.: www.totalrecallvr.com :.

Total Recall VR LinX Altus

Maintenance Guide

April, 2016

Issue 3.0

Prolancer

Amendment Summary:

Issue	Date	By	Amendment
0.1	09-Sep-2014	EA	Initial draft.
1.0	19-Sep-2014	EA	Full review and associated updates. Ready for comment by distributors and resellers.
2.0	16-Sep-2015	EA	Updated product codes. Add procedures for the 7" LCD panel and streamline exiting procedures for the 6.4" panel. Add procedures for AMBE decoder.
3.0	22-Apr-2016	EA	Add procedures for access to OSD menus for systems with 7" LCD panel.

Related Documents:

[1] Aaeon, GENE-LN05 Manual Rev. B, 3rd Edition, June 2012

[2] Prolancer Pty Ltd, GENE-LN05 BIOS settings for Total Recall VR, v1.0

[3] Prolancer Pty Ltd, Total Recall VR Embedded GUI User Guide, latest version

Table of Contents

1. Preface

1.1. Conventions

Our guides use several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

1.1.1. Notes & Warnings

We use the following visual styles to draw attention to information that might otherwise be overlooked:

Notes are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.

Important boxes detail things that are easily missed. Ignoring the information will not cause damage to the system, but may cause irritation and frustration, not to mention increase in maintenance time.

Warnings should not be ignored. Ignoring warnings will most likely cause damage to the system or a system that does not function correctly due to issues that were introduced during maintenance.

1.1.2. Procedures

We use numbered sequence of steps to define procedures for performing certain tasks. For example:

Procedure Title

1. This is the first step of the procedure.
2. This is the second step of the procedure.
    a. This is the first sub-step of step 2.
    b. This is the second sub-step of step 2.
3. This is step three.

2. Introduction

2.1. About This Guide

This guide is the maintenance manual for the Total Recall VR LinX Altus audio logger and call recorder.

The guide is intended for Total Recall VR product distributors and resellers with qualified staff capable of repairing/upgrading computer and electronic equipment and facilities suitable for doing so.

This guide is and remains the property of Prolancer Pty Ltd at all times. It contains proprietary and confidential information and should not be copied and distributed without written authorisation from Prolancer Pty Ltd.

If you have obtained a copy of this manual without authorisation please destroy it and do not share it.

The guide contains a set of maintenance procedures for the Total Recall VR LinX Altus product.

Always follow basic safety precautions when repairing/upgrading Total Recall VR to reduce the risk of injury from electrical shock and fire.

WARNING: Potential shock hazard. Total Recall VR must be repaired/upgraded by qualified person.

The guide assumes that a suitably qualified and trained person will execute the procedures. As a result, the procedures are written to guide rather than educate. For example, the procedures do not explain what tools to use, how to use tools, how to setup a static free environment and safety when working with exposed electronic circuits under power.

If you damage a component while performing procedures you will void the warranty of the component and system.

2.2. Release & Hold Harmless Statement

By preforming the procedures in this document:

1. You acknowledge that you have voluntarily chosen to do so.
2. You acknowledge that you understand the risks involved including the risks of injury, loss of life and voiding of system warranty.

As a result, you agree to accept all associated risks, including but not limited to property damage or loss, bodily injury and death.

Further, you agree to indemnify, defend and hold harmless Prolancer Pty Ltd, its officers, directors, employees and contractors from and against all claims arising out of or resulting from execution of the procedures in this document.

IF YOU DO NOT AGREE, then do not perform the procedures in this document.

You can send your system back to the factory where all maintenance and upgrades are performed under controlled conditions.

2.3. Support Information

If when using this manual you have questions about the maintenance of Total Recall VR, or you continue to experience problems with your Total Recall VR, then:

1. Please visit the Resources section on our web site http://www.totalrecallvr.com
2. Contact technical support via e-mail: itsupport@prolancer.com.au

2.4. Total Recall VR LinX Altus Overview

Total Recall VR LinX Altus is an ideal, professional solution for high-density VoIP, RoIP and AoIP and analogue audio logging and call recording applications. It offers plethora of professional voice logging and call recording functions and features in a compact rack mountable enclosure.

Recording Channel Capacity

This model is capable of recording audio from different analogue audio sources as well as recording telephone calls on analogue and VoIP networks, including:

- Calls on analogue lines via a high impedance (Hi-Z) analogue line tap.
- Audio from any line level analogue audio source.

- SIP sessions (calls) via SPAN port.
- SIP sessions (calls) via UDP port.
- H.323 calls via SPAN port.
- Unicast RTP streams via SPAN port.
- Multicast RTP streams via SPAN port.
- RTP streams via UDP port.
- DMR recording via Tait VRP.
- DMR recording via Hytera HDAP.

The maximum recording channel capacity of this model is:

- 72 analogue recording channels; or
- 30 VoIP recording channels; or
- 72 analogue and 30 VoIP recording channels.

Analogue recording channels are sold in groups of 4 while VoIP recording channels are sold in groups of 10.

If a system is not at its maximum analogue recording channel capacity (72), then the number of analogue recording channels can be increased by adding additional analogue channel cards to the system, or by replacing existing analogue channel cards with larger capacity analogue channel cards.

This model can accommodate up to 6 analogue channel cards. Each analogue channel card can have 4, 8 or 12 analogue recording channels.

Unlike analogue recording channels, the number of VoIP recording channels can be increased with a new channel license key which activates a larger number of VoIP recording channels while the system is operational.

Enclosure

This model comes in a standard 5RU rack-mount enclosure that is made of zinc passivized steel and powder coated face. The dimensions of the enclosure are: 220 x 480 x 230mm (H x W x D).

Systems of this model have maximum weight of 14Kg when fitted with 6 analogue channel cards and hot-swap power supply. The weight of most units does not exceed 11.5 Kg.

Hardware Components

From hardware perspective this model comprises of:

- Intel Atom™ D525 based industrial motherboard.
- 7” wide screen colour LCD display.
- Control panel comprising of a numeric keys, player control keys and menu and record navigation keys.
- Single AV-GP (1 million hours MTBF) hard drive for on-board recording storage.
- Single BluRay archive device capable of creating archives on DVD+RW, BD-R and BD-RE discs.
- Built in audio amplifier and 2W speaker.
- Single auto sensing 180W universal power supply.

The previous list details the standard hardware configuration for this model. However, the following hardware options are available on request:

- Mobile hard drive for shock sensitive environments.
- Solid state hard drive (SSD) for improved performance.
- Dual hot swap hard drives, or solid state drives, in RAID-1 configuration for improved reliability.
- Dual hot-swap power supply for improved reliability.
- 12VDC, 24VDC and 48VDC power supply for mobile deployment.
- AMBE decoder.

3. System Components

3.1. Component Ordering Guide

Please specify the serial number of your system when ordering components.

We need the serial number of your system so we can send you replacement components that are compatible with the rest of the components in your system.

Please use the following part numbers when ordering electronic components.

Electronic parts:

Part Number	Description
LCD43-LVDS	6.4” LCD panel with LVDS interface
LCD43-INV	Inverter for 6.4” LCD panels
LCD169-TTL	7” wide screen LCD panel with TTL interface
LCD169-VGA	VGA driver board for 7” LCD panels
KYB-R	Keyboard for TRVR Rack
SPKR-9050	Speaker 90x50mm, 8ohm
FAN-80-12V	Fan, 80x80mm, 12V
MIDB-V10	Mid-board, V10
HDD-SATA	Hard disk with SATA interface and Total Recall VR software Please specify the version number of the Total Recall VR software that you would like us to install on the drive. Otherwise we will install the latest version that is compatible with the hardware of your system.
HDD-SATA-M	Mobile hard disk with SATA interface and Total Recall VR software Please specify the version number of the Total Recall VR software that you would like us to install on the drive. Otherwise we will install the latest version that is compatible with the hardware of your system.
HDD-SATA-S	Solid state disk with SATA interface and Total Recall VR software Please specify the version number of the Total Recall VR software that you would like us to install on the drive. Otherwise we will install the latest version that is compatible with the hardware of your

	system.
BD-RW-SATA	BluRay drive with SATA interface
HDD-CADY-RD	Hard disk and disc drive caddy for RAID-1 option
PSU-FLEX-250	250W flex format power supply
PSU-HS-400W	400W dual redundant power supply
PSU-12V	12VDC power supply
PSU-24V	24VDC power supply
PSU-48V	48VDC power supply
PB-LN05-D525	GENE LN05 with 4Gb RAM
DSP4-USB	DSP card with 4 analogue channels
DSP8-USB	DSP card with 8 analogue channels
DSP12-USB	DSP card with 12 analogue channels
PCI-SATA	Dual SATA port miniPCIe expansion card
TRVR-AMBE	One channel AMBE decoder for in-system installation
TRVR-AMBE-3	Three channel AMBE decoder for in-system installation

Cables:

Part Number	**Description**
CBL-GRN	DSP audio (green)
CBL-SND-4	GENE-LN05 audio
CBL-GRY	YDP-5090-11 speaker
CBL-FP-1	GENE-LN05 front panel cable
CBL-PS2-4	Mid-board to GENE-LN05 keyboard
CBL-SATA-RR	SATA, 2 x right angle
CBL-USB-3	External USB to DSP
CBL-USB-5	GENE-LN05 USB to DSP
CBL-LAN-1	Cross over LAN cable
CBL-LAN-3	LAN port to enclosure
CBL-KEY-1	NC-768 power key switch
CBL-PWR-1	IDE to SATA converter
CBL-PWR-2	IDE to Floppy converter
CBL-PWR-4	P4 12V to pins
CBL-PWR-5	IDE to VS-TY50-V1
CBL-PWR-6	SATA to IDE converter
CBL-VGA-1	VGA port to VS-TY50-V1
CBL-OSD-1	VS-TY50-V1 to OSD switches board

3.2. Single Board Computer

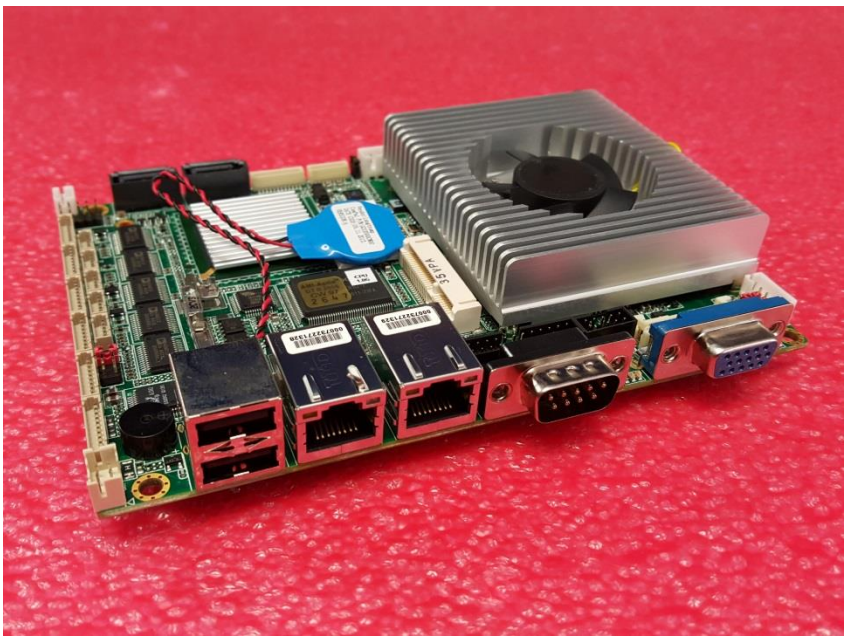
Total Recall VR may be powered by one of the following custom modified 3.5” single board computers.

Total Recall VR uses custom modified 3.5” SBCs from reputable manufacturers. The same SBCs may be available in an OEM/retail version. Please do not use the OEM/retail version as it will not have the right connectors and BIOS version.

3.2.1. Aaeon GENE-LN05

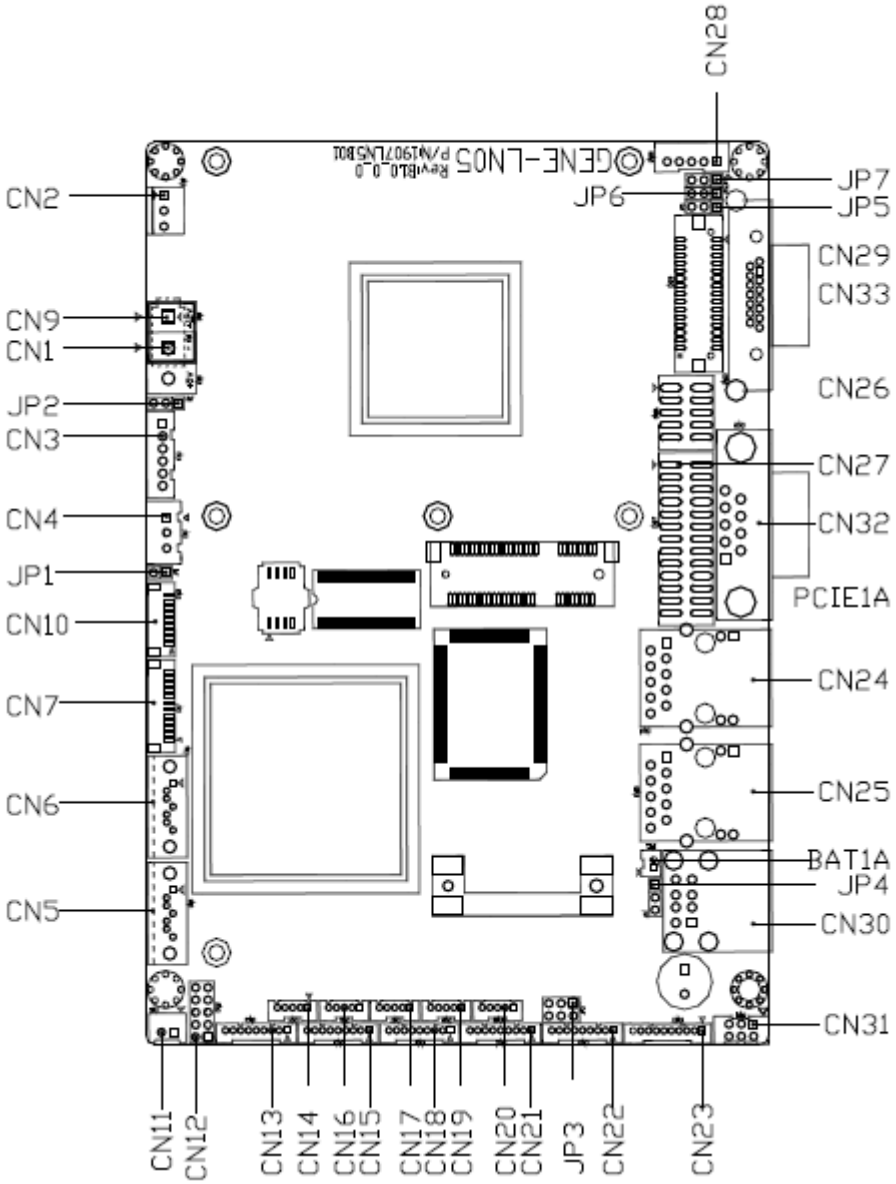
Order code: PB-LN05-D525

By default, Total Recall VR is fitted with an Aaeon GENE-LN05 SBC. It features and D525 Atom CPU and Intel ICH8M chip set. For more details see the GENE-LN05 user’s guide [1].

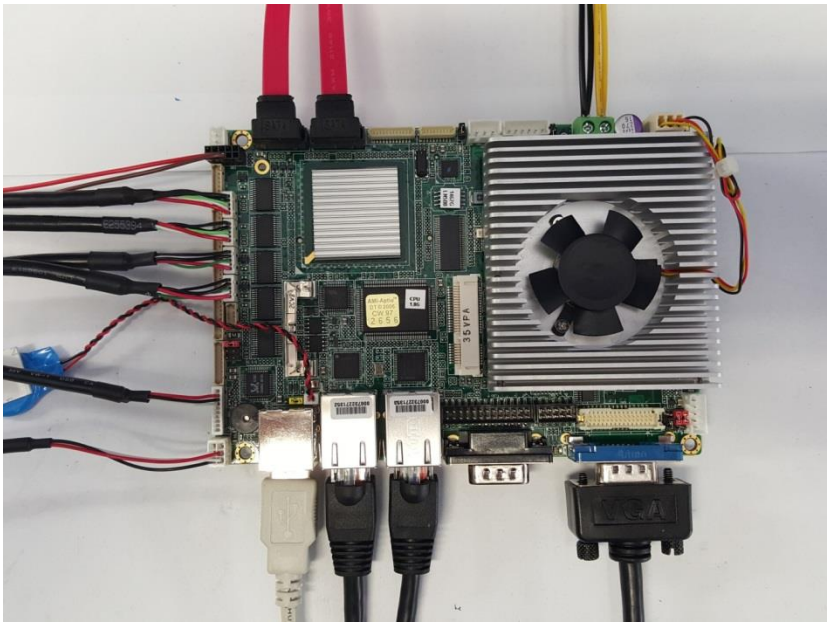


The following figure shows the location and designation of all connectors on the GENE-LN05. The figure is reproduced here from the GENE-LN05 user’s manual [1]

and is made available here as a quick reference. Please consult the user's manual for full information.



The following figure shows all cables that connect to the GENE-LN05 when it is used in a Total Recall VR LinX Altus.

