

Directions for QICK Enclosure Assembly

November 4, 2024 Rev B



Bill Of Materials:

Enclosure Bill Of Materials						
Item	Quantity	Designator	Part Number	Description	Manufacturer	Notes
1	3	CBL1, CBL2, CBL3	415-0031-018	CBL ASSY SMA JACK-PLUG RG316 18"	Cinch Connectivity Solutions Johnson	
2	1	CBL27	PM5BWDW6.0-CC	LED Panel Indicator Blue Wire Leads - 6" (152.40mm)	Bivar Inc.	
3	8	CBL10, CBL11, CBL12, CBL13, CBL14, CBL15, CBL16, CBL17	PM5GDW6.0-CC	LED ASSY PNL 5MM GRN DIFF 6"	Bivar Inc.	
4	1	CBL26	BC-5UK001F	Modular Cable Plug to Plug 8p8c (RJ45, Ethernet) 1.00" (304.8mm) Unshielded	Bel Inc.	
5	14	CBL43, CBL44, CBL45, CBL46, CBL47, CBL48, CBL49, CBL54, CBL55, CBL56, CBL57, CBL58, CBL59, CBL60	135110-01-06.00	CBL ASSY SMA JACK-PLUG RG316 6"	Amphenol RF	These have been modified to custom cable length of 7 inches
6	16	CBL29, CBL30, CBL39, CBL40, CBL42, CBL50, CBL51, CBL52, CBL53, CBL61, CBL62, CBL63, CBL64, CBL68, CBL69, CBL70	PM5GDW3.0-CC	LED ASSY PNL 5MM GRN DIFF 3"	Bivar Inc.	
7	2	CBL65, CBL67	240-109	Specialized Cables 2x6 Pin Cable for PMOD	Diligent	
8	1	CBL66	M3AWK-1606J	IDC CABLE - MSC16K/MC16G/MPL16K	3M	
9	1	ENCL1	QICK Enclosure	QICK Enclosure	://www.protocasedesigner.com	Use file RF216_2U_V2_1.pda
10	2	FAN1, FAN2	FN-SX05-40	FAN AXL 50X15MM 12VDC RECT CONN	Gelid Solutions LLC	
11	1	J14	ECF504-SC5E	Cat5e RJ45 Coupler Shielded (8x8) Panel Mount Style	L-com	
12	2	J50, J57	TSW-106-09-G-D-RA	CONN HEADER R/A 12POS 2.54MM	Samtec Inc.	
13	10	MRB1, MRB2, MRB3, MRB4, MRB5, MRB6, MRB7, MRB8, MRB9, MRB10	720	BUMPER CYLINDRICAL 0.5" DIA BLK	Keystone Electronics	Not needed if assembled inside Enclosure



14	20	MS1, MS2, MS3, MS4, MS5, MS6, MS7, MS8, MS9, MS10, MS11, MS12, MS13, MS14, MS15, MS16, MS17, MS18, MS19, MS20	9900	MACHINE SCREW PAN PHILLIPS 4-40	Keystone Electronics	
15	1	MS21	91772A105	Passivated 18-8 Stainless Steel Pan Head Phillips Screw, 4-40 Thread Size, 3/16" Long	McMaster Carr	Box of 100
16	10	MS01, MS02, MS03, MS04, MS05, MS06, MS07, MS08, MS09, MS010	91115A518	Female Threaded Hex Standoff, 18-8 Stainless Steel, 3/16" Hex, 5/8" Long, 4-40 Thread	McMaster Carr	
17	1	MW1	98023A111	Zinc Yellow-Chromate Plated Grade 8 Steel Washer for Number 4 Screw Size, 0.125" ID, 0.312" OD Qty 100	McMaster Carr	Not needed if assembled inside Enclosure
18	24	TSP1, TSP2, TSP3, TSP4, TSP5, TSP6, TSP7, TSP8, TSP9, TSP10, TSP11, TSP12, TSP13, TSP14, TSP15, TSP16, TSP17, TSP18, TSP19, TSP20, TSP21, TSP22, TSP23, TSP24	91075A460	Male-Female Threaded Hex Standoff, 18-8 Stainless Steel, 3/16" Hex, 3/16" Long, 4-40 to 4-40 Thread	McMaster Carr	
19	6	SHNT1, SHNT2, SHNT3, SHNT4, SHNT5, SHNT6	SNT-100-BK-G	CONN SHUNT 2POS	Samtec	
20	2	MS23, MS24	9902	Screw	Keystone Electronics	
21	2	NUT1, NUT2	96278A005	18-8 Stainless Steel Locknut with External-Tooth Lock Washer 4-40 Thread Size	McMaster Carr	Box of 100, may substitute vendor for single nut



