Intelli-Lift®

Off-Center, Side Pull & Snag Detection System Technical Manual

MAGNETEK

Part Number: 113-11895 R3
April 2023

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PREFACE AND SAFETY

Product Safety Information

Magnetek, Inc. (Magnetek) offers a broad range of radio remote control products, control products and adjustable frequency drives, industrial braking systems, and power delivery products for material handling applications. This manual has been prepared by Magnetek to provide information and recommendations for the installation, use, operation and service of Magnetek's material handling products and systems (Magnetek products). Anyone who uses, operates, maintains, services, installs or owns Magnetek products should know, understand and follow the instructions and safety recommendations in this manual for Magnetek products.

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists, lifting devices or other equipment which use or include Magnetek products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where the Magnetek products are used,
- Plant safety rules and procedures of the employers and the owners of the facilities where the Magnetek products are being used,
- Regulations issued by the Occupational Health and Safety Administration (OSHA),
- Applicable local, state, provincial, or federal codes, ordinances, standards and requirements, or
- Safety standards and practices for the industries in which Magnetek products are used.

This manual does not include or address the specific instructions and safety warnings of these manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users and operators of the Magnetek products to know, understand, and follow all of these requirements. It is the responsibility of the employer to make its employees aware of all of the above listed requirements and to make certain that all operators are properly trained. **No one should use Magnetek products prior to becoming familiar with and being trained in these requirements and the instructions and safety recommendations for this manual.**

Product Warranty Information

For information on Magnetek-brand product warranties by product type, please visit www.columbusmckinnon.com/magnetek.

DANGER, WARNING, CAUTION and NOTE Statements

Read and understand this manual before installing, operating, or servicing this product.

The following conventions indicate safety messages in this manual. Failure to heed these messages could cause fatal injury or damage products and related equipment and systems.

DANGERS, WARNINGS and CAUTIONS

Throughout this document DANGER, WARNING, and CAUTION statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING

- Read this user manual in its entirety before installing Intelli-Lift™ software.
- DO NOT connect or disconnect wiring or perform signal checks while the electrical power is ON.
- Improper programming with this software can lead to unexpected, undesirable, or unsafe operation.

Failure to observe these and other precautions indicated in this manual will expose the user to high voltages, resulting in serious injury or death. Damage to equipment may also occur.

CAUTION

No patent liability is assumed with respect to the use of the information contained herein. Moreover, Magnetek is constantly improving its high-quality product; therefore, the information contained in this manual is subject to change without notice. Every precaution has been taken in the preparation of this document. Nevertheless, Magnetek assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained in this publication.

NOTE: *A NOTE statement is used to notify installation, operation, programming, or maintenance information that is important, but not hazard-related.*

Table of Contents

1 Introduction

The Magnetek® Intelli-Lift™ system, part of the Intelli-Crane™ portfolio of products, uses a sensor placed on the hoist rope that measures the angle of the hook compared to the hoist. If the angle of the hook exceeds the defined limit, hoisting will automatically stop until the user corrects the angle to meet the defined limit. The sensor and controller determine if the hook is off-center or snagged. The controller will then assert control of the Variable Frequency Drives (VFDs) installed on the crane to prevent motion if the hook is off-center or snagged.

The Intelli-Lift system contains two enclosures that work in tandem, the “control enclosure” and the “status control light box.” Mount the “control enclosure” near the VFDs or controls of the crane. The “status control light box” contains the status lights and should be mounted near the hoist, preferably within easy view of the operator.

Four status lights mounted on the “remote enclosure” indicate if the hook is off-center; these amber-colored lights are positioned in the four cardinal directions. The enclosure features two additional lights, one green light positioned in the middle of the four cardinal direction lights to indicate when the hook is centered and when hoisting can occur. The final light, which is red, is positioned in one of the corners of the system for the bypass indicator.

If the hook is off-center, the user can either manually correct the hoist location, use the bypass mode, or trigger the crane to automatically center the hook. The user triggers the “auto-center” process. The user holds down a control switch from the radio, pendant or control system that is wired to the Auto-Center Request Input on the Intelli-Lift control terminals. Bypass mode disables the protective lifting features of the Intelli-Lift, which allows the crane to operate as if the Intelli-Lift is not there. The system logs entry into and exit out of this mode and allows the user to set a time limit with the web-based user interface (UI).

Intelli-Lift systems are suitable for applications in which the tilt sensor can be mounted on a wire rope hoist that remains perpendicular to the ground during the entire lifting range.

1.1 Intelli-Lift Products

Intelli-Lift Description	Catalog Part Number
Intelli-Lift Correction with Festoon Control & Wireless Interface	OCPP-AM-F-W
Intelli-Lift Correction with Festoon Control & PC Interface	OCPP-AM-F-P
Intelli-Lift Detection with Visual Indication with PC Interface	OCPP-DETECT-P
Intelli-Lift Detection with Visual Indication with Wireless Interface	OCPP-DETECT-W

OCPP - Off-Center Pick Prevention
AM - Auto or Manual Correction; Inhibits hoist and traverse motion
DETECT - Detection only; Does **NOT** inhibit traverse motion. Hoist motion inhibited with optional output signal
F - Festoon or wired option for new or retrofit installations
W - Wireless user interface from the plant floor
P - PC connection for programming for those customers sensitive to wireless communications in the plant

1.2 Product Descriptions

Off-Center Pick Prevention
Off-Center Pick Prevention is the product offering that provides alignment of the hook and load below the hoist. This product provides visual indications to the operator to properly align the bridge, trolley, rope, hook and load prior to hoisting. This product reduces the risk of the operator lifting a load that is not centered below the hoist, which would cause the load to swing after leaving contact with the ground and lead to potential damage to nearby equipment.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

WARNING

This product is NOT intended to prevent the load from swaying while it is lifted if the hoist is not connected to the center of gravity of the load.

Auto or Manual Correction Product
The Intelli-Lift system works with the motor controls for the bridge, trolley and hoist motion. The customer control for the hoist, bridge and trolley motions must be connected to the Intelli-Lift system. The customer controls from an existing radio, pendant or controller can connect to the Intelli-Lift system at the terminal block provided.

1. Auto Mode - designed to allow the Intelli-Lift system to correct the position of the bridge and trolley to align the hoist, rope and hook above the load when lifting. The status control light box indicates the alignment of the hoist, rope and hook above the load during lifting operations. In this mode the system reviews the angle and position and will start and stop the necessary controls to move to the correct position for a vertical lift. The customer must provide a control signal input from the radio, pendant or control system that starts the auto-correction. The customer will hold down the “hoist up” and “auto-correct” buttons for the initial lift to allow the system to correct any position error.
2. Manual Mode - designed to allow the operator to correct the position of the bridge and trolley to align the hoist, rope and hook above the load when lifting. In this mode the system reviews the angle and position and provides indication to the status control light box which direction the operator needs to move to center the hoist, rope and hook for a vertical lift.

Detection Product
The detection product offering does not interact with the controls of the bridge or trolley. The detection system incorporates the Intelli-Lift rope sensor and the status control light box. Once installed, the detection monitors the rope angle and provides indication to the operator which direction the bridge and trolley need to move to center the hoist, rope and hook above the load. The operator must connect the hook to the load and take up any slack in the rope before lifting the load off the ground or platform so the system sees the rope angle and provides feedback. The detection system does have a “hoist up” stop output that can be tied into the hoist control in order to stop the hoisting if the hook is off-center.

Festoon Control

The Intelli-Lift Auto and Manual product offering has two enclosures that require installation. The status control light box must be installed at the hoist for the operator and the control box must be installed at the enclosure for the bridge, trolley and hoist motions. Use a festoon system or control wiring to connect the two boxes. This solution works with new or retrofit installations.

Wireless User Interface

Intelli-Lift features a user interface that does not require special software or Programmable Logic Controller (PLC) programming knowledge.

1. Access the user interface by connecting to the wireless Wi-Fi connection from the plant floor. The user interface allows the operator to access the setup of the system and parameter along with fault and troubleshooting information.
2. To connect, open the settings of your smartphone, tablet or PC and connect to the Wi-Fi Network Name: *MagnetekOCP_xxxx* wireless network. In some instances you might need to turn off cellular network or put device in airplane mode.
3. Once connected, open a browser (Chrome, Microsoft Edge, Safari) and type in the IP address 192.168.1.1:8080/webvisu.htm to access the user interface. The camera function or a QR reader can be used to scan the following QR code to resolve the IP address listed.
4. User Interface Default Password is “MagnetekOCP”. This default password can be changed as described below.

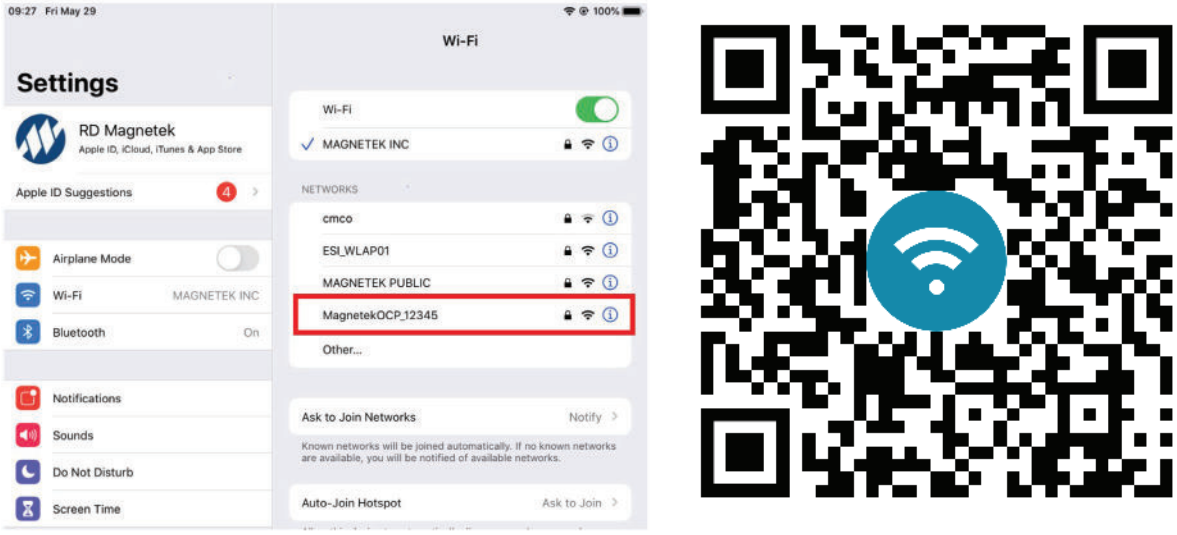


Figure 1-1: Wireless Network Name - MagnetekOCP_xxxx (xxxx is based on the serial number of the unit) Wireless Network Password - MagnetekOCP

For wireless connection details and changing the Wi-Fi Network name and the password, ***see Appendix A – Wireless (Wi-Fi) SSID Setup and Password on page 51*** and ***Appendix B – RJ45 Programming Port Ethernet SSID Setup and Password on page 53*** of the user manual.

PC Connection
Intelli-Lift features a user interface that does not require special software or PLC programming knowledge.

1. Access the user interface by connecting a PC to the provided RJ-45 port on the front of the enclosure. The user interface allows the operator to access the setup of the system and parameter along with fault and troubleshooting information.
2. Once connected, open a browser (Chrome, Microsoft Edge, Safari) and type in the IP address 192.168.1.1:8080/webvisu.htm to access the user interface.
3. User Interface Default Password is “MagnetekOCP”. This default password can be changed as described below.

1.3 System Features

Features	Detection	Manual Correction	Auto Correction
Load Angle Detection	•	•	•
Control Test at Power-Up*	•	•	•
Stop Hoist Motion During Lift	•	•	•
Log Data: Time & Date	•	•	•
Angle Adjustment	•	•	•
Status Control Light Box	•	•	•
Bypass Feature: Key Switch		•	•
Programmable Bypass Time		•	•
Auto-Correct Functionality			•
Side Pull/Snag Prevention		•	•
Off-Center Pick Prevention	•	•	•

*The control system will power LEDs on the control box for the operator to confirm that lights are in working condition.

1.4 Flexible Configurations with User Interface (UI)

Through our web-based UI, a user can perform the following standard operations using an iPhone, iPad, Android mobile, or host computer over Wi-Fi or through the RJ-45 programming port.

