MAC Panel Company

DAK Assembly Instructions

2532 Style

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Overview - Assembling a DAK onto a PXI Instrument

Each MAC Panel DAK (Direct Access Kit) is designed to work with a range of PXI instruments.

Before commencing assembly ensure that you have the correct DAK for your instrument. If you are uncertain, please refer to the DAK Selector tool on the MAC Panel website https://www.macpanel.com/dak_selector/

To complete this assembly process, you will require the following:

- PXI Instrument
- DAK to suit the specific instrument.
- DAK tool kit, MAC Panel part number 561211 https://www.macpanel.com/product/561211/
    - The tool kit contains all tools to ensure satisfactory assembly.
    - Full details can be found in Appendix D

Figure 1 DAK Tool Kit

The images in these instructions are taken from an assembly video that can be found at https://youtu.be/7li5axZhVvY

It is highly recommended that you view this video in conjunction with these written instructions.

Step 1 Remove Right Cover Plate

These instructions relate to a number of DAKs. A full list can be found in Appendix A at the end of this manual.

These instructions show the 561796X1 DAK being attached to a NI PXIe-2532B that has been purchased with a TB2643B Terminal Block

Please refer to our website www.macpanel.com to locate the specific customer drawing for your DAK.

Each DAK is supplied with 2 cover plates. Remove only the right cover plate as shown.

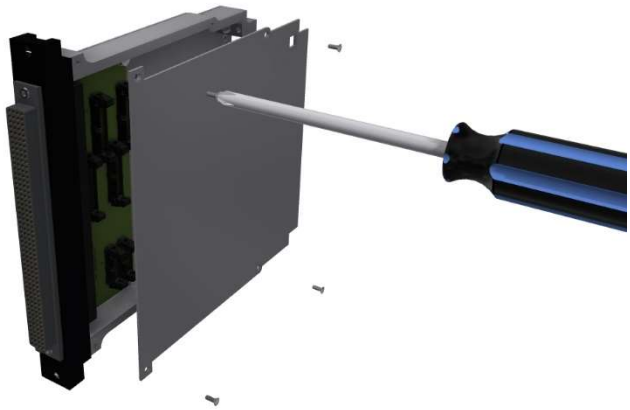

Figure 2 Remove right cover plate.

The primary PCB supplied with the DAK will now be clearly visible.

Figure 3 Primary PCB is now visible.

Step 2 Identify Style of DAK

DAKs of this style are supplied in 2 variants:

With secondary PCB provided by MAC Panel in the DAK

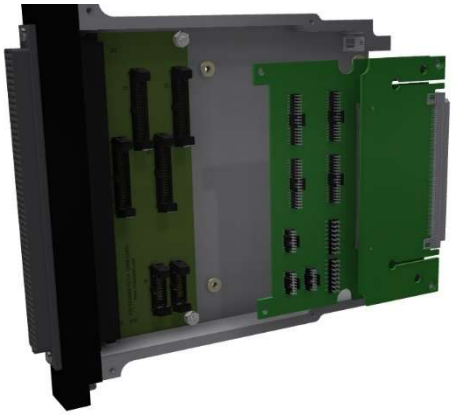

Figure 4 A DAK with all PCBs supplied by MAC Panel

Without secondary PCB. In these instances, the customer will have purchased the appropriate terminal block separately. In these instances, please refer to appendix A for additional instructions before proceeding to step 5.

Figure 5 An example of a Terminal Block (TB) purchased separately by customer.

A full list of DAK part numbers and associated TBs is included in appendix B.

Step 3 Install secondary PCB.

You will now use either the secondary PCB supplied with the DAK, or the secondary PCB removed from the NI terminal block (TB)

Determine the correct number of washers to correctly align the secondary PCB. At this stage use 1 washer in each of the left hand positions and a stack of 3 in the right hand position.

Figure 6 Identify correct number of washers.

Align the secondary PCB with the fixing holes.