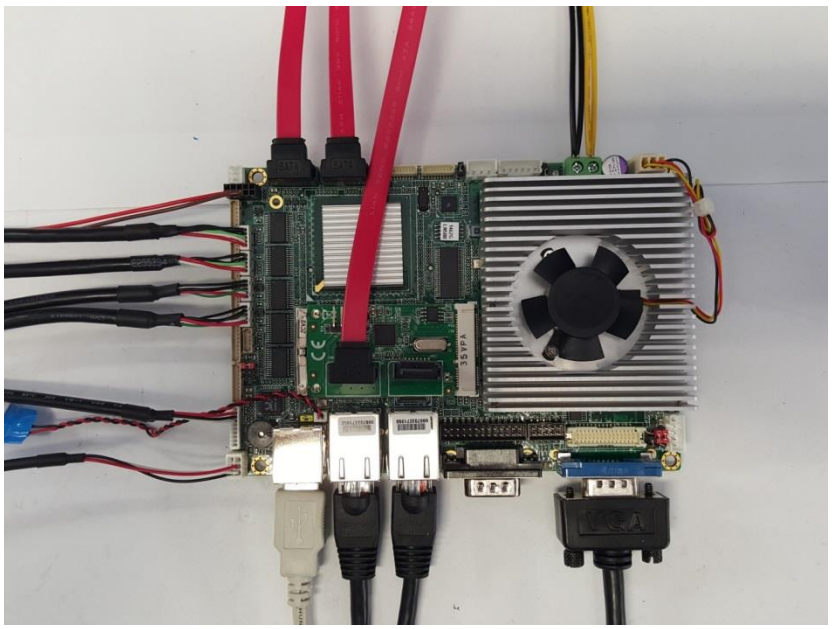


Connections:

Cable	GENE-LN05 connector	Notes
CBL-VGA-1	CN33	VGA cable to the LCD screen.
CBL-PWR-4	CN9	12V DC power supply.
CBL-SATA-RR	CN5 and CN6	SATA cables for the HDD and DVD drive.
CBL-FP-1	CN21; red cable to pin 3 and brown cable to pin 5	Red cable connects the GENE-LN05 HDD LED to the mid-board. Brown cable connects the GENE-LN05 speaker to the mid-board.
CBL-USB-5	CN14, CN16, CN17, CN19 and CN20	USB cables to the analogue channel cards.
CBL-USB-3	CN30 (bottom)	USB cable that connects the USB port on the mid-board to an external USB port on the GENE-LN05.
CBL-USB-3	CN30 (top)	USB cable to one of the analogue channel cards.
CBL-SND-4	CN23	Audio cable that connects the internal audio connector on the GENE-LN05 to the mid-board
CBL-PS2-4	CN31	Keyboard cable that connects the GENE-LN05 keyboard to the mid-board.

CBL-LAN-2	CN24 and CN25	CAT 5 cables that expose the LAN interfaces on the GENE-LN05 as the LAN 1 and LAN 2 ports on the enclosure.

The following figure shows all cables that connect to the GENE-LN05 when it is used in a Total Recall VR LinX Altus that is fitted with the RAID-1 option.



Connections:

Cable	GENE-LN05 connector	Notes
CBL-VGA-1	CN33	VGA cable to the LCD screen.
CBL-PWR-4	CN9	12V DC power supply.
CBL-SATA-RR	CN5, CN6 and CON2 on miniPCIe card	SATA cables for the HDD and DVD drive.
CBL-FP-1	CN21; red cable to pin 3 and brown cable to pin 5	Red cable connects the GENE-LN05 HDD LED to the mid-board. Brown cable connects the GENE-LN05 speaker to the mid-board.
CBL-USB-5	CN14, CN16, CN17, CN19 and CN20	USB cables to the analogue channel cards.
CBL-USB-3	CN30 (bottom)	USB cable that connects the USB port on the mid-board to an external USB port on the GENE-LN05.

CBL-USB-3	CN30 (top)	USB cable to one of the analogue channel cards.
CBL-SND-4	CN23	Audio cable that connects the internal audio connector on the GENE-LN05 to the mid-board
CBL-PS2-4	CN31	Keyboard cable that connects the GENE-LN05 keyboard to the mid-board.
CBL-LAN-2	CN24 and CN25	CAT 5 cables that expose the LAN interfaces on the GENE-LN05 as the LAN 1 and LAN 2 ports on the enclosure.

3.3. Mid-Board

The mid-board is a custom Total Recall VR board. The mid-board functions include:

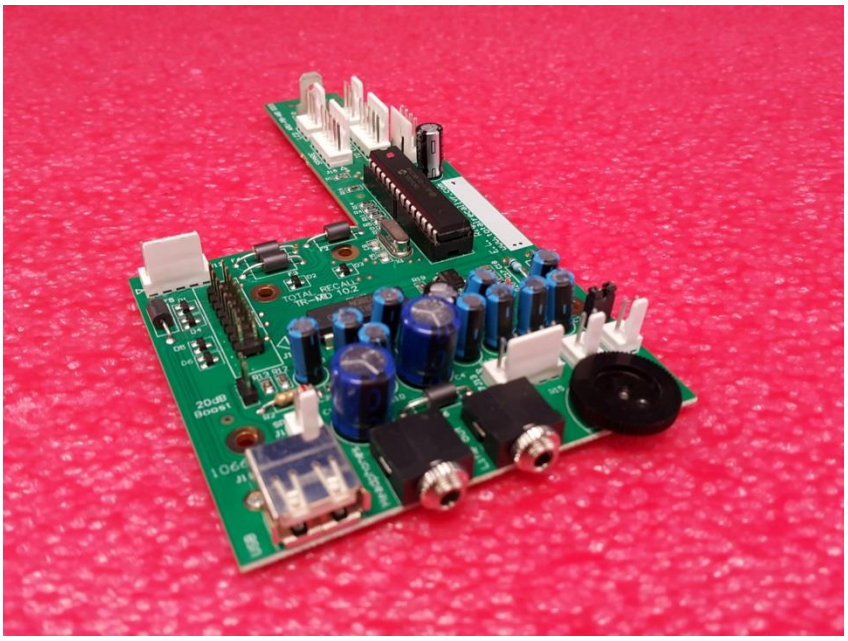
1. Keyboard interface – provides the interface necessary to connect the Total Recall VR control keypad to the SBC.
2. External HDD (red) LED and external power (green) LED control.
3. Audio mixer and amplifier – audio mixer capable of mixing audio from the PC buzzer and analogue channel cards. The signal is then amplified by a 2W audio amplifier before presented to the built-in speaker.
4. Line audio interface – line out and headphones audio outputs.
5. Fan power.
6. External USB port.

There are different versions of the mid-board. The following versions of the mid-board are used in the Total Recall VR LinX Altus model.

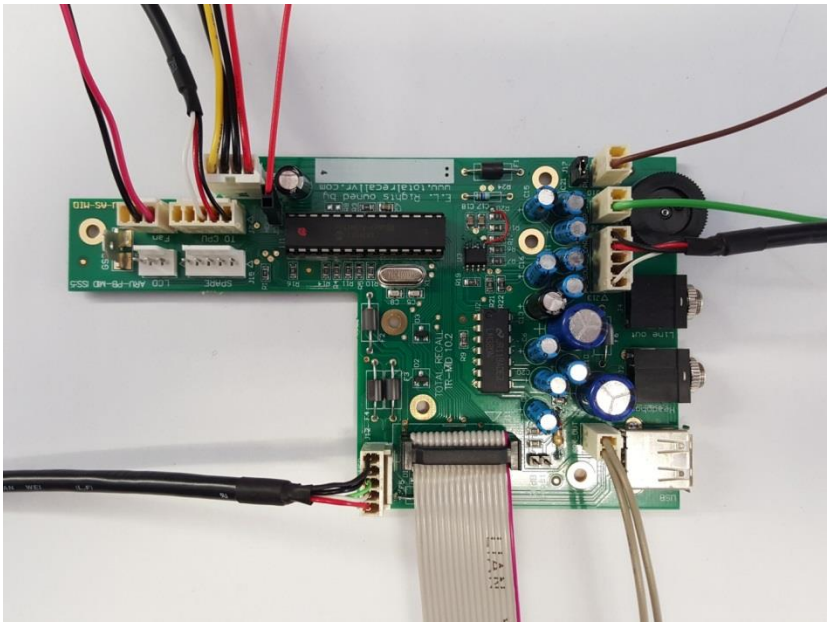
3.3.1. V10 Mid-board

Order code: MIDB-V10

The V10 mid-board is the most common version of the mid-board in use.



The following figure shows all cables that connect to the V10 mid-board when it is used in a Total Recall VR LinX Altus.



Connections:

Cable	Mid-board connector	Notes
CBL-FP-1	J10 (brown) and J3 (red)	Brown cable from the buzzer on the SBC. Red cable from the HDD LED on the SBC.
CBL-GRN	J6	Green cable for audio from the analogue channel cards.
CBL-SND-4	J13	Audio cable from the internal audio port on the SBC.
CBL-GRY	J1	Pair of grey cables that connect the external speaker to the mid-board.
Keyboard ribbon	J11	Ribbon cable from the control keypad.
CBL-USB-5	J12	USB cable from one of the USB ports on the SBC.
Fan power	J9	Fan power supply cable.
CBL-PS2-4	J7	Keyboard cable that connects the SBC keyboard to the mid-board.
CBL-PWR-2	J8	Mid-board power supply cable.

Note: J16 must be removed when using the V10 mid-board with GENE-LN05.

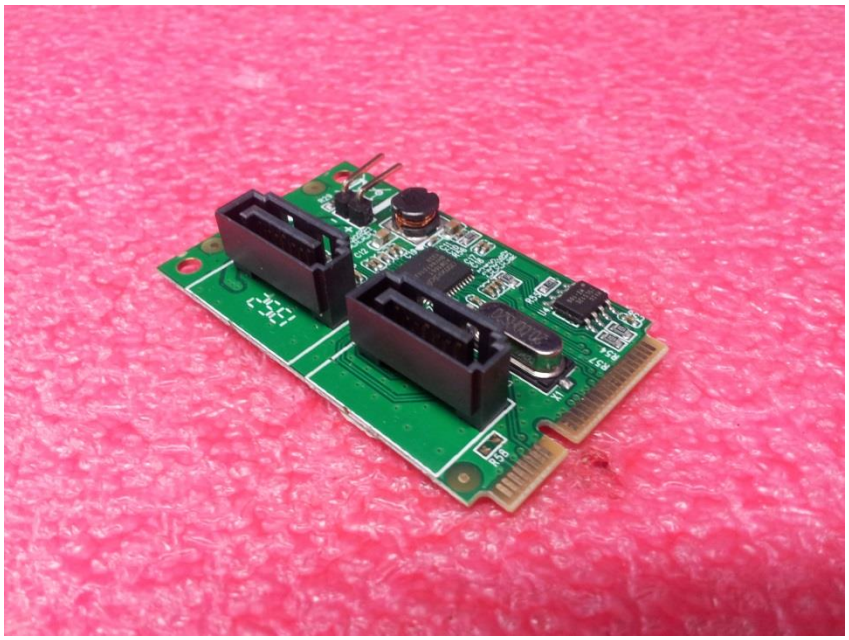
3.4. SATA Port Expansion Card

Order code: PCI-SATA.

Total Recall VR uses standard off-the shelf miniPCIe SATA port expansion card when fitted with the RAID-1 option.

It is important to use a card with compatible SATA chip set. Not all SATA chip sets are compatible with the operating system used by Total Recall VR.

By default Total Recall VR is fitted with a SATA expansion card which uses the ASMEdia ASM1061 chipset.



3.5. Analogue Channel Card

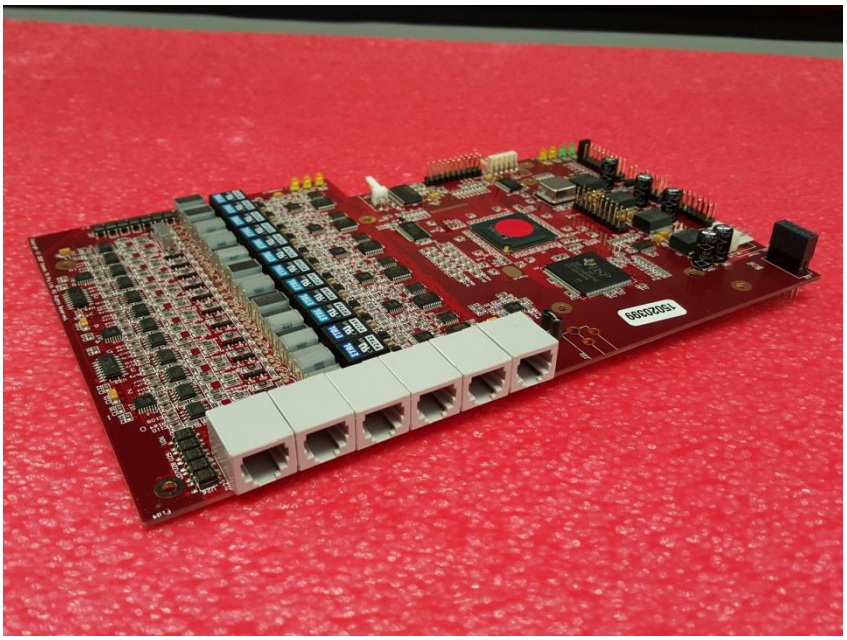
Order codes:

DSP4-USB 4 channel card

DSP8-USB 8 channel card

DSP12-USB 12 channel card

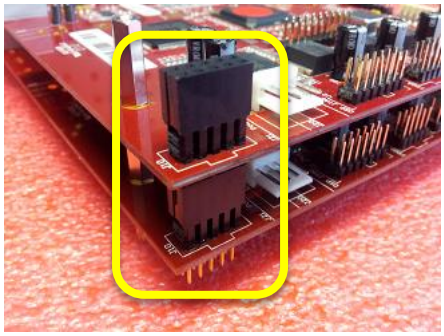
The analogue channel card is a custom Total Recall VR card.

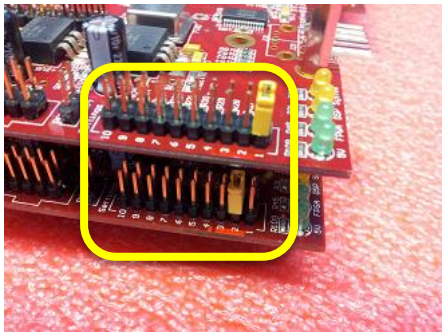


Its function is to interface analogue audio lines and analogue telephone lines to the Total Recall VR for the purpose of recording.

Each card can have 4, 8 or 12 recording channels. However, this card is stackable. Up to 6 cards can be combined in a single stack to provide up to 72 recording channels in a single stack. The following image shows a stack of two cards: a 12 channel card and an 8 channel card which creates a stack capable of recording 20 analogue sources.

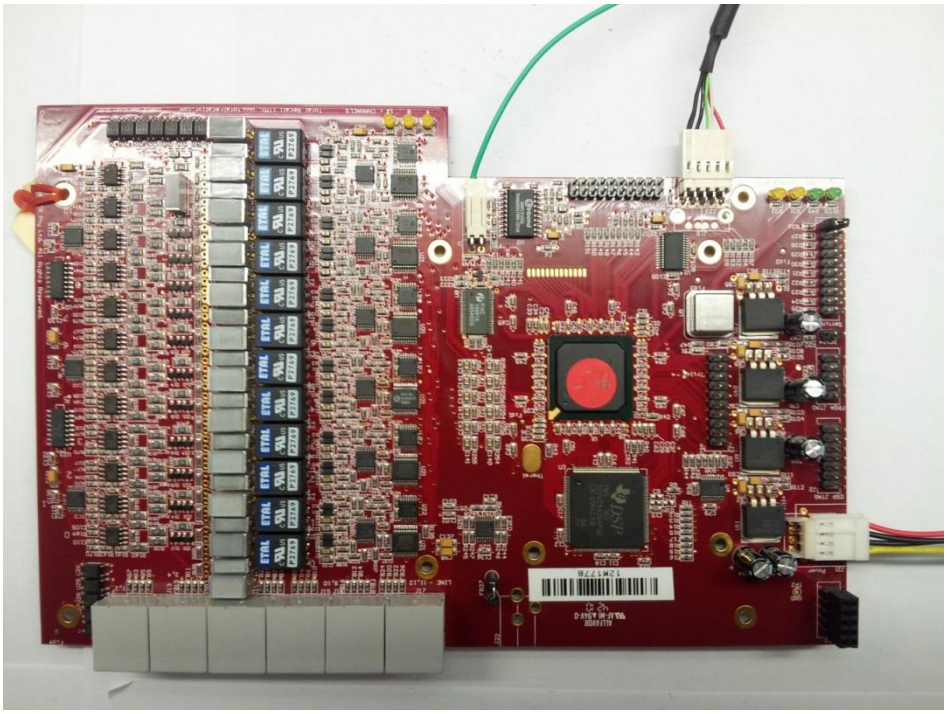
When stacking cards it is important to get two things right. First, the power connector, J10, must be connected correctly. Second, the stack position jumper, J5, must be set to the correct position: 1 for the first card, 2 for the second, 3 for the thirds card and so on.





If two cards in the stack have the J5 jumpers in the same position, then the system may not detect the cards correctly and will fail to initialise the cards.

The following figure shows all cables that connect to the analogue channel cards when it is used in a Total Recall VR LinX Altus.



The CBL-GRN and the power cable always connect to the 1st card in the stack.

The top card in the stack should always be the 1st card. This makes it easy to connect all cables to it.

Connections:

Cable	DSP card connector	Notes
CBL-GRN	J1	Green audio cable that connects the channel card to the mid-board.
CBL-USB-1	J23	USB cable which connects the card to one of the USB ports on the SBC.
Power cable	J21	Power for the (stack of) cards.

3.6. Power Supply

Total Recall VR is powered by a standard Flex form factor power supply. However, optionally, Total Recall VR may be fitted with an ATX size dual hot-swap power supply.

We modify the cable configuration of power supplies that are used in Total Recall VR to reduce wire clutter, connect correct power connectors and extend wires to correct length.

If you purchase a power supply from sources other than us, then it is likely that you will need to modify the power supply cables in order to fit the power supply in the enclosure.

Total Recall VR requires the following power connectors on the power supply:

One P4 connector (12VDC) to power the SBC.

Two floppy connectors to power the mid-board and the stack of analogue channel cards.

Two SATA power connectors for power to the HDD and DVD/BD drive.

3.6.1. FSP Group FSP-180PLA1

Order code: n/a

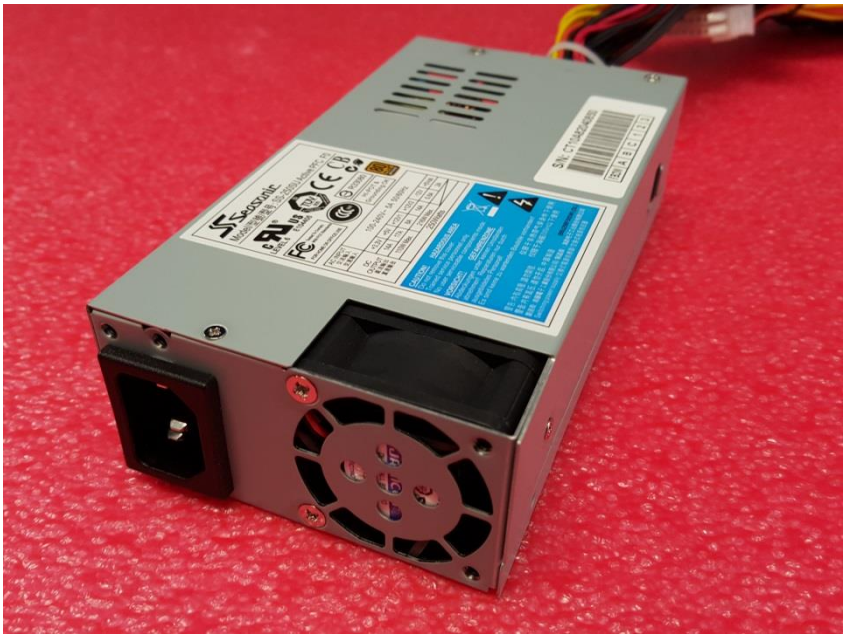
Order PSU-FLEX-250 instead.

