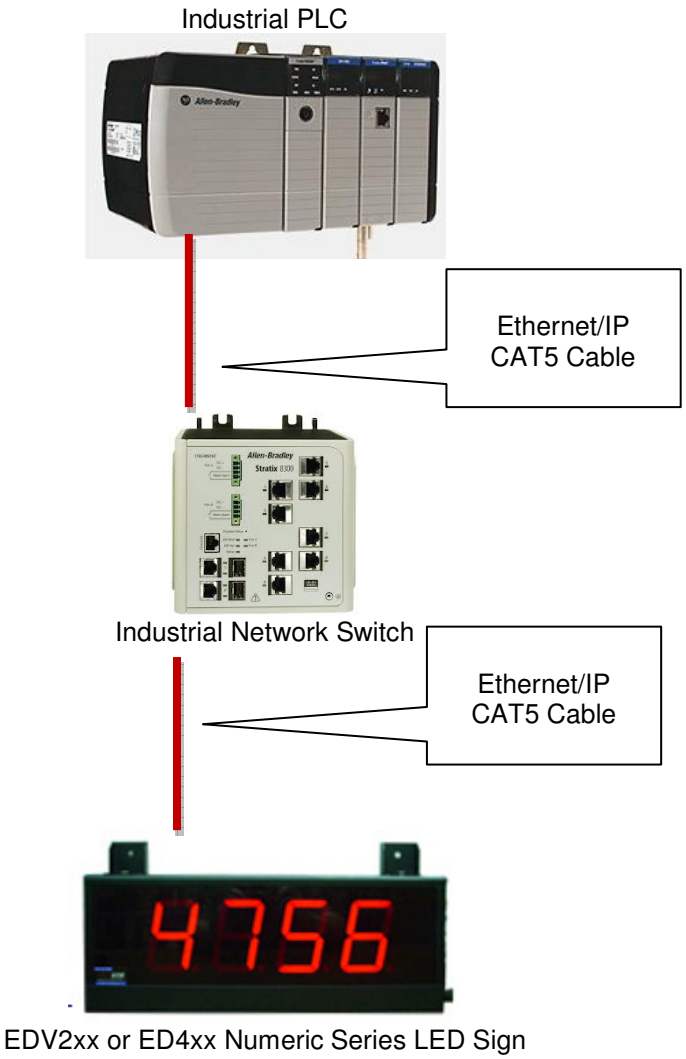
1.3 Supported LED Signs

- ED202
- ED206
- ED402
- ED406

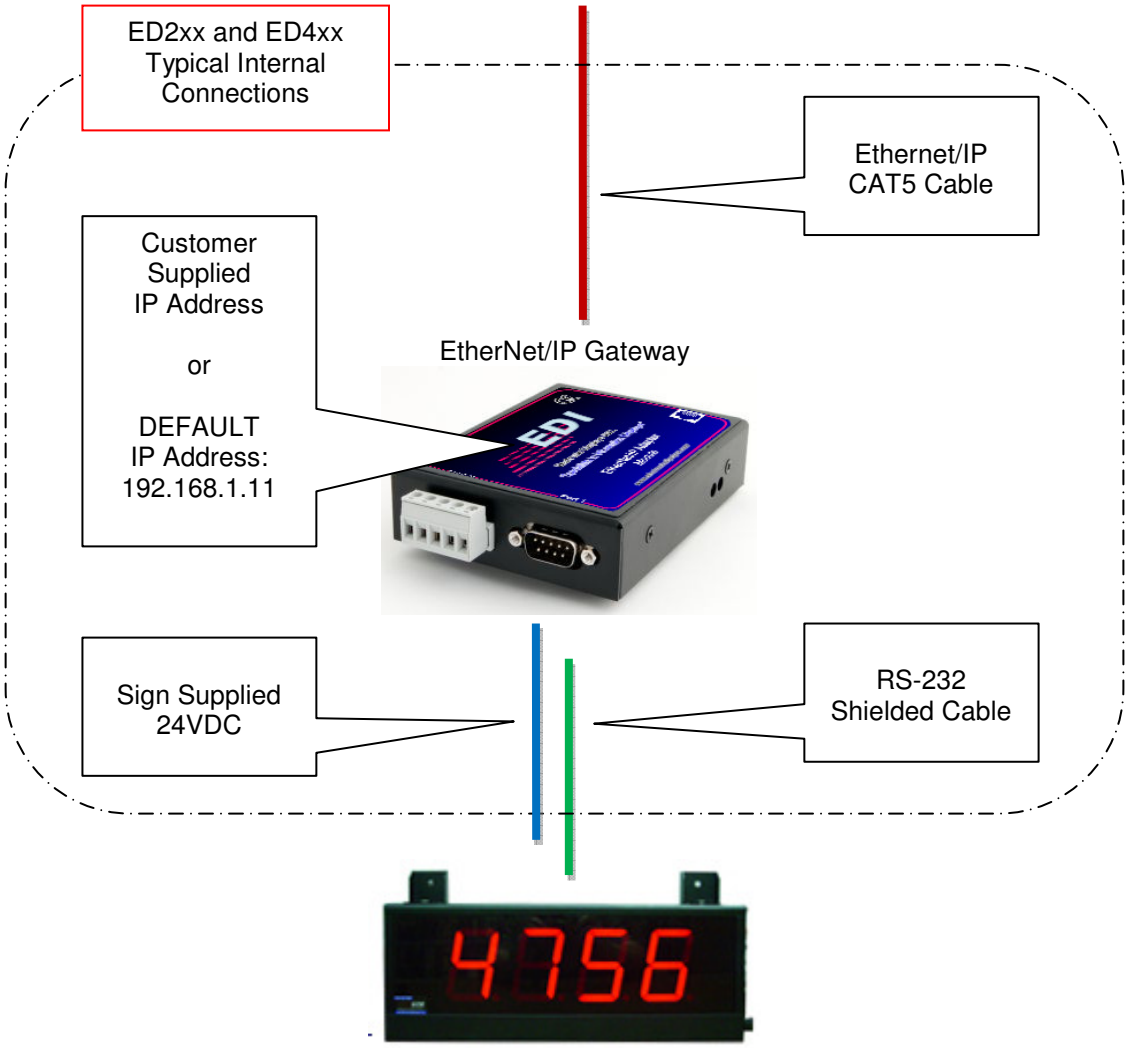
2 SYSTEM BLOCK DIAGRAM

ED2xx and ED4xx Numeric LED signs come equipped with an Ethernet/IP (EIP)_ gateway device that exchanges the Ethernet/IP protocol into ASCII serial strings compatible with the LED signs. This allows for the LED signs to be connected via an Ethernet CAT5 cable and not limited to a short distance RS-232 cable typically connected to traditional LED signs displays.

2.1 Typical Connection Diagram



2.2 Internal ED2xx and ED4xx Connection Diagram



ED2xx and ED4xx Numeric Series LED Sign

2.3 Single Sign Connection

Single sign connection must have an installed "Master" EIP gateway device.

2.4 Multiple Sign Connection (More than 50 Feet apart)

Each sign will require an ED2xx or ED4xx to be internally installed as a "Master" EIP gateway device.

ED2xx and ED4xx Numeric
Series LED Sign
(with EIP Gateway)

3 CUSTOMIZE THE IP ADDRESS EIP Gateway

3.1 Install Electronic Displays Network Manager

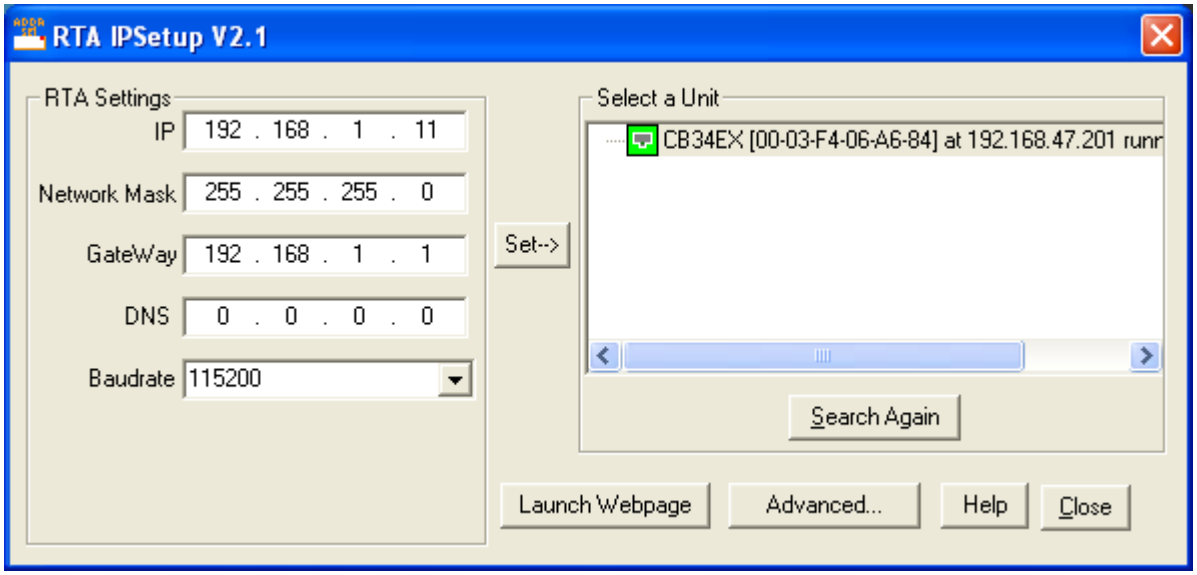
Download and install the EDI Network Manager software from EDI website Before the device can be configured, the gateway's network settings must be set.