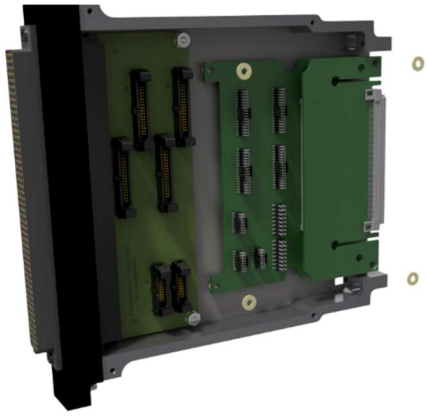

Figure 7 Align the secondary PCB.

Using the nylon screws and washers supplied, attach the secondary PCB to the DAK. Note that the screws will protrude through the left cover plate.

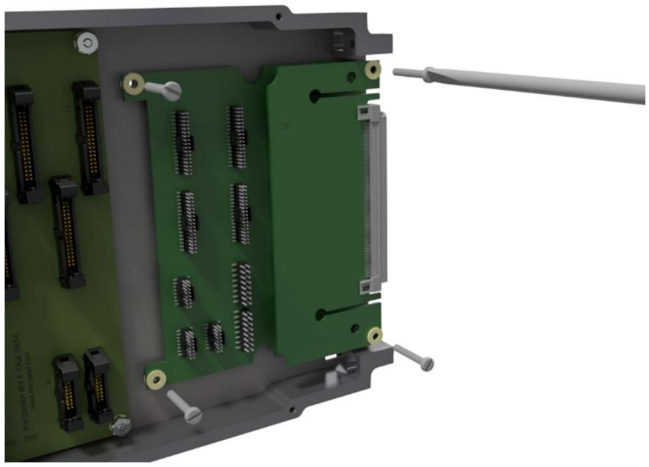

Figure 8 Attach the secondary PCB.

Turn the DAK over and remove the excess nylon thread from each of the 4 screws.

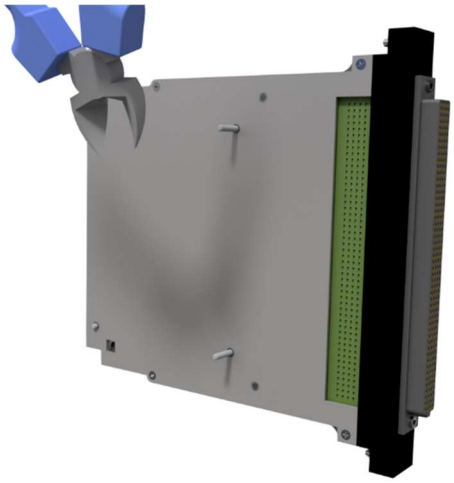

Figure 9 Remove excess thread from nylon screws.

Ensure that all thread is removed so that this DAK will slide into the SCOUT system next to adjacent DAKs.

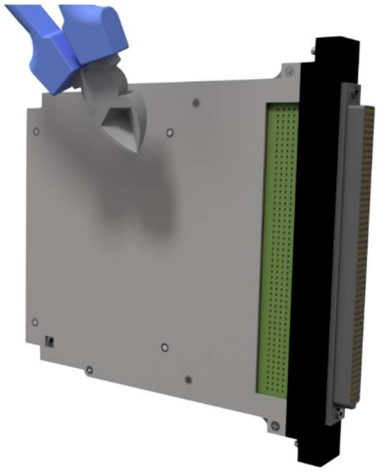

Figure 10 Ensure that no thread is protruding.

The sides of the DAK must be flat with no screws protruding.

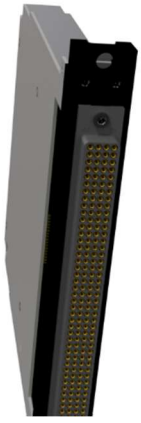

Figure 11 If screws protrude this DAK will not fit correctly into the receiver.

Step 4 Attach the PXI instrument to the DAK.

Align the PXI instrument with the DAK.

