SATLOC® FALCON® & SATLOC® FALCON® PRO

Installation Guide

875-3004-000 Rev B1

Overview: This installation guide lists all the parts in the Falcon GPS System kit and provides instructions on installing the Falcon GPS System components, associated cables, and switches.

Read this manual thoroughly before beginning the installation.
If you have any questions, contact your local dealer or Satloc Customer Service.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Latest Version of the Falcon Installation Guide

Satloc is dedicated to providing updated versions of installation guidebooks for its customers. For the latest version of the Falcon Installation Guide, visit www.Satloc.com.

Notice to Customers
Contact your local dealer for technical assistance. To find an authorized dealer near you, visit www.Satloc.com.

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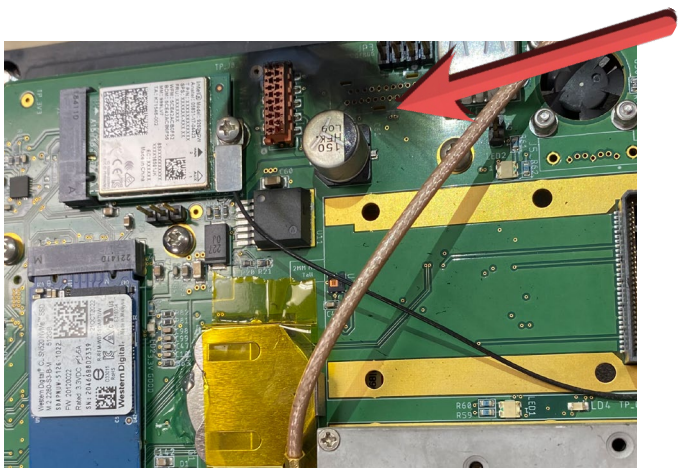
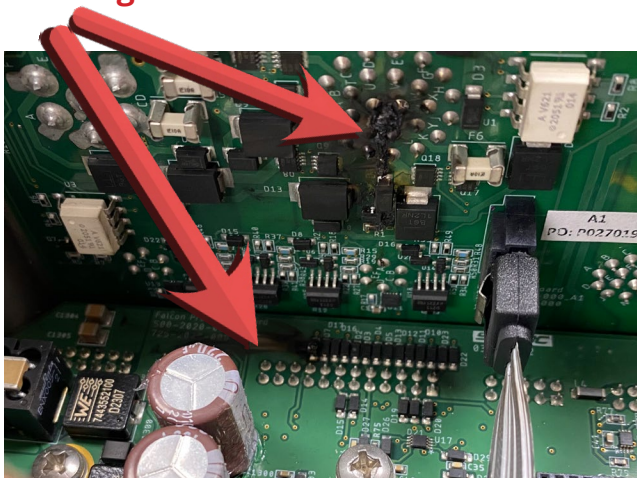
WARNING

Waranty is voided if you feed aircraft power through low voltage IO. If this occurs, there will be evidence within the Falcon/Falcon Pro CPU. Please see pictures below as examples of someone feeding aircraft power through low voltage IO. **Pay special attention to the Pilot Boom Input wiring.**

Results of Improper Wiring





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SAFETY INFORMATION

Read and Follow Safety Messages

WARNING

Satloc GPS systems are intended for VFR (visual flight rules) use only. Information provided is intended solely for recording aerial application activities and enhancing application guidance. Satloc is not a replacement for best pilot practices. Follow required procedures, flight rules, and regulations during use.

- In these instructions, you may see the heading **WARNING** and/or the safety alert symbol ⚠. They indicate a hazardous situation that, if not avoided, could result in death or serious injury. The safety messages provide information to identify a hazard associated with potential injury.
- Read and understand this manual and all the warnings below before installing, operating, or performing maintenance or service. FAILURE TO DO SO MAY CAUSE IRREVERSIBLE DAMAGE TO YOUR SYSTEM.
- Keep this manual and all related safety information with the manuals for your aircraft.

WARNING

Plan your installation by considering the following:

- Cable lengths
- Clearance space
- Power source
- Aircraft structure
- Visibility

WARNING

Consider using existing hardware and hardware locations. Avoid drilling holes that may damage other equipment (such as structural frame members, electrical cables, or fluid lines).

WARNING

Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.

WARNING

Do not allow anyone to operate without instruction.

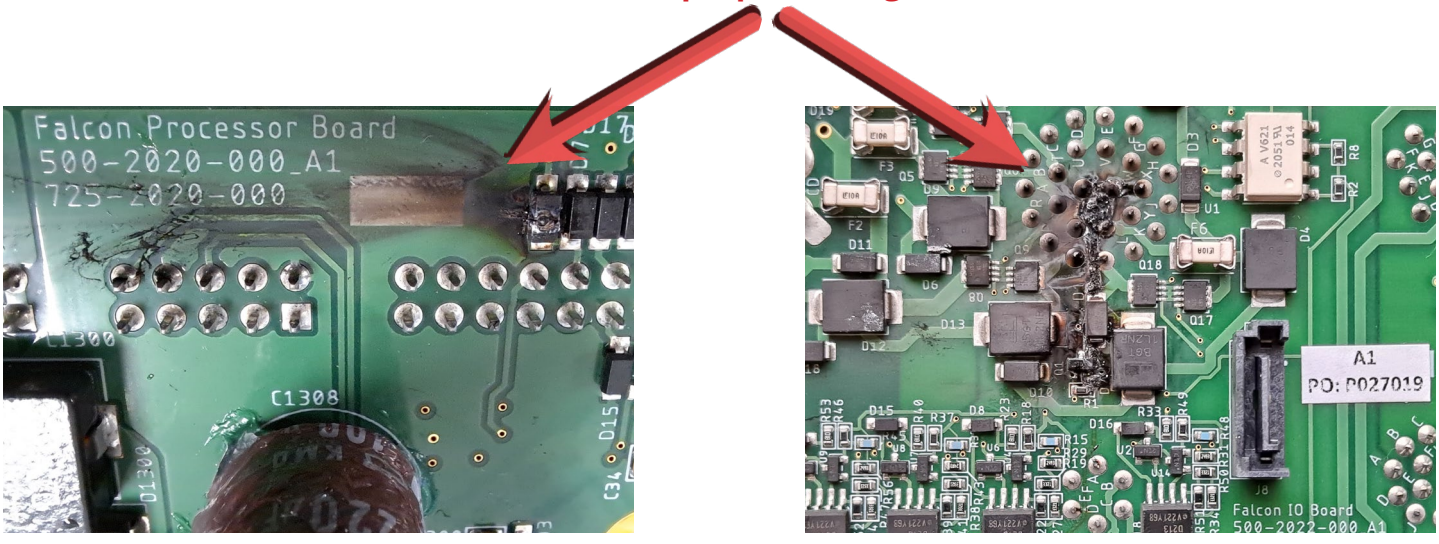
WARNING

For trouble-free operation and maintenance of your Falcon system, avoid using Falcon in extreme environmental conditions (40-140°F is recommended operating temperature range).

WARNING

Waranty is voided if you feed aircraft power through low voltage IO. If this occurs, there will be evidence within the Falcon/Falcon Pro CPU.

Results of Improper Wiring



Chapter 1: Getting Started

Parts Lists

Component Weights

Planning the Installation

The system modules that ship with the Falcon and connect to the CPU are:

- 7” or 9” color touchscreen
- Lightbar
- Antenna
- Optional switches (spray on/off, swath advance)

WARNING

Read this entire manual before beginning installation. Failure to follow instructions in this manual could void your warranty. **Waranty is voided if you feed aircraft power through low voltage IO.** If this occurs, there will be evidence within the Falcon/Falcon Pro CPU.

Pay careful attention to safety reminders and warnings to eliminate the possibility of personal injury or damage to the system. Comply with all electrical connections and requirements to prevent damage to the system.

PARTS LISTS

Review the contents of your Falcon purchase to ensure the components are not damaged. If chosen, a 7” display kit will replace the 9” display kit. Optional upgrade kits are only included with additional purchase(s).

Table 1-1: Falcon and Falcon Pro CPU Kits (PN 900-4100-000 or PN 900-4101-000)

Component	Part Number	Qty
Satloc Falcon (CPU/Controller)	806-1060-000	1
A21 GPS antenna	150-0056-01	1
Antenna cable, TNC(M)-TNC(M) 5M	052-0005-000#	1
Antenna, monopole ADSB-IN	804-4000-000	1
Antenna, WIFI, dual band	804-4001-000	1
Cable, power / relay	050-2200-000	1
Cable, GPIO	050-2202-000	1
Cable, comports (COMM)	050-2203-000	1
Cable, ADS-B In	050-2522-000	1
Kit, Falcon, slide mount hardware	710-2001-000	1
Kit, Falcon control components	710-2007-000	1
PCA, IMU, Falcon, Calibrated*	725-2050-000	1
Kit, IMU mounting*	710-2004-000	1
Manual, Installation Guide, Satloc Falcon, (this manual)	875-3004-000	1

*Only included in the Falcon Pro CPU Kit, which is inside the CPU unit.

Table 1-2: Falcon Touchscreen Kit (9” Display) (PN 900-4200-000)

Component	Part Number	Qty
9” Display	806-4403-000	1
Cable, cockpit	050-2201-000	1
Cable kit, display to panel USB	050-2525-000	1
Cable, display encoder (for Falcon Pro) or Cable, display encoder (for Falcon - Basic)	050-2528-000 or 050-2545-000	1 (for Falcon Pro) 1 (for Falcon - Basic)
Cable, display audio out	050-2536-000	1
Kit, display components	710-2006-000	1

Table 1-3: Falcon L8 Lightbar Kit (PN 900-4300-000)

Component	Part Number	Qty
L8 Lightbar	806-4400-000	1
Cable, extension 22	050-2205-000	1
Kit, L8 Lightbar mounting	710-0031-000	1

Table 1-4: Optional - Falcon Second GPS Upgrade Kit for AIMMS (PN 900-4104-000)

Component	Part Number	Qty
Novatel 7600 receiver	750-6000-000	1
A21, L1 GNSS, LBAND antenna	804-3036-000#	1
Cable, RF, MCX(M)-TNC(F)	050-2516-000	1
Cable, RF-X, TNC(M)-TNC(M), 5M	052-0005-000#	1
Kit, Novatel 7600 mounting components	710-2005-000	1

COMPONENT WEIGHTS

Table 1-6: Falcon Component Weights

Component	Weight
CPU	5 lbs
Complete cable set for CPU	8 lbs
9” Touchscreen and Cables	7 lbs (3 lbs for touchscreen, 4 lbs for cables)
L8 Lightbar	9 lbs (6 lbs for lightbar, 2 lbs for brackets, 1 lb for cables)
Antenna	1 lb

PLANNING THE INSTALLATION

WARNING

- **Turn off aircraft power before connecting or disconnecting cables. Failing to do so can damage the system.**
- Plan your installation by considering the following: 1) cable lengths, 2) clearance space, 3) power source, 4) aircraft structure, and 5) visibility.
- Consider using existing hardware and hardware locations. Avoid drilling holes that may damage other equipment (such as structural frame members, electrical cables, or fluid lines).
- Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.
- Do not route cables alongside power generator wire and other high-noise electric sources. This will cause interference.
- Do not kink or force cables into sharp bends. This can damage the cable. Instead, bend individual wires to a minimum radius of ten times the outside diameter of the wire, except at terminal boards where the wire is suitably supported at each end of the bend, a minimum radius of three times the outside diameter of the wire is acceptable.
- Bend wire bundles to a minimum radius of ten times the outside diameter of the largest wire in the bundle. Never bend coaxial cable to a smaller radius than six times the outer diameter.
- Route the excess cable along the plane’s length, doubling back for weight and balance. Avoid high-temperature exposure (for example, exhaust manifold) when routing cables.
- Do not allow anyone to operate without instruction.