Location: http://www.electronicdisplays.com/ → Support → Downloads → Allen Bradley → **ED3600 Network Manager**

1) If the PC is currently setup with DHCP turned on, turn off DHCP and set a static IP and corresponding Subnet Mask for your PC.

2) Connect the 7-30 VDC power source to the device.

3) Using the supplied crossover cable, connect the device to the PC.



4) RTA Settings: IP Address is set to 192.168.1.11 and Subnet Mask is set to 255.255.255.0 by default.

7) Configure the IP Address and the Subnet Mask so that it matches your PC's network settings.

8) Click **Set->**. This will restart the gateway.

9) Under Select a Unit, the gateway will come back online. When visible again, highlight and click **Launch Webpage**.

10) If gateway does not reappear under Select a Unit, click **Search Again** and repeat step 10. If problems continue, jump to the Troubleshooting section. Otherwise, you may continue with your normal gateway configuration.

QUICK START USING TEMPLATE PROGRAM

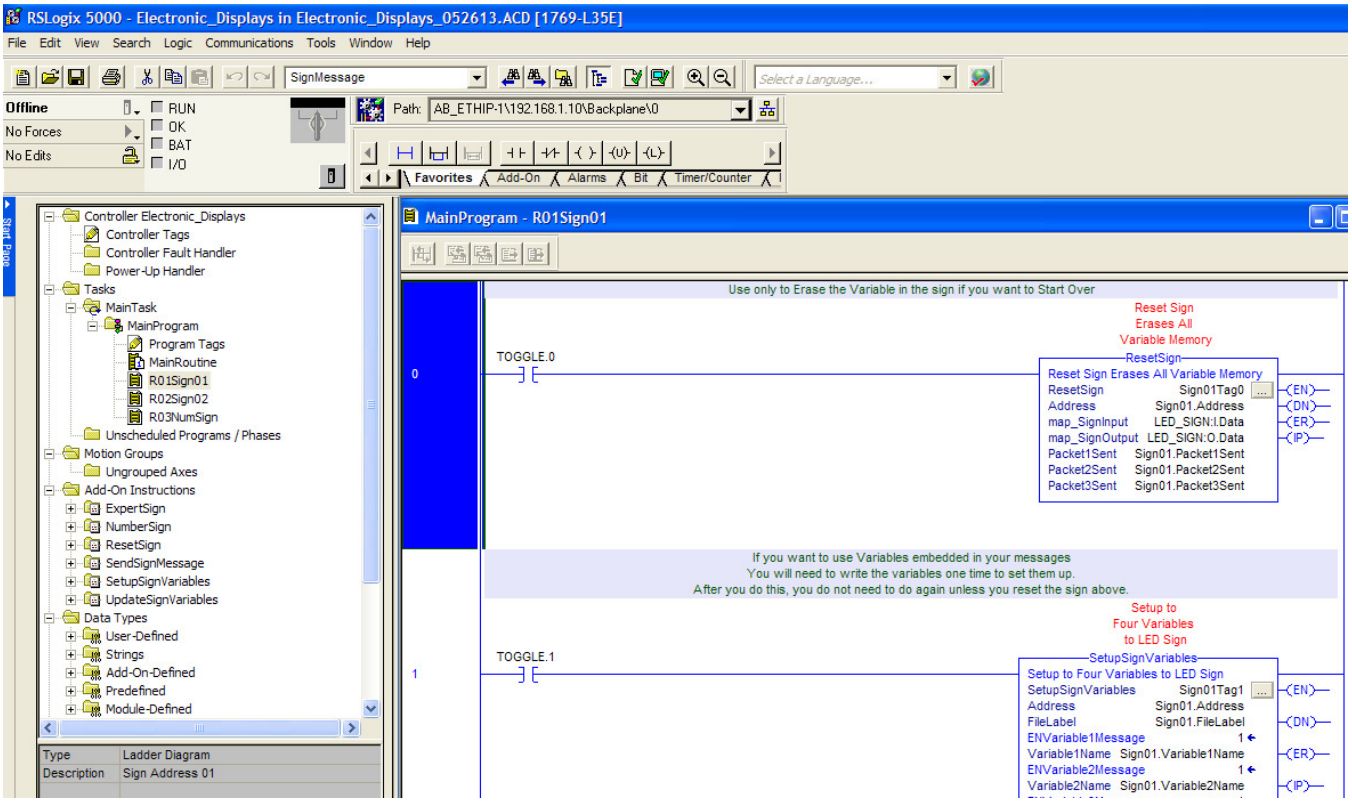
Download the sample PLC program from the Electric Displays website.

Electronic_Displays_052613.acd
(or latest version)

3.3 Quick Start with Template Program

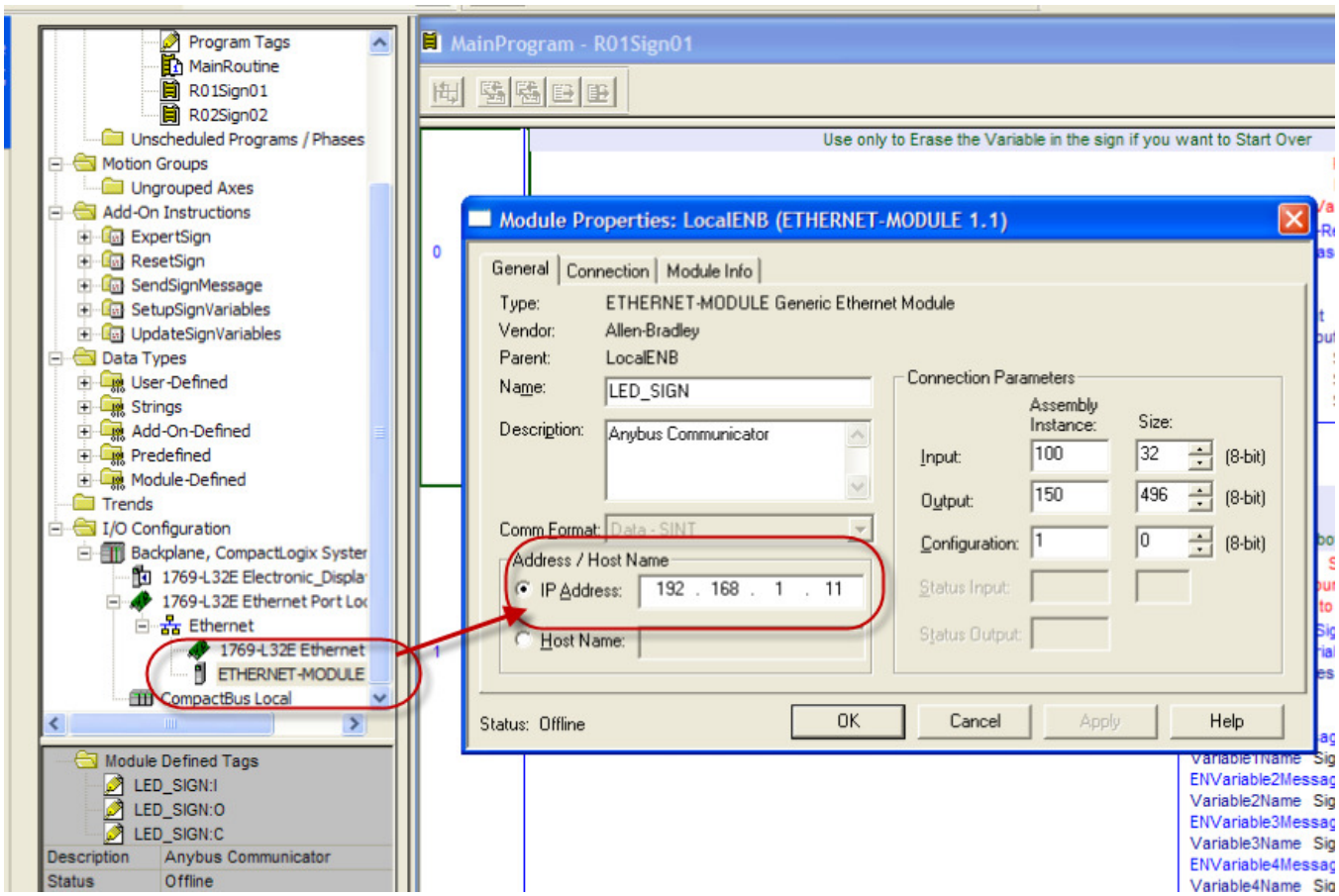
The purpose of the template sample program is provide a bases of settings and tags that are setup in the PLC along with sample ladder logic that can be written to send messages to the sign.

