

**EAGLE  
USER'S  
MANUAL**



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## Manual Revisions

If you contact us in reference to this manual, please include the following name and revision number

**Name:** Eagle User's Manual

**Revision:** UMAN\EAGLE\0204\Rev0

We hope that you find this manual informative. If additional information or technical assistance is needed please contact:



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## Introduction

In this chapter. . .

- Purpose of this Manual
- Introduction to Eagle
- Eagle Configuration
- Eagle Applications
- Eagle Specifications

## 1.1 Purpose of this Manual

The intention of this Operation Manual is to provide a guide for Safe installation, Configuration and operation of Eagle. This manual is applicable for general purpose Eagle (Part Eagle-XXXX) units. **Functionality of all the Eagle models is same.**

Read this operation manual thoroughly before installing and operating Eagle.

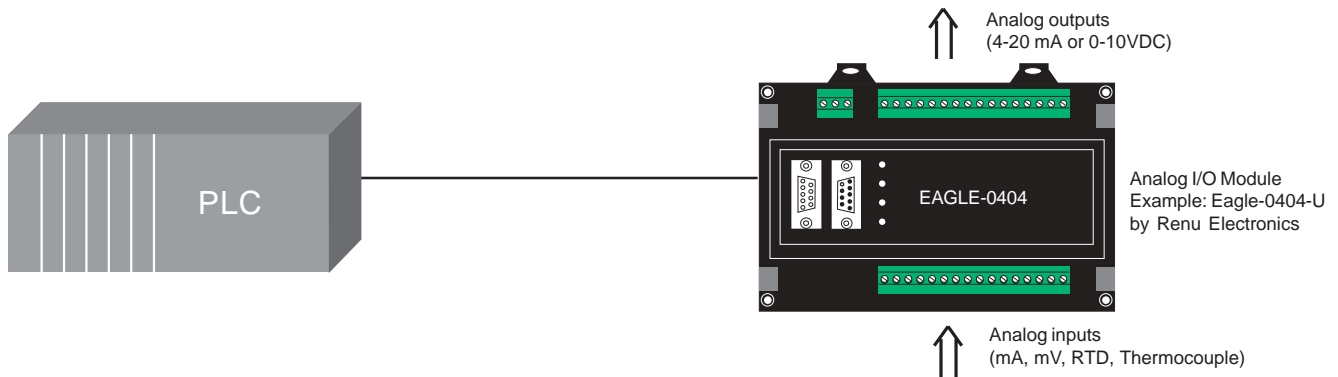
This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information in this document may not cover all the details or variations in hardware or software. Features described herein may not be present in all hardwares. Renu Electronics reserves the right to update information in this publication without prior notice.

## 1.2 Introduction to Eagle

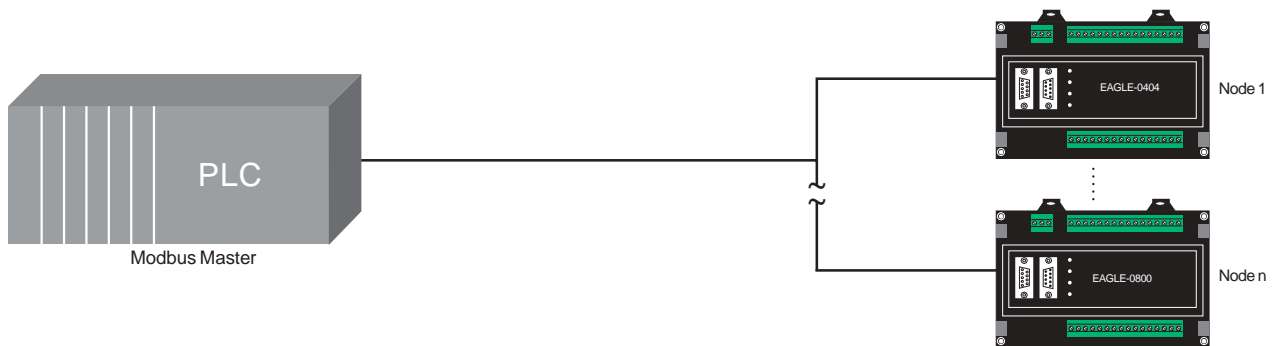
Eagle is an Industrial Analog I / O series. It accepts Universal Analog Input (e.g. Thermocouples, RTDs, mA, mV) and provides Analog Outputs (4 to 20 mA or 0 to 10 V DC). Eagle can be connected to the programming port of PLC and SCADA Applications.

## 1.3 Eagle Configuration

Each Eagle has to be configured using Windows based configuration Software before connecting it to the PLC.



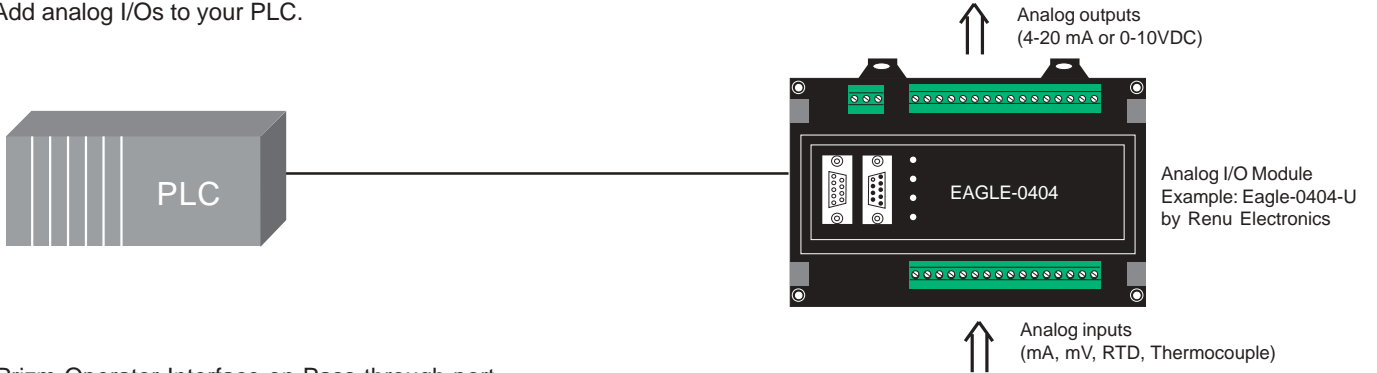
Multiple Eagle units (Modbus Slaves) connected to one PLC



