

Interface Option Cards

Interface for the 882IS/882IS Plus Indicator

Installation and Programming Manual



EtherNet/IP™



PROFINET



PROFIBUS DP



Modbus® TCP



DeviceNet®



EtherCAT®

An ISO 9001 registered company
© Rice Lake Weighing Systems. All rights reserved.

Rice Lake Weighing Systems® is a registered trademark of
Rice Lake Weighing Systems.

All other brand or product names within this publication are trademarks or registered
trademarks of their respective companies.

All information contained within this publication is, to the best of our knowledge, complete
and accurate at the time of publication. Rice Lake Weighing Systems reserves the right to
make changes to the technology, features, specifications and design of the equipment
without notice.

The most current version of this publication, software, firmware and all other product
updates can be found on our website:

www.ricelake.com

Contents

1.0	Introduction	1
1.1	Overview	2
1.1.1	EtherNet/IP	2
1.1.2	DeviceNet	2
1.1.3	EtherCAT	2
2.0	Installation	3
2.1	Installing the Interface Option Card	3
3.0	Status LEDs and Connectors.....	5
3.1	EtherNet/IP	5
3.1.1	Network Status LED	5
3.1.2	Module Status LED	6
3.1.3	Link/Activity LED	6
3.1.4	EtherNet/IP Connector	6
3.2	PROFINET	7
3.2.1	Network Status LED	7
3.2.2	Module Status LED	7
3.2.3	Link/Activity LED	8
3.2.4	PROFINET Connectors	8
3.3	PROFIBUS DP	8
3.3.1	Operation Mode LED	8
3.3.2	Module Status LED	9
3.3.3	DB9F Connector	9
3.4	Modbus TCP	10
3.4.1	Network Status LED	10
3.4.2	Module Status LED	10
3.4.3	Link/Activity LED	11
3.4.4	Modbus TCP Connector	11
3.5	DeviceNet	11
3.5.1	Network Status LED	11
3.5.2	Module Status LED	12
3.5.3	DeviceNet Connector	12
3.6	EtherCAT	13
3.6.1	Run Status LED	13
3.6.2	Error Status LED	13
3.6.3	Port Status LEDs	14
3.6.4	EtherCAT Ports	14

4.0	Data Structure	15
4.1	882IS Output	15
4.1.1	882IS Status Bits	16
4.1.2	882IS Error Status Bits	17
4.2	882IS Input	18
4.2.1	882IS Command Bits	18
5.0	Network Settings.....	19
5.1	Configuring the Network settings	19
5.2	Configuring a Generic EtherNet Module	22



Rice Lake continually offers web-based video training on a growing selection of product-related topics at no cost. Visit www.ricelake.com/webinars.

1.0 Introduction

This manual provides information on the installation and use of the following interface option cards.

- EtherNet/IP™
- PROFINET
- PROFIBUS DP
- Modbus® TCP
- DeviceNet®
- EtherCAT®

The EtherNet/IP, PROFINET, PROFIBUS DP and Modbus TCP interface option cards can be used to read and write data to the 882IS using a PLC or another primary controller.

The DeviceNet interface option card allows the 882IS to communicate with a primary controller on a DeviceNet network, while the EtherCAT interface option card allows the 882IS to communicate with an EtherCAT network.

**WARNING**

Some procedures described in this manual require work inside the 882IS enclosure. These procedures are to be performed by qualified service personnel only.

All of the interface option cards are installed inside the 882IS enclosure and installation in NEMA Type 4X stainless steel enclosures permits use in washdown environments.

See the 882IS technical manual for additional installation information and detailed descriptions of the 882IS functions.



Manuals can be viewed or downloaded from the Rice Lake Weighing Systems website at www.RiceLake.com/manuals

Warranty information can be found at www.RiceLake.com/warranties

**Note**

882IS configuration and calibration cannot be performed through an interface option card.

1.1 Overview

The primary controller communicates by sending commands through the PROFINET, PROFIBUS DP and Modbus TCP interface option cards to an 882IS. The 882IS responds to the primary controller with data and status depending on the command sent. These actions are referred to as polled response.



Note *A CD-ROM containing the GSD file used to configure the primary device is supplied with the PROFIBUS DP interface option card.*

The EtherNet/IP and DeviceNet interface option card returns weight and status information from an 882IS to the network and provides limited control of 882IS functions to the programmer.