This template file is design to communicate with the Number Sign logic and is located in “Rung 03”. There are also examples for the EDV111 signs. Sign #1 is a master sign which is connected via an RS-232 cable daisy chained to Sign #2.



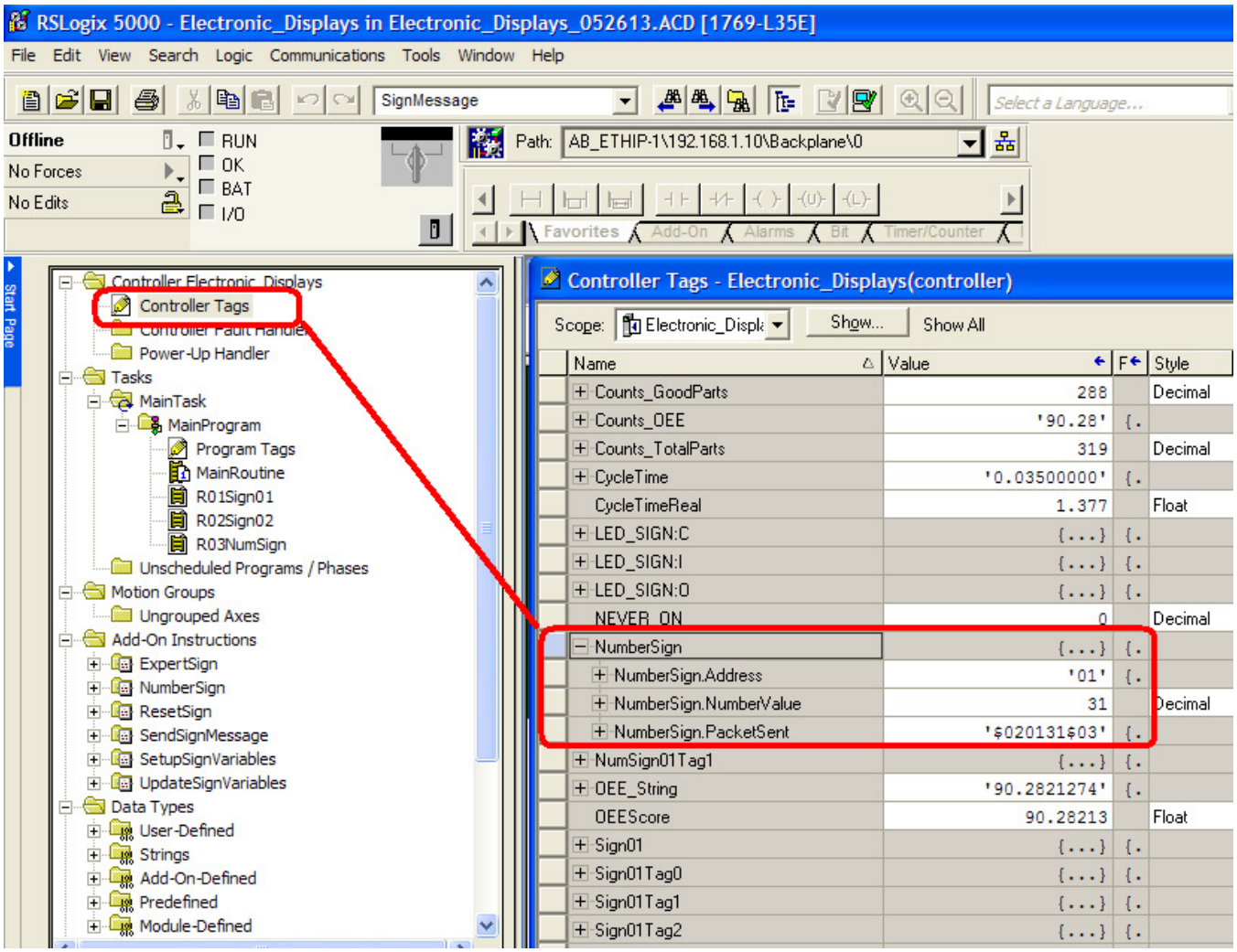
3.4 Update Sign IP Address in Sample Program

Open the Ethernet Module setting and update the IP Address of the sample program. The sample program is setup with the default sign IP address of 192.168.1.11. If you customized your IP, you will need to update this target address below.



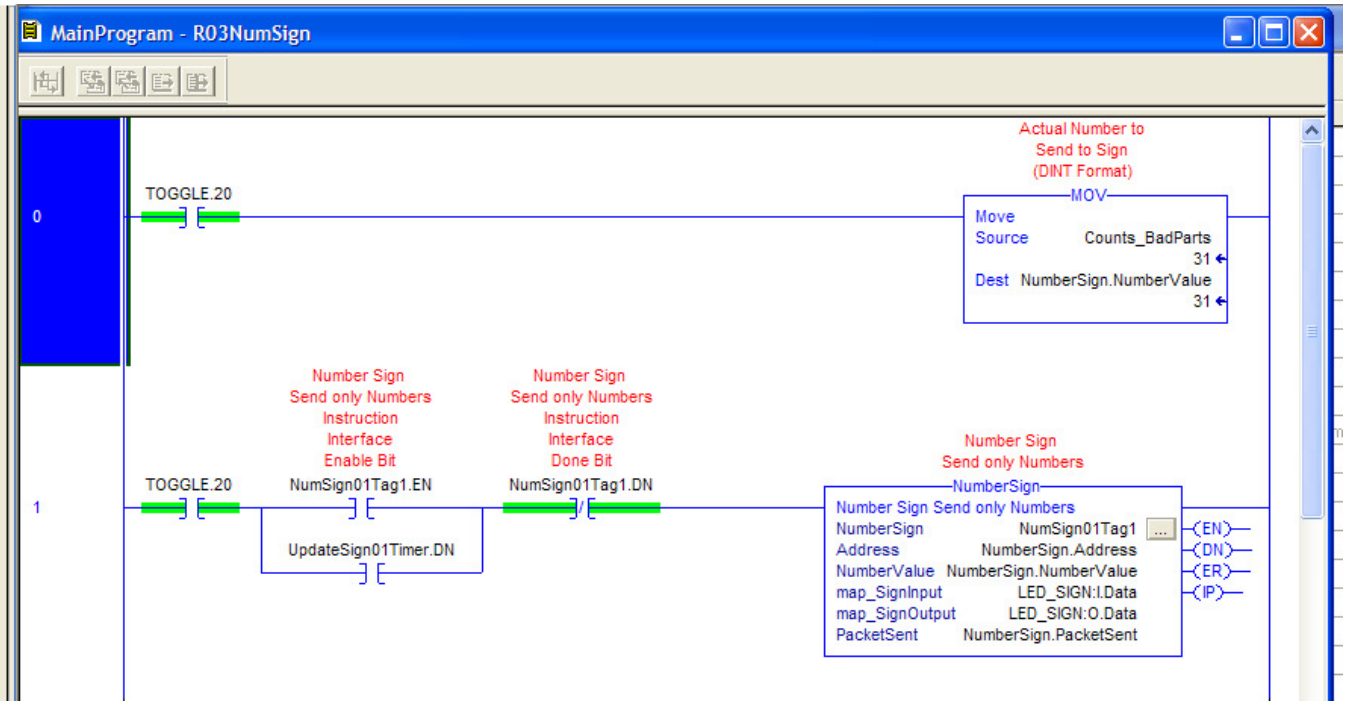
3.5 Update Messages and Sign Format Tags

Open the Controller Tags and update the NumberSign tag with the sign address. See the description or AOI help file to determine which options are available.



3.6 Create and Customize Ladder Logic

Create ladder logic to enable the rungs in sequence to send message to the sign. The .NumberValue parameter expects a DINT format to send a number to the sign.



