

CCD231-C6 CUSTOMER UNPACKING AND HANDLING PROCEDURE

DAS770208AK-10

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1. INTRODUCTION

1.1. PURPOSE

This procedure describes the unpacking and handling of a CCD231-C6 device by the customer. This document should be read before any unpacking is performed.

1.2. SAFETY AND HANDLING PRECAUTIONS

e2v accepts no responsibility for loss, damage or personal injury arising from failure to follow these instructions and advises the user of these instruction to carry out their own Risk Assessment before carrying out any of these operations.

e2v internal risk assessment for the process:

[PAC-R-110](#)

The e2v risk assessment has identified the following potential risks that could result from this process:

- Devices/transport case dropping on foot
- Cuts from scissors/ scalpel/ knife/ screwdriver
- Asphyxiation from Nitrogen cabinet (if used)
- Use of solvent: Propanol

2. FACILITIES, STORAGE AND TRANSPORT

2.1 Anti-static handling precautions must be observed during this process.

2.2 Anti-static clean gloves must be worn when handling components.

2.3 Required clean room facilities: the clean room should be locally a Class 1000 facility or better. All surfaces that the device or its metal packing case rests on should be ESD protected with surfaces grounded via a minimum 1 mega ohm resistor. All personnel handling a device must wear non-ESD generating clothing and be grounded from their skin via a similar resistor. Personnel must also wear well fitting cleanroom gloves, which do not generate static charge.

2.4 Any transportation of a device should take place with the device retained within a metal or conductive plastic box with a lid. If the device is to be stored for a significant time period it is recommended that the device case is stored in a dry nitrogen environment, but note that the case lid should not seal to allow circulation of nitrogen around the device. Avoid high flow rates of nitrogen as this can generate static charges.

2.5 The CCD231-C6 sensor is a fragile device that must be handled carefully, avoiding shocks and excessive vibration at all times.



