WILL-BURT

AccuPoint®

AP-8, AP-30, AP-50

ACCUPOINT POSITIONER OPERATOR'S MANUAL

UK CA CE

Will-Burt United Kingdom
Unit 5b, Station Approach
Four Marks, Alton, Hants GU34 5HN

www.willburt.com

PM-01010-REV 2, 28th June 2022

Original Instructions

Warranty

Will-Burt warrants its Accupoint Positioners to be free from defects in material and workmanship for a period of three (3) years, with such a time period running from the date of shipment by Will-Burt. Will-Burt shall not be responsible for any damage resulting to or caused by its products by reason of failure to properly install, maintain or store the product; use of the product in a manner inconsistent with its design; unauthorized service, alteration of products, neglect, abuse, accident, or acts of God. This warranty does not extend to any component parts not manufactured by Will-Burt; provided, however, Will-Burt's warranty herein shall not limit any warranties by manufacturers of component parts which extend to the buyer.

The foregoing warranty is in lieu of all other warranties, and no representations, guarantees or warranties, express or implied, including but not limited to, a warranty of merchantability, fitness for a particular purpose, or non-infringement are made by Will-Burt in connection with the manufacture or sale of its products. No employee, distributor, or representative is authorized to change this warranty in any way or grant any other warranty on behalf of Will-Burt.

Claims for defects in material and workmanship shall be made in writing to Will-Burt within thirty (30) days of the discovery of defect. Failure to provide notice as required hereby shall be conclusive evidence that the product was in conformity with the warranty and Will-Burt shall be released from any, and all liability relating to the product. Will-Burt may either send a service representative or have the product returned to its factory at Buyer's expense for inspection. If judged by Will-Burt to be defective in material or workmanship, the product will be replaced or repaired at the option of Will-Burt, free from all charges except authorized transportation.

The remedies of buyer set forth herein are exclusive and are in lieu of all other remedies. The liability of Will-Burt whether in contract, or, under any warranty, or otherwise, shall not extend beyond its obligation to repair or replace, at its option, any product or part found by Will-Burt to be defective in material or workmanship. Will-Burt shall not be liable for cost of installation and/or removal, or be responsible for direct, indirect, special, or consequential damages of any nature.

EU Declaration of Conformity

According to EN 45014

The directives covered by this Declaration:
2004/108/EC Electromagnetic Compatibility directive, as amended

Name of Manufacturer:	Will-Burt United Kingdom
Address of Manufacturer:	Unit 5b, Station Approach Four Marks Alton Hants GU34 5HN

Hereby declares that the following product(s)

Product Designation:	Accupoint Positioners
Models:	All
Serial Number:	All
Year of Construction:	2022

are in conformity with the applicable requirements of the following documents:

BS EN 61000-6-1	Electromagnetic compatibility (EMC). Generic standards. Emission for residential, commercial, and light industrial environments.
BS EN 61000-6-2	Electromagnetic compatibility (EMC). Generic standards. Emission for residential, commercial, and light industrial environments.

I hereby declare that the equipment named above has been designed and tested to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable essential requirements of the directives.

Issue Date: 21st March 2022

Lee Turner
General Manager

UK Declaration of Conformity

According to BS EN 45014

The directives covered by this Declaration:
Electromagnetic Compatibility Regulations 2016
Electrical Equipment (Safety) Regulations 2016

Name of Manufacturer: The Will-Burt United Kingdom

Address of Manufacturer:
Unit 5b, Station Approach
Four Marks
Alton
Hants
GU34 5HN

Hereby declares under our sole responsibility that the following product(s)

Product Designation: Accupoint Positioners
Models: All
Serial Number: All
Year of Construction: 2022

Conforms with the following applicable requirements of the following documents:

BS EN 61000-6-1/2 Electromagnetic compatibility emission requirements for electrical and electronic equipment intended for use at residential, commercial, and light industrial locations and applies where's there's no relevant dedicated product or product family EMC emission standard.

The product herewith, named above has been designed and tested to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable essential requirements of the directives.

The Technical Construction File is kept in the UK office (address as above)

Issue Date: 21st March 2022
Issue Place: Four Marks

Lee Turner
General Manager

Document History

Document Numbers	Dates	Remarks
PM-01010-REV 1	21/03/2022	Initial Release (ECN 11175)
PM-01010-REV 2	28/06/2022	New high level part numbers replacing existing high level part numbers, AP-22 has been upgraded to AP-30

Table of Contents

Safety Summary

This section describes safety information for the Accupoint Positioner and its joystick controller. These are recommended precautions that personnel must understand and apply throughout installation, operation, maintenance, and troubleshooting. Be sure to read and understand the entire manual before performing any procedure outlined in this manual.

SIGNAL WORD DEFINITIONS

⚠ WARNING

Warnings highlight an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to, or death of, personnel or long-term health hazards.

⚠ CAUTION

Cautions highlight an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

Note: Notes highlight an essential operating or maintenance procedure, condition, or statement.

GENERAL SAFETY INSTRUCTIONS

The following are general safety precautions that are not related to any specific procedures. These are recommended precautions that personnel must understand and apply throughout installation, operation, maintenance, and troubleshooting. Additional precautions which apply to specific procedures and steps may be listed with the procedure or step to which they apply.

⚠ WARNING

Electrocution Hazard! Do not touch live wires. Make sure all power has been isolated and locked off prior to performing installation or maintenance. Make certain that the area is free of overhead power lines and other unwanted sources of electricity. Do not operate the system during an electrical storm. Follow relevant safety regulations when working near energized power lines. Be sure to allow sufficient clearance on all sides of the positioner and its payload for entire pan and tilt motion. Death or serious injury could result if proper precautions are not performed.

⚠ WARNING

Safety Instruction – Lightning! Lightning protection is not part of this system. A proper means of electrical grounding should be provided. Failure to observe this warning could result in death or serious injury.

⚠ WARNING

Resuscitation! Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the British Red Cross.

⚠ WARNING

Pinch Point Hazard! Keep clear of moving parts. Be sure to stay clear of the positioner during operation. Moving parts can crush and cut resulting in serious injury.

⚠ WARNING

Crush Hazard! Do not stand directly beneath the positioner or payload. Be certain payload is properly installed and secured. In locations or areas where the risk of injury occurs, or any part of the assembly may become detached or fall for any reason, a safety chain or wire hawser should be attached between the equipment and the mounting surface. At all times, normal safety precautions must be employed. Death or serious injury could result if positioner fails suddenly.

⚠ WARNING

Safety Equipment! Correct PPE, Helmets or hard hats, eye protection, gloves, and safety shoes or combat boots must be properly worn while working in the deployment area. Death or serious injury could result if proper safety equipment is not properly worn.

⚠ WARNING

Trained Personnel Only! Installation, operation, and maintenance to be performed by trained and authorized personnel only. Death or serious injury could result if proper installation, inspection, operation, and maintenance procedures are not observed.

⚠ WARNING

Lifting Hazard! Manually lifting over 25kg (55 lb.) is prohibited. In the UK, all lifting equipment must be thoroughly examined annually by a competent person and hold a certified safety certificate according to the Lifting Operations and Lift Equipment Regulations 1998. Equivalent regulations exist in other EU Countries.

⚠ WARNING

Safety Instruction – Remote Control! The equipment is subject to remote control and may be operated at any time. Persons working on the equipment should take appropriate precautions to ensure that any unexpected movement does not occur as this could lead to injury.

⚠ WARNING

Safety Instruction – Impact Loading! Utilize a fall arrest system to secure the payload in the event of impact loading. The fall arrest system should connect to the positioner mounting pedestal or other rigid structure. Death or serious injury could result if proper precautions are not performed.

⚠ CAUTION

Equipment Damage! All persons installing and maintaining this equipment should be suitably qualified and work to national and local standards and codes of practice.

⚠ CAUTION

Safety Instruction – High Pressure Spray! Do not expose the positioner to high pressure spray. Equipment damage may occur.

Section 1 Introduction

Review this manual in its entirety. Contact the Will-Burt United Kingdom with any questions before performing any procedure outlined in this manual.

The Accupoint Positioners are pan and tilt positioners used as platforms for many different applications. The Accupoint Positioners are designed to remotely position a payload and may be attached on top of a mast.

This manual covers the following Accupoint Positioners:

- **AP-8** (Over the Top, Side Mount & Antenna Mount)
- **AP-30** (Over the Top, Side Mount & Antenna Mount)
- **AP-50** (Over the Top, Side Mount & Antenna Mount)

1.1 Safety Precautions

Refer to the Safety Summary for precautions to be observed while installing, operating, maintaining, or troubleshooting this equipment.

1.2 How this Manual is Organized

This manual is organized into the following sections:

Section 1 Introduction

Section 2 Installation

Section 3 Operation

Section 4 Maintenance

Section 5 Troubleshooting

Section 6 Appendix

1.3 Additional Documentation

In addition to this manual, the controllers ship with a controller manual. Reference the relevant controller manual for additional information on the setup and function of the controller.

1.4 Definitions of Terms and Symbols

Throughout this manual, the following will be used:

1.4.1.1 General Terms:

- Positioner refers to the Accupoint Positioner
- Controller refers to the controller controlling the Accupoint Positioner
- System refers to the entire positioner and control system
- Payload refers to the object or equipment being mounted to the positioner
- “Over the Top Mount” or “OTT” refers to a positioner with the payload mounting plate located over the top of the positioner body
- “Side Mount” refers to a positioner with the payload mounting plate located to the side of the positioner body.
- “Antenna Mount” refers to a front mounted plate that utilizes the over the top mount

1.4.1.2 Positions

- “Factory Home” (Figure 1-1) refers to the factory set preset position [0] (zero) which is set to move the positioner to the mid-point of both the pan and tilt. In this position, the tilt platform will be horizontal, and the pan axis will be in the center position. In this position, the rear of the positioner is the side with the power/data connector on the body of the positioner. Note that the offset on the left of the positioner, as you face the connector, is wider than the offset to the right. The positioner ships in the Factory Home position.
- The Factory Home position is programmed at the factory to the center of its mechanical travel. This Factory Home position can be reprogrammed by the installer using the set up GUI. Please refer to XXX for detail on how to achieve this.

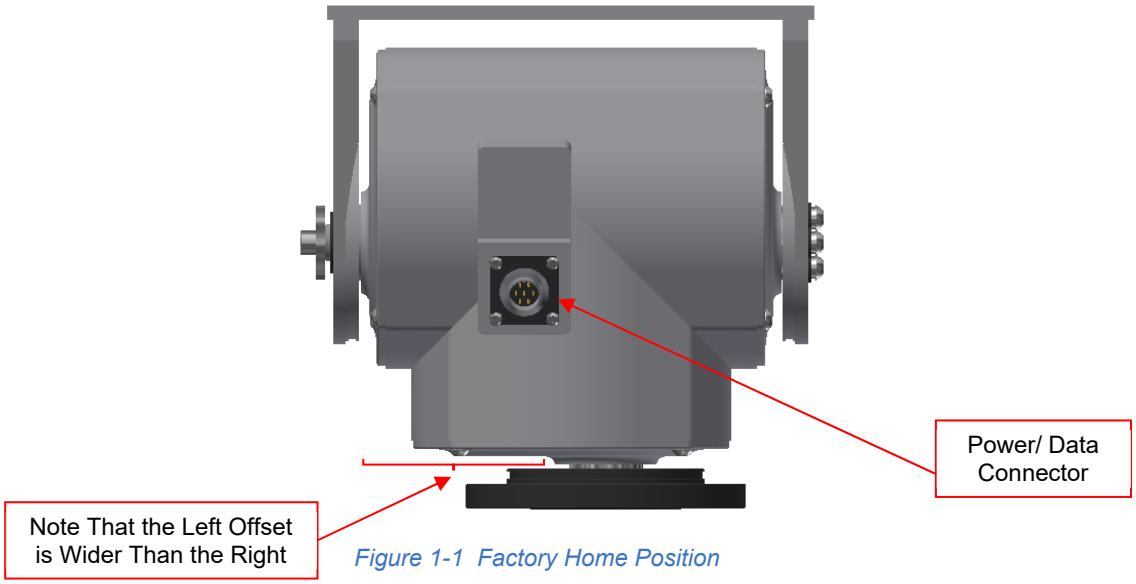


Figure 1-1 Factory Home Position

- “Stowed” refers to a customer-set preset position whereby the positioner moves the payload to a desired pan and tilt position for travel or safe storage. Preset [1] is designated as the “Stowed” position.
- “Unstowed” refers to a customer-set preset position whereby the positioner moves the payload to a desired pan and tilt position from the stowed position. The customer should be sure the positioner can be safely moved to this position from the stowed position without causing damage. Preset [2] is designated as the “Unstowed” position.