4 IMPORTING WITH NEW PROGRAM OR EXISITING PROGRAM

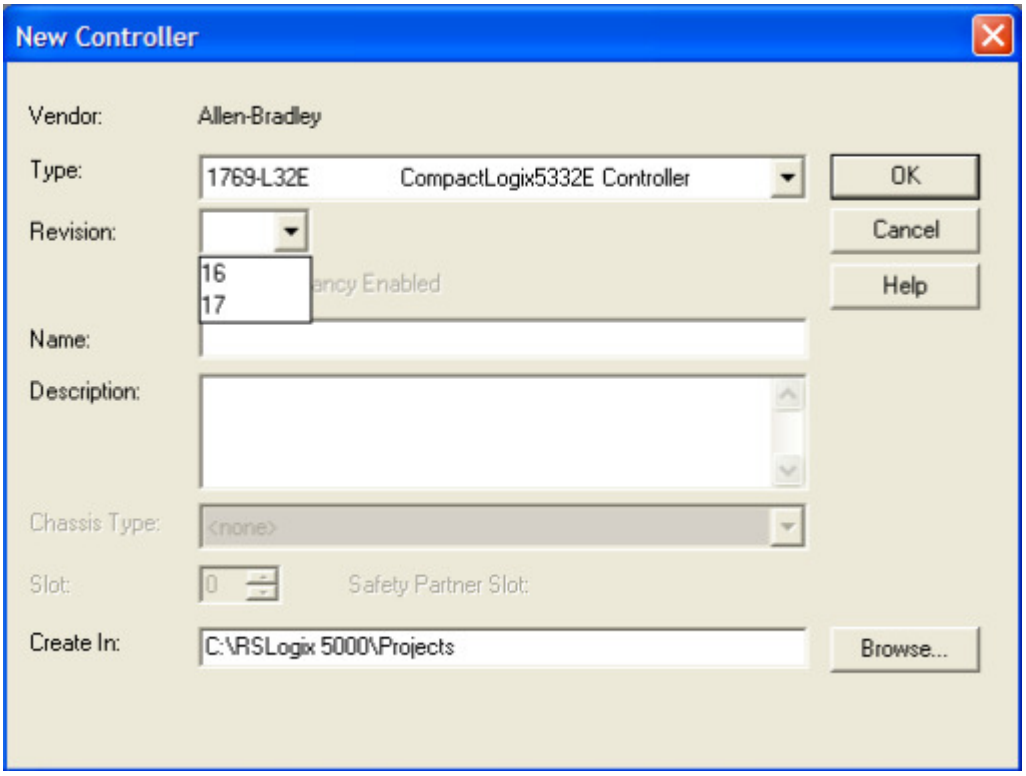
4.1 Start a new project with RS Logix 5000

Click File, New Project to start a new PLC project.

Choose PLC Type.

Choose PLC firmware revision.

Name your PLC Project.

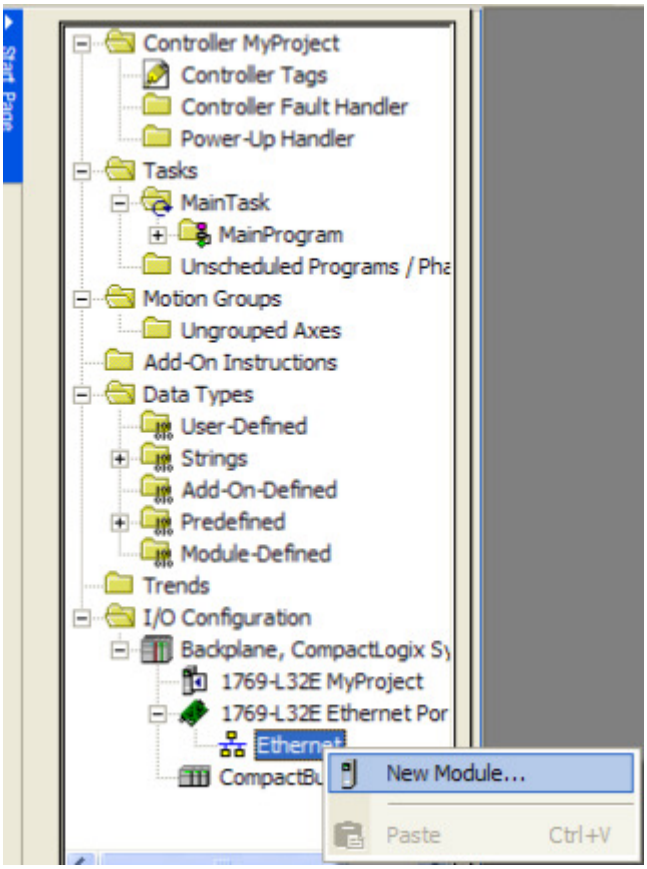


4.2 Create a New Ethernet Connection

In the controller tree view.

Right click the Ethernet ICON

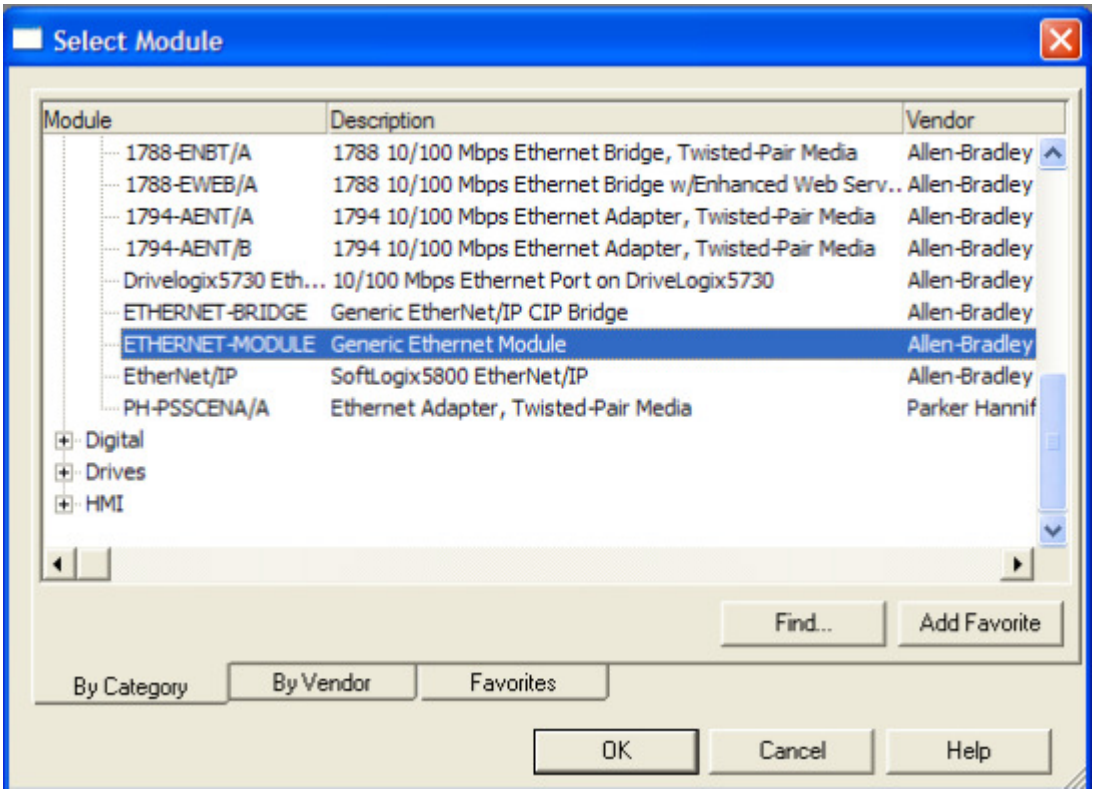
Choose New Module



Choose Communication.

Choose ETHERNET-MODULE (Generic Ethernet Module)

Click OK



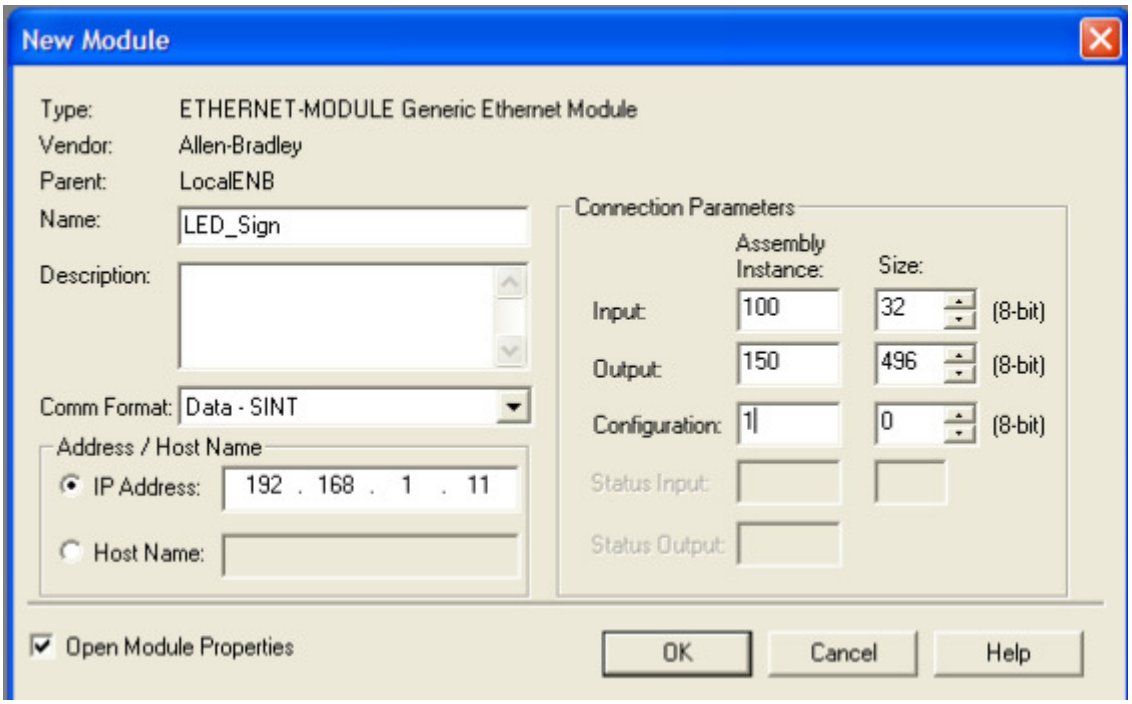
Name the Ethernet Connection:
LED_SIGN
(This will be the prefix name of the tags in the controller.)