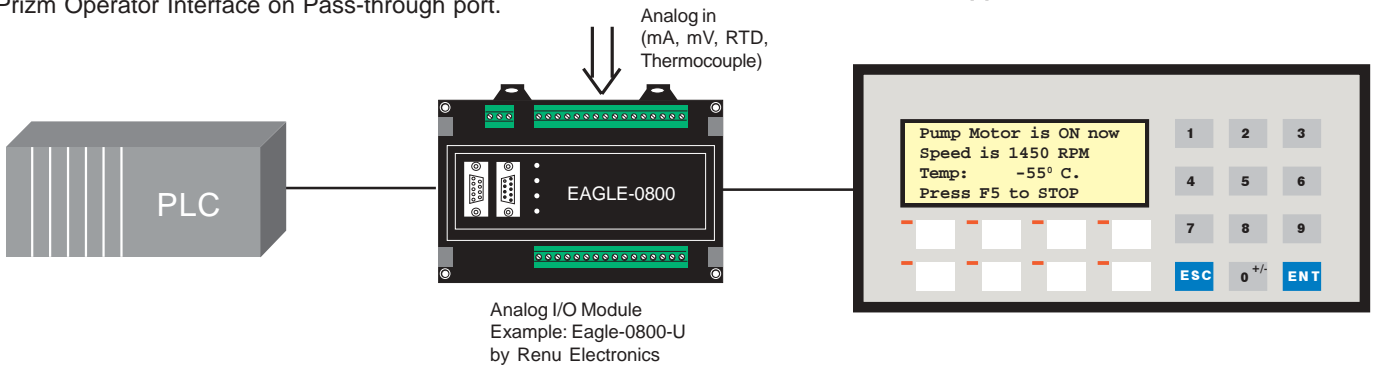
## 1.4 Eagle Applications

Our users have used Eagle units in various different applications across many industries. The typical configurations include the followings:

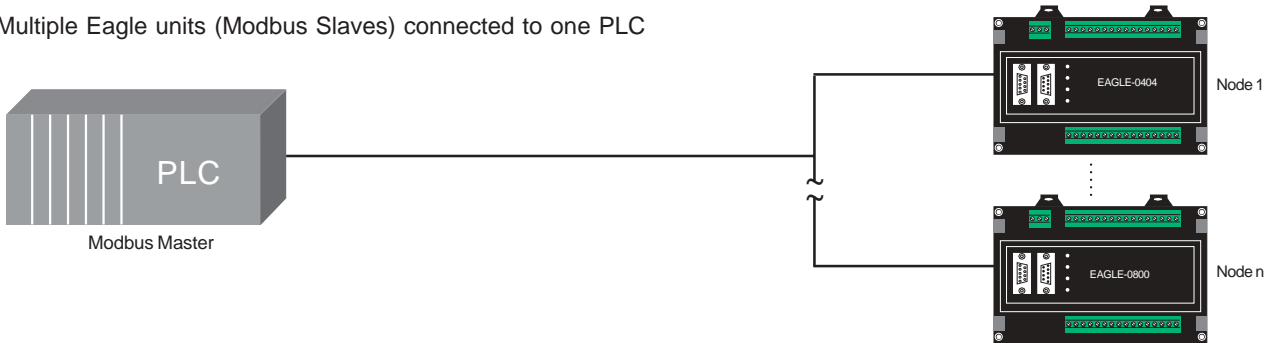
1. Add analog I/Os to your PLC.



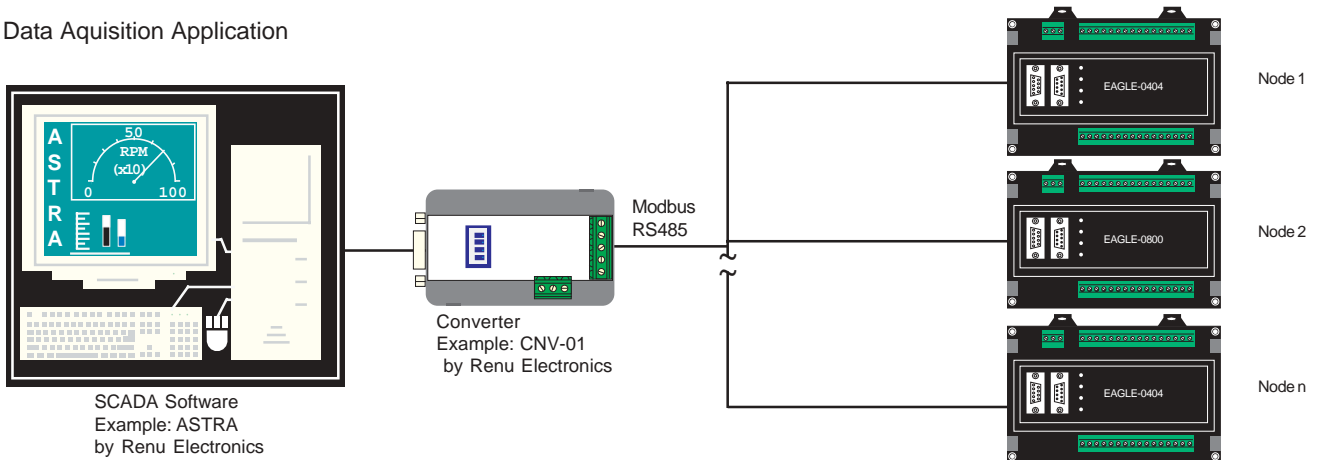
2. Prizm Operator Interface on Pass-through port.



3. Multiple Eagle units (Modbus Slaves) connected to one PLC



4. Data Acquisition Application





## 1.5 Eagle Specifications

For Voltage inputs:

Uses 0-100 mV input range resolved in 12 bit.

For higher input ranges, use externally calibrated shunt.

Total error:  $\pm 0.1\%$  of scale  $\pm 1$  bit.

For Current inputs:

Uses 0-20mA input range with 5W precision shunt resolved in 12 bit. Total error:  $\pm 0.1\%$  of scale  $\pm 1$  bit.

For RTD input:

Uses 3 wire compensation technique. Current sense is 0.5mA.

Power dissipated in RTD is 0.025mW @ 100W.

Range supported: -200 to 850°C.

For Thermocouple Input:

Uses 0-100mV input range resolved in to 12 bits for positive input and resolved in 11 bits for negative inputs.

Cold junction error is 1° maximum and 0.5° typical.

Total error:  $\pm 0.5\%$  of scale  $\pm 1$  bit + CJC error

Input Type	Temperature Range	1 Bit Corresponds to
J	-210 to 770°C	0.43°C
K	-200 to 1373°C	0.61°C
E	-200 to 1000°C	0.32°C
R	-50 to 1769°C	2.04°C
S	-50 to 1769°C	2.31°C
B	0 to 1820°C	3.21°C
N	-200 to 1300°C	0.7°C
T	-200 to 400°C	0.47°C

For outputs:

(Supported outputs are mA and Volts)

mA range: 4-20mA resolved in 12 bits.

