



# ICON USER MANUAL

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## INDEX *(CLICK TO NAVIGATE TO PAGE)*

### ITA

[3 ITA PART DIAGRAM](#)

[4 ITA COVER INSTALLATION](#)

[6 ITA COVER REMOVAL](#)

[7 ITA CABLE CLAMP INSTALLATION & REMOVAL](#)

[8 XL PART DIAGRAM](#)

[9 XL CABLE CLAMP INSTALLATION & REMOVAL](#)

[10 XL DUST COVER EXCESS MATERIAL REMOVAL](#)

[11 ITA PROTECTIVE COVER INSTALLATION](#)

[12 ITA MODULE INSTALLATION & REMOVAL](#)

### RECEIVER

[13 RECEIVER PART DIAGRAM](#)

[14 RECEIVER STRAIN RELIEF ASSEMBLY](#)

[15 RECEIVER MOUNTING](#)

[16 RECEIVER PROTECTIVE COVER INSTALLATION](#)

[17 RECEIVER MODULE INSTALLATION & REMOVAL](#)

### ITA & RECEIVER

[18 ITA & RECEIVER ENGAGEMENT/ DISENGAGEMENT](#)

[19 KEYING PIN KIT, ASSEMBLY](#)

[20 CABLE SHIELD TERMINATION](#)

*continued on next page*



## INDEX PAGE 2

### PCB

21 [PCB MOUNTING](#)

24 [PCB LAYOUT- QUADRAPADDLE](#)

25 [PCB LAYOUT- TRIPADDLE](#)

26 [PCB LAYOUT- QUADRAPADDLE & MICRO POWER](#)

27 [PCB LAYOUT- PCB AND WIRED MODULES](#)

*Please note that any printed or downloaded user manuals may not reflect the most current revisions. The information contained in this manual is subject to change. For the most current information available, visit [vpc.com](http://vpc.com).*

## ITA PART DIAGRAM

PART # 410123101, 410123102

Features of the iCon ITA that help distinguish the top and bottom are the alpha (top) and numeric (bottom) keying receptacles (**Figure A**).

The front and rear are distinguished by protruding guide pins (front) and the engagement handle (rear) (**Figure B**).

Other features are labeled in the illustrations below. NOTE: The iCon EMI and XL have varying cable exits than the cable clamp illustrated in Figures A and B below.

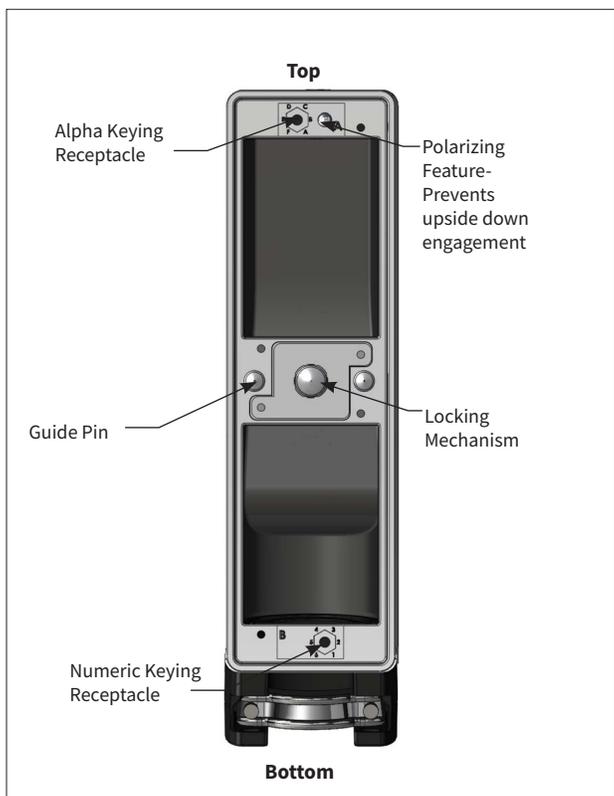


Figure A. Front view.



Figure B. ITA side view.

[RETURN TO INDEX](#)

## ITA COVER INSTALLATION

PART # 410123101, 410123102, 410123232

### TOOLS REQUIRED

- Flat Head Screwdriver
- Phillips Head Screwdriver

There are two cover installation options.

#### OPTION A

Install cover with ITA disengaged from receiver/ in disengaged position (Figure A).

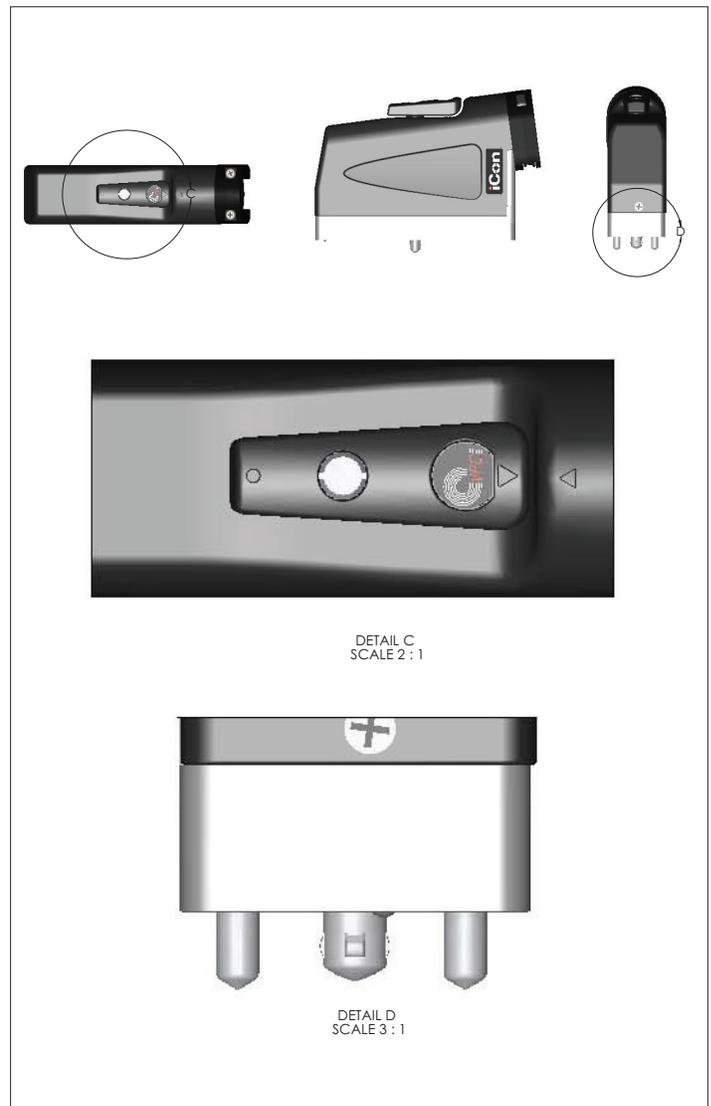
Figure A. Open/ disengaged position.



#### OPTION B

Install cover with ITA engaged to receiver/ in engaged position (Figure B).

Figure B. Closed/ engaged position.



[RETURN TO INDEX](#)

## ITA COVER INSTALLATION (CONT'D)

PART # 410123101, 410123102, 410123232

### OPTION A: Disengaged Position

1. Place the cover on the ITA (**Figure A**). The lip will align with the ITA groove.
2. Slide the cover onto the ITA frame until it is fully seated against the cable clamp.
3. Place the handle onto the shaft with the *raised circles* aligned. Make sure wires are routed around the shaft and do not get caught between the handle (**Figure B**) and shaft.
4. Position the supplied 6-32 shoulder screw into the handle and tighten with a Flat Head screwdriver (**Figure B**).

**NOTE:** The iCon XL has two additional installation screws, one on each side of the cable clamp. These screws are not captive.

5. Finally, tighten the captive screw at the top of the ITA to secure the cover.

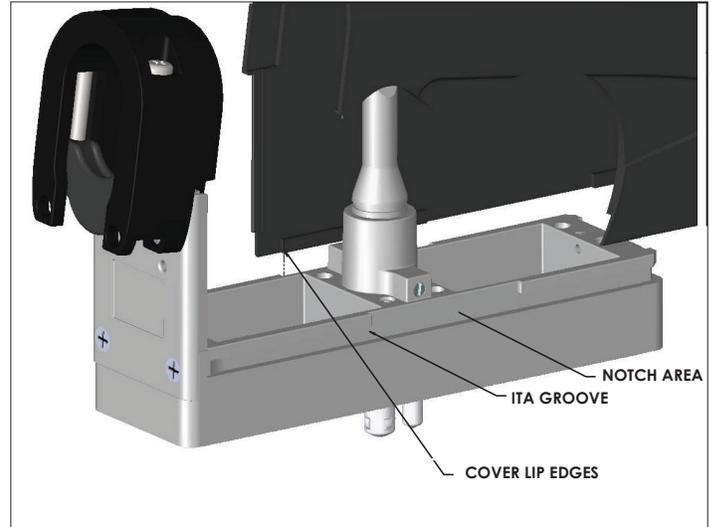


Figure A.

### OPTION B: Engaged Position

1. Place the cover onto the ITA (**Figure A**). The lip will align with the ITA groove.
2. Slide the cover onto the ITA frame until it is fully seated against the cable clamp.
3. Place the handle onto the shaft with the *raised triangles* aligned (**Figure B**).
4. Position the supplied 6-32 shoulder screw into the handle and tighten with a Flat Head screwdriver (**Figure B**).

**NOTE:** The iCon XL has two additional installation screws, one on each side of the cable clamp. These screws are not captive.