Enter the Anybus Communicator Default IP address or your custom IP address:
192.168.1.11
or
custom IP address
(xxx.xxx.xxx.xxx)

Choose Comm Format
Data-SINT
(Important)

Enter Required Assembly Instance
Input: 100 and 32 bytes
Output: 150 and 496 bytes
Configuration: 1 and 0 bytes

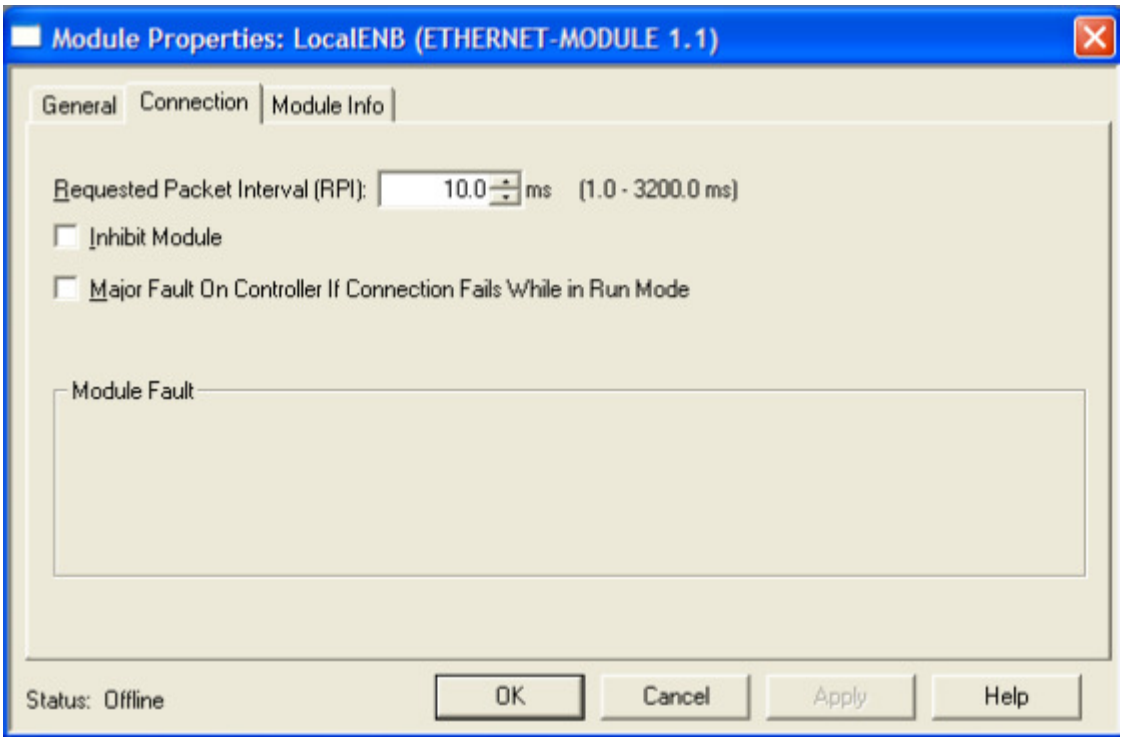
Click OK



Choose RPI interval:

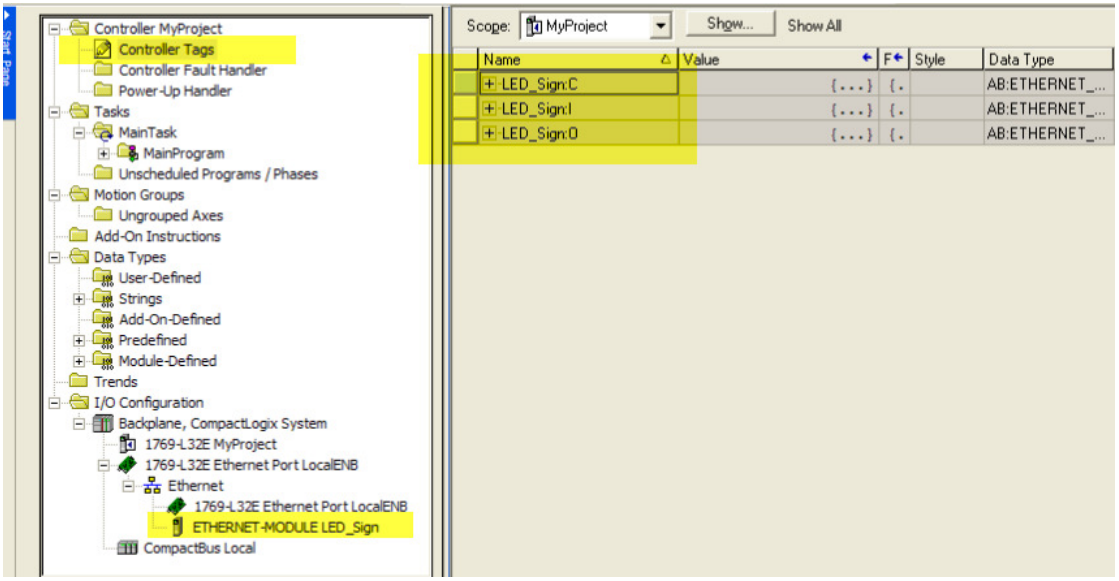
Default 10.0 ms is ok

Click OK



Confirm Controller Tags

Confirm Ethernet Module is configured

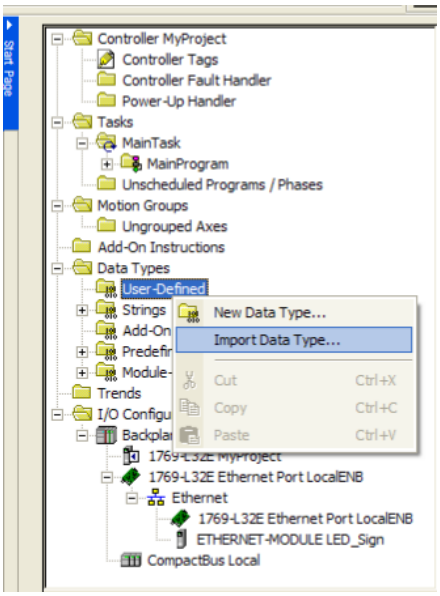


4.3 Importing Data-Types

In the controller tree view

Right click User-Defined under "Data Types"

Choose Import Data Type



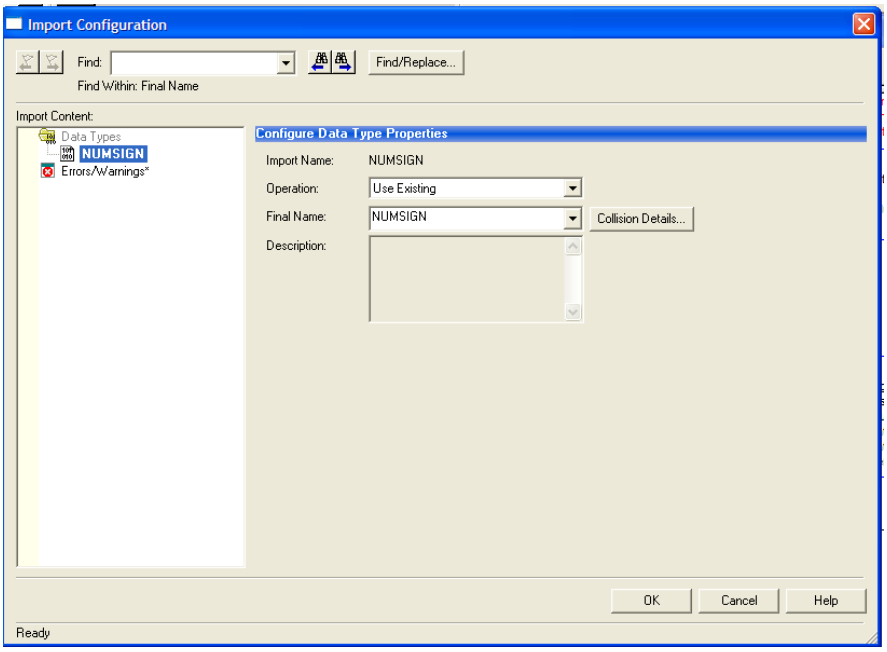
Browse to the folder containing Data Type