Max load impedance: upto 500  $\Omega$

Voltage Range:0-10VDC resolved in 12 bits

Min load impedance: 400 W

## 1.6 General Specifications

Power : +24 V DC +5%, 3.5 W maximum

Operating Temperature : 0° to 50°C

Storage Temperature : -20° to 80°C

Humidity : 10% to 90% (Non condensing)

Mounting : DIN rail or back panel mounting

Dimensions :

Eagle-0404, Eagle-0800 : 155mm X 102mm X 48mm

Eagle-0201 : 94mm X 42mm X 47mm

Immunity to ESD : 8 kV air, 6kV contact as per IEC 61000-4-2

Transient Immunity : 2kV as per IEC 61000-4-4

Radiated Immunity : 10V/meter as per IEC 61000-4-3

Emissions : EN55011 CISPR A

Isolation : Analog section from digital.

: No isolation between channels.

IBM Port : Connects to PC for application download or operator interface for Pass-through.

PLC Port : Connects to PLC.

Response time : Depends on driver. Typical 25 mSec / Channel

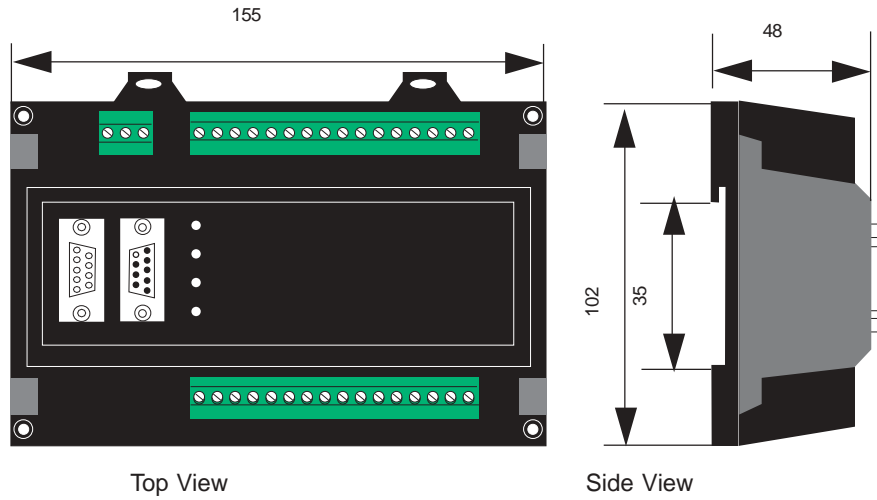
## Hardware

In this chapter. . .

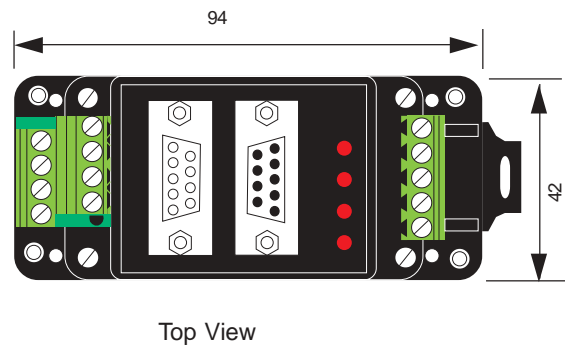
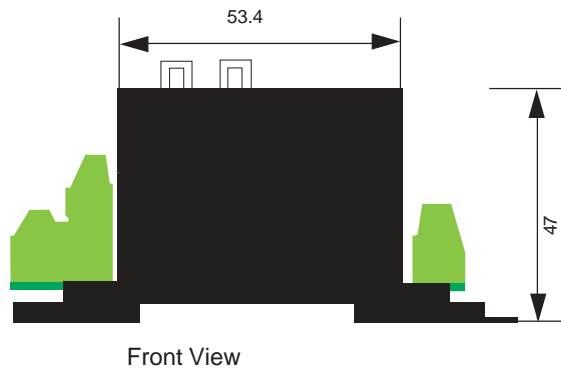
- Dimensional Details and Mounting Instructions
  - Power Requirements
  - Communication
-

## 2.1 Dimensional Instructions

All dimensions are in mm.  
For Eagle-0800 and Eagle-0404



Eagle-0201





## 2.2 Power Requirements

Eagle units operate on 24V DC external supply. Power should be applied to the PCB Terminal block on the Eagle unit. Power rating is +24VDC  $\pm$  5%, 125mA max. Please follow the instructions given below while making power supply connections:

Follow the sticker wiring diagram on the unit which shows terminals for the positive DC, negative DC and EARTH.

To make a connection strip about 1/4" (6mm) of insulation of the wire and turn the connector screw counter-clock wise until the gap is wide open. Insert the wire all the way in and turn the screw clockwise until it is tight.

Wire lengths should be minimum. Wires should run in pairs with a neutral or common paired with a live or signal wire.

Eagle products are housed in a molded ABS plastic case which eliminates any electrical shock hazard. Hence safety ground is not required to be connected to the chassis of the unit.



The DC ground is not directly coupled to Earth ground internally. The unit is designed to operate properly whether the DC ground is connected to the Earth ground or not. We do recommend, however, that if the DC ground has to be connected to the Earth ground, the Earth connection should be made to a central star point as poor site earths can introduce noise into a system.



Do not power Eagle and inductive loads with the same power supply even though there is enough immunity in the Eagle to withstand the transients present on these lines. Avoid using power supplies with large capacitive outputs, which may cause problems if power is cycled within a short time period. If wiring is to be exposed to lightening or surges, use appropriate surge suppression devices.



Keep AC, high energy and rapidly switching DC wiring separate from signal wires.



Connecting high voltages or AC power mains to the DC input will make Eagle unusable and may create an electrical shock hazard to personnel. Such a failure or shock could result in serious personal injury, loss of life and/or equipment damage. DC voltage sources should provide proper isolation from main AC power and similar hazards.



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## Getting Started

In this chapter. . .

- Eagle Operation - Configuration and Communication



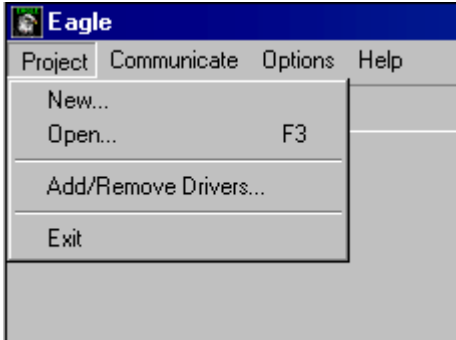
### 3.1 Eagle Operation - Configuration and Communication

Install the Eagle Setup Software from the installable device (CD).

It will add the icon in your program manager as Eagle.