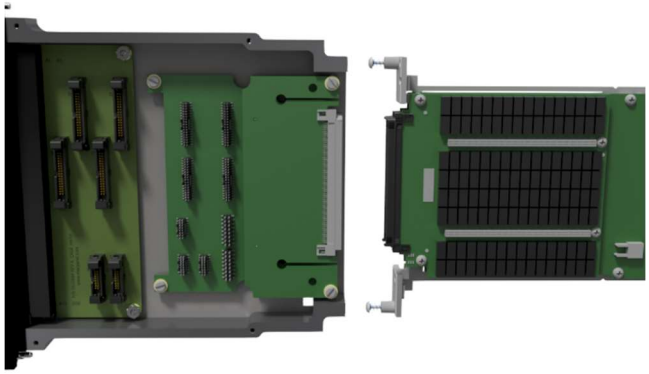

Figure 12 Align Instrument with DAK

and secure using the 2 socket head screws.

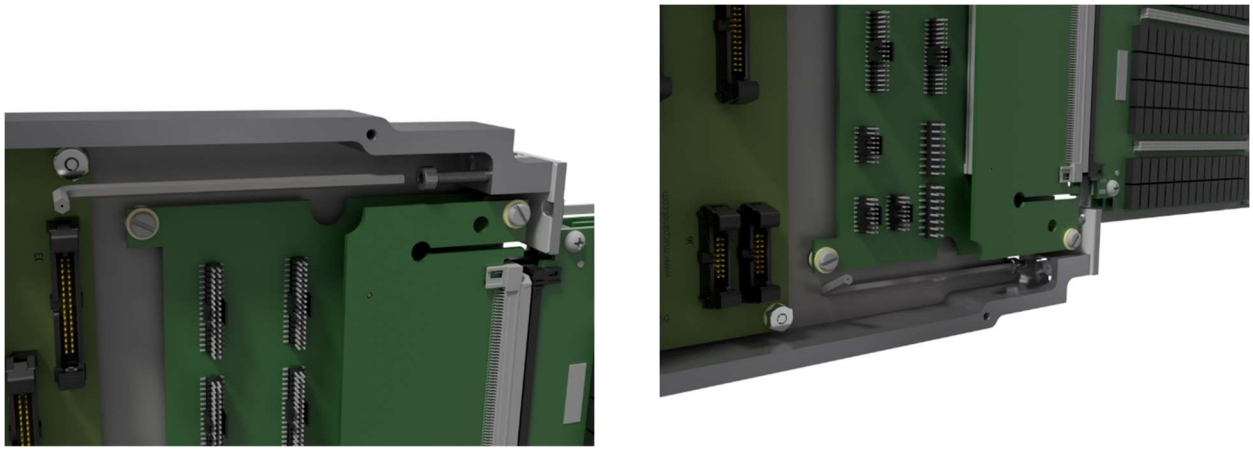

Figure 13 Insert and tighten upper and lower screws.

Step 5 Check for Correct Assembly

It is critical that the DAK has been aligned with the PXI instrument. Ensure that the DAK and instrument are aligned in the location shown. A straight edge such as this rule can be used.

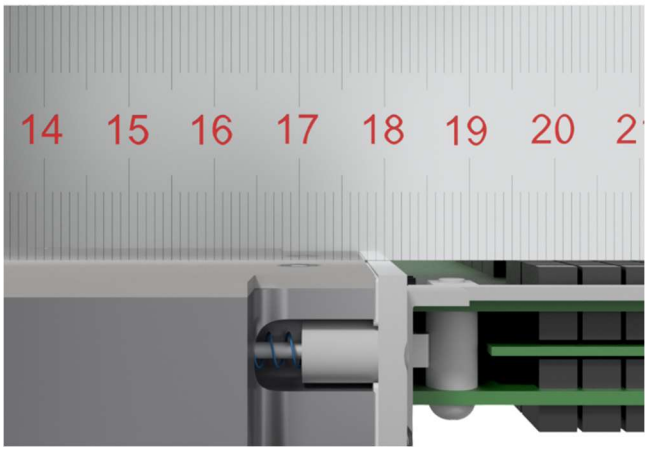

Figure 14 Ensure that the DAK and instrument are aligned.

Step 6 Attach Ribbon Cables

There are many different configurations. Please refer to the customer drawing on the website www.macpanel.com for the DAK part number that you are building.

The customer drawing will identify the correct configuration that must be used.