Daughter Boards

A	1	H1	1726A44	3 inch Threaded-Hole Pull Handles	McMaster Carr	3 inch handle for OUT boards
A	1	H1	1726A43	2 inch Threaded-Hole Pull Handles	McMaster Carr	2 inch handle for IN boards
B	4	CBL1, CBL2, CBL3, CBL4	415-0031-018	CBL ASSY SMA JACK-PLUG RG316 18"	Cinch Connectivity Solutions Johnson	2 cables are provided for the IN Daughter boards. 4 cables are provided for OUT boards
C	3	CN1, CN2, CN3	99022A101	18-8 Stainless Steel Cap Nut, 4-40 Thread Size	McMaster Carr	
D	4	CVR1, CVR2, CVR3, CVR4	VFC-302-16	VFC Series vinyl caps feature a long flat tab that is centered at the top of the closure	capplugs.com	2 caps are provided for the IN Daughter boards. 4 caps are provided for the OUT Daughter boards



Tools needed:

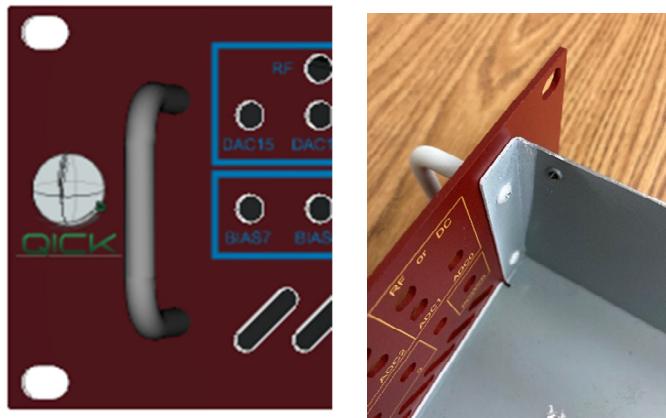
1. #1 Phillips head screwdriver
2. 3/16" nut driver for mounting standoffs
3. Small needle nose pliers
4. Torque wrench for SMA connector on daughter cards Suhner part# 74_Z-0-0-21 or equivalent.
5. 1/4" nut driver for daughter board cap nuts

Notes:

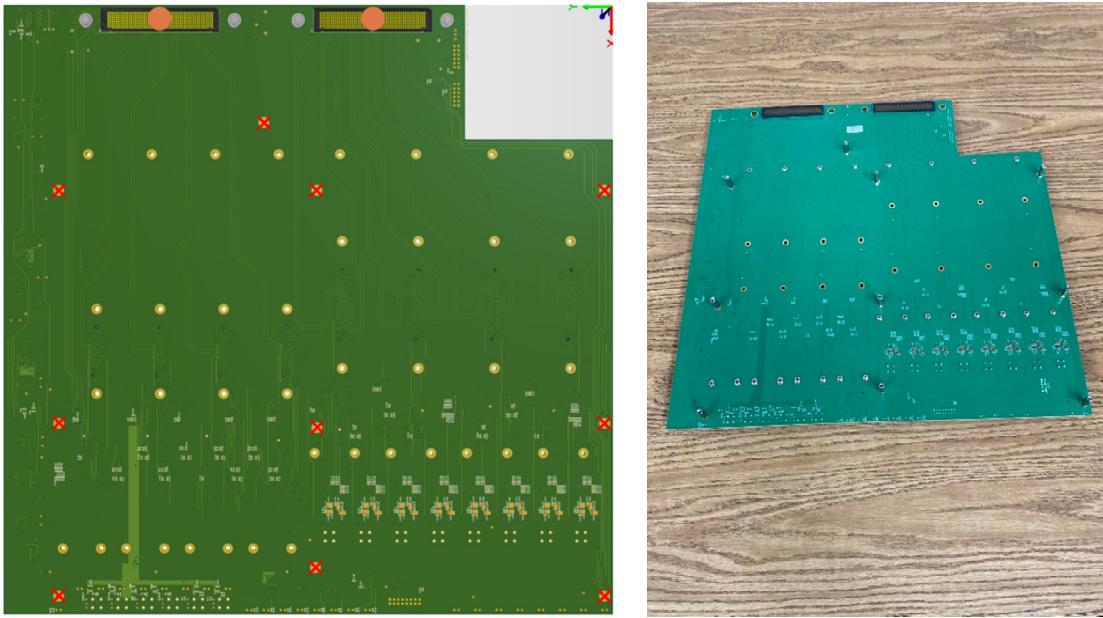
1. The ZCU216 is not included with the QICK pc boards and enclosure. The user must purchase the ZCU216 separately.
2. RF216 Main board, ZCU216, and Enclosure have numeric Item numbers in the Bill of Materials above. Daughter boards have letter item numbers.
3. All of SMA cable mounting holes on the enclosure front and rear panels are "D" shaped to match the cable connector.
4. Use the SMA torque wrench for **ALL** SMA connections to avoid overtightening.