Import NUMSIGN.L5X file

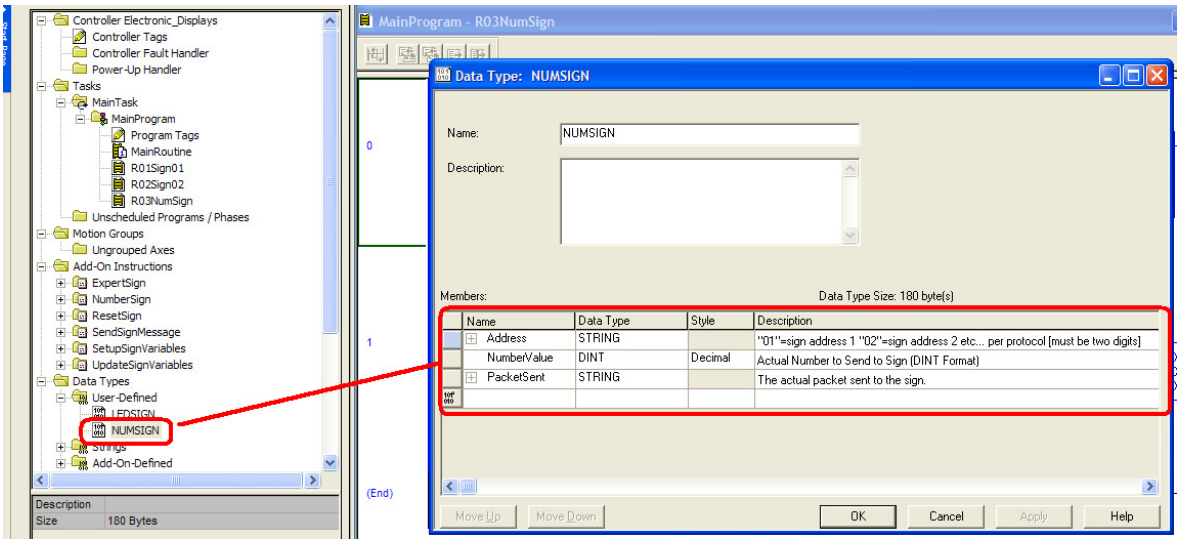
Click OK

Confirm no version conflicts

Click OK



Confirm Data Type "NUMSIGN"

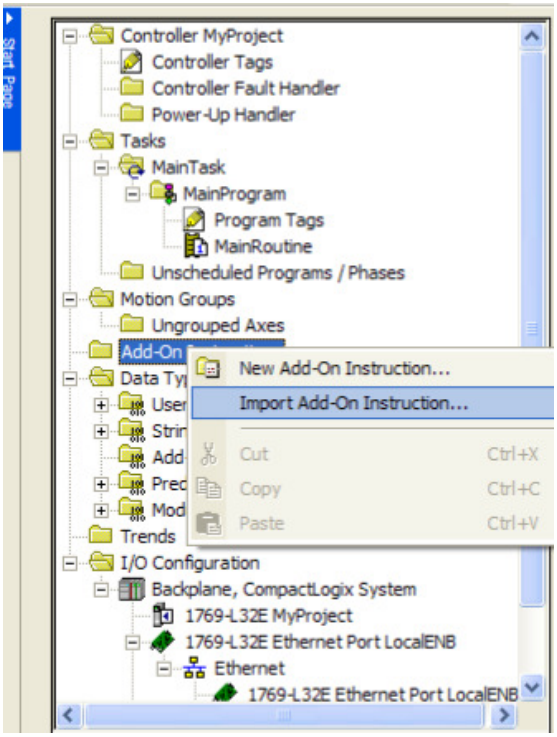


4.4 Importing Add-on Instructions

In the controller tree view

Right click Add-On Instruction

Choose Import Add-On Instruction

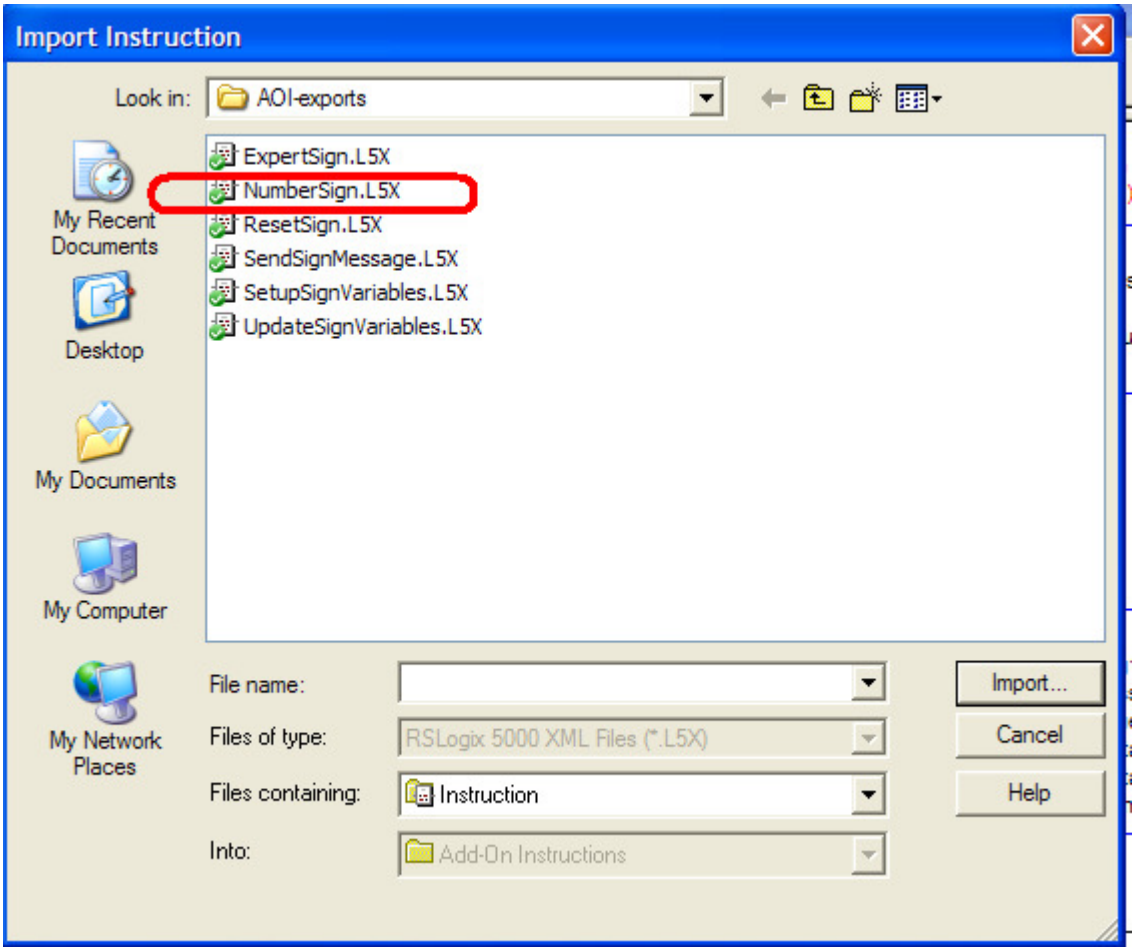


Browse to the folder containing Add-On Instructions

Import the NumberSign .L5X extension.

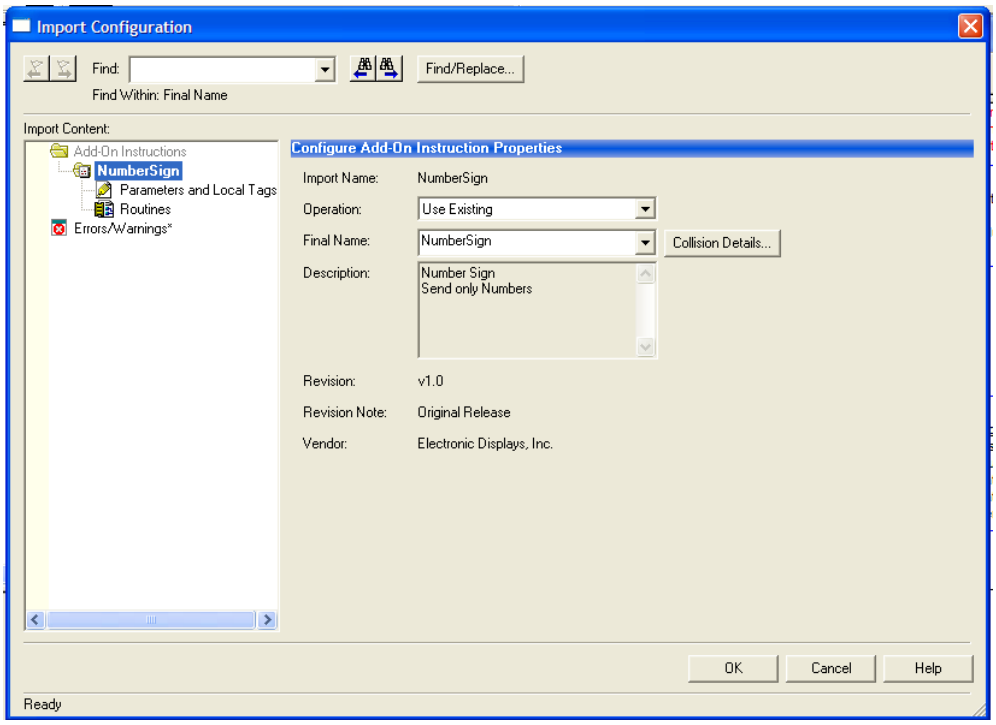
This is the only AOI required for the ED2xx or ED4xx signs.

