BINTRAC®

HouseLink HL-10E

Installation and Operation Manual
Modbus TCP and XML

HerdStar®

HouseLink™ HL-10E

Table of Contents

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Installation Overview

This guide covers the mounting and wiring of the HouseLink HL-10E interface. HouseLink interfaces should be placed indoors.

This symbol means the text has extra importance since it is describing the importance of a feature or explaining a step to which you should pay close attention to avoid problems, or to which safety is a concern.

Components

A BinTrac system consists of a number of basic components:

BinTrac Indicator

This is the main unit of the BinTrac system. The BinTrac Indicator communicates with the Smart Summing Boxes to register the weight of feed in the bins and peripheral devices including HouseLink HL-10E. The feed level is computed and displayed on the LED bar graph. One BinTrac Indicator can display up to four feed bins.

Load Cell Bracket

The Load Cell Bracket allows for easy installation on new or existing bins. Due to the patented design, the bracket does the lifting and there is no need for time consuming field calibration.

Smart Summing Box

One Smart Summing Box per bin communicates the current reading on the leg brackets to the BinTrac Indicator.

BinTrac Power Supply

This provides the power for the BinTrac system. The power supply converts the line voltage to low voltage.

HouseLink Model HL-10E

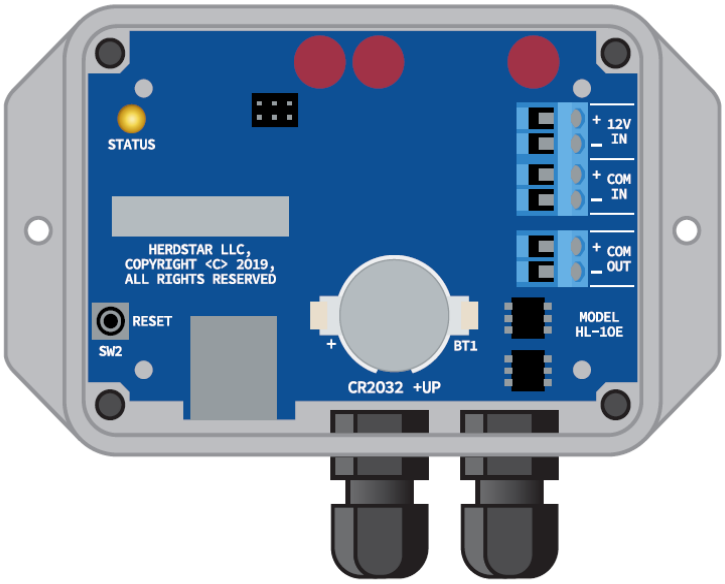
The HouseLink 10E (HL-10E) provides an interface to the BinTrac system via Ethernet utilizing Modbus TCP or XML. Each HL-10E can support up to eight BinTrac Indicators. Rev H hardware must start with software Version 2.00.

Installation

Mounting HouseLink HL-10E

Step 1: The HouseLink HL-10E should be mounted indoors and away from moisture and debris. Additionally, it should be mounted in or near the peripheral device it is connecting to.

Wiring the HouseLink HL-10E



HL-10E	BinTrac Indicator (COMM Port)
+COM (IN)	*+12 SIG*
-COM (IN)	*-12 SIG*
HL-10E	**Power Supply**
+12V (IN)	*+12V*
-12V (IN)	*-12V*
HL-10E	**House Control/PLC**
Ethernet Port	***Ethernet Port***

Figure 1

Step 2: Connect the +12V (IN) and -12V (IN) on the HL-10E to the provided power supply.

Step 3: The +COM (IN) and –COM (IN) on the HL-10E connect to the +SIG and -SIG on the COMM Port of the BinTrac Indicator **(Figure 1)**. To add multiple BinTrac Indicators, connect them to each other on the +SIG and -SIG on the COMM Port **(Figure 2)**.

IMPORTANT – When connecting multiple BinTrac Indicators to the HL-10E, each must be set to a unique ID number. This is configured with the **id** function in the **SETUP** menu of the BinTrac Indicator. See the **BinTrac BT260/BT200 Operation Manual** for further information on the configuration of the BinTrac Indicator.