1.4.1.3 Directions

- When operating the positioner, directions are given as follows:

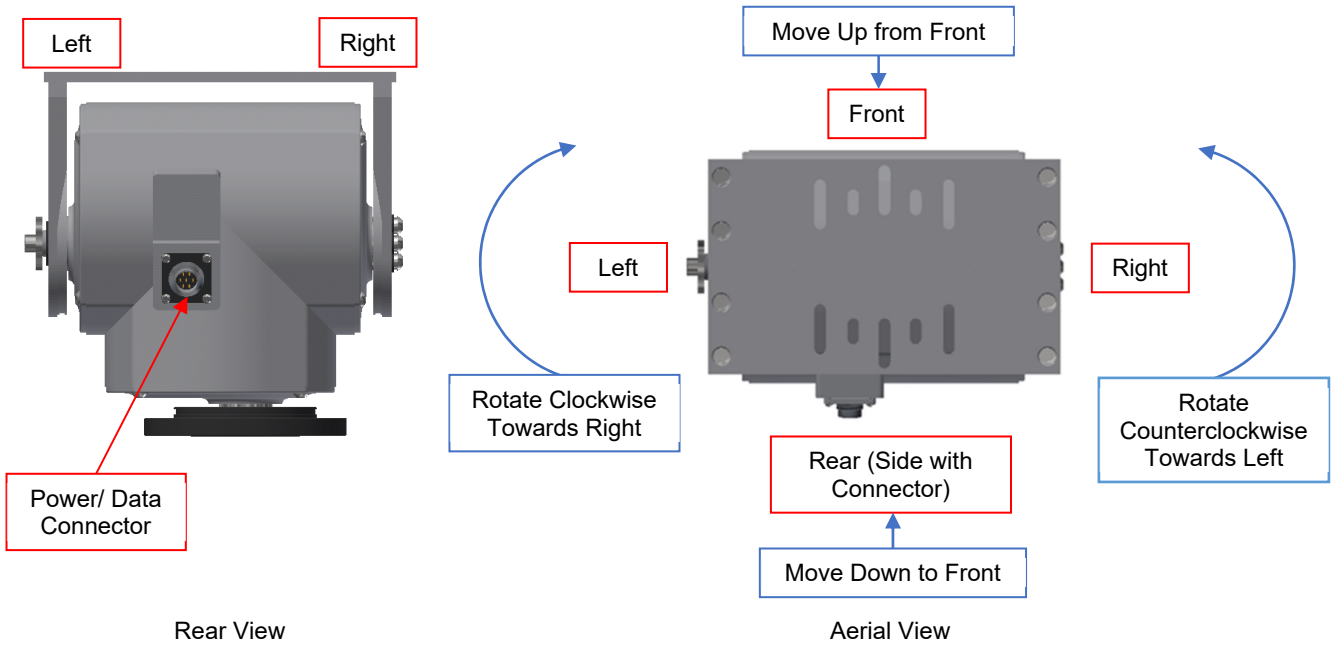


Figure 1-2 Positioner Directions

- When using the joystick controller:
  - Pushing the joystick forward will tilt the positioner towards the rear
  - Pulling the joystick back will tilt the positioner towards the front
  - Moving the joystick to the right will rotate the positioner clockwise
  - Moving the joystick to the left will rotate the positioner counterclockwise

1.4.1.4 Symbols:

- Characters inside < > as in <Success!> represent text that appears on the display screen.
- Characters inside [ ] as in [1] represent buttons or keys being used.
- Arrows as in “▲, ►, ▼, ◄” represent the direction(s) the positioner is moving in. These arrows are shown on the display screen of the joystick controller.

1.5 Specifications

Table 1-1 lists the part numbers for Accupoint Positioners in different finish variants.

Table 1-2, Table 1-3 & Table 1-4 lists the specifications for the Accupoint Positioners.

Table 1-5 & Table 1-6 list the specification for the Joystick Controller

Table 1-7, Table 1-8 & Table 1-9 lists the specifications for Rack Mount Controller

For various positioner models, add-on features can be added to improve performance such as gas struts for additional payload capacity, heaters for lower temperature operation, alternative gear boxes for reduced/increased rotational speeds and more. Contact WB Customer Service for more information.

Table 1-1 Accupoint Positioner Part Numbers

Description	Duty / Application	Part Number Goose Grey (Std)
AP-8 (Over the Top Mount)	Max 8ft lb on Tilt - Static	LF2/51/TX/XXX/RX2-00
AP-8 (Side Mount)	Max 8ft lb on Tilt - Static	LF2/51/SX/XXX/RX2-00
AP-8 (Antenna Mount)	Refer to Antenna mount specification	LF2/51/AX/XXX/RX2-00
AP-30 (Over the Top Mount)	Max 30ft lb on Tilt - Static	MF2/83/TX/XTX/RX2-00
AP-30 (Side Mount)	Max 30ft lb on Tilt - Static	MF2/83/SX/XTX/RX2-00
AP-30 (Antenna Mount)	Refer to Antenna mount specification	MF2/83/AX/XTX/RX2-00
AP-50 (Over the Top Mount)	Max 50ft lb on Tilt - Static	HF2/62/TX/XDX/RX2-00
AP-50 (Side Mount)	Max 50ft lb on Tilt - Static	HF2/62/SX/XDX/RX2-00
AP-50 (Antenna Mount)	Refer to Antenna mount specification	HF2/62/AX/XDX/RX2-00

1.5.1 Positioner Specifications & Dimensions

1.5.1.1 AP-8 Specifications

AP-8 Over the Top (OTT) Mount
(P/N LF2/51/TX/XXX/RX2-00*)*

AP-8 Side Mount
(P/N LF2/51/SX/XXX/RX2-00*)*

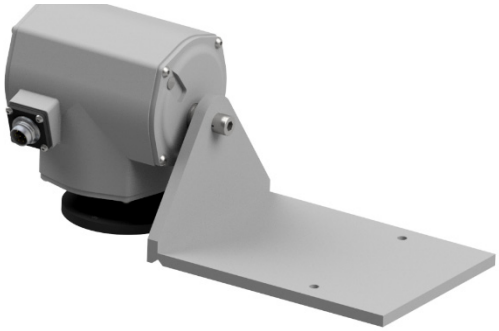


Table 1-2 AP-8 Specifications

Functional Characteristic	Specifications (Over the Top Mount)	Specifications (Side Mount)
Payload Capacity	8 ft.-lb. (10.8 Nm)	8 ft.-lb. (10.8 Nm)
Approximate Weight	2.3 kg (5.1 lb)	2.5 kg (5.5 lb)
Pan Axis	360° (± 180°)	360° (± 180°)
Tilt Axis	+90° / -45°	180° (±90°)
Pan Speed (Proportional)	0 to 24° / Second	0 to 24° / Second
Tilt Speed (Proportional)	0 to 6° / Second	0 to 6° / Second
Backlash	<0.15°	<0.15°
Repeatability	<0.3°	<0.3°
Maximum Continuous Power	20 W	20 W
Maximum Continuous Current @ 24VDC	0.85 A	0.85 A
Input Voltage	24VDC (12VDC Optional)	24VDC (12VDC Optional)
Operating Temperature	-20° to 50°C (-4° to 122°F)	-20° to 50°C (-4° to 122°F)
Ingress Protection Rating	IP68	IP68
Protocol	Pelco D	Pelco D
Baud Rate	Selectable 2,400 4,800 9,600	Selectable 2,400 4,800 9,600
Absolute Positioning	Yes	Yes
Positional Feedback	Yes	Yes
Application	Static Mount	Static Mount

**Alternative gear box speeds available upon request*
For Antenna Mount, refer to specific Antenna Mount documentation

1.5.1.2 AP-8 Dimensions

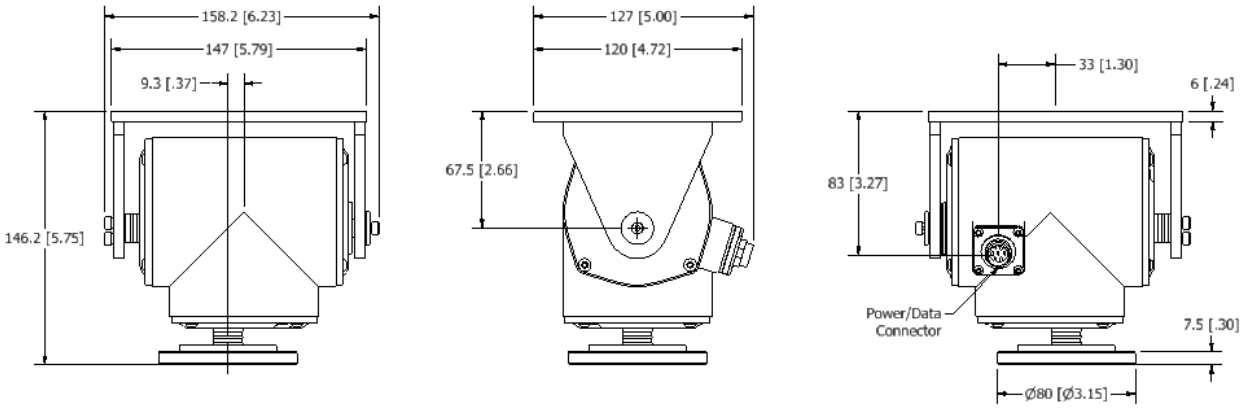


Figure 1-3: AP-8 (Over the Top Mount)

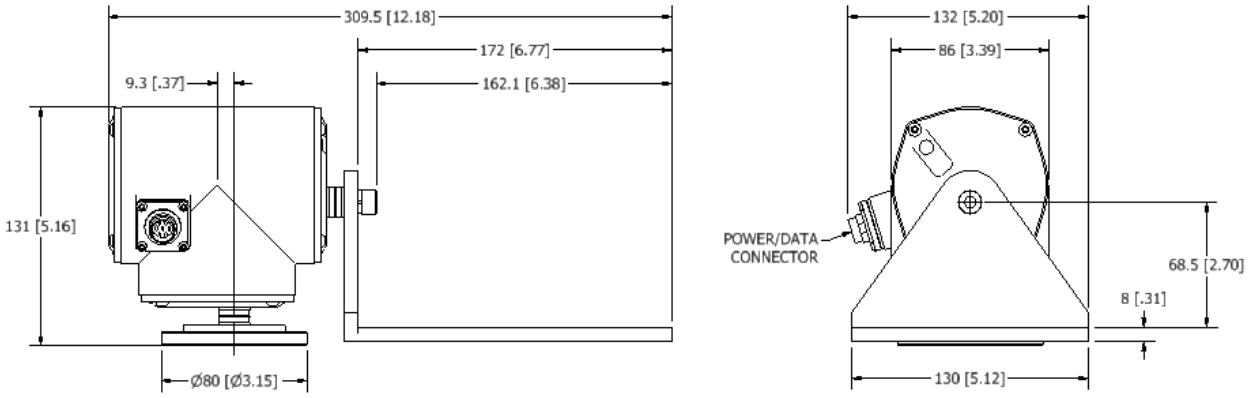


Figure 1-4: AP-8 (Side Mount)

See Section 2.5 and Section 2.7 for Positioner and Payload Mounting Patterns
Dimensions: mm [in]

1.5.1.3 AP-30 Specifications

AP-30 Over the Top (OTT) Mount
(P/N MF2/83/TX/XTX/RX2-00)

AP-30 Side Mount
(P/N MF2/83/SX/XTX/RX2-00)

Table 1-3 AP-30 Specifications

Functional Characteristic	Specifications (Over the Top Mount)	Specifications (Side Mount)
Payload Capacity*	30 ft.-lb. (40.7 Nm)	30 ft.-lb. (40.7 Nm)
Approximate Weight	6.7 kg (14.7 lb)	6.6 kg (14.6 lb)
Pan Axis	360° (± 180°)	360° (± 180°)
Tilt Axis	+90° / -45°	180° (±90°)
Pan Speed (Proportional)**	0 to 48° / Second	0 to 48° / Second
Tilt Speed (Proportional)**	0 to 12° / Second	0 to 12° / Second
Backlash	<0.15°	<0.15°
Repeatability	<0.3°	<0.3°
Maximum Continuous Power	44 W	44 W
Maximum Continuous Current @ 24VDC	1.85 A	1.85 A
Input Voltage	24VDC (12VDC Optional)	24VDC (12VDC Optional)
Operating Temperature	-20° to 50°C (-4° to 122°F)	-20° to 50°C (-4° to 122°F)
Ingress Protection Rating	IP68	IP68
Protocol	Pelco D	Pelco D
Baud Rate	Selectable 2,400 4,800 9,600	Selectable 2,400 4,800 9,600
Absolute Positioning	Yes	Yes
Positional Feedback	Yes	Yes
Application	Static Mount	Static Mount

**Alternative gear box speeds available upon request*
***Gas Springs optional for additional load compensation*
For Antenna Mount, refer to specific Antenna Mount documentation

1.5.1.4 AP-30 Dimensions

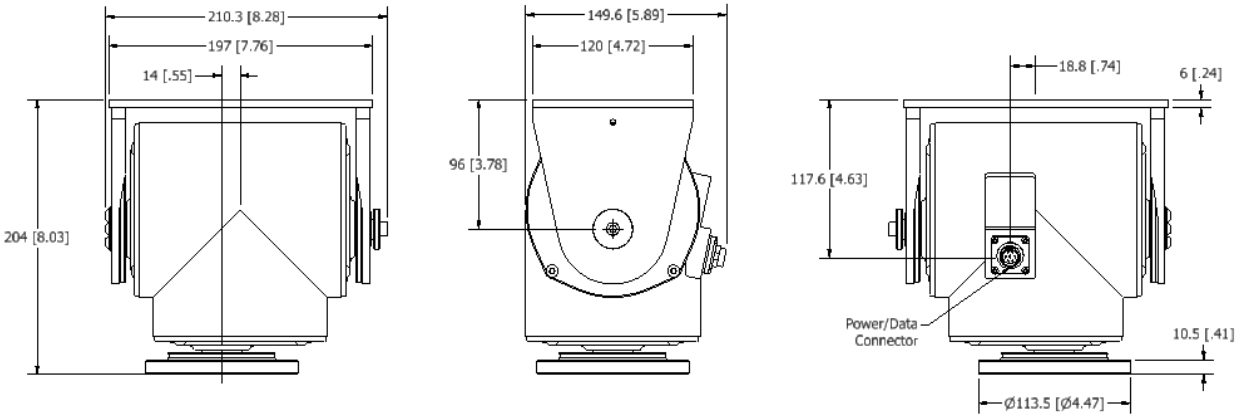


Figure 1-5: AP-30 (Over the Top Mount)