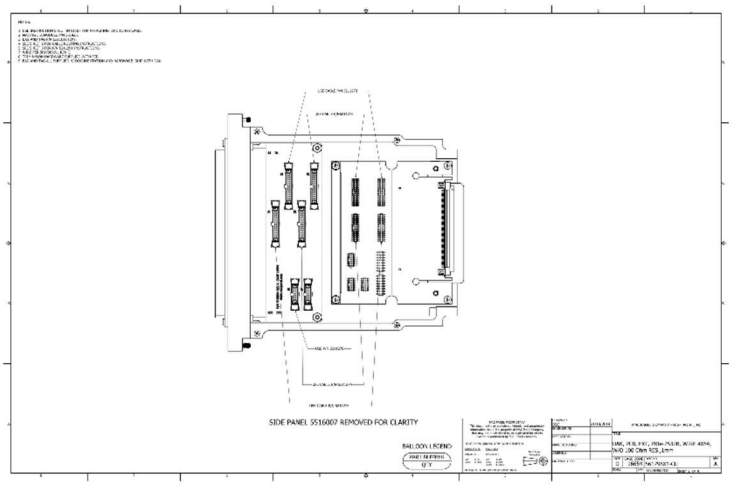

Figure 15 Example of customer documentation

Attach the correct ribbon cables in the positions identified on the customer drawing.

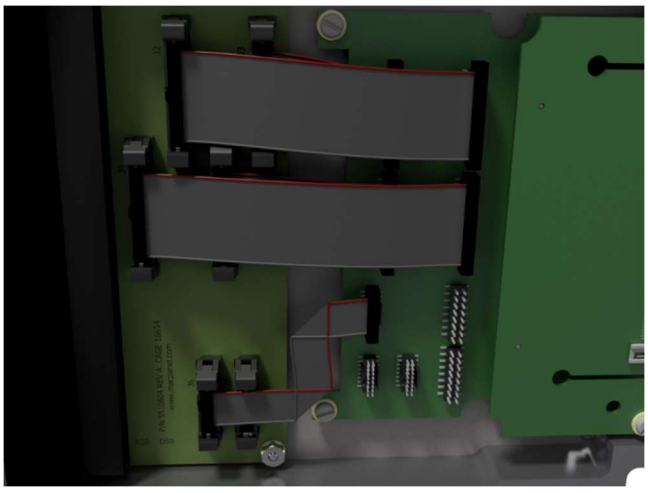

Figure 16 Attach ribbon cables.

Step 7 Complete the Assembly

Re-attach the right side cover plate.

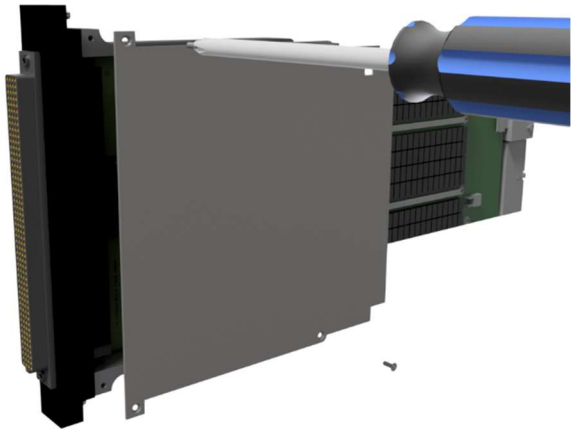

Figure 17 Attach right side plate.

The DAK is now ready to assemble into the SCOUT system.

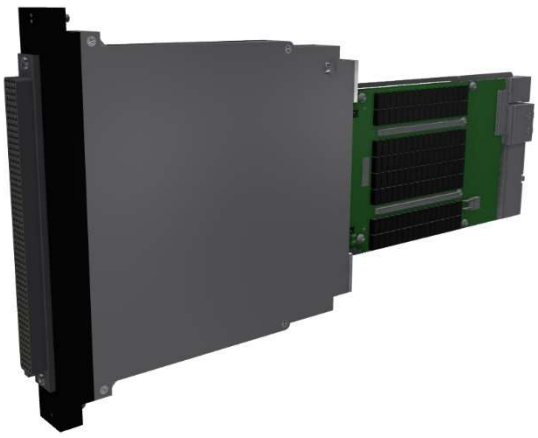

Figure 18 Completed DAK

Appendix A Instructions for removing PCB from NI Terminal Block

Some customers will choose to purchase the terminal block directly from the manufacturer. In these instances, the following instructions will illustrate how to correctly prepare the unit for assembly into the DAK.