Early systems were fitted with a FSP-180PAL1 power supply. It is a Flex form factor, non-redundant, 180W power supply.

3.6.2. Seasonic SS-250SU

Order code: PSU-FLEX-250

The SS-250SU is the most common power supply in use. It is a Flex form factor, non-redundant, 250W power supply.



The position of the fan is not the same on all Flex form factor power supplies. If you source your own power supply you may find that the fan hole on the enclosure partially covers the fan.

If you fit such power supply, air flow will be restricted which will severely reduce the life-span of the power supply and cause it to fail due to overheating.

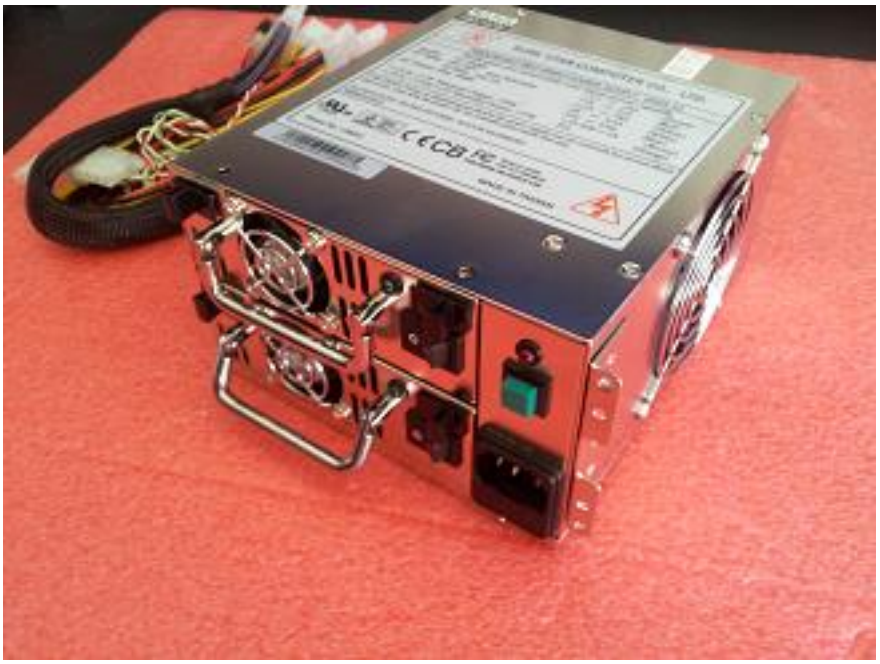
When a power supply fails it is very likely that it will damage other electronic components in the system.

3.6.3. Sure Star TC-400R8

Order code: PSU-HS-400W

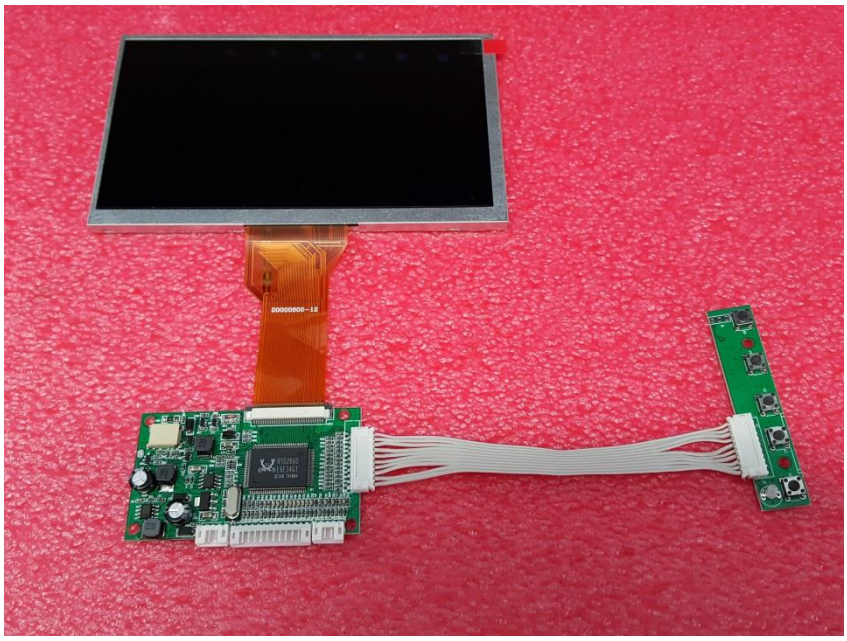
The TC-400R8 is the dual hot-swap redundant power supply.

To our knowledge this is the only dual hot-swap redundant supply that fits in the Total Recall VR LinX Altus enclosure.

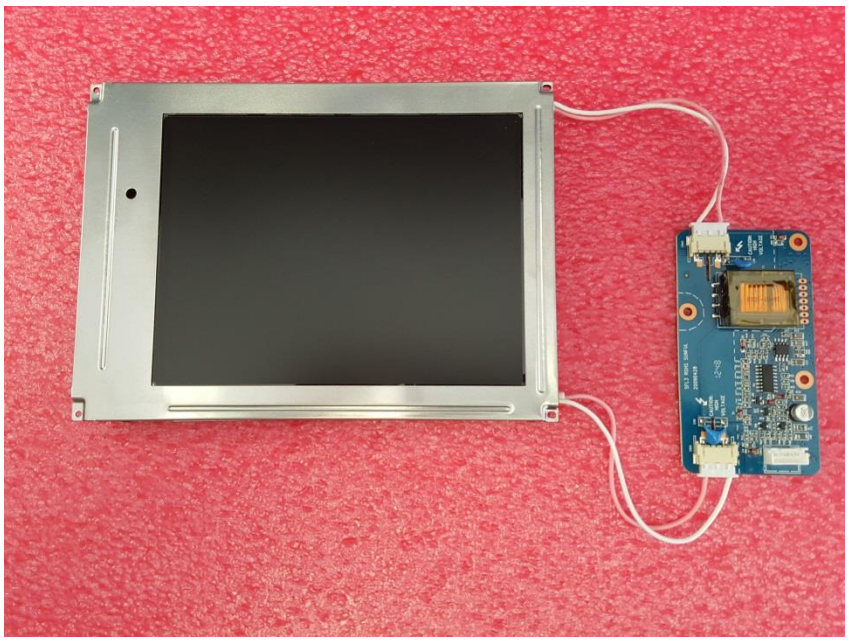


3.7. LCD Panel

Total Recall VR uses a 7” wide screen LCD panel with TTL interface. In order to connect the panel to the SBC, Total Recall VR uses a TTL to VGA converter board.



However, some Total Recall VR systems were fitted with a 6.4” LCD panel with LVDS interface. Inverters were used with such panels in order to power their back light.



3.7.1. Innolux AT070TN92

Order code: LCD169-TTL

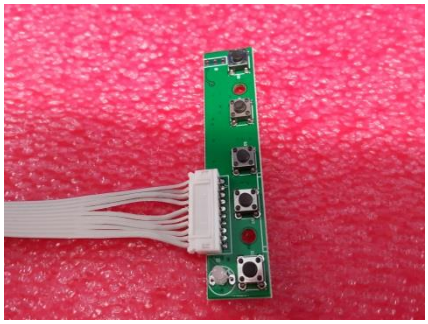
The Innolux AT070TN92 LCD panel is the most common panel in use by Total Recall VR. It has a TTL video interface and supports the 640x480 video resolution.

3.7.2. Jouynet JYVGA-01

Order code: LCD169-VGA

The Jouynet JYVGA-01 is a VGA to TTL converter board that is capable of displaying VGA signal on Innolux LCD panels with TTL interface such as the Innolux AT070TN92.

The converter comprises of 2 parts: the VGA to TTL converter board and an OSD button board.



The BIOS of the VGA to TTL converter has custom settings for Total Recall VR.

Boards that are not purchased from us must be reprogrammed with the correct settings in order to operate correctly when fitted in a Total Recall VR.

3.7.3. E-Ink PD064VL1

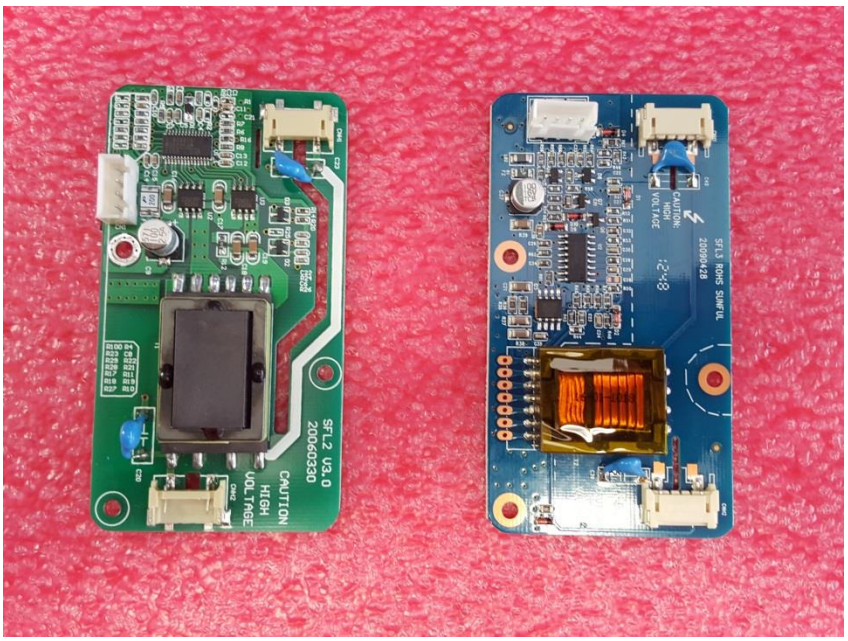
Order code: LCD43-LVDS

The E-Ink PD064VL1 is 6.4” LCD panel. It has an LVDS video interface and supports the 640x480 video resolution.

3.7.4. E-Sunfly Technology SFD064VL1-INVT-R or Homtecs HT064VL1-INVT

Order code: LCD43-INV

The SFD064VL1-INVT-R and HT064VL1-INVT are inverter boards capable of driving the backlight of E-Ink’s PD064VL1 LCD panel.



Note: the two inverters are interchangeable.

3.8. Control Keypad

Order code: KYB-R

Total Recall VR uses a custom designed control keypad.

3.9. Storage Devices

3.9.1. Hard Disks

Order codes:

HDD-SATA	3.5” hard disk with Total Recall VR software
HDD-SATA-M	2.5” hard disk with Total Recall VR software
HDD-SATA-S	2.5” SSD with Total Recall VR software

Total Recall VR, in its standard configuration, is fitted with high performance 3.5” hard drives that are designed for audio-visual applications.

Alternatively, Total Recall VR can be fitted 2.5” mobile hard drives and solid state drives (SSD).

Supported drives:

1. 3.5” disk drives
    a. Western Digital WD10EURX
    b. Western Digital WD10PURX
2. 2.5” disk drives
    a. Western Digital WD10JFCX
3. 2.5” solid state drives
    a. Samsung MZ-7K1T0BW (850 Pro)

3.9.2. Disc Drives

By default, Total Recall VR is fitted with a 5.25” BluRay disc reader/writer.

Order code: DVD-RW-SATA

Supported drives:

1. Pioneer BDR-209DBK

2. Panasonic UJ260

3.10. Hard Disk Caddy

Order code: HDD-CADY-RD.

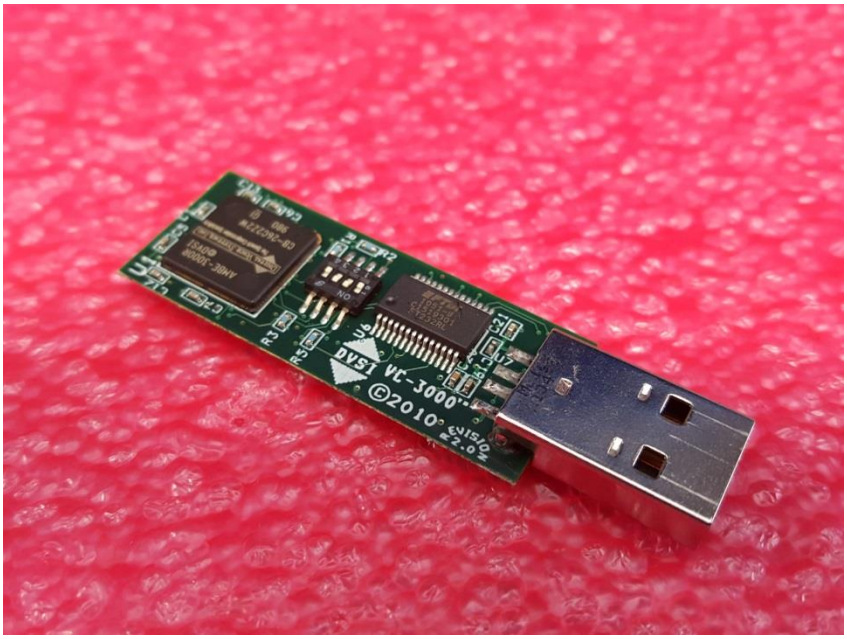
Total Recall VR uses the MB994IPO-3SB disk drive caddies from Icy Dock when fitted with the RAID-1 option.

3.11. AMBE Decoder

Order codes:

TRVR-AMBE	One channel AMBE decoder
TRVR-AMBE-3	Three channel AMBE decoder

Total Recall VR may be fitted with a hardware based AMBE decoder. If fitted, the AMBE decoder is attached to one of the interval USB ports and it cannot be removed from the system without opening the enclosure.



4. How to …

4.1. Replace the filter

You can replace the filter while the system is operational.

You can purchase new filter from your Total Recall VR reseller/distributor or directly from us.

Step 1:

	Remove the filter cover.
	Then simply replace the filter with a new one. Optionally, you can wash the filter in warm and soapy water. Then leave it to dry thoroughly before replacing it back.

	Finally, fit the filter cover.

4.2. Remove the top cover plate

In most cases you will need to remove the top cover plate in order to complete maintenance activities.

Step 1:

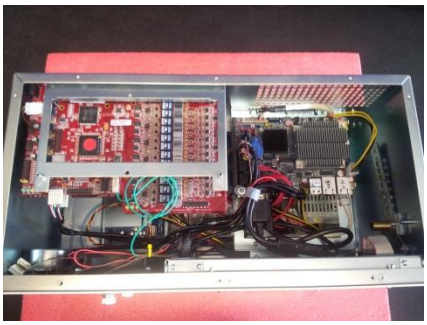
	Remove the two screws that hold the stack of analogue channel cards first. These screws are a bit longer than the other screws that hold the top cover in place. Make sure to keep them separate from the rest. They are easy to mix up.

Step 2:

	Remove the rest of the screws (10 in total) that hold the top cover plate in place. Make sure to keep them separate from the two screws that you removed during step 1. They are shorter and easy to mix up.

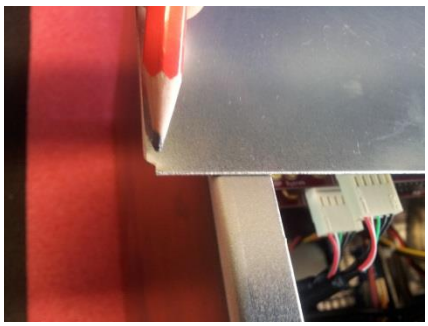
Step 3:

	Finally, simply remove the top cover plate.

	The unit without its top cover.

4.3. Fit the top cover plate

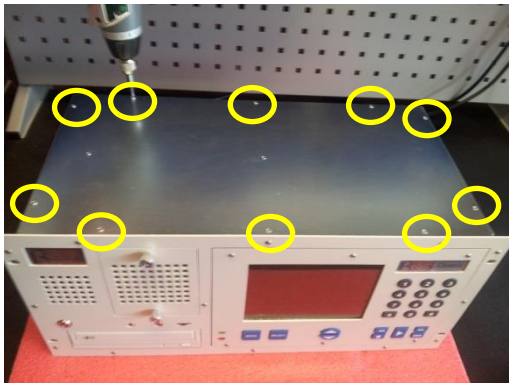
Step 1:

	Identify the front edge of the cover plate by looking for the edge with corners with small cut-outs.
	Put the cover plate in place.

Step 2:

	Fit the two screws that hold the stack of analogue channel cards first. These screws are a bit longer than the other screws that hold the top cover plate in place.

Step 3:

	Fit the rest of the screws (10 in total) that hold the top cover plate in place.

4.4. Remove the bottom cover plate

You need to remove the bottom cover plate for some maintenance operations, such as replacing the hard disk, disc drive or power supply for example.

Step 1:

	Flip the unit upside down.

Step 2:

	Remove the screws (10 in total) that hold the bottom cover plate in place.

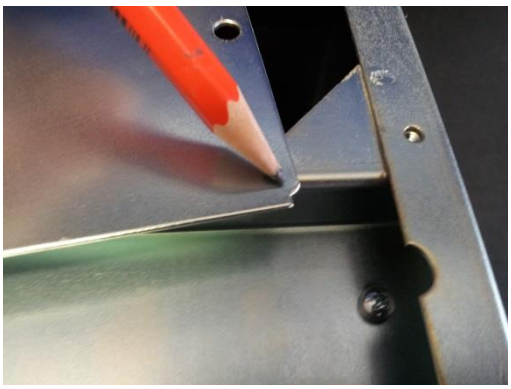
Step 3:

	Finally, simply remove the bottom cover plate.

	The unit without its bottom cover.

4.5. Fit the bottom cover plate

Step 1:

	Identify the front edge of the cover plate by looking for the edge with corners with small cut-outs.
	Put the cover plate in place.

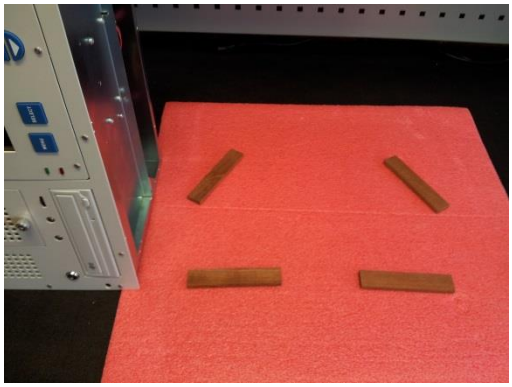
Step 2:

	Fit the screws (10 in total) that hold the bottom cover plate in place.