- Configure the sensor sensitivity and responsiveness for both bridge and trolley motion
- View alarm and fault history
- View live angular feedback from the sensor

1.5 Intelli-Lift Parts

Components	Spec	Qty
Control Panel	Includes PLC and Wi-Fi	1
Status Control Light Box	Includes PLC and LEDS (Wi-Fi based on version)	1
Angle Sensor	0.1 Degree Accuracy	1
Angle Sensor Mounting Kit		
Mounting Plate (147-20123)	Supports 5/16", 9/16", and 1-3/8" Ropes	2
Mounting Plate (147-20124)	Supports 1/8", 7/8", and 1-1/8" Ropes	2
Cardinal Direction Stickers	North, South, East, West	1 each

1.6 Environmental Ratings and Certifications

Specification	Control and Light Box Enclosures
Operating Temperature	-10° to 50°C (14° to 122°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Vibration	10 to 20 Hz at 9.8 m/s^2
Humidity	95% (non-condensing)
Environmental Classification	NEMA 4X/IP 56
Certification	UL508A Industrial Control Panel Complies with CSA 22.2 No. 14

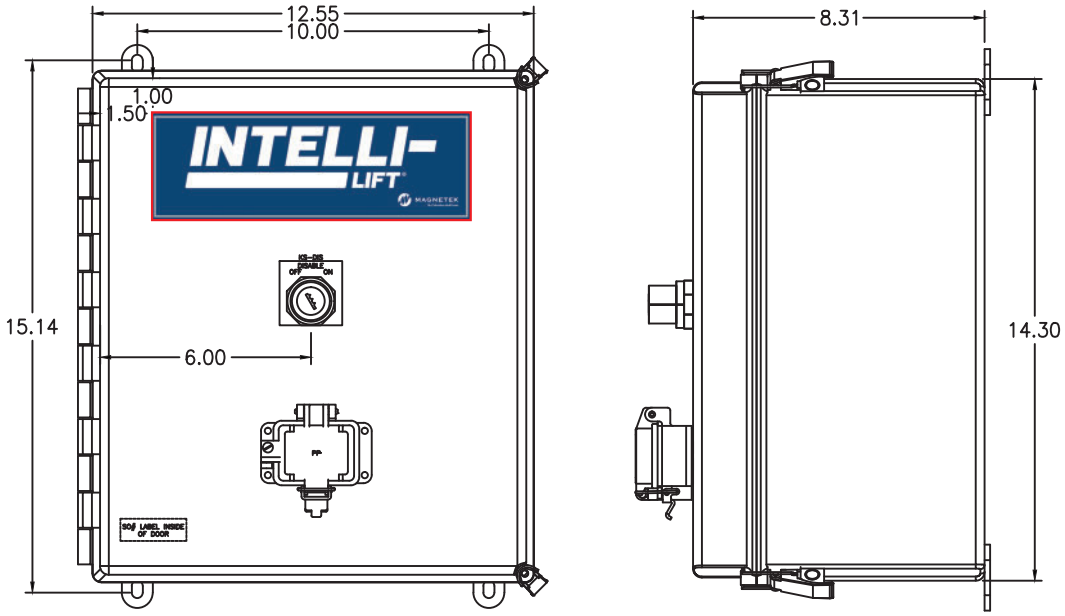
Suitable for outdoor use and direct sunlight. For extreme temperatures, contact Columbus McKinnon.

1.7 Sensor Specification

Specification	Sensor
Resolution	0.1°
Cable Length	13.0 ± 0.5 m (43 ± 1.5 ft)

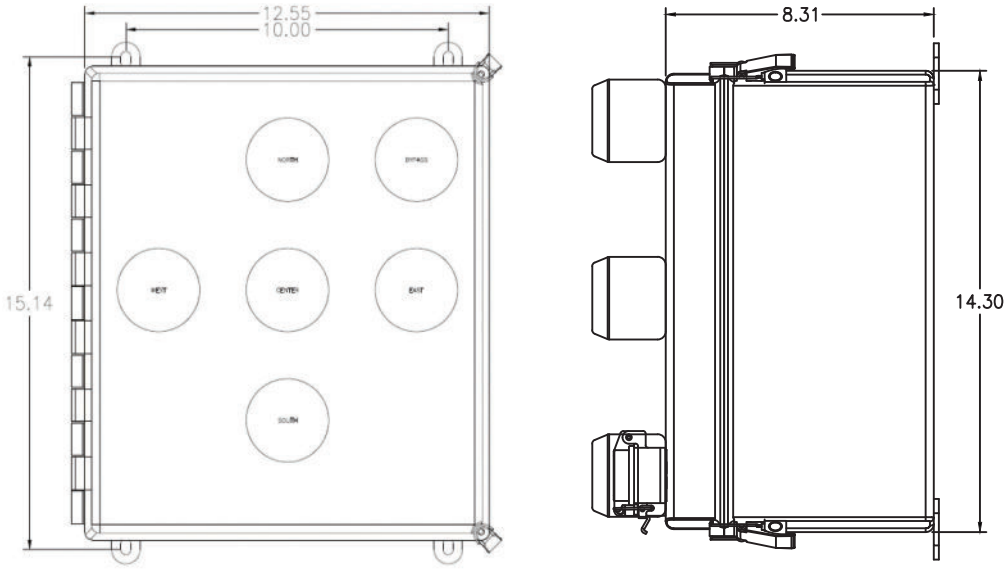
2 Mechanical Installation

2.1 Control Enclosure Auto or Manual Product



- Provided with the Auto and Manual product offering
- External panel-mounted key switch to disable system and allow movement in all directions
- Includes padlock provision

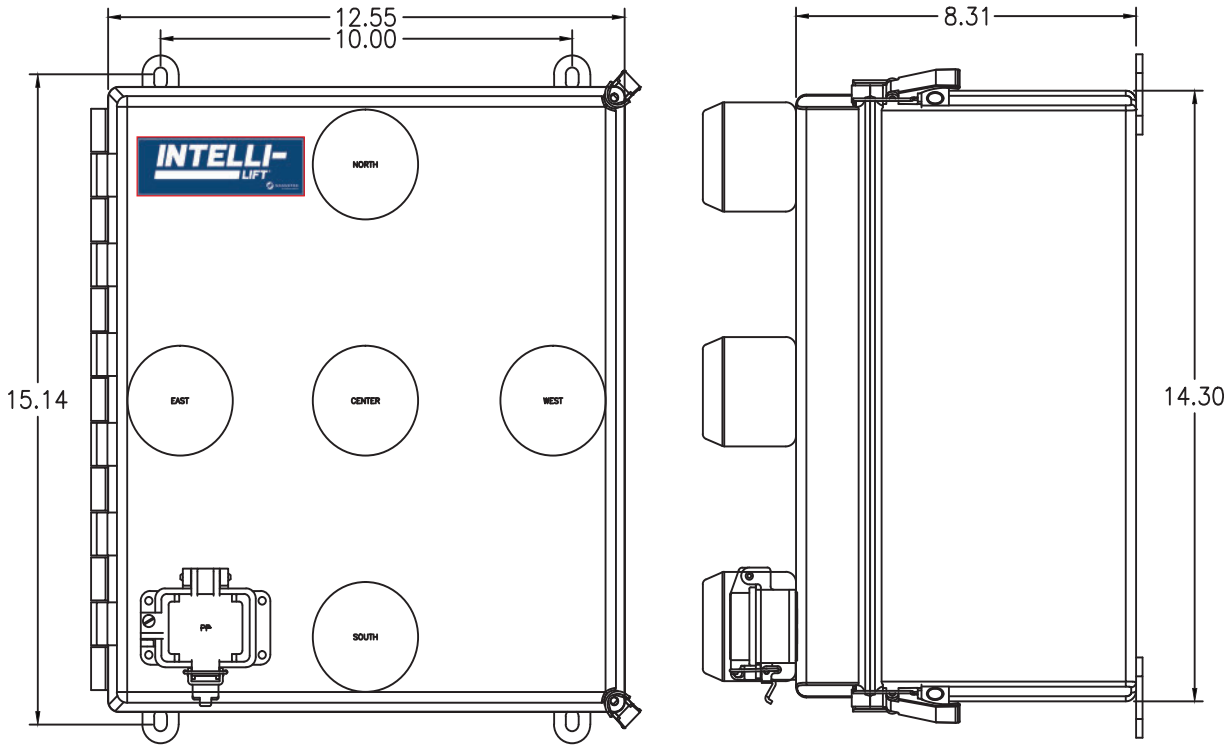
2.2 Status Control Light Box – Auto or Manual Product



- External panel mounted indicator lights to notify operator if the load is centered or off-center
- Bypass indicator light for use when programmed bypass time has been set or if the system disable key switch is set to disable the system
- Includes padlock provision

Light	Function
Center Green	Indicates the hoist, rope and hook are centered
Corner Red Bypass	Indicates the system is disabled or in programmed bypass mode
Four Directional Lights	Indications for which direction the hoist, bridge and trolley need to move to center the hoist, rope and hook

2.3 Status Control Light Box – Detection Product



- External panel mounted indicator lights to notify operator if the load is centered or off-center
- Includes padlock provision

Light	Function
Center Green	Indicates the hoist, rope, and hook are centered
Four Directional Lights	Indications for which direction the hoist, bridge and trolley need to move to center the hoist, rope and hook

NOTE: *The Detection product offering includes a status control light box but does not offer a bypass feature.*

2.4 Mounting Location Considerations

If possible, mount the status control light box onto the trolley near the hoist to provide easy-to-see feedback for the operator.