To begin, undo the 2 retaining screws and remove the front panel.

Figure 19 Remove 2 screws.

Turn the unit over and undo the 2 retaining screws on the rear side.

Figure 20 Remove the remaining screws.

The two halves of the terminal block housing can now be separated.

Figure 21 Separate the terminal block.

Undo the mounting screws to release the PCB.

Figure 22 Remove mounting screws.

Remove the mounting strip and the 2 threaded standoffs. Discard the mounting strip and stand offs.

Figure 23 Remove mounting strip and standoffs.

Undo the two mounting screws to release the PCB.

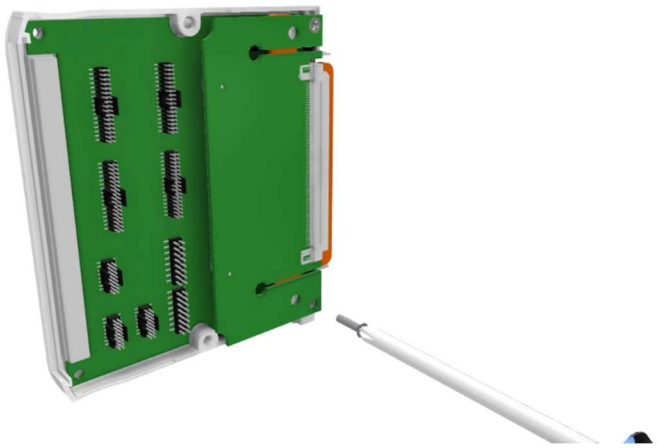

Figure 24 Remove screws.

Remove the PCB from the housing.

Figure 25 Remove PCB

The TB unit PCB is now ready to install into the DAK.

Figure 26 TB PCB ready for assembly

Proceed to step 3 in this document

Appendix B List of supported DAKs

These instructions cover the following DAKs for the NI PXI and PXIe range of 2532 crosspoint matrix switch modules.

DAK Part #	Matrix	MAC Panel Supplied TB	Customer Supplied TB	Website link	Comment
561796X1	4 x 64	TB-2643B	-	www.macpanel.com/product/561796X1/	
561819X1	16 x 32	TB-2652B	-	www.macpanel.com/product/561819X1/	
561823X1	8 x 32	TB-2644B	-	www.macpanel.com/product/561823X1/	
561824X1	8 x 64	TB-2641B	-	www.macpanel.com/product/561824X1/	
561826X1	4 x 128	TB-2640B	-	www.macpanel.com/product/561826X1/	
562751X1	16 x 16	TB-2645B	-	www.macpanel.com/product/562751X1/	Note A
562752X1	8 x 64	TB-2641B	-	www.macpanel.com/product/562752X1/	Note A
562757X1	16 x 16	TB-2645B	-	www.macpanel.com/product/562757X1/	Note A
562815X1	8 x 32	TB-2646B	-	www.macpanel.com/product/562815X1/	
562851X1	4 x 128	-	TB-2640B	www.macpanel.com/product/562851X1/	

Note A

These DAKs are supplied with an additional external connector that allows multiple 2532 switches to be combined to increase the matrix size. The picture below shows 2 switches being combined this but the design allows for 3 or more switches to be combined if required.

Figure 27 Multiple switches can be combined.

Appendix C Avoid Damage to Module Contacts

The MAC Panel contacts used in these DAKS are the strongest, most reliable contacts available for this style of connection. The vertical and horizontal distance between contacts (known as “pitch”) is an industry standard 0.100” (2.54mm). Almost all male contacts used on this pitch are 0.024” (0.6mm) diameter but the MAC Panel contacts are .040” (1.0mm) diameter. In practice this increases the strength by a factor of around 4x and means that they are virtually unbreakable in normal working conditions.

The female contacts have been designed to complement the larger male contacts and are equally robust and reliable. However, the female contacts can be damaged if an incorrect diameter probe is used during development or maintenance routines.