Approved by

I. Swindells

3. EQUIPMENT AND MATERIALS

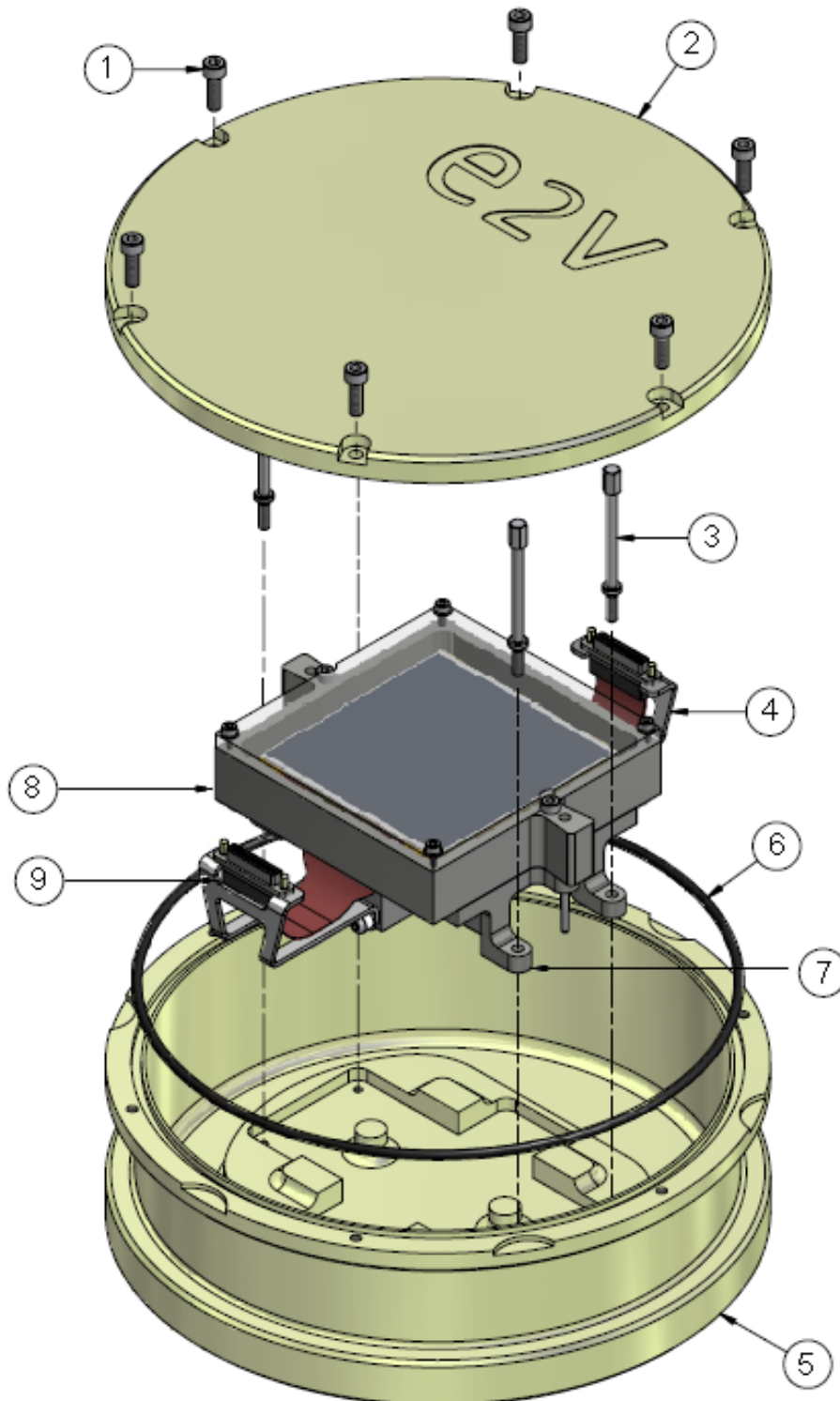


Figure 1: Exploded view of assembly



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3.1 CCD273 Transport Box and Device Assembly:

Consists of (see Figure 1):

Item 1	Screw, M5x16 Cap HD screw,	6 off
Item 2	Case top	1 off
Item 3	Extended retaining screws, Hex head, 6.0 mm A/F	4 off
Item 4	Flexi support arms. These are screwed to the handling jig (item 7)	2 off
Item 5	Case bottom	1 off
Item 6	O-Ring, Viton	1 off
Item 7	Handling Jig	1 off
Item 8	CCD Cover	1 off
Item 9	37-Way Micro-D Connector	2 off

These are secured to the flexi support arms (item 4) via 2 jack posts (Glenair MRM5254 Hexagonal Jackposts).

Note: Not shown in Figure 1 are the push fit shorting blocks supplied on each connector.

Equipment needed for unpacking [not supplied]:

- o Scissors
- o Sharp knife/scalpel
- o Lint free clean room cloth
- o Propanol
- o Gloves

Useful tools [not supplied]:

- o Hex drive bit 3 mm
- o Hex drive bit 4 mm
- o Hex drive bit 6 mm
- o Hex drive socket 8 mm
- o 3.2 mm A/F open-ended spanner
- o Handling rod or manipulation jig (see section 4.2)



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4 UNPACKING AND HANDLING

4.1 UNPACKING FROM THE TRANSPORT BOX

Read in conjunction with Figure 1.

- 4.1.1 Before taking the device into a clean room, carefully remove the device from the outer packing, cardboard box and shock protection. A metal case within double-layered anti-static sealed plastic bagging will be revealed. This assembly should be wiped down with soft, lint free, Propanol soaked cloth or paper to remove dust particles from the outer packing before transfer into a clean area. Once inside the clean room, the outer anti-static bag should be wiped again with Propanol.
- 4.1.2 Using sharp scissors to cut the sealed bags, carefully remove the anti-static bagging. Proceed with unpacking by slitting through the ESD warning labels on the case side with a sharp knife or scalpel.
- 4.1.3 Remove the case top retaining bolts [1] using a 4 mm hex drive bit and suitable ratchet/screwdriver. Slots are provided along the case joint line to insert a flat screwdriver and break the case lid [2] away from the case if the inside of the case has been depressurised during transit. Remove the case lid [2] and place aside.
- 4.1.4 Unscrew the four extended retaining screws [3] using a 6 mm hex drive socket and suitable ratchet/screwdriver. Gently lift the CCD/handling jig assembly and from the case bottom [8].