In planning the installation locations, see Chapter 3, “Connecting the CPU,” for a visual overview of how the components are connected.

Chapter 2: Mounting the Components

Mounting the CPU

Mounting the Touchscreen

Installing the Cockpit Switches

Mounting the Lightbar

Mounting the A21 GPS Antenna

Mounting the Monopole ADS-B In Antenna

MOUNTING THE CPU

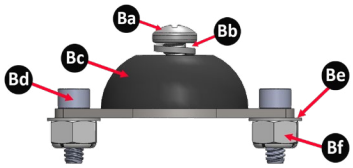
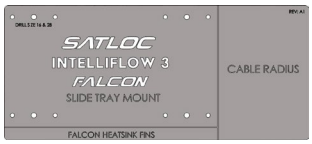
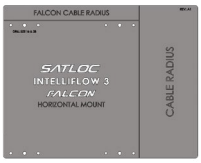
Before mounting (installing) components, read the short section, "Planning the Installation" in Chapter 1.

WARNING Review all warnings in Chapter 3, "Connecting the CPU," before attempting to connect any of the components together using the supplied cables. Connecting cables improperly can damage your system.

Consider using existing hardware and hardware locations. Avoid drilling holes that may damage other equipment (such as structural frame members, electrical cables, or fluid lines).

Where hardware such as screws, washers, and nuts, is not provided for a particular mounting or installation, you will need to provide the hardware appropriate to your specific needs.

Table 2-1: Falcon CPU Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	#710-2001-000		Horizontal Mounting Bracket Kit	
		2	Brackets	
B	#710-2001-000		Hardware Kit	
		4	M4 Screw - part Ba	
		4	Washer, split-lock - part Bb	
		4	Vibration Isolator - part Bc	
		8	Bolt, 6-32 x 3/8" - part Bd	
		8	Washer, - part Be	
		8	Nut, locking 6-32 - part Bf	
C	601-1313-000	1	(Optional, not included in kits. Dealer may request a template.) Mounting Layout Template for Falcon/IF3 Rack Mount	
D	601-1317-000	1	(Optional, not included in kits. Dealer may request a template.) Mounting Layout Template for Falcon/IF3 Horizontal Mount	

Warning: For the IMU to properly work, one of the six Falcon Pro faces must be installed perpendicular to the wings of the aircraft. See Appendix B for reference.

Mount the CPU in an available space on the aircraft that has the necessary room and is sheltered from the elements. For example, inside or around the baggage compartment, inside or around the cockpit. Ensure there is enough space for making connections and cable bend radius. Access is needed behind the mounting surface to attach the nuts to the bolts (Ref B). When you have selected the mounting location, use an optional plate stencil (Ref C or Ref D) as a template to mark fastener positions or get appropriate dimensions from CPU. Use the appropriate drill bit size as called out in instructions or on optional templates to drill holes for the fasteners and secure the Falcon CPU to the aircraft using hardware (Ref B).

Figure 2-1: PN 601-1313-000 (Optional, Available for Purchase) **Mounting Layout Template for Falcon/IF3 Rack Mount** (See Appendix C for dimensions reference.)

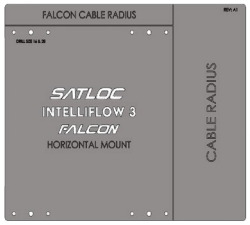


Figure 2-2: PN 601-1317-000 (Optional, Available for Purchase) **Mounting Layout Template for Falcon/IF3 Horizontal Mount** (See Appendix C for dimensions reference.)

Rack Mounting: It is recommended to use the Mounting Layout Template (PN 601-1313-000, Ref C) to assure accuracy for locating the correct position of the vibration isolators. ***This template is available for purchase.***

Horizontal Mounting: It is recommended to use the Mounting Layout Template (PN 601-1317-000, Ref D) to assure accuracy for locating the correct position of the vibration isolators. ***This template is available for purchase.***

1. CPU Rack Mounted Upright (PN 601-1313-000, Ref C)
    a) Vibration Isolators (Ref Bc) With Template
        i) Place the template (Ref C) in the desired location while heeding the above recommendations.
        ii) Use the template to mark the fastener hole locations of the four vibration isolator feet (Ref Bc). There are eight holes at #28 drill bit (0.140”).
        iii) Drill holes being careful not to cause damage.
        iv) Use references Bd, Be, and Bf to attach Bc to the airframe.
        v) Use references Ba and Bb to attach the CPU rack system to vibration isolators (Ref Bc).

    b) Vibration Isolators Without Template
        i) Using references Ba and Bb attach vibration isolators (Ref Bc) to the CPU rack system.
        ii) Place CPU in the desired location while heeding the above recommendations.
        iii) Mark airframe fastener locations using the open holes in the vibration isolator feet.
        iv) Drill holes being careful not to cause damage.There are eight holes at #28 drill bit (0.140”).
        v) Use references Bd, Be, and Bf to attach vibration isolators (Ref Bc) to approved structure.

2. CPU Horizontally Mounted With Vibration Isolators
    a) Horizontal Mounts With Template (PN 601-1317-000, Ref D)
        i) Place the template (Ref D) in the desired location while heeding the above recommendations.
        ii) Use the template to mark the fastener hole locations of the four vibration isolator feet (Ref Bc). There are eight holes at #28 drill bit (0.140”).
        iii) Drill holes being careful not to cause damage.

iv) Use hardware from the pre-assembled rack mount system to attach horizontal mounting brackets (Ref A) to the CPU.
v) Use references Bd, Be, and Bf to attach vibration isolators (Ref Bc) to approved structure.
vi) Use references Ba and Bb to attach vibration mounts to horizontal mounting brackets (Ref A).

b) Horizontal Mounts Without Template
i) Use hardware from the pre-assembled rack mount system to attach horizontal mounting brackets (Ref A) to the CPU.
ii) Use references Ba and Bb to attach vibration isolators (Ref Bc) to horizontal mounting brackets.
iii) Place CPU in the desired location while heeding the above recommendations.
iv) Mark the fastener hole locations of the four vibration isolator feet. There are eight holes at #28 drill bit (0.140").
v) Drill holes being careful not to cause damage.
vi) Use references Bd, Be, and Bf to attach vibration isolators (Ref Bc) to approved structure.

3) CPU Horizontally Mounted Without Vibration Isolators
a) Horizontal Mounts With Template (PN 601-1317-000, Ref D)
i) Place the template (Ref D) in the desired location while heeding the above recommendations.
ii) Use the template to mark the fastener hole locations of the 4 fastener locations. There are four holes at #16 drill bit (0.177").
iii) Drill holes being careful not to cause damage.
iv) Use hardware from the pre-assembled rack mount system to attach horizontal mounting brackets (Ref A) to the CPU.
v) Use locally sourced hardware to attach the CPU to approved structure.

b) Horizontal Mounts Without Template
i) Use hardware from the pre-assembled rack mount system to attach horizontal mounting brackets (Ref A) to the CPU.
ii) Place CPU in the desired location while heeding the above recommendations.
iii) Mark the fastener hole locations of the four fastener locations. There are four holes at #16 drill bit (0.177").
iv) Drill holes being careful not to cause damage.
v) Use locally sourced hardware to attach the CPU to approved structure.

MOUNTING THE TOUCHSCREEN

Usually, the console is located in the front center of the cockpit, just below normal line of sight and within the operator's reach. Use the following parts list and instructions to hard mount the touchscreen on the cockpit dashboard. Mount the touchscreen inside the cockpit of the aircraft where it is:

- Easily visible while flying
- Within arm's reach of the operator (pilot), depending on the pilot's arm length, the display can be mounted either further or closer to the pilot
- Mount the display far enough back as to not interfere with the yoke, with a gloved hand wrapped around it, when in full nose down position

WARNING Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.

The following tools are needed to mount the touchscreen:

- Drill and drill bit
- Phillips head screwdriver
- Four screws for hard mount (size and length vary with differnt installs)
- Marker pen

WARNING Based upon different installs, screw size and length varies for hard mounting the touchscreen. Larger screws could crack or otherwise damage the screen. Do not drill holes in screen cover. This will void the warranty.

Table 2-2: Falcon Touchscreen Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	806-4403-000	1	9" Display	
B	050-2201-000	1	Cable, cockpit	
C	050-2545-000 or 050-2528-000	1 or 1	Cable, display encoder for Falcon or Cable, display encoder for Falcon Pro	
D	050-2525-000	1	Cable kit, display to panel USB	
E	601-1321-000	Optional	Optional mounting bracket on Air Tractor aircraft for 9" display	

NOTE: **Appendix D provides touchscreen mounting dimensions.**

Step One

Choose Mounting Location

Determine where, within easy reach and visiblity of the operator to mount the touchscreen.

Choose a location inside the cockpit of the aircraft where it is:

- Easily visible while flying
- Within arm's reach of the operator (pilot), depending on the pilot's arm length, the display can be mounted either further or closer to the pilot
- Mount the display far enough back as to not interfere with the yoke, with a gloved hand wrapped around it, when in full nose down position

Step Two

Put Appropriate Screws in Corner Holes

Put screws of approprate size and length through the four corner holes and through the dashboard.

Do not drill holes in screen cover. This will void the warranty.

Step Three

Attach Nuts to Screws

Attach nuts to screws to secure the display console in place.

NOTE: **There is an optional dash mount bracket (PN 601-1321-000) that can be used with the touchscreen display. This is for Air Tractor aircraft.**

INSTALLING COCKPIT PARTS

Table 2-3: Falcon Cockpit Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	710-2008-000 For Falcon Basic		**Falcon Display Components Kit**	
		1	Knob, Concentric Encoder Outer Shaft	
		1	Cap, Concentric Cap	
B	710-2006-000 For Falcon Pro		**Falcon Pro Display Components Kit**	
		1	Knob, Concentric Encoder Outer Shaft	
		1	Knob, Concentric Encoder Inner Shaft	
		1	Cap, Concentric Cap	
C	710-2007-000		**Falcon Control Component Kit**	
		1	SW STR-Lever (075-4001-000#)	
		1	Breaker Switch (424-0003-000#)	

WARNING Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.