5. Finally, tighten the captive screw at the top of the ITA to secure the cover.

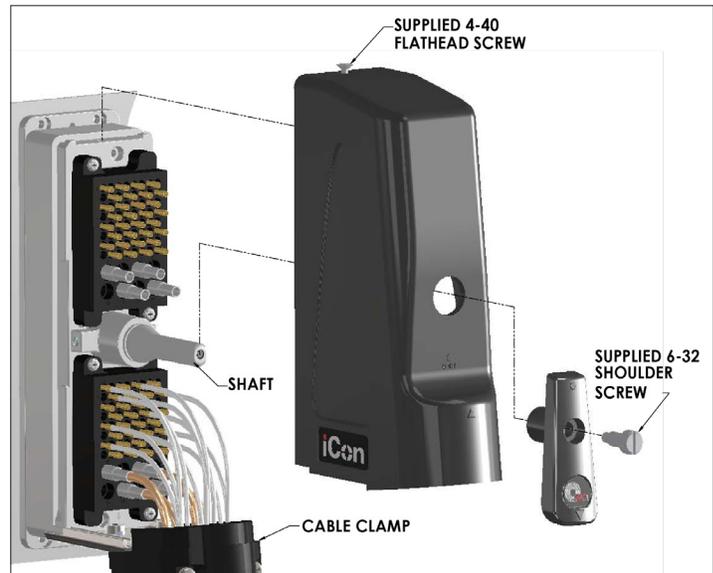


Figure B. Route the wires around the shaft to avoid damage when the handle is attached.

[RETURN TO INDEX](#)

## ITA COVER REMOVAL

PART # 410123101, 410123102, 410123232

### TOOLS REQUIRED

Flat Head Screwdriver  
Phillips Head Screwdriver

There are two cover removal options.

#### OPTION A

Slide the cover straight up the ITA frame (**Figure A**).  
Requires 4.75" of vertical clearance/space above the iCon.

#### OPTION B

Slide the cover halfway up the ITA frame, then lift away from the frame.  
Recommended if components are mounted above the iCon. Requires only 1.64" of vertical clearance/ space above the iCon.

#### OPTION A

1. Using a flat head screwdriver, remove the shoulder screw located on the top of the cover (**Figure B**).
2. Remove the engagement handle by pulling it upward (**Figure B**).
3. Loosen the captive screw with a Phillips head screwdriver (**Figure B**).

**NOTE:** The iCon XL has two additional screws to remove, one on each side of the cable clamp. These screws are not captive.

4. Slide the cover off (**Figure A**).

#### OPTION B

1. Using a flat head screwdriver, remove the shoulder screw located on the top of the cover (**Figure B**).
2. Remove the engagement handle by pulling it upward.
3. Loosen the captive screw with a Phillips head screwdriver (**Figure B**).

**NOTE:** The iCon XL has two additional screws to remove, one on each side of the cable clamp. These screws are not captive.

4. Slide the cover up until the cover notch aligns with the notch on the ITA frame (**Figure C**).
5. With the notches aligned, lift the cover up and remove it.

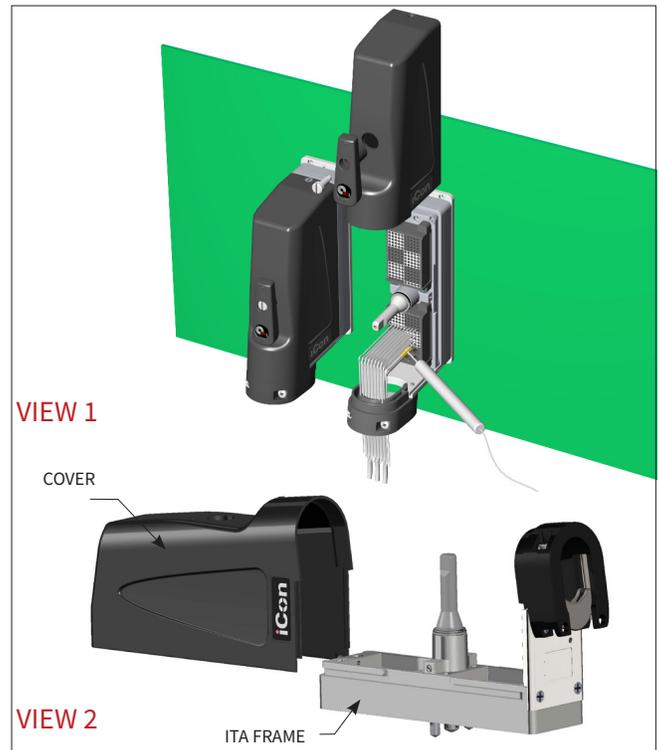


Figure A.



Figure B.

[RETURN TO INDEX](#)

## ITA CABLE CLAMP INSTALLATION AND REMOVAL

PART # 410123101

### TOOLS REQUIRED

Phillips Head Screwdriver

### INSTALLATION

1. Install .375" screws to mount the clamp to ITA frame. Slowly alternate tightening the 1.5" screws until the clamp has cinched the cable(s) tightly.
2. Place the cable(s) into the U-shaped clamp. Install the strain relief bar and start installing the 1.5" screws. Slowly alternate tightening the screws until the clamp has cinched the cable(s) tightly.

**NOTE:** The U-shaped cable clamp is adjustable to accommodate the size of the cable bundle.

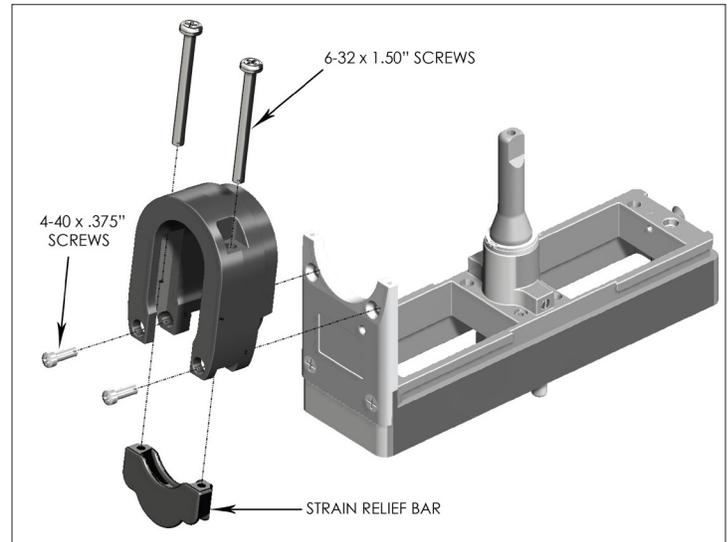


Figure A

### REMOVAL

1. After removing the handle and cover, loosen the 1.5" screws to allow the cable(s) to slide freely in the clamp.
2. Unscrew the .375" screws holding the clamp to the ITA frame (**Figure A**). If necessary, entirely remove the screws to allow the cable(s) to be removed.

### Formula= Max # of Wires in a Cable Bundle

$B = 1.2 \sqrt{(N_1 d_1^2 + N_2 d_2^2 + N_n d_n^2)}$		
B = Wire bundle diameter	$N_1$ = Number of first wire type $N_2$ = Number of second wire type $N_n$ = Number of $n^{th}$ wire type	$d_1$ = Outside Diameter of first wire type $d_2$ = Outside Diameter of second wire type $d_n$ = Outside Diameter of $n^{th}$ wire type

Wire Type	Ø [in]	# WIRES	BUNDLE Ø [in]
26 AWG 16878/4	0.043	549	1.21
24 AWG 16878/4	0.048	441	
22 AWG 16878/4	0.054	348	
M27500-26ml2t08	0.114	78	
M27500-24ml2t08	0.126	64	
M27500-22ml2t08	0.140	52	
M27500-22ml1t08	0.087	134	
22AWG 16878/4 T/P	0.108	87	
24AWG 16878/4 T/P	0.096	110	

[RETURN TO INDEX](#)

## XL PART DIAGRAM

PART # 410123232

Features of the iCon XL that help distinguish the top and bottom are the alpha (top) and numeric (bottom) keying receptacles (**Figure A**).

The front and rear can be distinguished by protruding guide pins (front) and the engagement handle (rear) (**Figure B**).

**NOTE:** The iCon XL is EMI compliant, but does not include a threaded feature at the cable exit for conduit termination like the standard iCon EMI ITA. Instead, the XL features a cable clamp with an adjustable dust cover. This cover has an SST filler, also present in the backshell and clamp housing.



Figure A. Front view



Figure B. Side view

[RETURN TO INDEX](#)

## XL CABLE CLAMP INSTALLATION AND REMOVAL

PART # 410 123 232

### TOOLS REQUIRED

Phillips Head Screwdriver

### INSTALLATION

1. Install the .375" screws to mount the clamp to the ITA frame.
2. Place cable bundle into U- shaped clamp. Install strain relief bar and dust cover using the 2.50" screws. Slowly alternate tightening the screws until the clamp has cinched the cable bundle snugly.
3. See instructions on next page for removal of excess material from dust cover.

### REMOVAL

1. After removing the handle and ITA cover, 2.50" screws to allow the cable bundle to slide freely in the clamp.
2. Remove cable clamp and dust cover.
3. Unscrew the .375" screws holding the clamp to the ITA frame (**Figure A**). If necessary, entirely remove the screws to remove the cable bundle.