1.1.1 EtherNet/IP

EtherNet/IP (Ethernet Industrial Protocol) is an open industrial networking standard allowing control applications to make use of Ethernet communications components and physical media.

EtherNet/IP is based on the IEEE 802.3 Ethernet standard, the TCP/IP protocol suite and CIP™ (Common Industrial Protocol), the real-time I/O and information protocol used by both DeviceNet™ and ControlNet™ networks.

1.1.2 DeviceNet

The installation functions as a communications adapter device on a DeviceNet network. It acts as a group-two-only server on the network. Supports one polled I/O connection.

The primary controller sends commands to the 882IS through the DeviceNet interface by writing the commands in the output command format. The installation returns the weight and status data in the input command format. These actions are referred to as polled I/O.

1.1.3 EtherCAT

The EtherCAT communication module provides instant EtherCAT conformance tested connectivity via the Anybus-CompactCom host interface. Any device supporting this standard can take advantage of the features provided by the module, allowing seamless network integration regardless of network type.

IMPORTANT

The EtherCAT card should not be used to communicate between buildings. The Ethernet port is not suitable for connection to circuits used outside the building and is subject to lightning or power faults.

2.0 Installation

Interface option card specific functions are provided by the option card module. The module must plug into option card slot 1 on the CPU board and provides power and access from the 882IS bus to the interface option card module.

IMPORTANT

See the 882IS Technical Manual (PN 183532) for additional installation instructions.

2.1 Installing the Interface Option Card

All the cards connect the same way. The interface option cards described in this manual only work in slot 1 of the 882IS CPU board (other available options work in either slot).

**WARNING**

Always disconnect power before removing 882IS backplate.

**CAUTION**

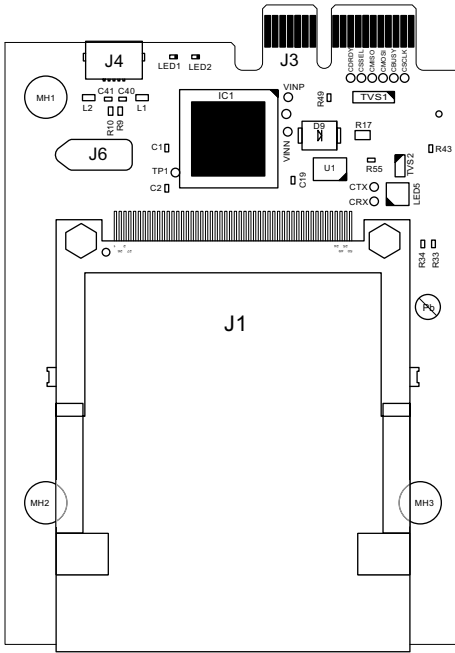
A grounding wrist strap must be worn to protect components from electrostatic discharge (ESD) when working inside the 882IS enclosure.

Installation Procedure

1. Disconnect power from the unit.
2. Remove the backplate from the enclosure.
3. Connect interface board to slot 1 of the CPU board.
4. Use three provided screws to secure the interface board.
5. Connect and properly run cables.
6. Reinstall the enclosure backplate.
7. Reconnect power to the unit.

The 882IS automatically recognizes all installed option cards when the unit is powered on. No hardware-specific configuration is required to identify the newly-installed card to the system.

Board Diagram



Carrier Board
PN 164756

Kit Numbers

- PN 190530 – EtherNet/IP
- PN 190531 – DeviceNet
- PN 190532 – PROFINET
- PN 190533 – Modbus TCP
- PN 190534 – PROFIBUS DP
- PN 190535 – EtherCAT

Figure 2-1. Interface Option Card Board

Environmental Specifications

Temperature: 14° to 104° F (-10° to +40° C)

Conformance



The EtherNet/IP and EtherCAT interfaces have been found in accordance with EMC directive 89/336/EEC for European standards EN 50081-2 and EN 61000-6-2.

3.0 Status LEDs and Connectors



WARNING

Always disconnect power before removing 882IS backplate.



CAUTION

A grounding wrist strap must be worn to protect components from electrostatic discharge (ESD) when working inside the 882IS enclosure.

3.1 EtherNet/IP



Note

To configure an IP Address, refer to [Section 5.1 on page 19](#).