Enclosure Assembly:

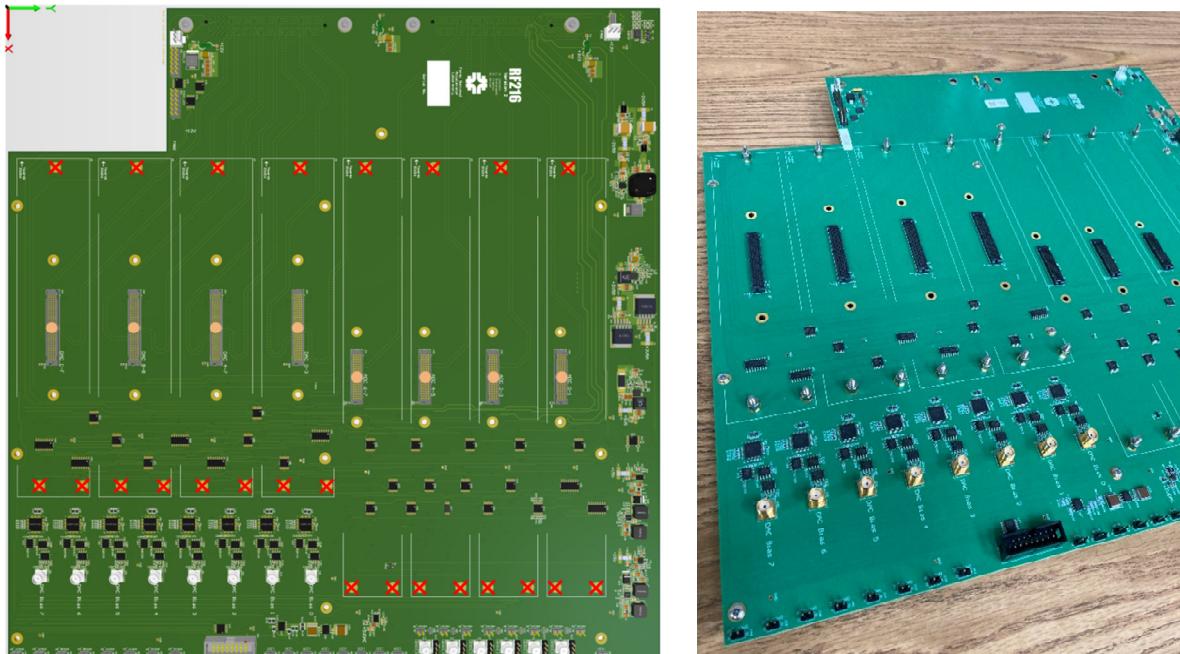
1. Install 2 enclosure handles (provided with Enclosure) on the Enclosure (#9)



2. Install 8-32 nut on threaded stud as shown below ?
3. Install 10 standoffs (#16) on bottom of RF216 Mainboard using 10 screws (#14) in locations shown below.



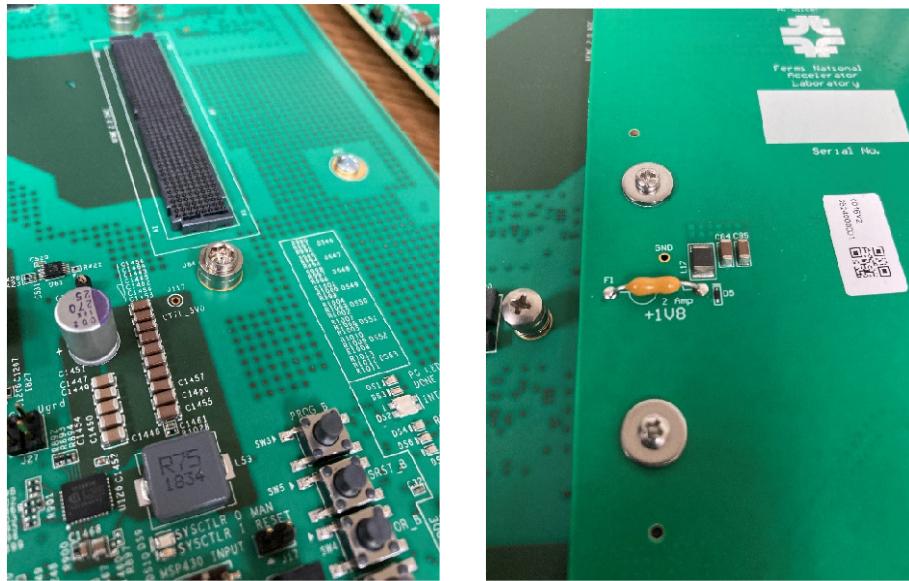
4. Standoffs should already be mounted to ZCU216. Remove rubber bumpers (#13) if necessary.
5. Mount 24 of the male/female threaded hex standoffs (#18) using 24 of the 3/16" 4-40 screws (#15) to the top side of the RF216 Main board. The male portion of the standoff should be pointed up and away from the RF216 Main board. Standoff locations are shown below.



6. Using small needle nose pliers, install 6 shunt jumpers (#19) on USERIO 0-5 3-pin headers. Choose IN or OUT depending on your needs.