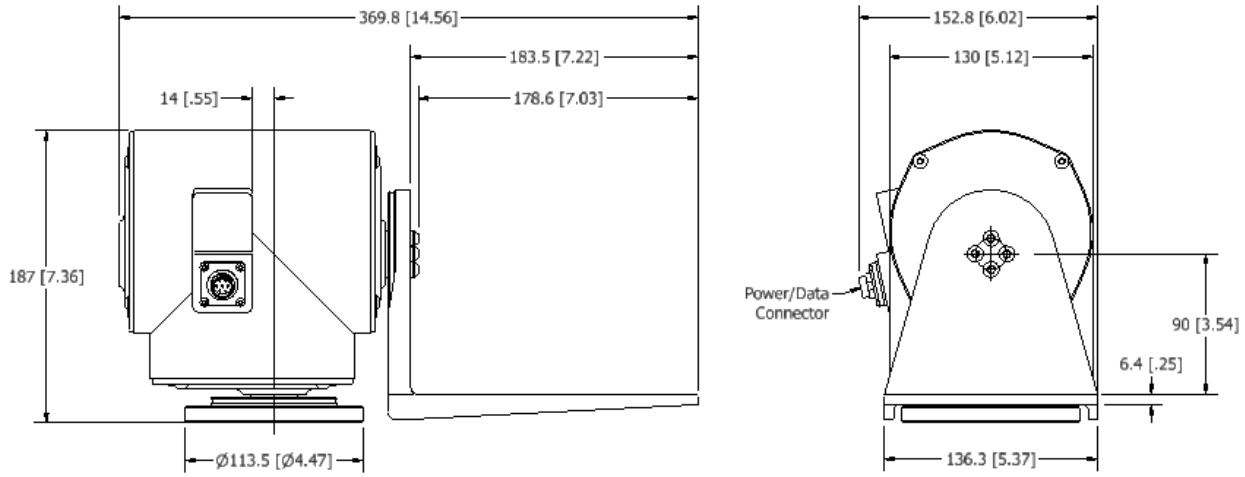
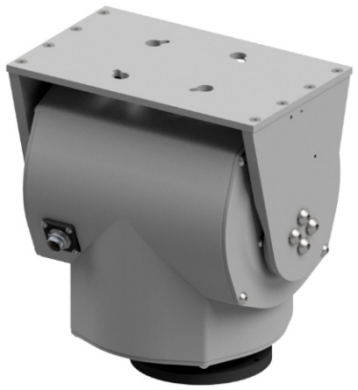


Figure 1-6: AP-30 (Side Mount)

See Section 2.5 and Section 2.7 for Positioner and Payload Mounting Patterns
Dimensions: mm [in]

1.5.1.5 AP-50 Specifications

AP-50 Over the Top (OTT) Mount
(P/N HF2/62/TX/XDX/RX2-00*)*



AP-50 Side Mount
(P/N HF2/62/SX/XDX/RX2-00*)*

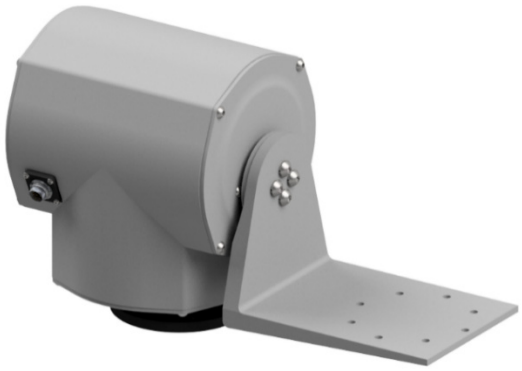


Table 1-4 AP-50 Specifications

Functional Characteristic	Specifications (Over the Top Mount)	Specifications (Side Mount)
Payload Capacity*	50 ft.-lb. (67.8 Nm)	50 ft.-lb. (67.8 Nm)
Approximate Weight	13 kg (28.7 lb)	12.2 kg (26.9 lb)
Pan Axis	360° (± 180°)	360° (± 180°)
Tilt Axis	+90°/-45°	180° (±90°)
Pan Speed (Proportional)**	0 to 30° / Second	0 to 30° / Second
Tilt Speed (Proportional)**	0 to 10° / Second	0 to 10° / Second
Backlash	<0.15°	<0.15°
Repeatability	<0.3°	<0.3°
Maximum Continuous Power	44 W	44 W
Maximum Continuous Current @ 24VDC	1.85 A	1.85 A
Input Voltage	24VDC (12VDC Optional)	24VDC (12VDC Optional)
Operating Temperature	-4° to 122°F (-20° to 50°C)	-4° to 122°F (-20° to 50°C)
Ingress Protection Rating	IP68	IP68
Protocol	Pelco D	Pelco D
Baud Rate	Selectable 2,400 4,800 9,600	Selectable 2,400 4,800 9,600
Absolute Positioning	Yes	Yes
Positional Feedback	Yes	Yes
Application	Static Mount	Static Mount

**Alternative gear box speeds available upon request*
***Gas Springs optional for additional load compensation*
For Antenna Mount, refer to specific Antenna Mount documentation

1.5.1.6 AP-50 Dimensions

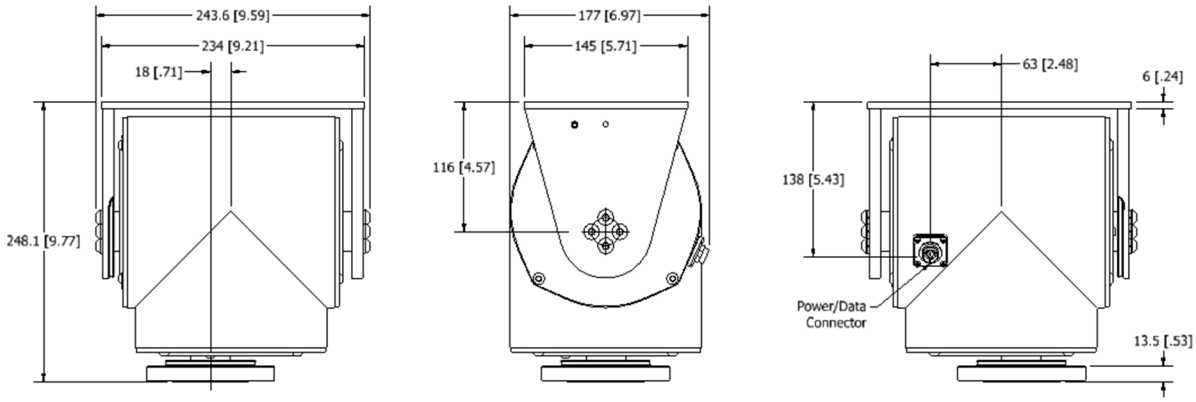


Figure 1-7: AP-50 (Over the Top Mount)

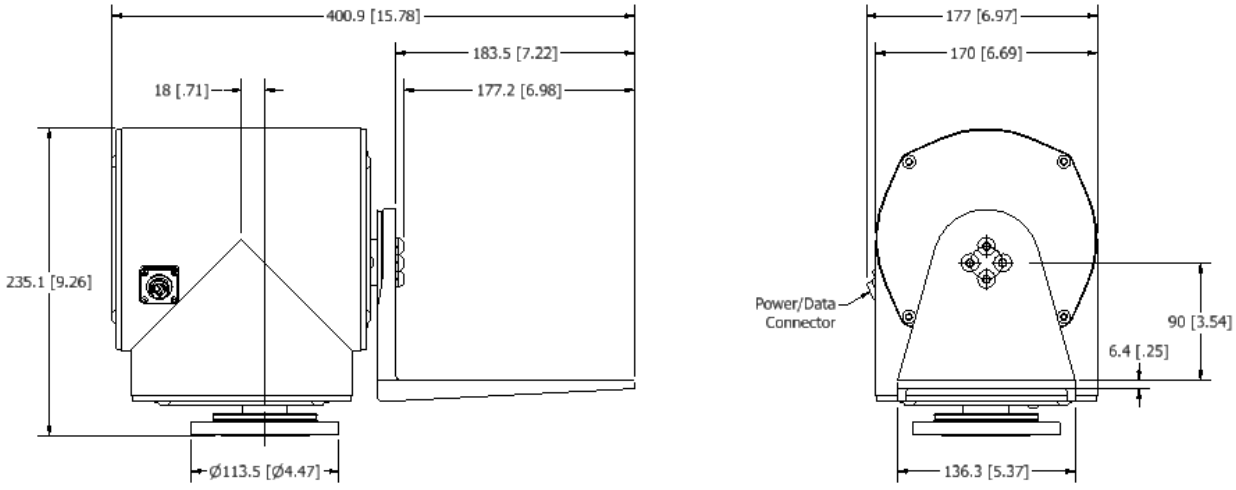


Figure 1-8: AP-50 (Side Mount Positioner)

See Section 2.5 and Section 2.7 for Positioner and Payload Mounting Patterns
Dimensions: mm [in]

1.5.2 Controller Specifications

1.5.2.1 Joystick Controller

Table 1-5 Joystick Controller Specifications

Functional Characteristic	Specification
Input Voltage	12VDC (See Table Below)
Rating Power	0.5 watts
Communication Interface	RS485
Communication Frequency	2,400; 4,800; 9,600; 19,200 bps
Operating Temperature	32°F to 122°F (0°C to 50°C)
Dimensions (W x H x L)	5.4 x 4.2 x 6.6 in. (136 x 105 x 168mm)
Weight	0.89 lb. (0.40 kg)
Protocol	Pelco D used
All dimensions and parameters are for reference only and are subject to change without notice.	

Table 1-6 Joystick Controller Part Numbers

Joystick Controllers	
Will-Burt Part Number	Input Voltage
5098901	110-240VAC
5288901	12VDC
5289001	24VDC

1.5.2.2 Rack Mount Controller

The Rack Mount Controller is a 2U profile rack mount designed to suit a standard 482.6mm (19 in) rack mount.

Table 1-7 Rack Mount Controller Specifications for use with Positioners

	Specification
Input Voltage	110 – 240VAC, 50/60 hz (24vDC version available)
Output Data	Pelco D protocol over RS485 (2 wire), 2400, 4800, 9600 Baud Rate
Weight	< 2.65 kg (5.8 lb.)
Operational Temperature Range	-20 to 50°C (-4 to 122°F)
Base Dimensions	301mm L x 428mm W
Front Panel Dimensions	88mm H x 483mm W
Mounting Hole Pattern	465mm x 76.2mm

See Rack Mount Controller Manual (PM-01005) for more information

The rack mount will operate both Gen1 Positioners (such as RX Bowler, Topper, Homburg) and Gen 2 Positioners (such as the Accupoint Range). When using a Gen2 Positioner it is recommended to use 9,600 baud rate for best possible performance in most applications.

1.5.2.3 User Supplied Controller

The Accupoint Positioners can be controlled using any Pelco D compatible controller over an RS485 data line that supports the appropriate command sets (ie; tilt, pan, etc.). See Section 3.4.3.9 and Section 6.3 for further details and a list of supported Pelco D commands.

1.6 Major Components

The typical major components of a positioner system are:

- Positioner
- Payload Platform & Base Mounting Ring (Provided with Positioner)
- Controller
- Power/Data Connector (Provided with Positioner)
- Power/Data Cable (optional)
- Positioner Power Supply (optional)
- Step Up Converter (optional)
- Step Down Converter (optional)

1.6.1 Positioner

Accupoint Positioners:

- Are made of die-cast aluminum casing
- Use stainless steel fasteners
- Are designed and tested to an IP68 ingress protection rating
- Are designed to minimize backlash
- Are configured to run on RS485 data using Pelco D protocol, other protocols available on request
- Ship with the Accupoint Positioner Operator’s Manual (this manual)

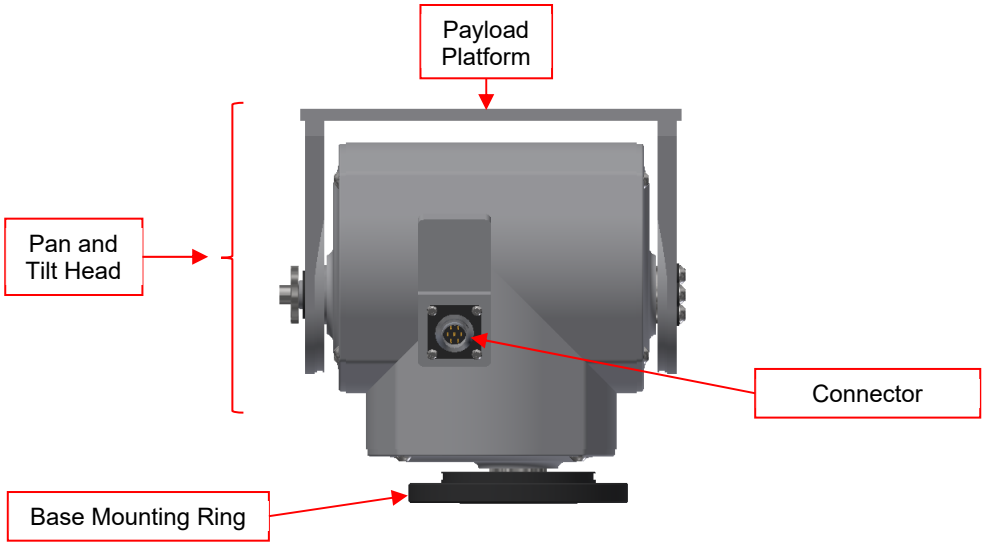


Figure 1-9 Accupoint Positioners

1.6.2 Power / Data Connector

The Power / Data Connector is a 90° 7-way circular connector that provides power and data from the power supply and controller to the positioner. The Power / Data Connector is a solder type connector. See Section 2.6.3 for pin out and wiring details.

1.6.3 Controllers

1.6.3.1 Joystick Controller

The joystick controller (Figure 1-10):

- Controls pan and tilt functions
- Is Pelco D compatible (along with other optional protocols)
- Has a joystick, LCD screen and a keyboard
- Can program and call presets
- Can program electronic limit stops
- Has proportional speed control

- Is not designed to handle inclement weather and should be kept in a protected environment
- Does not support absolute positioning and positional feedback

Figure 1-10 Joystick Controller (Left: With Keyboard Cover On. Right: With Keyboard Cover Off.)