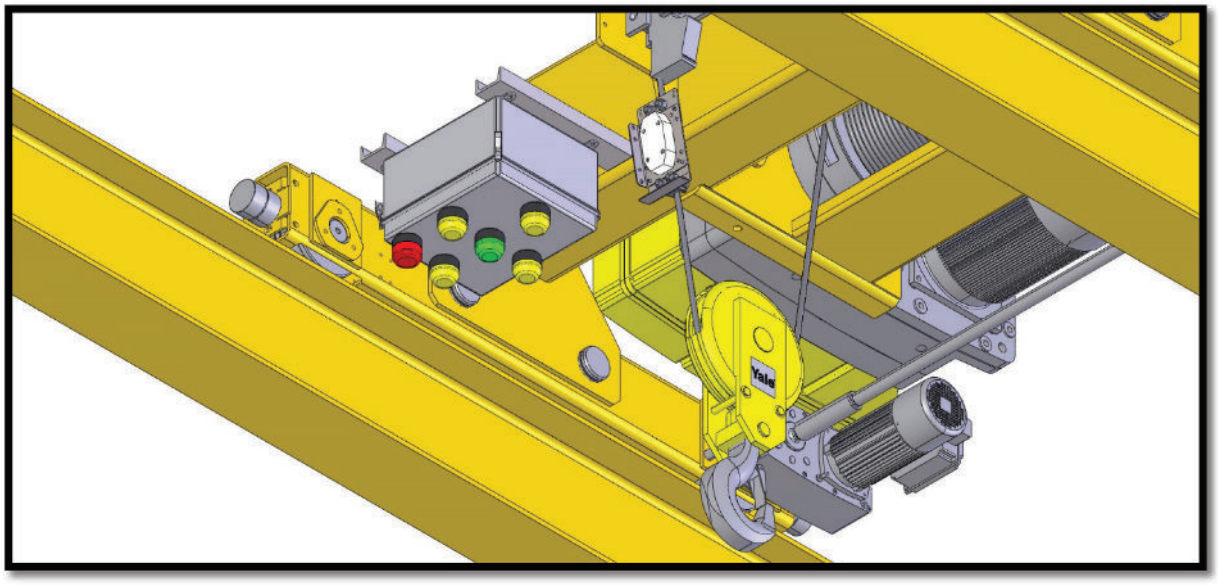


Figure 2-1: Status Control Light Box – Installed on Hoist for Operator Use

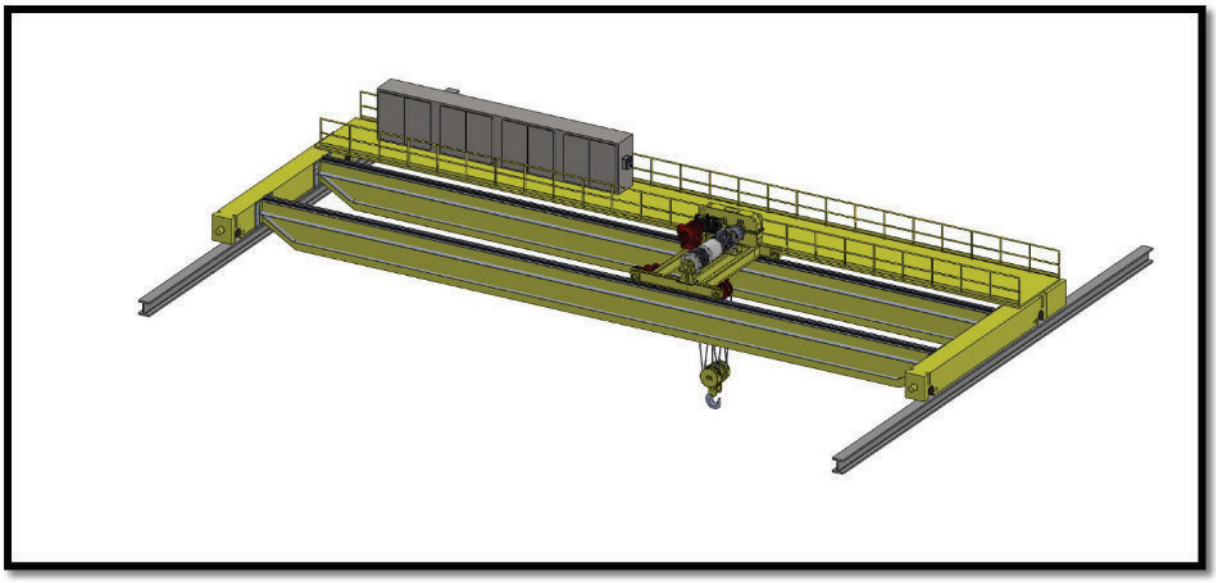


Figure 2-2: Control Enclosure – Mounted with Bridge and Trolley Control Cabinet

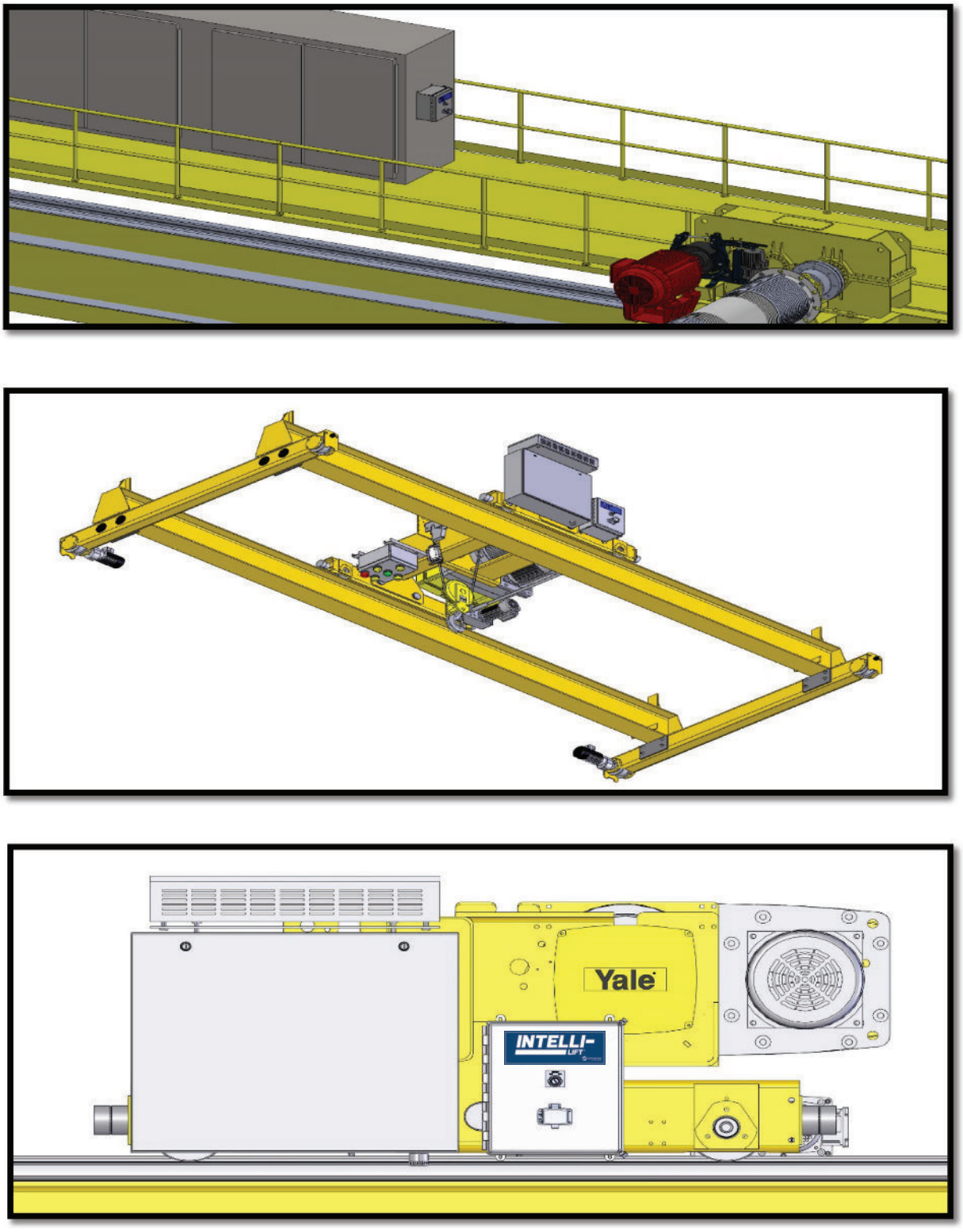


Figure 2-3: Control Enclosure – Mounted on the Hoist

2.5 Sensor Installation

Intelli-Lift and the sensor work with hoists that have a dead end or idler sheave. The sensor must be installed to a static point and not a fully live rope.

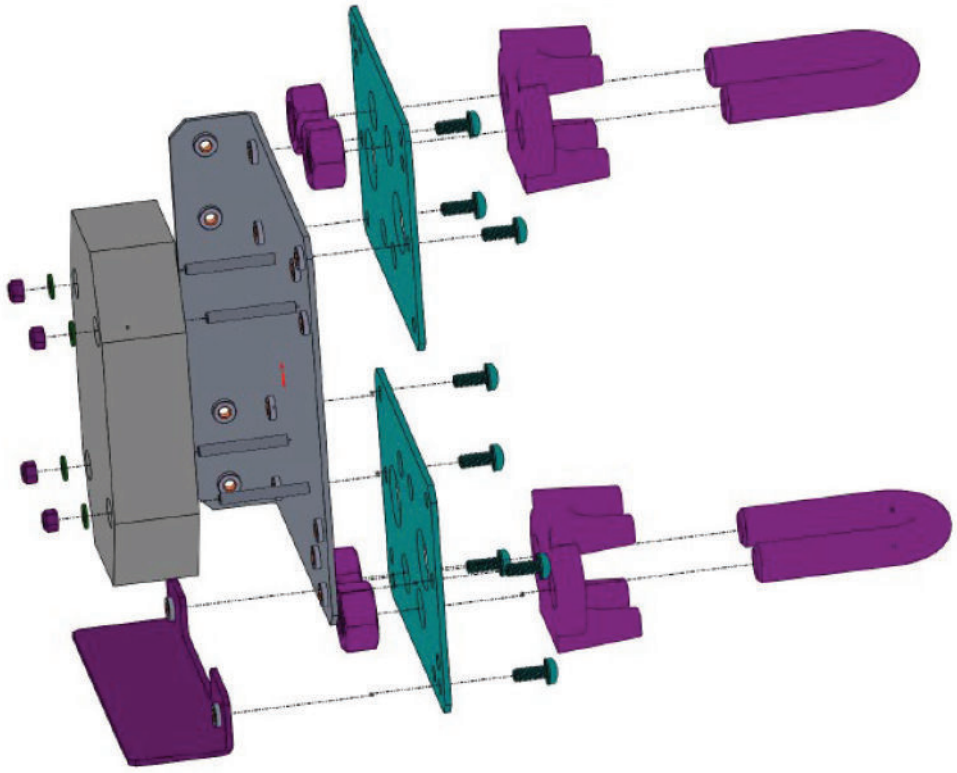


Figure 2-4: Expanded View of Sensor Bracket

Mounting Plate	Cable Clamp Size	Height	Depth	Width	Weight	Cable Range
147-20124	1/8"	7.71"	2.1"	5"	2.5 lbs	1/8" to 1/4" (4 to 6 mm)
	7/8"	10.32"	3.9"	5"	6 lbs	7/8" to 1" (22 to 26 mm)
	1-1/8"	10.44"	4.7"	5"	8 lbs	1-1/8" to 1-1/4" (28 to 32 mm)
147-20123	5/16"	8.45"	2.8"	5"	3 lbs	5/16" to 1/2" (8 to 12 mm)
	9/16"	9.33"	3.6"	5"	5 lbs	9/16" to 3/4" (14 to 20 mm)
	1-3/8"	11.05"	5.6"	5"	12 lbs	1-3/8" to 1-1/2" (34 to 40 mm)

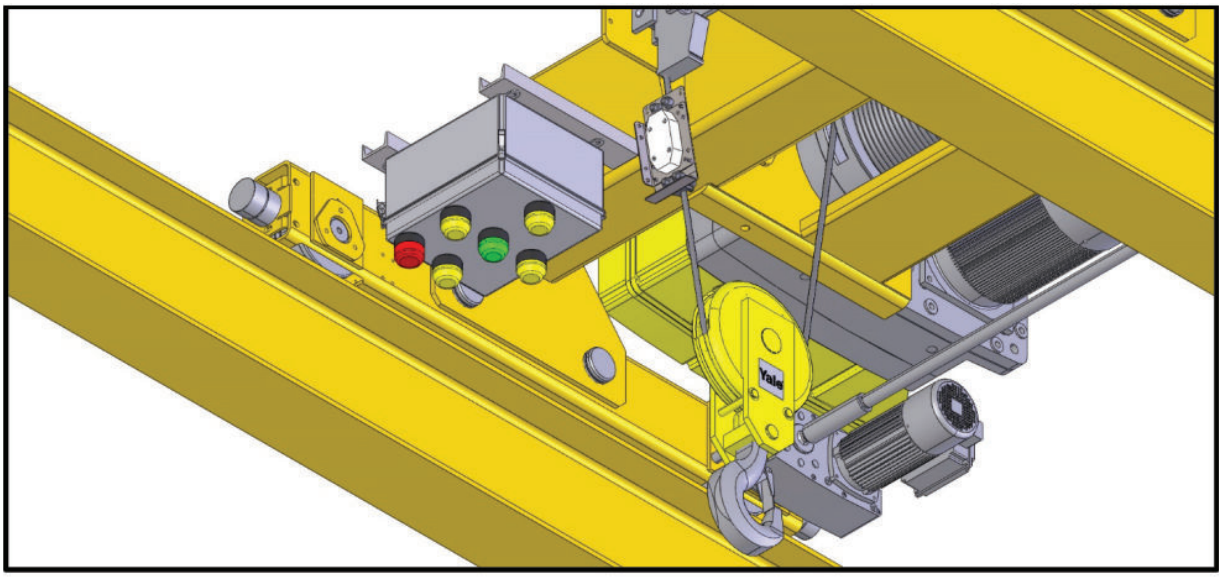


Figure 2-5: Sensor Installation Dead End

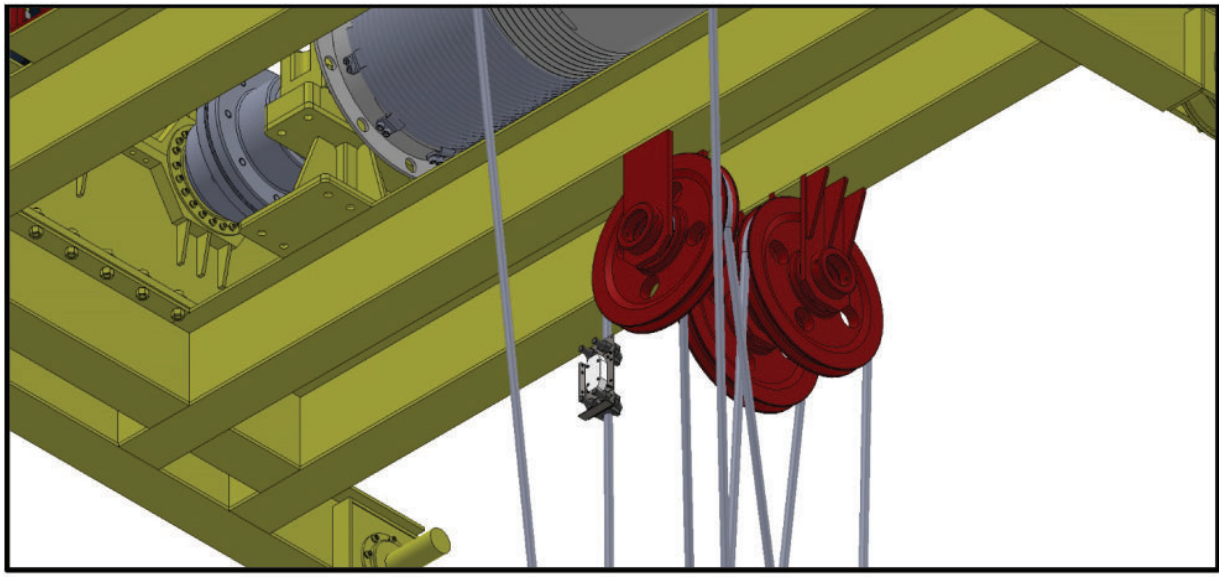


Figure 2-6: Sensor Installation with No Dead End

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

NOTE: *Leave 6 in. between the sensor bracket and the balancing sheave.*

NOTE: *After installing the sensor on the hoist rope, check the upper limit switch setting of the hoist and, if necessary, adjust it to prevent the hoist block from striking the sensor.*

3 Power and Control Wiring

This section provides details on power wiring for the status control light box and control box.

WARNING

THE UNIT MUST BE WIRED TO THE CORRECT VOLTAGE. FAILURE TO DO SO MAY DAMAGE THE SYSTEM.