7. Use ZCU216 jackscrews to secure ZCU216 to RF216 Mainboard

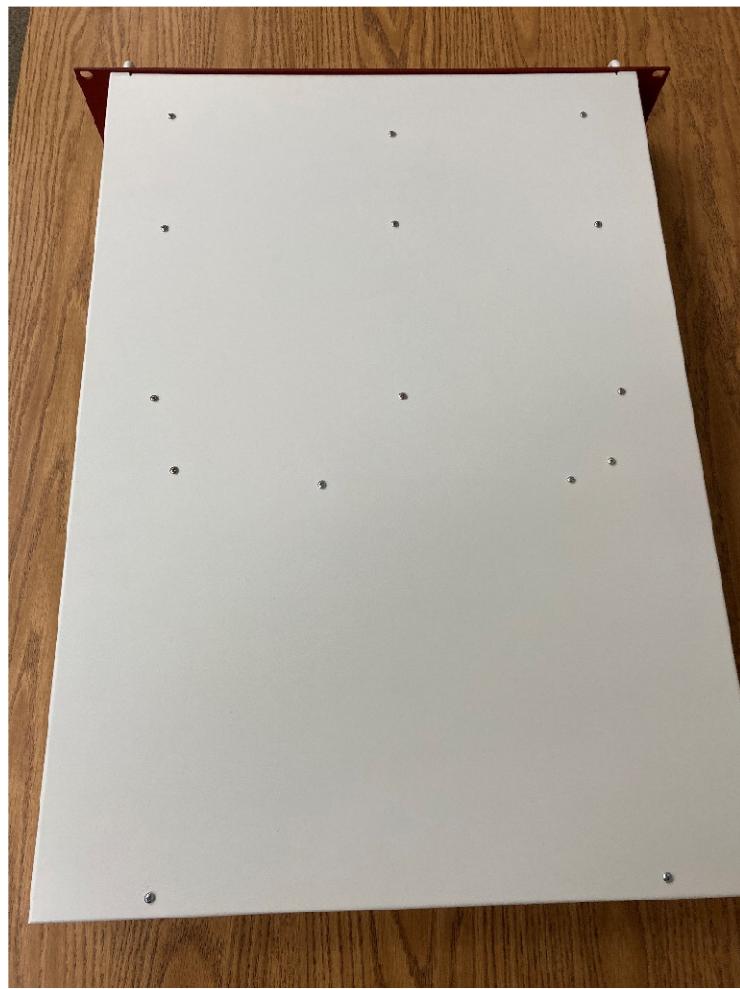


8. Remove lid of QICK Enclosure

9. Place ZCU216/RF216 Main board assembly in enclosure with ZCU216 toward rear of enclosure.



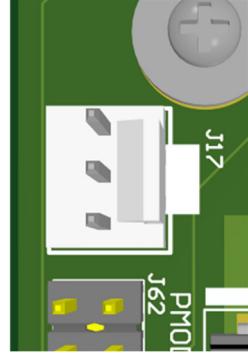
10. Secure Board Assembly to enclosure using 10 screws (#14) for RF216 Main board and screws provided with ZCU216. Mounting holes are pre-drilled in the enclosure.



11. Install left fan (#10) using 4 screws provided with the fan. Note the orientation of the fan plug wire and the direction the fan is facing.



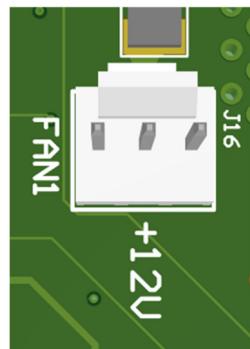
12. Connect left fan to RF216 Main board at connector J17.



13. Install right fan (#10) using 4 screws provided with the fan. Note the orientation of the fan plug wire and the direction the fan is facing.



14. Connect right fan to RF216 Main board at connector J16.



15. Install the RJ45 panel mount coupler (#11).



16. Connect RJ45 cable (#4) between RJ45 coupler (#11) and Ethernet connector P1 on ZCU216.



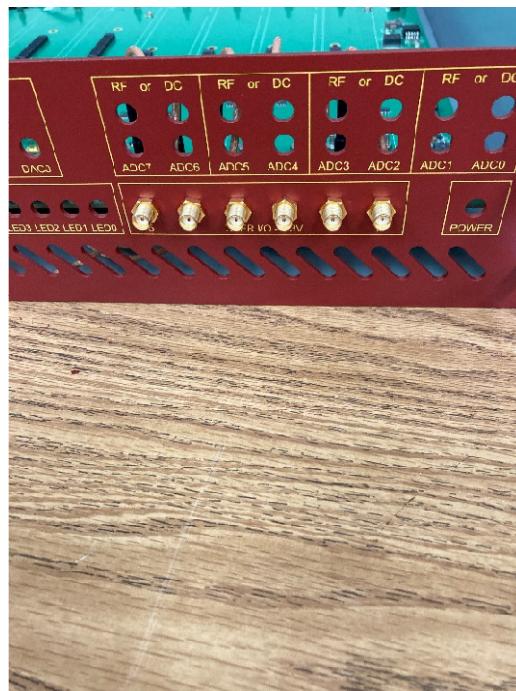
17. Install eight 7" SMA cables (#5) in the "BIAS" 0-7 labeled front panel holes.