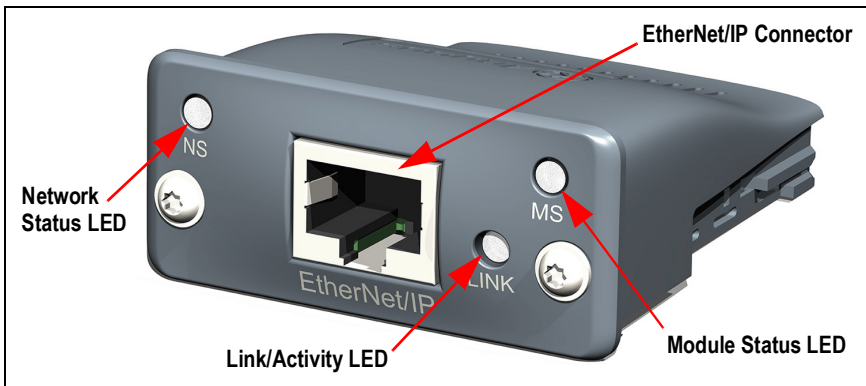


Figure 3-1. EtherNet/IP Module

3.1.1 Network Status LED

LED State	Description
Off	No power or no IP address
Green	On-line, one or more connections established (CIP Class 1 or 3)
Green, flashing	On-line, no connections established
Red	Duplicate IP address, <i>FATAL</i> error
Red, flashing	One or more connections timed out (CIP Class 1 or 3)

Table 3-1. Network Status LED Descriptions



Note

A test sequence is performed on this LED during startup.

3.1.2 Module Status LED

LED State	Description
Off	No power
Green	Controlled by a scanner in run state
Green, flashing	Not configured, or scanner in idle state
Red	Major fault (EXCEPTION state, FATAL error etc.)
Red, flashing	Recoverable fault(s)

Table 3-2. Module Status LED Descriptions



Note A test sequence is performed on this LED during startup.

3.1.3 Link/Activity LED

LED State	Description
Off	No link, no activity
Green	Link established
Green, flickering	Activity

Table 3-3. Link/Activity LED Descriptions

3.1.4 EtherNet/IP Connector

The Ethernet interface supports 10/100 Mbps, full or half duplex operation.

3.2 PROFINET

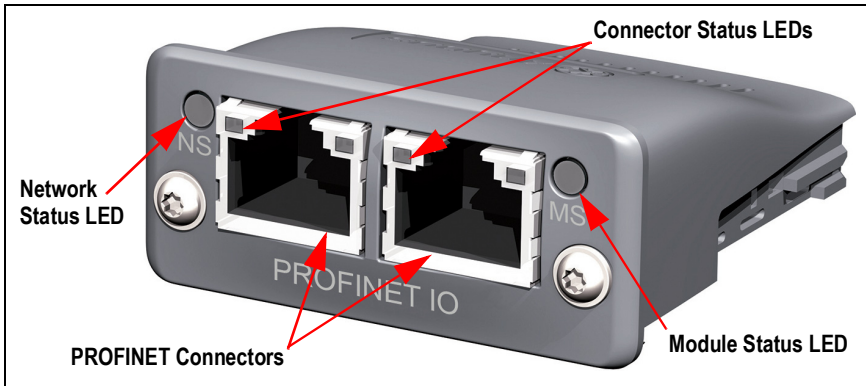


Figure 3-2. PROFINET Module

3.2.1 Network Status LED

LED State	Description
Off	No power or connection with IP controller
Green, flashing	Connection with IP controller established I/O controller in STOP state

Table 3-4. Network Status LED Descriptions



Note A test sequence is performed on this LED during startup.

3.2.2 Module Status LED

LED State	Description
Off	Not initialized – no power or module in SETUP or NW_INIT state
Green	Normal operation – module has shifted from the NW_INIT state
Green, 1 flash	Diagnostic event(s) present
Green, 2 flashes	Blink used by engineering tools to identify the node on the network
Red	Exception error – module in EXCEPTION state
Red, 1 flash	Configuration error – expected identification differs from real identification
Red, 2 flashes	IP address error – IP address not set
Red, 3 flashes	Station name error – station name not set
Red, 4 flashes	Internal error – module has encountered a major internal error

Table 3-5. Module Status LED Descriptions



Note A test sequence is performed on this LED during startup.