NOTE: *The unit should not be connected to lines containing excessive power-up transients or continuous commutator noise. If necessary, use a line conditioner in some installations.*

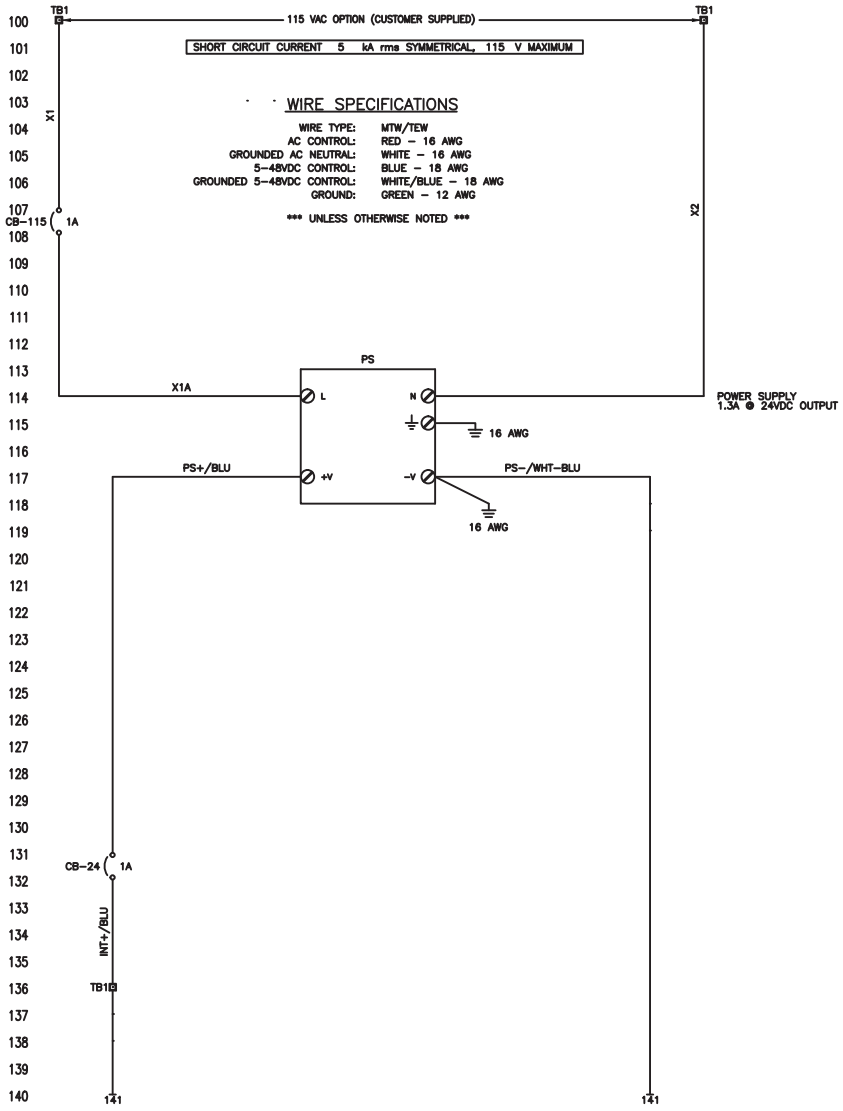


Figure 3-1: Wiring

Control Box **Status Control Light Box**

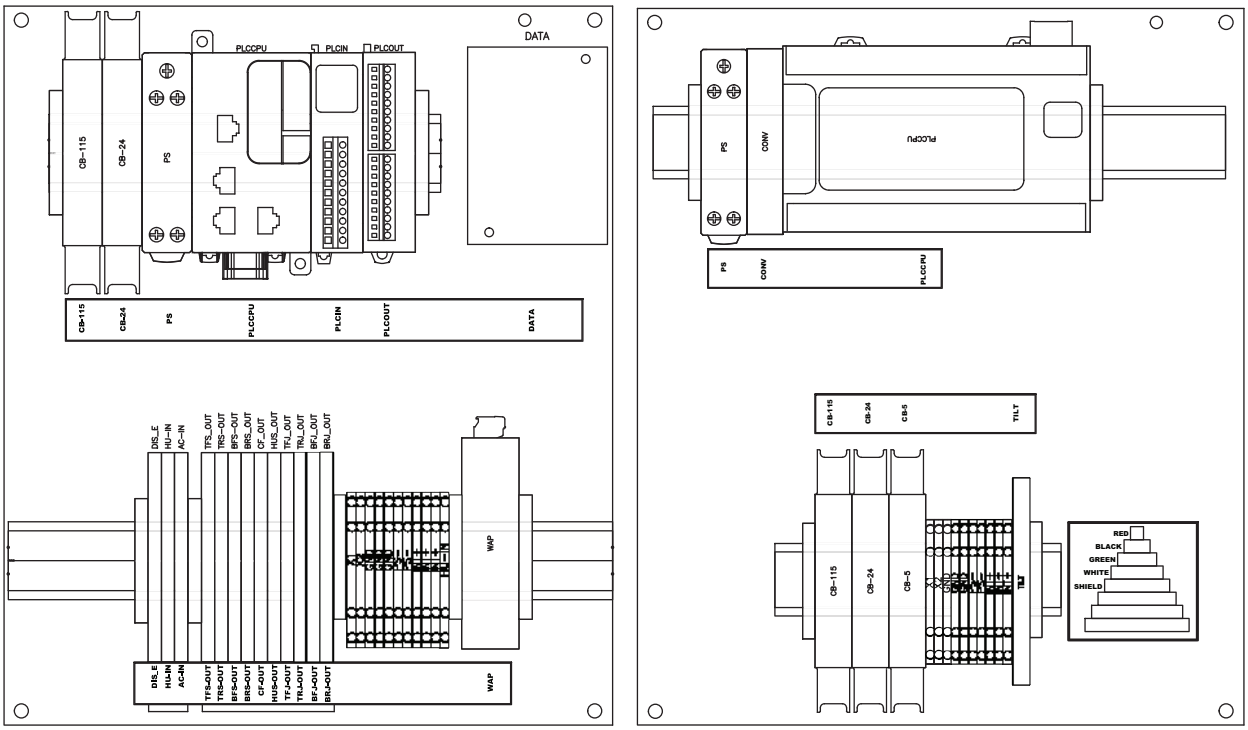


Figure 3-2: Enclosure Layouts

3.1 Intelli-Lift Auto/Manual Control Enclosure

The following diagram shows terminal block connection points for power and control wiring of the Intelli-Lift control box enclosure. The customer supplies 115 VAC, 3 Amp, 60 Hz power. Ensure that power and control wiring follow all necessary national and local standards.

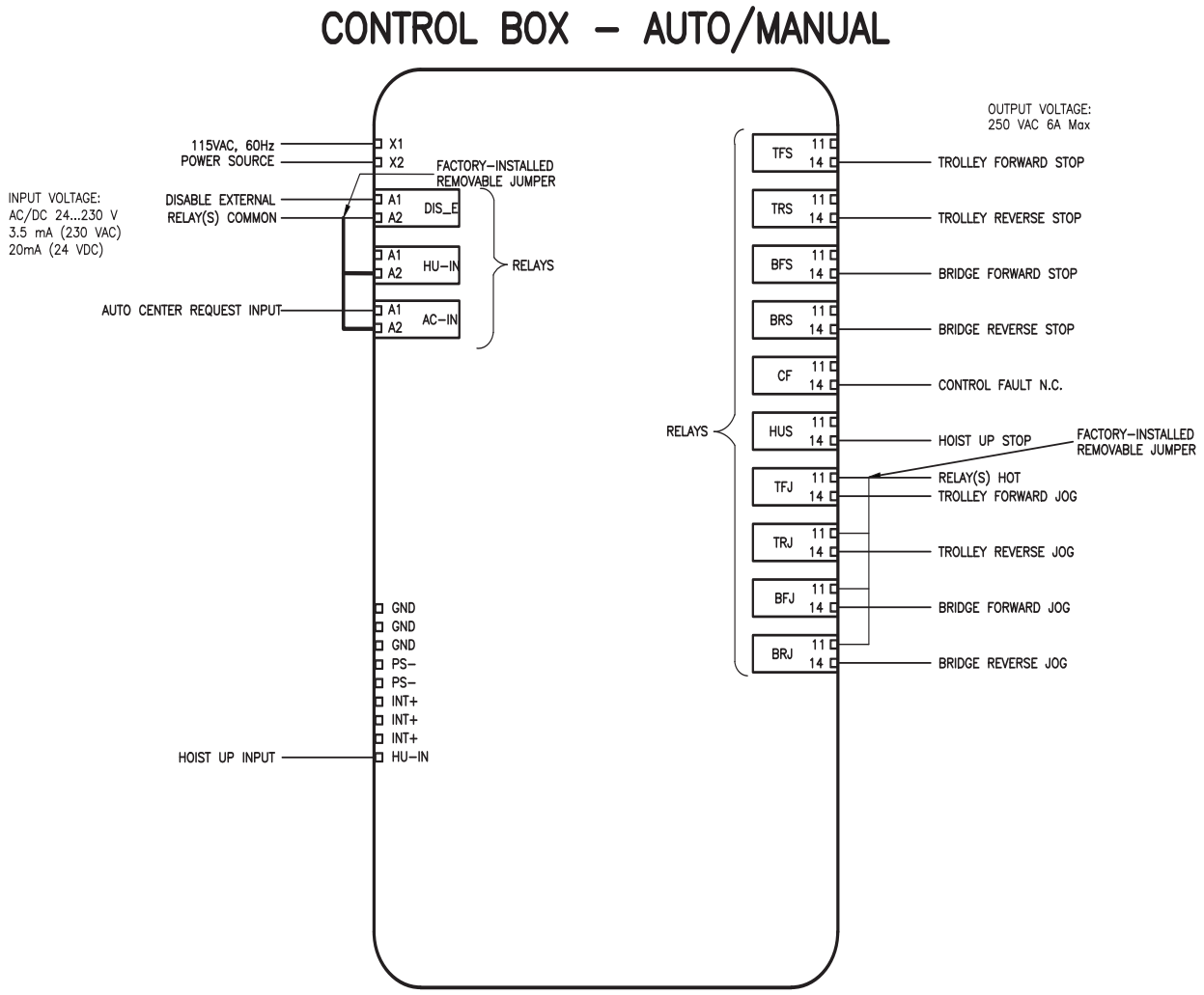


Figure 3-3: Control Enclosure Terminal Block Connection Points

The system includes factory-installed removable jumpers to make wiring easier for the inputs and outputs.

Intelli-Lift works with the current control system, radio or pendant control for the hoist, trolley and bridge motions. The commands from the control system must be wired to the Intelli-Lift input and output terminals to control the motions and stop movement of the hoist, trolley or bridge if the system detects a snag, side pull or off-center lift taking place.

NOTE: *When power is applied to the system, the wireless communication needs to be established. This can take 45-60 seconds. To avoid this delay, provide a separate power source for Intelli-Lift system or order Intelli-Lift wired version.*

Function	Terminal	Description
User Inputs	AC-IN	Auto-center request input
	HU-IN	“Hoist up” input from control system, radio or pendant
	DIS-E	External disable input
User Outputs	TFS	Trolley forward stop output relay
	TRS	Trolley reverse stop output relay
	BFS	Bridge forward stop output relay
	BRS	Bridge reverse stop output relay
	CF	Control fault output relay
	HUS	“Hoist up” stop output relay
	TFJ	Trolley forward jog output for auto-centering
	TRJ	Trolley reverse jog output relay for auto-centering
	BFJ	Bridge forward jog output relay for auto-centering
	BRJ	Bridge reverse jog output relay for auto-centering

1. Inputs – Include removable jumpers for the common leg of the relay inputs.
2. Outputs – Designed for fail-safe operation, the control outputs are wired to an external controller, drive or contact that controls the trolley, bridge and hoist motions.
3. AC-IN – The auto-center request input is needed for those customers wanting the system to auto-correct the position. This input, along with the “hoist up” input and the outputs to the hoist, trolley and bridge, are required for auto-positioning.
   - Auto Mode – If the operator uses the AC-IN input, the system will auto-correct. If this input is not used, the system will default to Manual mode. The system does not require programming for the selection of Auto or Manual modes.
   - Manual Mode – If the AC-IN input is not used, the system defaults to Manual mode. The system does not require programming for the selection of Auto or Manual modes.
4. DIS-E – External disable input that can be tied to a customer control system or externally mounted control switch. This input has the same functionality as the disable on the front of the Intelli-Lift control box. It disables the functionality. This is not an electronic bypass of the wiring inside the control box.
5. Jog Outputs – The jog output allows the Intelli-Lift system to normalize and to take up slack in the rope. Includes removable jumper from the factory for common power connection to each relay.
6. CF – Control fault output for optional connection to a fault input on an external drive or to connect to other desired devices such as external enunciators in the event of an Intelli-Lift fault. Faults include sensor calibration faults, loss of sensor communications or other system faults.

Details on trolley and bridge wiring to the external controller, Variable Frequency Drives (VFDs) or contactor control appear in Intelli-Lift control outputs (***see Magnetek Application Examples on page 46***).

3.2 Intelli-Lift Status Control Light Box

The following diagram shows terminal block connection points for power and control wiring of the Intelli-Lift status control light box. The customer supplies 115 VAC, 3 Amp, 60 Hz power. Ensure that the power and control wiring follows all necessary national and local standards.