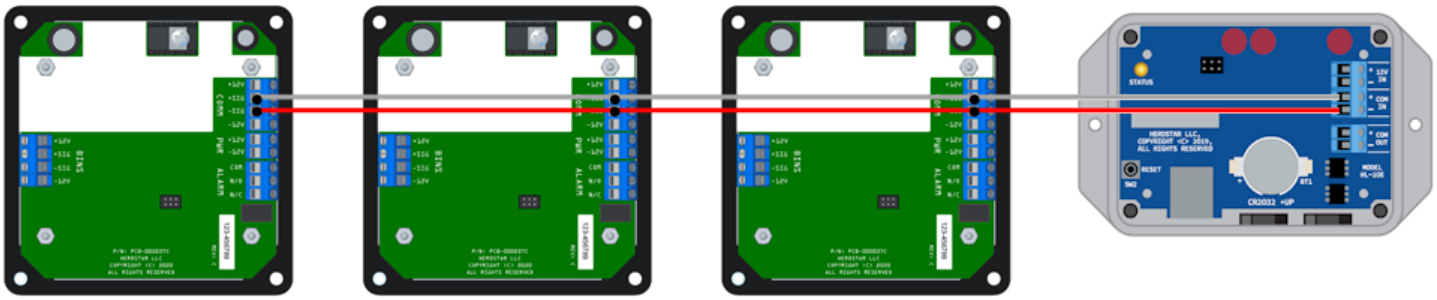


Figure 2

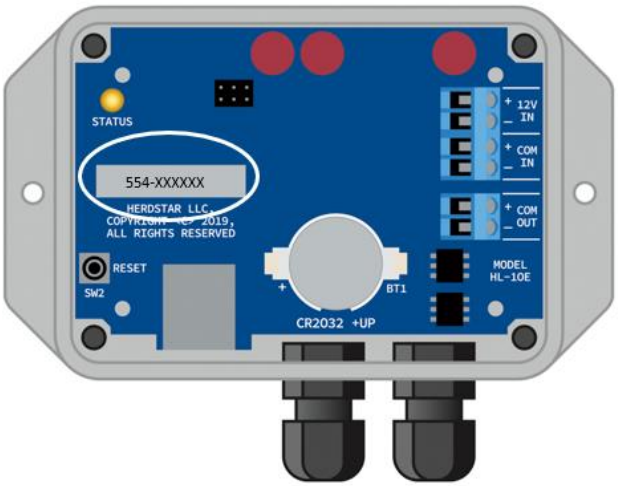
Step 4: The Ethernet port will connect to a router, PLC, or other house control using a standard CAT5 Ethernet cable.

Reset Button: Pressing and releasing the RESET will put the HL-10E in discovery mode where the device will search for connected BinTrac devices. The LED will flash quickly and then return to a slow flash once discovery is complete.

Setup & Configuration

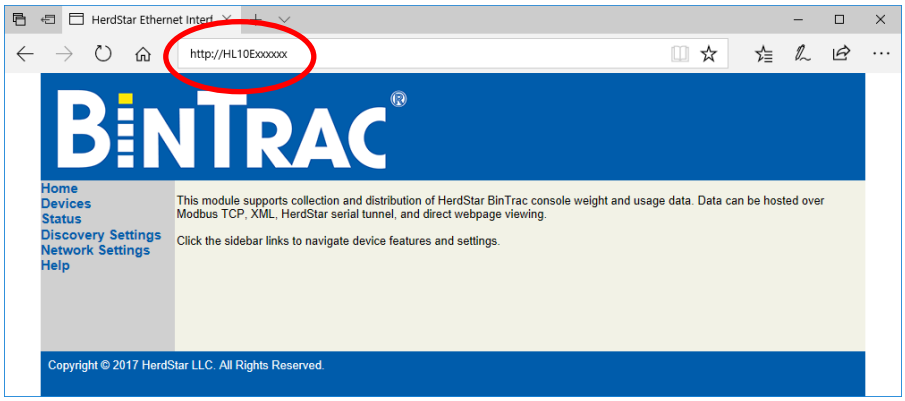
Initial Setup

1. Connect the HL-10E to a DHCP enabled Local Area Network(LAN).
2. Open a web browser on any device connected to the same LAN as the HL-10E.
3. Type in **http://HL10Exxxxxx/** where “xxxxxx” equals the serial number on the HL-10E that comes after the three-digit date code. (Circled below)