1.6.3.2 Rack Mount Controller

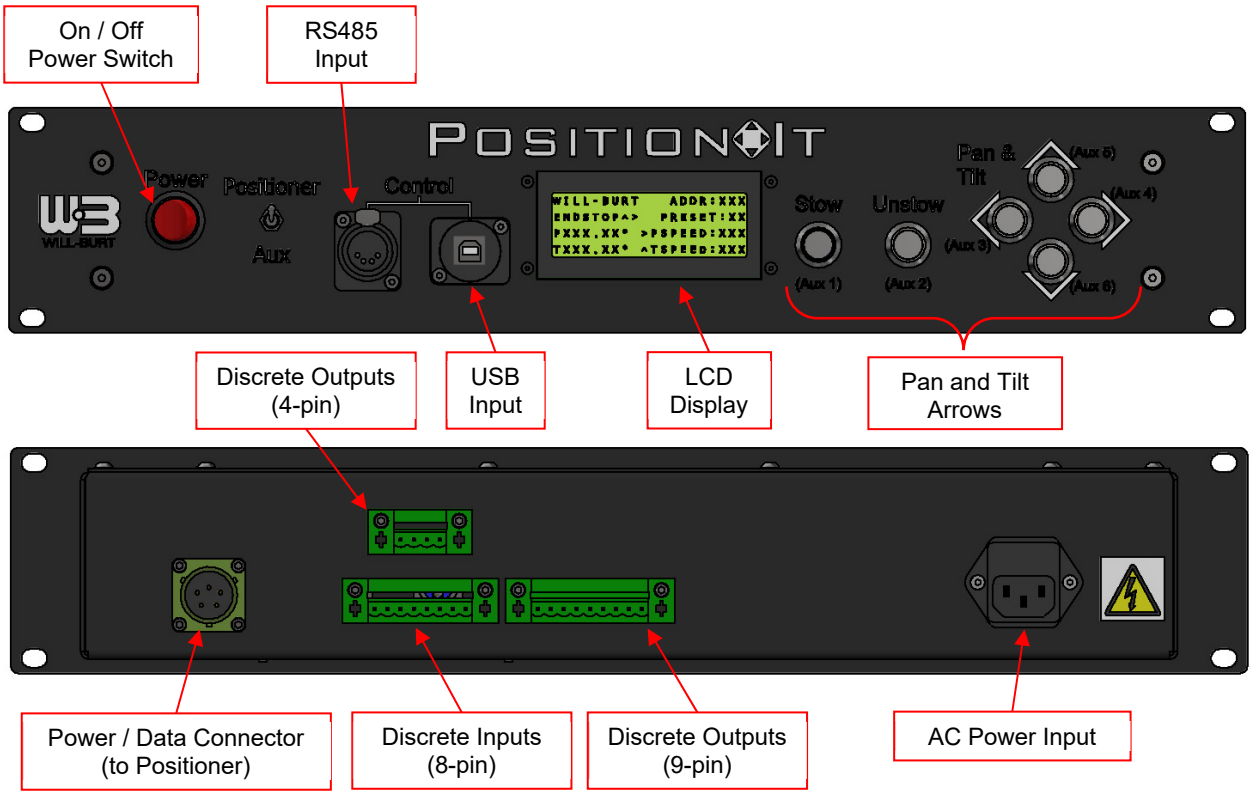


Figure 1-11 Rack Mount Controller

1.6.4 USB to RS485 Converter

The USB to RS485 converter converts USB to serial RS485 to allow users to control their Accupoint Positioner using a Laptop/PC with an installed Graphic User Interface (GUI).

Figure 1-12 USB to RS485 Converter

1.6.5 Power/Data Cable

The power/data cable (Figure 1-13) consists of (2) 0.75mm^2 power wires, (2) 0.75mm^2 control wires and (1) earth/shield wire. The cable ships with a 90° 7way connector installed on one end and flying leads with 0.75mm^2 ferrules on the other end. The end with the wire ferrules can be cut if the customer requires a shorter length.

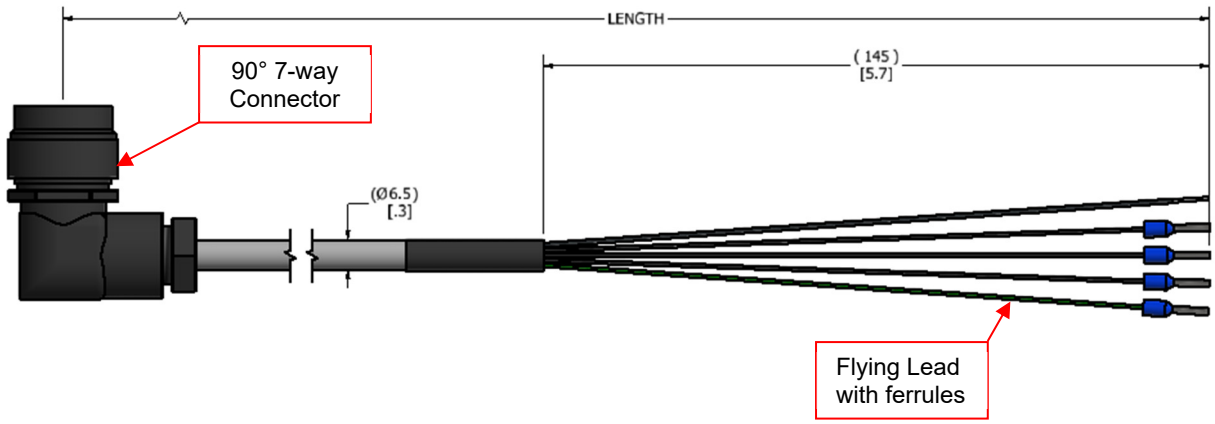


Figure 1-13 Power/Data Cable

Table 1-6 provides the part numbers for the standard cables.

Table 1-10 Standard Accupoint Power/Data Cables

Will-Burt Part Number	Length
610/05175	10m (33 ft)
610/05182	20m (66 ft)
610/05183	30m (98 ft)

1.6.6 Positioner Power Supply

1.6.6.1 AC/DC Converter

The positioner power supply (P/N: 208016) (Figure 1-14) is used in systems using 110VAC (50 or 60 Hz) or 240VAC (50 or 60 Hz) to convert the AC power to 24VDC input power for the positioner. The power supply has short circuit, overcurrent, overvoltage, and over temperature protections. It is an IP67 design and is suitable for dry, damp, or wet locations.

Figure 1-14 Positioner Power Supply

1.6.6.2 Step Up Converter

The step-up converter (P/N: 208012) (Figure 1-15) is used in systems with 12VDC input power to step up the power to 24VDC for the positioner.

Figure 1-15 Step Up Converter

1.6.6.3 Step Down Converter

The step-down converter (P/N: 208017) (Figure 1-16) is used in systems with 24VDC input power to step down the power to 12VDC to power the joystick controller if the AC power supply supplied with the joystick is not used to provide power.

Figure 1-16 Step Down Converter

1.6.6.4 Barrel Connector (2.1mm)

The 2.1mm barrel connector (P/N: 5195601) (Figure 1-17) can be used to connect the joystick controller to the step-down converter or 12VDC power source.

Figure 1-17 Barrel Connector

1.7 Quick Overview

This section provides a quick overview of the system. Be aware of and follow all associated precautions when performing these procedures.

1.7.1.1 To install the positioner (Section 2):

1. Mount the positioner using the appropriate hardware (see Section 2.5).
2. Wire the positioner according to the schematic (see Section 2.6).
3. Mount the payload with appropriate hardware (see Section 2.7).

1.7.1.2 To operate the positioner (Section 3):

1. Connect the controller.
2. Operate the positioner using a controller (see Section 3).
3. If required, see Section 3.4.3.4 for information on how to adjust the electronic limit stops. The positioner ships from the factory with electronic limit stops set. There are no hard limit stops.
4. If required, see Section 3.4.3.7 for information on how to use preset positions.

Section 2 Installation

This section describes the installation of the system and provides general procedures that must be followed to ensure a successful installation.

2.1 Pre-Installation Check

Before installing the system:

- Be sure to read and understand the entire installation procedure before beginning installation.
- Ensure that only a properly trained and qualified certified electrician performs electric installations and maintenance.
- Ensure that all required tools are readily available.
- Ensure that the following warnings are understood and followed:

⚠ WARNING

Mounting Structure Hazard! Before installation, be certain the mounting structure is capable of resisting forces generated from all loading and environmental conditions including, but not limited to natural frequency/resonance, system size and weight, payload size and weight, sail size, and wind speed. Mounting the system to a structure unable to resist the forces generated from customer-specific loading scenario could result in death or serious injury and could damage the system.

⚠ WARNING

Safety Instruction – Mounting Instructions! Be sure to understand all mounting instructions. The mounting hardware must include proper means to resist vibration loosening such as thread-locking compound or locking hardware. Failure to follow mounting instructions can result in death or injury.

⚠ WARNING

Trained Personnel Only! Only trained and qualified personnel should perform installation, adjustments, and servicing. Only a properly trained and qualified certified electrician should perform electric installations and service. Death or serious injury could result if proper installation, inspection, operation, and maintenance procedures are not observed.

⚠ CAUTION

Equipment Damage! Failure to follow mounting instructions can result in damage to the positioner. For any inversion of the unit that differs from a horizontal mounting consult with Will-Burt Engineers prior to any installation.

2.2 Installation Tools

Table 2-1 lists tools and materials recommended for installation.

Table 2-1 Tools and Materials Recommended for Installation

Tools and Materials		
Safety Glasses	Safety Gloves	Safety Shoes or Combat Boots
Hard Hat or Helmet	Wrenches	Screwdrivers
Wire Cutter / Stripper	Crimping Tools	Mounting Hardware (Payload)
Spirit Level	Soldering Kit	Mounting Hardware (Pedestal)
Thread-Locking Compound or Locking Hardware		
Laptop with RS 485 Connection Kit, installed GUI		

2.3 Components

When unpacking, check to ensure all ordered components have arrived. The components your system includes will vary based upon your order.

Possible components include:

- Positioner
- Mating Connector (provided with positioner)
- Controller (joystick controller, rack mount controller, etc.)
- Controller Manual (provided with controller)
- Accupoint Positioners Operator's Manual (this manual)
- Power/Data Cable (used to connect positioner to the controller and power supply)
- Some combination of the following:
    - Positioner Power Supply (used in systems with AC input power)
    - Step Up Converter (used in systems with 12VDC input power)
    - Step Down Converter
- Barrel Connector (2.1mm) (used to connect the controller to a 12VDC power supply)

2.4 Unpacking

Unpack as follows:

1. Carefully open the box(es) and unpack all components.
2. Check for any damage from shipping. If damage has occurred, notify the carrier.
3. Ensure that all required tools are readily available.

2.5 Mounting the Positioner

When installing, the front of the positioner can be identified as the side of the positioner opposite of the Power/Data Connector (Figure 2-1). Note that the offset on the left of the positioner, as you face the connector, is wider than the offset to the right. The positioner ships in the Factory Home position.

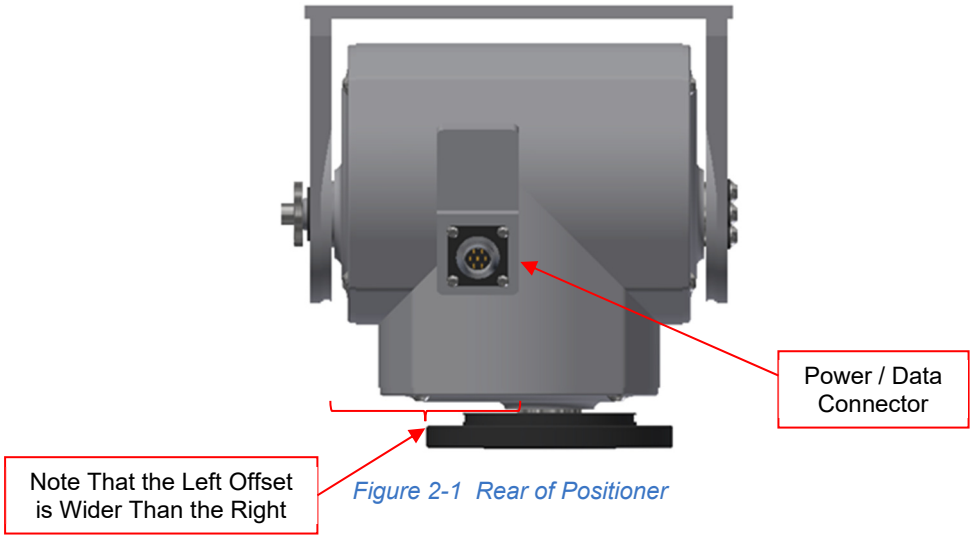


Figure 2-1 Rear of Positioner

The mounting location must:

- Be capable of withstanding the holding forces required by the bolts
- Be free of obstructions
- Allow for sufficient pan and tilt movement
- The positioner is designed to be operated in the vertical position but can be operated at other angles, consult with Will-Burt Engineers prior to any operation other than the vertical position.
- Be sure to take into consideration other external factors, such as resonance/natural frequency, wind or ice loading, when selecting a mounting location. Make sure that these external factors do not overload the system.

Reference Figure 2-2, Figure 2-3 and Figure 2-4 for the mounting hole locations for each Accupoint Positioner. Mount the positioner using the appropriate hardware (customer supplied). Torque all hardware as appropriate for its material and size. The mounting hardware should include proper means to resist vibration loosening such as thread-locking compound or locking hardware.