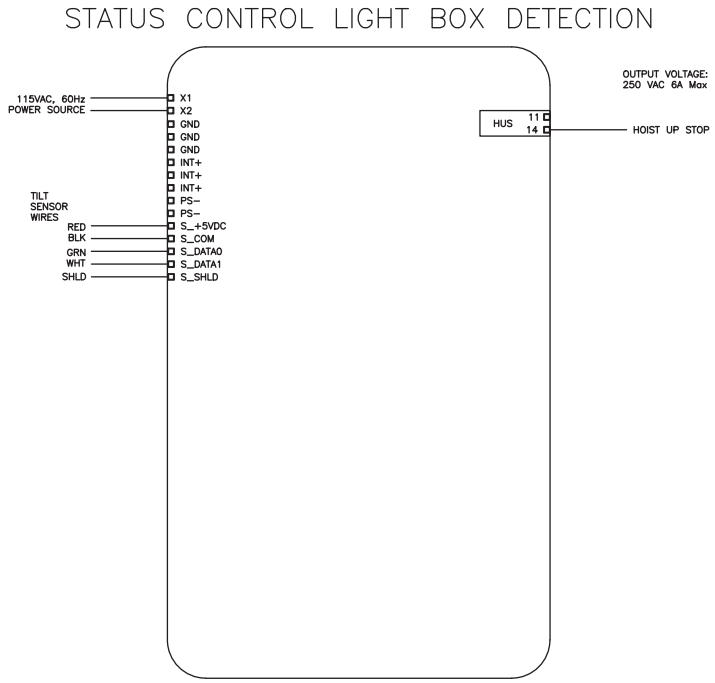
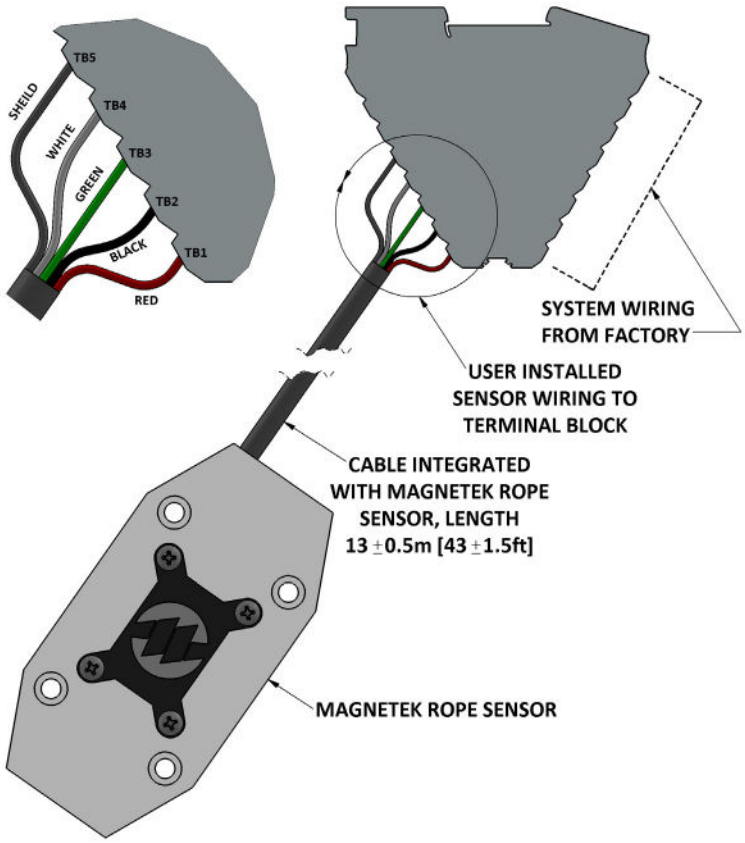
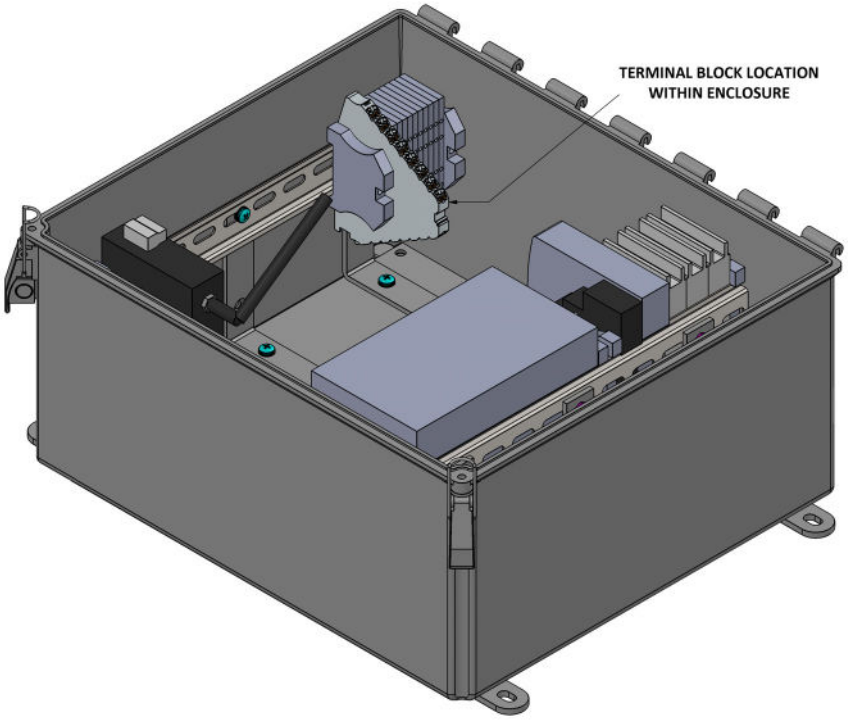


Figure 3-4: Status Control Light Box Terminal Block Connection Points

Function	Terminal	Description
Sensor Wiring	S_+5VDC	5 VDC to power sensor
	S_COM	Common control point for sensor
	S_DATAO	Data output to the sensor
	S_DATAI	Data input from the sensor
	S_SHLD	Shield for sensor control wiring
User Outputs	HUS	“Hoist up” stop


TB5
SHEILD
TB4
WHITE
TB3
GREEN
TB2
BLACK
TB1
RED
SYSTEM WIRING
FROM FACTORY
USER INSTALLED
SENSOR WIRING TO
TERMINAL BLOCK
CABLE INTEGRATED
WITH MAGNETEK ROPE
SENSOR, LENGTH
13 ±0.5m [43 ±1.5ft]
MAGNETEK ROPE SENSOR


TERMINAL BLOCK LOCATION
WITHIN ENCLOSURE

4 User Interface (UI)

The web visualization monitors the Intelli-Lift system and configures system parameters.

1. Access the web visualization by connecting to the wireless access point and going to 192.168.1.1:8080/webvisu.htm in a browser. Default password is MagnetekOCP.
2. If the Intelli-Lift does not have the wireless access point, then connect an Ethernet cable to the RJ-45 port on the base enclosure to a PC and go to 192.168.1.1:8080/webvisu.htm in a browser.
3. On initial start-up, the first-time setup screens will appear.
4. Once first-time setup is complete, the main screen will appear. The main screen serves as the central navigation point.
5. The “ALM” box in the upper-right corner of all screens (except first-time setup screens) changes from white to red when a fault or alarm occurs.

NOTE: *When accessing the user interface for Intelli-Lift, the QR code below can be scanned with the phone or tablet camera to access the web interface.*

4.1 First-Time Setup

The first-time setup screens appear after installation. The screens guide the user to set values for parameters that vary depending on the system and are required for system operation.

1. Selecting a drop-down box will display the available options for the parameter.
2. Selecting the “?” button will open a dialog window that shows the description of that parameter.
3. Selecting the “Confirm” button will save the parameter value selections and move to the next setup screen.
4. The first-time setup only appears the first time a user applies power to the control boxes and access the user interface. After the initial setup, the first-time setup screens will no longer appear. Users can still access all parameters from the selections on the main screen.

First Time Setup Requirements

Step	Action Required
1	**Set Bridge & Trolley Directions** – System orientation related to cardinal directions with forward and reverse direction control: north, south, east, west
2	**Set Sensor Face Direction** – System orientation of the sensor related to cardinal direction: north, south, east, west
3	**Set Date and Time** – Time and date stamp for event log

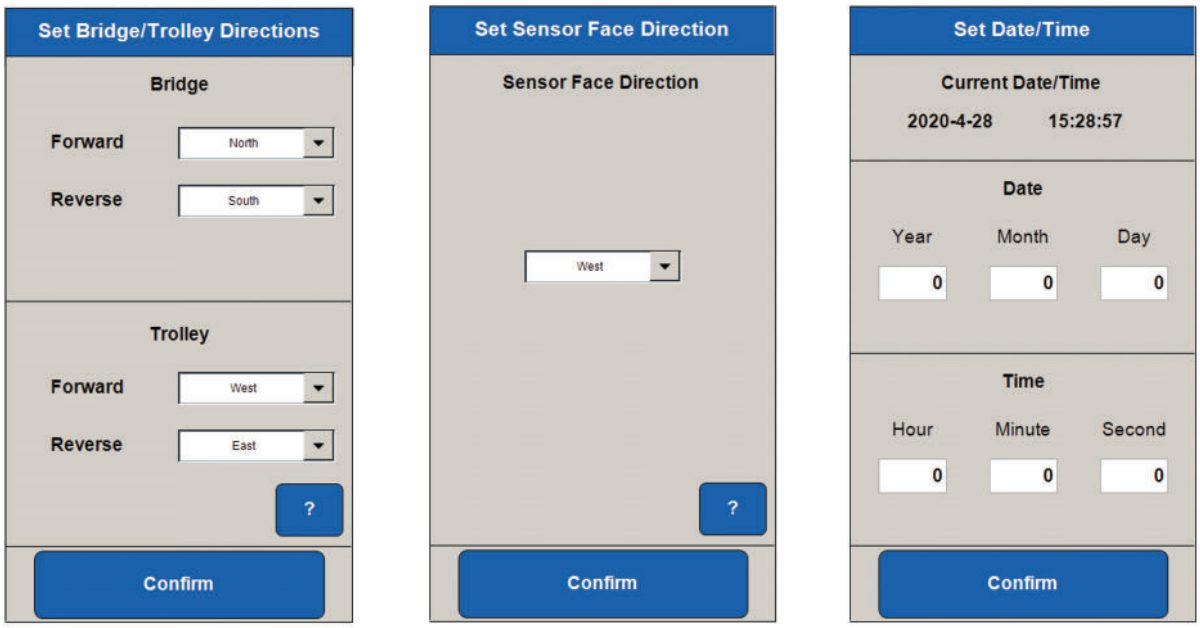


Figure 4-1: First-Time Setup Screens

4.2 Main Screen

The main screen serves as the central navigation point of the system.

1. After the first-time setup is completed this screen will appear every time the user connects to the Intelli-Lift. The current date and time display in the upper right corner of the screen.
2. Selecting the "?" will bring up the main menu help screen.

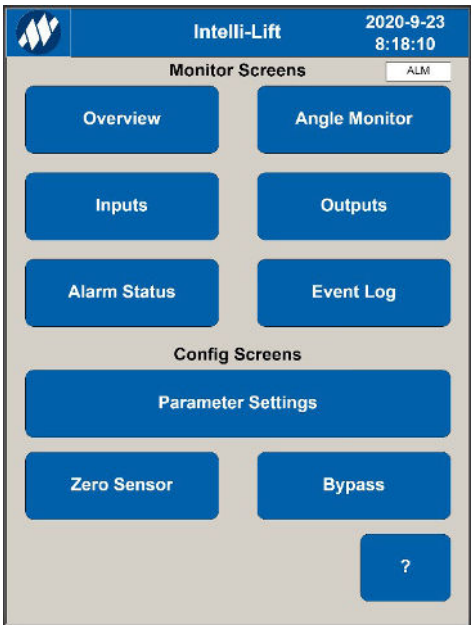


Figure 4-2: Main Screen

4.3 Overview Screen

The overview screen shows the cardinal directions in relation to the bridge and trolley.

1. The bridge and trolley will be centered on the screen. The “Bridge Forward” label will appear on the top of the screen, and the “Bridge Reverse” label will appear on the bottom of the screen. The “Trolley Forward” label will appear on the right of the screen, and the “Trolley Reverse” label will appear on the left of the screen. The angle sensor symbol will display on the outside of the bridge/trolley symbols towards the cardinal direction based on the “sensor face direction” parameter setting.
2. Select the “Main” button to return to the main screen.

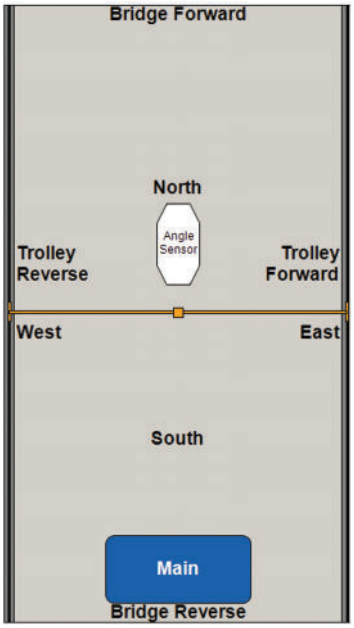


Figure 4-3: Overview Screen

4.4 Angle Monitor Screen

The angle monitor screen allows the user to monitor the angle of the four cardinal directions and the state of the status lights and bypass horn.

1. If the output is inactive (OFF), the corresponding circular indicator will appear white. If the output is active (ON), the corresponding circular indicator will be the color of the LED on the light box. If the bypass horn is active, the indicator will appear red.
2. Selecting the “Main” button returns the user to the main screen.

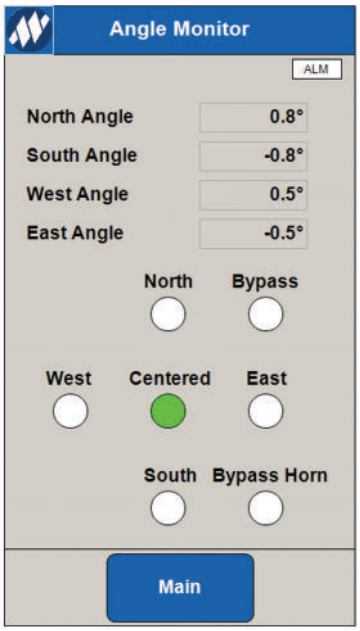


Figure 4-4: Angle Monitor Screen

4.5 Input/Output Screen

The inputs and outputs screens allow the user to see what the PLC input and output states tied to the hoist, bridge and trolley motions.

1. Use the screen can be used to diagnose faulty inputs or outputs during installation or during a system fault. The circular indicators located on the left side of each name show the state of the corresponding input or output. Green means “on” and white means “off.”
2. Selecting the “Main” button will return the user back to the main screen.