Quick start for setup for Eagle & input parameters alongwith downloading ranges, LED indications & status word meanings are as mentioned below:

Select *Project / New...* from the Eagle Setup Software



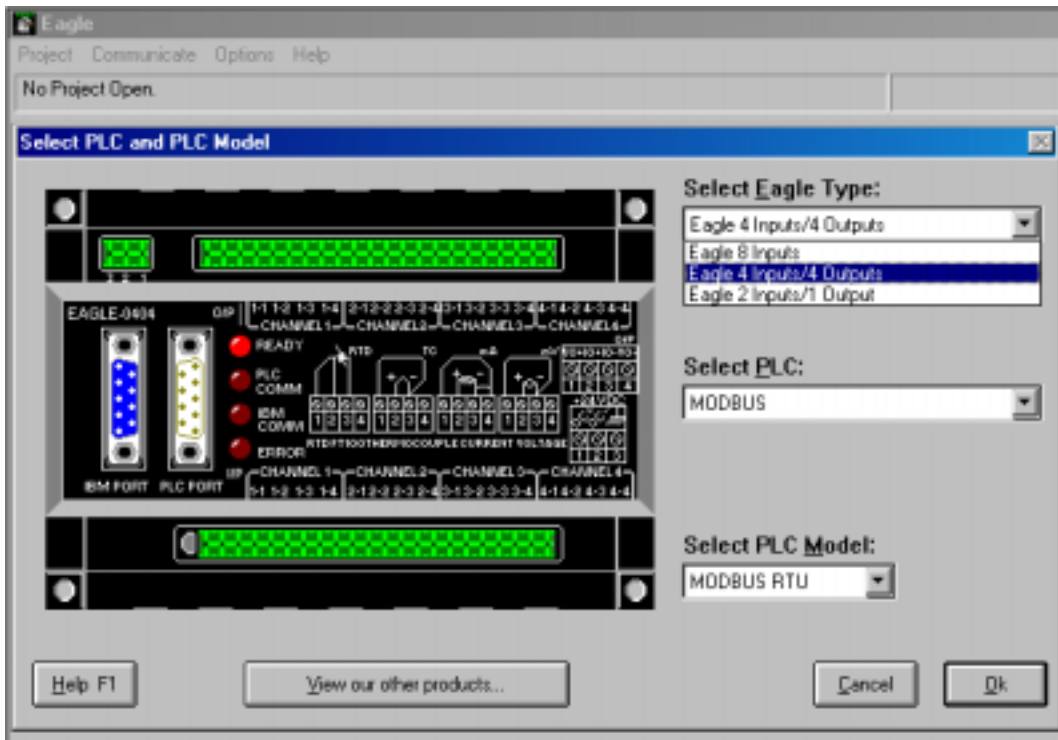
Select the Eagle Model:

**EAGLE-0800:** 8 Universal Inputs ,no Outputs.

**EAGLE-0404:** 4 Universal Inputs, 4 Analog Outputs.

**EAGLE-0201:** 2 Universal Inputs, 1 Analog Output.

Select the *PLC and PLC Model:* Select the PLC Model for which Eagle Unit is to be connected.





Select *Edit | Channel Info...* to configure the channels.

**Eagle**

Project Edit Communicate Options Help

C:\EAGI Channel Info... F5

Setup... F6

**Channel Configuration**

Channel No.: I/P Channel 1 Channel Type: Not configured Normalizing Factor: ( 00 to 99 ) 0

Higher settings provide more averaging for more stable display. Derived from the equation  $(old\ data * nf + new\ data) / (nf + 1)$

Outputs 1 2 3 4

EAGLE-0404

O/P CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4

READY PLC COMM IBM COMM ERROR

RTD TC mA mV

RTD PT100 THERMOCOUPLE CURRENT VOLTAGE

IBM PORT PLC PORT I/P CHANNEL 1 CHANNEL 2 CHANNEL 3 CHANNEL 4

1-1 1-2 1-3 1-4 2-1 2-2 2-3 2-4 3-1 3-2 3-3 3-4 4-1 4-2 4-3 4-4

Inputs 1 2 3 4

Help F1 Click RIGHT mouse button on any channel to see connection and other information.

Accept Changes Cancel Ok



---

## EAGLE-0800:

In case of 8 analog inputs:

Select the Channel No. ( 1 to 8 ) from the Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.

Input types and sub-types supported are:

Thermocouples:

- Thermocouple B type,
- Thermocouple R type,
- Thermocouple S type,
- Thermocouple E type,
- Thermocouple J type,
- Thermocouple K type,
- Thermocouple N type,
- Thermocouple T type.

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100(3 wires supported)

Temperature Coefficient 1 ( 0.00385 ),

Temperature Coefficient 2 ( 0.00392 ).

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA ( milli Ampere ),

0 - 20 mA ( Linear and 16 point Non-Linear ),

4 - 20 mA ( Linear and 16 point Non-Linear ).

\* Internal shunt of 5 ohm is assembled.

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV ( milli Volts ).

0 - 100 mV ( Linear and 16 point Non-Linear ),

0- 50 mV ( Linear and 16 point Non-Linear ).

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input. (m in the PLC / Host device Minimum, intermediate and maximum is preferred)

When you select, Non-linear, you must enter atleast 3 sets of input and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

Once you have configured the channels, Press Accept Changes button

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## EAGLE-0404:

In case of 4 analog inputs, 4 analog outputs:

Select the Channel No. ( 1 to 4 i/p or 1 to 4 o/p ) from Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.

Inputs types and sub-types supported:

Thermocouples:

Thermocouple B type,  
Thermocouple R type,  
Thermocouple S type,  
Thermocouple E type,  
Thermocouple J type,  
Thermocouple K type,  
Thermocouple N type,  
Thermocouple T type.

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100(3 wires supported)

Temperature Coefficient 1 ( 0.00385 ),  
Temperature Coefficient 2 ( 0.00392 ).

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA ( milli Ampere ),

0 - 20 mA ( Linear and 16 point Non-Linear ),  
4 - 20 mA ( Linear and 16 point Non-Linear ).

\* Internal shunt of 5 ohm is assembled.

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV ( milli Volts ).

0 - 100 mV ( Linear and 16 point Non-Linear ),  
0- 50 mV ( Linear and 16 point Non-Linear ).

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

When you select, Non-linear, you must enter atleast 3 sets of input and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

Outputs:

4 - 20 mA: Sourcing current output @ 500 ohm max. load impedance  
0 to 10 V DC ( Linear output): Minimum load impedance 400 ohm.

Once you have configured the channels, Press Accept Changes button

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## EAGLE-0201:

In case of 2 Inputs analog, 1 analog Outputs:

Select the Channel No. ( 1 to 2 Input or Single Output ) from Channel number list.

Select the Channel Type from the Type list:

Default for the channel is Not configured.

Inputs types and sub-types supported:

Thermocouples:

- Thermocouple B type,
- Thermocouple R type,
- Thermocouple S type,
- Thermocouple E type,
- Thermocouple J type,
- Thermocouple K type,
- Thermocouple N type,
- Thermocouple T type.

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for thermocouples in the PLC / Host device.

RTD:PT-100(3 wires supported)

- Temperature Coefficient 1 ( 0.00385 ),
- Temperature Coefficient 2 ( 0.00392 ).