Only MAC Panel 1mm male contacts must be inserted into the female contacts.

Most probes supplied with handheld multimeters are larger diameter than 1mm. They may look quite similar but, in practice, will almost always damage the female contact leading to it having to be replaced.

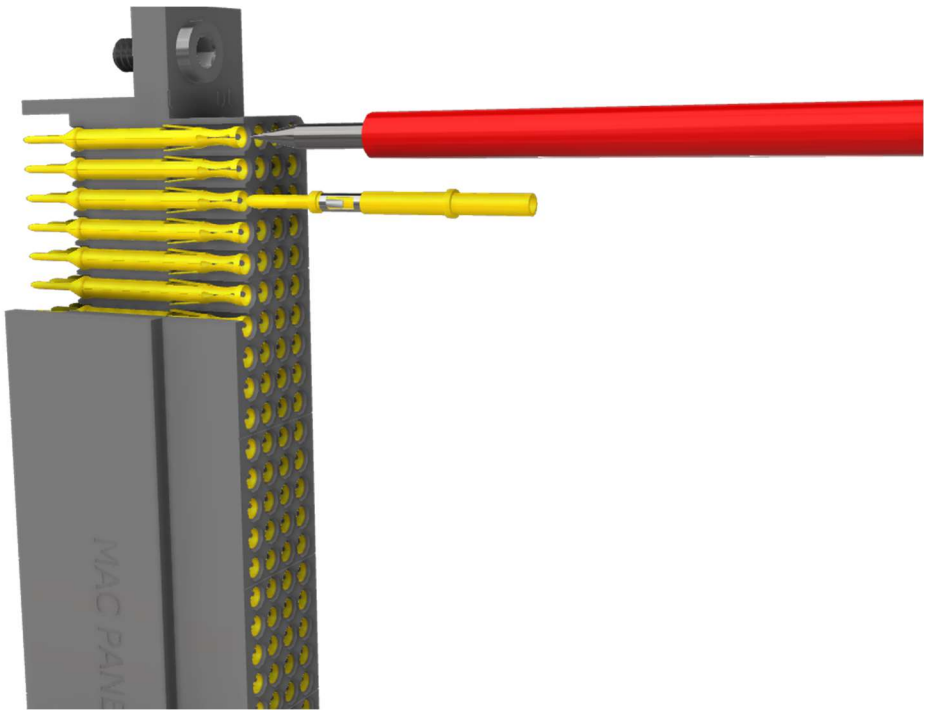

Figure 28 1mm contact and probe.

The female contact is designed so that 4 equally spaced “leaves” will move radially outwards when the male is inserted and will spring back to the original position when the contact is removed. Extensive testing shows that these contacts will perform in this manner for over 20,000 mating cycles.

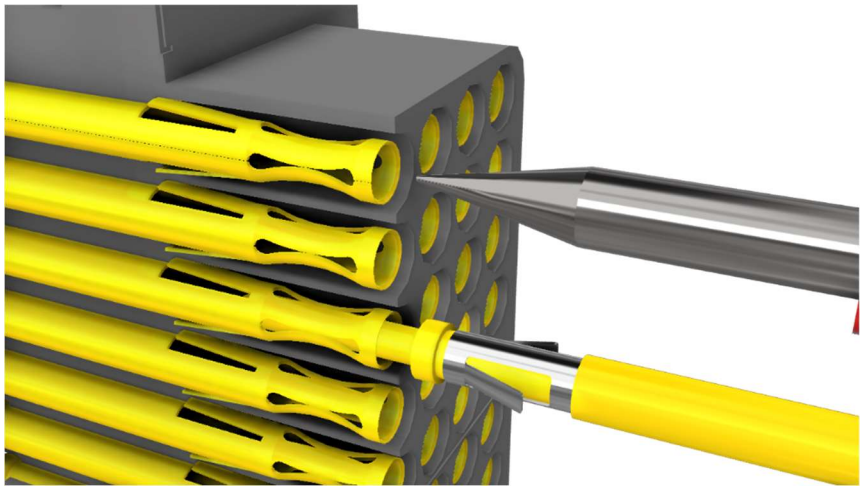

Figure 29 1mm contact inserted.