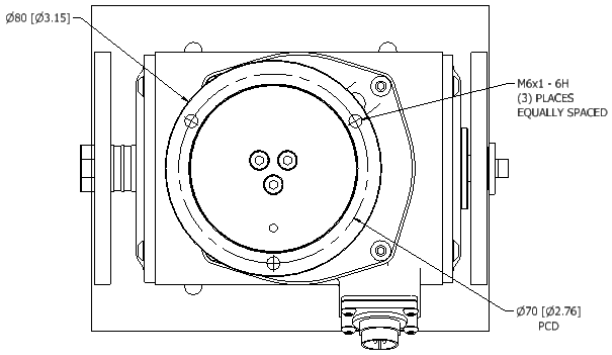


Figure 2-2 AP-8 OTT, AP-8 Side Mount, Mounting Pattern (Bottom of Positioner)

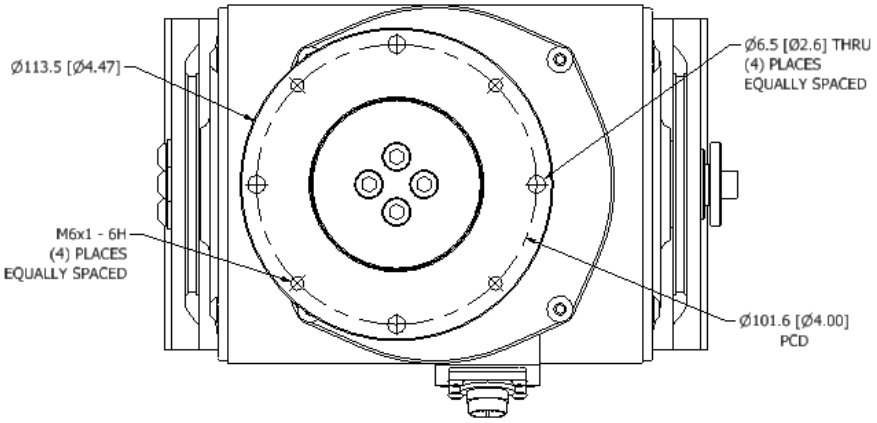


Figure 2-3: AP-30 OTT & AP-30 Side Mount Mounting Pattern (Bottom of Positioner)

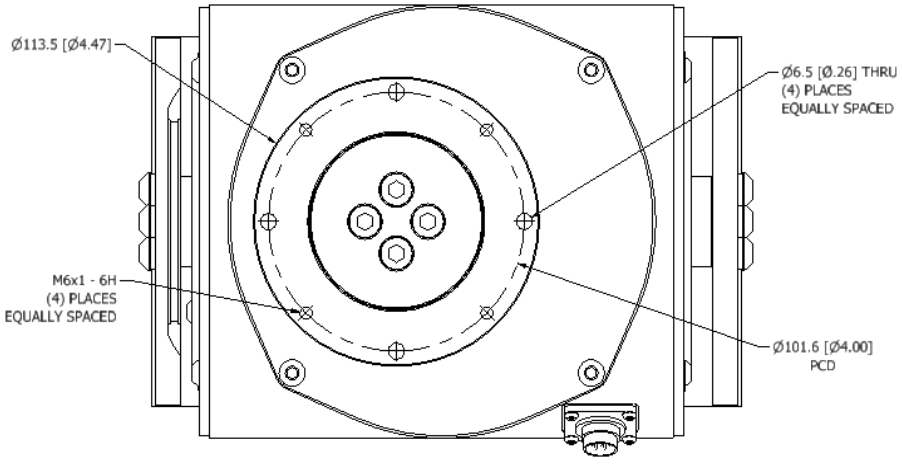


Figure 2-4: AP-50 OTT & AP-50 Side Mount Mounting Pattern (Bottom of Positioner)

Dimensions: mm [in]

2.6 Wiring the System

This section discusses wiring the system assuming the joystick controller is being used. Alternative Pelco D compatible controllers can be used to control the Accupoint Positioners. Contact the Will-Burt Technical Team if further assistance is needed.

2.6.1 Positioner Power/Data Connector

The positioner has one Power/Data Connector located on the back side of the body of the positioner (Figure 2-5). The Power/Data Connector has two pins designated for power and 2 pins designated for data, see Section 2.6.3 for more details

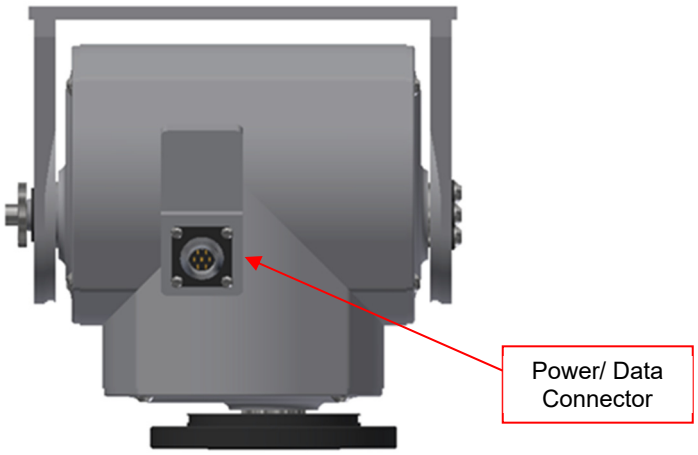


Figure 2-5 Positioner Power/Data Connector Location

2.6.2 Power and Controls System Overview

This section provides an overview of a standard 24VDC Accupoint Positioner system setup. Examples are provided for systems with 12VDC, 24VDC and 110VAC/240VAC supplied power. Before setting up your system verify the voltage of your positioner by checking the serial tag located on the positioner. If you are unsure of your positioners voltage rating contact Will-Burt Customer Service

⚠ CAUTION

Equipment Damage! Ensure the connections are made properly to prevent water ingress into the positioner through the connections. Should water enter the positioner, extreme problems can occur.

The system configuration depends on the power provided to your system. Select the appropriate power below for your system and configure accordingly:

1. Powered with 12VDC
2. Powered with 24VDC

3. Powered with 110VAC (50 or 60 Hz) or 240VAC (50 or 60 Hz)

Powered with 12VDC:

If the input power supply is 12VDC, the system will require:

- A 12VDC to 24VDC step-up converter (P/N: 208012) to power the positioner
- 5 Amp Fuse

Figure 2-6 provides a quick overview of the wiring for a system powered with 12VDC input.

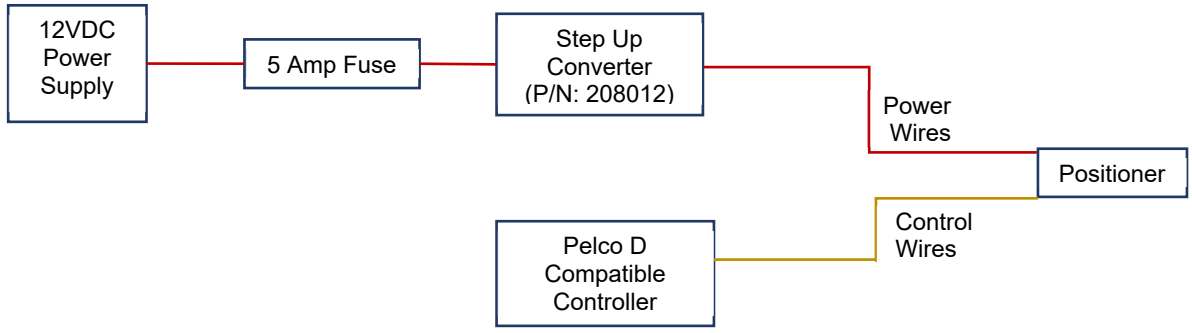


Figure 2-6 Powered with 12VDC

Powered with 24VDC:

If the input power supply is 24VDC, the system will require:

- 2 Amp Fuse

Figure 2-7 provides a quick overview of the wiring for a system powered with 24VDC input.

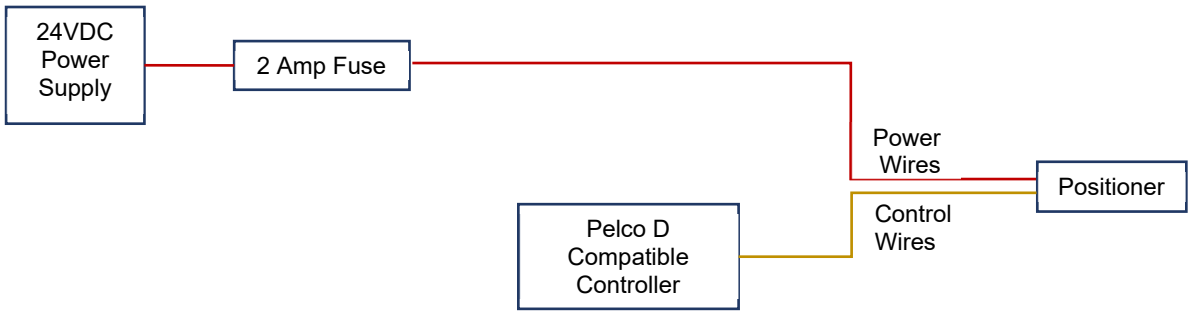


Figure 2-7 Powered with 24VDC

Powered with 110VAC (50 or 60 Hz) or 240VAC (50 or 60 Hz):

If the input power supply is 110-240VAC 50/60Hz, the system will require:

- A power supply (P/N: 208016) for the positioner
- 2 Amp Fuse

If the customer is using AC input power and the power supply (P/N: 208016), the customer is responsible for installing a plug (customer-supplied) based on their region. The power supply ships with flying leads to connect to the appropriate customer supplied plug.

Figure 2-8 provides a quick overview of the wiring for a system powered with AC input.

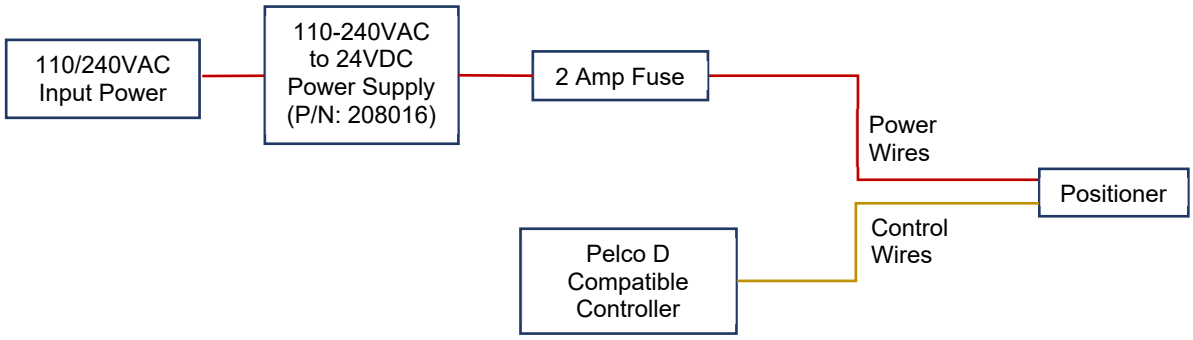


Figure 2-8 Powered with 110-240VAC 50/60 Hz

2.6.3 Power/Data Pinout

Figure 2-9 shows the appropriate pin out diagram for wiring the 90° 7-way connector that connects to the positioner connector.

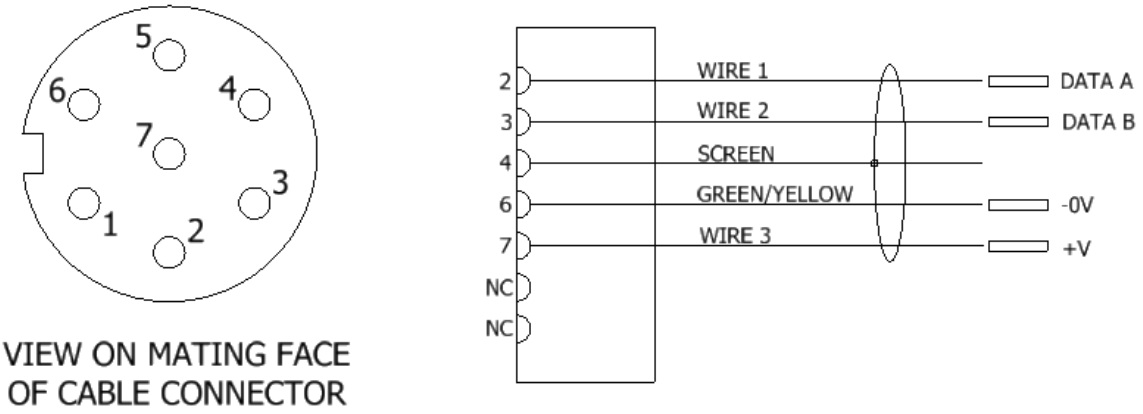


Figure 2-9 Cable Pinout

2.7 Mounting the Payload

This section discusses mounting the payload.

⚠ WARNING

Safety Instruction – Mounting Instructions! Before operation, be certain the positioner is capable of resisting forces generated from all loading and environmental conditions including, but not limited to resonance/natural frequency, payload size and weight, sail size, and wind and ice loading. The mounting hardware must include proper means to resist vibration loosening such as thread-locking compound or locking hardware. Mounting the payload onto a positioner unable to resist the forces generated from the customer-specific loading scenario could result in death or serious injury, this can also damage the positioner.

To attach the payload:

1. Ensure power to the system is off while installing the payload.
2. Reference the payload mounting hole patterns for each positioner on the next page. Torque all hardware as appropriate for its material and size. The mounting hardware must include proper means to resist vibration loosening such as thread-locking compound or locking hardware.
3. Position the payload on the mounting plate.
4. Connect the payload to the top of the positioner with appropriate hardware. Torque all hardware as appropriate for its material and size. The mounting hardware must include proper means to resist vibration loosening such as thread-locking compound or locking hardware. Ensure hardware does not contact body of positioner at any point along the tilt path.

