

SERVICE BULLETIN

SUBJECT: COMMUNICATIONS – ACARS & CPDLC – Modify unit software.

1. PLANNING INFORMATION

A. Effectivity

This change applies to the Dlink+ w/CPDLC units shown below.

Part Number	Mod Level	Serial Numbers	Quantity
14114-1-01	none	1004-1022, 1024, 1031-1050	40
14114-1-02	none	1023, 1025	2

B. Concurrent Requirements

None.

C. Reasons

(1) The condition the Service Bulletin will correct or improve:

The modification improves the VHF radio reporting of the current channel utilization parameter and corrects an issue with the re-queuing of ACARS messages during VHF frequency changes. An infrequent case where the unit improperly processed requests for re-transmission of data link layer frames from VHF ground stations was corrected. This modification also adds data parameter collection capabilities for user defined messages

(2) Service or industry experience:

Interoperability testing was performed successfully at both ARINC and SITA network provider interoperability test labs.

(3) Consequences if the modification is not performed:

There is a potential for a VHF radio fault to be displayed to the air crew in rare circumstances that would require resetting of the unit to restore operational capability.

(4) Expected benefits:

The modification will result in improvement in message transmission success rates and robustness of VHF data link.

D. Description

The unit is opened and software in the on-board flash memory is changed in-circuit by an external computer operating through a programming interface.

E. Compliance

This service bulletin should be performed as soon as practical.

F. Approval

Not applicable. This modification is classified as Minor per 14 CFR Part 21, Subpart O.

G. Manpower

The table below shows an estimate of the man-hours necessary to make this change for each unit. This estimate is for direct labor only, done by an experienced crew.

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Task	Man-Hours
Remove/attach cover.	0.15
Program flash memory in SBC, IO, VDLA, VDL2, and DU.	0.15
Run script.	0.10
Re-mark unit. Fill out report.	0.10
TOTAL FOR EACH UNIT	0.50

H. Weight and Balance

None.

I. Electrical Load Data

Not changed.

J. References

None.

K. Other Publications Affected

None.

L. Interchangeability or Intermixability of Parts

Not applicable.

2. MATERIAL INFORMATION

A. Material – Price and Availability

No material purchases are necessary.

B. Industry Support Information

This software modification is supplied at no charge to the customer.

C. Material Necessary for Each Component

None.

D. Material Necessary for Each Spare

None.

E. Re-identified Parts / Existing Parts Accountability

Unit	Part No.	Old Mod	New Mod	Qty	Disposition
Dlink+ w/CPDLC	14114-1-01	none	1	40	RWK / R
Dlink+ w/CPDLC	14114-1-02	none	1	2	RWK / R

RWK – Make the change given in this service bulletin

R – The Old Mod is the Mod level of the units on which the change is to be done and the New Mod is the Mod level of the units after the change is done.

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F. Special Tooling and Software Necessary to do this Service Bulletin

Note: Equivalent alternatives may be used.

Note: One copy of each item is needed.

(1) Supplied by Spectralux

Part No.	Description	Source
“SB - 14114-23-01 Revision -.zip” from VDD - 14114-23-01 Revision -	Programming and end unit software	Spectralux
96215-1 BOM Revision -	Jumper handle	Spectralux
Described in paragraph 7.B.	11-pin Power interface cable	Spectralux
Described in paragraph 7.C.	61-pin Ethernet/Loopback cable	Spectralux
12854-4 BOM Revision A	Personality module	Spectralux
USB-ML-PPCBDM	Power Architecture 5xx/8xx BDM Interface (USB), including USB cable.	P&E Micro
Latitude D820	Laptop PC with Windows XP	Dell
2122	Ethernet cable, Cat 5e, RJ45 male – RJ45 male, 3 ft (0.92 m)	Monoprice

(2) Expected shop equipment

Part No.	Description	Source
3306D	28 VDC power supply, 6 A or greater	Topward
25-T-FN	Termination, 50 Ohm, 25 W N female (dummy load)	Bird Electronic Corp
PE3652-12	Cable, N male – TNC male, 50 Ohm, 1 ft (0.3 m) (adjust length as needed)	Pasternack Enterprises
CL-6500 + CLT-50 + BP-H5-#1-3.0-80mm	Torque screw driver, #1 Philips, (powered preferred)	Hios

3. PC CONFIGURATION INSTRUCTIONS (ONE TIME)

- A. Copy the folder “SB - 14114-23-01 Revision -.zip” to the Windows desktop. Extract the “SB - 14114-23-01” folder and its contents to the Windows desktop, and open the folder.
- B. Double click on Spectralux-SB-14114-23-01.EXE. Click YES in response to the query, “Install Spectralux Service Bulletin Files.”

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- C. Click Next in response to the dialog box stating, “Welcome to the InstallShield Wizard for PE PowerPC kit– 32-bit.”
- D. Accept the terms of the license agreement and click Next.
- E. Enter your User Name and Organization, select the “Anyone who uses this computer” option, and click Next.
- F. Click Next to accept the default folder.
- G. Click Install to begin installation.
- H. If you receive a notification stating that WinDriver has not passed Windows Logo testing, click Continue Anyway.
- I. Click Quit without Registering. Click Yes in response to the query, “Are you sure you would like to quit without registering?”
- J. Click Finish.
- K. Click No in order to restart later.
- L. Click OK in response to Installation Complete message.
- M. Restart the PC.
- N. After the PC has rebooted, attach the USB-ML-PPCBDM to a USB port. The New Hardware Wizard will appear. Select “No, not this time” in response to the query, “Can Windows connect to Windows Update to search for software?” Click Next to continue.
- O. Select “Install the software automatically” and click Next to continue.
- P. If you receive a notification stating that USB Multilink 2.0 has not passed Windows Logo testing, click Continue Anyway.
- Q. Click Finish when the Completing New Hardware Wizard message appears. The blue light on the USB-ML-PPCBDM will be lit.
- R. Delete the “SB - 14114-23-01 Revision –.zip” folder and the extracted folder from the Windows desktop.
- S. Set the IP address of the PC to 192.168.255.12, subnet mask to 255.255.255.0.
- T. **CAUTION:** Use ESD precautions when installing the personality module.
Attach the personality module to the 11-pin cable.