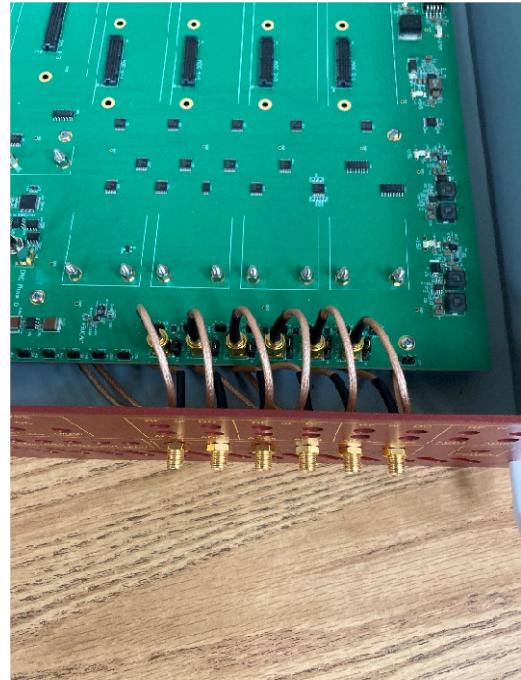
18. Use the SMA torque wrench to install opposite end of "BIAS" SMA cables on "DAC Bias" 0-7 SMA connectors on RF216 Main board.



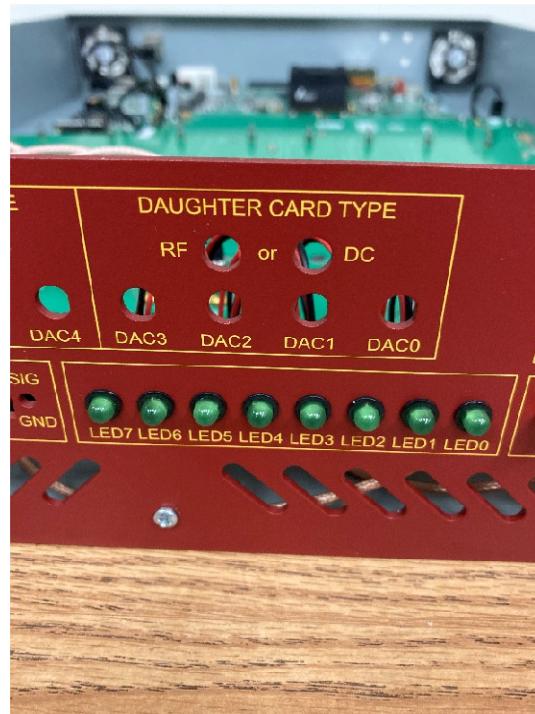
19. Install six 7" SMA cables (#5) in the "USER I/O" 0-5 labeled front panel holes.



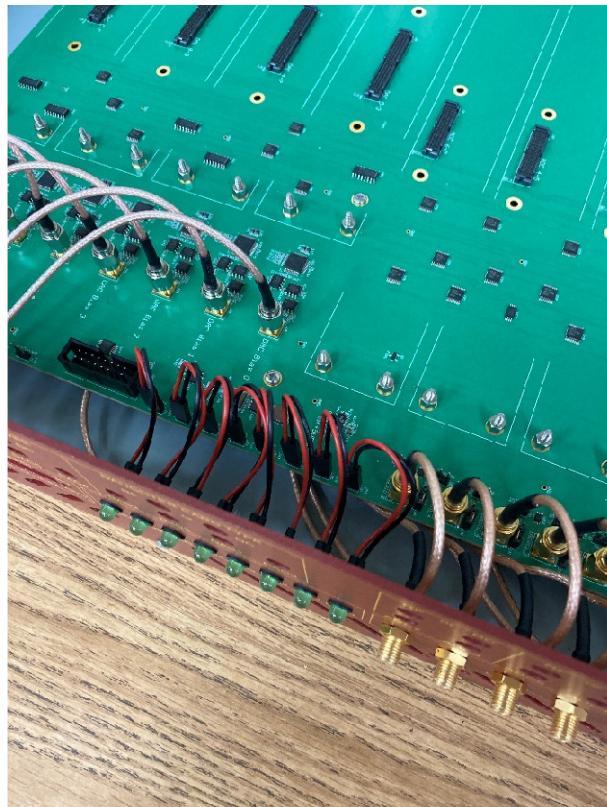
20. Use the SMA torque wrench to install opposite end of "USER I/O" SMA cables on "USER I/O" SMA connectors on RF216 Main board.



21. Install eight 3" LEDs (#6) in LED 0-7 holes on enclosure front panel.



22. Connect opposite end of those LEDs to 2-pin headers labeled "LED0" – "LED7" on the RF216 Main board. Notice that the headers have one pin labeled "B" (Black) and one pin labeled "R" (Red). Match the wire color of the LED accordingly.



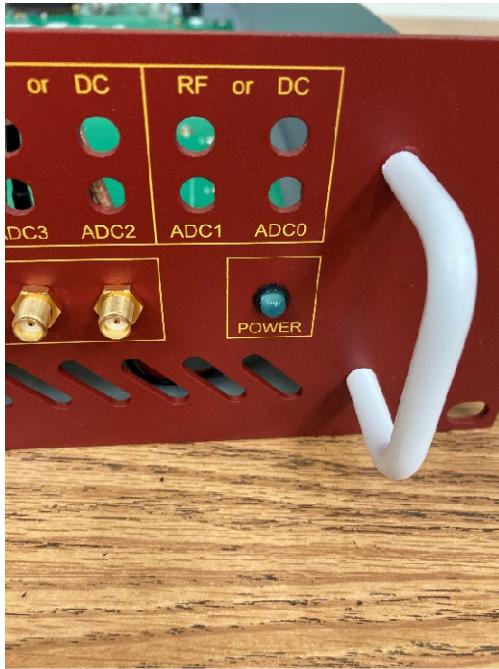
23. Install panel mount side of IDC Cable (#8) in rectangular cutout marked "USER I/O" on the enclosure front panel. Tab cutout side of connector is up. Use $\frac{1}{2}$ " 4-40 screws (#20) and 4-40 nuts (#21) to secure header to front panel.