The individual parts for the cockpit are part of kits PN 710-2008-000 (Falcon Pro) PN 710-2006-000 (Falcon Basic) and PN 710-2007-000.

- Use existing buttons on cockpit stick to control swath advance
- Encoder knob(s)
- One mechanical switch for dry gate control. This switch is often used to monitor the spray handle position, so its intended use is with the Gate / Boom Pressure circuit.
- One On/Off 7 1/2 amp toggle breaker switch for power (connect to aircraft power 24 VDC)

Find appropriate locations in the cockpit to mount the individual cockpit parts. **The parts must be within easy reach of the operator and in an area where those can be connected to the GPIO cable (PN 050-2202-000) or power cable (PN 050-2200-000).**

MOUNTING THE USB PORT

Table 2-4: USB Port Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	050-2525-000	1	Cable kit, display to panel USB	

Figure 2-3: Install Image of Optional USB Port

In case WiFi is unavailable, a USB port can be installed for use with the Falcon. Install USB port on the upper left or right dash, per pilot preference. The cable from the USB port is 1 meter long or 3.28 feet in length; please keep this in mind when choosing the location to mount the USB port PN 050-2525-000. With the cable, connect the port to the back of the display.

MOUNTING THE L8 LIGHTBAR

Table 2-5: L8 Lightbar Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	806-4400-000	1	L8 for Falcon GPS	
B	602-1014-000 602-1012-000 602-1016-000 (RH) & 602-1017-000 (LH)	2 2 Optional	Lightbar brackets, standard, 5.25" Lightbar brackets, short, 3" Lightbar brackets, Wingman, 7.5" (RH and LH)	
C	602-1018-000	2	Top bracket	
D	*80011 *80570 *81219	4 4 (of 10) 4 (of 10)	Bolt, #10-32 x 21/32" Nut, #10-32 Washer, #10-32	
E	*80922 *81202	4 4	Screw, #10-32 x 5/8" Washer, Internal Lock, #10-32	
F	*80013 *80570 *81219 *601-1045-000	4 4 (of 10) 4 (of 10) 2	Bolt, #10-32 x 25/32" Nut, #10-32 Washer, #10-32 Backing plate	
G	*86071 **OR** * 86436 *80007 *80570 *81219	2 2 2 (of 10) 2 (of 10)	Adel clamp Bolt, #10-32 x 17/32" Nut, #10-32 Washer, #10-32	
H	050-2205-000	1	L8 Lightbar cable for Falcon	

*Part of Hardware Kit
P/N 710-2003-000

A drill and 1/4" drill bit are required for this installation.

Unpack the kit and identify the required parts as shown. Kit items are referenced A, B, C, etc. The references are used in the installation steps and pictures. Be sure to mount the lightbar in front of the pilot at a comfortable viewing distance.

WARNING Do not obstruct the view of, or access to, other instruments or the flying visibility of the operator.

Step One

Assemble Lightbar Mounting Brackets

Using hardware D, assemble two mounting brackets using parts B and C.

Note: There are three size options for the mounting brackets.

Tilting of lightbar brackets is available in 2.5 degree increments. Plus or minus 10 degrees. Examples shown below.

Step Two

Attach Mounting Brackets to Lightbar

Using hardware E, attach the two mounting brackets to the Lightbar.

Step Three

Marking Holes for Drilling

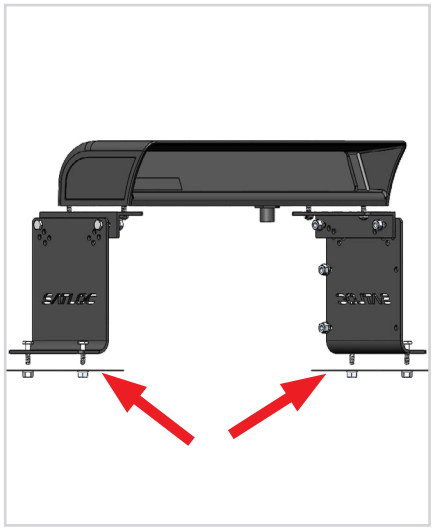
Using the assembled lightbar and brackets as a template, mark the four mounting hole positions on a suitable surface/location on the aircraft. Using a 1/4" drill bit, carefully drill the four holes.

Do not hit any wires or hydraulics while drilling. Check both sides of the aircraft before drilling.

Figure 2-4: Tilting Angles of L8 Lightbar

Step Four

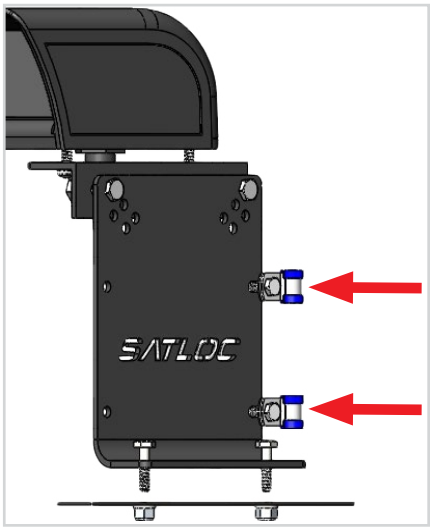
Secure Lightbar to Aircraft



Using hardware F, secure the lightbar to the aircraft. Use the backing plates on the underside of the mounting surface for additional reinforcement (These provide additional support to prevent the bolts from pulling through the surface under vibration**).**

Step Five

Attach Cable to Lightbar



Connect cable to the bottom of the lightbar. Using hardware G, attach the cable to the lightbar. Be careful not to make any sharp turns or bends.

Note: There are two size options for the Adel clamps.

Step Six

Tighten Hardware

When finished, tighten all hardware.

EXPLODED VIEW

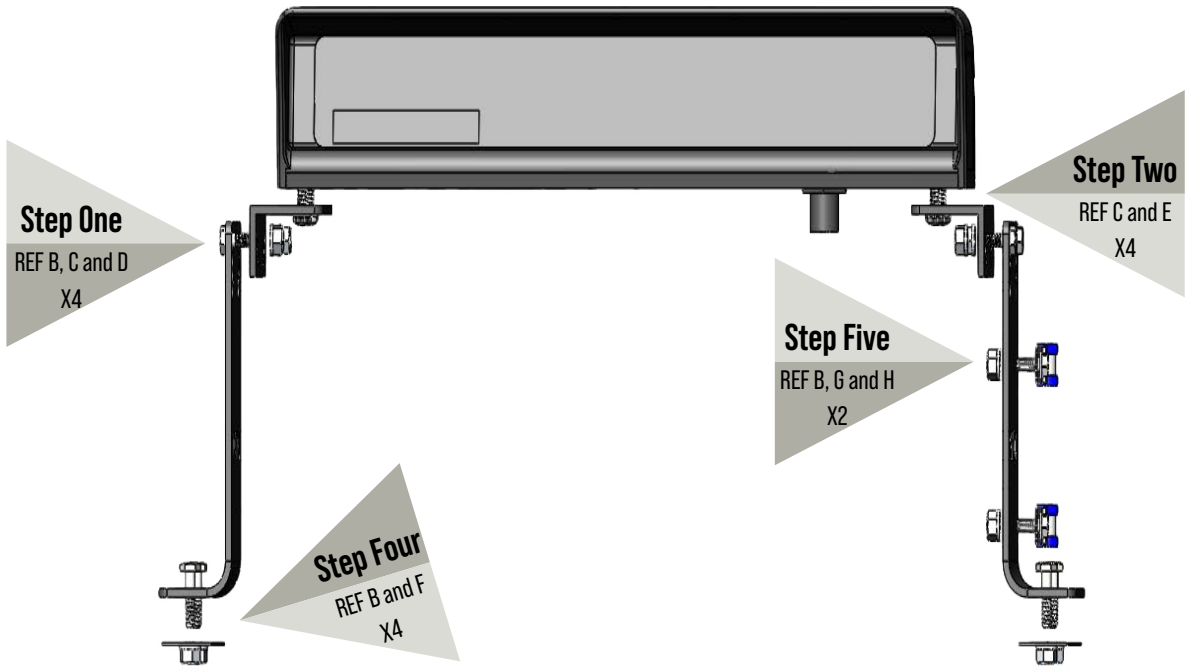


Figure 2-5: Exploded View of L8 Lightbar Mount

MOUNTING THE A21 GPS ANTENNA

NOTE: **Appendix A provides mounting dimension for the A21 GPS antenna. Appendix A is not a template.**

Antenna position is critical to system performance. Therefore, these conditions must be met for proper system operation:

- Mount the antenna at least 5 ft (1.524 m) from transmitting antennas of any frequency
- Mount the antenna at the highest practical point that will give a good view of the horizon.
- The positions that the receiver calculates are at the positions of the antenna. Mount the antenna on the aircraft's centerline.

The following tools are needed to mount the antenna:

- Phillips screwdriver
- Four #8-32 screws
- Drill, 1/8" drill bit and 7/16" drill bit
- Marker pen

WARNING Positioning the antenna less than 5 ft (1.524 m) from transmitting antennas of any frequency may cause overloading of RF circuits.

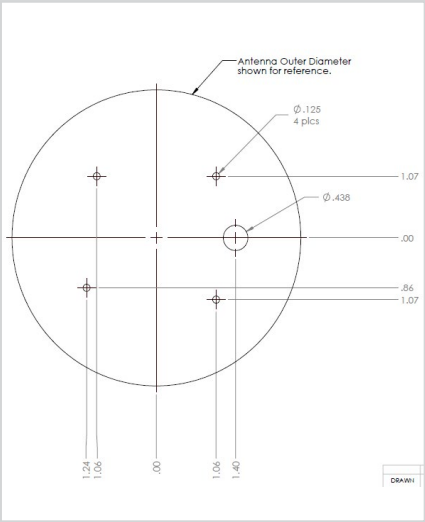
NOTE: **Satloc recommends flush mounting the antenna along the aircraft's centerline, with an unobstructed view of the sky and horizon.**

Table 2-6: A21 GPS Antenna Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	804-3036-000#	1	A21, L1 GNSS, LBAND antenna	
B	052-0005-000#	1	Cable, RF-X, TNC(M)-TNC(M), 5M	

Step One

Use the A21 GPS Antenna Mounting Dimensions Drawing (Appendix A)



Using the Antenna Mounting Dimension Drawing (Appendix A) as a guide (this is not a template), mark the mounting position and the antenna connector hole locations on the aircraft's outer surface.

Step Two

Drill the Antenna Holes

Using a 1/8" drill bit, carefully drill the four screw holes.