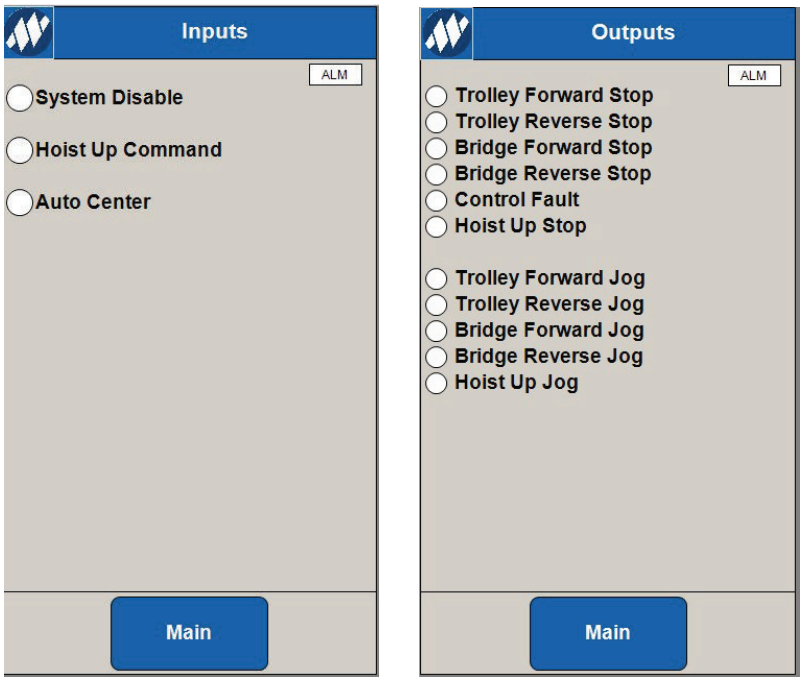


Figure 4-5: I/O Screen

4.6 Alarms Status Screen

The alarm status screen will show the description of all active alarms.

1. If no alarms are active, the alarm description list will be empty.
2. Select the “Main” button to return to the main screen.

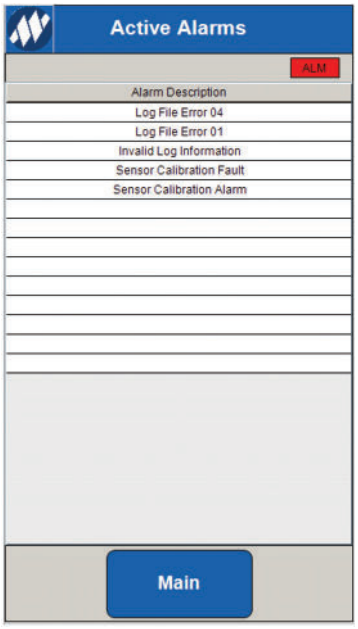


Figure 4-6: Active Alarms Screen

4.7 Event Log Screen

The event log screen shows a list of the date, time and description of the last 100 logged events.

1. The information pertaining to the most recent logged event appears at the top of the list. When the maximum number of logged events is exceeded, the information pertaining to the oldest logged event disappears from the list.
2. Select the “Main” button to return to the main screen.

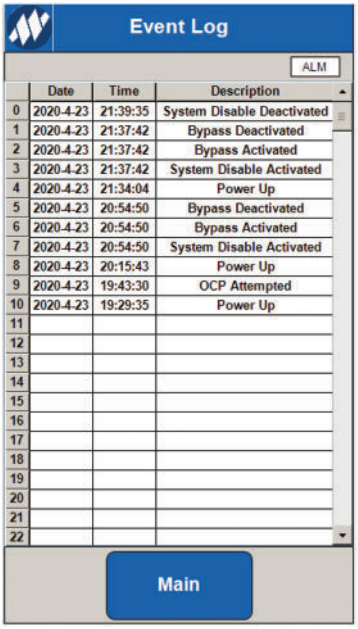


Figure 4-7: Event Log Screen

4.8 Parameter Settings Screens

Use the “Parameter Settings” screen to access all parameter screens by selecting the parameter buttons. Select the “Main” button to return to the home screen.

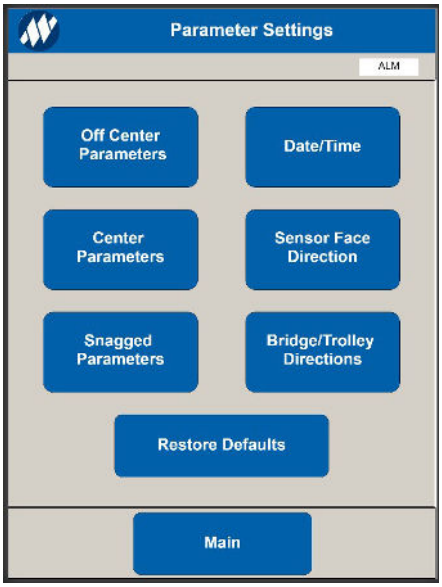


Figure 4-8: Parameter Settings Screens

4.9 Bypass Settings

This feature defines the amount of time to allow bypass to stay active. Once this time expires, bypass mode deactivates.

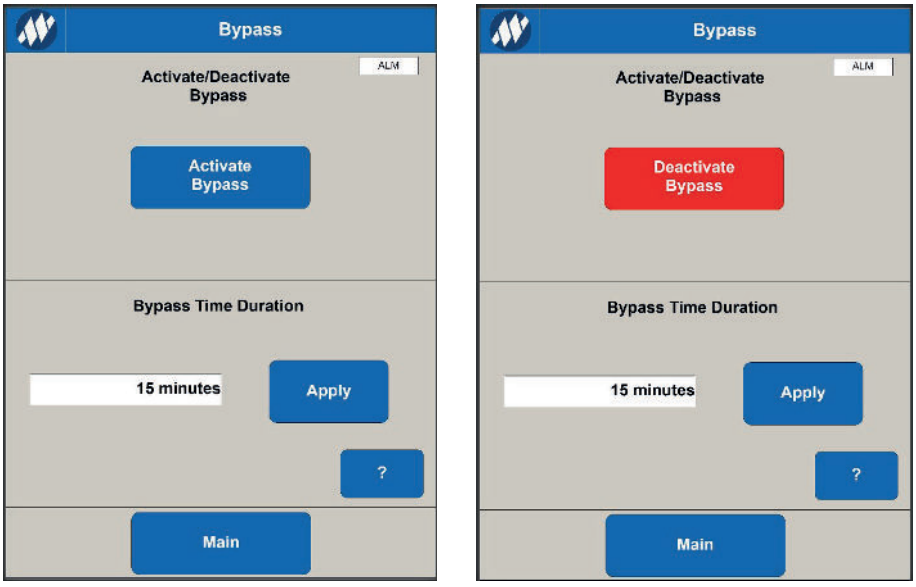


Figure 4-9: Bypass Activated and Deactivated Screens

5 Parameters

Use the parameter screens to set values for each parameter.

1. Select a text box to open a numeric keypad so you can enter the desired parameter value.
2. Select a drop-down box to display the available options for that parameter.
3. Select a “?” button to open a dialog window that shows the description of the parameter corresponding to the location of the “?” button.
4. Select the “Apply” button to save all parameter values on the current screen and return the user to the “Parameter Settings” screen.
5. Select the “Cancel” button to revert all changes to the last saved parameter values and return the user to the “Parameter Settings” screen.

5.1 Off-Center Filter Parameters

The “Angle Trip Limit” parameter serves as the angle threshold to determine if the hook is off-center.

1. If the angle of the hook exceeds this level, the system will prevent hoisting and the respective indication light will illuminate.
2. The “Sensitivity Level” parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.

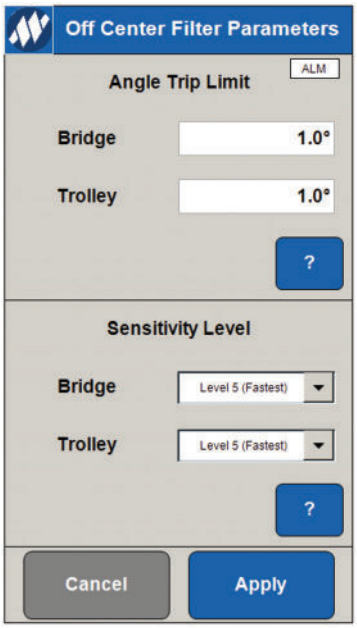


Figure 5-1: Off-Center Filter Parameter Screen

5.2 Centered Filter Parameters

The “Angle Trip Limit” parameter serves as the angle threshold to determine if the hook is centered below the hoist.

1. Use this level to support the auto-center feature.
2. The “Sensitivity Level” parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.

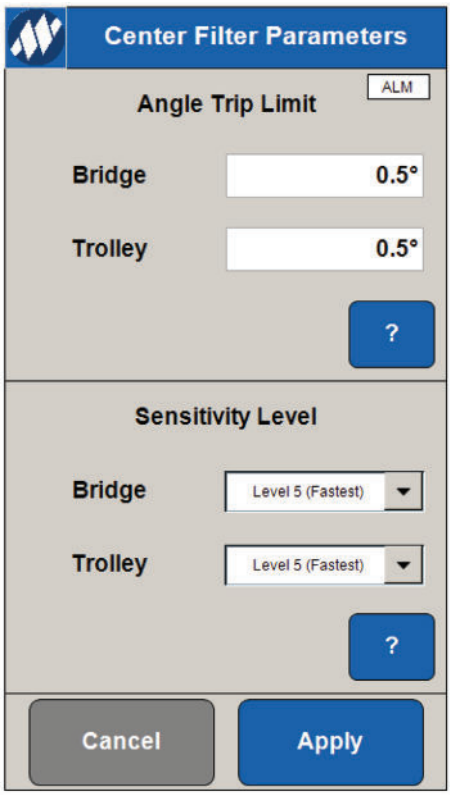


Figure 5-2: Center Filter Parameter Screen

5.3 Snagged Filter Parameters

The “Angle Trip Limit” parameter serves as the angle threshold to determine if the hook is snagged.

1. Use this level only for the snag detection feature.
2. The “Sensitivity Level” parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.

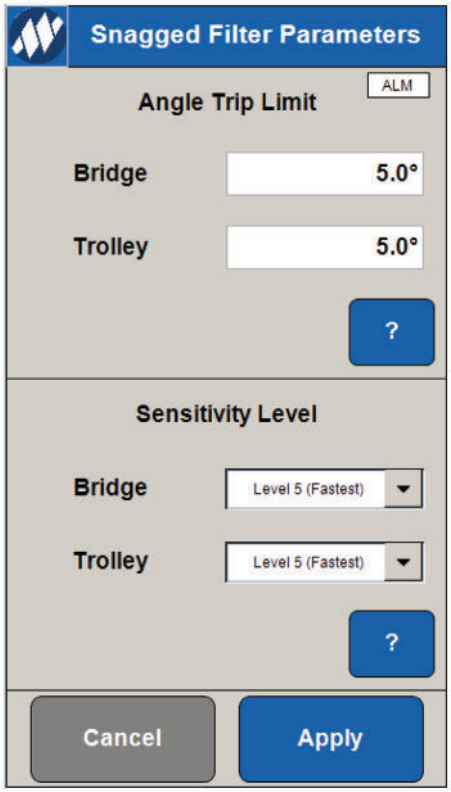


Figure 5-3: Snagged Filter Parameter Screen

5.4 Parameter List

Name	Description	Default Value	Min. Value	Max. Value
Off-Center Angle Trip Limit Bridge	This parameter serves as the angle threshold to determine if the hook is off-center. If the angle of the hook exceeds this level, the system will prevent hoisting and the respective indication light will illuminate.	1.0°	0.0°	15.0°
Off-Center Angle Trip Limit Trolley	This parameter serves as the angle threshold to determine if the hook is off-center. If the angle of the hook exceeds this level, the system will prevent hoisting and the respective indication light will illuminate.	1.0°	0.0°	15.0°
Off-Center Sensitivity Level Bridge	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5
Off-Center Sensitivity Level Trolley	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5
Centered Angle Trip Limit Bridge	This parameter serves as the angle threshold to determine if the hook is centered below the hoist. Use this level to support the auto-center feature.	0.5°	0.0°	1.0°
Centered Angle Trip Limit Trolley	This parameter serves as the angle threshold to determine if the hook is centered below the hoist. Use this level to support the auto-center feature.	0.5°	0.0°	1.0°
Centered Sensitivity Level Bridge	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5
Centered Sensitivity Level Trolley	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5
Snagged Angle Trip Limit Bridge	This parameter serves as the angle threshold to determine if the hook is snagged. Use this level only for snag detection.	5.0°	3.0°	15.0°
Snagged Angle Trip Limit Trolley	This parameter serves as the angle threshold to determine if the hook is snagged. Use this level only for snag detection.	5.0°	3.0°	15.0°
Snagged Sensitivity Level Bridge	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5
Snagged Sensitivity Level Trolley	This parameter defines the sensitivity of the angle filter. The higher the sensitivity, the quicker the filter will respond.	Level 5	Level 1	Level 5

Name	Description	Default Value	Min. Value	Max. Value
Bypass Time Duration	This parameter defines the amount of time to allow bypass to stay active. Once this time expires, bypass mode deactivates and requires the user to re-trigger it.	15 min.	2 min.	90 min.
Sensor Direction	The sensor cannot always be mounted based on true north. This parameter defines which direction the name plate faces.	West	North South West East	
Date/Time	This parameter allows the user to set the date and time of the system and keeps track of the time that has been set by the user.	YY/MM/DD 0:00.0	Year, Month, Day Hour, Minute, Second	
Activate/Deactivate Bypass	This parameter allows the user to activate or deactivate bypass mode.	Deactivated	Activated, Deactivated	
Bridge Forward	This parameter defines which cardinal direction the hook will move toward when a bridge command is activated.	West	North, South, East, West	
Bridge Reverse	This parameter defines which cardinal direction the hook will move toward when a bridge command is activated.	West	North, South, East, West	
Trolley Forward	This parameter defines which cardinal direction the hook will move toward when a trolley command is activated.	West	North, South, East, West	
Trolley Reverse	This parameter defines which cardinal direction the hook will move toward when a trolley command is activated.	West	North, South, East, West	

5.5 Level Settings

The installation and setup process will be unique for the differences in crane installations, mechanics and environments.