4.6. Remove the main face plate

You need to remove the main face plate for some maintenance operations, such as replacing the mid-board for example.

Step 1:

	To remove the main face plate you must sit the unit at a small distance from the bench surface. You can use 4 pieces of wood or plastic which are at least 5mm high.
	Sit the unit on top of the spacer and make sure that the front bottom edge is above the bench surface.

Step 2:

	Remove the screws (13 in total) that hold the face plate in place.

	The unit without its main face plate.

4.7. Fit the main face plate

Step 1:

	To fit the main face plate you must sit the unit at a small distance from the bench surface. You can use 4 pieces of wood or plastic which are at least 5mm high.
	Sit the unit on top of the spacer and make sure that the front bottom edge is above the bench surface.

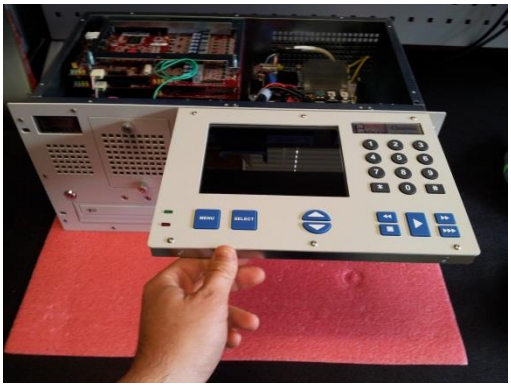
Step 2:

	Place the face plate in position and then replace the screws (13 in total) that bind the face plate to the main enclosure.

4.8. Remove the keyboard & LCD face plate

You need to remove the keyboard and LCD face plate for some maintenance operations, such as replacing the LCD protective glass and the LCD screen itself.

Step 1:

	To remove the keyboard and LCD face plate you must lift the screen flat to its highest up-right position.

Step 2:

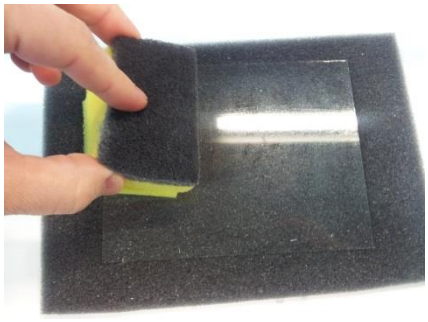
	Remove the screws (6 in total) that hold the face plate in place. Be careful to not push down the flap while removing the screws. A glass plate, which can break easily, exists just under the face plate and above the LCD screen.
	Remove the face plate while making sure that the flap remains in its up-right position.

	Remove the glass cover plate which protects the LCD screen. NOTE: The LCD screen can easily scratch without the protective glass cover plate.
	The unit without its keyboard and LCD face plate.

4.9. Fit the keyboard & LCD face plate

It is important to keep the protective glass cover and the LCD display surface clean from dust and other particles during this procedure.

Step 1:

	Clean the protective glass plate with glass cleaner. We use Windex No-Streak cleaner in the factory. The glass must be clear of all dust and finger marks.

Step 2 (optional):

	If you installed a new LCD screen then peel the screen protector from the face of the screen.

Step 3:

	To fit the keyboard and LCD face plate you must lift the screen flat to its highest up-right position

	Place the glass plate on top of the display. Make sure to not leave any finger marks on the glass while doing this. Make sure there is no dust or other particles on the surface of the LCD screen.
	Place the face plate in position. Make sure that the flap remains in its up-right position while doing this.
	Replace the screws (6 in total) that hold the face plate in place. Be careful to not push down the flap while replacing the screws.

4.10. Remove the analogue channel card stack

You must remove the stack of analogue channel cards before you can add cards to it or replace faulty cards. Also, some maintenance activities are only possible when the stack of analogue channel cards is not in the enclosure.

Before you begin:

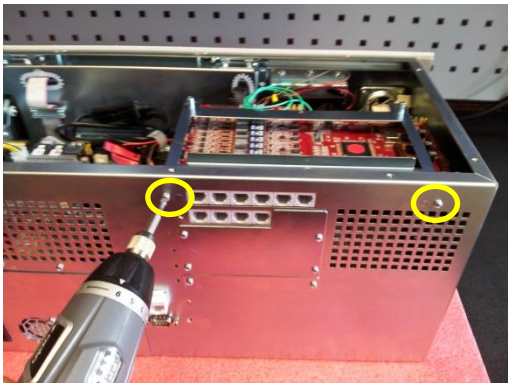
1. Remove the top cover plate – section 4.2.

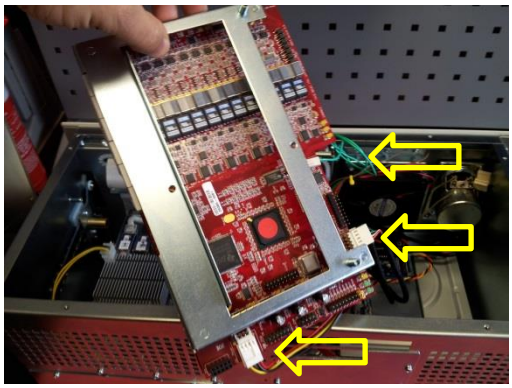
Then:

Step 1:

	It is easier to remove the stack of analogue channel cards if you are facing the back of the unit.

Step 2:

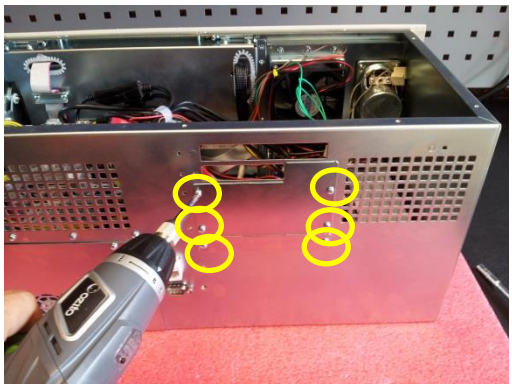
	Remove the screws (2 in total) that hold the stack support frame. Note: you may have to hold the frame with one hand to stop it from falling into the enclosure and damaging the mid-board which is right under the stack.

	Lift the whole stack out of the enclosure. Detach the cables from the channel cards: • Green cable from the top card • Power cable from the top card • USB cable from each of the cards
	The stack of analogue channel cards free from the system.

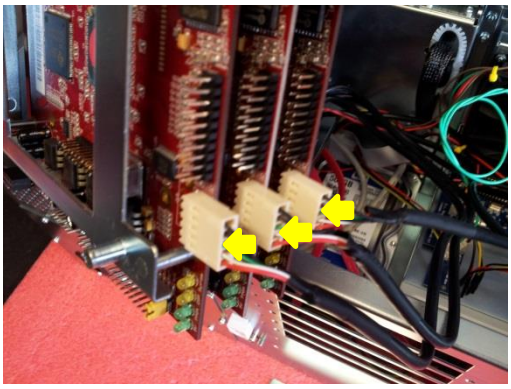
4.11. Install the analogue channel card stack

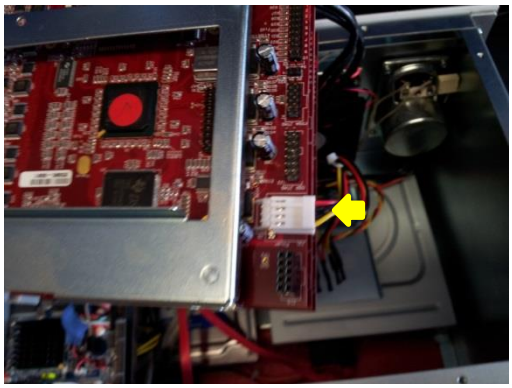
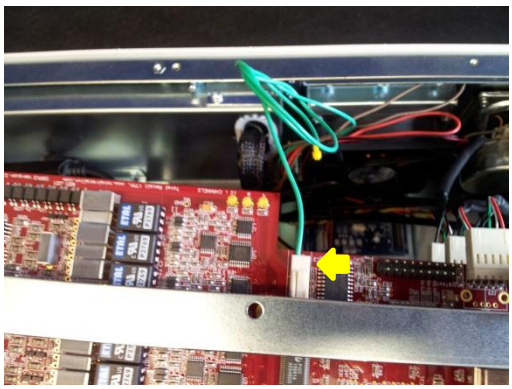
You may have to remove the port blanking plates in order to install the stack of analogue channel cards back into the enclosure. This is optional and necessary only when you change the configuration of the stack.

Step 1 (optional):

	Remove the port blanking plates.
	The enclosure without port blanking plates.

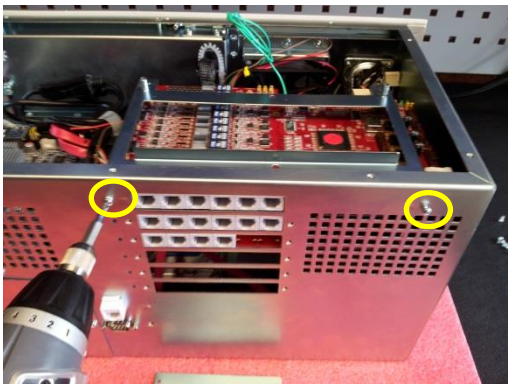
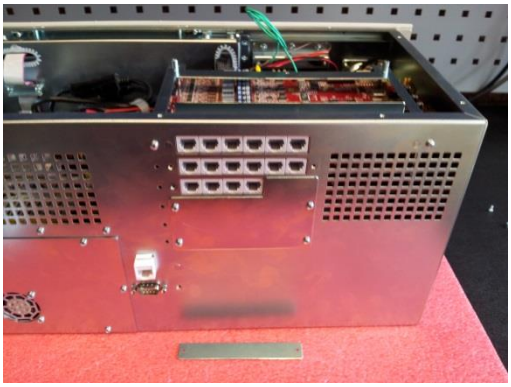
Step 2:

	Attach a USB cable to J23 on each of the cards.

	Attach power to J21 on the top card.
	Attach the green audio cable to J1 on the top card.

Step 3:

	Place the stack in its position in the enclosure. The stack frame (top metal bracket) needs to slot into two guides on the inside wall of the enclosure wall.

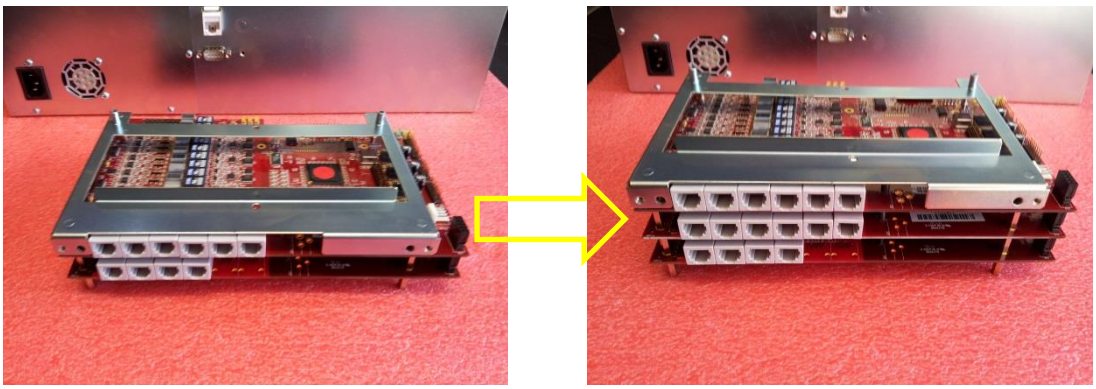
	Replace the screws (2 in total) that attach the frame to the enclosure wall.
	Install the port blanking plates(s) – if removed.
	The unit with the stack of analogue channel cards in place.

You may need different (new) port blanking plates if you change the configuration of the stack. Please order port blanking plates from your Total Recall VR reseller/distributor or directly from us.

4.12. Add an analogue channel card

You need to add one, or more, analogue channel cards in order to increase the number of analogue recording channels.

In this section, as an example, we explain how to add a 12 channel card to a stack of two analogue channel cards: one with 12 and another with 8 analogue channels.



Note that, as an example, during the procedure we will move the card with 8 channels from position 2 in the stack to position 3. The new 12 channel card will take position 2. Typically you will simply add the new card as the last card in the stack.

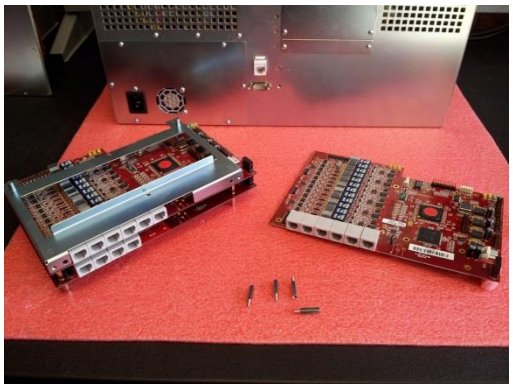
Please use the example as a learning aid and modify the steps to suit your upgrade scenario.

Before you begin:

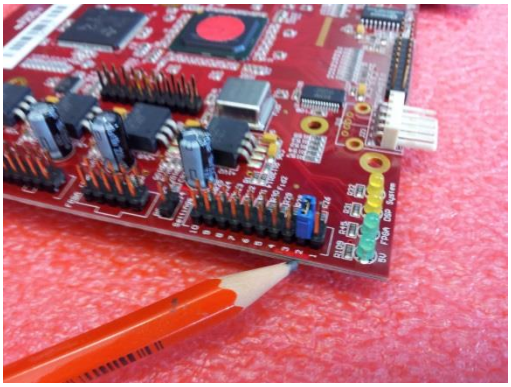
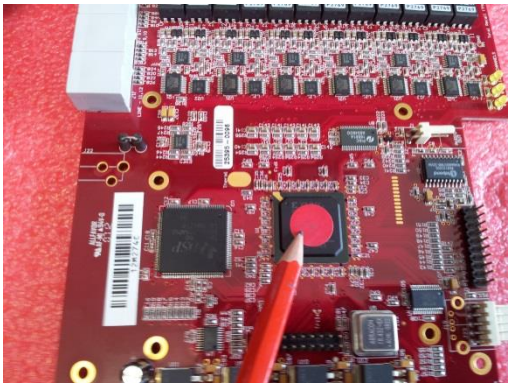
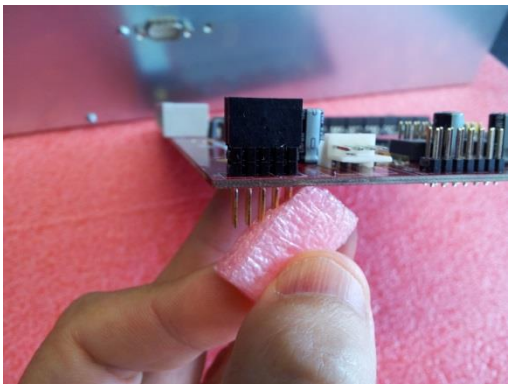
1. Remove the top cover plate – section 4.2.
2. Remove the analogue channel card stack – section 4.10.

Then:

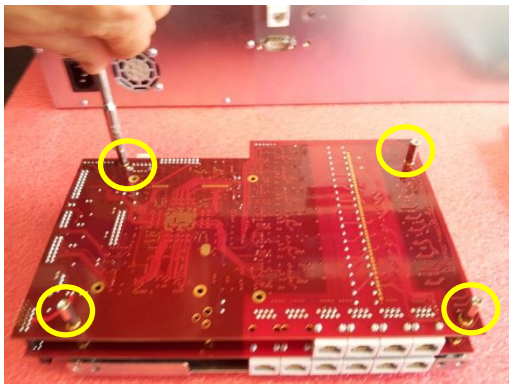
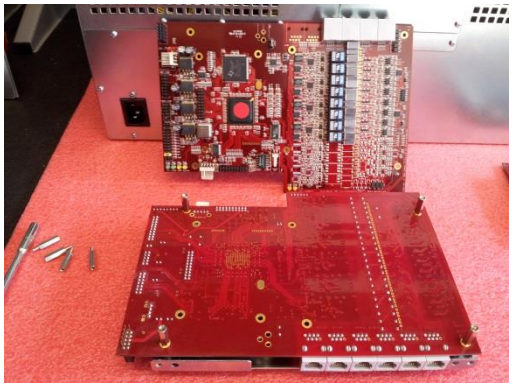
Step 1:

	Make sure that you have a new analogue channel card. You need 4 female-male spacers [M3 x 16 – 6.5mm].

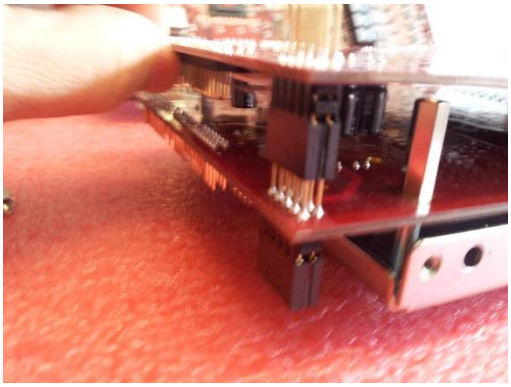
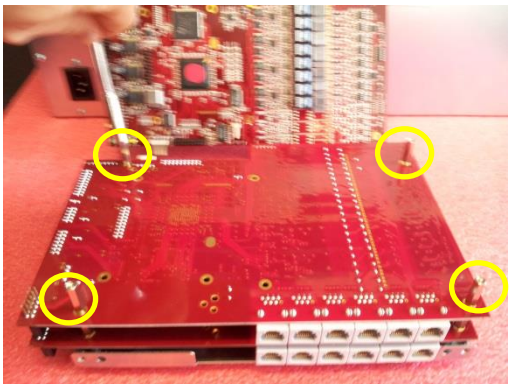
Step 2:

	We will place the new card in position 2 in the stack (2nd card in the stack). So, make sure that the new card has a jumper in position 2 of J5. If you plan to place the new card in a different position in the stack, then make sure that J5 has a jumper in the correct position.
	Make sure that the new card has the same colour sticker on the FPGA chip as the other cards in the stack. NEVER mix cards with different colour stickers in the same stack.
	Remove the protective sponge from the power connector on the new card.