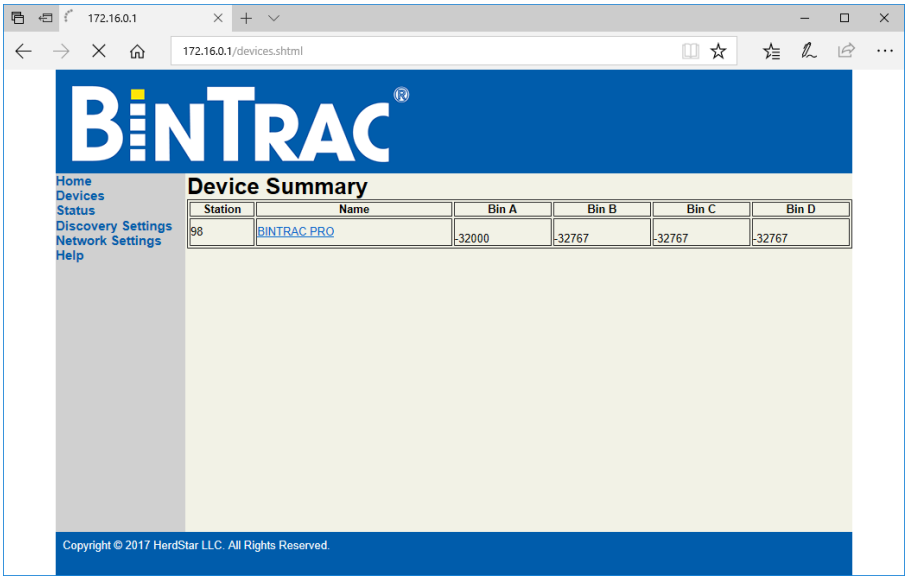
4. Initially, a password is not required, the device will go directly to the Home page. If a password is used, the login screen will pop up, simply enter “admin” for the username and “AAAAA” as the default password and the device will then display the Home page. See “*Network Settings”* for more information regarding setting the password.

Home Page



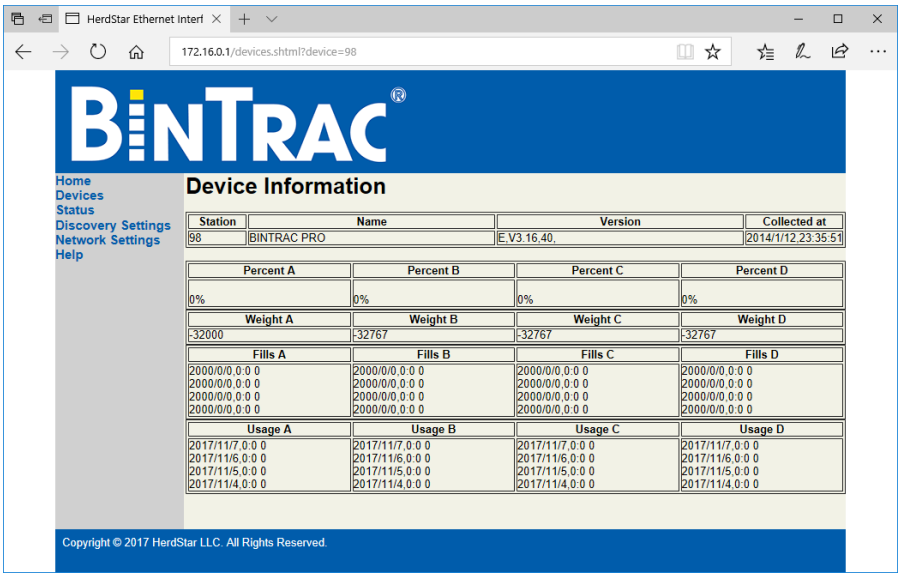
Devices Page

- Identifies connected devices and current weights of each bin.