1. Fine-tune the system during the setup process to help it respond as quickly as possible to a snag, side pull or off-center lift.
2. The system provides filtering for the hoist, bridge and trolley motions.
3. Adjust the filter sensitivity level to increase or reduce the response of the filtering. The fastest response and highest level of protection is at the Level 5 selection for the given parameter. Adjusting the level down to level 4, 3, 2 or 1 will decrease the sensitivity and dampen the affects. The default and recommended setting are Level 5.
4. If false trips occur, adjust the settings to Level 4 and try the operations again.

6 System Start-Up

Follow these steps to set up the Intelli-Lift system for Auto, Manual and Detection products.

1. On power-up, verify that each LED is powered on for 5 seconds.
2. Once the 5 seconds has elapsed and the system is powered on, the center green light and the red bypass light should turn off, leaving the four amber cardinal lights illuminated. This indicates that the sensor has not been calibrated yet.
3. Using the web-based UI, go through the ***First-Time Setup on page 27***.
4. Lower the crane hook to where your ideal zero position will be. This will be the position where the load is considered center under the crane. The hook should not touch the floor.
5. Using the zero-sensor button on the main screen in the web-based UI, zero the sensor. This will set the crane's zero position; the four cardinal amber LEDs will turn off and the center green LED will turn on. From this point the system is operational and will begin to work. **If the sensor does not perform the calibration or if the four amber LEDs stay on, check the wiring to the sensor itself.**

7 System Verification

Follow these steps to set up the Intelli-Lift system for Auto and Manual correction products.

1. While the system is centered, command the hoist to lift. Verify that the lifting is allowed.
2. Move the crane hook towards the north until the green center LED turns off and the amber south indicator turns on. **If a different directional LED turns on, check the sensor orientation and wiring.** The light should turn on, indicating the direction the crane needs to move to center over the hook and load. Test all the directions to ensure all lights work and all directions are correctly wired.
3. Test the system bypass feature using the setup in the user interface. The red bypass light will turn on.

Auto-Center Feature
In order to perform auto-center, the user must command the “hoist up” signal and the “auto-center” signal at the same time. This will begin the auto-center process, auto-center will cancel if the user releases the hoist command early or if the user gives a directional command to the bridge or trolley drives. If the auto-center is not used, the operator will need to manually move the crane into position.

While auto-centering occurs, the center LED blinks green and the crane moves to correct the position. **If the system does not move in the correct direction or fails to do so, check the wiring to the respective VFD and the wiring to the auto-center input.**

8 Sensor Calibration for Auto-Center

Two parameters on the auto-center feature affect the sensitivity of the sensor and help the user fine-tune the auto-center for crane setup.

Centered Angle Trip Limit: These parameters set the angle threshold that determines if the hook is centered below the hoist.

Centered Sensitivity Level: These parameters set the sensitivity level of the angle sensor. The higher the level, the faster the system will respond to an angle change.

Using these two parameters, the user can adjust sensor sensitivity so that the crane stops where they desire during auto-centering. This feature is important due to the inertia of the system, which will prevent the crane from stopping immediately. Being able to adjust for this drift allows the user to compensate accordingly.

For Example: *If "Centered Angle Trip Limit" is set to 1 degree and "Centered Sensitivity Level" is set to level 3, what will happen when performing an auto-center is this. When the sensor detects that the crane has reached 1 degree, the crane will continue to move for a time before stopping motion (note that even with motion halted the crane will continue to move due to the inertia built up in the system) due to the setting of the sensitivity level. At this point the angle feedback will determine the crane is not at 1 degree but could in fact be closer to 0.4 degrees or worse yet, the crane could be past the load at this point. Using these parameters, the user can adjust settings to allow the crane to detect that it is at/near center and still have enough time to slow down and come to a stop close to 0.0 degrees.*

9 Bridge Auto-Center Calibration

Follow these steps to calibrate the sensor for the “bridges” direction of travel. In the following steps it is assumed that the bridge motion is in the north/south direction of travel.

1. Set “Centered Angled Trip Limit Bridge” to 1 degree and set the “Centered Sensitivity Level Bridge” to any level you choose. **Note: The higher the sensitivity level, the faster the response will be from the system.**
2. Position a test/dummy load for your crane under the system, and center under the hook.
3. Connect the test/dummy load to the hook and lower the hook enough so that it is slack on the load. **Note: This calibration will involve moving the crane away from the load while it’s attached to the hook; provide enough slack that the crane does not side-pull the load during this calibration.**
4. Move the crane to the south until the Intelli-Lift system becomes off-center (center indicator turns off; north indicator turns on only).
5. While commanding the hoist to lift the load, activate the auto-center, the system will start moving north to bring the system to the “Centered Angled Trip Limit Bridge.”
6. When the system stops moving north, navigate to the monitors menu using the web-based UI and view the angle feedback for the north direction. Record this value.
7. If the angle feedback from step 6 shows that the angle feedback for the north direction is negative, the crane has overshot the load. Increase the sensitivity of the sensor with the parameter “Centered Sensitivity Level Bridge” and repeat steps 4 through 7.
8. If the angle feedback from step 6 shows that the angle exceeds 0.0±0.1 degrees for the north angle, the centered angle is too large. Try adjusting the parameter “Centered Angled Trip Limit Bridge” to a smaller value and repeat steps 4 through 8.
9. If the angle feedback from step 6 is showing 0.0±0.1 degrees for the north angle and the crane hook is centered over the load, then calibration is complete for this direction.

10 Trolley Auto-Center Calibration

Follow these steps to calibrate the sensor for the “trolleys” direction of travel. In the following steps it is assumed that the trolley motion is in the west/east direction of travel.

1. Set “Centered Angled Trip Limit Trolley” to 1 degree and set the “Centered Sensitivity Level Trolley” to any level you choose. **Note: The higher the sensitivity level, the faster the response will be from the system.**
2. Position a test/dummy load for your crane under the system, and center under the hook.
3. Connect the test/dummy load to the hook and lower the hook enough so that it is slack on the load. **Note: This calibration will involve moving the crane away from the load while it’s attached to the hook; provide enough slack that the crane does not side-pull the load during this calibration.**
4. Move the crane to the east until the Intelli-Lift system becomes off-center (center indicator turns off; west indicator turns on only).
5. While commanding the hoist to lift the load, activate the auto-center. The system will start moving west to the “Centered Angled Trip Limit Trolley.”
6. When the system stops moving west, navigate to the monitors menu using the web-based UI and view the angle feedback for the west direction. Record this value.
7. If the angle feedback from step 6 shows that the angle is negative by a couple of degrees, the crane has overshot the load. Increase the sensitivity of the sensor with the parameter “Centered Sensitivity Level Trolley” and repeat steps 4 through 7.
8. If the angle feedback from step 6 shows that the angle exceeds 0.0±0.1 degrees for the west angle, the centered angle is too large. Try adjusting parameter “Centered Angled Trip Limit Trolley” to a smaller value and repeat steps 4 through 8.
9. If the angle feedback from step 6 is showing 0.0±0.1 degrees for the west angle and the crane hook is center over the load, then calibration is complete.

11 Maintenance Schedule

To function properly, the Intelli-Lift requires users to conduct regular maintenance checks. Calibrate the sensor once every 90 days. If the sensor hasn't been calibrated in that time period, a "Sensor Calibration Alarm" will display to remind the user to perform maintenance. If the sensor has not been calibrated in 120 days, the Intelli-Lift will display a "Sensor Calibration Fault" and the system will become inoperable until the sensor is calibrated.

Maintenance Items	Period
Zero the sensor	90 days
Date and time verification	90 days
Sensor mounting – verify installation	90 days

12 Magnetek Application Examples

12.1 Connection Diagram with Magnetek IMPULSE® Series 4 Drive

Example connections to Magnetek IMPULSE® Series 4 drives using normally closed (NC) relays within the Intelli-Lift enclosure. These are 120VAC inputs to the drives.

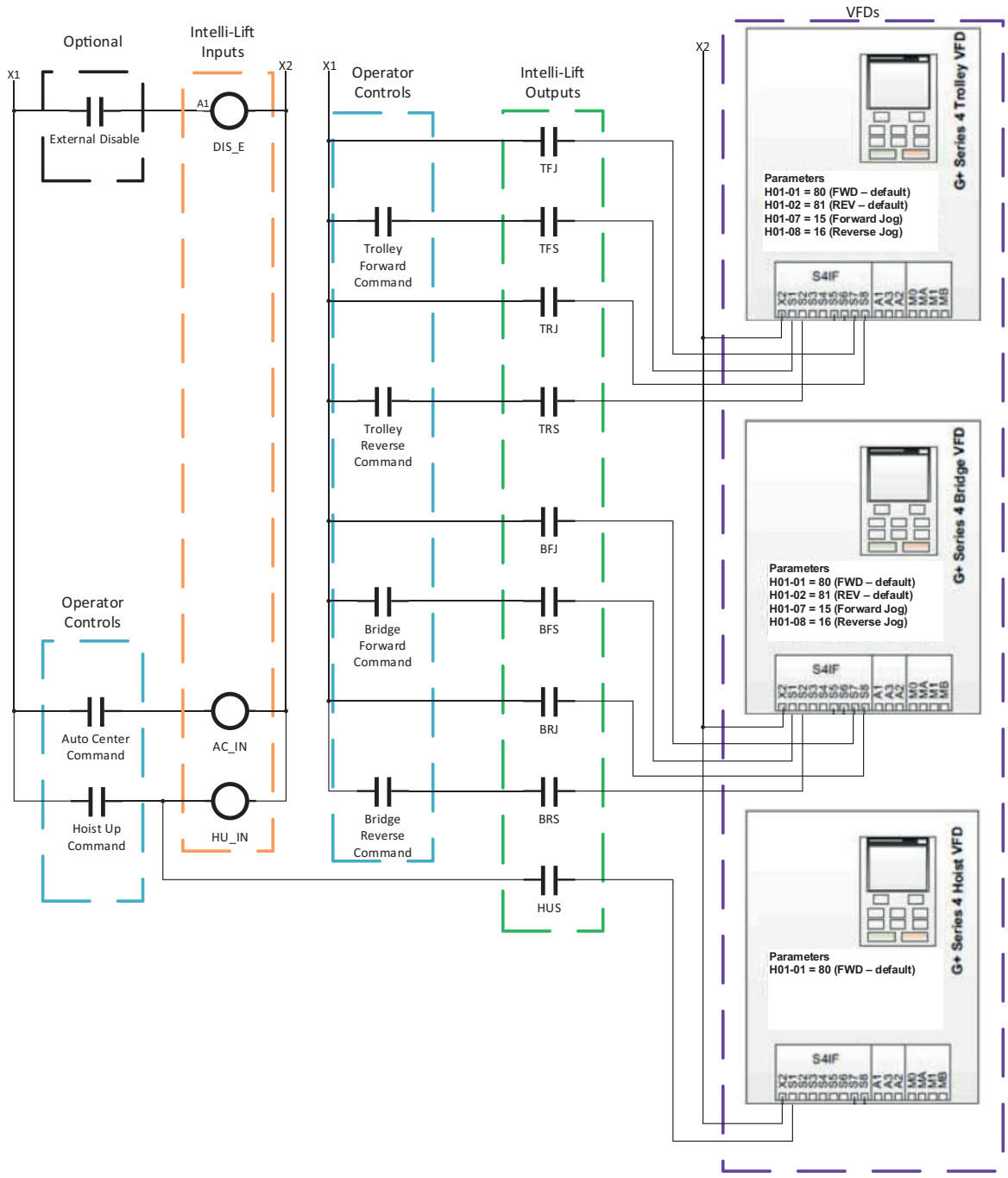


Figure 12-1: Example Connections to Magnetek IMPULSE Series 4 Drives

12.2 IMPULSE®·G+/VG+ Series 4 Drive Programming

For IMPULSE·G+ and VG+ Series 4 drives, use the following parameter settings. Using the control signal outputs from the Intelli-Lift controller, wire the outputs to the trolley, bridge and hoist drives.