Step Three

Drill the Antenna Connector Holes

Using a 7/16" drill bit, carefully drill the hole for the antenna connector.

Step Four

Secure Antenna to Aircraft Surface

Use four #8-32 thread screws to secure the antenna (PN 804-3036-000#) to the aircraft's surface. Black RTV silicone can be used to seal around the antenna base. A doubler backing plate may be necessary.

Step Five

Connect Wire to Antenna

Connect cable PN 052-0005-000# to antenna PN 804-3036-000#.

MOUNTING THE ADS-B IN MONOPOLE ANTENNA

Install PN 804-4000-000 at least 3.3 feet (1 meter) away from communications or transponder antenna. Additionally, install six and a half feet from DME or ADF antenna. Preferred cable length less than 8 ft (2.4 meters) but recommended less than 12 ft (3.6 meters).

NOTE: **Preferred cable length less than 8 ft but recommended less than 12 ft (3.6 meters).**

The following tools are needed to mount the antenna:

- Drill, 7/16” drill bit
- Marker pen

Table 2-7: ADS-B In Monopole Antenna Mount Parts

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	804-4000-000	1	Antenna, monopole ADSB-IN	
B	050-2522-000	1	Cable, ADS-B In	

Step One

Choose Location of the ADS-B In Antenna

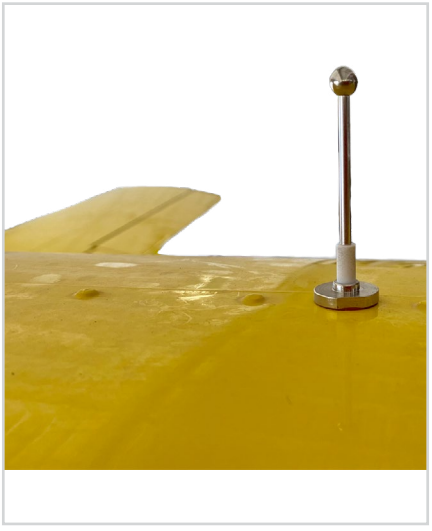
Step Two

Drill the Antenna Connector Hole

Using a 7/16” drill bit, carefully drill the hole for the antenna connector.

Step Three

Secure Antenna to Aircraft Surface



Use the hardware with PN 804-4000-000 to secure antenna to aircraft surface. Connect cable PN 052-2522-000 to antenna.

Chapter 3: Connecting the CPU

Warnings

Cables to Connect the CPU

Cables to Connect the Touchscreen Display

Connections Diagram

Connecting Cables

WARNINGS

Heed all warnings before continuing. Failure to do so could void your warranty.

General Cable Connection Warnings

WARNING

- **Turn off aircraft power before connecting or disconnecting cables.** Failing to do so can damage the system.
- Finger tighten all cable connections. Do not use any tools.
- Do not route cables alongside power generator wire and other high-noise electric sources. This will cause interference.
- Do not kink or force cables into sharp bends. This can damage the cable. Instead, bend individual wires to a minimum radius of ten times the outside diameter of the wire, except at terminal boards where the wire is suitably supported at each end of the bend, a minimum radius of three times the outside diameter of the wire is acceptable.
- Bend wire bundles to a minimum radius of ten times the outside diameter of the largest wire in the bundle. Never bend coaxial cable to a smaller radius than six times the outer diameter.
- Route the excess cable along the plane's length, doubling back for weight and balance.
- Do not coil the cables. This will introduce noise in the system.
- Avoid high-temperature exposure (for example, exhaust manifold) when routing cables.

Antenna Cable Warnings

WARNING

- Never connect or disconnect the antenna cable with the power on.
- Do not route the antenna cable with any other radio system cables. This will cause interference. Keep 12 inches apart.
- If you must cross the antenna cable with other cables, do so at a 90° angle. This will prevent interference between systems.
- Do not coil excess cable length. Doing so can introduce noise and cause signal degradation.

GPIO Cable Warnings

WARNING

- Do not connect Spray On/Off leads to a flow system if it contains live voltage.

Table 3-1: Cables to Connect the Falcon CPU

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	050-2200-000	1	Cable, power / relay for Falcon CPU	
B	050-2201-000	1	Cable, cockpit	
C	050-2202-000	1	Cable, GPIO	
D	050-2203-000	1	Cable, comports (COMM)	

Table 3-1: Cables to Connect the Falcon CPU — Continued

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
E	050-2204-000	1 (If connecting to IF3)	Cable, extension jumper to connect Falcon to IF3	
	050-2207-000	1 (If connecting to IF2)	Cable, extension jumper to connect Falcon to IF2	
F	050-2205-000	1 (If connecting to L8 Lightbar)	Cable, extension 22 to connect Falcon to L8 Lightbar	
G	050-2522-000	1	Cable, ADS-B In	
H	052-0005-000#	1	Cable, Antenna - TNC(M)-TNC(M) 5M	
I	804-4001-000	1	Antenna, WIFI, dual band	
J	050-2521-000	Optional	Cable, extension for WIFI antenna	
K	82404	1	Diode	
		NOTE:	**This diode provides transient voltage suppression. In other words, it absorbs random and irregular bursts in the voltage. Basically, it shunts those spikes to Ground.**	

Table 3-2: Cables to Connect the Falcon Touchscreen

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	050-2525-000	1	Cable kit, display to panel USB	
B	050-2545-000 or 050-2528-000	1 or 1	Cable, display encoder for Falcon or Cable, display encoder for Falcon Pro	
C	050-2536-000	1	Cable, display audio out (Future Development)	

CONNECTIONS DIAGRAMS

The following diagrams provide visual representations of the Falcon CPU and the touchscreen display connections. Install each Falcon cable between the CPU and a modular component. Each cable is labeled with its name and part number. A color band is also on each cable. The color matches a port on the Falcon CPU port where the connection needs to be inserted. Each cable fits into its appropriate port. Line up a connector with its matching pins and gently insert and turn. Finger tighten the connectors until they lock into place.

Figure 3-1: Connections to Front of Falcon

Figure 3-2: Install Image of Connections to Front of Falcon

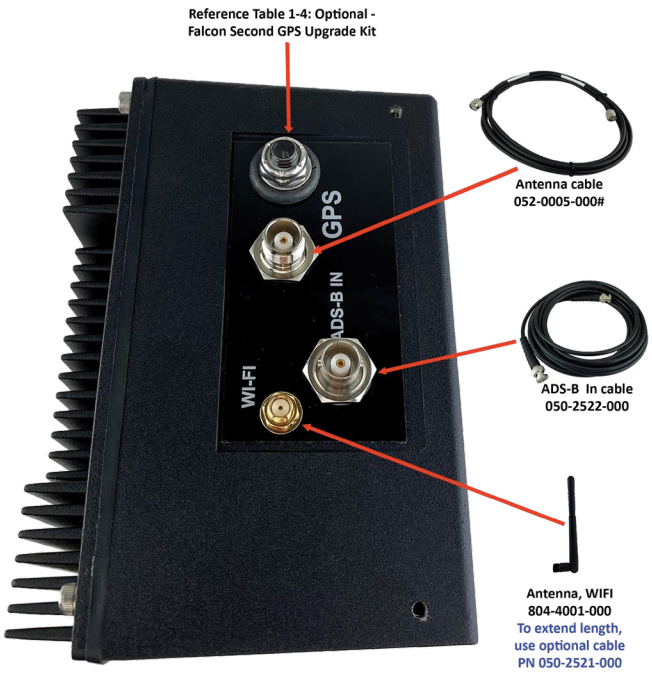


Figure 3-3: Connections to Top of Falcon

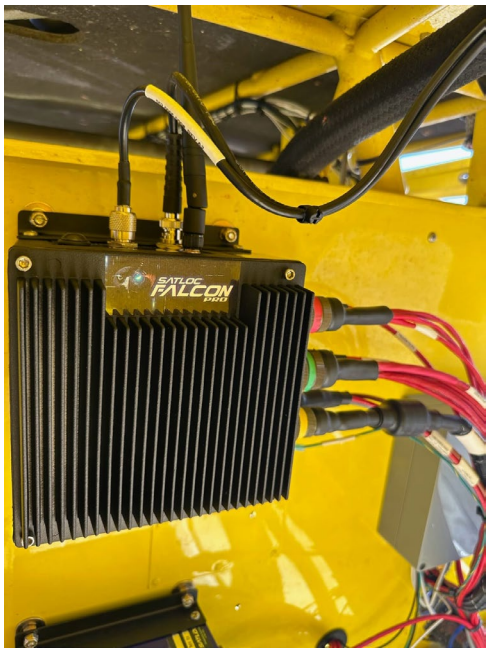


Figure 3-4: Install Image of Connections to Top of Falcon

Where wiring is attached downward to a connector, terminal block, panel or junction box, a drip loop shall be provided in the wiring to prevent fluids or condensation from running into the components.

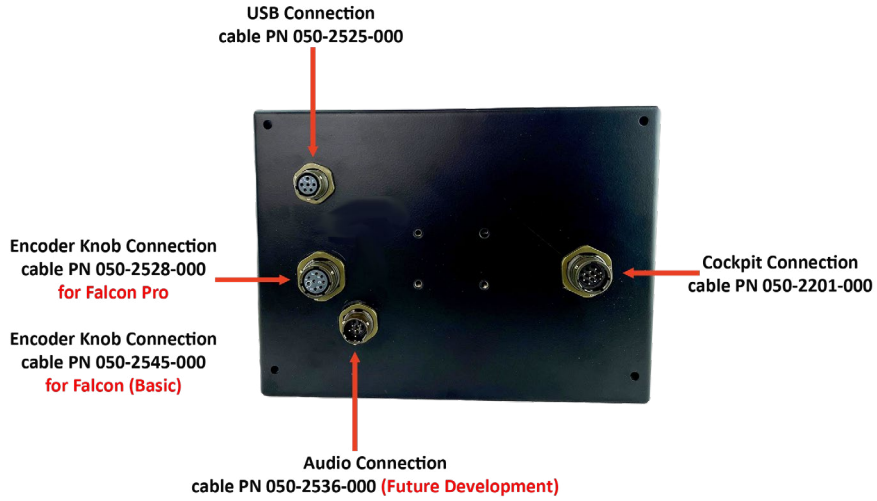


Figure 3-5: Connections to the back of the touchscreen display

CONNECTING CABLES

The following diagrams provide visual representations of the Falcon CPU and the touchscreen display connections. Install each Falcon cable between the CPU and a modular component. Each cable is labeled with its name and part number. A color band is also on each cable. The color matches a port on the Falcon CPU port where the connection needs to be inserted. Each cable fits into its appropriate port. Line up a connector with its matching pins and gently insert and turn. Finger tighten the connectors until they lock into place.

WARNING

- **Turn off aircraft power before connecting or disconnecting cables. Failing to do so can damage the system.**
- Finger tighten cable connections — do not use tools.
- Do not route cables alongside power generator wire and other high-noise electric sources. This will cause interference.
- Ensure no chafing of cables can occur.