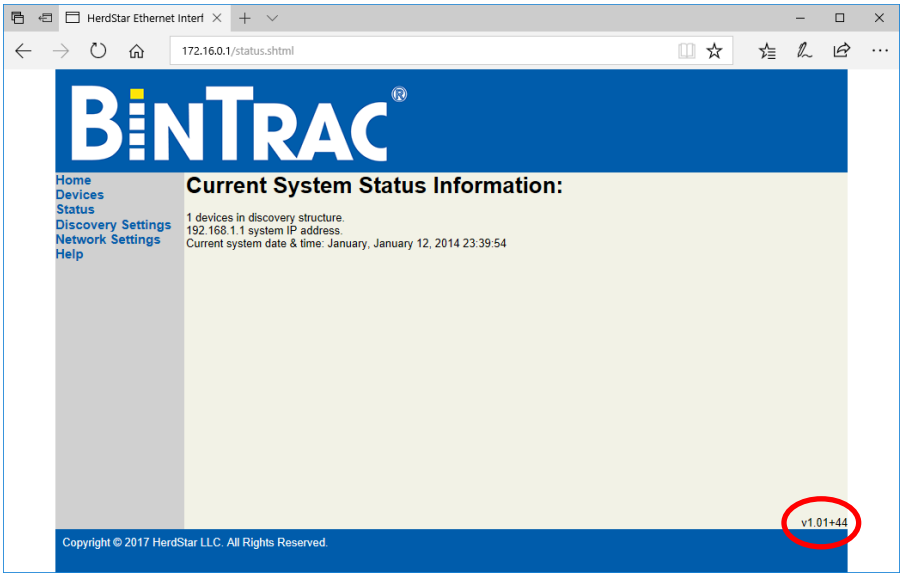
BinTrac Device Page

- Clicking on the individual devices brings up details about each bin such as weights, percentages and the firmware version of the BinTrac Indicator.



Status Page

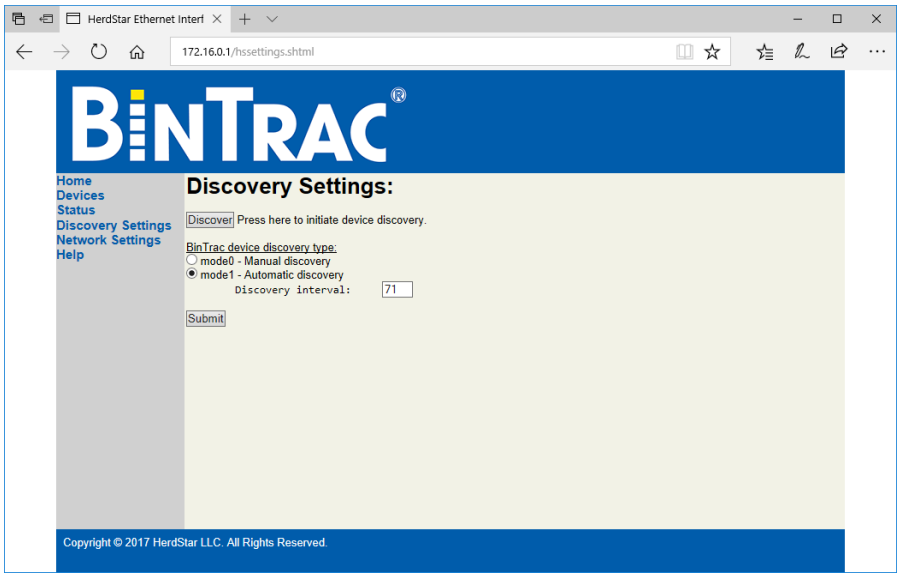
- Identifies the number of BinTrac devices and the IP address of the HL-10E.
- Additionally, the firmware version of the HL-10E device is located in the bottom right corner of this page.