Click OK

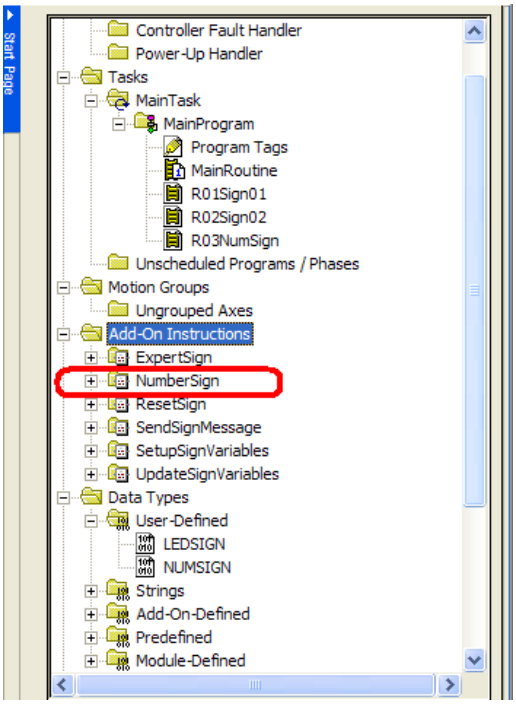


Confirm no version conflicts

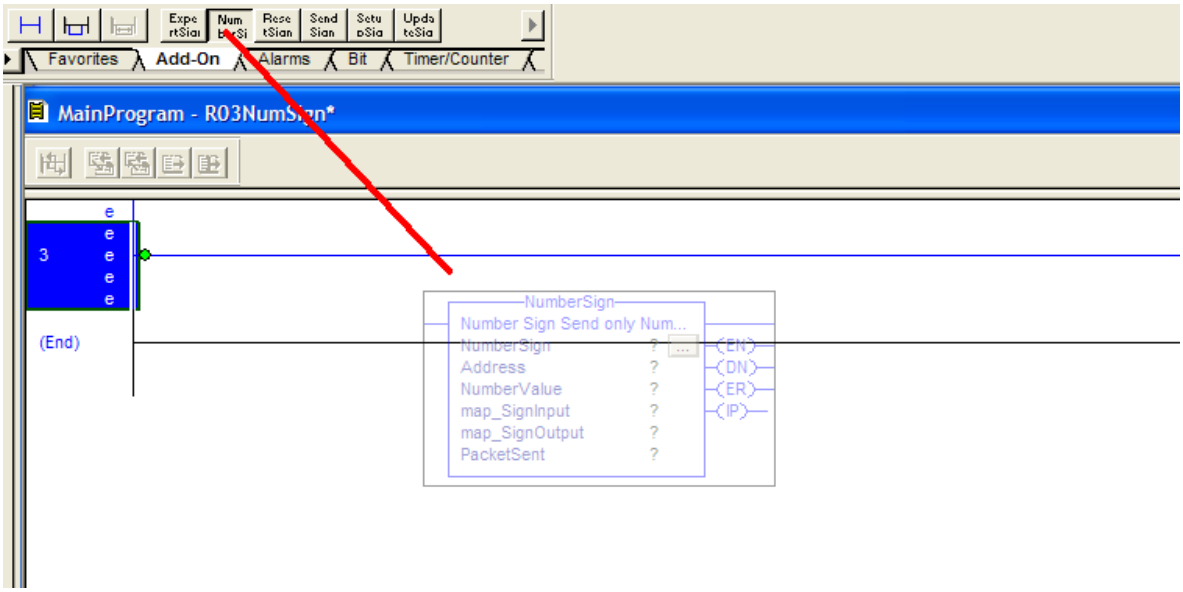
Click OK



Confirm NumberSign AOI Instruction is imported



Confirm AOIs are added to Toolbar in RS Logix 5000



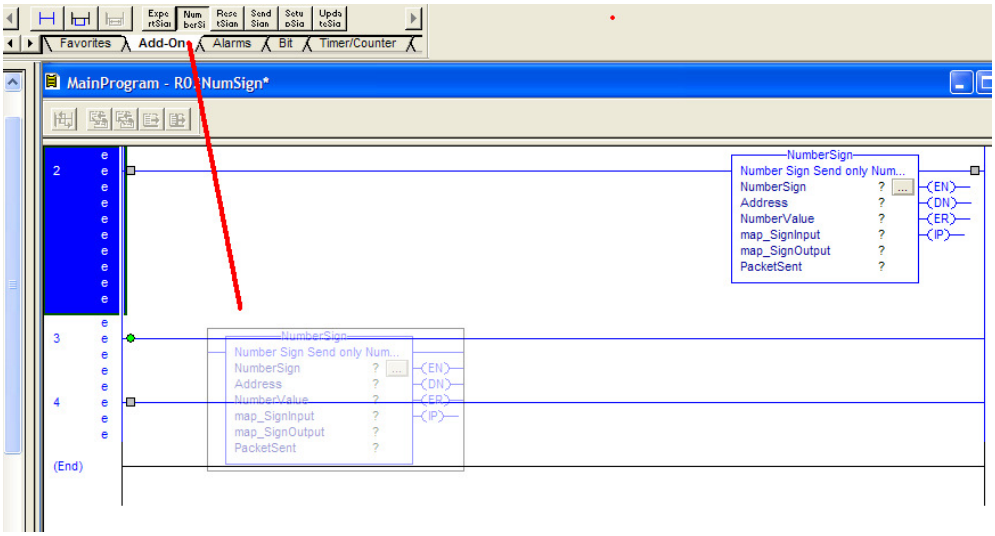
5 USING THE AOI INSTRUCTIONS IN THE PROJECT

5.1 Add AOIs to Ladder Programming via Drag and Drop

Click on the Add-On Toolbar

Drag and Drop the desired control AOI block to a new rung

TIP: You can also drag and drop from the Add-On Menu Tree on the left as well

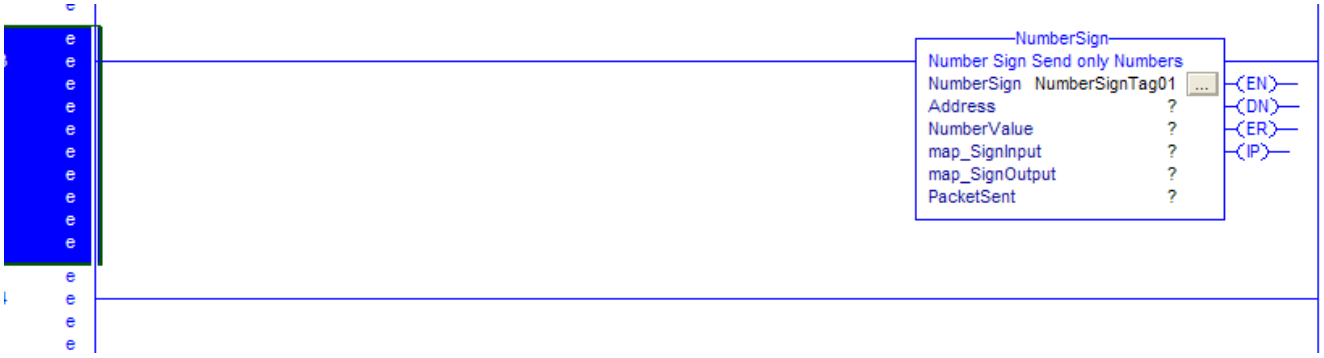


5.2 Creating Unique Tags for AOI

Under the AOI "Tag" parameter, begin to type a desired tag name.

Best Practice here might be to name the tag with the sign address. In this case, the default sign address is "01". NumberSignTag01 might be an example.

Be sure you scope your tag properly.