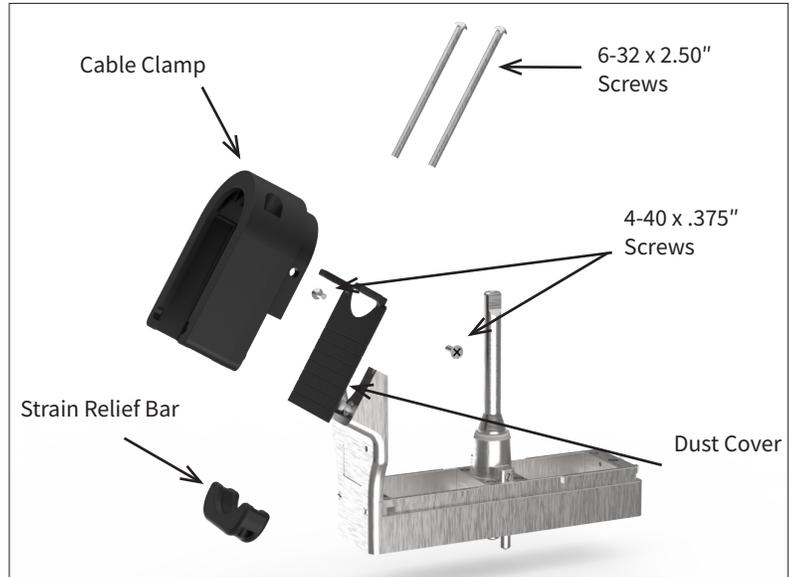


Figure A

### Formula= Max # of Wires in a Cable Bundle

$B = 1.2 \sqrt{(N_1 d_1^2 + N_2 d_2^2 + N_n d_n^2)}$		
B = Wire bundle diameter	$N_1$ = Number of first wire type $N_2$ = Number of second wire type $N_n$ = Number of n <sup>th</sup> wire type	$d_1$ = Outside Diameter of first wire type $d_2$ = Outside Diameter of second wire type $d_n$ = Outside Diameter of n <sup>th</sup> wire type

Wire Type	Ø [in]	# WIRES	BUNDLE Ø [in]
<b>26 AWG 16878/4</b>	0.043	1428	1.95
<b>24 AWG 16878/4</b>	0.048	1146	
<b>22 AWG 16878/4</b>	0.054	905	
<b>M27500-26ml2t08</b>	0.114	203	
<b>M27500-24ml2t08</b>	0.126	166	
<b>M27500-22ml2t08</b>	0.140	134	
<b>M27500-22ml1t08</b>	0.087	348	
<b>22 AWG 16878/4 T/P</b>	0.108	226	
<b>24 AWG 16878/4 T/P</b>	0.096	286	

[RETURN TO INDEX](#)

## XL DUST COVER EXCESS MATERIAL REMOVAL

PART # 410 123 232

1. Removal of dust cover excess material should only be performed while the ITA is *disengaged*.
2. The iCon XL cable clamp can is designed so that excess material can be snapped off/ removed once the cable bundle is securely in place.
3. The excess material should only be removed after installation of the cable clamp/ strain relief bar.
4. Gently apply pressure to the material protruding from the base of the ITA. There are dividers on the dust cover that allow the cover to snap off with ease.
5. Snap the material off by pushing down, then gently pulling up on the excess material (**Figure B**).

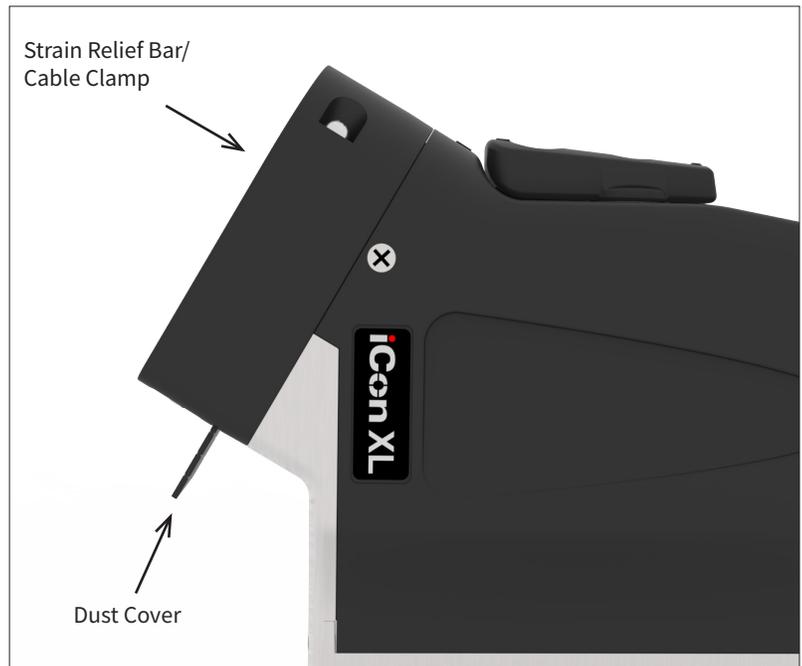


Figure A.



Figure B.

[RETURN TO INDEX](#)

## ITA PROTECTIVE COVER INSTALLATION

PART # 410112750

### INSTALLATION

1. Move the iCon engagement handle to the open position (raised circles aligned).
2. Place the protective cover on the engagement mechanism of the ITA (**Figure A**).
3. Turn the engagement handle to the closed position (triangles aligned) to fully mate the ITA and protective cover (**Figure B**).

### COVER CHAIN INSTALLATION

1. Attach one end of the chain to one of the supplied eyelets.
2. Attach the eyelet to the mounting hole in the protective cover using the supplied 4-40 screw (**Figure D**).
3. Thread the chain through the mounting hole on the ITA base (**Figure C**).
4. Attach the end of the chain to the end of the eyelet.



Figure A.



Figure B.

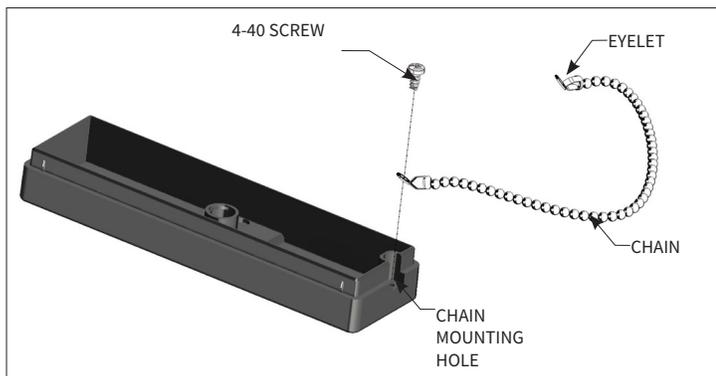


Figure D.



Figure C.

[RETURN TO INDEX](#)

## ITA MODULE INSTALLATION AND REMOVAL

PART # 410123101, 410123102, 410123232

### TOOLS REQUIRED

Phillips Head Screwdriver

### INSTALLATION

1. Remove the cover.
2. Place the module in the ITA until the upper and lower module screws touch the mating holes in the frame. Install modules so that pin position 1 is located at the top of the ITA frame and aligns with pin position 1 on the receiver module when mating (**Figure A**).
3. Using a Phillips head screwdriver, tighten the top screw 1-2 full turns, while pushing lightly against the face of the module.
4. Maintain this pressure while tightening the bottom screw 1-2 full turns.
5. Repeat until the module is seated. Torque the screw to 1.5 in-lbs [0.16 Nm].
6. Reinstall the removable cover. Ensure the engagement handle is correctly aligned.

**NOTE:** For optimum performance and system longevity, distribute the contact load evenly throughout the module.

### REMOVAL

1. To remove, loosen the top module screw 1-2 full turns. Then, loosen the bottom screw 1-2 full turns.
2. Repeat until the module is separated from the ITA.

### REVERSE MODULE FUNCTIONALITY

1. If required by an application, iCon ITA modules can be installed in the receiver (must use receiver part # 310 123 103) and receiver modules can be installed in the ITA.
2. If using modules in reverse functionality, it is important to ensure the contacts installed in each module remain consistent with that module type (receiver contacts in receiver modules and ITA contacts in ITA modules).
3. Keying kits should also be used to prevent incorrect module mating.

For more information on reverse module functionality, consult *VPC Tech Tip: Reverse Module Functionality* at [vpc.com](http://vpc.com) or use [this link](#).

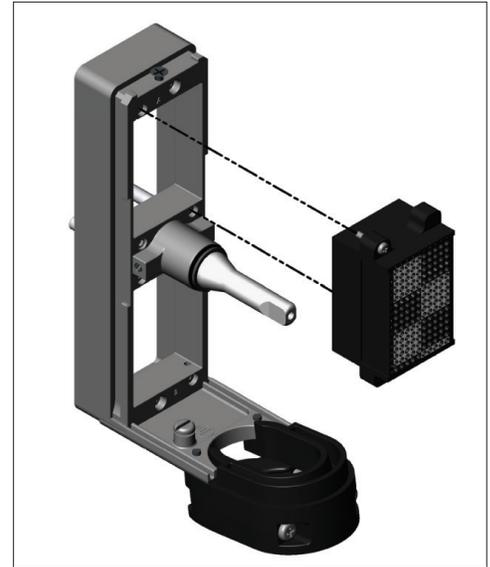


Figure A.

## RECEIVER PART DIAGRAM

PART # 310123101, 310123102, 310123103

Features of the iCon Receiver that help distinguish the top and bottom are the alpha (top) and numeric (bottom) keying receptacles (**Figure A**).

The front and rear are distinguished by a polarizing feature receptacle on the front (**Figure B**). The polarizing feature prevents upside-down mating with the ITA. The front is the mating side and the rear is the wiring side.

Other features are shown in the illustrations below.

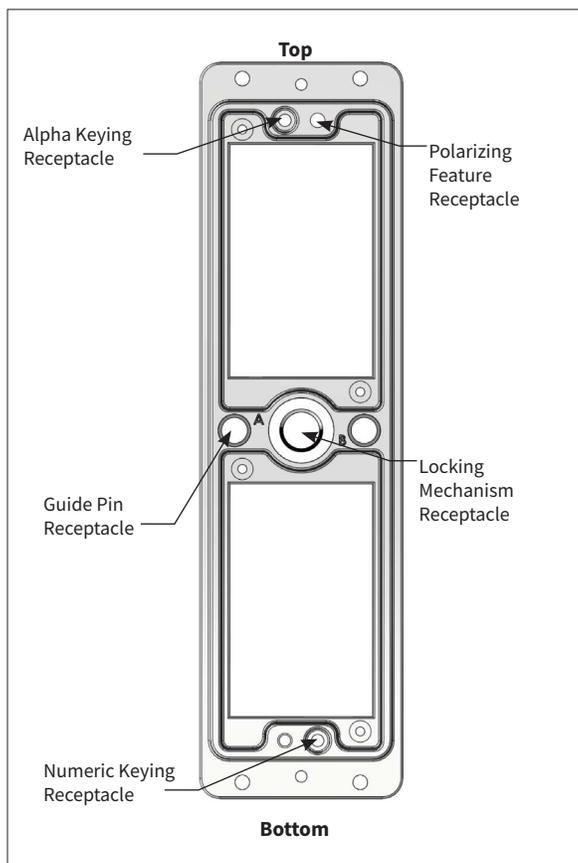


Figure A. Receiver front view.