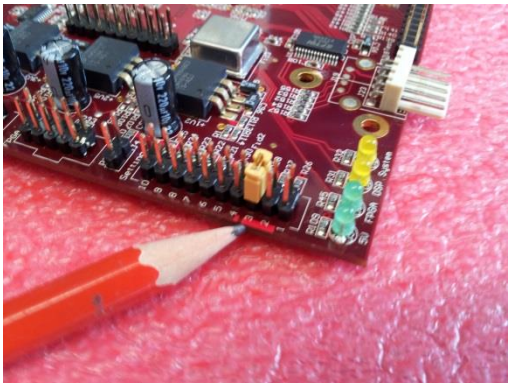
Step 3:

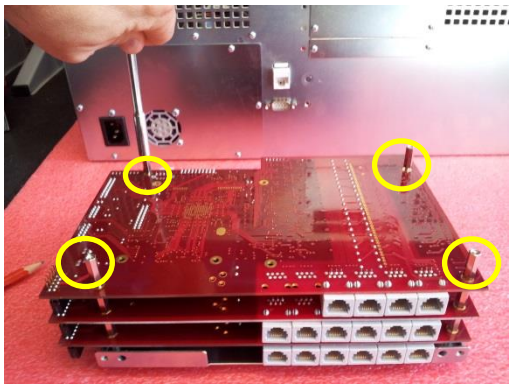
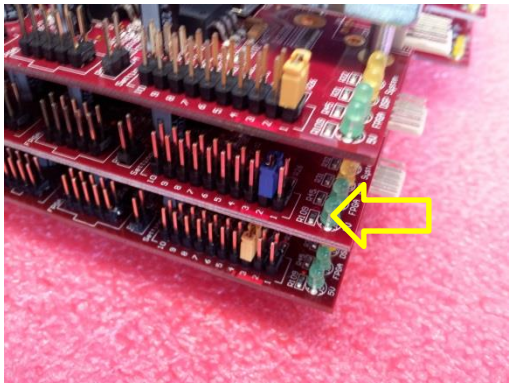
	Place the stack upside down, so it sits on the stack support frame.
	Remove the spacers which hold the last card in the stack.
	Carefully separate the last card from the stack.

Step 4:

	Add the new card to the stack. Make sure that the all pins of the power connector connect.
	Attach the new card to the stack with 4 spacers.

Step 5:

	Re-attach the old card to the stack. However, before we do that we need to set J5 correctly. It is set to position 2 because the card was the 2nd card in the stack. It needs to be set to position 3 as the card is now the 3rd card in the stack. So move the jumper to position 3.

	No add the card to the stack and attach it with the spacers.
	Flip the stack to its upright position.
	One final check of the jumpers on the J5 connectors. They need to be in position 1, 2, and 3 starting from the top card and moving towards the bottom card. The card (arrow) with a blue jumper is the new card which now is between the two old cards.

At this stage we can install the stack back into the enclosure. To complete the procedure:

1. Install the analogue channel card stack– section 4.11.

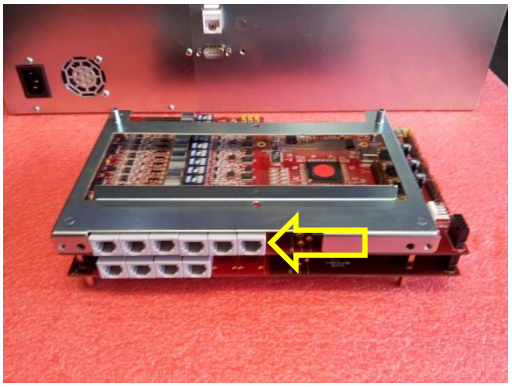
You may need different (new) port blanking plates to complete the upgrade. Please order port blanking plates from your Total Recall VR reseller/distributor or directly from us.

Your Total Recall VR reseller/distributor and we can supply you with channel number labels.

4.13. Replace an analogue channel card

You need to replace an analogue channel card when it is no longer working properly or if you wish to add a new card with higher channel count in its place.

In this section, as an example, we explain how to replace a 12 channel card which is the first card in a stack of two analogue channel cards: one with 12 and another with 8 analogue channels.



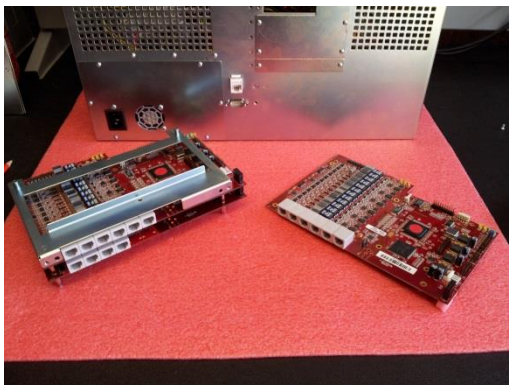
Please use the example as a learning aid and modify the steps to suit your repair scenario.

Before you begin:

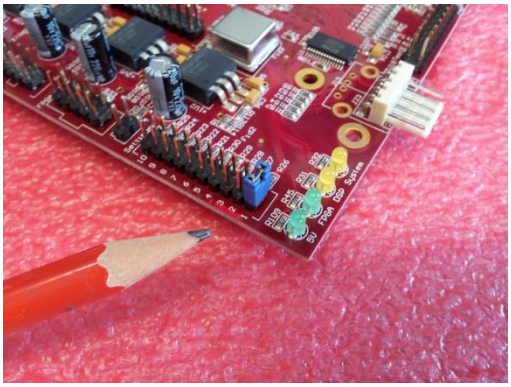
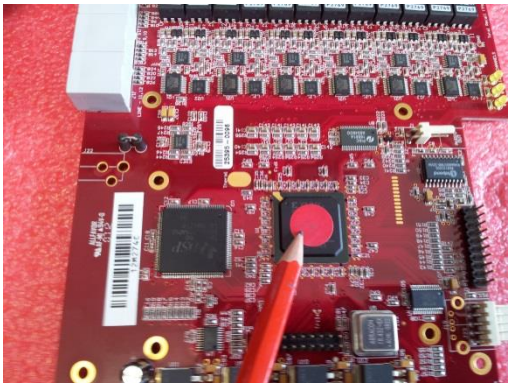
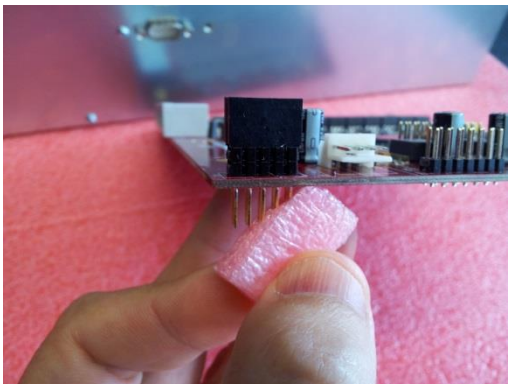
1. Remove the top cover – section 4.2.
2. Remove the analogue channel card stack – section 4.10.

Then:

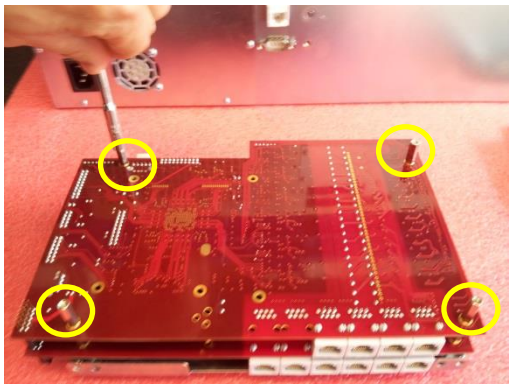
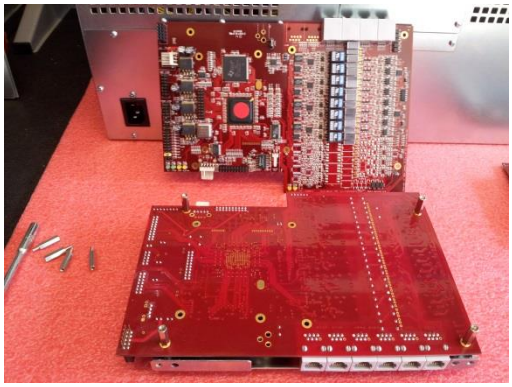
Step 1:

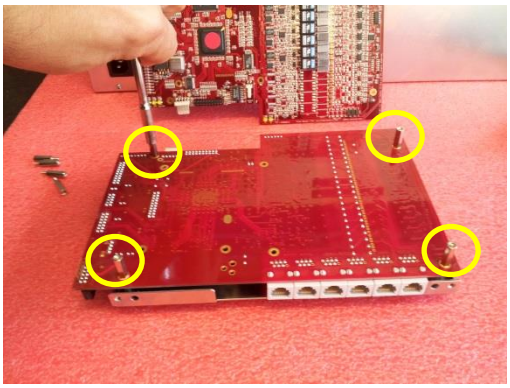
	Make sure that you have a new analogue channel card.

Step 2:

	We will place the new card in position 1 in the stack (1st card in the stack). So, make sure that the new card has a jumper in position 1 of J5. If you plan to place the new card in a different position in the stack, then make sure that J5 has a jumper in the correct position.
	Make sure that the new card has the same colour sticker on the FPGA chip as the other cards in the stack. NEVER mix cards with different colour stickers in the same stack.
	Remove the protective sponge from the power connector on the new card.

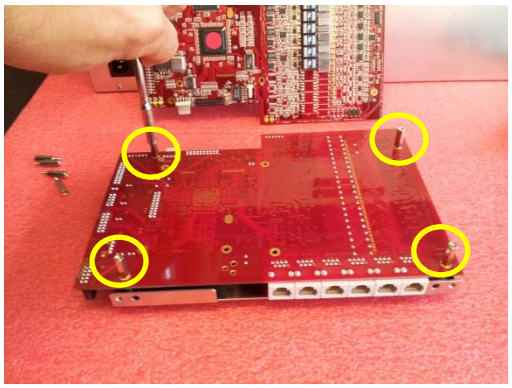
Step 3:

	Place the stack upside down, so it sits on the stack support frame.
	Remove the spacers which hold the last card in the stack.
	Carefully remove the last card from the stack.

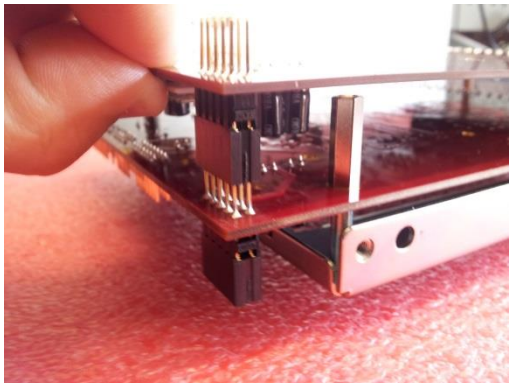
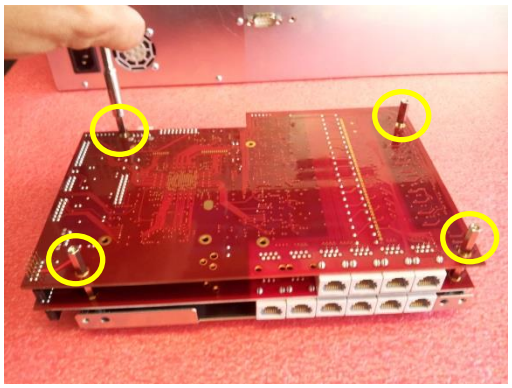
	Remove the spacers which hold the card that will be replaced.
	Remove the card that will be replaced. Put this card aside so you do not mix it up with the new card.

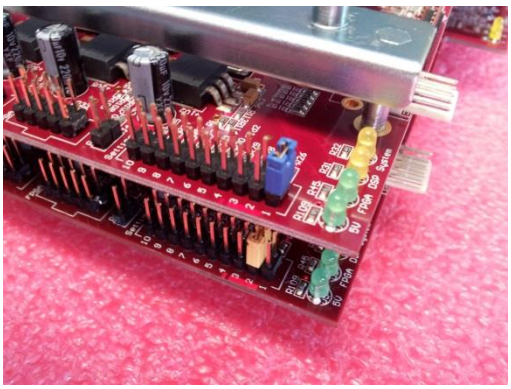
Step 4:

	Place the new card in its position.

	Attach it to the stack with the spacers.

Step 5:

	Replace the old working card in its position. Make sure that the all pins of the power connector connect.
	Attach it to the stack with the spacers.

	Flip the stack to its upright position.
	One final check of the jumpers on the J5 connectors. They need to be in position 1 and 2 starting from the top card and moving towards the bottom card. The card with a blue jumper is the new card which now is in the same position as the card that was replaced.

At this stage you can install the stack back into the enclosure. To complete the procedure:

1. Install the analogue channel card stack– section 4.11.

4.14. Replace the single board computer

You need to replace the SBC when it is no longer functioning.

> A new SBC will invalidate the channel and feature license of the system. Please send us the Hardware Key once you complete the procedure in this section so we can issue a new channel and feature license key.

Before you begin:

1. Remove the top cover – section 4.2.

Then:

Step 1:

	Make sure that you have a replacement SBC.

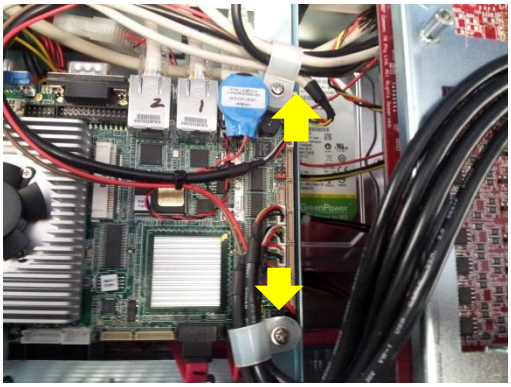
Step 2:

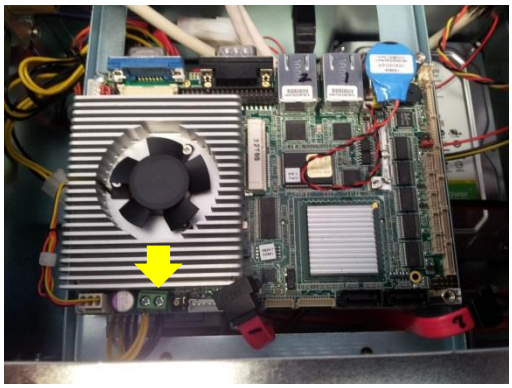
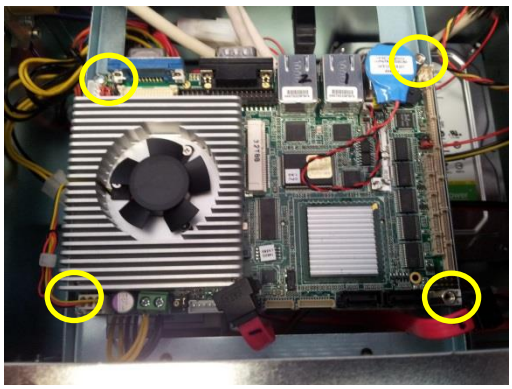
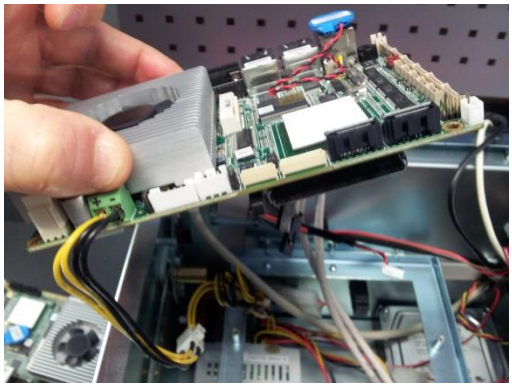
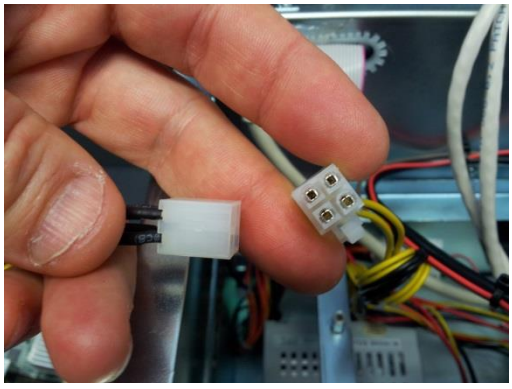
	It is easier to replace the SBC if the back of the enclosure is facing you.

Step 3 (optional and on early systems only):

	Identify the keyboard connector. It is covered by duct tape to stop it from disconnecting during transport.
	Remove the duct tape and disconnect the keyboard from the SBC.

Step 4:

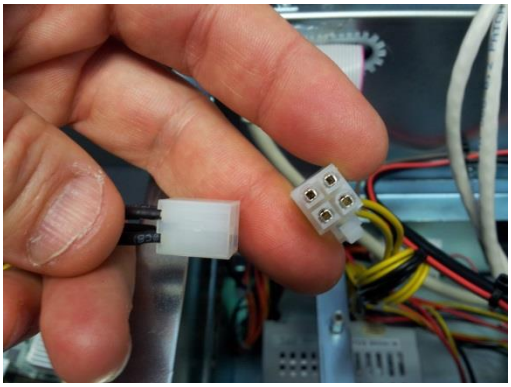
	Remove the P clips (2 in total) that attach cables to the edges of the SBC.

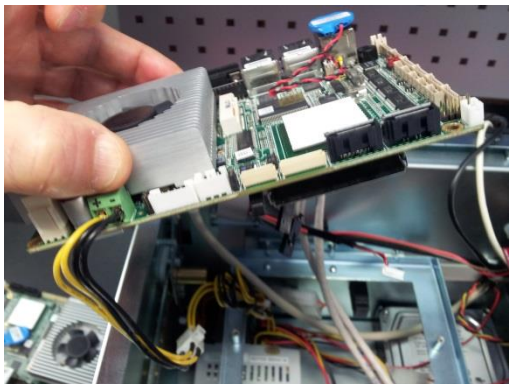
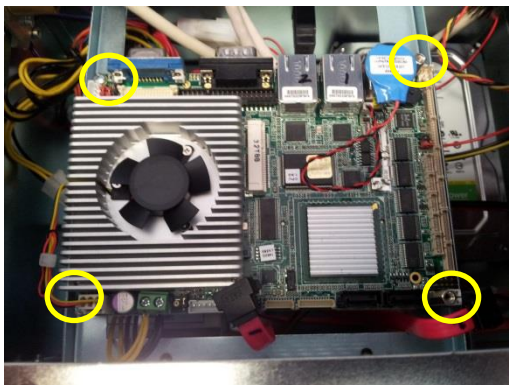
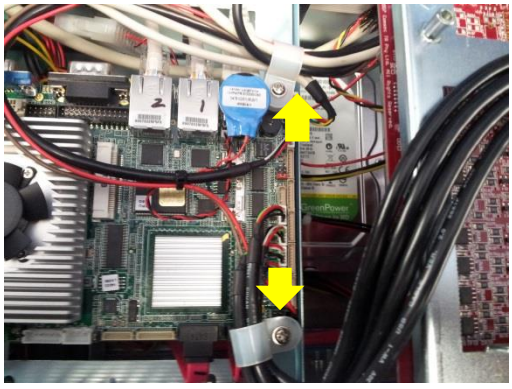
	Disconnect all cables from the SBC except for the power cable (the arrow points to this cable). The image shows the SBC free of cable connections except the keyboard/mouse cable.
	Remove the screws (2 in total) and spacers (2 in total) that bind the SBC to the frame.
	Carefully lift the SBC out of the enclosure.
	Disconnect the power cable.