3.2.3 Link/Activity LED

LED State	Description
Off	No link, no activity
Green	Link established
Green, flickering	Activity

Table 3-6. Link/Activity LED Descriptions

3.2.4 PROFINET Connectors

The PROFINET interface supports 10/100 Mbps, full or half duplex operation. Update rate is dependent on the configured baud rate and the number of network nodes.

3.3 PROFIBUS DP

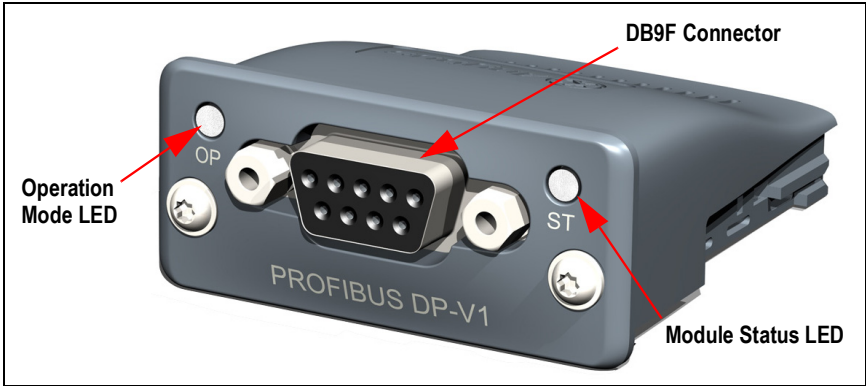


Figure 3-3. PROFIBUS Module

3.3.1 Operation Mode LED

Status	Description
Off	No powered or not online
Steady Green	Data exchange
Flashing Green	Clear
Flashing Red (1-flash)	Parametrization error
Flashing Red (2-flash)	PROFIBUS configuration error

Table 3-7. Operation Mode LED Descriptions

3.3.2 Module Status LED

Status	Description	Comments
Off	Not initialized	Anybus state = SETUP or NW_INIT
Steady Green	Initialized	Anybus module has left the NW_INIT state
Flashing Green	Initialized, diagnostic event(s) present	Extended diagnostic bit is set
Steady Red	Exception error	Anybus state = EXCEPTION

Table 3-8. Module Status LED Descriptions

3.3.3 DB9F Connector

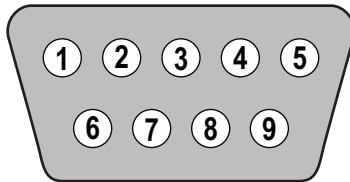


Figure 3-4. DB9F Pinout Orientation

Pin	Signal	Description
1	-	
2	-	
3	B Line	Positive RxD/TxD, RS485 level
4	RTS	Request to send
5	GND Bus	Ground (isolated)
6	+5 V Bus Output	+5 V termination power (isolated, short-circuit protected)
7	-	
8	A Line	Negative RxD/TxD, RS485 level
9	-	
Housing	Cable Shield	Internally connected to the Anybus protective ground via cable shield filters according to the PROFIBUS standard.

Table 3-9. PROFIBUS Connector Pinout Descriptions

3.4 Modbus TCP

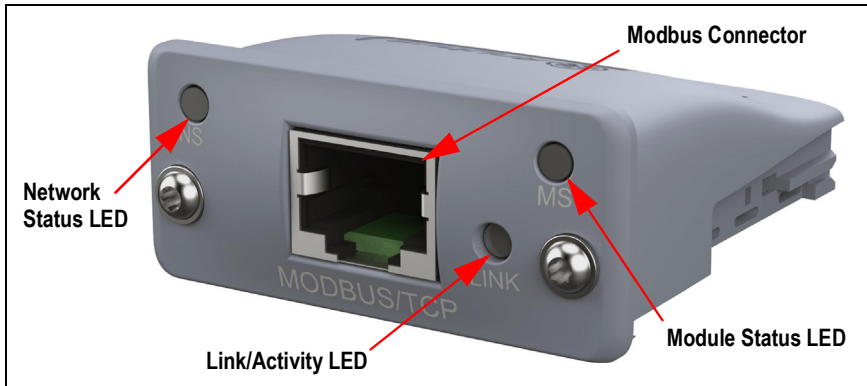


Figure 3-5. Modbus TCP Module

3.4.1 Network Status LED

LED State	Description
Off	No power or no IP address
Green	Module is in process active or idle state
Green, flashing	Waiting for connections
Red	Duplicate IP address, <i>FATAL</i> event
Red, flashing	Process active timeout

Table 3-10. Network Status LED Descriptions



Note A test sequence is performed on this LED during startup.