4.2 REMOVAL OF HANDLING JIG

- 4.2.1 If at all possible, handling of the device by hand should be avoided. In order to remove the device from the supplied assembly handling jig and manipulate the device afterwards, two suggested techniques are described below:

4.2.2 Technique 1: Handling Rod

- 4.2.2.1 Indicated as point A in Figure 2, there is an M4 threaded insert in the centre of the underside of the package. A hole in the bottom of the assembly handling jig allows access to this insert. With the device in its handling jig inverted on a level table, a rod of recommended diameter 6.35 mm (1/4") with an M4 thread at one end can be secured to the package via this insert and used to handle the device when removing it from the handling jig.
- 4.2.2.2 Once the handling rod is secured, turn the device assembly back over so the image surface is uppermost. Locate the end of the handling rod in to a suitably designed holder and secure firmly, such that the device assembly is supported on its handling rod.
- 4.2.2.3 To dismount the CCD assembly from the handling jig, carefully remove the shorting block from connector 1 by hand taking care not to touch the exposed pins at the end of the connector. Using 3.2 mm A/F open-ended spanner, unscrew the flexi connector jackscrews to free the flexi. Refit the shorting block immediately to the connector. Repeat this process for connector 2.
- 4.2.2.4 Using a 3 mm hex drive bit and a suitable ratchet/screwdriver, remove the two M4 cap head screws holding the CCD cover in place. Lift the cover vertically upwards and away from the device assembly. Take care not to touch any part of the CCD with the cover or guide pins.

NOTE: DO NOT RELEASE THE HANDLING JIG WITHOUT FIRST REMOVING THE CCD COVER

NOTE: WITH THE CCD COVER REMOVED THE DEVICE IS VERY VULNERABLE AND EXTREME CARE SHOULD BE TAKEN.

4.2.2.5 To release the CCD package from the supplied handling jig, carefully reach underneath the jig and remove the three nuts and sets crinkle washers on the studs located at points C in Figure 2, supporting the handling jig with one hand. An 8 mm hex drive socket and suitable driver may be used to release the nuts.

4.2.2.6 The handling jig can then be lowered down the handling rod and away from the CCD package. By releasing the handling rod from its holder the jig may then be removed.

4.2.3 Technique 2: Manipulation Jig

4.2.3.1 Four through holes, indicated as points B in Figure 2, are present in the buttable sides of the package. By design of a suitable manipulation jig, these holes can be utilised to manipulate the device. An example jig, as used by e2v, is shown in Figure 3. Details of this design are available on request.

4.2.3.2 To use such a jig, first remove the CCD cover by using a 3 mm hex drive bit and a suitable ratchet/screwdriver to remove the two M4 cap head screws holding the CCD cover in place. Remove the cover being careful not to touch the surface of the CCD with the cover guide pins or the wire bonds with the inside of the cover.

NOTE: WITH THE CCD COVER REMOVED THE DEVICE IS VERY VULNERABLE AND EXTREME CARE SHOULD BE TAKEN.

4.2.3.3 Ensuring the support pins are fully retracted, fit the manipulation jig over the device and guide it on to the handling jig using the guide pins and handling jig holes, being careful not to touch the surface of the CCD with the guide pins. Secure it to the device by screwing the support pins in to the holes in the sides of the package.