Step 5:

	Attach the power cable to the new SBC.
	Attach the battery to the top of the USB port stack on the new SBC.

Step 6:

	Attach the power cable from the SBC to the power supply.

	Carefully place the new SBC in position. Be careful to leave all cables above the SBC.
	Replace the screws (2 in total) and spacers (2 in total) that bind the SBC to the frame.
	Attach all cables to the SBC.
	Replace the P clips (2 in total) that attach cables to the edges of the SBC.

Step 7 (optional and on early systems only):

	Identify the keyboard connector and connect the system keyboard to it.
	Replace the duct tape that stops the keyboard connectors from disconnecting.

At this stage you should:

1. Check the BIOS settings – section 4.15. And if the BIOS settings are correct, then:
2. Fit the top cover plate – section 4.3.

Start the Total Recall VR application and send us the new Hardware Key for the system so we can issue new Feature and Channel license keys for it. The Total Recall VR Embedded GUI User Guide [3] contains details on the Hardware Key and license keys.

4.15. Check the BIOS settings

To check the BIOS settings you must connect an external keyboard to the SBC. You need a USB keyboard.

DO NOT attempt this procedure unless you are a qualified to work with exposed electronic circuitry under power. You risk serious injury and possible loss of life.

Electronic circuitry with hazardous voltages and under power will be exposed during this procedure.

Step 1:

	Connect a USB keyboard to the external USB port.
	Turn the system on and while it is starting press the Delete key on the keyboard to enter the BIOS setup program.

Now check that the BIOS settings against the values in the BIOS settings document for Total Recall VR that is available separately (see [2] for BIOS settings for the GENE-LN05 SBC).

Make sure to save the BIOS settings if you change any.

When done, reboot the system.

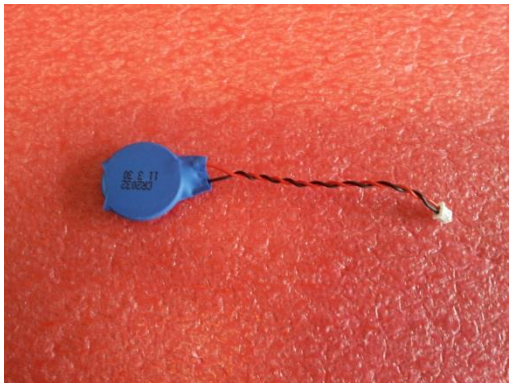
4.16. Replace the BIOS battery

Before you begin:

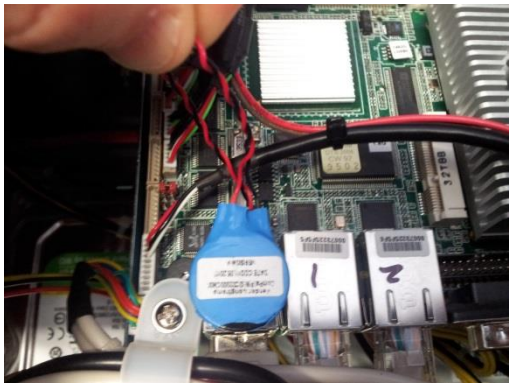
1. Remove the top cover plate – section 4.2.

Then:

Step 1:

	Make sure that you have a replacement battery.

Step 2:

	Simply disconnect the old battery and connect the new one.

At this stage you must:

1. Check the BIOS settings – section 4.15.
2. Fit the top cover plate – section 4.3.

4.17. Install an AMBE decoder

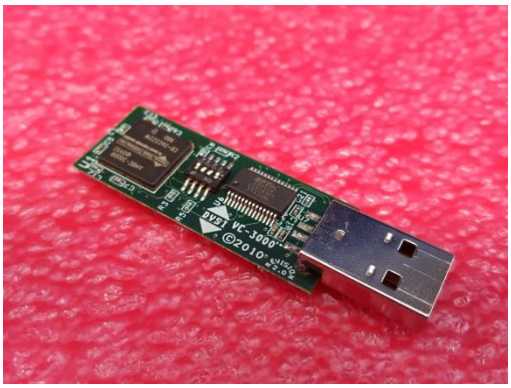
You need to install an AMBE decoder if you wish to listen to recordings that use the AMBE audio format.

Before you begin:

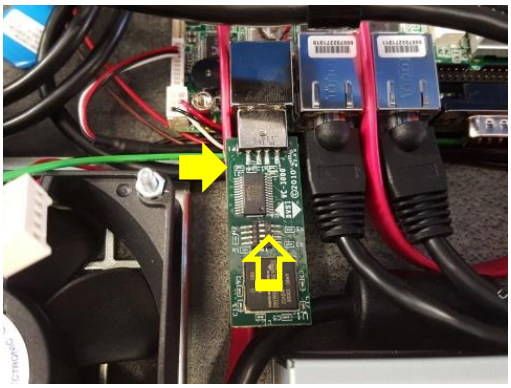
1. Remove the top cover plate – section 4.2.

Then:

Step 1:

	Make sure that you have a new AMBE decoder.

Step 2:

	Attach the AMBE decoder to the top external USB port on the SBC.

At this stage you can:

1. Fit the top cover plate – section 4.3.

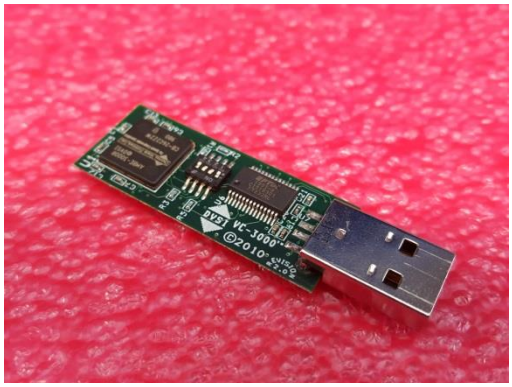
4.18. Replace the AMBE decoder

Before you begin:

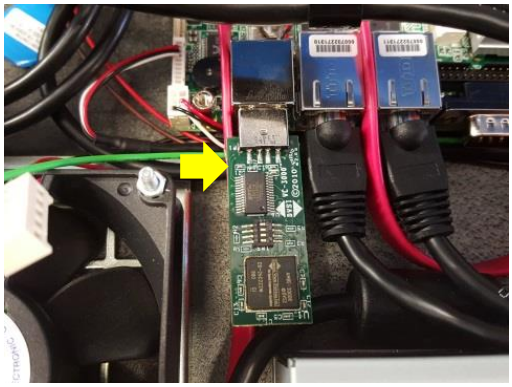
1. Remove the top cover plate – section 4.2.

Then:

Step 1:

	Make sure that you have a replacement AMBE decoder.

Step 2:

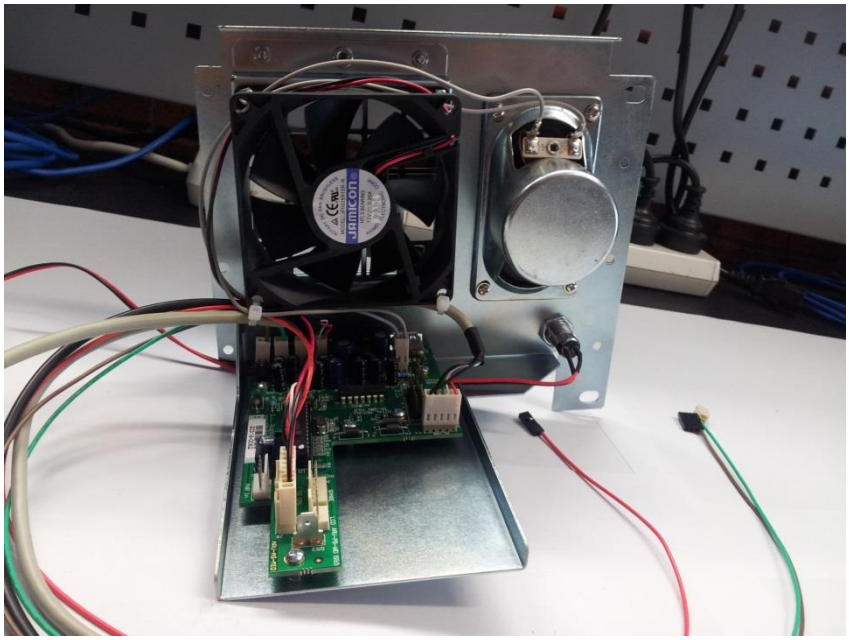
	Remove the old AMBE decoder and attach the new AMBE decoder to the top external USB port on the SBC.

At this stage you can:

1. Fit the top cover plate – section 4.3.

4.19. Replace the mid-board

The mid-board is part of a sub-assembly that comprise of the mid-board itself, the fan and the speaker. The following image shows the sub-assembly free from the main enclosure.



Before you begin:

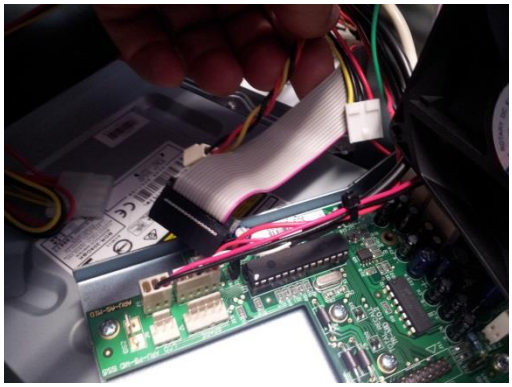
1. Remove the top cover plate – section 4.2.
2. Remove the main face plate – section 4.6.

Then:

Step 1:

	It is easier to replace the mid-board if you are facing the front of the unit.

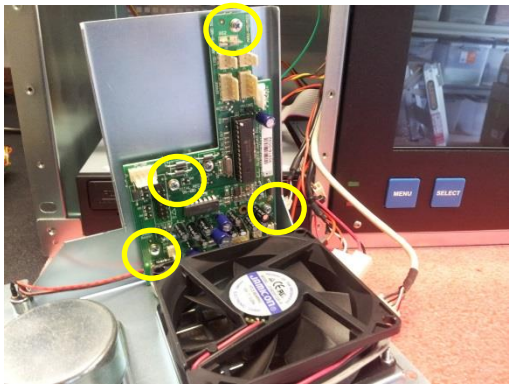
Step 2:

	Remove the screws (4 in total) that bind the sub-assembly to the main enclosure.
	Start pulling the sub-assembly out. Be careful to not damage any cables, the remaining face plate and the LCD screen.
	Start disconnecting cables from the mid-board to free the assembly from the enclosure. Disconnect the keyboard ribbon cable, mid-board power cable and LCD inverter power cable.

	You should be able to pull the whole assembly out with the remaining cables attached to the mid-board.

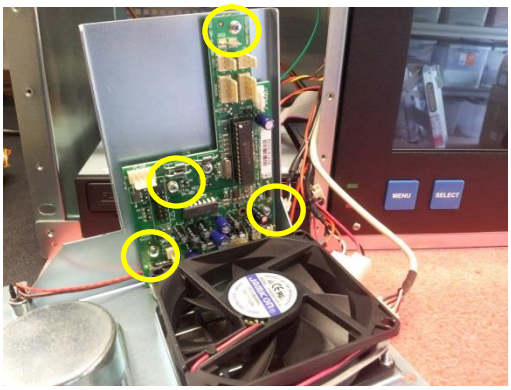
Step 3:

	Disconnect all cables from the mid-board. Note: the power switch cable is not connected to the mid-board and will remain connected during this procedure.
	Remove the nuts from the two audio jacks.

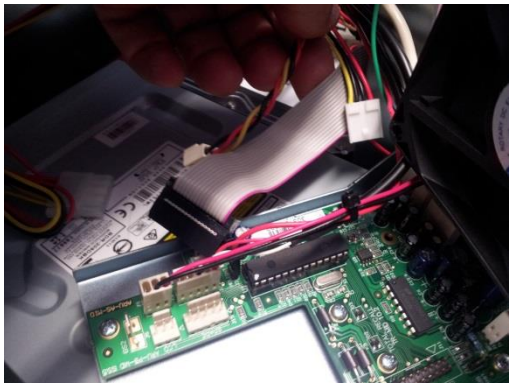
	Remove the screws (4 in total) that bind the mid-board to the metal part.
	Finally, simply separate the mid-board from the sub-assembly.

Step 4:

	Make sure you have a replacement mid-board.

	Remove the nuts from the audio jacks.
	Put the mid-board in its position.
	Replace the screws (4 in total) that bind the mid-board to the metal part.
	Replace the nuts to the two audio jacks.

Step 5:

	Reconnect cables to the mid-board. Note, you cannot connect the keyboard ribbon cable, mid-board power cable and LCD inverter power cable at this point.
	List the assembly up and half insert it in its position.
	You will be able to reconnect the keyboard ribbon cable, mid-board power cable and LCD inverter power cable now.

	Put the whole sub-assembly back into the enclosure. Replace the screws (4 in total) that bind the sub-assembly to the main enclosure.

To complete the procedure:

1. Fit the main face plate – section 4.7.
2. Fit the top cover plate – section 4.3.

4.20. Replace the hard disk

You can use any recommended SATA hard disk with capacity of 1TB or grater when replacing the hard disk.

However we recommend that you purchase a hard disk from your Total Recall VR distributor/reseller or directly from us because:

1. The hard disk will come with Total Recall VR software on it which will save you time as you do not need to install the operating system and application from scratch.
2. The hard disk will be from a reputable manufacturer and it will have performance characteristics that are necessary to maximise the performance of Total Recall VR.

Before you begin:

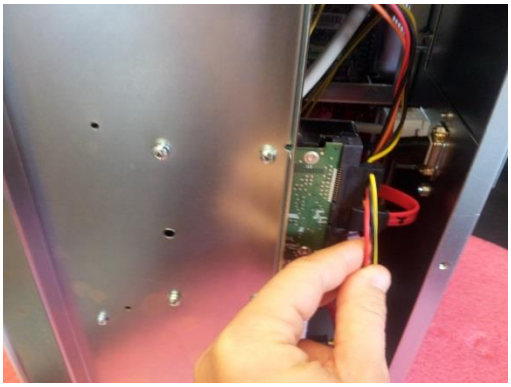
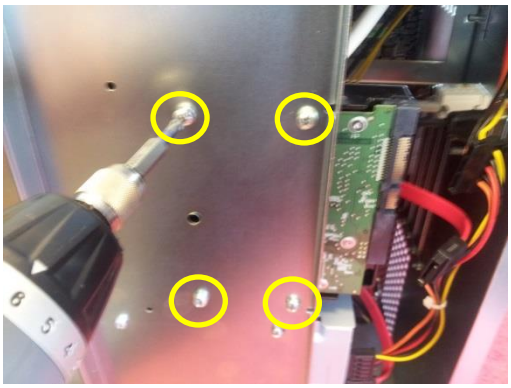
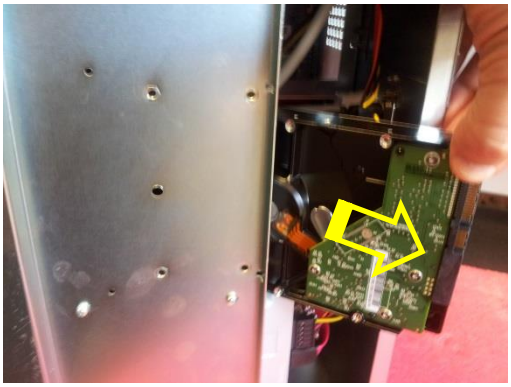
1. Remove the bottom cover plate – section 4.4.

Then:

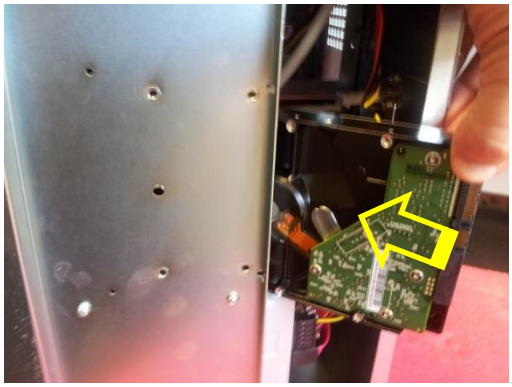
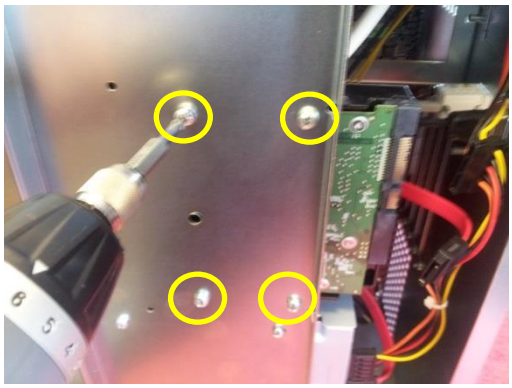
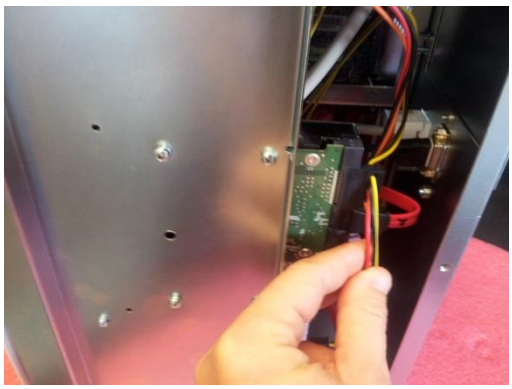
Step 1:

	It is easier to replace the hard disk if you sit the unit on its side. Also, make sure that the bottom of the unit is facing you.

Step 2:

	Disconnect the SATA and power cable from the hard disk.
	Remove the screws (4 in total) that bind the hard disk to the enclosure frame. Note: hold the hard disk with one hand while removing the last screw to stop it from dropping down onto the DVD drive.
	Simply remove the hard disk from the enclosure.