24. Insert opposite end of IDC Cable in connector J60 on RF216 Main board. Match pin 1 of cable connector with J60 connector pin 1 designator.



25. Insert one 6" Blue LED (#2) in enclosure front panel hole labeled "POWER".

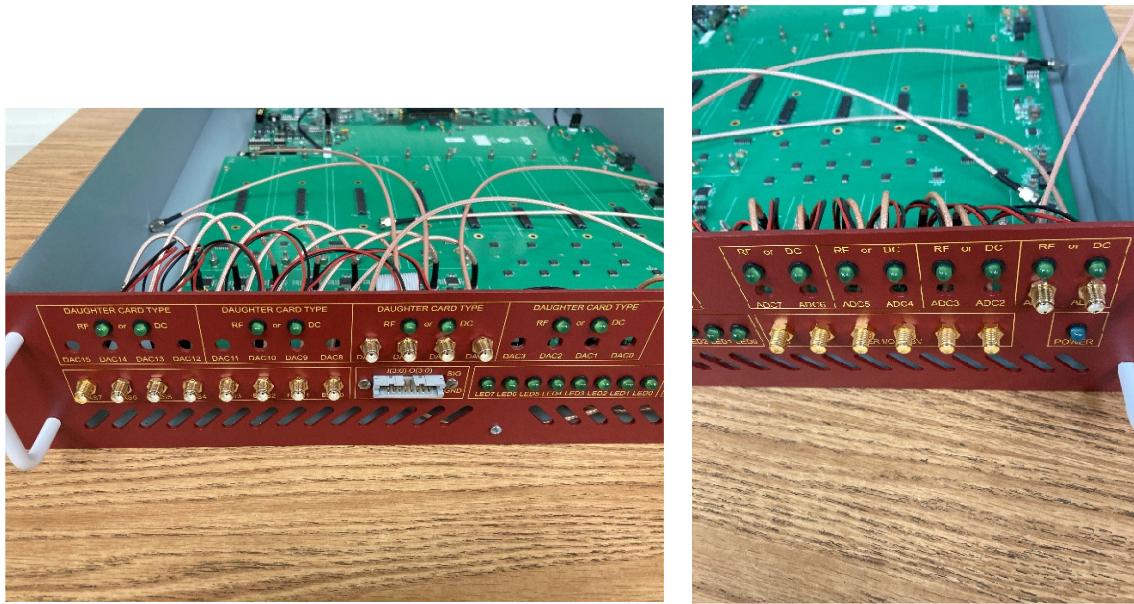


26. Connect the other end of Blue LED to 2-pin header J59 labeled "+12V". Notice that the header has one pin labeled "B" (Black) and one pin labeled "R" (Red). Match the wire color of the LED accordingly.

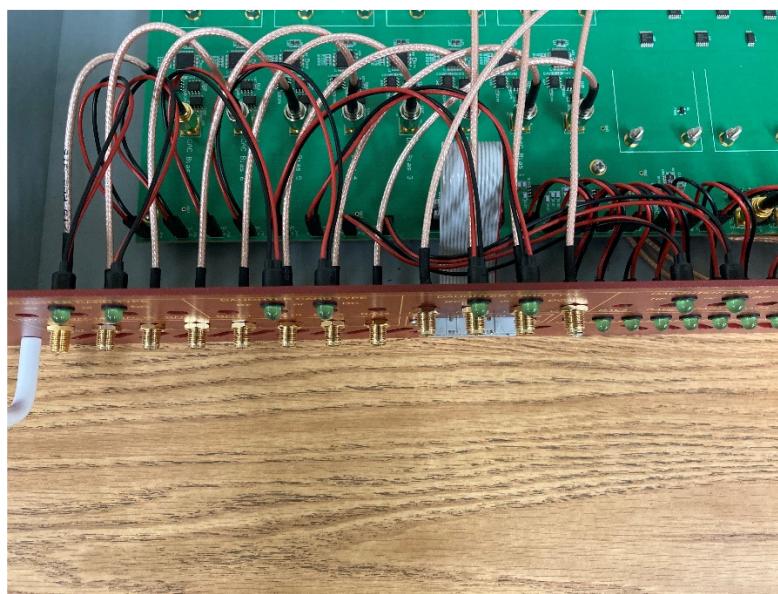


27. Insert as many 15" SMA cables (#B) as necessary for your "OUT" and "IN" daughter board configuration into enclosure front panel holes labeled "DACx" and/or "ADCx". "DAC" (Or "OUT"

daughter boards) will have 4 SMA cables per daughter board. “ADC” (Or “IN” daughter boards) will have 2 SMA cables per daughter board.