3.4.2 Module Status LED

LED State	Description
Off	No power
Green	Normal operation
Red	Major fault; module is in EXCEPTION state (or <i>FATAL</i> event)
Red, flashing	Minor fault in diagnostic object; IP conflict

Table 3-11. Module Status LED Descriptions



Note A test sequence is performed on this LED during startup.

3.4.3 Link/Activity LED

LED State	Description
Off	No link, no activity
Green	Link established
Green, flickering	Activity

Table 3-12. Link/Activity LED Descriptions

3.4.4 Modbus TCP Connector

The Modbus interface supports 10/100 Mbps, full or half duplex operation.

The Modbus TCP connection uses holding registers to transfer data between the 882IS and the PLC or primary device. See [Section 4.0 on page 15](#) for output and input data structure.

3.5 DeviceNet

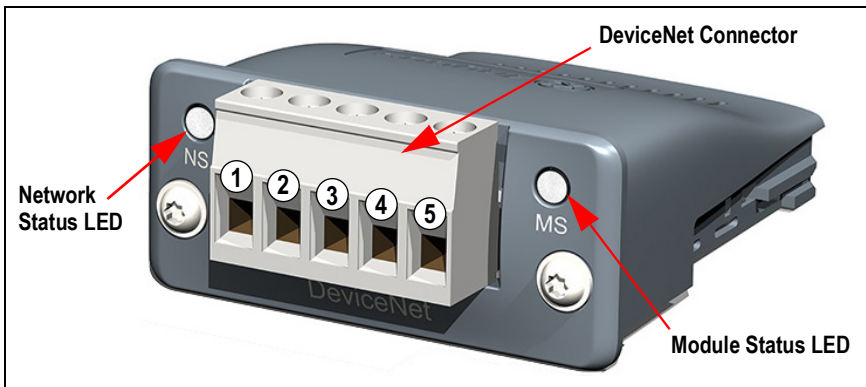


Figure 3-6. DeviceNet Module

3.5.1 Network Status LED

LED Status	Description
Off	Not powered or not online
Steady Green	Online, connected
Flashing Green	Online, not connected
Steady Red	Critical link failure
Flashing Red	Connection time-out

Table 3-13. Network Status LED Descriptions

3.5.2 Module Status LED

LED Status	Description
Off	No power to module
Steady Green	Module operational
Flashing Green	Missing or incomplete configuration, device needs commissioning
Steady Red	Unrecoverable fault
Flashing Red	Recoverable fault

Table 3-14. Module Status LED Descriptions

3.5.3 DeviceNet Connector

See [Figure 3-6](#) for connector pinout orientation.

Pin	Signal	Description
1	V-	Negative bus supply voltage
2	CAN_L	CAN low bus line
3	SHIELD	Cable shield
4	CAN_H	CAN high bus line
5	V+	Positive bus supply voltage

Table 3-15. DeviceNet Connector Pinout

3.6 EtherCAT

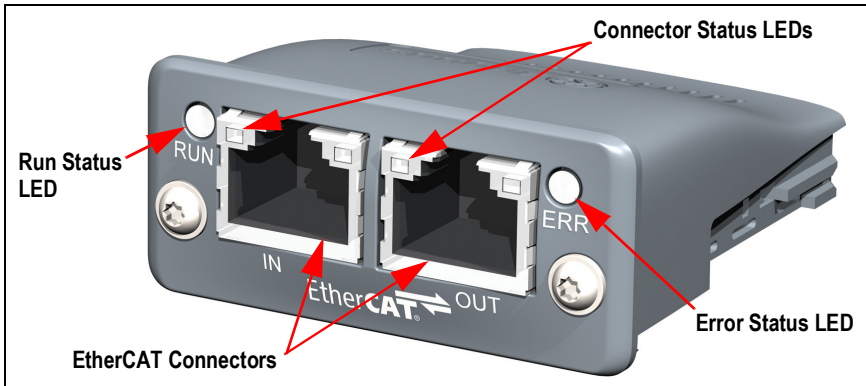


Figure 3-7. EtherCAT Module

3.6.1 Run Status LED

Status	Description
Off	CoE device in <i>INIT</i> state or has no power
Steady green	CoE device in operational state
Flashing green	CoE device in pre-operational state
Green, single flash	CoE device in safe-operational state
Red	Fatal event, forcing the bus interface to a physically passive state; contact technical support.