Step 3:

	Insert the new hard disk into the enclosure.
	Replace the screws (4 in total) that bind the hard disk to the enclosure frame. Note: hold the hard disk with one hand in position while replacing the first two screws.
	Attach the SATA and power cables to the hard disk.

To complete the procedure:

1. Fit the bottom cover plate – section 4.5.
2. Optionally, if you are using your own hard disk: Rebuild the system from scratch – section 4.35.

4.21. Replace a hard disk – system with RAID-1 option

You can use any 2.5” SATA hard disk with capacity of 1TB or grater when replacing the hard disk.

However we strongly recommend that you use the same brand and model number for both drives when replacing one faulty drive.

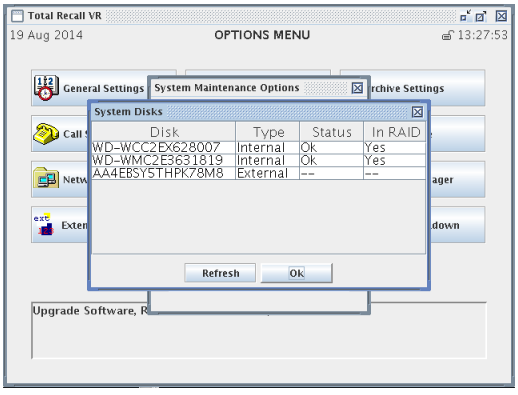
Also, you MUST use a brand new disk drive which has not been partitioned. If you use a drive that has already been partitioned, then the drive will not be able to participate in the RAID-1 configuration.

If you need to replace both drives, then we recommend that you purchase hard disks from your Total Recall VR distributor/reseller or directly from us because:

1. The hard disks will come with Total Recall VR software on it which will save you time as you do not need to install the operating system and application from scratch.
2. The hard disk will be from a reputable manufacturer and it will have performance characteristics that are necessary to maximise the performance of Total Recall VR.

The system has two hard disks which are housed in easy access caddies.

Step 1:



If you are hot replacing a drive then use the GUI application to detach the faulty drive from the system.

For details on how to do this see the Embedded GUI User Guide [3].

This feature is only available on systems with application release 10.7.0 or better.

Step 2:

	Make sure you have a replacement hard drive.

Step 3:

	Push the latch on the side of the hard disk bracket to release the bracket.
	Use the front arm of the bracket to disconnect the dive and pull the bracket out.

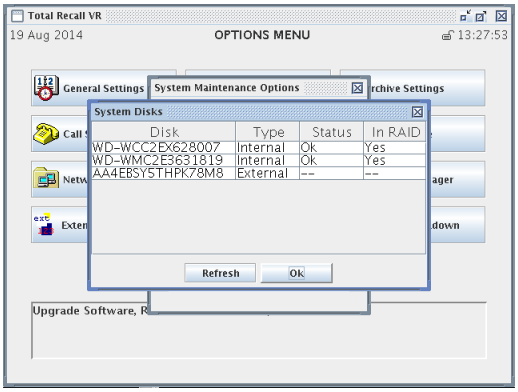
Step 4:

	Replace the faulty drive with the new one.

Step 5:

	Put the bracket in the caddy.
	Use the arm to connect the disk to the system and lock in place.

Step 6:



If you are hot replacing a drive then use the GUI application to attach the new drive to the system.

For details on how to do this see the Embedded GUI User Guide [3].

This feature is only available on systems with application release 10.7.0 or better.

4.22. Replace the disc drive

You can use any SATA Blu-ray burner when replacing the disc drive.

However we recommend that you purchase a disc drive from your Total Recall VR distributor/reseller or directly from us to avoid issues with incompatibility between drives and the Linux operating system and the disc burning software used by Total Recall VR.

Before you begin:

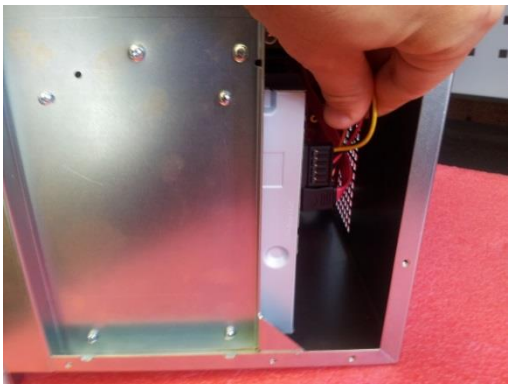
1. Remove the bottom cover plate – section 4.4.

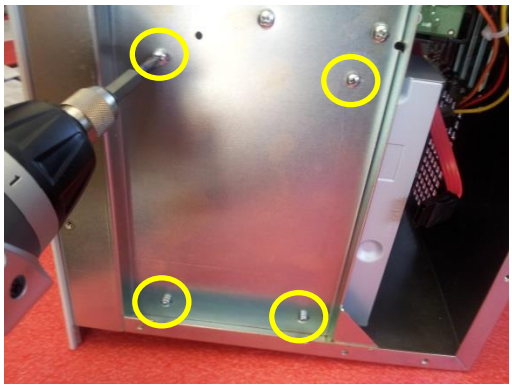
Then:

Step 1:

	It is easier to replace the disc drive if you sit the unit on its side. Also, make sure that the bottom of the unit is facing you.

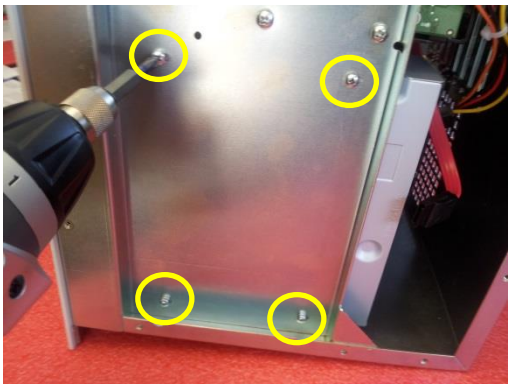
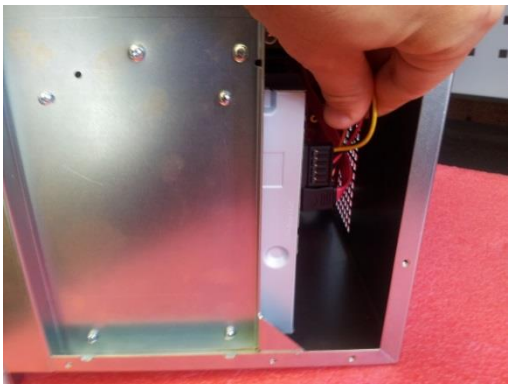
Step 2:

	Disconnect the SATA and power cable from the disc drive.

	Remove the screws (4 in total) that bind the disc drive to the enclosure frame.
	Simply remove the disc drive from the enclosure.

Step 3:

	Insert the new disc drive into the enclosure.

	Replace the screws (4 in total) that bind the disc drive to the enclosure frame. Make sure that you align the face of the disc drive with the face of the unit before you tighten the screws.
	Attach the SATA and power cables to the disc drive.

To complete the procedure:

1. Fit the bottom cover plate – section 4.5.

4.23. Replace the disc drive – system with RAID-1 option

You can use any recommended slim (12mm) SATA Blu-ray burner when replacing the disc drive.

However we recommend that you purchase a disc drive from your Total Recall VR distributor/reseller or directly from us to avoid issues with incompatibility between drives and the Linux operating system and the disc burning software used by Total Recall VR.

Step 1:

	Make sure you have a replacement disc drive.

Step 2:

	Use a small screwdriver to release the latch that holds the arm of the bracket that houses the disc drive. When you push the latch in the arm will pop out.

	Use the arm to disconnect the disc drive from the system and pull it out.

Step 3:

	Replace the faulty drive with a new one.

Step 4:

	Use the arm of the bracket to connect the disc drive to the system and lock it in place.

4.24. Replace the power supply

If your system is fitted with a standard power supply, you can use any Flex form factor power supply capable of producing 180W or better.

However we recommend that you purchase a customised power supply from your Total Recall VR distributor/reseller or directly from us.

We modify the cable configuration of power supplies that are used in Total Recall VR to reduce wire clutter, connect correct power connectors and extend wires to correct length.

If your system is fitted with a dual hot-swap redundant power supply then you must replace it with the same brand and model power supply which is available from your Total Recall VR distributor/reseller or directly from us. It is unlikely that you will find a replacement which will fit in the enclosure.

In this section, as an example, we explain how to replace a standard Flex form factor power supply. The Flex form factor power supply is the most common power supply that you will face. The procedure itself is the same for all types of power supplies. The only difference is the bracket, or face plate, which attaches the power supply to the main enclosure, is different for different form factor power supplies.

Please use the example as a learning aid and modify the steps to suit your repair scenario.

Before you begin:

1. Remove the top cover plate – section 4.2
2. Remove the analogue channel card stack – section 4.10
3. Remove the bottom cover plate – section 4.4.

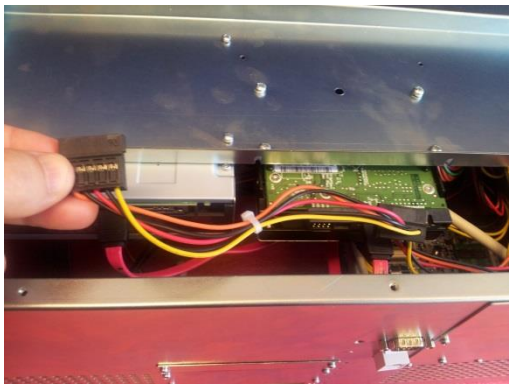
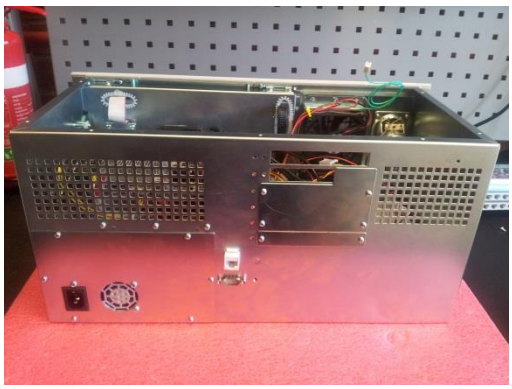
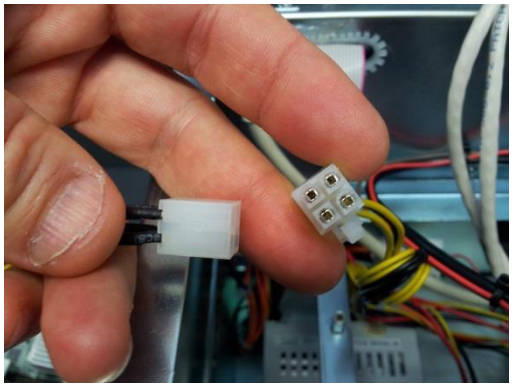
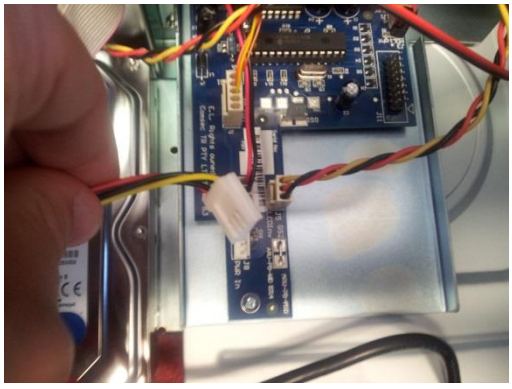
Then:

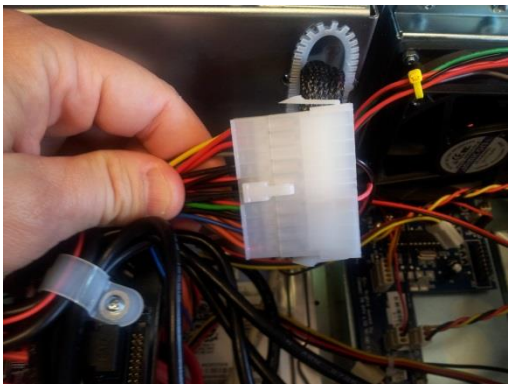
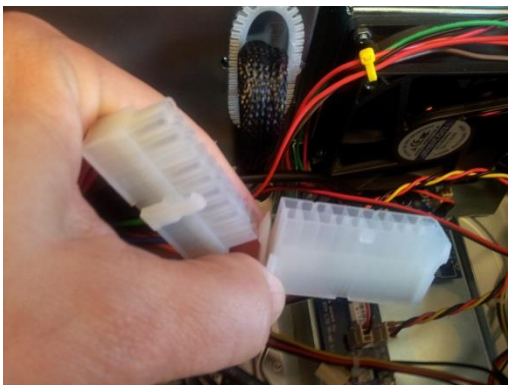
Step 1:

	Sit the unit on its side.
	Skip this step if you are replacing a dual hot-swap power supply. Otherwise: Remove the screw (1 screw, 2 washers and 1 nut) that binds the power supply to the bottom face of the enclosure. Make sure to remove all parts: 1 screw, 2 washers and 1 nut from the inside of the enclosure.

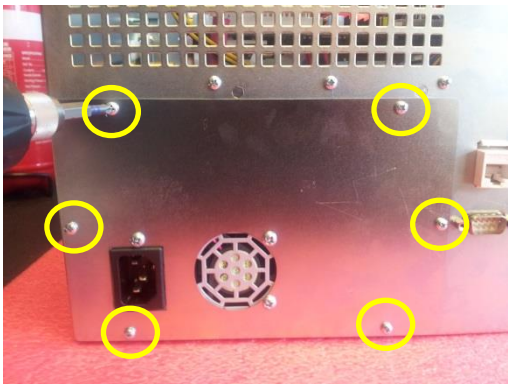
Step 2:

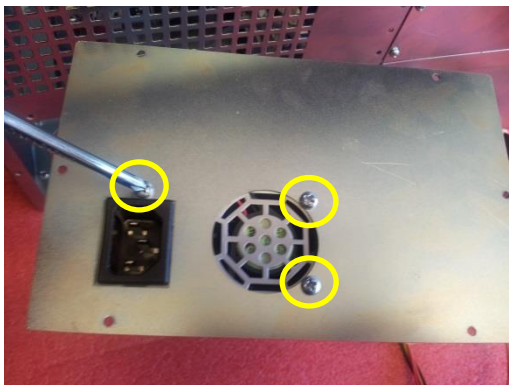
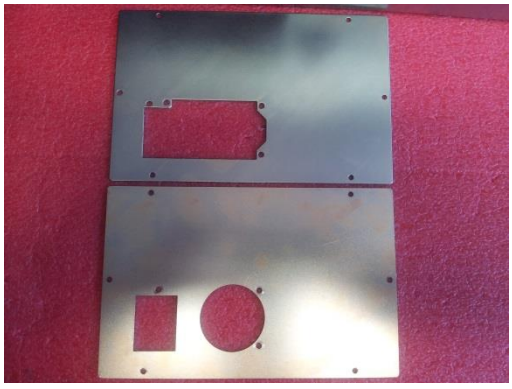
	Flip the unit upside down and sit it on its top.

	Disconnect the power cables from the disc drive and the hard disk.
	Flip the unit upright and sit it on its base.
	Disconnect power from the SBC.
	Disconnect power from the mid-board.

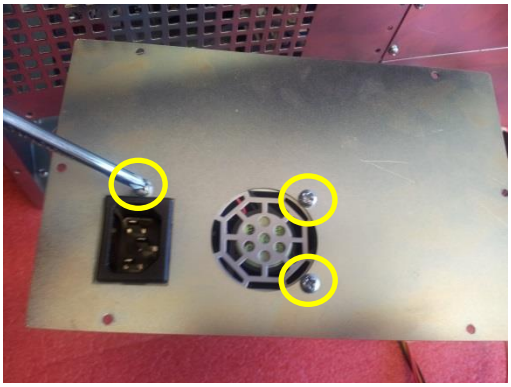
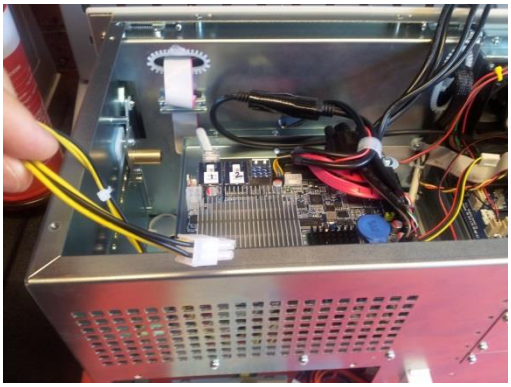
	Locate the on/off key switch connector. It may be hidden under the SBC and close to the power supply.
	Disconnect the on/off key switch.

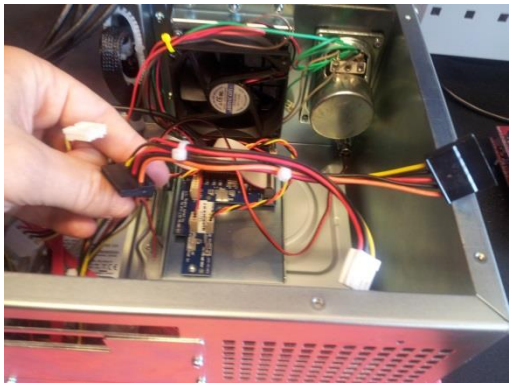
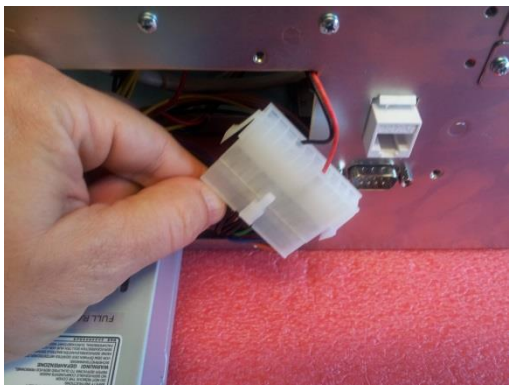
Step 3:

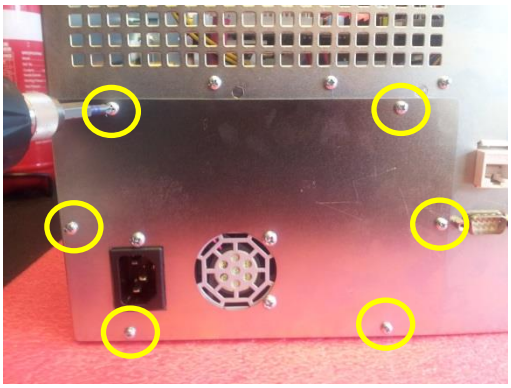
	Remove the screws (6 in total) that bind the power supply cover plate to the enclosure frame. Other form factor power supplies have a different type of bracket. Irrespective of the type of bracket, you need to detach it from the main frame in order to remove the power supply from the frame.