2.7.1 AP-8 Payload Mounting Pattern

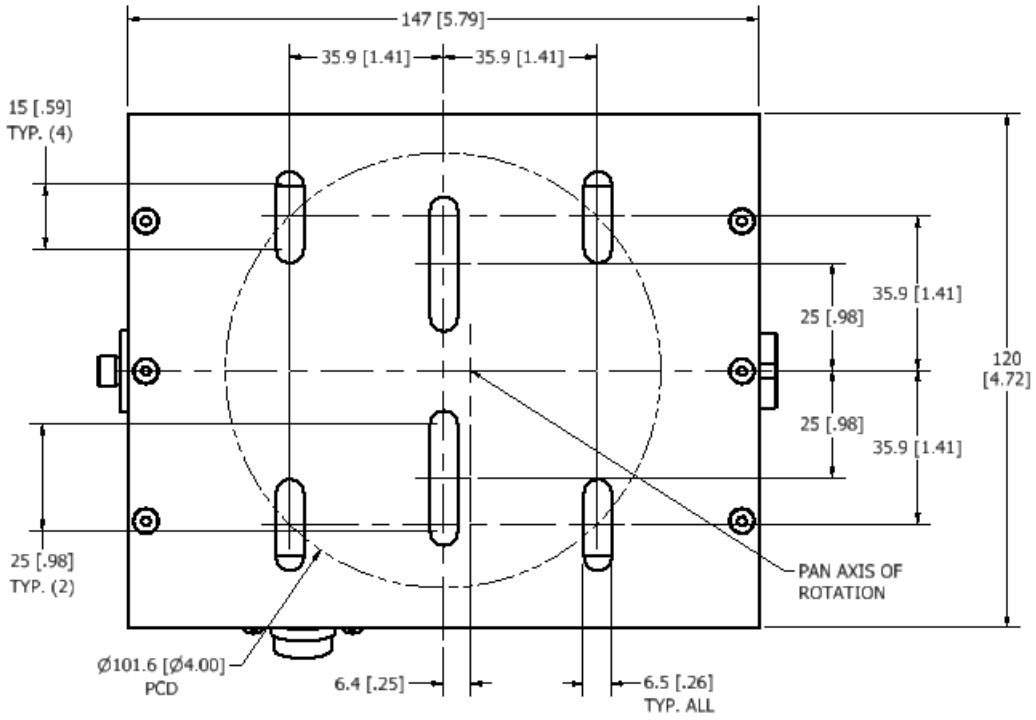


Figure 2-10 AP-8 OTT - Payload Mounting Pattern
(P/N *LF2/51/TX/XXX/RX2-00*)

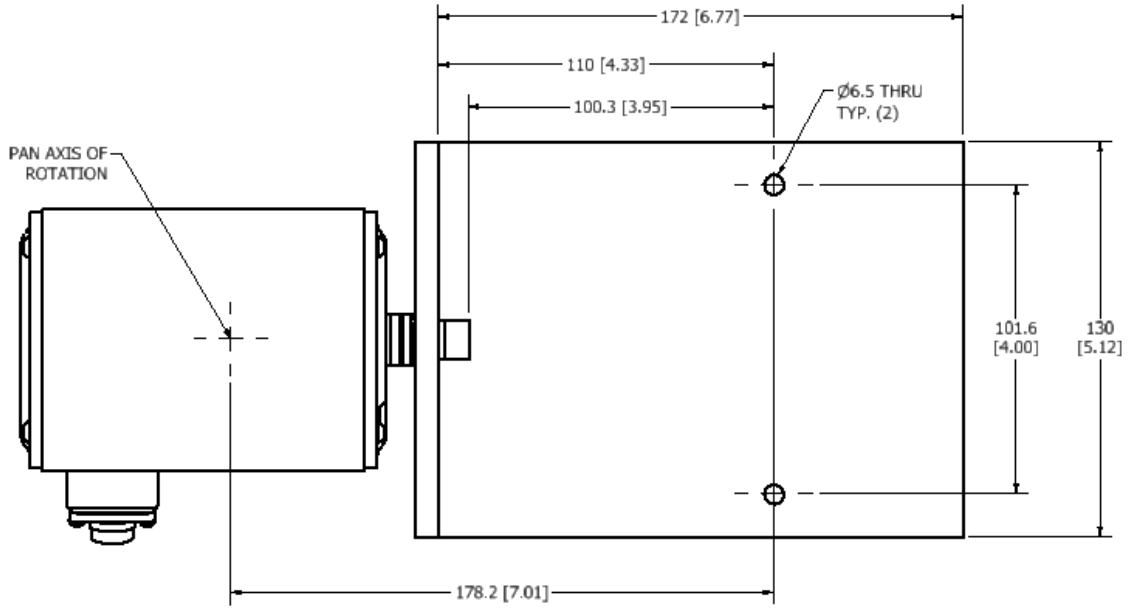


Figure 2-9 AP-8 Side Mount - Payload Mounting Pattern
(P/N *LF2/51/SX/XXX/RX2-00*)

Dimensions: mm [in]

2.7.2 AP-30 Payload Mounting Pattern

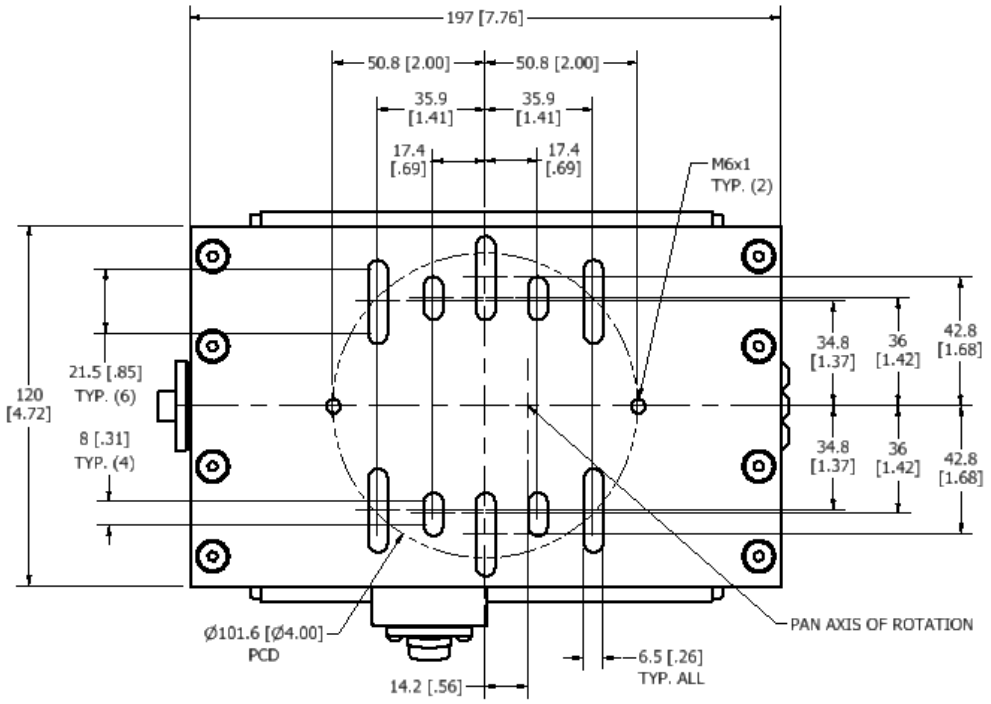


Figure 2-10 AP-30 OTT - Payload Mounting Pattern
(P/N *MF2/83/TX/XTX/RX2-00*)

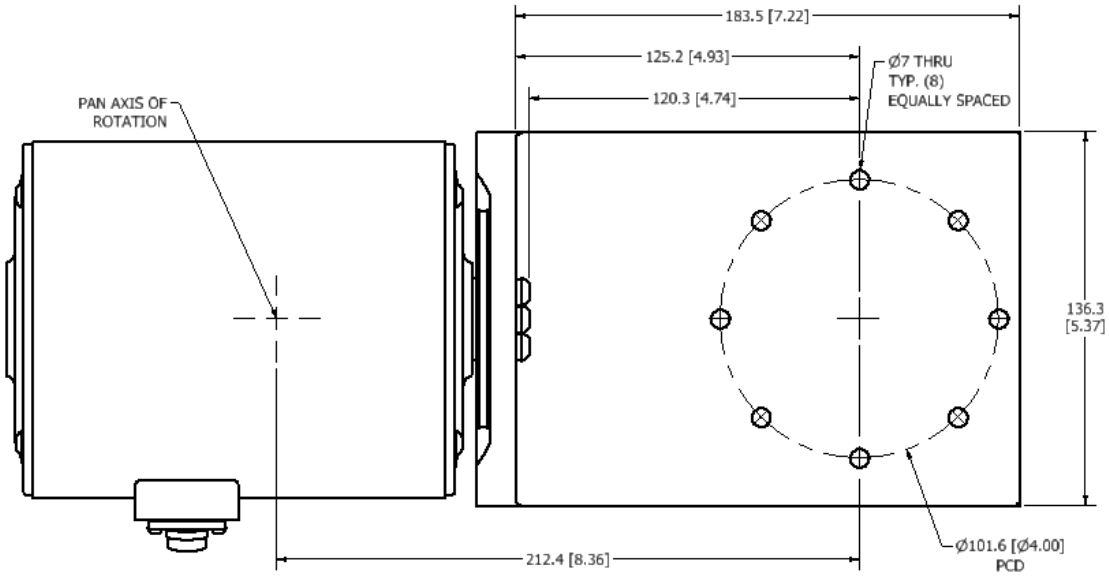


Figure 2-11 AP-30 Side Mount - Payload Mounting Pattern
(P/N *MF2/83/SX/XTX/RX2-00*)

Dimensions: mm [in]

2.7.3 AP-50 Payload Mounting Pattern

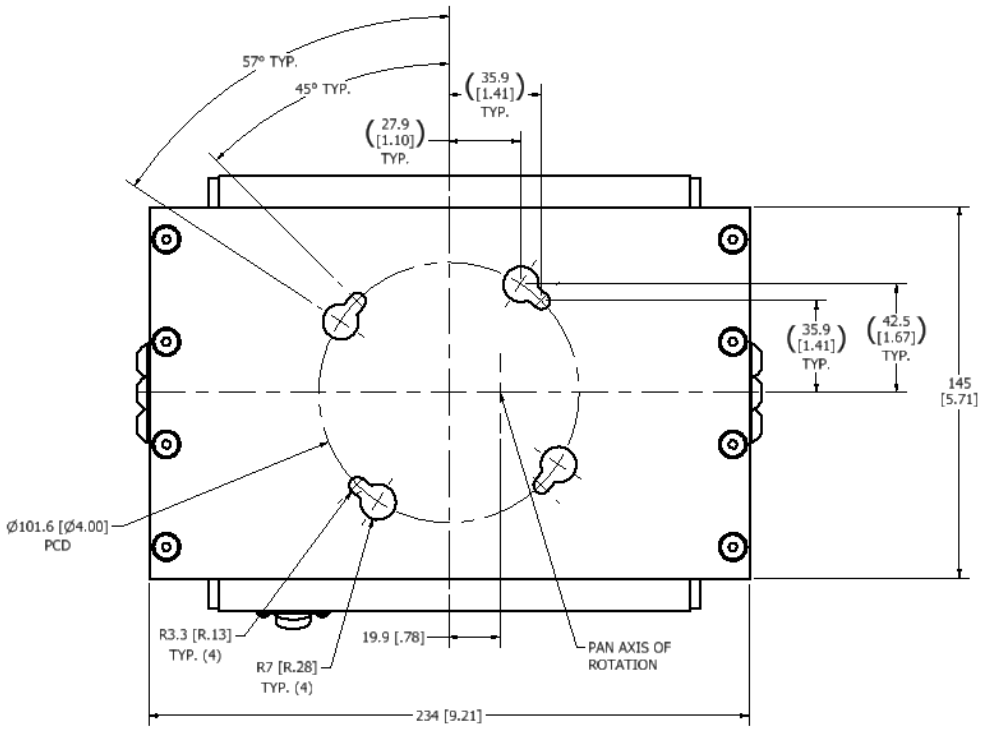


Figure 2-124 AP-50 OTT - Payload Mounting Pattern
(P/N *HF2/62/TX/XDX/RX2-00*)

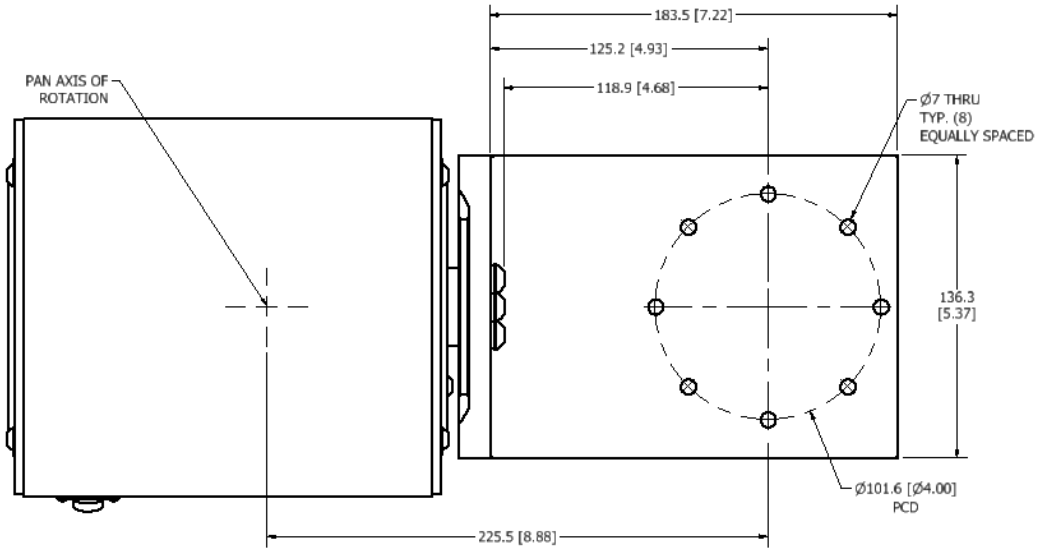


Figure 2-13 AP-50 Side Mount - Payload Mounting Pattern
(P/N *HF2/62/SX/XDX/RX2-00*)

For Antenna Mount Mounting Pattern refer to Specific Antenna Mount Documentation

Dimensions: mm [in]

Section 3 Operation

This section describes the operation of the system.

3.1 Pre-Operation Check

Before operating the system:

- Be sure to read and understand the entire operation procedure before beginning operation.
- Visually inspect the system for damage. If damage is apparent, do not use the system, and have it serviced prior to use.
- Read and understand the controller manual. Ensure that all warnings, associated with the controller are understood and followed. Ensure all relevant installation, operation, and maintenance instructions are followed.
- Ensure that the area around the pan and tilt area is clear so no damage will result from unexpected movement.
- Ensure that all wiring connections are tight and appropriately connected.
- Ensure that the following warnings are understood and followed:

⚠ WARNING

Safety Instruction – Operation! For outdoor use only. Do not use in areas that have been classified as hazardous as defined by ATEX/DSEAR directives

⚠ WARNING

Safety Instruction – Keep Clear! Keep personnel clear of the positioner during operation.

⚠ CAUTION

Equipment Damage! Check for and remove any objects which might obstruct motion, cause binding, or hinder function of the system. Hitting obstructions will cause damage to the positioner.

⚠ CAUTION

Equipment Damage! If the electronic tilt limit stops are reset to their original settings, it is possible to drive the payload platform into contact with the positioner. Damage to the positioner and/or payload will occur.

⚠ CAUTION

Entanglement Hazard! Ensure cables are not tangled and are free to play out as the mast is extended. Tangled cables can cause equipment damage.

3.2 PPE requirements

Table 3-1 lists PPE requirements for Operation and Maintenance

Table 3-1 PPE Recommended for Operation and Maintenance

PPE Requirements		
Safety Glasses	Safety Gloves	Safety Shoes
Hard Hat or Helmet	Hi-Visibility Jacket or Vest	

3.3 General Controls

The information and instructions described in this section are for controlling the Accupoint Positioner.