Table 3-16. Run Status LED Descriptions

3.6.2 Error Status LED

Status	Description
Off	No error (or no power)
Red, blinking	Invalid configuration, state change received from primary is not possible due to invalid register or object settings
Red, double flash	Application (sync manager) watchdog timeout
Red	Fatal event, forcing the bus interface to a physically passive state; contact technical support.

Table 3-17. Error Status LED Descriptions

3.6.3 Port Status LEDs

Status	Description
Off	Link not sensed (or no power)
Green	Link sensed, no activity
Green, flickering	Link sensed, activity detected

Table 3-18. Port Status LED Descriptions

3.6.4 EtherCAT Ports

The EtherCAT interface supports 10/100 Mbps, full or half duplex operation. Port 1 is for incoming communications and Port 2 is for outgoing communications.

4.0 Data Structure

The data structure describes the output and input format that is used by the PLC or primary device to communicate with the 882IS.

Decimal Point Handling

Integer commands return no decimal point information to the primary. All values are 32-bit with an assumed decimal place. Floating point commands support decimal point information with no special handling.

Example: A value of 750.1 displayed on unit is returned to the primary as 7501.

4.1 882IS Output

The output data is what is sent to the PLC or other primary device. Some of the data is sent continuously where other data is dependent on what input data is sent from the PLC.

Modbus Address	Word	Description
40257	0	Error status; Section 4.1.2 on page 17
40259	1	882IS status; Section 4.1.1 on page 16
40261	2	Gross weight
40263	3	Tare weight
40265	4	Net weight
40267	5	Accumulator value
40269	6	Current mode 0 = primary, 1 = secondary

Table 4-1. 882IS Output

4.1.1 882IS Status Bits

Word Bit	882IS Status Data	
	Value = 0	Value = 1
00	In weigh mode	In setup mode
01	Weight OK	Weight over/Under range
02	Not in zero band	In zero band
03	Not used	Not used
04	Not in warmup	In warmup
05	Heartbeat low	Heartbeat high
06	Not used	Not used
07	Not used	Not used
08	Not used	Not used
09	Gross positive value	Gross negative value
10	Tare positive value	Tare negative value
11	Net positive value	Net negative value
12	No motion	Scale in motion
13	Tare not acquired	Tare acquired
14	Tare not entered	Tare entered
15	Unused	Unused
16	Unused	Unused
17	Unused	Unused
18	Unused	Unused
19	Unused	Unused
20	Unused	Unused
21	Unused	Unused
22	Unused	Unused
23	Unused	Unused
24	Unused	Unused
25	Unused	Unused
26	Unused	Unused
27	Unused	Unused
28	Unused	Unused
29	Unused	Unused
30	Unused	Unused
31	Unused	Unused
32	Unused	Unused

Table 4-2. 882IS Status Bits

4.1.2 882IS Error Status Bits

Word Bit	882IS Error Status Data	
	Value = 0	Value = 1
00	No error	Configuration corrupt
01	No error	Configuration checksum error
02	No error	Load cell data checksum error
03	No error	Print format checksum error
04	Unused	Unused
05	Unused	Unused
06	No error	Low battery backup voltage
07	Unused	Unused
08	Unused	Unused
09	Unused	Unused
10	Unused	Unused
11	Unused	Unused
12	Unused	Unused
13	Unused	Unused
14	Unused	Unused
15	Unused	Unused
16	No error	A/D physical error
17	Unused	Unused
18	Unused	Unused
19	Unused	Unused
20	Unused	Unused
21	Unused	Unused
22	Unused	Unused
23	Unused	Unused
24	Unused	Unused
25	Unused	Unused
26	Unused	Unused
27	Unused	Unused
28	Unused	Unused
29	Unused	Unused
30	Unused	Unused
31	Unused	Unused
32	Unused	Unused

Table 4-3. 882IS Error Status Bits

4.2 882IS Input

The input data is information received from the PLC or primary device that is used to perform different actions depending on the data received.