Discovery Settings Page

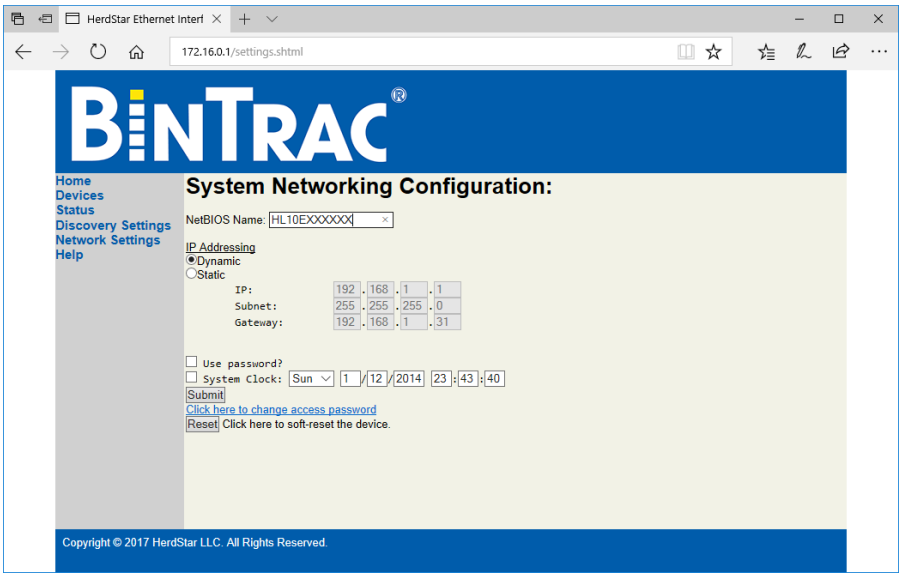
The discovery settings page allows you to view and edit your discovery settings.

- Press the discovery button to initiate a device discovery. This can also be done by pressing the reset button on the HL-10E device.
- The HL-10E device has an auto discovery feature that can be modified by changing the “Discovery Interval” number (minutes) and pressing the submit button. The auto discovery feature can also be disabled to avoid interruption in situations of consecutive information pulling such as Modbus and XML.



Network Settings Page

The network settings page displays the current NetBIOS name, dynamic or static IP addressing and the system clock. You may change the IP addressing by selecting “Static” and making the appropriate changes. This page also allows you to adjust the password settings.



- NetBIOS Name:
  - Max 16 characters
  - Must use only uppercase letters
  - Alpha-numeric
  - No special characters
- The static IP address requires the IP address as well as the Subnet Mask and Gateway IP. Changing these can make the device not work so be sure of the changes before pressing submit.
- The system clock can be updated for the current date and time. Adjust the time, check the box and press submit to proceed with the changes.
- A password can be used to protect the access of the HL-10E device. To use this feature, check the “Use password?” box and click submit to apply changes.
- The password can be changed by using the “Click here to change access password” link. Password must NOT exceed 9 characters and contain NO special characters (Alphanumeric characters only).

Help Page

The Help page can answer some of the more common issues. If you continue to have problems, please call 1-877-BINTRAC for technical assistance.

XML Interface

The XML interface can be used by developers or advanced users to get detailed information from the BinTrac indicators or set up an automated collection scheme. The XML interface responds to POST requests at the XML generation page found at: **http://HL10Exxxxxx/generateXML.xml**