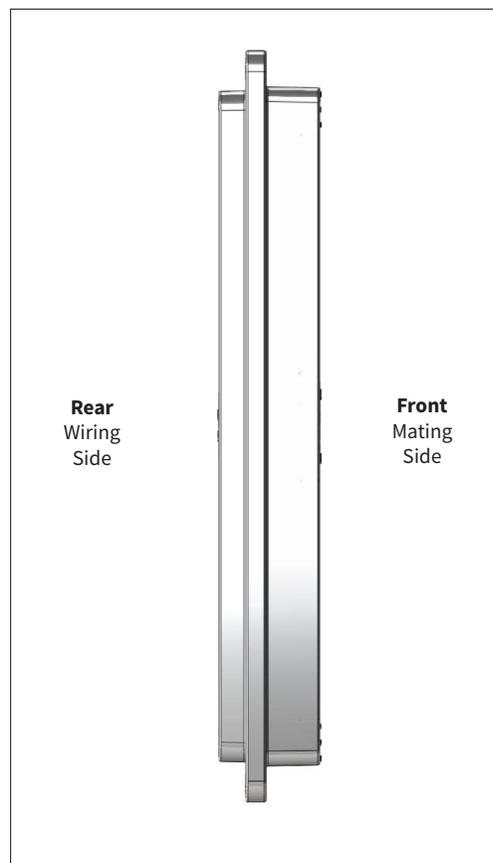


Figure B. Receiver side view.

[RETURN TO INDEX](#)

## RECEIVER STRAIN RELIEF INSTALLATION

PART # 310113456, 310113582

### TOOLS REQUIRED

Phillips Head Screwdriver

1. Install the strain relief to the iCon receiver on the wiring side of the frame being sure to properly align both holes(**Figure A**).
2. Fasten the strain relief to the receiver with the included screws using a Phillips head screwdriver.
3. Wires should be restrained a minimum of 2 inches from the face of the module. Six wire ties are included with the strain relief. For more information on properly using strain relief, consult VPC's Strain Relief User Manual at [vpc.com](http://vpc.com) or use [this link](#).

**NOTE:** If using 8 AWG, 10 AWG, or non-flexible coax wire in the center module positions, the iCon Strain Relief Stand-off Kit (part # 310 113 582) will be required. When using this kit, install patchcords into module before attaching strain relief.



Figure A.

[RETURN TO INDEX](#)

## RECEIVER MOUNTING

PART # 310123101, 310123102, 310123103

### TOOLS REQUIRED

Phillips Head Screwdriver

### MOUNTING

1. Prepare the mounting surface using the dimensions provided below. Calculate the distance needed between side-by-side cutouts, if applicable (**Table A**).
2. Attach the iCon receiver to the panel with the provided 2-56 Phillips head screws and nuts (**Figure A**). Torque screws to 2 in-lbs [0.23 Nm].

**NOTE:** If the mounting surface is thicker than 0.125" [3.18 mm], longer screws may be needed. If the mounting surface has threaded holes, the nuts will not be needed.

**NOTE:** M2.5 hardware can be used in place of the provided 2-56 hardware.

Dimensions: inches [millimeters]

ITA Part Number	ITA Description	Receiver Cutout Spacing
410123101	ITA, iCon	1.75 [44.45]
410123102	ITA, iCon, EMI-Shielded	2.20 [55.88]
410123232	ITA, iCon XL	

Table A.

5. See (**Table A**) for minimum distance of subsequent side-by-side cutouts.

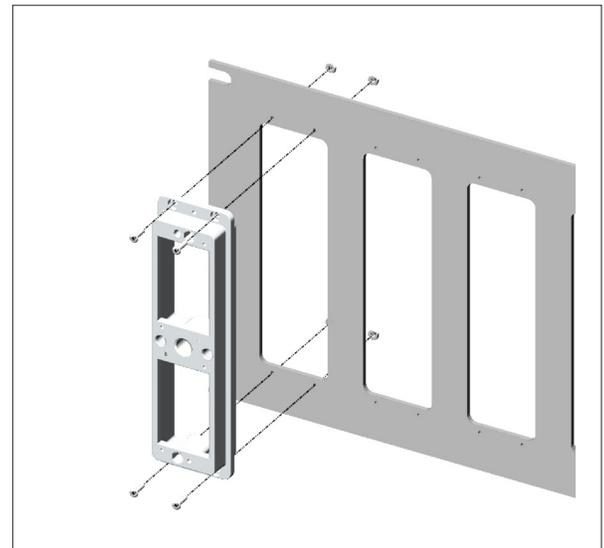
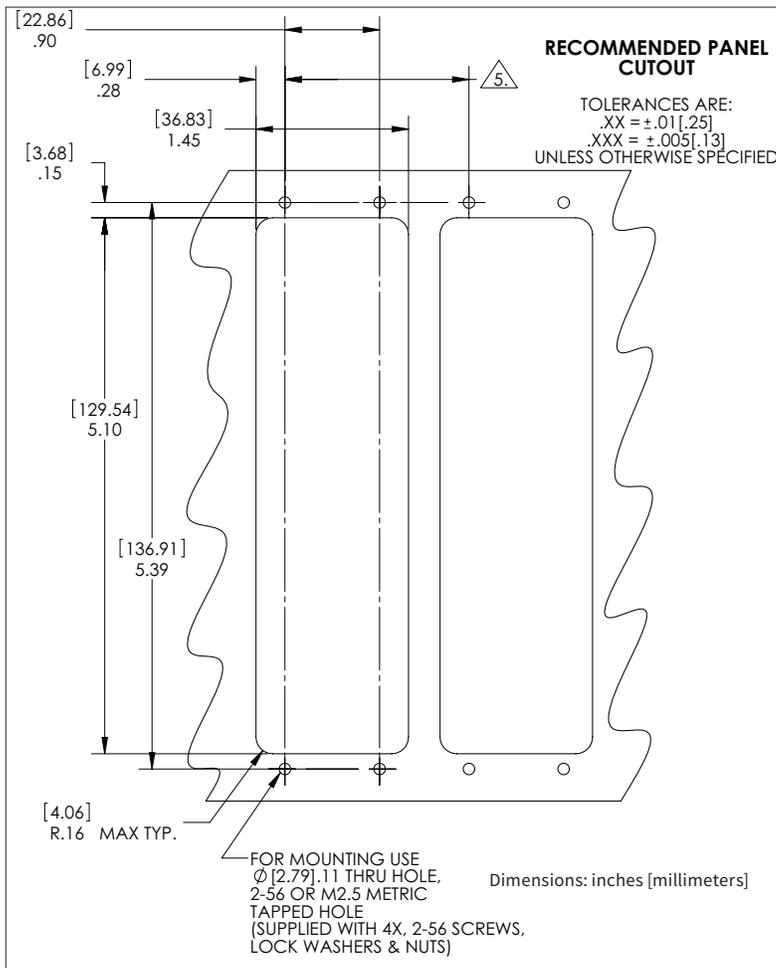


Figure A.

[RETURN TO INDEX](#)

## RECEIVER PROTECTIVE COVER INSTALLATION

PART # 310113460

1. Align the center boss on the cover with the center bushing on the receiver (**Figure A**).
2. Press the cover until it seats fully against the receiver.
3. Attach the cover's chain to the base of the receiver frame under the receiver panel mounting screw.

Figure A.



[RETURN TO INDEX](#)

## RECEIVER MODULE INSTALLATION AND REMOVAL

PART # 310123101, 310123102

The iCon receiver is designed so that modules mount from the rear. This allows the user to easily mount wired cable assemblies without having to route connectors through the receiver frame.

### TOOLS REQUIRED

Phillips Head Screwdriver

### INSTALLATION

1. Place the module in the receiver until the upper and lower module screws touch the mating holes in the frame. Install modules so that Pin 1 is located at the top of the receiver frame and aligns with pin position 1 on the ITA module when mating (**Figure A**).
2. Using a Phillips head screwdriver, tighten the top screw 1-2 full turns, while pushing lightly against the face of the module.
3. Maintain this pressure while tightening the bottom screw 1-2 full turns.
4. Repeat this sequence until the module is seated. Torque the screw to 1.5 in-lbs [0.16 Nm].

### REMOVAL

1. To remove, loosen the top screw 1 to 2 full turns. Loosen bottom screw 1 to 2 full turns.
2. Repeat until the module is separated from the receiver.

**NOTE:** For optimum performance and system longevity, distribute the contact load evenly throughout the module.

### REVERSE MODULE FUNCTIONALITY

1. If required by an application, iCon receiver modules can be installed in the ITA and ITA modules can be installed in the receiver (must use receiver part # 310 123 103).
2. If using modules in reverse functionality, it is important to ensure the contacts installed in each module remain consistent with that module type (receiver contacts in receiver modules and ITA contacts in ITA modules).
3. Keying kits should also be used to prevent incorrect mating orientation.

For more information on reverse module functionality, consult VPC Tech Tip: Reverse Module Functionality at [vpc.com](http://vpc.com) or use [this link](#).

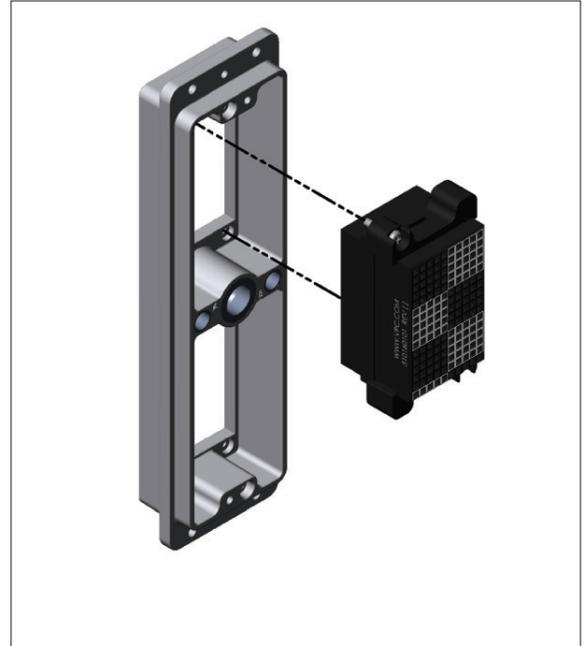


Figure A.