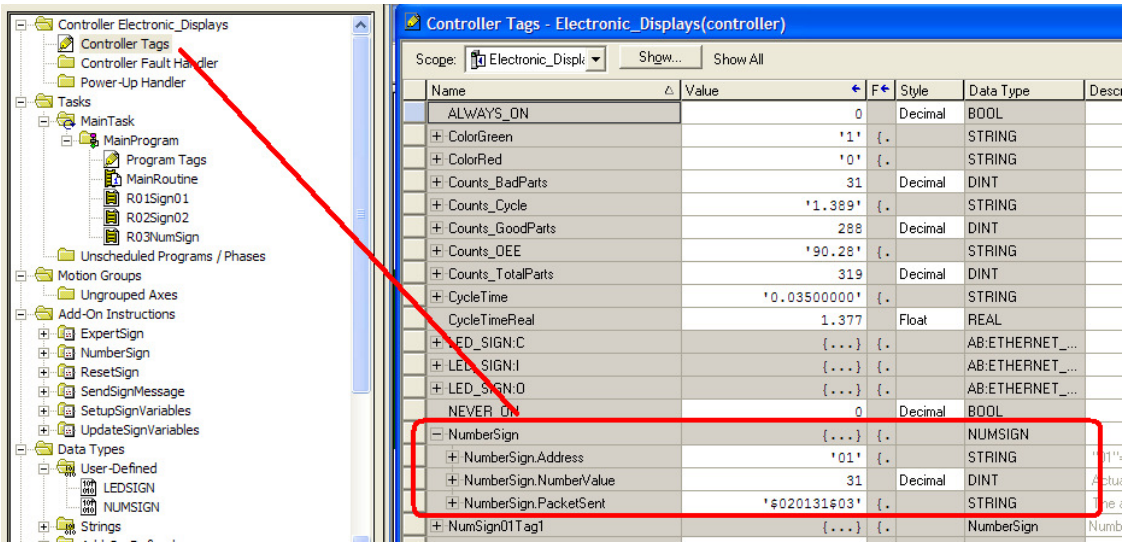


5.3 Creating Unique Tags for Sign Parameters

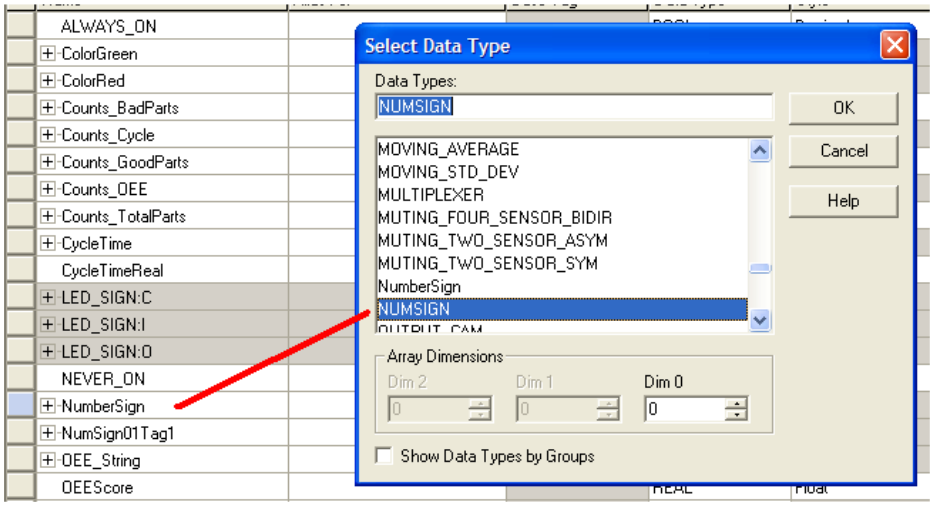
Each sign, needs a "parameter" file which it retrieves all information and settings from the PLC to the sign.

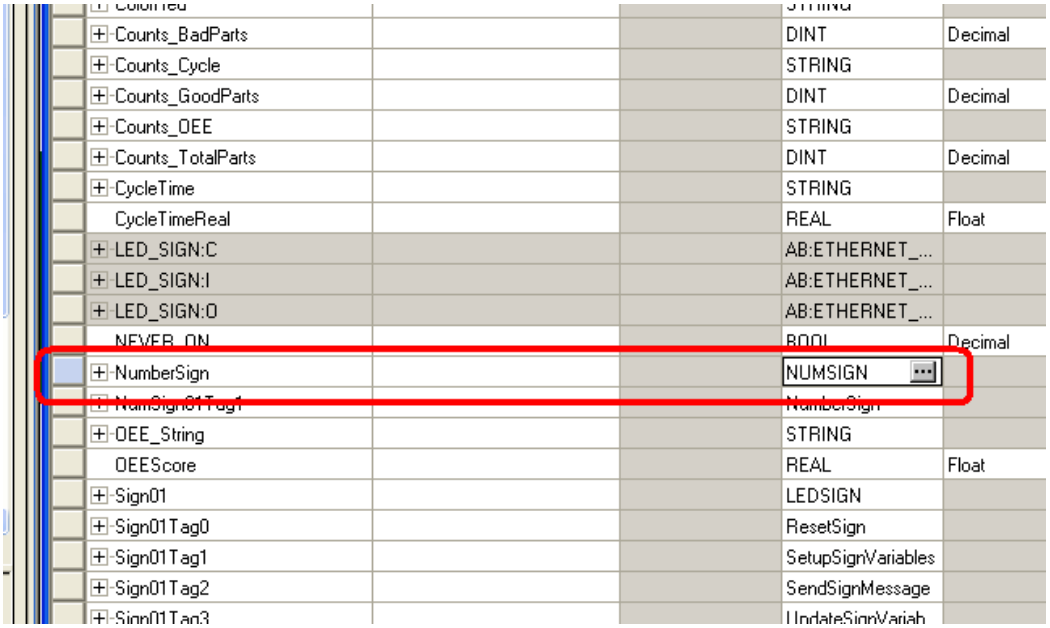
Best practice would be to create a tag with the name of your sign.

Choose NUMSIGN as the Data Type.



Map the DATA TYPE of your "Sign" tag to the NUMSIGN data type.
(This data type was imported earlier)





5.4 Setting up the Sign Tag

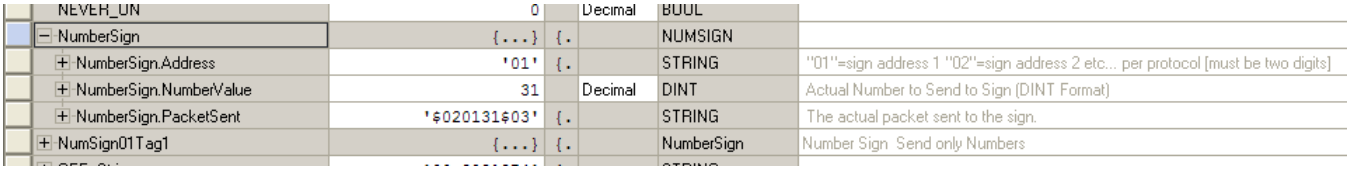
Sign tag will now need parameter information filled out.

Click the ▪▪▪ ICON to begin filling in initial information.

Use the description column for "help".

Several of the parameters have "defaults" that can be used.

Hover mouse over description column to see details.

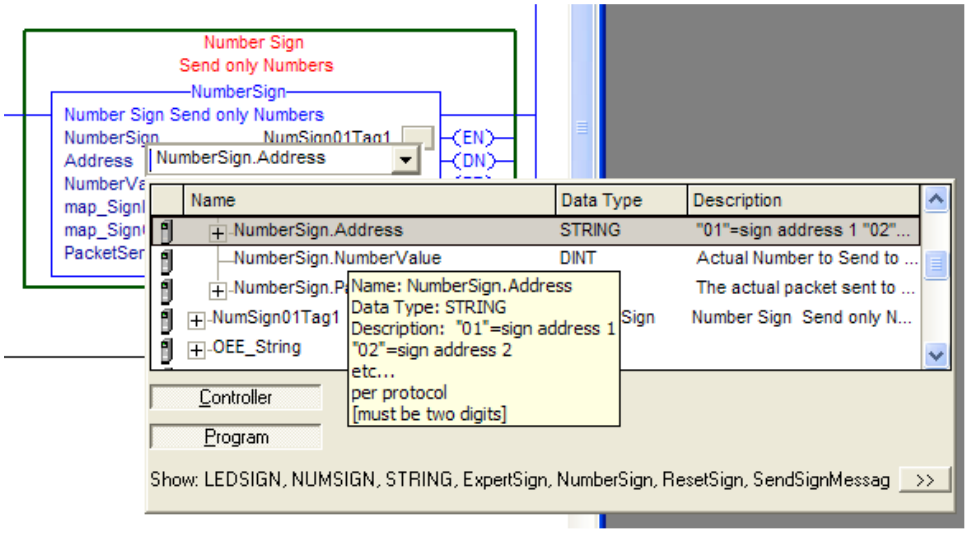


5.5 Mapping Sign Tag to AOI Function Block in Ladder Logic

Begin mapping all the sign tags to the fields in the AOI function blocks.

Sign tag parameters are word for word matched.

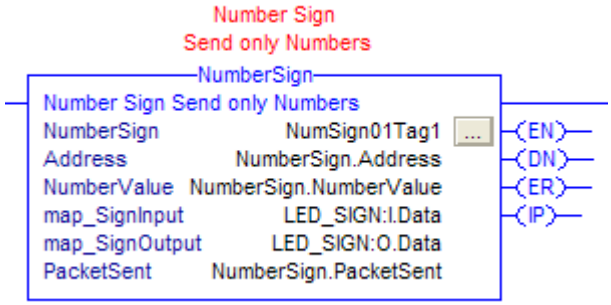
Map all parameters.



6 ELECTRONIC DISPLAY AOI INSTRUCTIONS

6.1 Number Sign Message AOI

Instruction used to send numbers to sign. (see video tutorials)



Operand	Type	Description
NumberSign	Tag	Unique Tag
Address	String	Two character sign address "00"
NumberValue	DINT	Value of Number to Send to Sign
map_SignInput	I:Data	Ethernet/IP Input Data Mapping
map_SignOutput	O:Data	Ethernet/IP Output Data Mapping
PacketSent	String	82 Length String Debug of Packet
EN	Bool	Instruction is enabled
DN	Bool	Instruction is done sending message
IP	Bool	Instruction is in progress sending
ER	Bool	Instruction failed to send message