WARNING

- Do not kink or force cables into sharp bends. This can damage the cable. Instead, bend individual wires to a minimum radius of ten times the outside diameter of the wire, except at terminal boards where the wire is suitably supported at each end of the bend, a minimum radius of three times the outside diameter of the wire is acceptable.
- Bend wire bundles to a minimum radius of ten times the outside diameter of the largest wire in the bundle. Never bend coaxial cable to a smaller radius than six times the outer diameter.
- Route the excess cable along the plane's length, doubling back for weight and balance.
- Do not coil the cables. This will introduce noise in the system.
- Avoid high-temperature exposure (for example, exhaust manifold) when routing cables.
- Cross the antenna cable (if necessary) at 90° to any other cable (prevents cross-interference).

GPIO Cable Connections

Each cable within the GPIO cable (PN 050-2202-000) is labeled. Every wire coming out of the different cables from the GPIO unit cable is also labeled. Connect the appropriate wires to the correct part/component.

A. Connect the connector end of the GPIO cable to the CPU serial port labeled "GPIO."

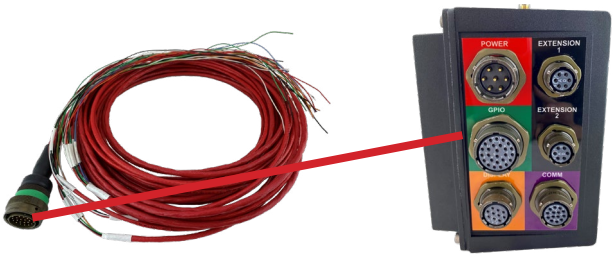


Figure 3-6: GPIO cable connection to the Falcon CPU

B. Connect the Control Stick cable (located on the GPIO cable) wires to the control stick terminal block under the cockpit. (Air Tractor has this factory installed.)

1. Dec wire - it is optional to route to control stick
2. Inc wire - route to control stick
3. Control Stick GND wire (**optional**) - route to control stick
4. TH-Button wire (**optional**) - routed to the control stick
5. TH-Up wire (**optional**) - route to the thumbstick
6. TH-Down wire (**optional**) -route to the thumbstick
7. TH-Right wire (**optional**) -route to the thumbstick
8. TH-Left wire (**optional**) - route to the thumbstick

Optional Connections

WARNING **Waranty is voided if you feed aircraft power through low voltage IO.**

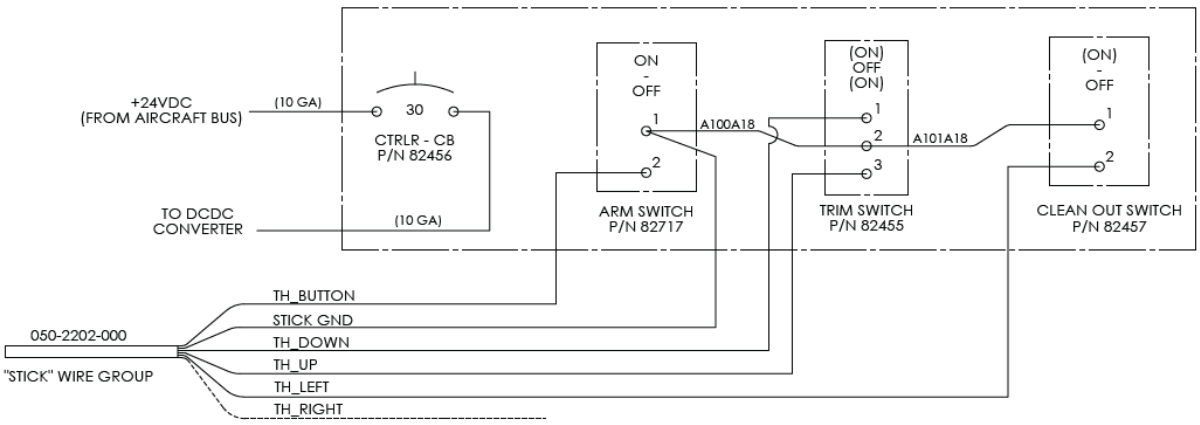


Figure 3-7: GPIO cable connection to Transland Electric Gate

WARNING **Waranty is voided if you feed aircraft power through low voltage IO.**

C. Connect the IO cable (located on the GPIO cable) wires to optional third party devices and other devices. These connections are optional.

1. Output 1 GND wire (**optional**) - route to a third party device
2. Output 1 Signal wire (**optional**) - route to a third party device
3. Relay C1 wire (**optional**) - route to something like a smoker or camera that needs to be turned on and off
4. Relay C2 wire (**optional**) - route to something like a smoker or camera that needs to be turned on and off

Optional Connections

D. Connect the Boom Control cable (located on the GPIO cable) wires to the boom shut-off valve.

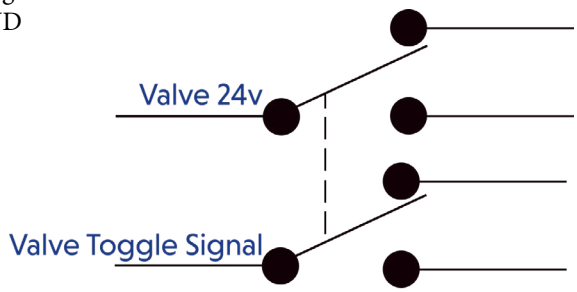
1. Valve Boom Power GND wire - each valve needs it own ground
2. Valve 1 Signal wire (**optional**)- when the valve closes, it sends a signal saying it is closed
3. Valve 2 Signal wire (**optional**) - when the valve closes, it sends a signal saying it is closed
4. Valve 3 Signal wire (**optional**) - when the valve closes, it sends a signal saying it is closed
5. Valve 4 Signal wire (**optional**) - when the valve closes, it sends a signal saying it is closed
6. Valve 1 Boom Power Actuate wire
7. Valve 2 Boom Power Actuate wire
8. Valve 3 Boom Power Actuate wire
9. Valve 4 Boom Power Actuate wire

Optional Connections for Future Technology

E. **For the 50% boom panel**, connect the Pilot Boom Input cable (located on the GPIO cable) wires to the switches in the cockpit. (Toggle switches not included in Falcon kit.)

1. Valve 1 Toggle-Signal wire
2. Valve 2 Toggle-Signal wire
3. Valve 3 Toggle-Signal wire
4. Valve 4 Toggle-Signal wire
5. Valve Toggle-GND

Optional Connections



The Valve Signal is ONLY to be connected to the Valve Toggle-GND.

There must be another pole on the switch for valve power.

Figure 3-8: Double-Pole, Double-Throw

WARNING **Waranty is voided if you feed aircraft power through low voltage IO.**

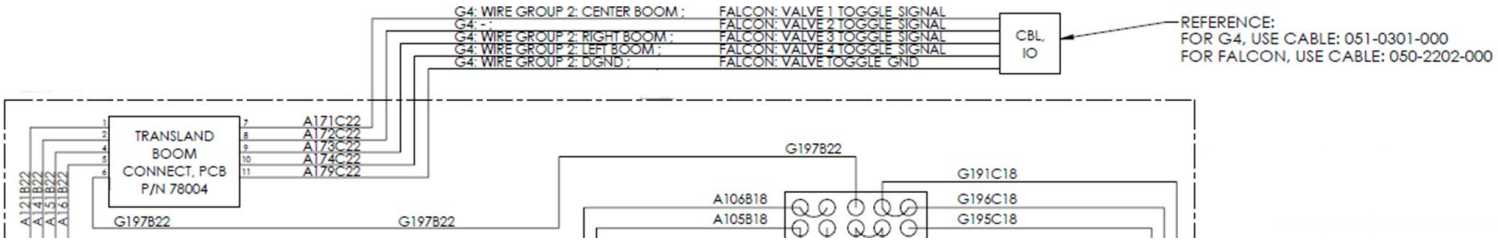


Figure 3-9: Wiring Schematic for Transland 50 or 60 Percent Boom Shut-Off Control Panel to Satloc GPS

For complete installation instructions for Transland's 50/60 Percent Boom-Shut-Off or Right-Hand Shut-Off, please reference Transland's website for install manuals under the 'Resources' tab.

F. Connect the Gate / Boom Pressure Switch (located on the GPIO cable) wires to a pressure switch and/or that comes off the boom or a mechanical switch.

1. Gate/Boom-Signal wire
2. Gate/Boom-GND wire

Gate / Boom Pressure Wire Connections Required to Determine Flow

NOTE: **Satloc suggests to use optional pressure switch PN 075-0035-000. The GPS and flow control systems operate off of different voltage signals. Therefore, there is a possibility that feedback will occur with only one switch. Also, as a switch ages, there might be degradation in the signal.**

IF3 or IF2 Flow Cable Connection

The Extension Jumper cable (PN 050-2204-000) connects the Falcon to the IF3. If connecting the Falcon to the IF2, use cable PN 050-2207-000. The Falcon's extension ports are interchangeable for the flow cable and and lightbar cable. Connect the Conxall connector of PN 050-2204-000 or PN 050-2207-000 into one of the Falcon's extension ports.

Figure 3-10: IF3 or IF2 Flow Cable Connections

Extension Cable (Lightbar Cable) Connections

The Extension cable (PN 050-2205-000) connects the Falcon to the L8 Lightbar. The Falcon's extension ports are interchangeable for the flow cable and and lightbar cable. Connect the Conxall connector of PN 050-2205-000 into one of the Falcon's extension ports. Then, connect the metal Bendix of PN 050-2205-000 to the matching connector on the back of the lightbar.

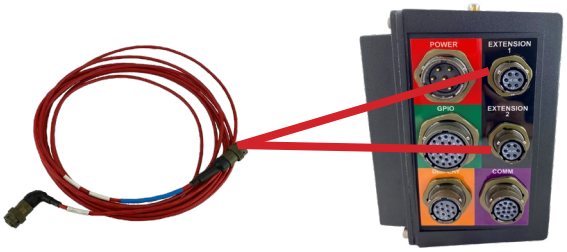


Figure 3-11: Extension Cable (Lightbar Cable) Connections

Display Cable Connections

The Cockpit cable (PN 050-2201-000) connects the Falcon's CPU to the touchscreen. Connect the connector of PN 050-2201-000 into the Falcon's cockpit port. Take the other end of PN 050-2201-000 and connect it to the connector on the back of the touchscreen

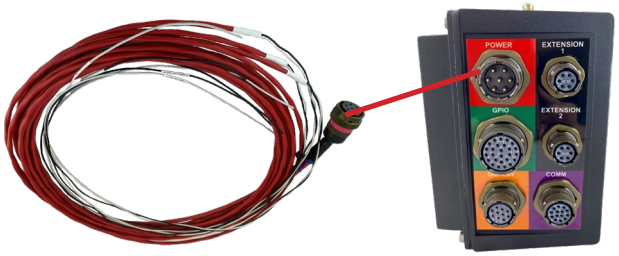
Figure 3-12: Display Cable Connections

Power Cable Connections

The Power cable (PN 050-2200-000) connects the Falcon's CPU to a power source that can supply between 10 and 36 VDC. Connect the Conxall connector of PN 050-2200-000 into the Falcon's CPU power port.