4. ACCOMPLISHMENT INSTRUCTIONS (EACH UNIT)

The paragraphs identified with a letter give the general work instructions and the necessary tests. Referenced figures are in **5. FIGURES** section.

CAUTION: Use ESD precautions when working inside the unit.

CAUTION: Make sure the power supply is set to 28 V ± 0.5 V with at least 6 A current limit. Do not enable power until instructed in the following steps.

CAUTION: Do not unplug circuit board assemblies or disconnect wire harnesses except for the programmer.

Note: There may be Windows Security Alert(s) asking if you want to keep blocking the program the first time this section is performed by a PC. Click Unblock.

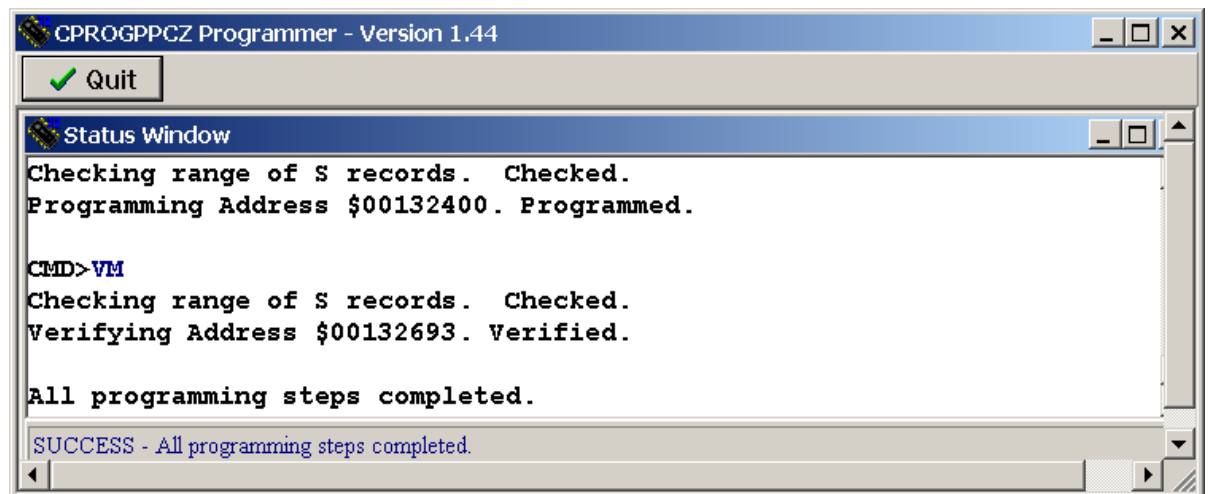
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Note: Fill out the Conversion Results worksheet in **6. WORKSHEET** during the programming process.

- A. Remove the cover from the Dlink+ w/CPDLC by removing 14 screws. See **Figure 1. Cover Removal/Attachment.**
- B. Attach the 50 Ohm dummy load to the TNC connector on the rear of the unit.
- C. Attach the 11-pin cable to the J1 connector on the rear of the unit.

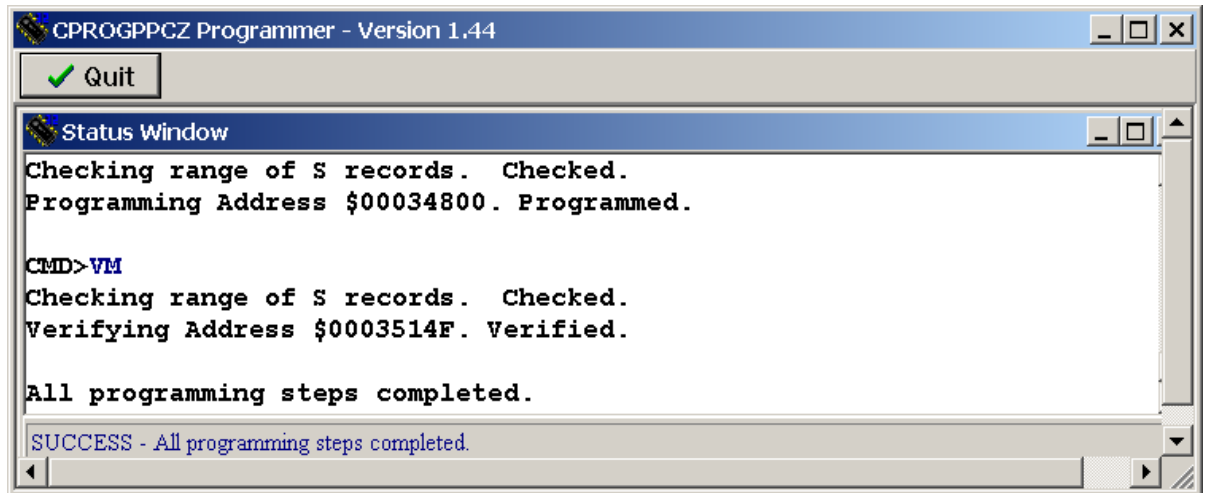
Note: Finger tighten. No need to engage the connector locking detent.

- D. Disable the watchdog by inserting the jumper handle onto J37 on the motherboard. See **Figure 2. Unit and Shorting Connectors.**
- E. Connect the 28 VDC power supply to the 11-pin cable, positive to red banana plug and negative to black banana plug.
- F. Attach the USB-ML-PPCBDM ribbon cable to J3 on the SBC CBA (circuit board assembly). Install so that the red edge of the ribbon cable is nearer to pin 1. See **Figure 3. DU/PS and SBC Programming Connectors.**
- G. Enable power.
- H. Double click the ProgramSBC.exe shortcut on the Windows desktop. A programming window will appear showing status. If programming is successful, the following will appear in the programming window. Click Quit.