[RETURN TO INDEX](#)

## ITA AND RECEIVER ENGAGEMENT / DISENGAGEMENT

PART # 310123101, 310123102, 310123103, 410123101, 410123102, 410123232

### ENGAGEMENT

1. Turn the engagement handle to the open/up position (**Figure A**). When open the text "OPEN" will be revealed and the two raised circles will align.
2. Align the dowel pins and gently push the ITA onto the receiver. There will be an approximately .20" gap.

**NOTE:** The iCon connector is polarized to prevent upside down engagement.

3. Rotate the handle 180° clockwise to close (**Figure B**). When closed the raised triangles will be aligned.

### DISENGAGEMENT

1. Turn the engagement handle 180° to the open position.
2. Remove the ITA.



Figure A.



**MAXIMUM CONTACT MATING FORCE SHOULD NOT EXCEED 100 LBS.**



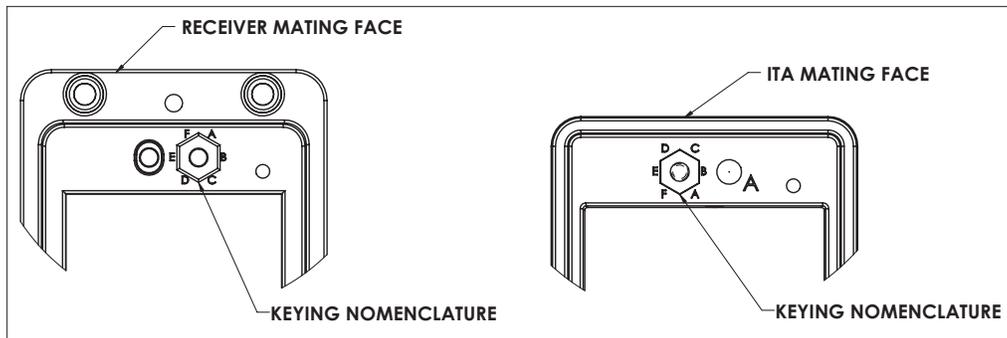
Figure B.

[RETURN TO INDEX](#)

## KEYING PIN KIT ASSEMBLY

PART # 310113461

The iSeries keying kit includes two pins and screws which provide six different keying options. The iCon system is designed to accept two kits which increase the keying options to 36.



### TOOLS REQUIRED

Phillips Head Screwdriver

1. For proper functionality, both keying pins need to be in the same alphabetical position in both the receiver and ITA.
2. Align the keying pin to the desired location. Place the keying pin in the hexagonal opening in the receiver
3. Secure the keying pin with the 2-56 screw using a Phillips head screwdriver (**Figure A**).
4. Remove the iCon ITA cover.
5. Place the other keying pin in the corresponding location in the ITA (**Figure B**).
6. Replace the ITA cover.

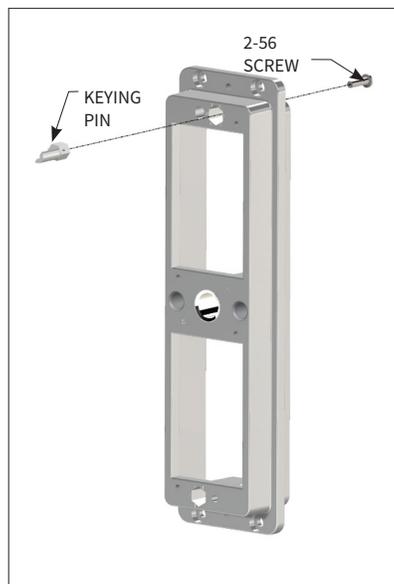


Figure A.

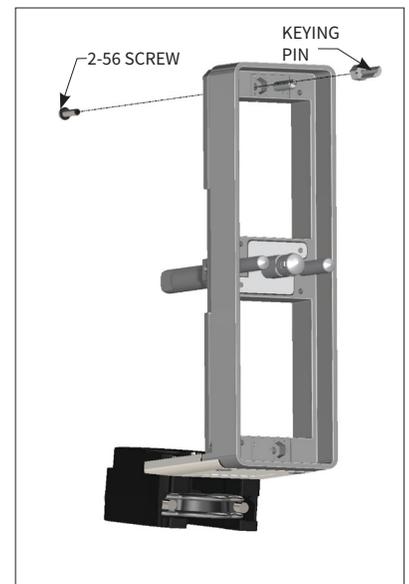


Figure B.

[RETURN TO INDEX](#)

## CABLE SHIELD TERMINATION

PART # 310123101, 410123101, 310113456

Cable shield termination locations for the iCon Receiver and ITA are different and identified below. Although, these instructions specifically call out the above ITA and receiver part numbers, they may be applicable to other iCon ITA and receiver part numbers. Consult product drawings for more information.

### ITA

On the ITA, the cable shield should be terminated to the internal grounding screw located near the cable exit at the bottom of the ITA (**Figure A**).

### RECEIVER

On the iCon receiver, the cable shield should be terminated to the receiver strain relief, part # 310113456. The ground screw is located in the top right corner of the strain relief (Figure B). More information on the iCon Receiver strain relief is available in this User Manual.

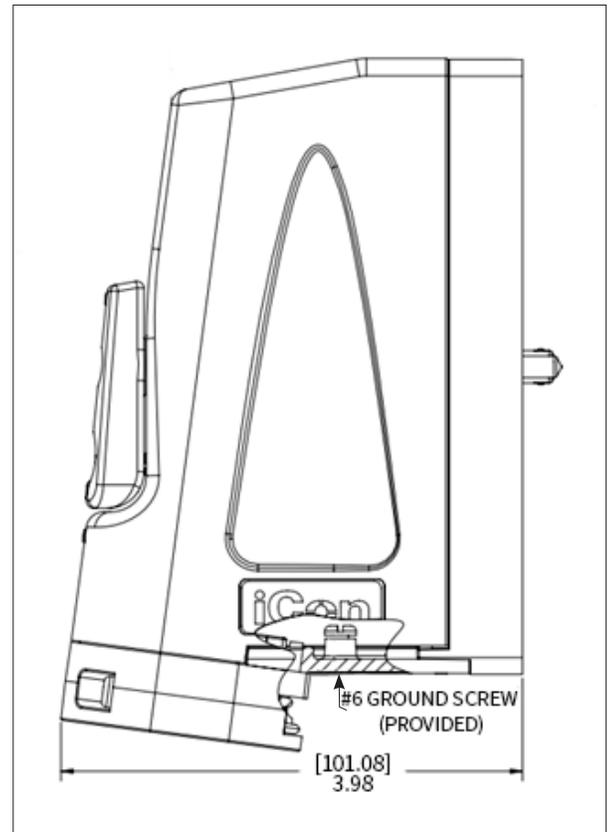


Figure A.

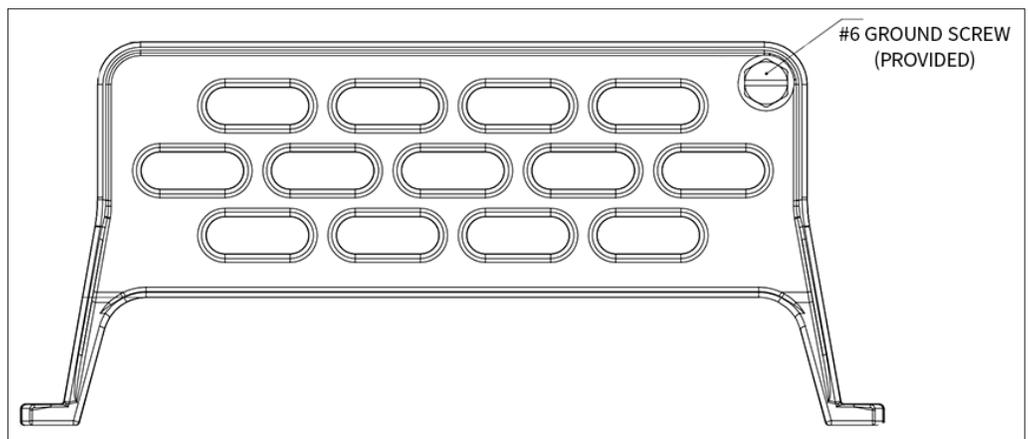


Figure B.

[RETURN TO INDEX](#)

## PCB MOUNTING

The iCon receiver is designed as a rack and panel mount connector to which a PCB may be attached on the rear side. While it can be mounted directly to a PCB without an intermediary panel, VPC’s recommended method of mounting is with the receiver to a panel.

When mounting a PCB (to the opposite side of a panel), stand-offs should be used (**Figure A**). This reduces the amount of stress on the PCB during the iCon engagement and disengagement process.