There is an ON/OFF switch (PN 424-0003-000) included in the Satloc Falcon kit. ***This switch contains a built-in 7.5A (max) circuit breaker that prevents voltage spikes and reverse polarity from damaging the system. Another important install part is PN 82404 Diode, which provides transient voltage suppression. In other words, it absorbs random and irregular bursts in the voltage. Basically, it shunts those spikes to Ground.***

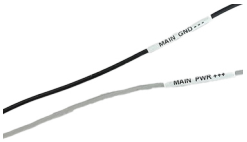
The Power cable contains three separate cables with protruded wires. One cable is labeled "Main Power." The wires extending from this cable connect to the power to the avionics +24 VDC bus and the ground to avionics GND bus. Another cable is labeled "Boom Valve Power." The wires extending from this cable connect to boom valve power and the boom valve ground. The last cable to be mentioned is not labeled. The wires extending from this cable connect to auto dispersal relayed power.



NOTE: **The ON/OFF switch (PN 424-0003-000) powers the CPU and the touchscreen.**

Figure 3-13: Power Cable Connection

Main Power cable - The wires extending from this cable connect to the avionics +24 VDC bus and the ground to avionics GND bus. Recommended voltage is 24 VDC.



Boom Valve Power cable - The wires extending from this cable connect the boom valve power and the boom valve ground. Supply power required for boom valve activation. 9 V or 24 V power as determined by boom valve motors.

Auto Dispersal cable - The wires extending from this cable connect to auto dispersal power out and auto dispersal power in. Relayed connection to start/stop per auto dispersal.

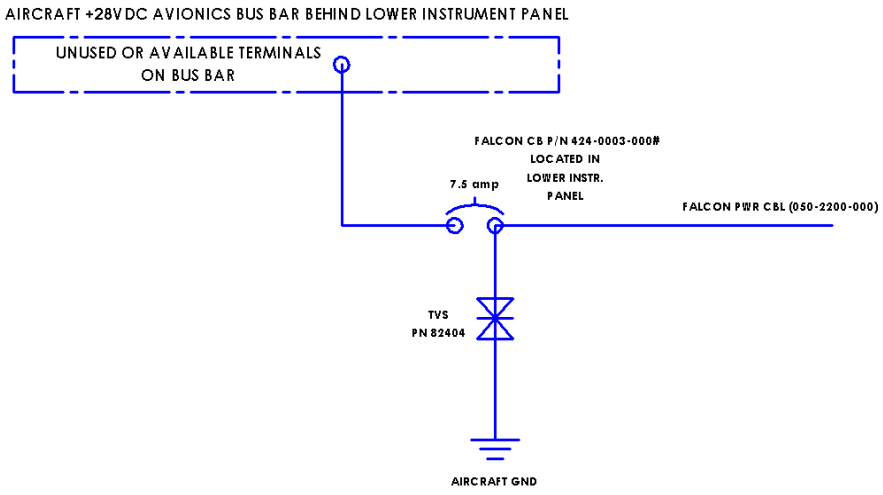


Figure 3-14: Falcon Power/TVS Circuit

Auto Dispersal Cable Connections

Waranty is voided if you feed aircraft power through low voltage IO. If this occurs, there will be evidence within the Falcon/Falcon Pro CPU.

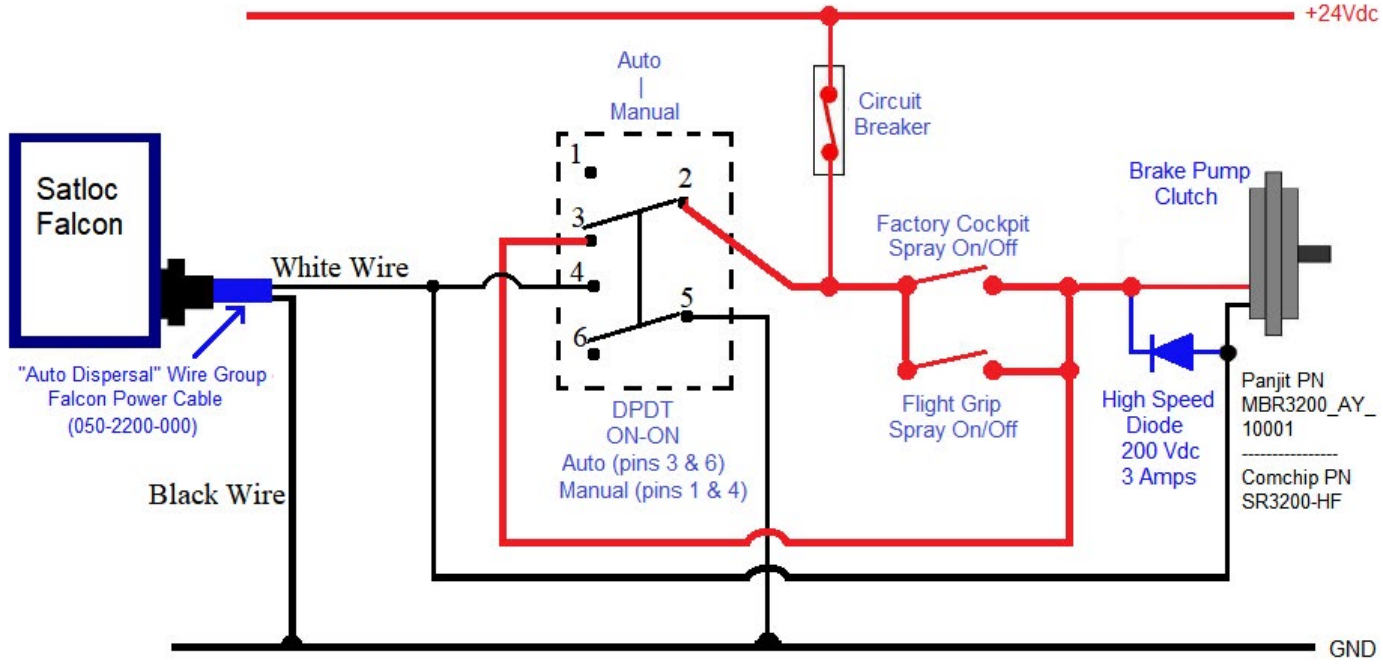


Figure 3-15: Auto Dispersal Cable Connections through Switches

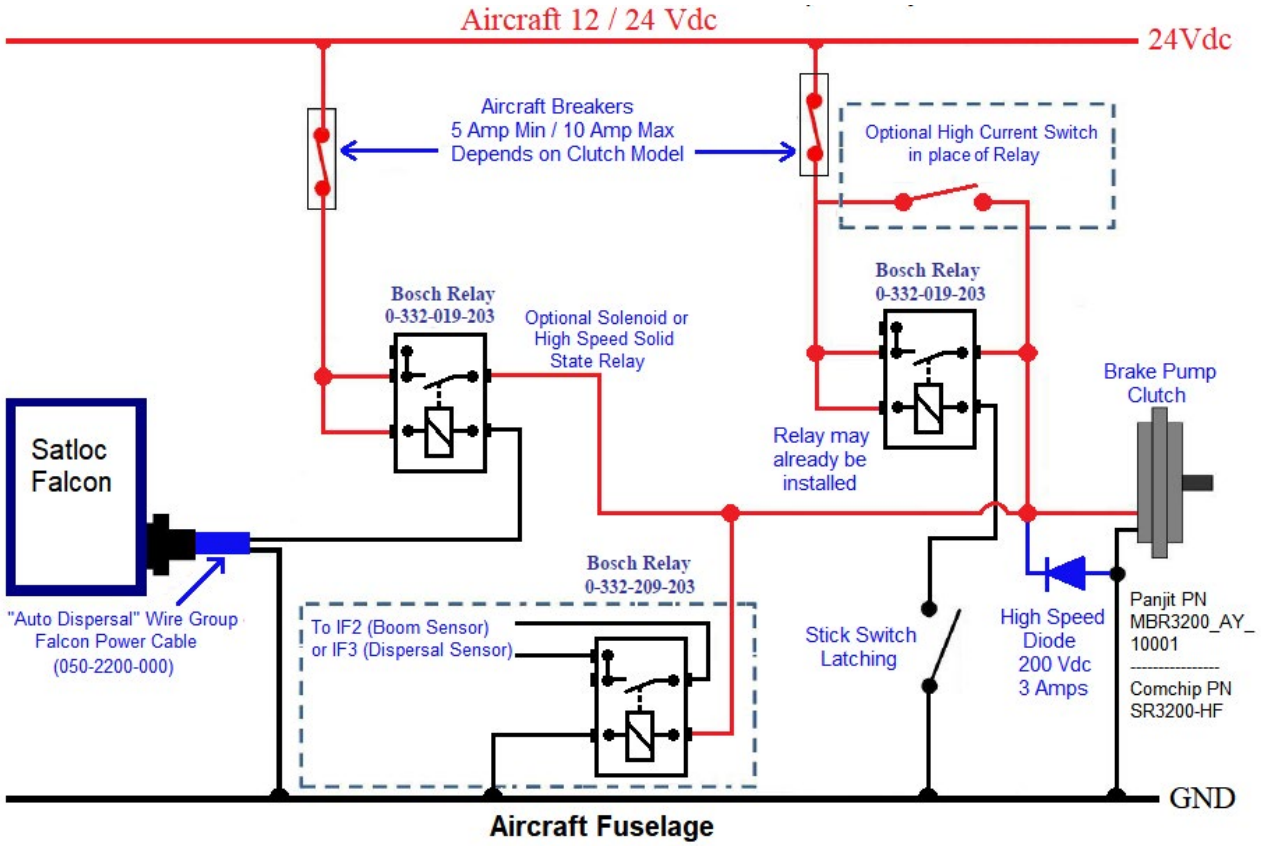


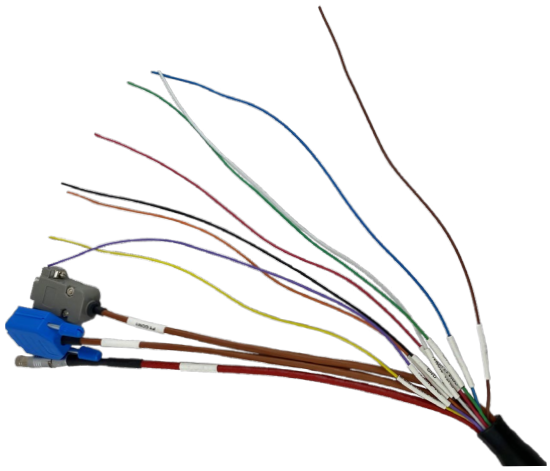
Figure 3-16: Auto Dispersal Cable Connections for Solenoid/Relays

Comports Cable Connections

The Comports cable (PN 050-2203-000) connects the Falcon's CPU to third part. The red cable extruding from the main cable labeled 'P2 AgLaser COM 2' connects to the optional AgLaser. The cable labeled 'P1 COM 1' connects to third party serial device. The cable labeled 'P4 CAN COM 4' connects to a third part CAN.