The positioner has been designed to be controlled via RS485, 2 wire (half duplex with handshaking) via Pelco D protocol.

The Accupoint range can be controlled via various control systems including, but not limited to, PC/Laptop/Tablet via a GUI, a CCTV style control keyboard/Joystick or a rackmount controller. Below are the installation and control instruction for some of these options.

The Commissioning GUI is to be used during installation and commissioning of an Accupoint unit.

3.3.1 Equipment Setup

3.3.1.1 Using Easysync USB to RS485 converter to drive Positioner.

- Set to RS485 Half duplex.
- Dip Switch settings: Up/Dn/Dn/Dn.
- Check you have the correct Com Port (Generally assigned by your device) but must be selected.
- Connect to positioner and test control of the Pan & Tilt movements.
  If no movement, it is common to have the RS485 TX and RX lines reversed.

3.4 Software Set Up

The unit can be configured, in software, to suit various applications.

To carry out the configuring it is recommended the installer use the Commissioning GUI which is available from Will-Burt.

3.4.1 Commissioning GUI Installation

The commissioning GUI is to be used for initial set up of the Accupoint Positioner. By using this GUI the installation engineer can set such parameters as addresses, baud rates, limit stops positions, home position, etc.

N.B: The commissioning GUI is not intended for use as a controller and should not be used as such.

Open the Commissioning GUI folder and install the GUI. Once installed, open the GUI program. The GUI is designed to be largely self-explanatory and the key steps are described below, however, if you require help please contact your Will-Burt representative who will help guide you through the commissioning process.

To install a new version of the GUI on you selected device (PC, Laptop, Tablet, etc.) you must first uninstall any previous version located on the device that you are installing to.

3.4.2 Key Commissioning Steps

1. Setting the Home Position:

The home position is factory set at the center of the mechanical travel of both axis. This factory set position is correct for the majority of installations, if this is the case please skip this step.

However, in some installations it may be required to adjust the home position. This can be carried out by the installer using the Commissioning GUI.

Key considerations before setting Home Position

- Once the a new home position is set, the factory set home position will be lost.
- When the home position is moved, limit stops and preset positions will have moved to **must be reset** to ensure safe operation of the positioner.

To set the home position:

1. Use the GUI to drive the unit to the new required home position.
2. Select the ‘Set Home Position’ Button on the GUI
3. Chose ‘yes’ on the confirmation box
4. The new Home Position has now been set, you can test this by either reading the pan and tilt positions or moving away from the home position and recalling ‘home’.

2. Setting Electronic Limit Stops

Electronic limit stops can be set within the positioner as part of the installation process. Setting electronic limit stops prevents the positioner from travelling past a specified point in either tilt or pan direction. The user has the option to set and clear electronic limit stops for the tilt up, tilt down, pan right and/or pan left directions.

It is recommended that the installer use the commission GUI to set the electronic limit stops.

1. Use the commissioning GUI to drive the positioner to where you want to set the limit stop
2. Select the appropriate limit (e.g set left limit) on the GUI.
3. The limit stop should now be set
4. Test by attempting to drive the unit beyond this limit stop point.

Limit Stops can also be set and cleared using most Pelco D compatible controllers but using presets 80, 81, 82 and 83 to set them and presets 70, 71, 72 and 73 to clear them. See Sections 3.4.3.4, 3.4.3.5, 3.4.3.5 and 6.3.

IMPORTANT! If the tilt limit stops are cleared to their default settings, it is possible to drive the payload platform into the power/data connector. This will cause damage to the positioner.

Presets can be set within the positioner to store a specified position. The user can store [1] - [50] presets. Presets can be cleared or over overwritten. Presets can be set, cleared, or overwritten using a Pelco D compatible joystick controller or a GUI. Preset [0] is designated for the “Factory Home” position and cannot be reset. Preset [1] and Preset [2] is designated for the “Stow” and “Unstow” position and are set by the user. See Sections 3.4.3.7 and 6.3 for more details.

3.4.3 Controllers

3.4.3.1 Keyboard

Refer to the controller manual for more information on the specific controller with your system. Some functions of the joystick controller are not used with the positioner.

The joystick controller is not designed to handle inclement weather and should be kept in a protected environment. When the controller is in operation, the LCD screen backlight will turn on. The keyboard and joystick can be used to access menu functions, adjust electronic limit stops, and store and call preset positions.

The controller contains functions and keys which are not used with the positioner. Keys (Figure 3-) which are used for operation include:

- [Menu] which is used to access menu functions
- [Ent] (enter) which is used to make selections within the menu
- [Set] which is used in the process to store presets and electronic limit stops
- [Pre] (preset) which is used in the process to store presets and electronic limit stops, and in the process to call presets
- [Mon] (monitor) which is used in the process to change the MonID
- [Cam] (camera) which is used in the process to change the CamID
- [Prev] (previous) which is used when using the menu to save preset positions, and to cancel out of a preset without calling it
- [N], where “N” represents a number on the keyboard, which is used to access menu functions, and as part of the processes to store and call presets

Figure 3-2 Keyboard Keys

3.4.3.2 Joystick

The joystick pans and tilts the positioner proportionally. The speed of the movement will directly relate to the lean angle of the joystick.

Menu

When used with menu functions, the joystick controller functions as follows:

- Push the joystick forward to move up the menu
- Pull the joystick back to move down the menu
- When the joystick is moved to the right, the menu will go to the sub menu or save the setup
- When the joystick is moved to the left, the menu will be exited

Panning and Tilting

When moving the positioner with the joystick, arrows pointing in the direction of the movement will display in the lower right corner of the LCD screen. The greater the lean of the joystick, the faster the movement.

When panning and tilting, the joystick functions as follows:

- When the joystick is pushed forward, the positioner will tilt back (Pointing the payload up). An arrow will appear pointing forward (▲) on the LCD screen.
- When the joystick is pulled back, the positioner will tilt forward (Pointing the payload down). An arrow will appear pointing back (▼) on the LCD screen.
- When the joystick is moved to the right, the positioner will rotate clockwise to the right. An arrow will appear pointing right (►) on the LCD screen.
- When the joystick is moved to the left, the positioner will rotate counterclockwise to the left. An arrow will appear pointing left (◄) on the LCD screen.
- It is possible to simultaneously pan and tilt the positioner by moving the joystick towards a diagonal. Arrows for both applicable directions will appear on the LCD screen. For example, when tilting forward and panning right, both an arrow pointing up and an arrow pointing right will appear (▲►).

The positioner will continue to move in the direction given by the joystick until the joystick is released or centered, or the positioner reaches one of its limits.

3.4.3.3 Menu Functions

To access menu functions with keyboard or joystick:

1. Ensure power is on to the system.
2. Press [Menu] for (2) seconds. The Menu screen (Figure 3-) will appear.

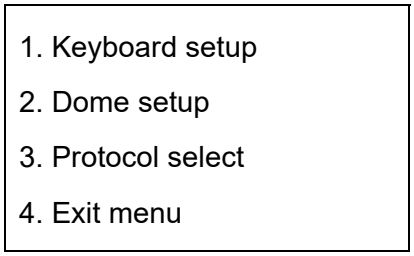


Figure 3-3 Menu Screen

3. Use the joystick to navigate through the menu. The number keys can also be used to assist in navigating through the menu.

Detailed steps of specific menu functions are listed in Section 3

3.4.3.4 Electronic Limit Stops

We recommend that all limit stops, home positions be set using the GUI.

Electronic limit stops can be assigned to restrict travel about the pan or tilt axes in either direction. **Ensure payload and positioner is clear from obstructions throughout its entire travel.** The positioner does not have mechanical hard stops. The positioner comes from the factory with electronic limit stops set to the maximum recommended pan and tilt (see below).

The factory electronic limits are set as follows:

- Pan limit stops are set to 360° of rotation (±180°)
- Tilt limit stops are set to
    - Over the Top Mount Accupoint Positioner: +90° / -45°
    - Side Mount Accupoint Positioner: 180° (±90°)
    - Antenna Mount Accupoint Positioner: Refer to specific Antenna Mount Documentation

IMPORTANT! **If the tilt limit stops are cleared, it is possible to drive the payload platform into the power/data connector. This will cause damage to the positioner.**

3.4.3.5 Setting Limit Stops with the Keyboard

To set the electronic limit stops with the keyboard:

1. Drive the positioner to the desired electronic limit stop.
2. Press [Set].
3. Press [N] where “N” represents the number which corresponds to the preset being adjusted. Reference Table 3-2 to determine which number to use to change each electronic limit stop.

Table 3-2 Limit Stop Presets

Set Preset [N]	Function
80	Stores New Pan Left (Counterclockwise) Limit
81	Stores New Pan Right (Clockwise) Limit
82	Stores New Up Limit
83	Stores New Down Limit

4. Press [Pre]. The electronic limit has been adjusted and the positioner will no longer move past that point.
5. Test to ensure electronic limit stop has been properly set.

Note that it is possible to set the electronic limit stops such that the positioner cannot move (e.g; setting the clockwise and counterclockwise limits to the same spot). If this happens, clear the electronic limit stops and reset electronic limit stops to the desired location.

3.4.3.6 Clear Limit Stops with the Keyboard

To clear the electronic limit stops with the keyboard:

1. Press [Set].
2. Press [N] where “N” represents the number which corresponds to the preset being cleared. Reference Table 3-3 to determine which number to use to change each electronic limit stop.
3. Press [Pre]. The electronic limit stops have been cleared.
   Ensure new limit stop is set.

Table 3-3 Default Limit Stop Numbers

Set Preset [N]	Function
70	Clears Left (Counterclockwise) Limit
71	Clears Right (Clockwise) Limit
72	Clears Up Limit
73	Clears Down Limit

3.4.3.7 Presets

Preset positions can be stored to a preset number between [1] and [50].

The controller comes from the factory with the preset [0] (zero) set to move the positioner to the Factory Home position (mid-point of both the pan and tilt). In this position the tilt platform will be horizontal, and the pan axis will be in the center position. This is referred to as the “Factory Home” position.

Preset [1] is designated for the “Stow” position.

Preset [2] is designated for the “Unstow” position.

Presets can be set or called using the keyboard keys or through menu functions. Presets can only be cleared through menu functions. It is possible to overwrite presets through either method.

Setting Presets with the Keyboard

To store a preset position using the keyboard:

1. Use the joystick to drive the positioner to the desired position for the preset.
2. Press [Set].
3. Press [N] where “N” represents the number being assigned to the preset position.
4. Press [Pre]. The preset position is stored.

Calling Presets with the Keyboard

The preferred way to call a preset position is with the keyboard as moving the joystick while in the menu will not stop the motion of the positioner (e.g., if an emergency stop is required).

To call a stored preset position using the keyboard:

1. Press [N] where “N” represents the number assigned to the desired preset position.
2. Press [Pre]. The positioner will move to the preset position. When moving to a preset position, the positioner will simultaneously pan and tilt for any user defined preset position.
3. As the positioner nears the preset position, it will slow down. If an emergency stop is required as the positioner is moving to a preset position, move the joystick to cancel out the preset position command.

3.4.3.8 Rack Mount Controller

See Rack Mount Controller manual for further control details

3.4.3.9 User Supplied Controller

The Accupoint Positioners can be controlled using any Pelco D compatible controller over an RS485 data line that supports the appropriate command sets (ie, tilt, pan, etc.). The user should refer to the controller manual for setup and installation details. The user should refer to the Positioner Specifications page of this manual to ensure compatibility and appropriate setup.

In the case of controlling the positioner using a PC/laptop via a Graphic User Interface (GUI) the user will need a USB to RS485 converter for sending and receiving data to and from the positioner. The Accupoint Positioners support several Pelco D command sets including Absolute Positioning and Positional Feedback (Query Position). See Section 6.3 for a list of supported Pelco D commands.

The Absolute Position of the “Factory Home” position, preset [0] (zero) is (See Figure 1-1):

- Tilt = 0°
- Pan = 180°

3.5 Setting Stow and Unstow

This section describes how to set the stow and unstow presets.

3.5.1.1 With the GUI

With the GUI

1. Pan and tilt the positioner until it reaches the desired position.
2. Set Preset 1 (Preset 1 is the always the stow position)
3. Set preset 2 (Preset 2 is always the unstow position)

3.5.1.2 With a Push Button Controller

With a push button controller:

1. Pan and tilt the positioner until it reaches the desired position.
2. Press and hold the left and right pan buttons simultaneously.
3. With the left and right pan buttons pressed, select “Stow” to set the stow preset position, or “Unstow” to set the unstow preset position.

3.5.1.3 With a Toggle Switch Controller

With a toggle switch controller:

If using a controller with toggle switches, a jumper will need to be used to connect the clockwise and counterclockwise contact closure wires to the contact closure power wire.

1. Pan and tilt the positioner until it reaches the desired position.
2. Attach a jumper from both the white (counterclockwise) contact closure wire and green (clockwise) contact closure wire to the red (power) contact closure wire.
3. Select “Stow” to set the stow preset position, or “Unstow” to set the unstow preset position.

IMPORTANT: <u>It is essential that Stow/ Unstow positions are set, before assigning any new limit stops</u>

3.6 Stow and Unstow Operation

3.6.1.1 Unstowing the Positioner

The Preset [2] position is designated as the “Unstowed” position. The user must Set Preset [2] using the joystick controller, rack mount controller or a GUI as described above before this function can be used.

To unstow the positioner:

1. Power on the system.
2. Perform the pre-operation check see Section 3.1
3. Press [2].
4. Press [Pre]. The positioner will move to the preset unstowed position. As the positioner nears the unstowed position, it will slow down. If an emergency stop is required as the positioner is moving to its position, move the joystick to cancel out the command.

3.6.1.2 Stowing the Positioner

The Preset [1] position is designated as the “Stowed” position. The user must Set Preset [1] using the joystick controller, rack mount controller or a GUI before this function can be used.

To stow the positioner:

1. Perform the pre-operation check see Section 3.1
2. Press [1].
3. Press [Pre]. The positioner will move to the preset stowed position. As the positioner nears the stowed position, it will slow down. If an emergency stop is required as the positioner is moving to its position, move the joystick to cancel out the command.
4. Power down the system.