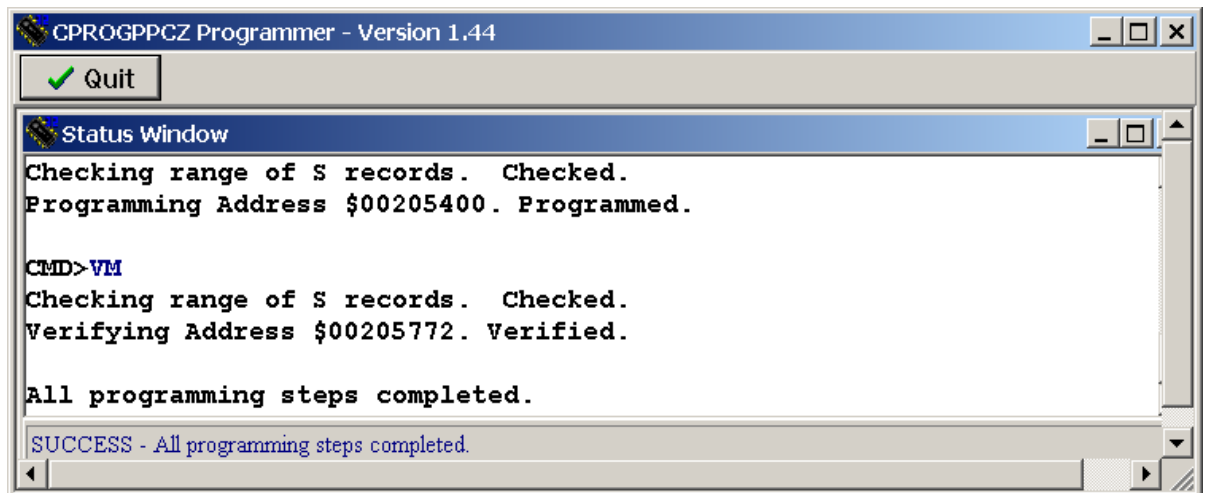


- I. Disable power.
- J. Remove the USB-ML-PPCBDM ribbon cable from the SBC and attach to P3 on the IO CBA. Install so that the red edge of the ribbon cable is nearer to pin 1. See **Figure 4. IO Programming Connector.**
- K. Enable power.
- L. Double click the ProgramIO.exe shortcut on the Windows desktop. A programming window will appear showing status. If programming is successful, the following will appear in the programming window. Click Quit.

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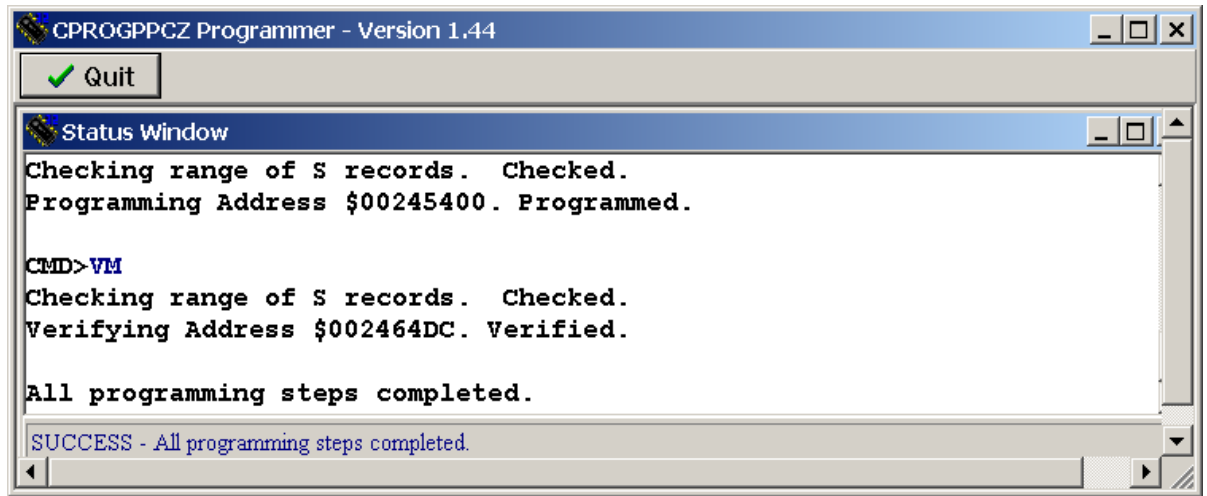


- M. Double click the ProgramVDLA.exe shortcut on the Windows desktop. A programming window will appear showing status. If programming is successful, the following will appear in the programming window. Click Quit.