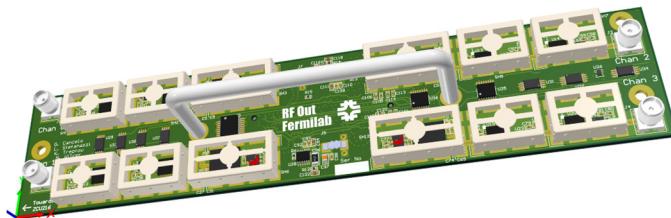
28. Insert eight 6" LEDs (#3) in enclosure front panel holes labeled “RF” and “DC” above the “DAC” SMAs.
29. Connect other end of the eight 6" LEDs to the eight 2-pin headers labeled “DACxx_RF” and “DACxx_DC” on the RF216 Main board. The “xx” value of the 2-pin header should match the value of the associated DAC SMA cables. Notice that the 2-pin header has one pin labeled “B” (Black) and one pin labeled “R” (Red). Match the wire color of the LED accordingly.



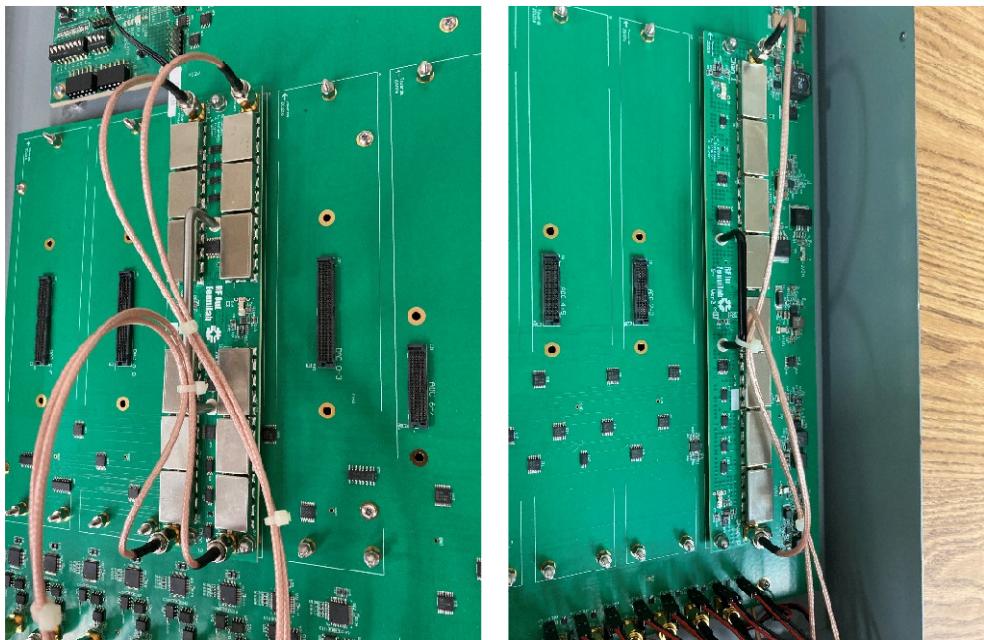
30. Insert eight 3" LEDs (#6) in enclosure front panel holes labeled "RF" and "DC" above the "ADC" SMAs.
31. Connect other end of the eight 3" LEDs to the eight 2-pin headers labeled "ADCxx_RF" and "ADCxx_DC" on the RF216 Main board. The "xx" value of the 2-pin header should match the value of the associated ADC SMA cables. Notice that the 2-pin header has one pin labeled "B" (Black) and one pin labeled "R" (Red). Match the wire color of the LED accordingly.



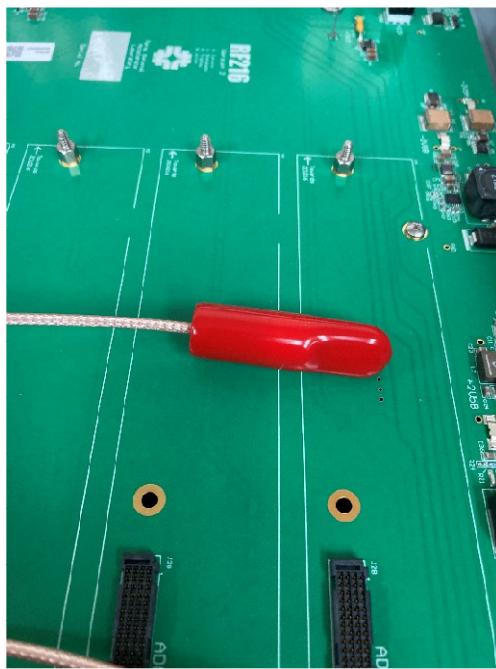
32. Assemble and install Daughter boards:
- Install handle (#A) using two 4-40 screws provided with the handles. IN (ADC) daughter boards use 2" handles. OUT (DAC) daughter boards use 3" handles.