However, when a conventional multimeter probe is used the larger diameter stretches the leaves beyond their natural sprung state. In almost all circumstances this will damage the contact and the contact will have to be replaced

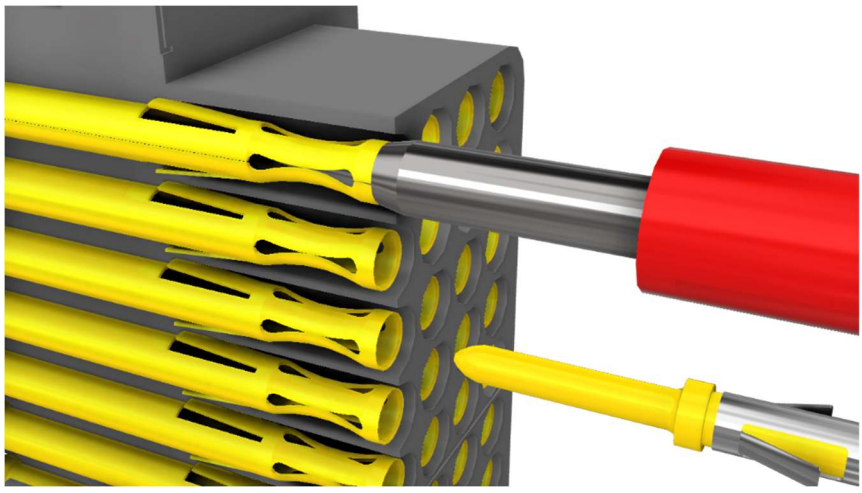

Figure 30 Probe inserted.

Below, the condition of the 2 contacts after the probe or contact has been removed can be seen.

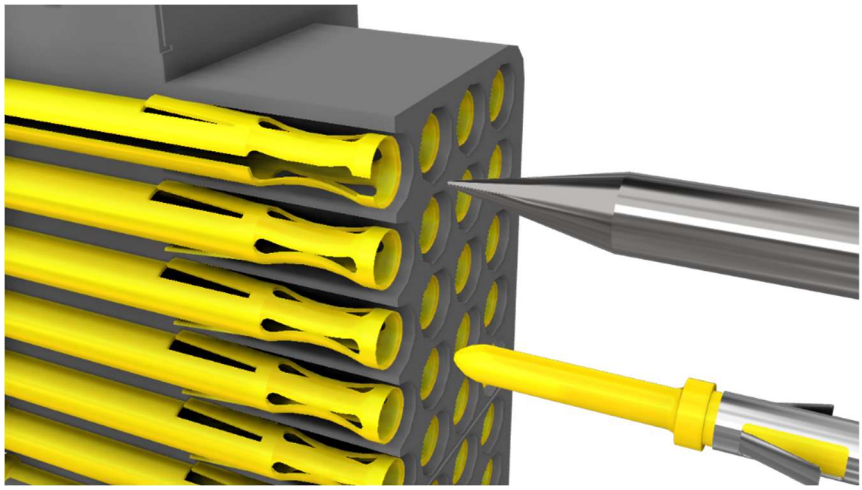

Figure 31 Damage caused by probe.

If the contact is damaged it must be replaced

Each contact can be replaced individually using MAC Panel extraction tool, part number 412801

Figure 32 Extraction Tool

Full instructions can be found on the MAC Panel website at

https://www.macpanel.com/wp-content/uploads/2018/08/IN91330-RevB.pdf

Appendix D DAK Tool Kit Contents

The DAK Tool Kit, part number 561211, includes all necessary tools to assist with satisfactory DAK assembly.

Figure 33 DAK Tool Kit

Location	Description	Part #
A	Alignment Tool	412640
B	Assorted Screwdrivers	#1 Philips #2 Philips 3/16” Slotted
C	Nut Extraction Tool	561588
D	Spare T bolts and nuts	5510941 4-40UNC
E	Patch cords for probing female contacts	PC 000 150 024 012
F	DAK Removal Tool	5212346
G	Combination Wrenches	3/16” 1/4”
H	Nut Driver	1/4”
J	Ejector Pin Extraction Tool	5515529
K	Hex Keys	
L	Spare Screws and nuts	