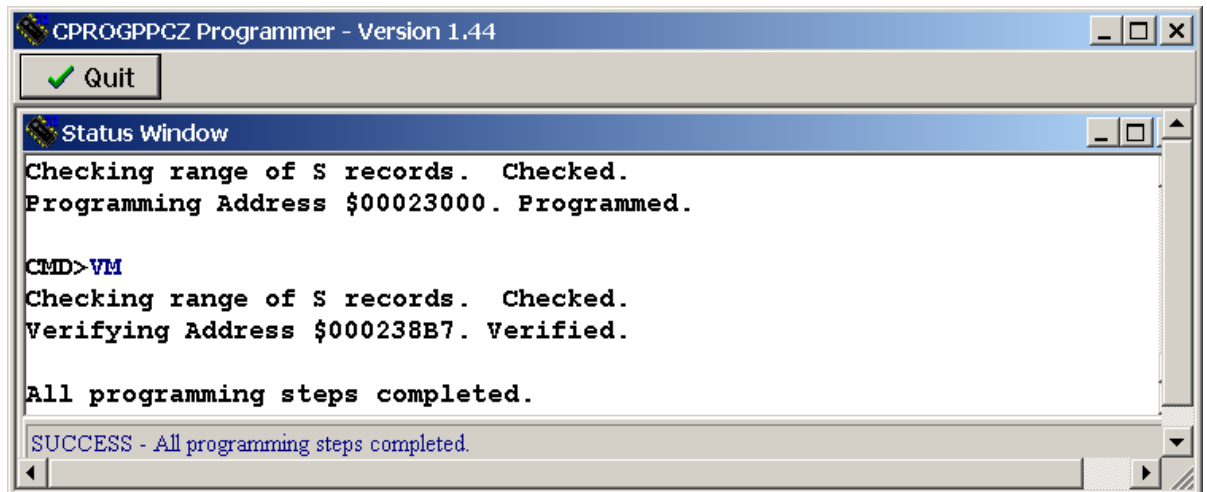


- N. Double click the ProgramVDL2.exe shortcut on the Windows desktop. A programming window will appear showing status. If programming is successful, the following will appear in the programming window. Click Quit.

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- O. Disable power.
- P. Remove the USB-ML-PPCBDM ribbon cable from the IO and attach to P2 on the DU CBA. Install so that the red edge of the ribbon cable is nearer to pin 1. See **Figure 3. DU/PS and SBC Programming Connectors**.
- Q. Enable power.
- R. Double click the ProgramDU.exe shortcut on the Windows desktop. A programming window will appear showing status. If programming is successful, the following will appear in the programming window. Click Quit.



- S. Disable power.
- T. Remove the USB-ML-PPCBDM ribbon cable.
- U. Remove the watchdog jumper handle and confirm that the two pins of J37 are visible and not touching each other. See **Figure 2. Unit and Shorting Connectors**.
- V. Reattach the cover to the unit with 14 screws torqued according to **Figure 1. Cover Removal/Attachment**. It may be necessary to remove the 11-pin cable and dummy load for this operation. If so, reattach them after the cover is secured.

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W. Attach the 61-pin cable to the J2 connector on the rear of the unit and connect the 61-pin cable to the PC with the ethernet cable.

Note: Finger tighten. No need to engage the connector locking detent.

X. Double click on “Shortcut to DTS.exe” to start DTS.

Y. If the Scripts window is not present, click the blue Script button just below the DTS menu toolbar.

Z. Enable power. Wait until the title bar of the DTS window states, “DTS (1.4.26) connected to Dlink+ V2 No Mod.”

AA. In the scripts list, click Run Script 1 to execute SB-14114-23-01.

BB. Twice during execution of the script, the following message will appear: MAKE SURE FAIL LAMP IS OFF – TEST IS A FAILURE IF LIT. See **Figure 5. FAIL Lamp Location**. Note the condition of the FAIL light on the front panel and press OK to continue.

CC. It will take approximately 2¼ minutes for the script to complete, depending on your time to respond to the FAIL lamp queries. At the completion of the script, the Script Result window should display, “Script complete status=PASS.”

DD. Click OK on Script Result window. Close the Script Result window.

EE. Disable power.

FF. Exit DTS.exe.

GG. Remove all cables.

HH. If all tests passed, mark the unit label according to **Figure 6. Label Marking**.

II. Complete the Conversion Results worksheet from **6. WORKSHEET** and return a copy to Spectralux.

JJ. Place unit in service if all results on the Conversion Results worksheet are PASS or YES.