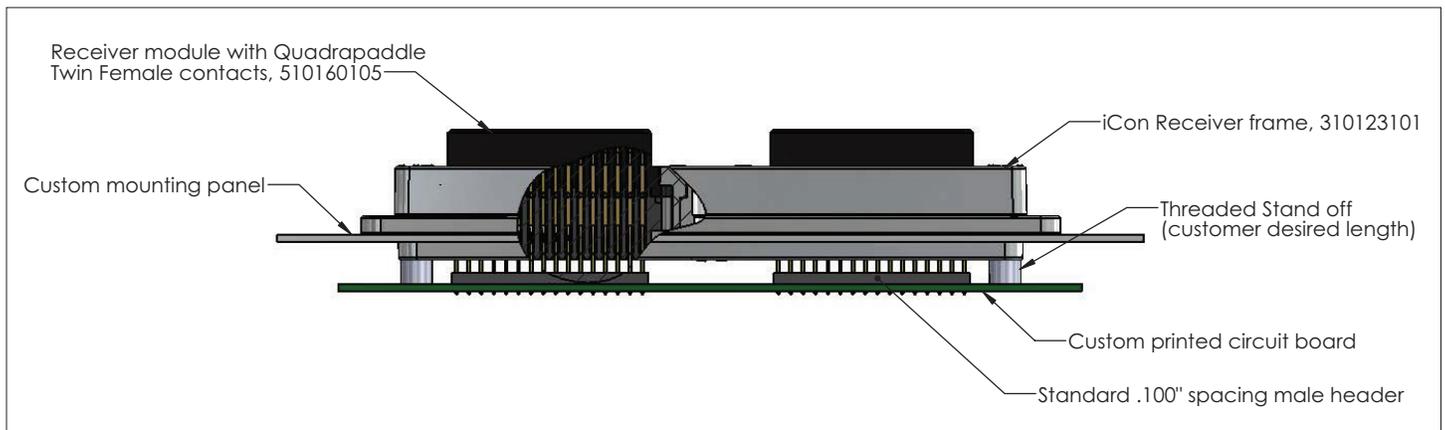
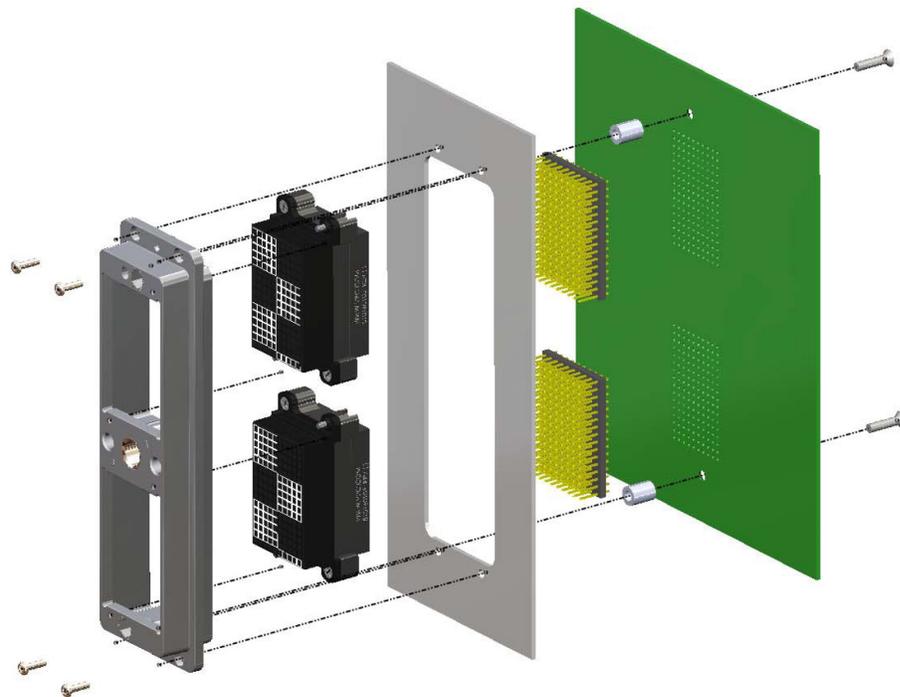


Figure A.

[RETURN TO INDEX](#)

### PCB MOUNTING (CONT'D)

1. When mounting a PCB directly to the back of an iCon receiver (**Figure B**), one configuration option includes
  - iCon Receiver
  - 2 QuadraPaddle modules, pre-loaded with twin female contacts (part # 510160105)
  - Each module accepts twin male headers connecting the female contacts to the PCB-plated through-holes (**Figure C**).
  - Several manufacturers offer the twin male header: Samtec, TE, MultiComp, Molex. The specific part number required is dependent on the distance of the iCon from the PCB, the thickness of the PCB, and the plating type required.
  
2. Use 2 x 4-40 screws to mount to the receiver frame. When using twin male headers, spacers may be needed to prevent unwanted stress on the PCB (**Figure B**).

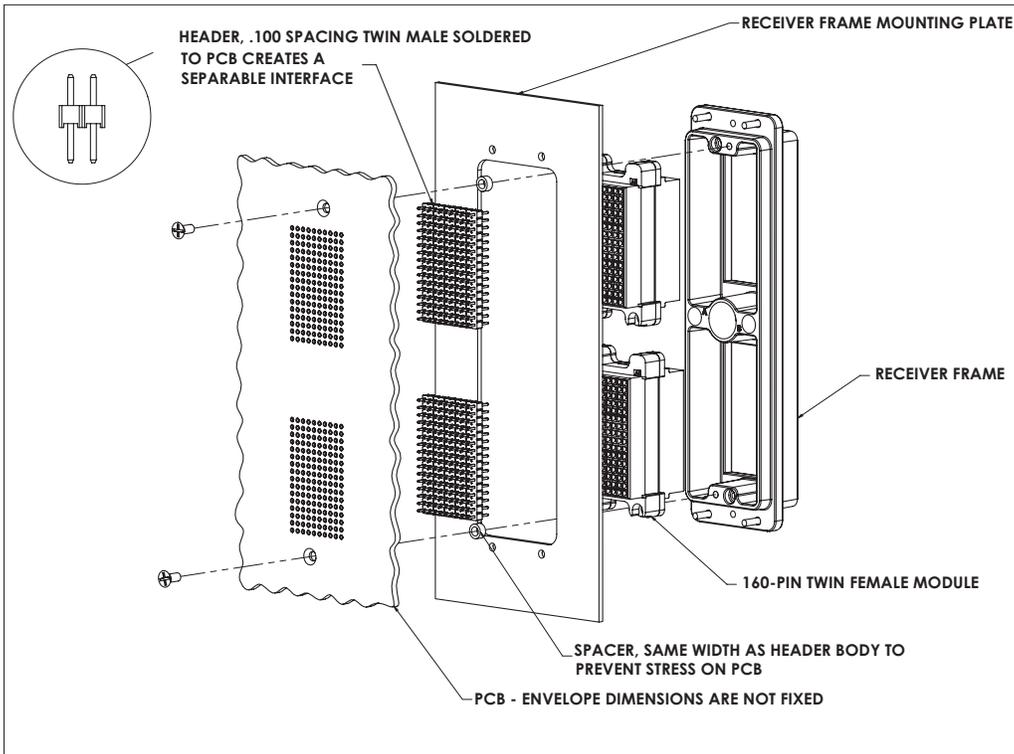


Figure B.

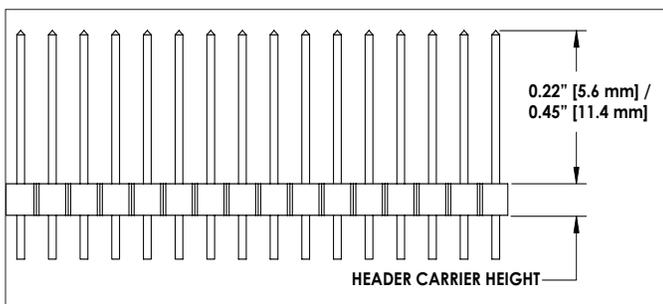


Figure C.

Twin male header.  
 Minimum spacer height = 0.24" + header carrier height - panel thickness (if used).  
 Any additional height beyond this min must be added to the header post limits.

[RETURN TO INDEX](#)

### PCB MOUNTING (CONT'D)

3. Using flat head screws, the PCB may now be mounted to the mounting panel (**Figure D**).
4. If a strain relief plate is needed, part # 310113456 is recommended. It should be secured using 4-40 pan head screws through holes on the PCB and to the receiver (**Figure E**).

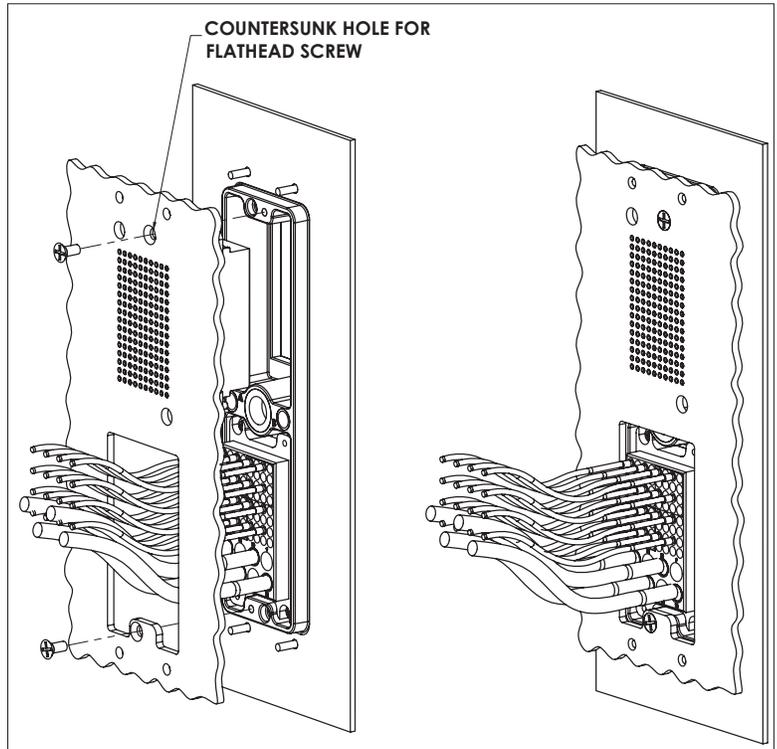


Figure D.