Bridge and Trolley Drives:

Parameter	Value	Display	Function
H01-01	80	FWD-Default	Term S1 Select
H01-02	81	Rev-Default	Term S2 Select
H01-07	15	Forward Jog	Term S7 Select
H01-08	16	Reverse Jog	Term S8 Select

Hoist Drive:

Parameter	Value	Display	Function
H01-01	80	FWD-Default	Term S1 Select

12.3 Connection Diagram with IMPULSE®·G+ Mini Drive

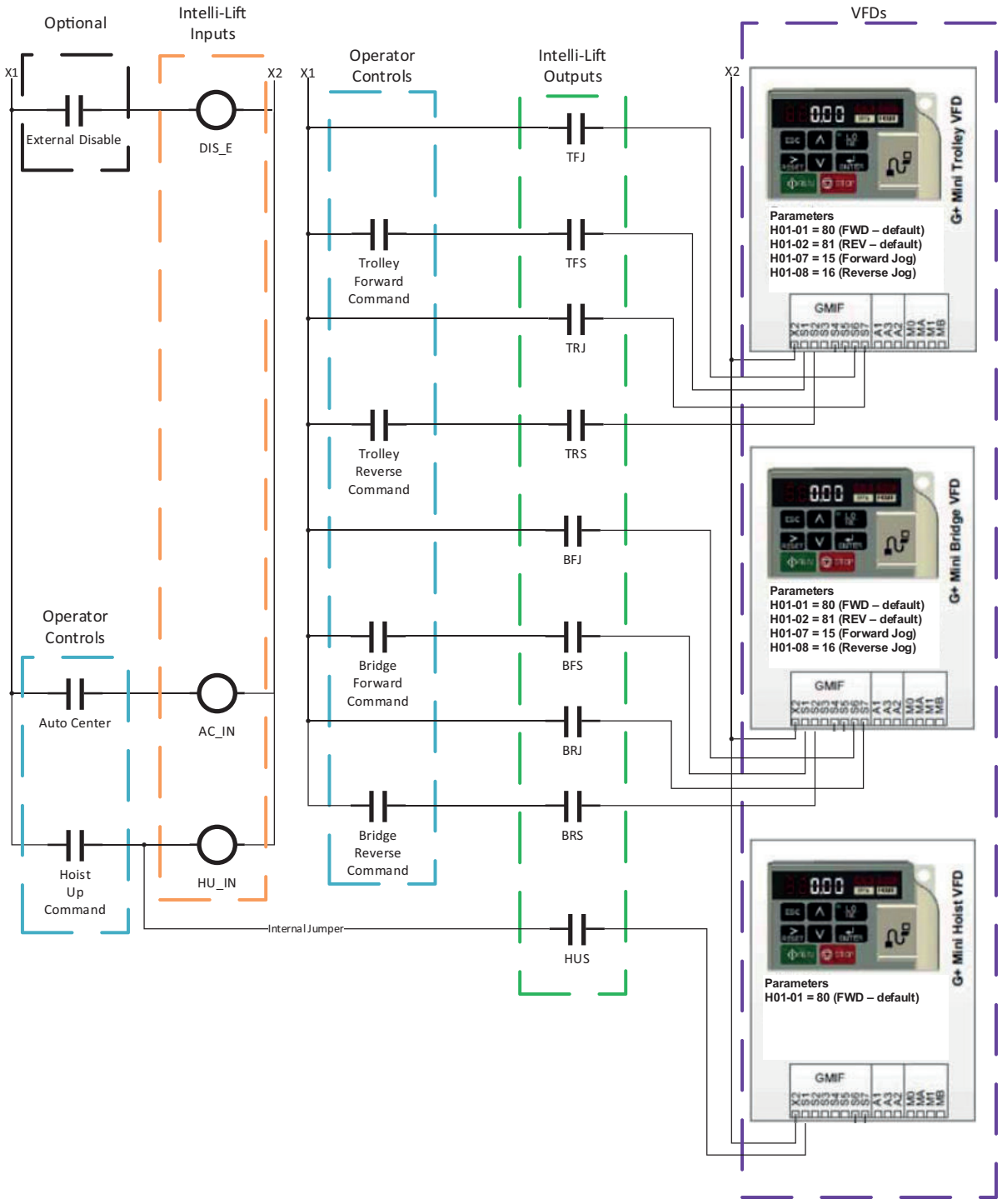


Figure 12-2: Example Connections to IMPULSE·G+ Mini Drives

12.4 IMPULSE®·G+ Mini Drive Programming

For IMPULSE·G+ Mini drives, use the following parameter settings. Using the control signal outputs from the Intelli-Lift controller, wire the outputs to the trolley, bridge and hoist drives.

Bridge and Trolley Drives:

Parameter	Value	Display	Function
H01.01	80	FWD-Default	Term S1 Select
H01.02	81	Rev-Default	Term S2 Select
H01.07	15	Forward Jog	Term S7 Select
H01.08	16	Reverse Jog	Term S8 Select

Hoist Drive:

Parameter	Value	Display	Function
H01.01	80	FWD-Default	Term S1 Select

13 Troubleshooting

Alarm	Cause	Resolution
Sensor Calibration Alarm	90 days has elapsed since the last sensor calibration.	Calibrate the sensor.
Sensor Calibration Fault	120 days has elapsed since the last sensor calibration. The crane will be in the inoperable state until the sensor is calibrated.	Calibrate the sensor.
Bad Sensor Data	Angle sensor is reporting an angle greater than 180.0°.	Contact Columbus McKinnon Corporation.
Real Time Clock (RTC) Not Set	RTC has not been set. The crane will be in the inoperable state until the RTC has been set.	Set the RTC. If the error persists, the RTC battery might be faulty. Contact Columbus McKinnon Corporation for replacement.
Invalid Log	Contents of the log file have been modified/corrupted. The crane will be in the inoperable state until the logs have been restored.	Contact Columbus McKinnon Corporation.
Invalid Log Information	Data in the log file has become corrupted. The crane will be in the inoperable state until the log file has been restored.	Contact Columbus McKinnon Corporation.
Unique ID Not Set	The crane will be in the inoperable state until the unique ID has been set.	Contact Columbus McKinnon Corporation.
Log File Missing	Log File cannot be found. The crane will be in the inoperable state until the log file has been restored/created.	Contact Columbus McKinnon Corporation.
Log File Error 01	Error when initializing the log file.	Re-attempt to initialize the log file. If the error persists, contact Columbus McKinnon Corporation.
Log File Error 02	Error when reading the time in the log file.	Check for RTC issues and power cycle. If RTC issues have been resolved and alarm is still active, contact Columbus McKinnon Corporation.
Log File Error 03	Contents of log file have been modified/ corrupted.	Contact Columbus McKinnon Corporation.
Log File Error 04	Log file index does not match last known state.	Contact Columbus McKinnon Corporation.
Log File Error 05	Error reading log file.	Contact Columbus McKinnon Corporation.
Loss of Sensor Comms	Communication to the angle sensor has been lost.	Check wiring to the sensor.

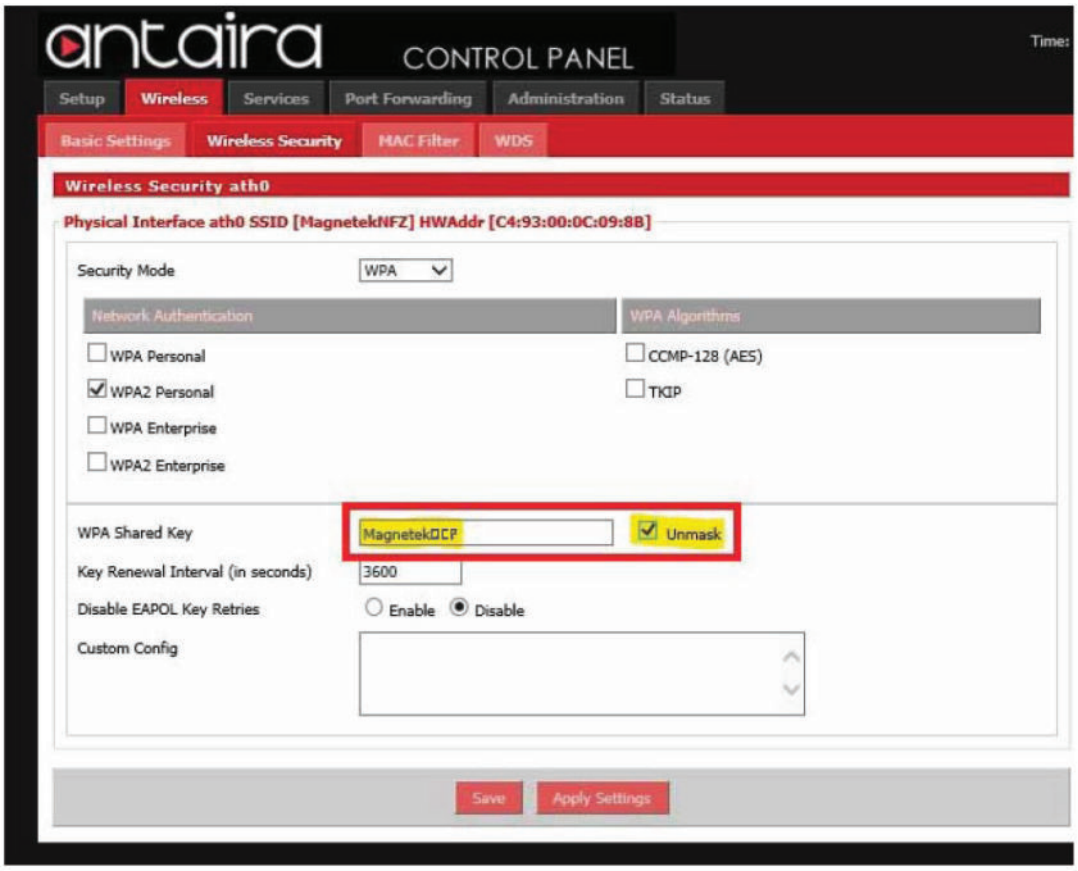
Appendix A – Wireless (Wi-Fi) SSID Setup and Password

A.1 Control Box – Auto/Manual

1. Access the web GUI, use a smartphone, tablet, or laptop/PC and go to the Wi-Fi settings and locate the “MagnetekOCP_xxxx” network. (The xxxx is based on the serial number of the units.)
2. Enter the password “MagnetekOCP.”
3. Using a web browser such as Chrome or Internet Explorer, type 192.168.1.100.
4. Select the “Wireless” tab.
5. Enter the following login ID and password:
   - Login ID - magnetek
   - Password - magnetek
6. Within the wireless menu select “Basic Settings.”
7. In the Wireless Network Name (SSID) field, change the SSID.

8. Select “Save” to ensure changes are saved in the event of a power loss.
9. Select “Wireless Security.”

10. In the “WPA Shared Key” check the “unmask” box and change the password.



11. Select “Save” and then “Apply Settings.”

Appendix B – RJ45 Programming Port Ethernet SSID Setup and Password

NOTE: *When changing the SSID and password, the changes need to be done on the status control light box first before being changed on the control box.*

B.1 Status Control Light Box – Auto/Manual/Detection

1. Access the web GUI, use a laptop/PC and connect an RJ-45 ethernet cable from the laptop/PC to the RJ-45 port on the front of the control box.
2. Using a web browser such as Chrome or Internet Explorer, type 192.168.1.101.
3. Select the “Wireless” tab.
4. Enter the following login ID and password:
   - Login ID - magnetek
   - Password - magnetek
5. Within the wireless menu select “Basic Settings.”
6. In the Wireless Network Name (SSID) field, change the SSID.

7. Select “Save” to ensure changes are saved in the event of a power loss.
8. Select “Wireless Security.”
9. In the “WPA Shared Key” check the “unmask” box and change the password.

10. Select “Save” and then “Apply Settings.”

B.2 Control Box – Auto/Manual

1. Access the web GUI, use a laptop/PC and connect an RJ-45 ethernet cable from the laptop/PC to the RJ-45 port on the front of the control box.
2. Using a web browser such as Chrome or Internet Explorer, type 192.168.1.100.
3. Select the “Wireless” tab.
4. Enter the following login ID and password:
   - Login ID - magnetek
   - Password - magnetek
5. Within the wireless menu select “Basic Settings.”
6. In the Wireless Network Name (SSID) field, change the SSID. Make sure this SSID matches the SSID set in the status control light box.

7. Select “Save” to ensure changes are saved in the event of a power loss.
8. Select “Wireless Security.”
9. In the “WPA Shared Key” check the “unmask” box and change the password. Make sure this password matches the password set in the status control light box.

10. Select “Save” and then “Apply Settings.”

Appendix C – Deflection Chart

The table below shows the amount of swing a load will have if lifted while at a specific angle respective to the hoist. The deflection values listed in the chart are in inches.

Height of Trolley from Factory Floor (ft)	Off-Center Angle									
	0.5°	1.0°	1.5°	2.0°	2.5°	3.0°	3.5°	4.0°	4.5°	5.0°
30'	3.14"	6.28"	9.43"	12.57"	15.72"	18.87"	22.02"	25.17"	28.33"	31.50"
40'	4.19"	8.38"	12.57"	16.76"	20.96"	25.16"	29.36"	33.56"	37.78"	41.99"
50'	5.24"	10.47"	15.71"	20.95"	26.20"	31.44"	36.70"	41.96"	47.22"	52.49"
60'	6.28"	12.57"	18.85"	25.14"	31.44"	37.73"	44.04"	50.35"	56.67"	62.99"
70'	7.33"	14.66"	22.00"	29.33"	36.68"	44.02"	51.38"	58.74"	66.11"	73.49"
80'	8.38"	16.76"	25.14"	33.52"	41.91"	50.31"	58.72"	67.13"	75.55"	83.99"
Amount of Deflection (inches)										

Intelli-Lift® Off-Center, Side Pull & Snag Detection System Technical Manual
Part Number 113-11895 Rev 03
April 2023

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