KK. END

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5. FIGURES

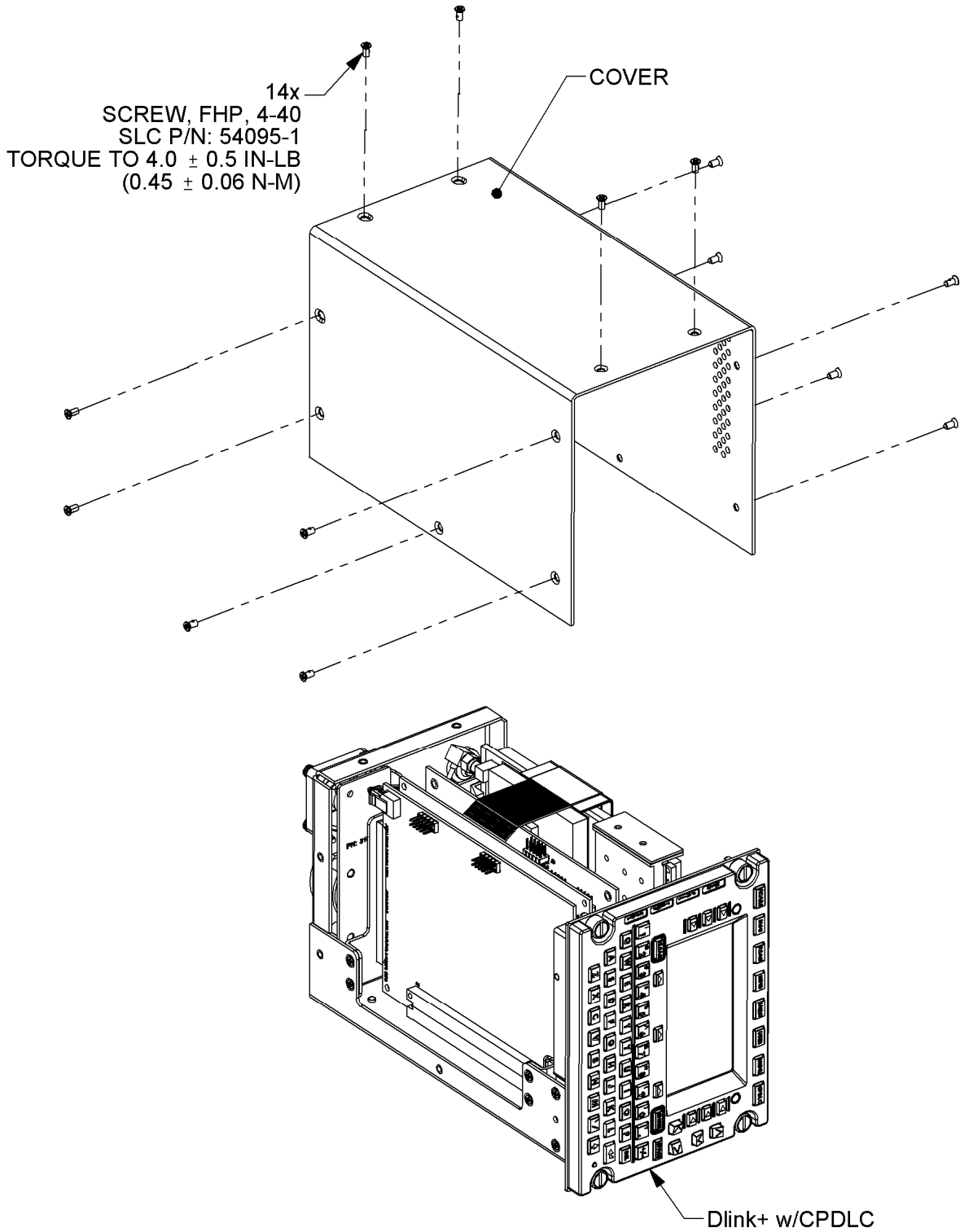


Figure 1. Cover Removal/Attachment

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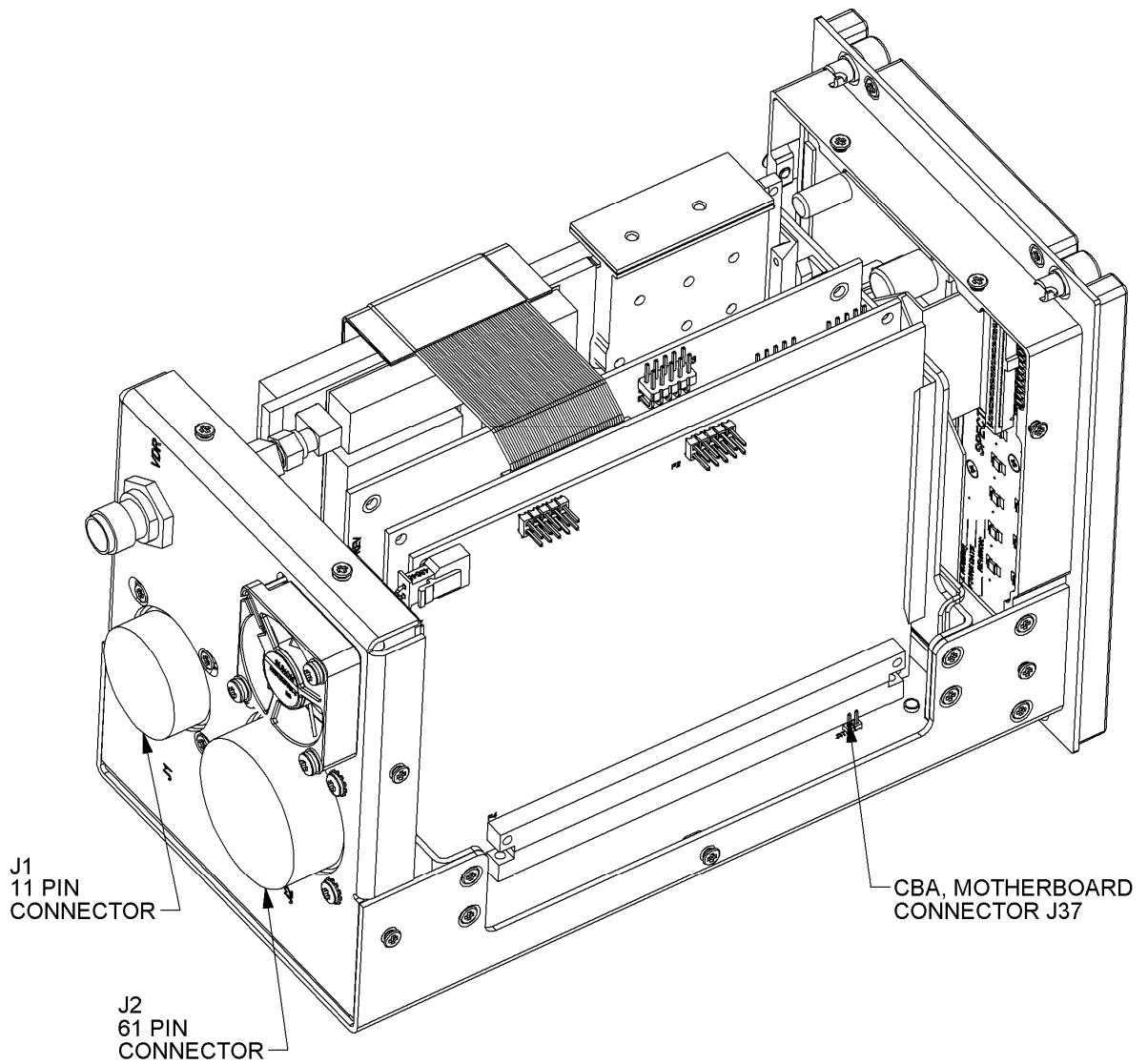