Modbus Address	Word	Description
40001	0	Enter tare value. If set to 0, the full gross weight will be used when the acquire tare command is set to 1.
40003	1	Indicator command bits
40005	2	Set scale mode. 0 = primary, 1 = secondary
40007	3	Unused
40009	4	Unused
40011	5	Unused
40013	6	Unused

Table 4-4. 882IS Input

4.2.1 882IS Command Bits

Word Bit	882IS Command Data	
	Value = 0	Value = 1
00	Return values as integers	Return values a float
01	No operation	Perform zero scale operation
02	No operation	Acquire tare
03	No operation	Clear tare
04	No operation	Clear accumulator
05	No operation	Print request
06	No operation	Lock major keys
07	No operation	Unlock major keys
08	Unused	Unused
09	Unused	Unused
10	Unused	Unused
11	Unused	Unused
12	Unused	Unused
13	Unused	Unused
14	Unused	Unused

Table 4-5. 882IS Command Bits

5.0 Network Settings

5.1 Configuring the Network settings

Configuring the network setting is done using a web browser or the Anybus® IP configuration utility.



Note

The card comes configured with the DHCP set to on, so it does not have a default IP address.

Set network settings using a web browser.

The following figures are examples only, actual displays vary.

1. Open a web browser and type the IP address of the card into the address bar.



Figure 5-1. EtherNet/IP Main Display in a Web Browser

2. Click **Network interface**.

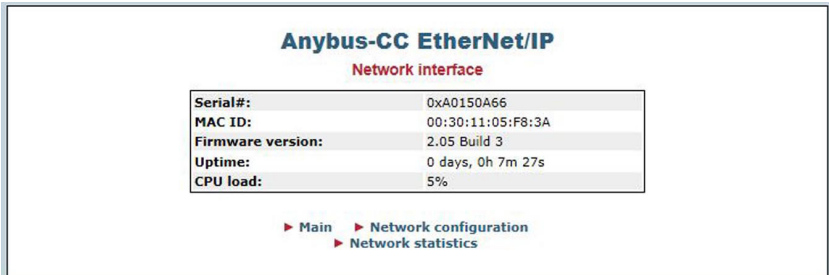


Figure 5-2. EtherNet/IP Network Interface Display in a Web Browser

3. Click **Network configuration**.

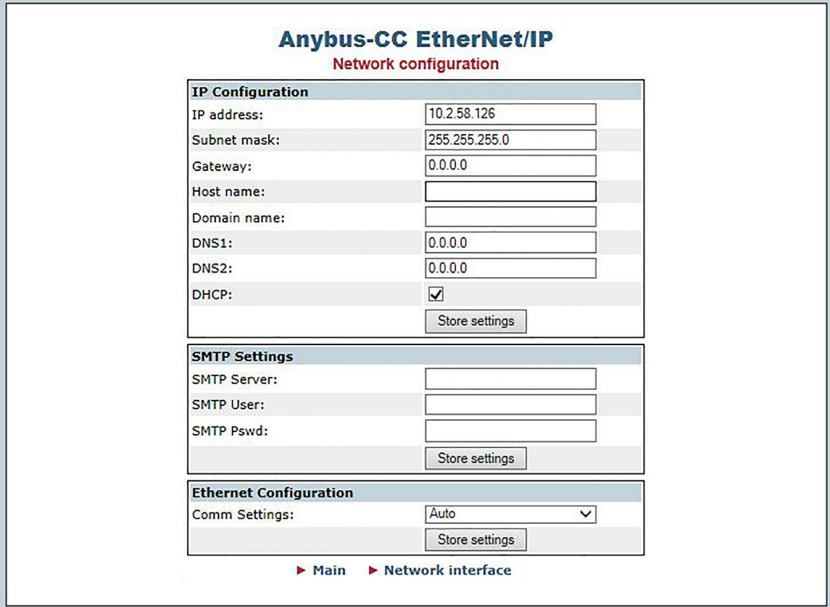


Figure 5-3. EtherNet/IP Network Configuration Display in a Web Browser

4. Change necessary settings.
5. Click **Store settings** to save any changes.

Set network settings using the Anybus IP configuration utility.