\* Eagle will download degree centigrade multiplied by 10 according to NBS polynomials for RTD in the PLC / Host device.

mA ( milli Ampere ),

- 0 - 20 mA ( Linear and 16 point Non-Linear ),
- 4 - 20 mA ( Linear and 16 point Non-Linear ).

\* Internal shunt of 5 ohm is assembled.

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

mV ( milli Volts ).

- 0 - 100 mV ( Linear and 16 point Non-Linear ),
- 0- 50 mV ( Linear and 16 point Non-Linear ).

\* Eagle will download the 12 bit count in case of linear input & engineering value in case of nonlinear input.

When you select, Non-linear, you must enter atleast 3 sets of input and engineering values. The input range is dependant on the mA or mV type and the engineering value is from -3276.0 to 3276.0.

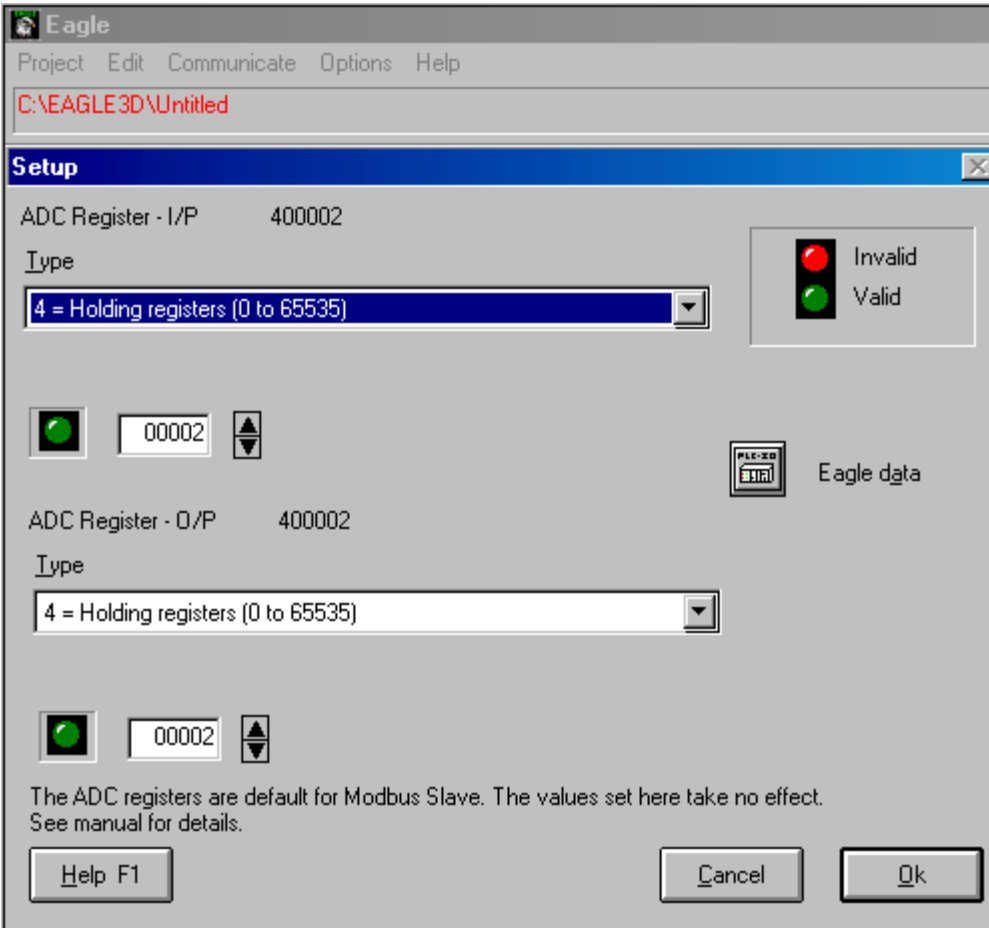
Outputs:

- 4 - 20 mA: Sinkining current output @ 750 ohm max. load impedance

Once you have configured the channels, Press Accept Changes button

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Select Edit Setup for configuration of PLC registers.



**ADC Register- I/P:**

This is the register where the information for the first input channel will be stored in the PLC. The following seven registers will have the data for the other seven channels and ninth register will store the STATUS WORD information of input channels.

**ADC Register- O/P:**

For Eagle 0404 and Eagle 0201, this is the register where the information for the first O/P channel will be stored in the PLC. The following three registers will have the data for the other three O/P channels.



### Eagle Data:

After Clicking this button you will see the following window. This is applicable for certain PLC's only. (e.g. MODBUS RTU)

**PLC Data**

Station ID  00 - 31

Level/Baud (0,1,2,3)  0 - 3

Parity - N/A  00 - 00

For Modbus Slave the parity is set by default to ODD. Level/Baud:

0 = 232/9600  
1 = 485/9600  
2 = 232/19200  
3 = 485/19200.

Station ID: In case of multiple units connected on the same network, this field defines unit address for the specific unit.

Level/Baud: There are four combinations for this field according to communication protocol (RS232 / RS485) and communication baud rate.

Select Project | Save... to save the project.

After making project file on setup, connect 24V DC@ 3 W regulated power supply to unit connect IBM Cable on the IBM port of Eagle and the PLC cable on PLC port of Eagle.

Select Communicate | Project will be downloaded to the Eagle.

Eagle will start communicating with the PLC.

Select Project | Save... to save the project.

## How to Order

In this chapter. . .

- How to Order
  - PLC's Supported by Eagle
  - Suitable Cables
-



## 4.0 How to Order

Model	Inputs	Outputs	Ordering Part Number	Listing
Eagle 0201	2 Universal	1 Analog (4-20 mA)	Eagle0201-12-U	CE / CSA
Eagle 0404	4 Universal	4 Analog (4-20 mA / 0-10 V DC)	Eagle0404-12-U	CE / CSA
Eagle 0800	8 Universal	0	Eagle0800-12-U	CE / CSA
Eagle 1600*	16 Linear	0	Eagle1600-12-L	CE / CSA
Eagle 0008*	0	8 Analog (4-20 mA / 0-10 V DC)	Eagle0008-12-U	CE / CSA

More models are being added. We also make custom models

\* Contact factory for details.