Figure 2. Unit and Shorting Connectors

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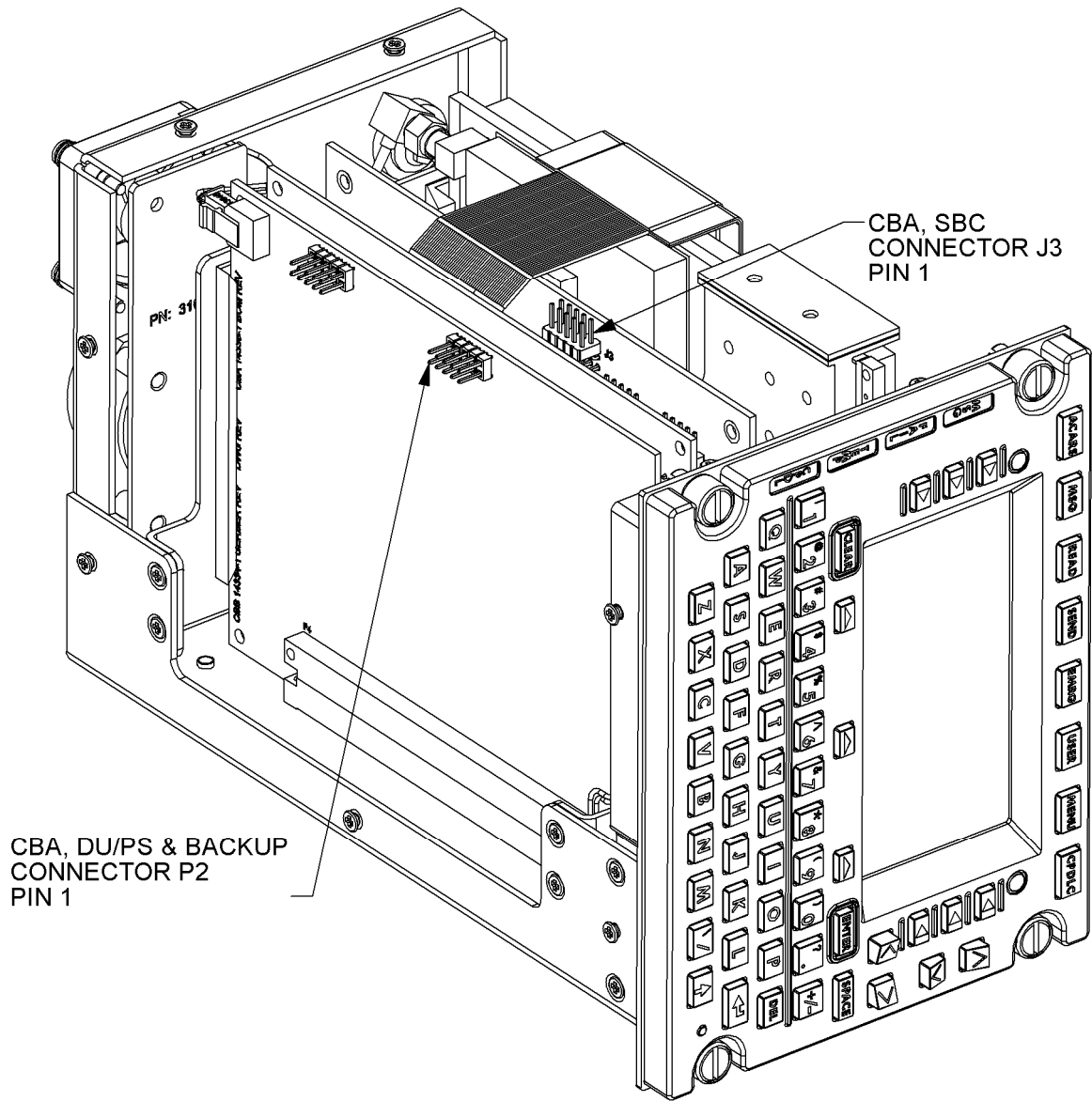


Figure 3. DU/PS and SBC Programming Connectors

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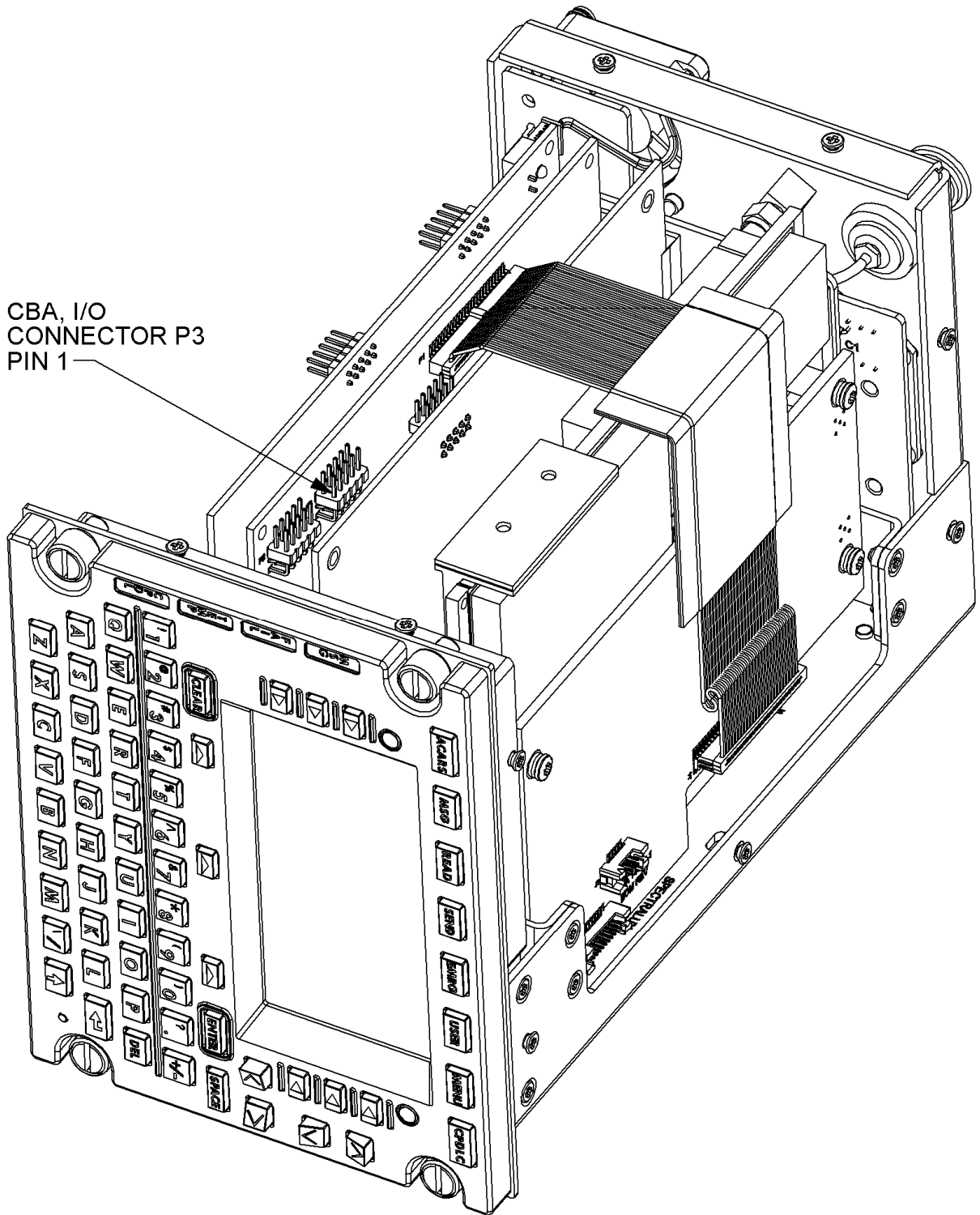