4.2.3.4 To dismount the CCD assembly from the handling jig, carefully remove the shorting block from connector 1 by hand taking care not to touch the exposed pins at the end of the connector. Using 3.2 mm A/F open-ended spanner, unscrew the flexi connector jack screws to free the flexi. Refit the shorting block immediately to the connector. Repeat this process for connector 2.

4.2.3.5 When ready to release the device from the assembly handling jig, carefully reach underneath the jig and remove the three nuts and sets crinkle washers on the studs located at points C in Figure 2. An 8 mm hex drive socket and suitable driver may be used to release the nuts.

4.2.3.6 The device and handling jig can then be separated.

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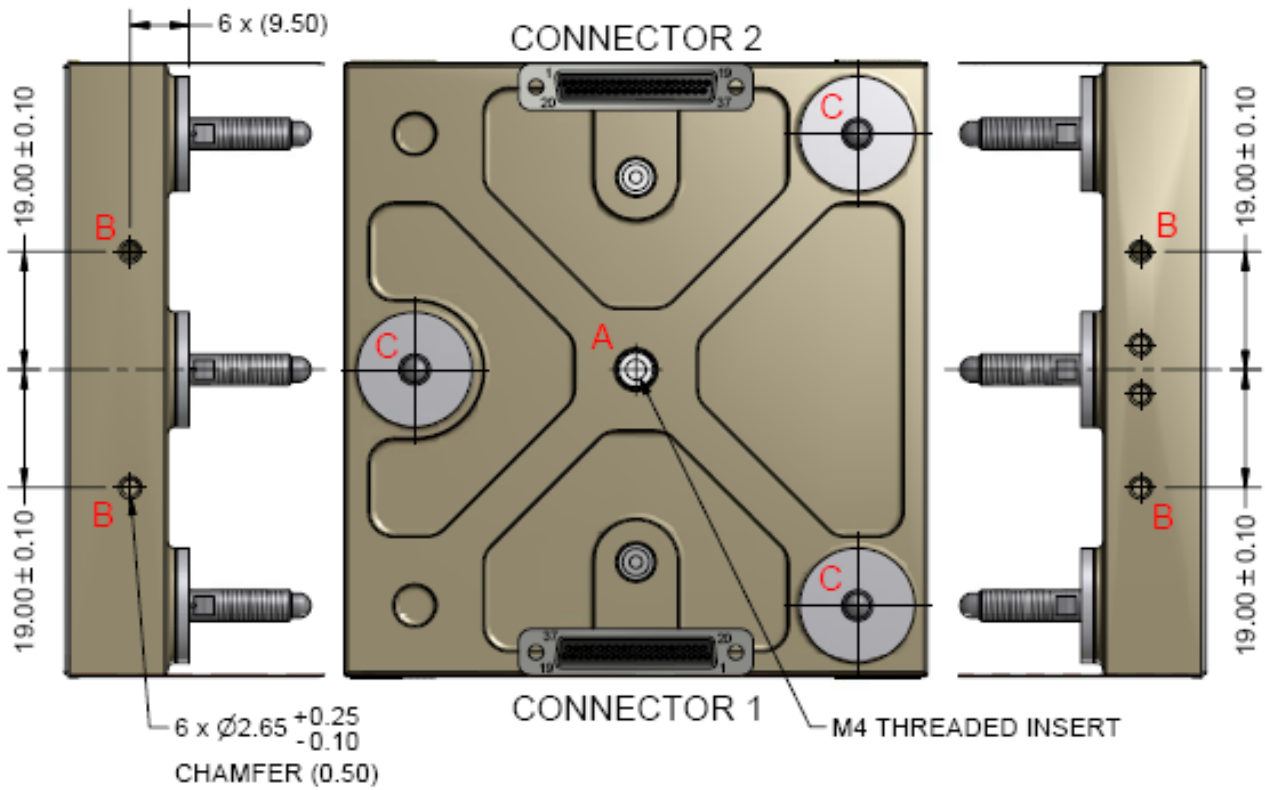