Cables

1. P1 COM 1
2. P4 CAN COM 4
3. P2 AgLaser COM 2 - connects to AgLaser directly



Wires

1. COM 12 Volt Out
2. 12 Volt GND
3. OUT1 GND
4. OUT1 Signal
5. IN1 Signal
6. GND
7. IO1 Signal
8. RX3/FLW-MTR IN
9. TX3/FLW-MTR 5V

Waranty is voided if you feed aircraft power through low voltage IO. If this occurs, there will be evidence within the Falcon/Falcon Pro CPU.

Antenna Cable Connections

WARNING **Where wiring is attached downward to a connector, terminal block, panel or junction box, a drip loop shall be provided in the wiring to prevent fluids or condensation from running into the components.**

The Antenna cable (PN 052-0005-000#) connects on the top of the Falcon's CPU to the GPS port. The other end of the cable connects to the A21 GPS Antenna.

Figure 3-15: Connect A21 antenna cable to Falcon CPU and A21 antenna

The WIFI Antenna (PN 804-40001-000) can connect directly to the WIFI port on the top of the Falcon's CPU. To place the WIFI antenna somewhere besides on top of the Falcon's CPU, use optional cable PN 050-2521-000. This cable will connect directly into the WIFI port on top of the Falcon's CPU while the other end will connect to the WIFI antenna.

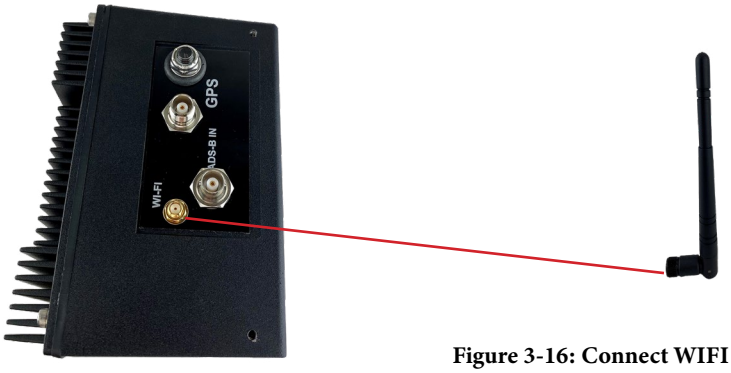


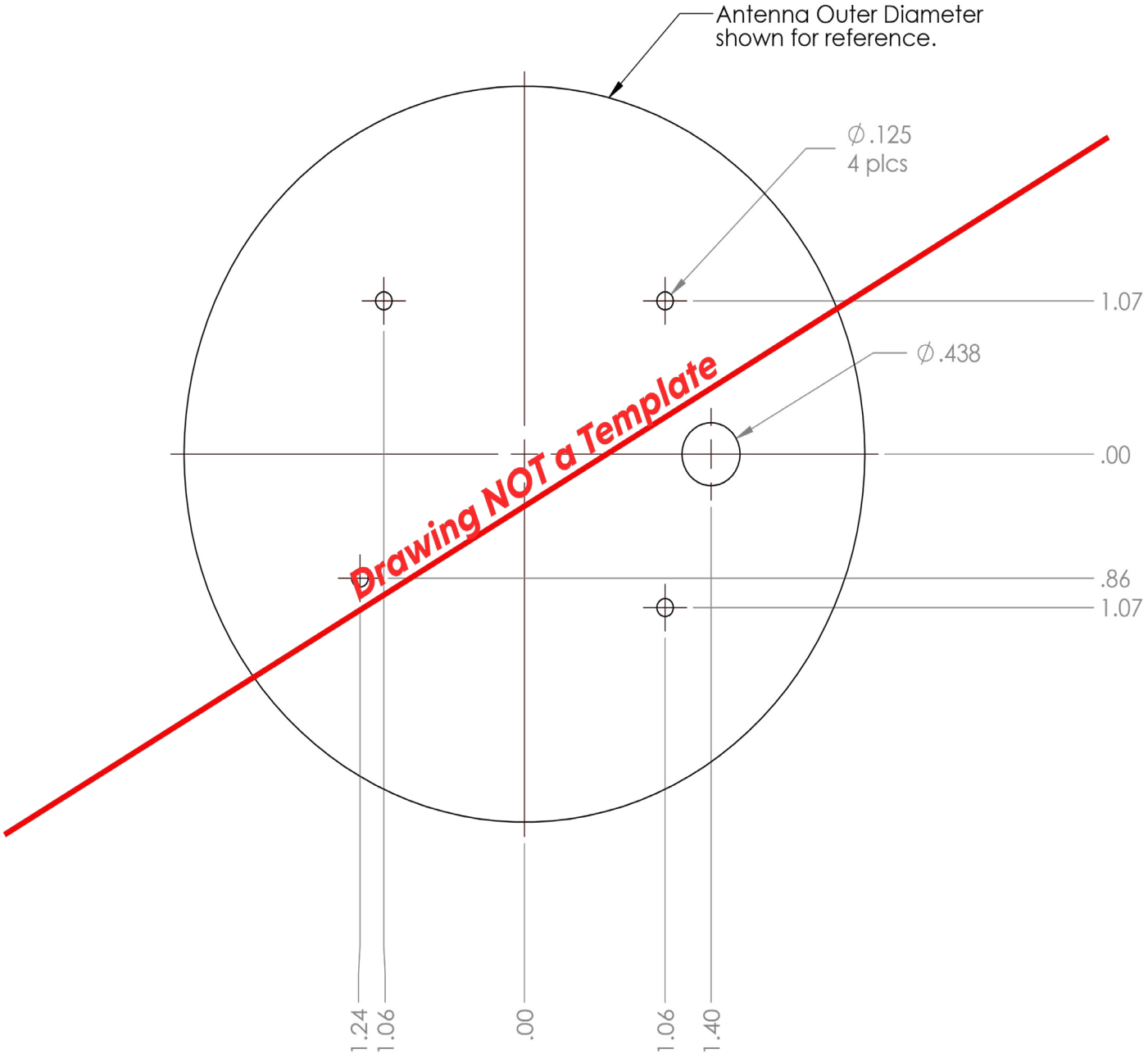
Figure 3-16: Connect WIFI antenna to Falcon CPU

The ADS-B In cable (PN 050-2522-000) connects on the top of the Falcon's CPU to the ADS-B In port. The other end of the cable connects to the ADS-B In monopole antenna.

Figure 3-17: Connect ADS-B In cable to ADS-B In antenna and Falcon CPU

APPENDIX A: A21 GPS ANTENNA MOUNTING DIMENSIONS

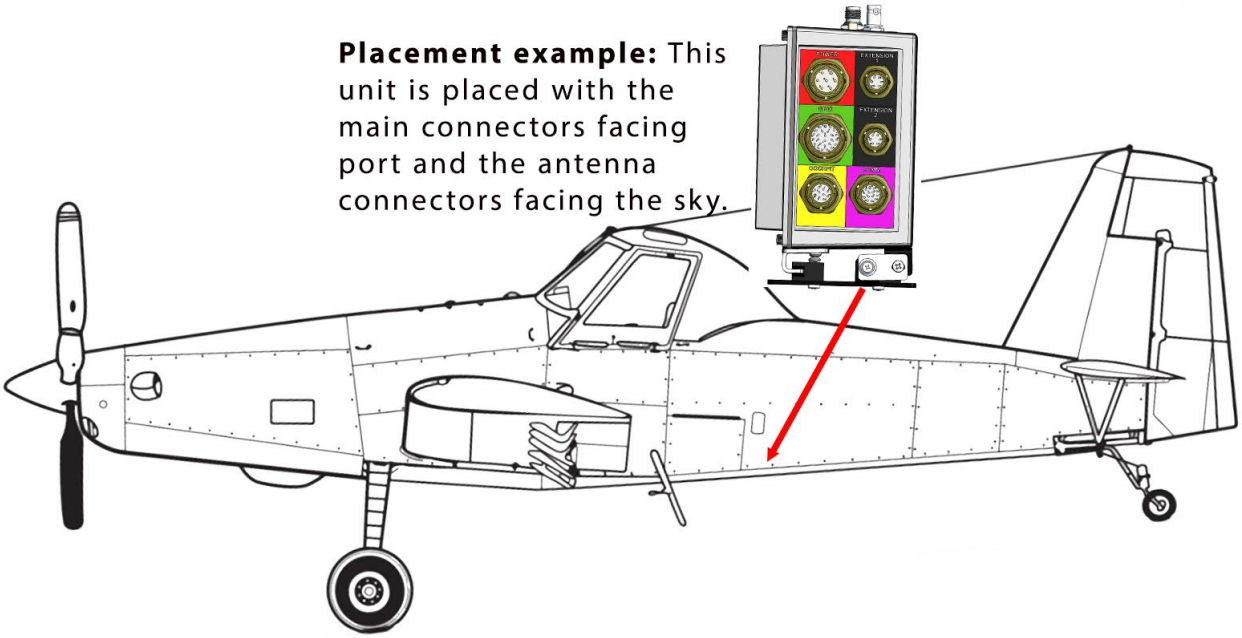
The "Antenna Mounting Dimensions" **drawing is not a template**. Instead, it gives the mounting dimensions. When mounting the antenna, measure off the center, where zero initiates.



APPENDIX B: FALCON PRO PLACEMENT FOR IMU TO WORK

To ensure the correct and optimal performance of the IMU, place the Falcon Pro at right angles within the aircraft.

NOTE: During the Falcon Pro setup, you will be asked about the orientation of the Falcon within the aircraft. Selecting the correct orientation is CRUCIAL for the IMU to work correctly.