Figure 4. IO Programming Connector

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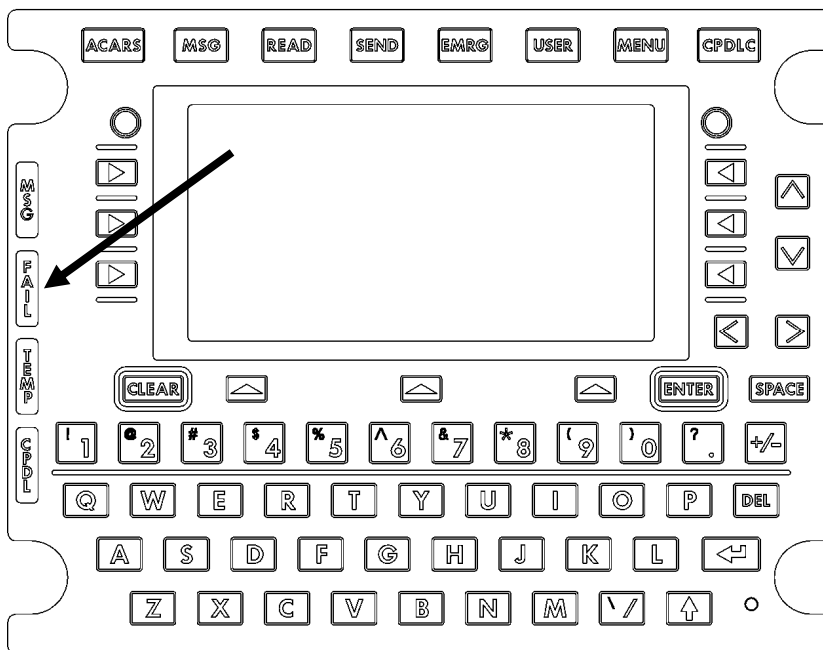


Figure 5. FAIL Lamp Location

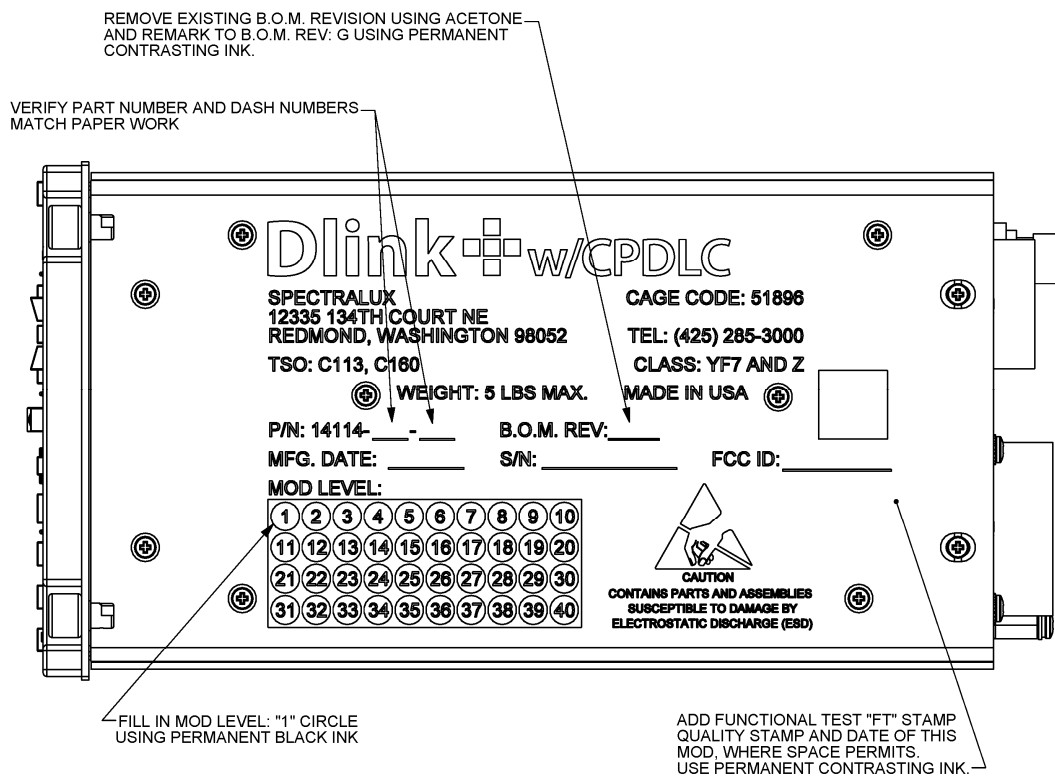


Figure 6. Label Marking

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6. WORKSHEET

The Conversion Results worksheet is on the next page.