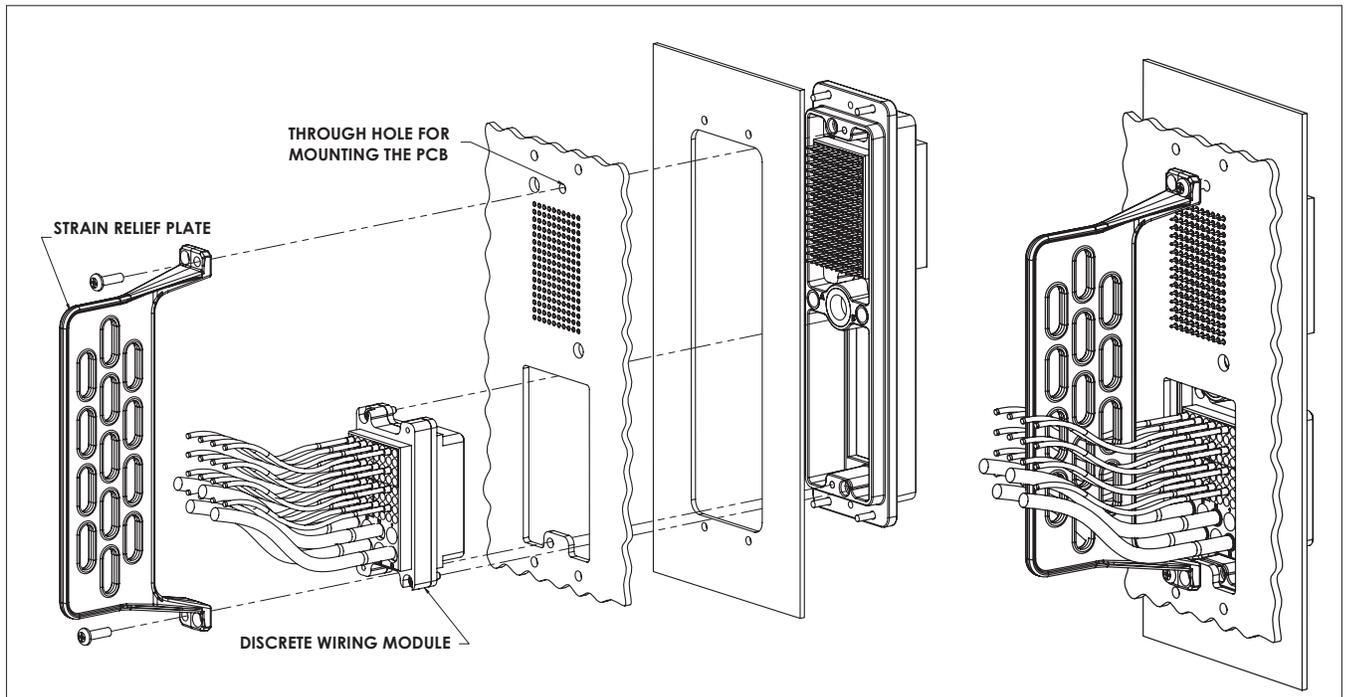


Figure E.

[RETURN TO INDEX](#)

# PCB LAYOUT QUADRAPADDLE

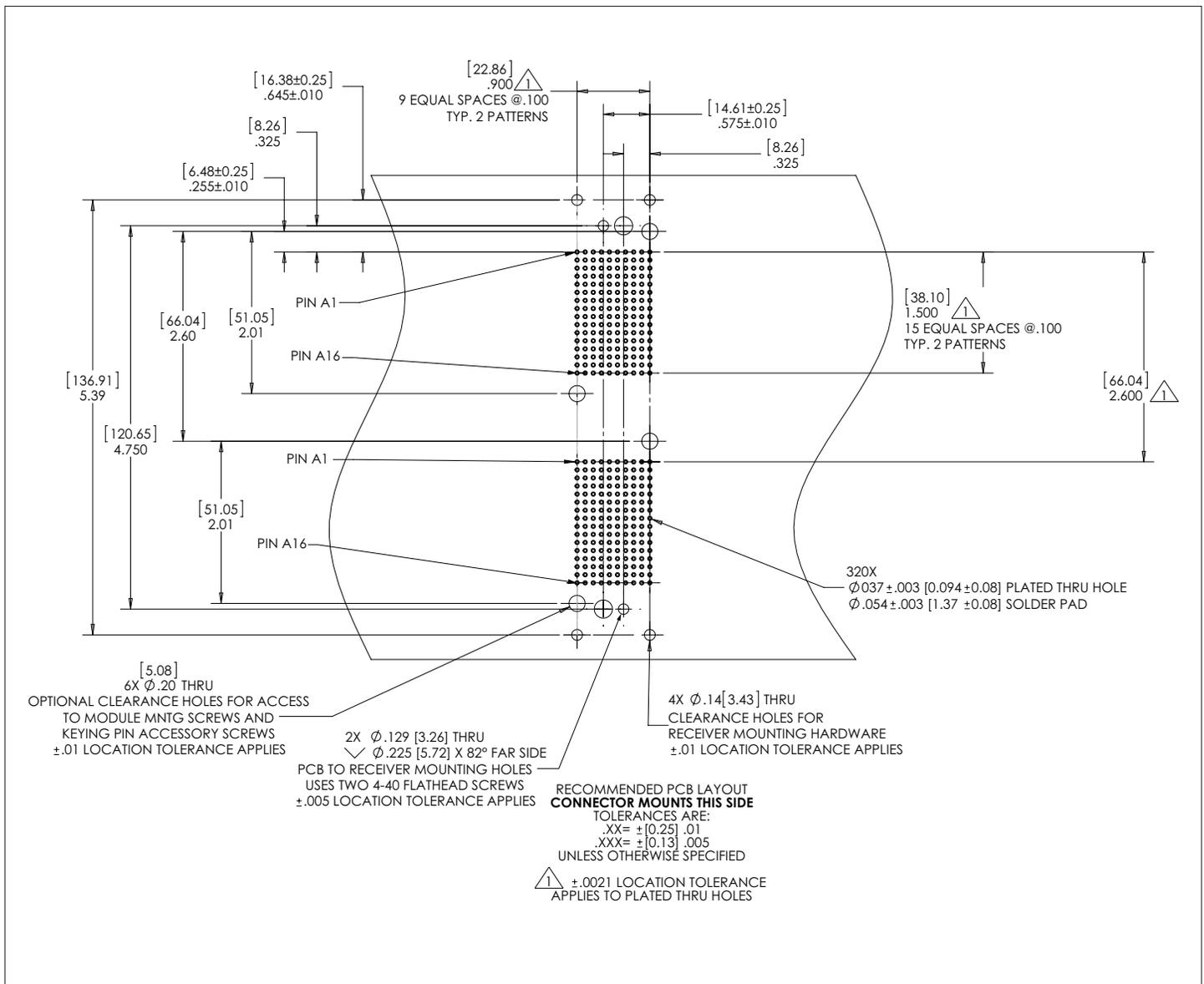
PART # 310123101, 510160105, 610138117

PCB layout for:

- iCon Receiver (part # 310123101)
- 2 QuadraPaddle modules (part # 510160105, pre-loaded w/ twin female QP contacts part # 610138200)
- Through-hole and pad diameters are for VPC QuadraPaddle male adapter contact (part #610138117)
- VPC modules/pin mount this side

**NOTE:**

- The size of holes may need to be different, if header from a different manufacturer is used
- Optional clearance holes also shown



[RETURN TO INDEX](#)

# PCB LAYOUT TRIPADDLE

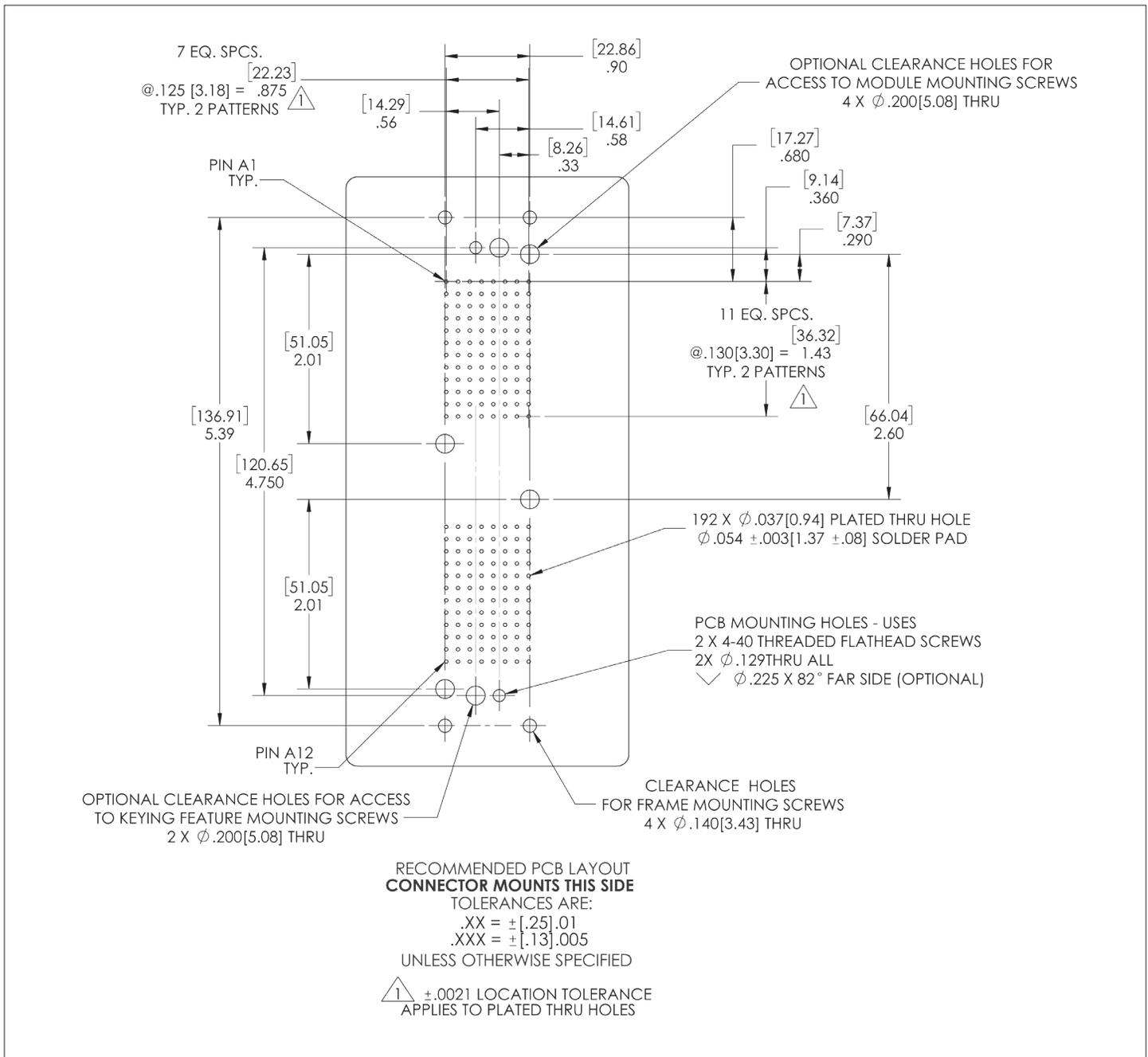
PART # 310123101, 510160108, 610110179

PCB layout for:

- iCon Receiver (part # 310123101)
- 2 TriPaddle modules (part # 510160108)
- Through-hole and pad diameters are for VPC TriPaddle contacts (part #610110179)
- VPC modules/pin mount this side

**NOTE:**

- The size of holes may need to be different if header from a different manufacturer is used
- Optional clearance holes also shown



[RETURN TO INDEX](#)

# PCB LAYOUT QUADRAPADDLE & MICRO POWER

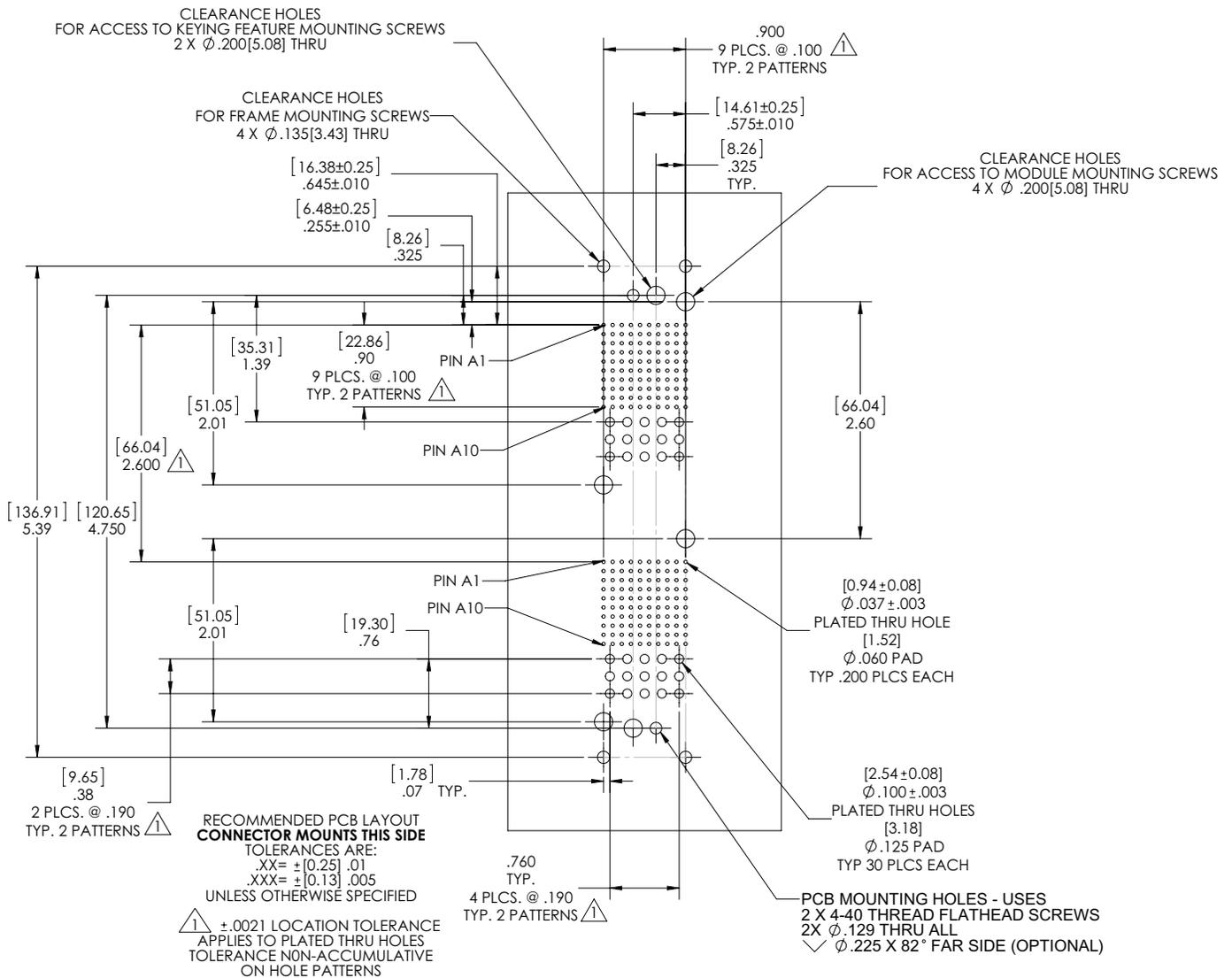
PART # 310123101, 510160113, 610138200, 610138117, 610142102

PCB layout for:

- iCon Receiver (part # 310123101)
- 2 Quadrapaddle hybrid modules (part # 510160113, pre-loaded w/ twin female QP contacts & round posts part #'s 610138200, 610138117))
- Through-hole and pad diameters are for VPC Micro Power contact (part #610142102)
- VPC modules/pin mount this side

NOTE:

- The size of holes may need to be different, if header from a different manufacturer is used
- Optional clearance holes also shown



[RETURN TO INDEX](#)

# PCB LAYOUT PCB AND WIRED MODULES

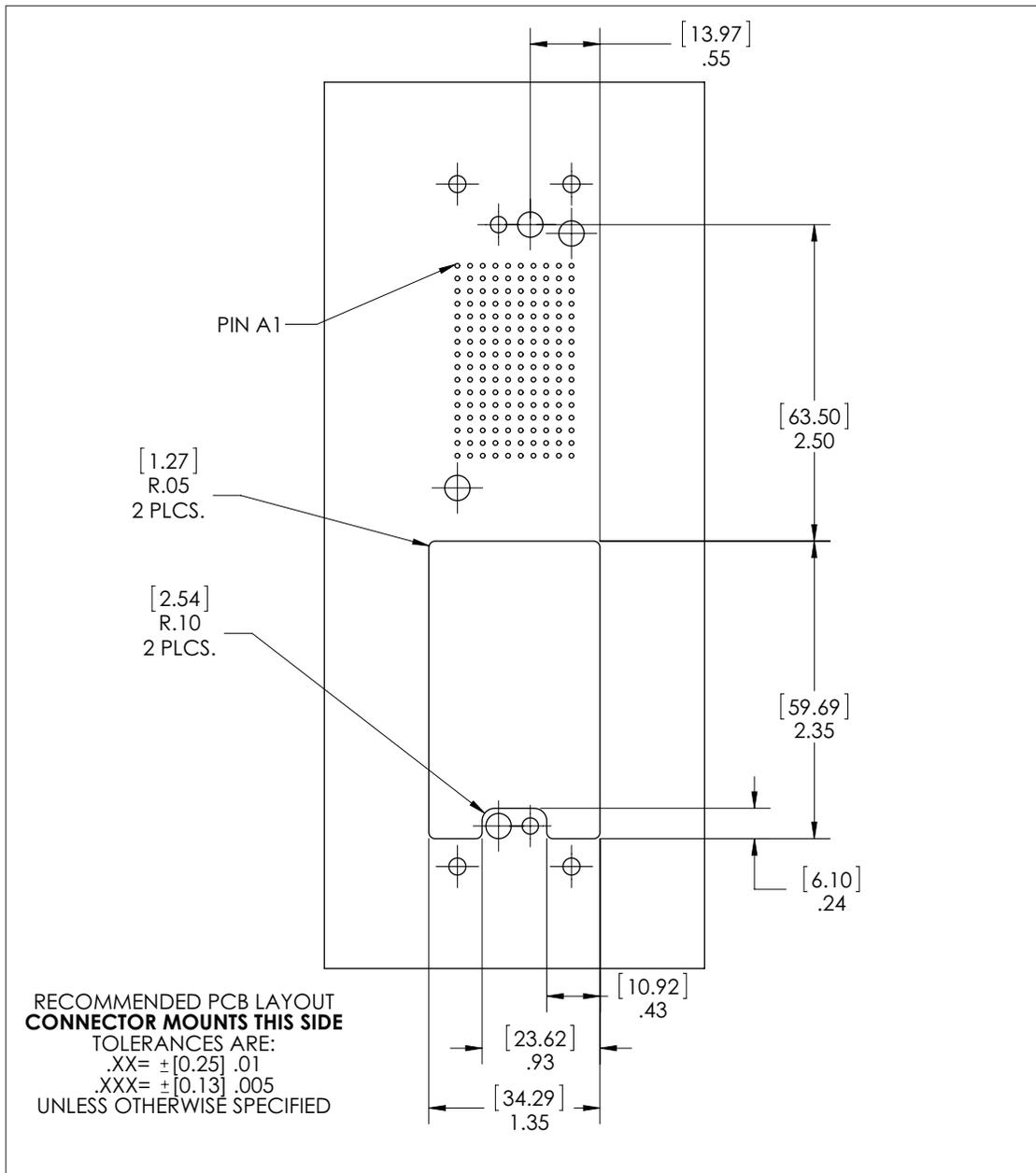
PART # 310123101

PCB layout for:

- iCon Receiver (part # 310123101)
- 2 modules (1 PCB-mounted, 1 discretely-wired)
- VPC modules/pin mount this side

**NOTE:**

- Optional clearance holes also shown



[RETURN TO INDEX](#)