## 4.1 PLC's Supported and suitable cables

PLC	COM Port	Cable Part Numbers		Pass-through Support
		Eagle0404, Eagle0800	Eagle0201	
AB Micrologix	RS232	SC-E-027A-00	SC-E-027A-00	✓
AB SLC 500 (DF1 and DH485)	RS485	SC-E-007-00	-	Network
Aromat FP0 Series	RS232	SC-E-015A-00	SC-E-015A-00	✓
Aromat FP1	RS485	SC-E-015B-00	SC-E-015B-00-S1	✓
Delta DVP Series	RS232	SC-E-044-00	SC-E-044-00	✓
Fuji NBO	RS485	SC-E-028-00	SC-E-028-00-S1	✗
GE Series 90-30 (SNP)	RS485	SC-E-002-00	SC-E-002-00-S1	✓
GE VersaMax, RJ45	RS232	SC-E-002A-00	SC-E-002A-00	✓
GE VersaMax, DB9	RS232	SC-E-002B-00	SC-E-002B-00	✓
IDEC Micro <sup>3</sup>	RS232	SC-E-025A-00	SC-E-025A-00	✓
IDEC Microsmart	RS232	SC-E-025B-00	SC-E-025B-00	✓
Keyence KV Series	RS232	SC-E-018-00	SC-E-018-00	✓
Koyo DL205	RS232	SC-E-005-00	SC-E-005-00	✗
LG-Master K Series	RS232	SC-E-037-00	SC-E-037-00	✗
Mitsubishi FX0	RS485	SC-E-008A-00	SC-E-008A-00-S1	✓
Modbus Slave	RS232/RS485*	User Supplied	User Supplied	Multidropping
Omron (Host Link) - 9 pin	RS232	SC-E-006B-00	SC-E-006B-00	✓
Omron (Host Link) - 25 pin	RS232	SC-E-006C-00	SC-E-006C-00	✓
Siemens S7-200 / Micro	RS485	SC-E-029-00	SC-E-029-00-S1	✓
Telemecanique TSX07/37	RS485	SC-E-026A-00	SC-E-026A-00-S1	Network
Telemecanique TSX17	RS485	SC-E-017A-00	SC-E-017A-00-S1	✗
Toshiba T1	RS232	SC-E-019A-00	SC-E-019A-00	✓
Toshiba T2	RS232	SC-E-019B-00	SC-E-019B-00	✓

\* Software Selectable

**New PLC drivers are constantly added. Please contact factory for more information. We welcome an opportunity to develop new drivers.**



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## **Installation and Wiring**

In this chapter. . .

- Hardware Installation
- Connector Details

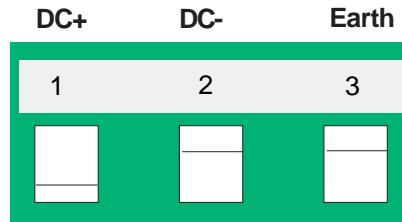


## 5.0 Hardware Installation



Use separate 24V DC./ 500mA regulated power supply for Eagle unit. Using common supply for the unit as well as i/p sensors (if any) may damage the i/p channel of the unit.

Before connecting 24V DC supply, check the positive and negative polarity as shown on the unit.



Power ON the unit. 'READY' LED will be ON . Refer Troubleshooting Guide for different LED Indications. Connect PLC cable between PLC PORT of Eagle and the PLC. This is dedicated cable for particular PLC and is supplied along with the unit.

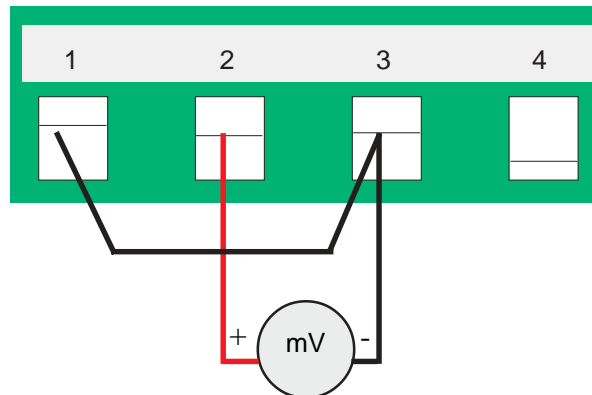
Refer Cable Part number list for more details. (Chapter No.4.1)

Power ON the PLC. If the driver for respective PLC is already downloaded in the unit, then Eagle will start communicating with the PLC. Then download the channel configuration as per the application through Eagle setup s/w.(PLC driver will be downloaded alongwith the channel configuration)(Refer Chapter No. for unit configuration)

Make connections to the required Input and/or Output channels as per the configuration downloaded.

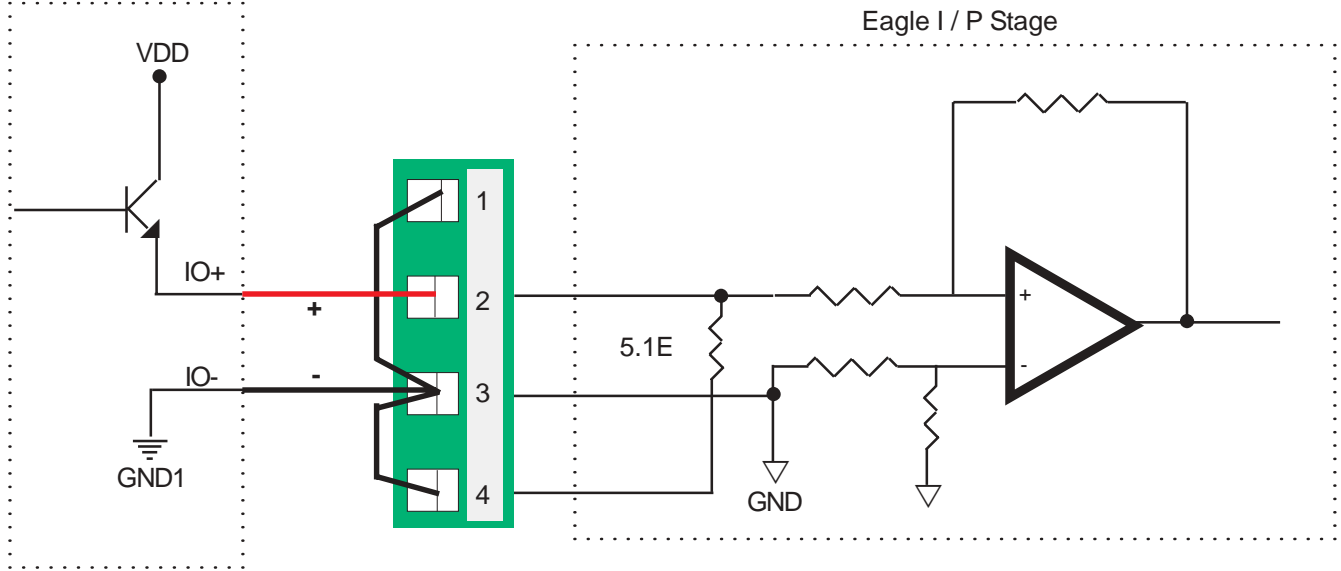
Connections for different types of I / Os are shown on the unit and are as follows-

For Voltage Input (0-50mV or 0-100mV)