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14114-1-xx to 14114-1-xx Mod 1 Conversion Results

Unit Part No. 14114-1-_____

Unit serial number: _____

Task	Result
Program SBC	PASS / FAIL
Program IO	PASS / FAIL
Program VDLA	PASS / FAIL
Program VDL2	PASS / FAIL
Program DU/PS	PASS / FAIL
Remove jumper handle and confirm that pins are not shorting	YES / NO
Reattach cover and properly torque 14 screws	YES / NO
Confirm FAIL lamp is off, 1 st instance	YES / NO
Confirm FAIL lamp is off, 2 nd instance	YES / NO
Note SB-14114-23-01 script complete status	PASS / FAIL
Mark unit label	YES / NO

Technician (printed name) _____ (signature) _____

Date _____

mm/dd/yyyy

Inspector (printed name) _____ (signature) _____

Date _____

mm/dd/yyyy

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7. CABLES

A. Crimping Tool

Note: Equivalent substitute may be used.

Tool	Manufacturer and Part Number
Crimping tool	Daniels Manufacturing Corp. M22520/1-01 + M22520/1-02 (#16) M22520/2-01 + M22520/2-02 (#20)

B. 11-Pin Cable

(1) Materials

Note: Equivalent substitutes may be used.

Component	Manufacturer and Part Number
Connector at Dlink+ w/ CPDLC end	Amphenol 1 x MS3476L18-11S
Connector socket contact, #16 (may be included with connector)	Amphenol 9 x M39029/5-116
Strain relief	Glenair M85049/52-1-18W
16 awg red stranded wire	Any manufacturer
20 awg black stranded wire	Any manufacturer
Banana wire-end connector	Any manufacturer 1 x red 1 x black
Connector housing	Molex 1 x 87369-0400
Connector contact	Molex 4 x 50212-8100
24 awg unshielded stranded wire	Any manufacturer
RTV	Dow Corning 3145

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(2) Signals

Pin	Signal	Description	Length
A	28VDC_IN	16 awg red to a red banana plug	23 in ± 2 in (58 cm ± 5 cm)
B J	28V_RTN CGND	20 awg black to a common black banana plug	23 in ± 2 in (58 cm ± 5 cm)
C	PERSONALITY_CLK	24 awg unshielded To personality module pin 3	6 in ± 1 in (15.2 cm ± 2.5 cm)
D	PERSONALITY_DATA	24 awg unshielded To personality module pin 1	6 in ± 1 in (15.2 cm ± 2.5 cm)
E	+3.3V	24 awg unshielded To personality module pin 2	6 in ± 1 in (15.2 cm ± 2.5 cm)
F	GND	24 awg unshielded To personality module pin 4	6 in ± 1 in (15.2 cm ± 2.5 cm)

(3) Construction

Fold the 24 awg wire or use additional wire to fill the oversize MIL contacts.

Crimp the personality module wires into the Molex contacts and insert the contacts into the Molex housing. Apply RTV over where the wires enter the Molex housing for strain relief.

C. 61-Pin Cable

(1) Components

Note: Equivalent substitutes may be used.

Component	Manufacturer and Part Number
Connectors at Dlink+ w/ CPDLC	Amphenol 1 x MS3476L24-61S
Connector socket contact, #20 (may be included with connector)	Amphenol 40 x M39029/5-115
Sealing plug, #20	Amphenol 21 x MS27488-20
Heat shrink tubing, 0.125 in (0.32 cm)	Alpha Wire FIT-221
RJ-45 female connector/cable assembly	L-com ECJ504-8

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Component	Manufacturer and Part Number
Banana wire-end connector	Any manufacturer 1 x red 1 x black
26 AWG unshielded wire	Any manufacturer
Epoxy	3M DP110
RTV	Dow Corning 3145
Heat shrink tubing, 1.5 in (3.8 cm)	3M FP-301

(2) Signals

(a) External Connections

Pass the four ethernet wires through 1 in (2.5 cm) of 0.125 in (0.32 cm) heat shrink tubing. Delay shrinking the tubing until the potting operation, below. Cut off the four unused ethernet wires at the RJ-45 connector.

61-Pin	RJ-45	Signal	Length
B	3	Ethernet Transmit +	6in ± 2 in (15 cm ± 5 cm)
C	6	Ethernet Transmit -	6in ± 2 in (15 cm ± 5 cm)
D	1	Ethernet Receive +	6in ± 2 in (15 cm ± 5 cm)
E	2	Ethernet Receive -	6in ± 2 in (15 cm ± 5 cm)

(b) Interconnections

Connect all the pins on the same row using 26 awg solid wire. Cut the wires to approximately 5" (13 cm). Connect two wires to one of the connections, then jumper one to each of the remaining two connections. Fold wires or use additional wire to fill the oversize MIL contacts.

Connection 1 Pin	Connection 2 Pin	Connection 3 Pin
TX1+ AA	RX3+ S	RX5+ W

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Connection 1	Connection 2	Connection 3
Pin	Pin	Pin
TX1- BB	RX3- T	RX5- X
TX2+ P	RX6+ Y	RX7+ d
TX2- R	RX6- Z	RX7- e
TX3+ t	RX8+ b	RX1+ CC
TX3- u	RX8- c	RX1- DD
TX4+ v	RX2+ EE	RX4+ U
TX4- w	RX2- FF	RX4- V
OUT1 G	IN1 j	IN5 L
OUT2 H	IN2 k	IN6 M
OUT3 J	IN3 y	IN7 g
OUT4 K	IN4 n	IN8 h

(3) Construction

Insert sealing plugs into the unused contact locations. Pot wires using the epoxy after the cable has been tested. Locate and shrink the ethernet tubing so that it will extend approximately 0.5 in (1.3 cm) on either side of the epoxy-air boundary. The epoxy depth should be enough to cover all the loopback wires. Cover the potted block with 1.5 in (3.8 cm) heat shrink tubing.

Use RTV for strain relief where wires enter the RJ-45 connector.

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8. APPROVAL

Prepared by: _____

Program Manager: _____

Director of Engineering: _____

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