Figure 2: Schematic of the underside of the package



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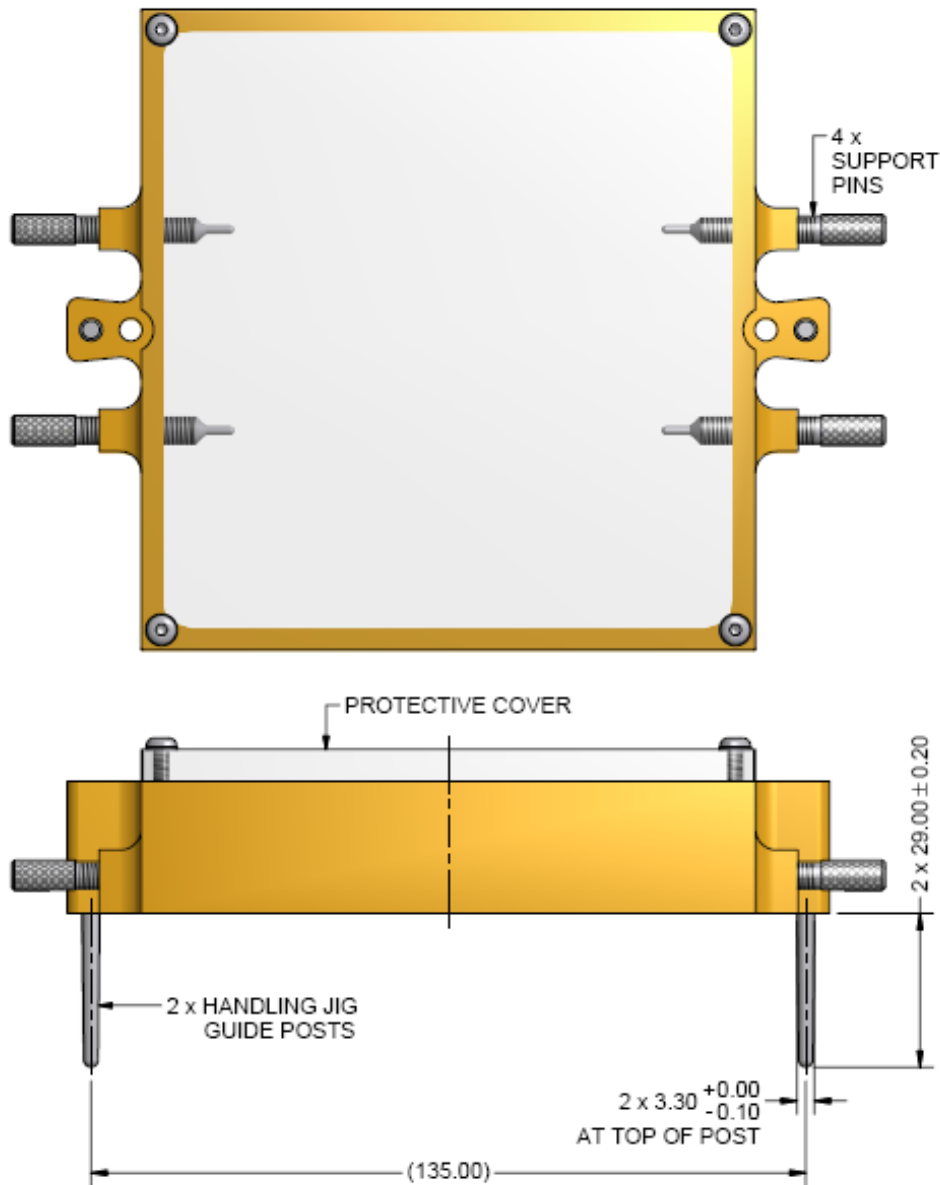


Figure 3: e2v jig used for device manipulation off the handling jig – 3D view.

There is a clear lid for ease of viewing, 4 threaded support pins to fit the holes in the side walls of the package and 2 guide posts that guide the jig over the e2v supplied handling jig in such a way that no contact occurs between the jig and CCD.