1. Install the configuration program found on the CD (IPconfigSetup.exe).
2. Open the installed configuration program (IPconfig.exe).

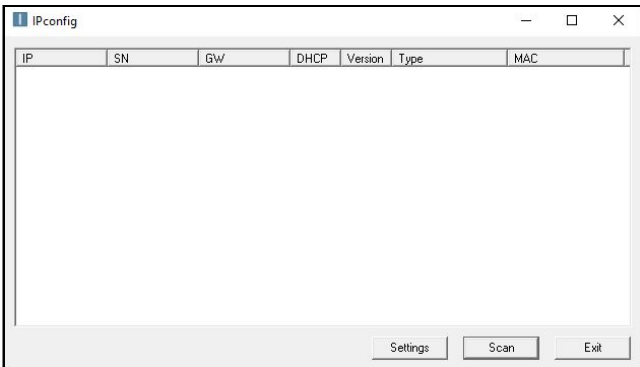


Figure 5-4. IP Configuration Utility – No Device

3. Click **Scan** if the device does not display in the menu.

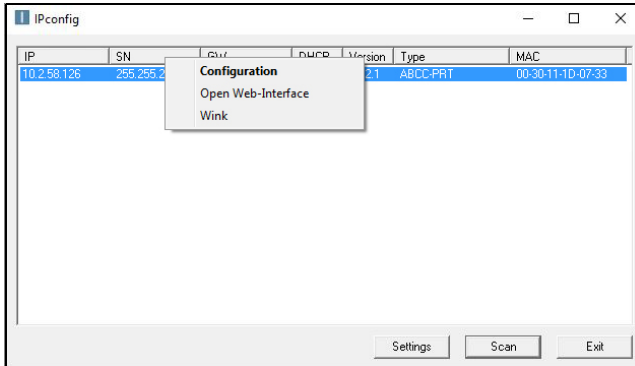


Figure 5-5. IP Configuration Utility – Right-Click Selection

4. Double-click on the device or right-click and select **Configuration**. A menu displays with the current network settings.

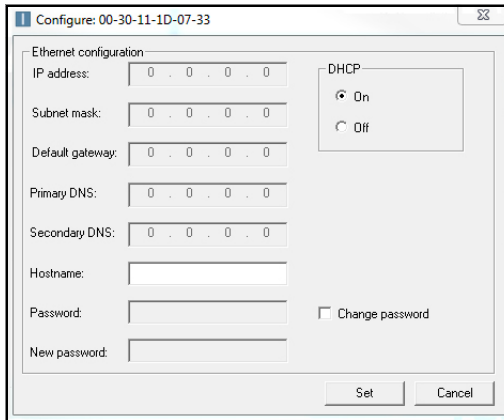


Figure 5-6. Configuration Menu

5. Change necessary settings.
6. Click on the **Set** button.

5.2 Configuring a Generic EtherNet Module (CompactLogix or ControlLogix PLC)

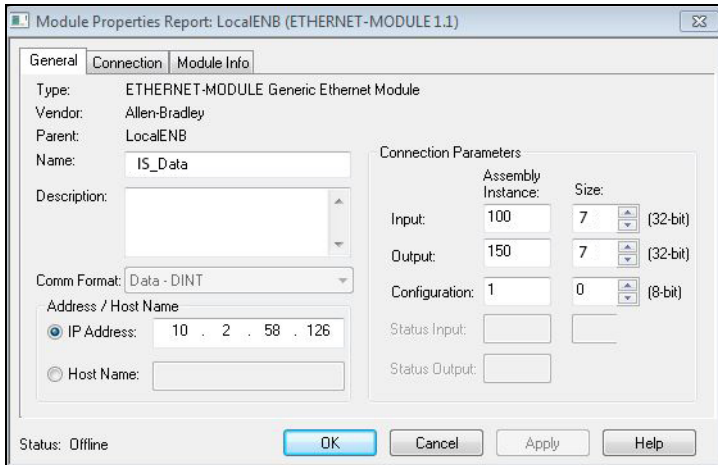


Figure 5-7. Generic EtherNet Module Screen



© Rice Lake Weighing Systems Specifications subject to change without notice.
Rice Lake Weighing Systems is an ISO 9001 registered company.

230 W. Coleman St. • Rice Lake, WI 54868 • USA
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319