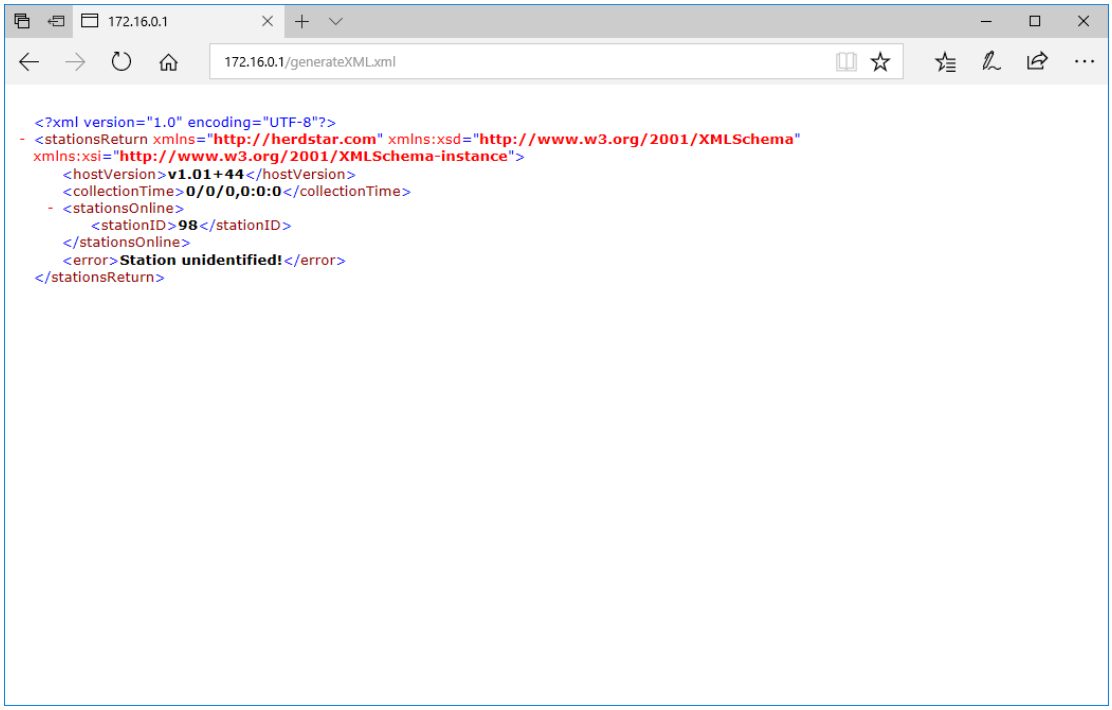
Query strings can be used to select individual BinTrac indicators which have been properly set up and discovered as follows: **http://HL10Exxxxxx/generateXML.xml?device=22**

The XML interface returns two distinct page types: an index/error page, and a device detail report. See below for example of these pages and short explanations.

The Index/Error Page

This page is returned when the XML interface is accessed with no query string, an invalid string, or a query string pointing to a device that is not discovered.

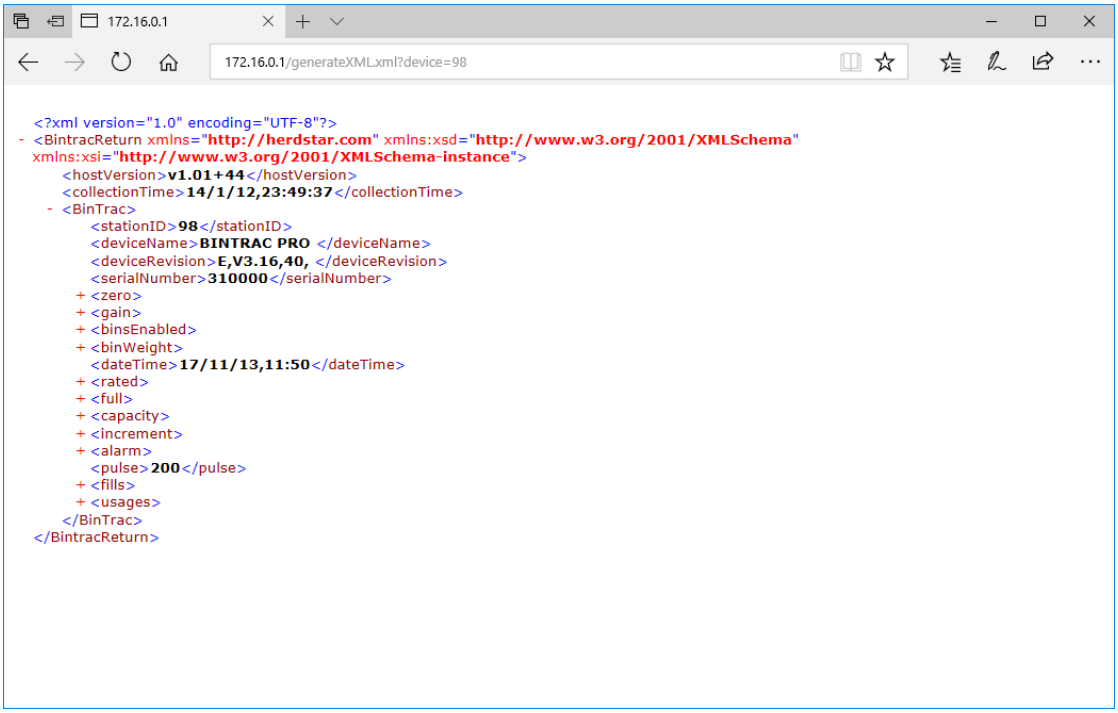
hostVersion Indicates the firmware version present on the HL10E device.
stationsOnline Returns a list of discovered BinTrac indicators.
error Displays “Station unidentified” when a BinTrac indicator isn’t found.