Section 4 Maintenance

This section describes maintenance of the system. Be sure to read and understanding the entire maintenance procedure before beginning maintenance.

4.1 Routine Maintenance

Maintain the positioner as follows:

- Visually inspect to ensure the positioner is kept clean.
- Visually inspect for damage. If damage is apparent, do not use the positioner and have it serviced prior to use.
- Inspect to ensure all fixings and fastenings are tight. All fixings and fastenings must be thoroughly checked for tightness one month following installation, and thereafter at regular six-month intervals.
- Inspect to ensure cables are undamaged and properly terminated. Cabling of the correct type as specified by national and local standards should be used. Cables should be checked for wear at six-month intervals and replaced as necessary.
- Ensure no water can enter the positioner particularly through the connectors. Water ingress may cause severe problems with the positioner.

4.2 Replacement Parts

To order spare or replacement parts contact Will-Burt customer service.

Section 5 Troubleshooting

This section describes troubleshooting of the system. Do not open the positioner. Opening the positioner will break the environmental seal. This will void the warranty. This troubleshooting guide assumes:

- Use of 1 positioner
- Use of 1 joystick controller

5.1 Troubleshooting Guide

This section covers troubleshooting as follows:

- Trouble Shooing the Positioner see Table 5-1
-
- Table 5-2

Table 5-1 Troubleshooting the Positioner

Symptoms	Possible Cause	Remedy
Positioner Does Not Pan or Tilt		
Positioner does not pan or tilt in one direction.	An electronic limit stop has been reached.	Check the current position of the electronic limit stop. If it is set in an incorrect position, reset it (Section 3.4.3.7).
Positioner does not pan or tilt in multiple directions.	The system is not receiving power.	Check Wiring (Section 2.6.3)
	The power supply is wrong.	Check System Configuration (Section 2.6.2)
	The system is not receiving data	Check Wiring (Section 2.6.3) and controller setting
	System settings are incorrect.	Reset the factory defaults (See Joystick Controller Manual).
	The controller is in a menu.	Exit the menu.
	The system wiring is incorrect.	Check System Configuration (Section 2.6)
	Wires are broken or improperly terminated.	Check the wires and connections.
	The electronic limit stops have been set so that the positioner cannot move.	Check the current position of the electronic limit stop. If it is set in an incorrect position, reset it (Section 3.4.3.7).
	The positioner is faulty.	Contact the factory.

Symptoms	Possible Cause	Remedy
Positioner Pans or Tilts Improperly		
Positioner pans or tilts in the wrong direction.	Pan and Tilt invert settings may be wrong	Query the pan and tilt using the set up GUI, check the status of the Pan / Tilt invert. If incorrect, change.

Table 5-2 Troubleshooting the Controller

Symptoms	Possible Cause	Remedy
Cannot Access the Controller Menu		
The operator cannot access the controller menu.	The controller is not receiving power and the display screen is off.	Power on the system.
		Check Controller Manual Wiring
	The [Menu] button does not respond as quickly as other buttons.	Hold the [Menu] button down for at least (2) seconds.
Stuck in Controller Menu		
While in menu functions, the operator cannot exit a menu.	The method to exit individual menus varies.	Move the joystick to the left to back out of the menu.
		Press the [Prev] button to back out of the menu.
		Look for an <Exit menu> option. Select that option.
		Disconnect and reconnect power to the controller.

Section 6 Appendix

This section contains the appendix for your system.

Follow all precautions when installing and operating components discussed in this section. Contact the Will-Burt United Kingdom with any questions before performing any procedure outlined in this manual.

6.1 Communications Bridge Board Interface (optional)

Will-Burt offers an optional communications bridge board interface (P/N: 5090411). The bridge board interface allows use of the contact switches for pan and tilt control. The bridge board interface is not required for systems using the joystick controller. Electronic limit stops cannot be programmed using the bridge board with contact switch arrangement. The joystick controller must be used to program the electronic limit stops.

The bridge board interface can be operated with:

- The Panel Mount Control Assembly (P/N: 4270601) (section 6.2)
- Toggle Switches
- Push Buttons

These controls are wired into J11 see Figure 6-1

6.1.1 Electrical Connections

The electrical connections are as follows see Figure 6-1

- J3: Board Power
- J11: Discrete Inputs (active high) [contact closure]

6.1.2 Wire the Bridge Board Interface

The bridge board interface operates from 10-33 VDC, however the positioner requires 24VDC for proper operation. Will-Burt recommends applying 24VDC to the bridge board interface, allowing the power to be controlled and fused to the positioner. To achieve this, apply switched/fused 24VDC vehicle power directly to J3 (red +, black -).

Wire the bridge board interface (Figure 6-1) according to Table 6-1. The twisted pair on J3 is not used. Only the wires from J11 and J3 are used in this application. When using the panel mount control assembly (P/N: 4270601) (section 6.2) the customer can connect the contact closure wires to a female connector (P/N: 213246) to allow the bridge board interface to plug to the panel mount controller assembly. The female connector (P/N: 213246) is not necessary when using toggle switches or push buttons.

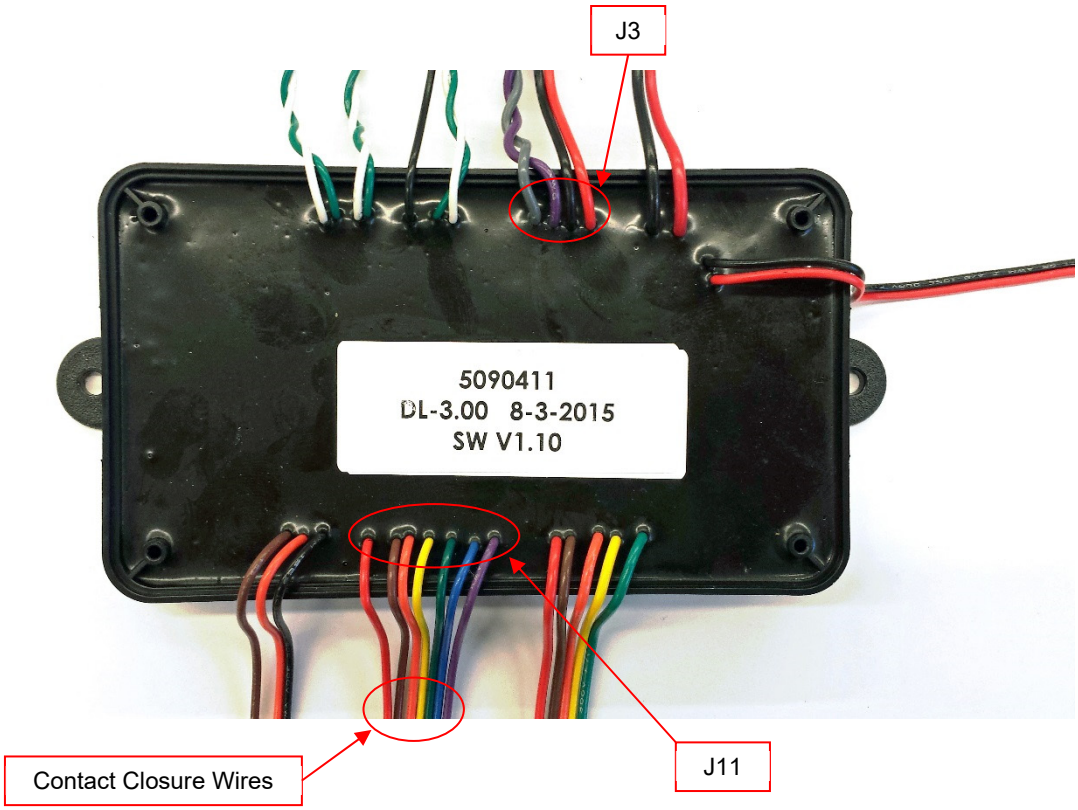


Figure 6-1 Contact Closure

Table 6-1 Contact Closure Wires

Wire Color	Function
Brown	Stow (preset 1)
Orange	Unstow (preset 2)
Yellow	Counterclockwise
Green	Clockwise
Blue	Up
Violet	Down

6.2 Panel Mount Controller Assembly (optional)

Will-Burt offers an optional panel mount controller assembly (P/N: 4270601) for the positioner. The panel mount controller assembly requires the communications bridge board interface (P/N: 5090411) (section 6.1). Electronic limit stops cannot be programmed using a Pelco D compatible joystick controller or a GUI.

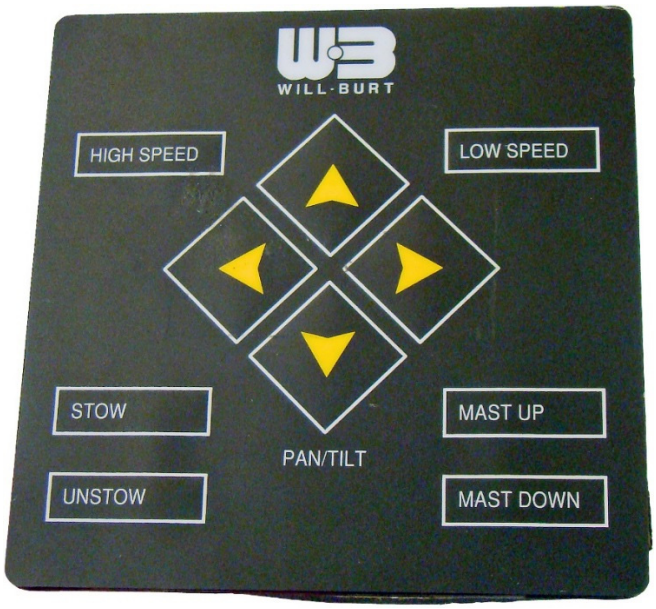


Figure 6-2 Panel Mount Controller (P/N: 4270601)

The membrane controller operates as follows:

- The (4) PAN/TILT arrow buttons pan the positioner left (◄) and right (►) and tilt the positioner up (▲) and down (▼).
- STOW moves the positioner into the stowed position.
- UNSTOW moves the positioner into the unstowed position.

The following buttons are not used:

- HIGH SPEED
- LOW SPEED
- MAST UP
- MAST DOWN

6.3 Pelco D Standard Commands

STANDARD COMMANDS	Op Code*	Hex Code	Decimal Code
STOP (Stop all Movement)	00	FF 01 00 00 00 00 01	255 001 000 000 000 000 001
Pan Right (Max. Speed)	02	FF 01 00 02 3F 00 42	255 001 000 002 063 000 066
Pan Left (Max. Speed)	04	FF 01 00 04 3F 00 44	255 001 000 004 063 000 068
Tilt Up (Max. Speed)	08	FF 01 00 08 00 3F 48	255 001 000 008 000 063 072
Tilt Down (Max. Speed)	10	FF 01 00 10 00 3F 50	255 001 000 016 000 063 080
Pan Right & Tilt Up (Max. Speed)	0A	FF 01 00 0A 3F 3F 89	255 001 000 010 063 063 137
Pan Right & Tilt Down (Max. Speed)	0C	FF 01 00 0C 3F 3F 8B	255 001 000 012 063 063 139
Pan Left & Tilt Up (Max. Speed)	12	FF 01 00 12 3F 3F 91	255 001 000 018 063 063 145
Pan Left & Tilt Down (Max. Speed)	14	FF 01 00 14 3F 3F 93	255 001 000 020 063 063 147
EXTENDED COMMANDS	**Op Code***	**Hex Code**	**Decimal Code**
Set Preset	03	FF 01 00 03 00 nn xx	255 001 000 003 000 nnn xxx
Clear Preset	05	FF 01 00 05 00 nn xx	255 001 000 005 000 nnn xxx
Go To Preset	07	FF 01 00 07 00 nn xx	255 001 000 007 000 nnn xxx
ADVANCED COMMANDS	**Op Code***	**Hex Code**	**Decimal Code**
Set Pan Position (Absolute Position – Pan)	4B	FF 01 00 4B mm ll xx	255 001 000 075 mmm lll xxx
Set Tilt Position (Absolute Position – Tilt)	4D	FF 01 00 4D mm ll xx	255 001 000 077 mmm lll xxx
Query Pan Position	51	FF 01 00 51 00 00 52	255 001 000 081 000 000 082
Query Pan Position Response	59	FF 01 00 59 mm ll xx	255 001 000 089 mmm lll xxx
Query Tilt Position	53	FF 01 00 53 00 00 54	255 001 000 083 000 000 084
Query Tilt Position Response	5B	FF 01 00 5B mm ll xx	255 001 000 091 mmm lll xxx
CUSTOM COMMANDS *Not Currently Supported by Accupoint Positioners	**Op Code***	**Hex Code**	**Decimal Code**
Query Movement Status	C1	FF 01 00 C1 00 00 C2	255 001 000 193 000 000 194
Query Movement Status Response [Go To Preset Active]	C3	FF 01 00 C3 00 10 D4	255 001 000 195 000 016 212
Query Movement Status Response [No Movement Sensed]	C3	FF 01 00 C3 00 00 C4	255 001 000 195 000 000 196
Query Movement Status Response [Up Limit Reached]	C3	FF 01 00 C3 00 01 C5	255 001 000 195 000 001 197
Query Movement Status Response [Down Limit Reached]	C3	FF 01 00 C3 00 02 C6	255 001 000 195 000 002 198
Query Movement Status Response [Left Limit Reached]	C3	FF 01 00 C3 00 08 CC	255 001 000 195 000 008 204
Query Movement Status Response [Right Limit Reached]	C3	FF 01 00 C3 00 04 C8	255 001 000 195 000 004 200
Query Movement Status Response [Up & Right Limit Reached]	C3	FF 01 00 C3 00 05 C9	255 001 000 195 000 005 201
Query Movement Status Response [Up & Left Limit Reached]	C3	FF 01 00 C3 00 09 CD	255 001 000 195 000 009 205
Query Movement Status Response [Down & Right Limit Reached]	C3	FF 01 00 C3 00 06 CA	255 001 000 195 000 006 202
Query Movement Status Response [Down & Left Limit Reached]	C3	FF 01 00 C3 00 0A CE	255 001 000 195 000 010 206

N.B: This list is not exhaustive and only shows the standard commands. For a full list of the advanced and custom commands please visit: www.willburt.com or contact your WB sales representative.