- Mount daughter board onto correct IN (ADC) or OUT (DAC) RF216 Main board connector. Verify correct board rotation. There are marks on the edge of the daughter board describing the correct daughter board mounting position.
- Install 3 cap nuts (#C) using 1/4" nut driver on daughter board mounting posts.
- Use the SMA torque wrench to connect enclosure front panel SMA cable to appropriate channel on daughter card.



- e. Use cable ties to neatly organize the SMA cables. Cable ties are not provided.
- f. Any SMA cables that are not connected to SMA connectors on a daughter board should have the cable end covered with a vinyl cap (#D) to prevent shorting.



- 33. If CLK104 board is not already installed on ZCU216 on connector J101, install it and secure the board with the 3 screws on the ZCU216.
- 34. Mount three 15" SMA cables (#1) to rear of enclosure.



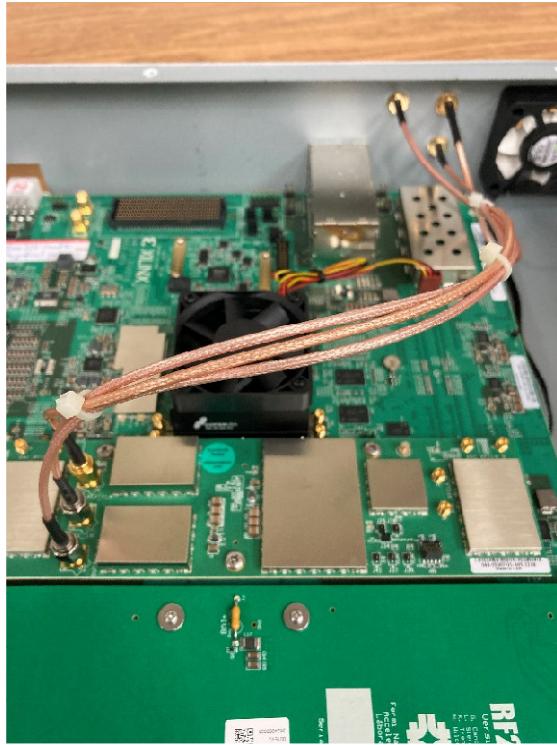
35. Use the SMA torque wrench to connect other end of the 3 SMA cables to the CLK104 board as described below:

Rear Panel CLK104

REF OUT OUTPUT_REF

IN REF INPUT_REF_CLK

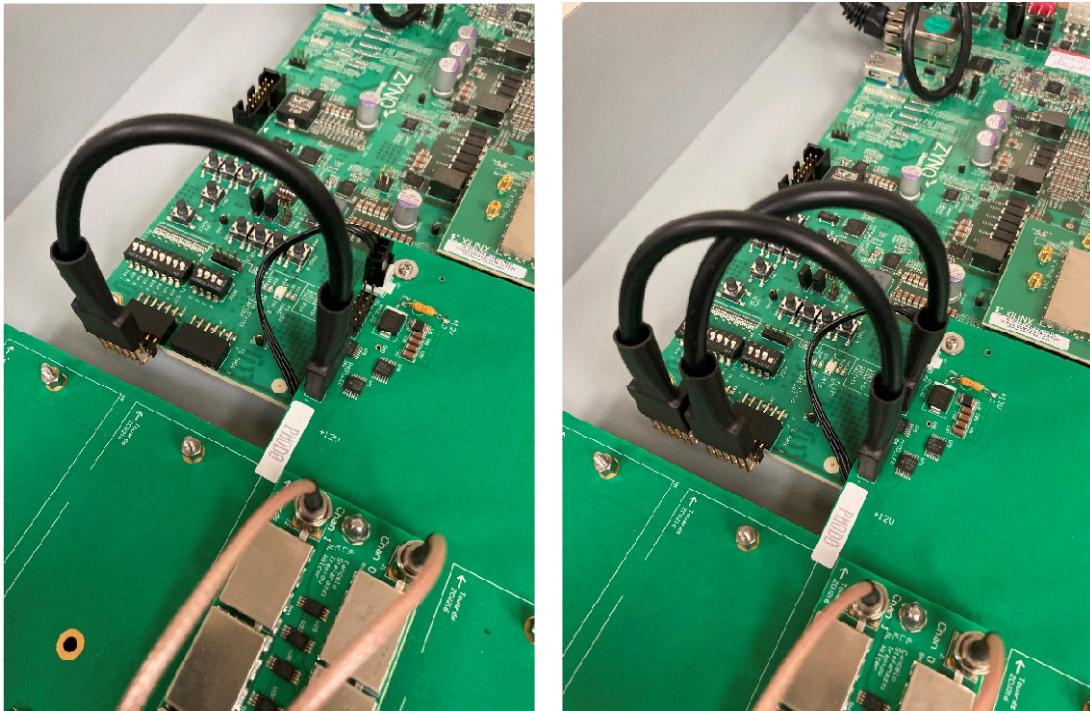
SYNC SYNC_IN



36. Install 2 right angle connector header (#12) to PMOD cables (#7).



37. Install 2 PMOD cables (#7) to ZCU216 and RF216 Main board as shown below. Pay particular attention to pin 1 markings on cables and pin 1 markings on pc boards.



38. Install QICK enclosure cover and secure with 6 screws provided with the enclosure.