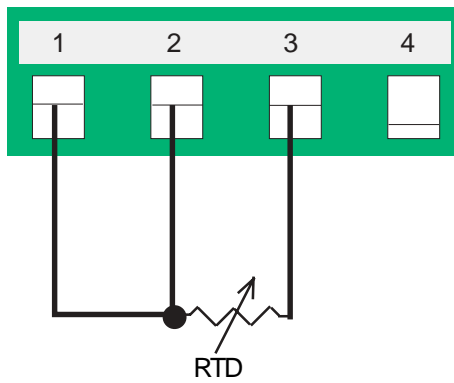


### For Current Input (0-20mA or 4-20 mA)

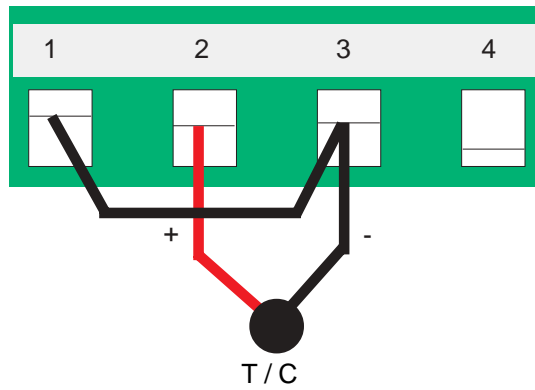
O / P Stage of external  
Current Source (0-20mA or 4-20 mA)



### For RTD Input

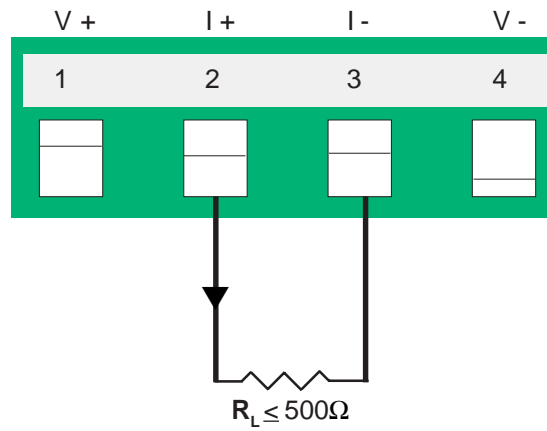


**For Thermocouple Input**

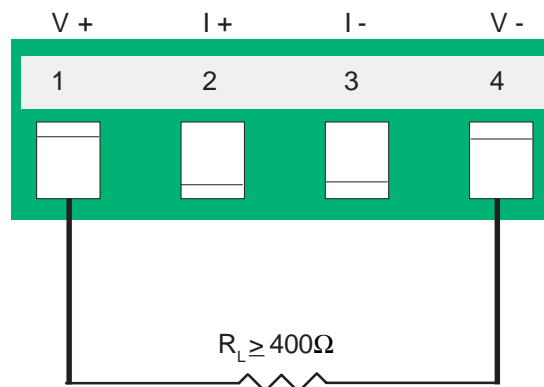


**Output Connections:**

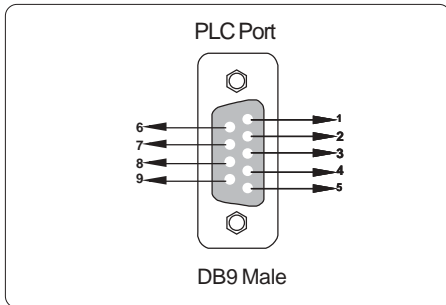
Current Output (4-20 mA): Maximum load variation for stable current output is 0-500 ohm.



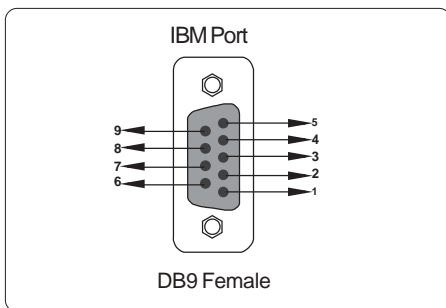
Voltage Output (0-10 V DC): Minimum load requirement for voltage o/p is 270 ohm.



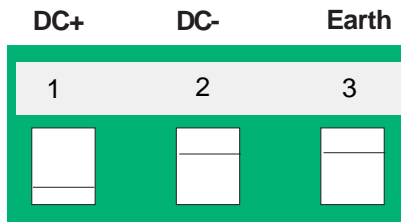
## 5.1 Connector Details



PIN #	Signal Name	Signal Description
1	TX+	RS-485 transmit positive
2	RX+	RS-485 receive positive
3	TXD	RS-232 transmit line
4	NC	NC
5	GND	GND
6	TX-	RS-485 transmit negative
7	RX-	RS-485 receive negative
8	RXD	RS-232 receive line
9	NC	NC



PIN #	Signal Name	Signal Description
1	NC	NC
2	TXD	RS-232 Transmit
3	RXD	RS-232 Receive
4	NC	NC
5	GND	GND
6	NC	NC
7	NC	NC
8	NC	NC
9	GND	GND



PIN #	Signal Description
1	DC+ (+24 V DC, $\pm 10\%$ )
2	DC- (GND)
3	Earth



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## Modbus Configuration

In this chapter. . .

- Eagle as Modbus RTU Slave





## 6.0 Modbus RTU Slave Eagle

In the MODBUS SLAVE configuration, Eagle supports following commands.

### “03” READ HOLDING REGISTERS

Command and response format for this command is as follows.

Command from Master:		Response from Slave (EAGLE)	
Field	Example ( Hex )	Field	Example ( Hex )
Slave address	01	Slave address	01
Function	03	Function	03
Start address (High)	00	Byte Count	02
Start address (Low)	64	Data for channel (1)(High)	XX
No.of words (High)	00	Data for channel (1)(Low)	XX
No.of words (Low)	01	CRC (Low)	
CRC (Low)	XX	CRC (High)	
CRC (High)	XX		

\*\* Master can send this command with the address 000A Hex to read the continuous channel data e.g. if the Master sends 03 command with starting address 000A Hex and No.of words 08H, Eagle will send data of all eight input channels to the Master.

### “06” Preset Single Holding Registers

Command and response format for this command is as follows.

Command from Master:		Response from Eagle (Slave)	
Field	Example ( Hex )	Field	Example ( Hex )
Slave address	01	Slave address	01
Function	06	Function	06
Register address (High)	00	Register address (High)	00
Register address (Low)	64	Register address (Low)	64
Preset Data (High)	00	Preset Data (High)	00
Preset Data (low)	01	Preset Data (Low)	01
CRC (Low)	XX	CRC (Low)	XX
CRC (High)	XX	CRC (High)	XX



**“16 (10 Hex)” Preset Multiple Holding Registers**

<b>Command from Master</b>		<b>Response from Eagle (Slave):</b>	
<b>Field</b>	<b>Example ( Hex )</b>	<b>Field</b>	<b>Example ( Hex )</b>
Slave address	01	Slave address	01
Function	10	Function	10
Start address (High)	07	Start address (High)	07
Start address (Low)	D1	Start address (Low)	D1
No.of words (High)	00	No.of words (High)	00
No.of words (Low)	02	No. of words (Low)	02
Byte Count	04	CRC (Low)	XX
Data for channel 1(High)	xx	CRC (High)	XX
Data for channel 1(Low)	xx		
Data for channel 2(High)	xx		
Data for channel 2(Low)	xx		
CRC Hi	xx		
CRC Lo	xx		

Eagle uses following Holding registers for storing channel data.