Possible Orientations

Main Connectors Face the Sky
- Antenna connectors face the nose
- Antenna connectors face starboard
- Antenna connectors face the tail
- Antenna connectors face port

Main Connectors Face the Ground
- Antenna connectors face the nose
- Antenna connectors face starboard
- Antenna connectors face the tail
- Antenna connectors face port

Main Connectors Face the Nose
- Antenna connectors face the sky
- Antenna connectors face starboard
- Antenna connectors face port
- Antenna connectors face the ground

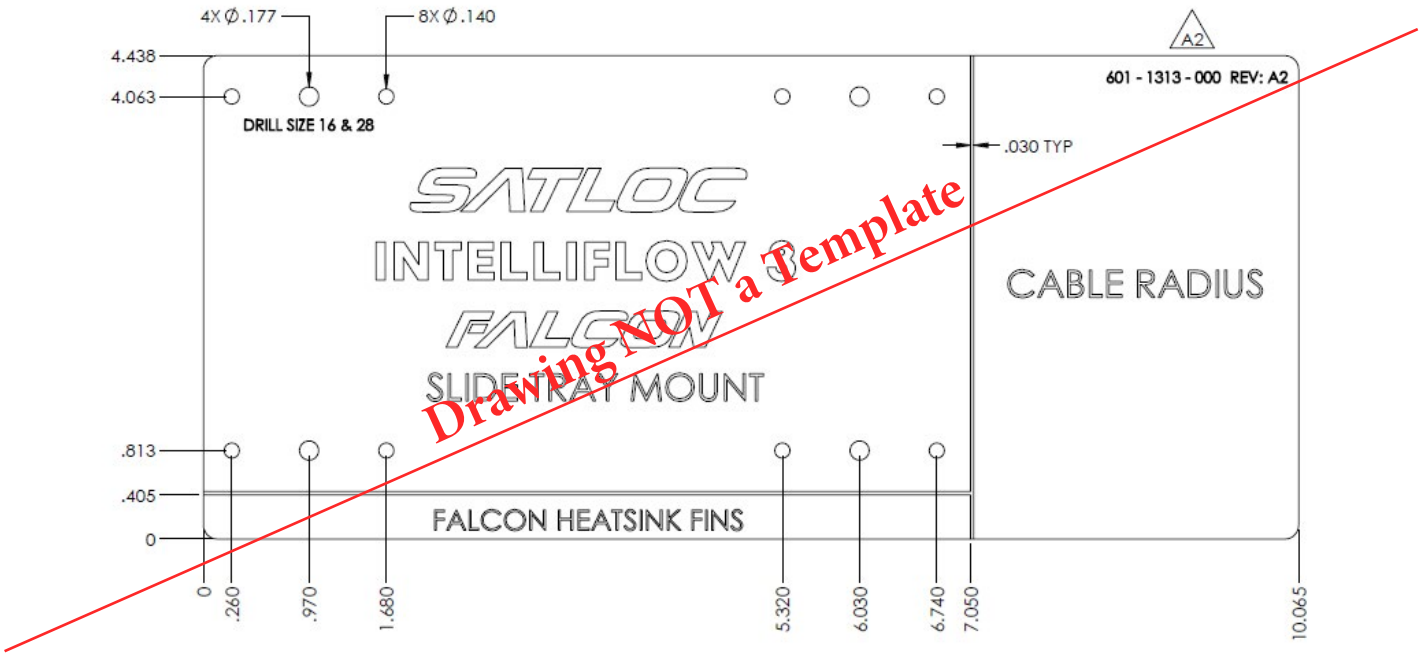
Main Connectors Face the Tail
- Antenna connectors face the sky
- Antenna connectors face starboard
- Antenna connectors face port
- Antenna connectors face the ground

Main Connectors Face Starboard
- Antenna connectors face the sky
- Antenna connectors face the nose
- Antenna connectors face the tail
- Antenna connectors face the ground

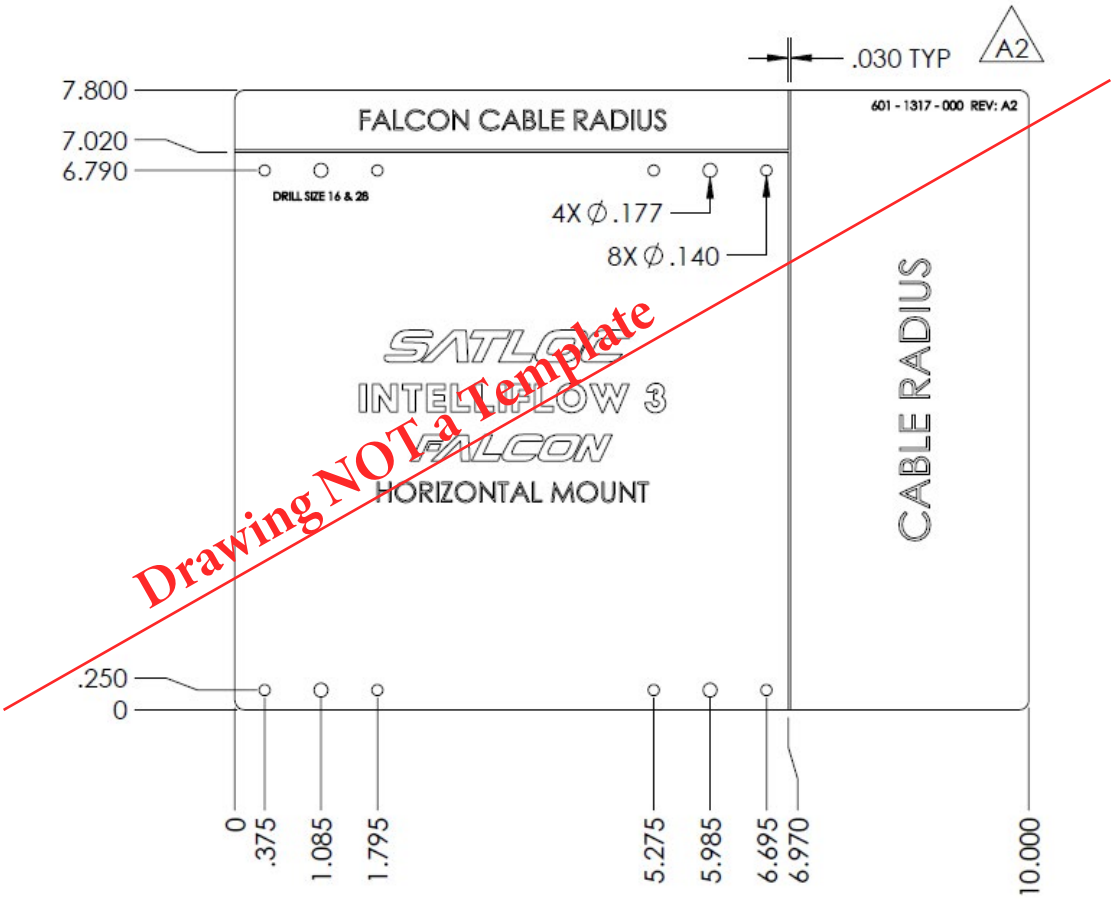
Main Connectors Face the Port
- Antenna connectors face the sky
- Antenna connectors face the nose
- Antenna connectors face the tail
- Antenna connectors face the ground

APPENDIX C: CPU MOUNTING DIMENSIONS

The "CPU Mounting Dimensions" **drawings are not templates**. Instead, they give the mounting dimensions.



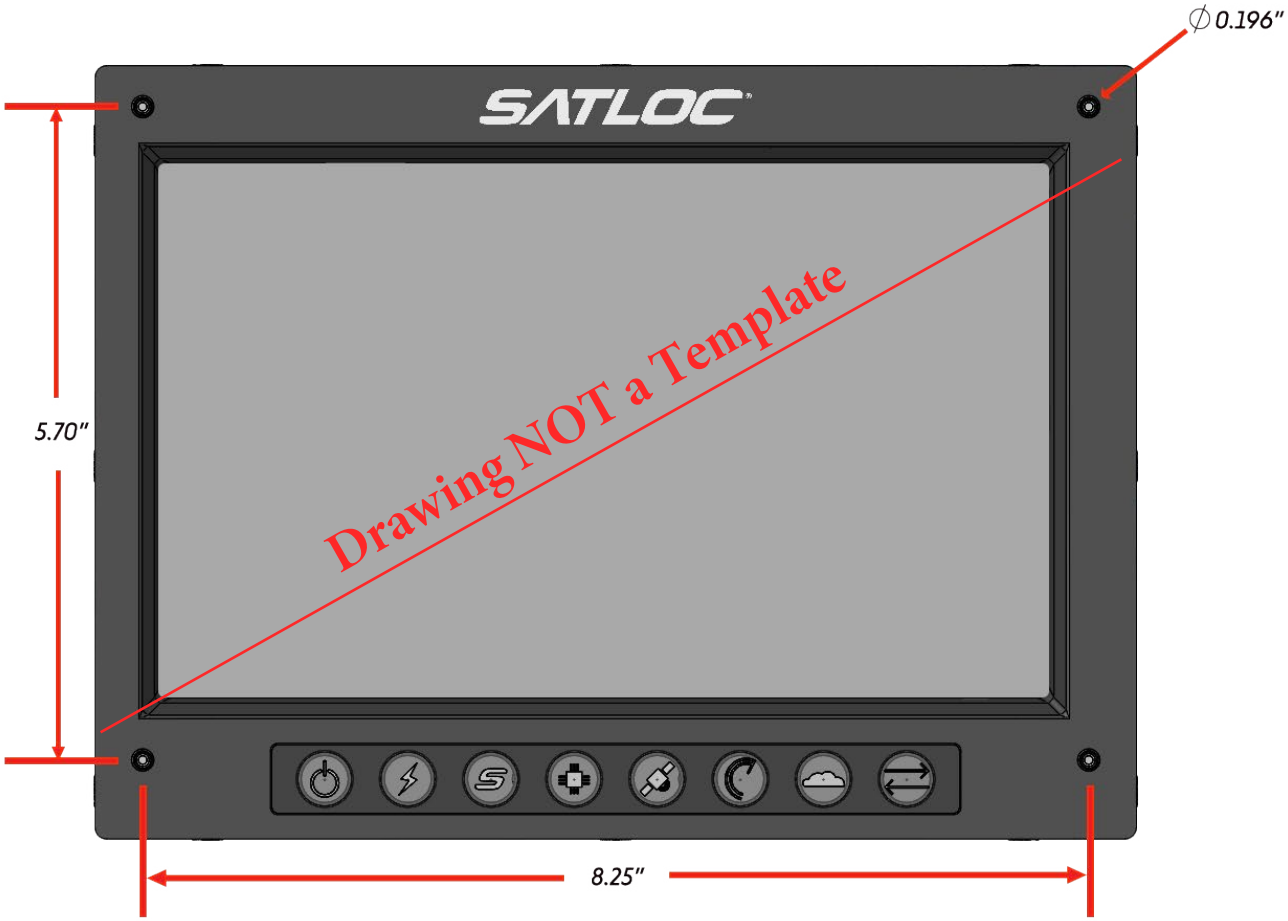
Rack Mount Dimensions



Horizontal Mount Dimensions

APPENDIX D: TOUCHSCREEN MOUNTING DIMENSIONS

The "Touchscreen Mounting Dimensions" **image is not template**. Instead, they give the mounting dimensions.



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