The Device Detail Report

This page is returned when the XML interface is provided a valid discovered BinTrac station ID. The page displays internal data and settings from the BinTrac indicator.

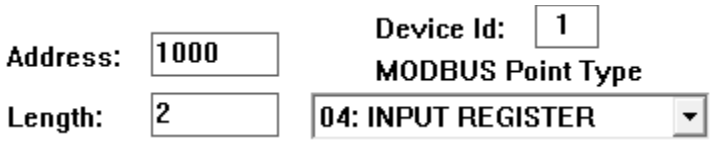
stationID	Locally unique identifier.
deviceName	Device name string.
deviceRevision	Device firmware version string.
serialNumber	Factory serial number.
zero	The zero represents the empty weight of the bin.
gain	A value used to scale raw counts to user standard measurement units.
binsEnabled	Lists whether each bin is enabled or not.
binWeight	Bin weight as measured by the BinTrac indicator.
dateTime	Current date and time as configured on the indicator.
rated	mV/V rating setting of for the connected load cells.
full	User value defining the weight that a bin is considered to be full.
capacity	Specified load cell capacity sum.
increment	Smallest units that the BinTrac display will count by.
alarm	A user defined weight value to flip a relay output.
pulse	If a pulse output is enabled, this value holds the number of pulses per unit weight.
fills	Timestamped fill weight data.
usages	Timestamped usage weight data.



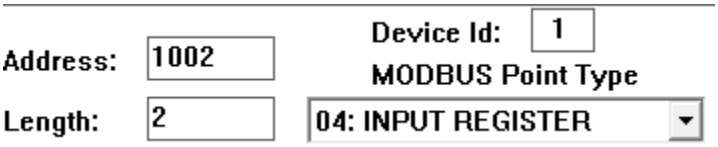
Modbus Packet Data Format

The Modbus module responds to an input register point type (4), at address 1000 with a length of eight bytes. Individual bin addresses are as shown below. The Modbus device ID will match to the BinTrac Indicator station ID as configured in the setup menu of the BinTrac indicator. A discovery must be done before any units will respond.

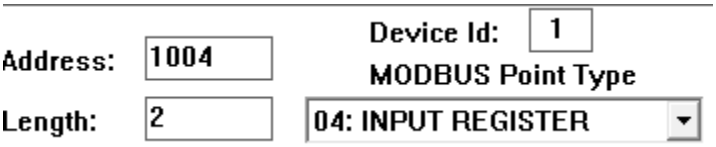
Bin A



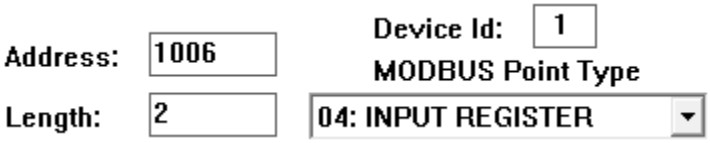
Bin B



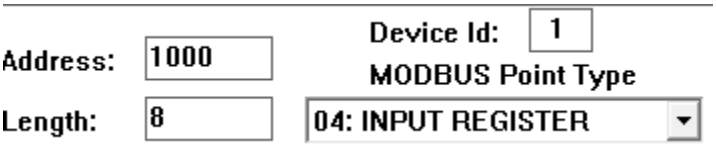
Bin C



Bin D



All Bins



Below are sample Modbus request and response packets:

Sample Modbus Weight Request

[4c][02][00][00][00][06][0b][04][03][e7][00][08]

HEX	DESCRIPTION	DECIMAL
4c02	TRANSACTION ID	19458
0000	PROTOCOL ID	0
0006	# OF BYTES	6
0b	DEVICE ID	11
04	INPUT REG	4
03e7	ADDRESS	1000
00008	LENGTH	8

Sample Modbus Weight Response

[4c][02][00][00][00][13][0b][04][10][ff][ff][80][01][ff][ff][80][01][00][00][6b][6e][ff][ff][80][01]

HEX	DESCRIPTION	DECIMAL
4c02	TRANSACTION ID	19458
0000	PROTOCOL ID	0
0013	# OF BYTES	19
0b	DEVICE ID	11
04	INPUT REG	4
10	SIZE	16
ffff8001	BIN A	-32767
ffff8001	BIN B	-32767
00006b6e	BIN C	27502
ffff8001	BIN D	-32767

Sample Fill Request

HEX	DESCRIPTION	DECIMAL
8B00	TRANSACTION ID	35584
0000	PROTOCOL ID	0
0006	# OF BYTES	6
09	DEVICE ID	9
04	INPUT REG	4
04AF	ADDRESS	1200
0012	LENGTH	18

Sample Usage Request

HEX	DESCRIPTION	DECIMAL
9200	TRANSACTION ID	37376
0000	PROTOCOL ID	0
0006	# OF BYTES	6
09	DEVICE ID	9
04	INPUT REG	4
0577	ADDRESS	1400
0012	LENGTH	18

Sample Fill Response

HEX	DESCRIPTION	DECIMAL
8B00	TRANSACTION ID	35584
0000	PROTOCOL ID	0
0027	# OF BYTES	39
09	DEVICE ID	9
04	INPUT REG	4
24	SIZE	36
11	YEAR	17
08	MONTH	8
1A	DAY	26
07	HOUR	7
09	MINUTE	9
000002E1	BIN A	737
11	YEAR	17
08	MONTH	8
1A	DAY	26
07	HOUR	7
37	MINUTE	55
00009F98	BIN B	40856
11	YEAR	17
08	MONTH	8
1D	DAY	29
08	HOUR	8
0A	MINUTE	19
00003D0D	BIN C	15629
11	YEAR	17
08	MONTH	8
0F	DAY	15
14	HOUR	20
02	MINUTE	2
00011C41	BIN D	72769

Sample Usage Response

HEX	DESCRIPTION	DECIMAL
9200	TRANSACTION ID	37376
0000	PROTOCOL ID	0
0027	# OF BYTES	39
09	DEVICE ID	9
04	INPUT REG	4
24	SIZE	36
11	YEAR	17
08	MONTH	8
1D	DAY	29
00	HOUR	0
00	MINUTE	0
000003E4	BIN A	996
11	YEAR	17
08	MONTH	8
1D	DAY	29
00	HOUR	0
00	MINUTE	0
00001DD2	BIN B	7634
11	YEAR	17
08	MONTH	8
1D	DAY	29
00	HOUR	0
00	MINUTE	0
00006514	BIN C	25876
11	YEAR	17
08	MONTH	8
1D	DAY	29
00	HOUR	0
00	MINUTE	0
00004308	BIN D	17160

Operational Specifications

Operating Temperature Range:	-40°C to +60°C (-40°F to +140°F)
Humidity:	5% to 95% (non-condensing)
Environmental Air:	No corrosive gasses permitted
Shock and Vibration:	Suitable for installation on stable surfaces
Enclosure Type:	Unsealed
Agency Approvals:	N/A
Wiring Type:	Screw terminal blocks plus RJ45 jack
Power Requirements:	10.5VDC – 13.5VDC, 160mA (typ @ 12.0VDC) (Current depends on port loading)
Serial Flash Memory:	16Mb
Real-Time Clock/Calendar:	Present
Ethernet Communication Port:	Single 10/100 Base-T with status indicators
COM IN/OUT Serial Communication Interfaces:	HerdStar optically isolated (proprietary)

Legal

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