<b>Inputs</b>		<b>Outputs</b>	
<b>Base Address</b>	<b>Channel No.</b>	<b>Base Address</b>	<b>Channel No.</b>
400100	1	402001	1
400300	2	402003	2
400500	3	402005	3
400700	4	402007	4
400900	5	402009	5
401100	6	402011	6
401300	7	402013	7
401500	8	402015	8
400010	For continuous channel data.		



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## FAQs

In this chapter. . .

- Frequently asked Questions for Eagle





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## 7.0 Frequently asked questions for Eagle

### **Q. What are the different types of Analog inputs and outputs Eagle series supports?**

Ans. Eagle series supports four types of Analog inputs and two types of Analog outputs.

They are:

Analog input types:

- a) 0 to 20 mA (linear and non-linear)
- b) 4 to 20 mA (linear and non-linear)
- c) 0 to 50 mV (linear and non-linear)
- d) 0 to 100 mV (linear and non-linear)
- e) RTD's (Alpha 1, Alpha 2)
- f) Thermocouples (J, K, E, R, S, B, N, T)

Analog output types:

- a) 4 to 20 mA
- b) 0 to 10 VDC

### **Q. How Analog input / output channels are mapped with the PLC Register?**

Ans. For Input Channels, one of the PLC Data Registers should be assigned as Input ADC Register where the information for the first channel will be stored in the PLC. The following registers will have the data for the other input channels and one more following register will store the STATUS WORD information of input channels. Similar concept is used for output register also.

### **Q. What are the ranges for digital values downloaded in the PLC input ADC Register?**

Ans. Different ranges based on the Analog inputs are as mentioned below:

- a) Milli Volts (0-100mV or 0-50 mV): 0 to 4095 decimal
- b) Milli Amperes (0-20mA or 4-20 mA): 0 to 4095 decimal
- c) Thermocouples & RTD's: Actual field values in degree centigrade multiplied by 10 in range of used Thermocouple and RTD type (as per NBS Standard Polynomials).

In case of non-linear inputs, Eagle will download the engineering value enter by user multiplied by 10 into the PLC.

### **Q. Can I have combinations of different types of inputs?**

Ans. Yes, you can. All the input channels of Eagle are user configurable and any combination of input types is possible. You can define different channels to Analog inputs like RTD, Thermocouple, mA and mV. All these inputs can be connected to Eagle at a time.

### **Q. Can I connect multiple Eagles to HMI Software / SCADA?**

Ans. Yes, you can. Up to 32 Eagle units can be connected on RS 485 Modbus network. Define Eagle units as Modbus RTU Slaves. Each Eagle unit will have unique slave ID. HMI Software / SCADA will be Modbus Master. In such applications Eagle units are connected on RS 485 multidrop mode for fast response.

### **Q. Can I connect Eagle on RS 485 Modbus network with other field devices?**

Ans. Yes, You can. Eagles will be connected in the RS 485 network as Modbus slaves with other field devices such as Energy Meters, Temp. Controllers, Operator Panels etc.

### **Q. Can I connect multiple Eagles to Devices or PLC's that do not support Modbus? How?**

Ans. Yes, you can.

In such applications REPL make Gateway (Protocol Converter) unit is used. Gateway has 2 communication ports that support RS 232 or RS 485. Gateway will convert PLCs' protocol to Modbus. One port of Gateway will be connected to PLC or non-Modbus device and other port will be Modbus Master. Multiple Eagles can be connected to Modbus Master port as Modbus slaves.

### **Q. Is it possible to connect two devices, Eagle and Prizm Operator Panel on the same port of the PLC?**

Ans. Yes, it is possible. Connect Eagle to the programming port of the PLC and Operator Interface to the IBM port of Eagle (Slave Port). You can read / write / edit all the PLC registers and coils including Eagle channels by Prizm Operator Interface using Eagle pass through port.

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**Q. Can I connect two different models of Eagles in the same network?**

Ans. Yes, you can.

**Q. What is the default Modbus ADC addresses when Eagle is defined as Modbus Slave?**

Ans. Modbus addresses for Input Channels are:

Input channel 1: 400101 or 400011  
Input channel 2: 400301 or 400012  
Input channel 3: 400501 or 400013  
Input channel 4: 400701 or 400014  
Input channel 5: 400901 or 400015  
Input channel 6: 401101 or 400016  
Input channel 7: 401301 or 400017  
Input channel 8: 401501 or 400018  
Status Register: 401701 or 400019

Modbus address for Output Channels are:

Output Channel 1: 402002  
Output Channel 2: 402004  
Output Channel 3: 402006  
Output Channel 4: 402008

**Q. Can I set the Baud rate and RS232 / RS485 communication levels in the Eagle setup software when defining Eagle as Modbus slave? How?**

Ans. Yes, you can.

Select Eagle data button in the EDIT/ Setup menu. Set Level / baud between range of 0 to 3, where:

0 means RS232 Level and 9600-baud rate  
1 means RS485 Level and 9600-baud rate  
2 means RS232 Level and 19200 baud rate  
3 means RS485 Level and 19200 baud rate

**Q. What is the response time of Eagle?**

Ans. All the channels of Eagle unit are scanned in 200 mSec. However, the overall response time depends on the level of communication and protocol used.

**Q. How Eagle unit is calibrated?**

Ans. Eagle unit is factory Calibrated. Special Calibration software and universal Calibrator is used to calibrate Eagle unit. Universal Calibrator is certified and traceable to the Standard Calibration Organization.

**Q. What are the different applications where Eagle units can be used?**

Ans. Eagle units can be used for:  
Process Automation.  
Data Acquisition and Data Logging applications  
Building Automation  
Pharmaceutical machines  
Test labs  
Turbines

**Q. Can I connect two different models of Eagles in the same network?**

Ans. Yes, you can.

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## Troubleshooting

In this chapter. . .

- Troubleshooting guide for Eagle



## 8.0 Troubleshooting Guide for Eagle

\* Indications of various LED configurations:

READY	PLC COMM	IBM COMM	ERROR	COMMENT
0	0	0	0	POWER OFF
1	0	0	0	POWER ON
blink	X	X	X	Calibration corrupted, default values loded
1	0	0	1	Driver corrupted
1	blink	0	0	Communication with plc
1	blink	blink	0	Communication with plc & IBM or slave device
1	blink	blink	blink	Communication with plc, error in status word
1	0	blink	0	Communication IBM in setup

\* Note: 0 = LED OFF, 1 = LED ON, X = Don't care

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