4.3 COLD PLATE REQUIREMENTS

- 4.3.1 If using either of the methods described above to handle the device when removed from its supplied handling jig, suitable holes will be needed in the cold plate to accept the handling rod or guide pins of the manipulation jig.

5 FLEXI PCB BENDING SPECIFICATION

5.1 The bend radius of the flexi PCB is recommended to be no less than 10 mm, with an absolute minimum of 5.8 mm. There should be no forced bending within 10mm of the connector potting (zone 1 in Figure 4). There should be no forced bending of the flexi in the negative direction within 5 mm of the flexi to package bondline (zone 2).

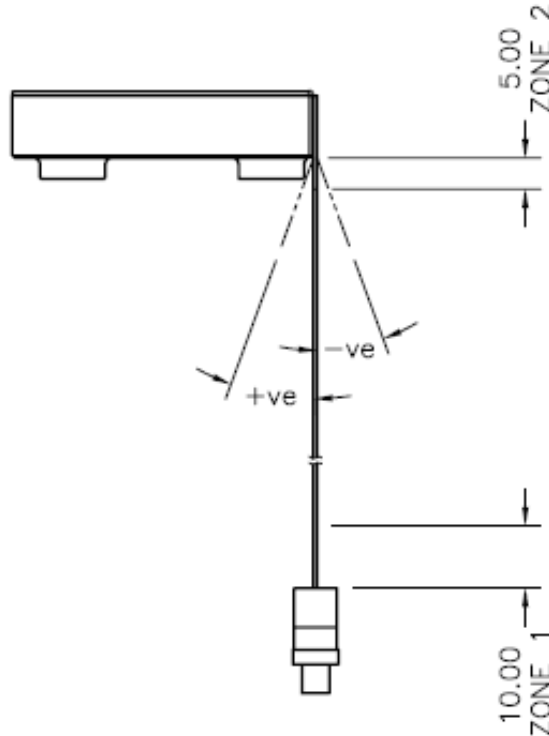


Figure 4: Flexi PCB zones for bend specifications as per section 5.

6 STUD AND NUT TORQUE SETTINGS

- 6.1 The 3 studs labelled C in figure 2 are screwed in to the package inserts. They hold the precision shims in place which guarantee the package height specification supplied with the device. If the studs/shims are removed this may nullify the package height measurements made at e2v. Should the studs be removed or come loose, they can be screwed back in to the inserts. The torque setting for screwing in the studs in as supplied is 50 (+2,-0) cNm. The studs have 2 flats in them that can be used to apply the torque for screwing them in. A special tool may be required, see Figure 5.
- 6.2 The CCD231-C6 device is supplied from e2v on a handling jig, item 7 in Figure 1. It is secured to the handling jig on each stud via a nut and a set of 2 crinkle washers per stud. The crinkle washers are needed when there is a difference in coefficient of thermal expansion between the cold plate and the studs/shims (which are made of invar 36). These nuts and crinkle washers should be used where possible to mount the device to a cold plate.
- 6.3 It is important that the crinkle washers are not compressed flat as they will be permanently deformed and lose their ability to compensate for changes in the joint grip length during temperature reduction in testing. The recommended maximum torque for the nuts with or without the crinkle washers is 10 cNm less than the stud torque, which is 40 cNm as supplied. This is so the stud will remain tight when the nut is released.



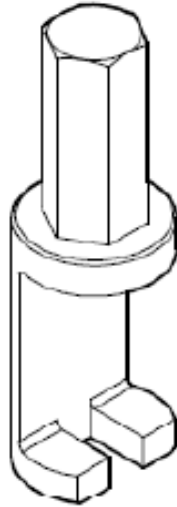


Figure 5: Stud torque tool. Details available from e2v on request

7 DOCUMENT AMENDMENT RECORD

Version	Issue Date	Change Request	Reasons for Change
1	16 Jul 2012	112988	New