	Remove the power supply (with the cover plate) from the enclosure. Do this slowly and make sure to free cables as you extract the power supply from the enclosure.
	Remove the screws (3 in total) that bind the cover plate to the power supply.
	The power supply free from all enclosure parts.
	Your system may be fitted with a different cover plate. The image shows the two different cover plates that we use for Flex form factor power supplies.

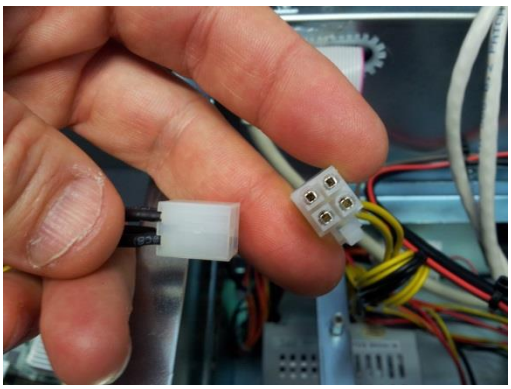
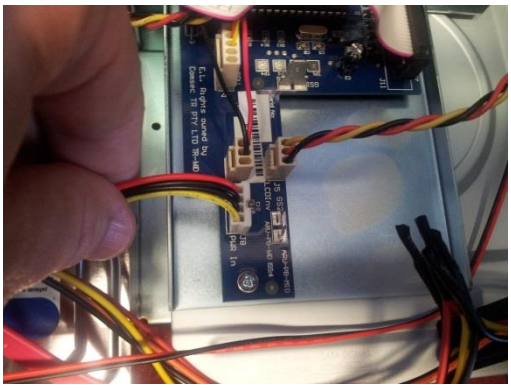
Step 4:

	Fit the cover plate to the new power supply.
	Insert all cables into the enclosure, but do not insert the power supply. Also, make sure that the on/off key switch connector remains just outside the enclosure.
	Route the power feed for the SBC to the left side of the enclosure.

	Route all other power feeds to the right side of the enclosure. This includes: • Power feed with two SATA connectors for the hard disk and disc drive • Power feed (long) with a floppy connector for the analogue channel cards • Power feed (short) with a floppy connector for the mid-board.
	Attach the on/off key switch to the power supply.
	Insert the power supply into the enclosure.

	Replace the screws (6 in total) that bind the power supply cover plate to the enclosure frame.

Step 5:

	Attach power to the SBC.
	Attach power to the mid-board.

	Flip the unit and sit it on its top. Then, attach power to the hard disk and disc drive.

Step 6:

	Flip the unit and sit it on its side.
	Skip this step if you are replacing a dual hot-swap power supply. Replace the screw (1 screw, 2 washers and 1 nut) that binds the power supply to the bottom face of the enclosure.

To complete the procedure:

1. Install the analogue channel card stack– section 4.11.
2. Fit the top cover plate – section 4.3
3. Fit the bottom cover plate – section 4.5.

4.25. Replace the protective glass for the LCD panel

To replace the protective glass on top of the LCD panel:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Fit the keyboard & LCD face plate – section 4.9. Of course, you will use a new glass plate during this step.

Be careful: glass can cut you if broken or chipped.

4.26. Access the OSD controls for the LCD panel – systems with 7” panel

Systems with 7” wide screen panel have OSD controls for the panel which can be used to make various adjustments to the display.

To access the OSD controls:

1. Remove the keyboard & LCD face plate – section 4.8.

The OSD controls are at the top edge of the display flap frame as shown on the following image.

Item	Description	Note
A	Reset	It resets the display when no OSD menu is displayed.
	Exit	Removes the OSD menu when one appears on the screen
B	Contrast	Displays the contrast adjustment control menu when no OSD menu is shown.
	▼	Moves to previous menu item in OSD menus.
	-	Reduces value when setting values.
C	Brightness	Displays the brightness adjustment control menu when no OSD menu is shown.
	▲	Moves to next menu item in OSD menus.
	+	Increases value when setting values.
D	OSD	Shows OSD menu.
	Select	Selects menu items and values when in OSD menu.
E	Power	On/off button for the display.

Leave the display in “on” state (E button) when making OSD adjustments.

4.27. Open the display flap

You need to open the display flap to perform a number of maintenance operations such as replacing the LCD panel and associated electronics or the control keypad.

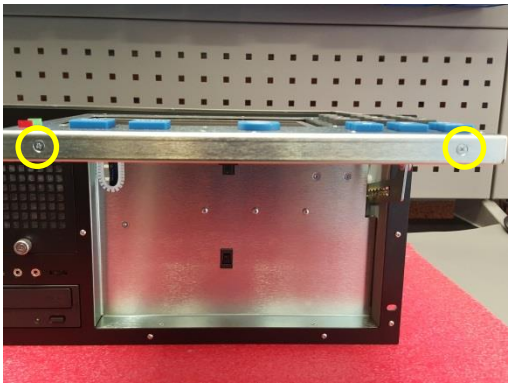
Handle the flap with caution. The LCD panel is not attached to the frame with screws and can easily come out of the frame.

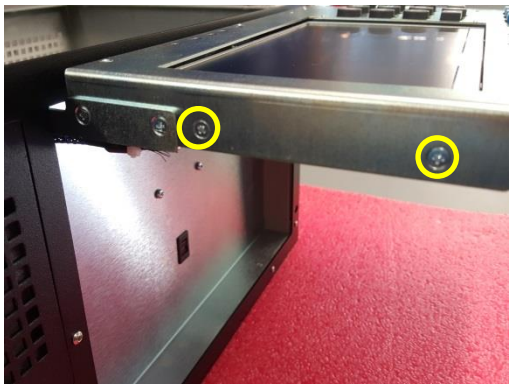
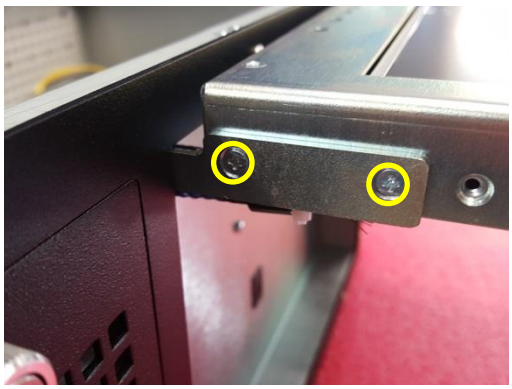
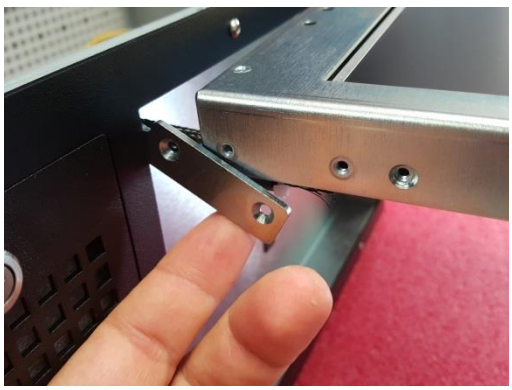
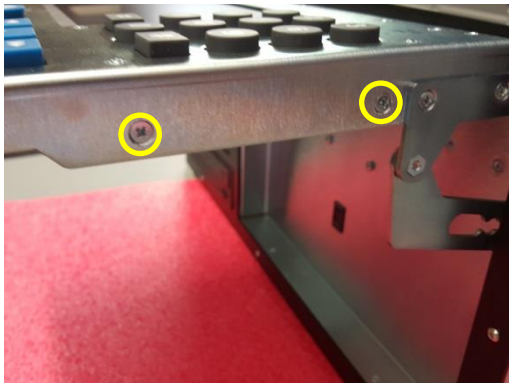
Before you begin:

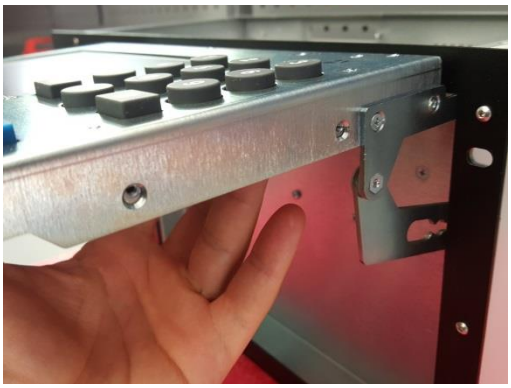
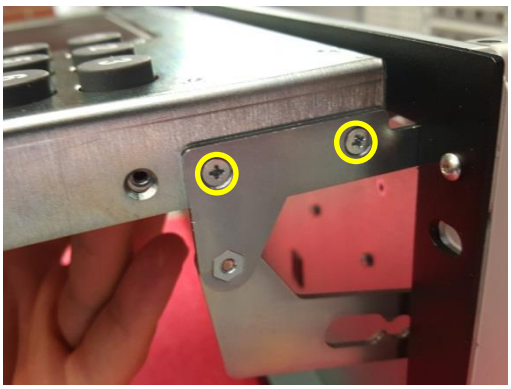
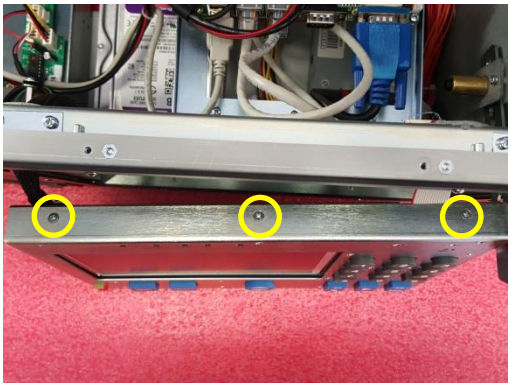
1. Remove the keyboard & LCD face plate – section 4.8.

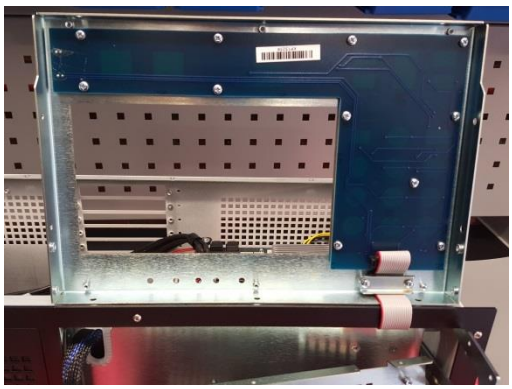
Then:

Step 1:

	Lift the flap fully upright.
	Remove 2 screws from the bottom edge of the flap.

	Remove 2 screws from the left edge of the flap.
	Detach the flap from the left pivot arm by removing the screws (2 in total) that bind the flap to the arm.
	The pivot arm will simply slide down.
	Remove 2 screws from the left edge of the flap.

	Support the flap from underneath.
	Detach the flap from the right pivot arm by removing the screws (2 in total) that bind the flap to the arm.
	Lower the flap down on the table and sit it on its bottom edge.
	Remove 3 screws from the top edge of the flap.

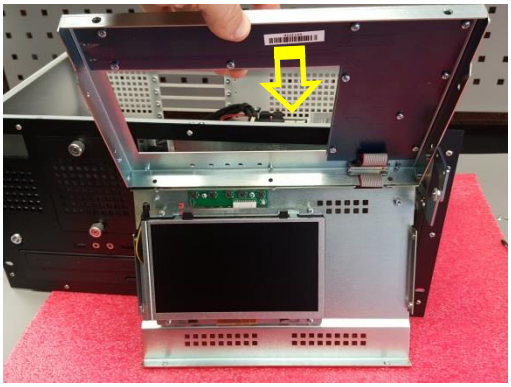
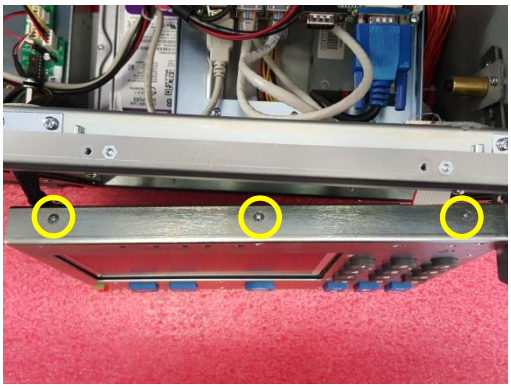
	Separate the keyboard from the monitor assembly by lifting the keyboard assembly from its lower edge.
	It should be possible to sit the keyboard assembly on the top edge of the unit.

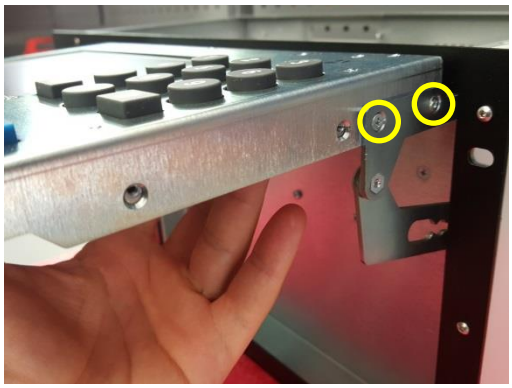
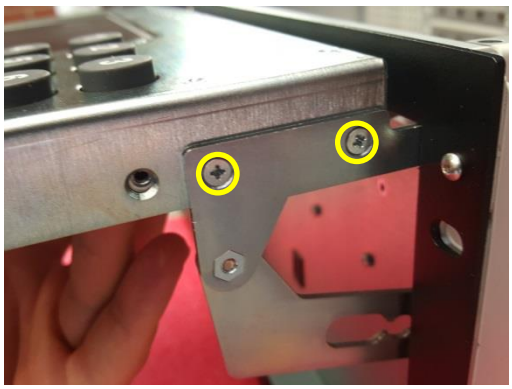
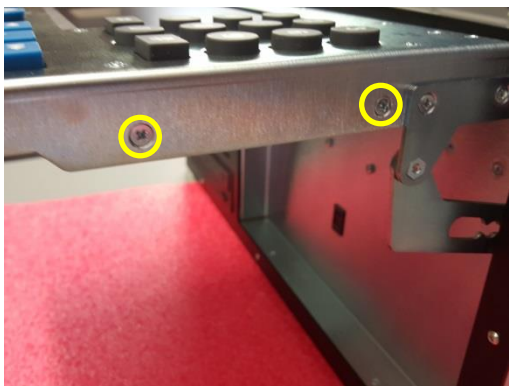
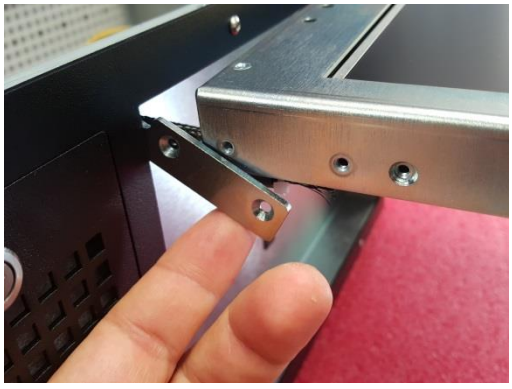
4.28. Close the display flap

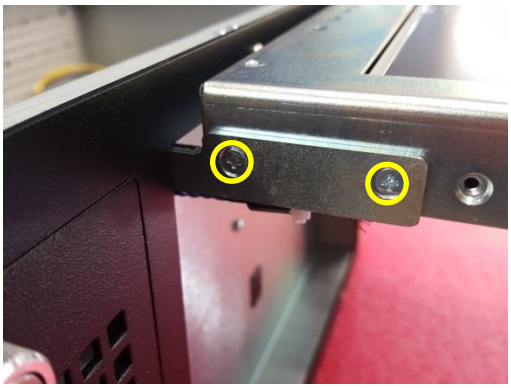
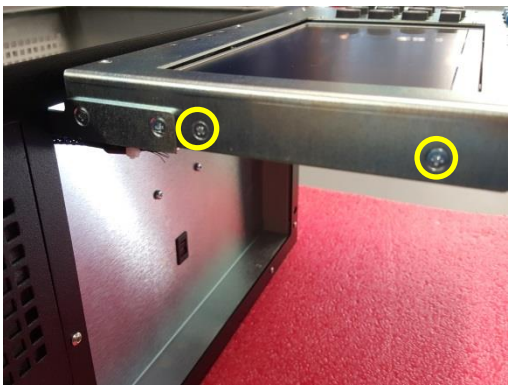
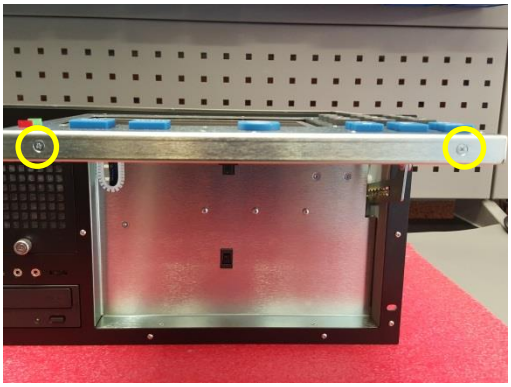
You need to close the display flap after you perform a number of maintenance operations such as replacing the LCD panel and associated electronics or the control keypad.

Handle the flap with caution. The LCD panel is not attached to the frame with screws and can easily come out of the frame.

Step 1:

	Join the keyboard from the monitor assembly by lowering the keyboard assembly from its lower edge.
	Replace 3 screws on the top edge of the flap.

	Lift the flap fully upright and bring its top right corner near the right pivot arm.
	Attach the flap to the right pivot arm by replacing 2 screws.
	Replace 2 screws from the left edge of the flap.
	Lift the left pivot arm in position.

	Attach the flap to the left pivot arm by replacing 2 screws.
	Replace 2 screws on the left edge of the flap.
	Replace 2 screws on the bottom edge of the flap.

Now you can:

1. Fit the keyboard & LCD face plate – section 4.9.

4.29. Replace the LCD panel – system with 6.4” panel

Total Recall VR uses a 6.4” LCD panel that is capable of displaying the 640x480 resolution with a custom mounting frame which is specific to Total Recall VR.

You must purchase a replacement LCD screen from your Total Recall VR distributor/reseller or directly from us.

To our knowledge no other screen comes fitted with the custom mounting frame specifically designed for the Total Recall VR. The mounting frame is part of the screen and is NOT available as a separate part.

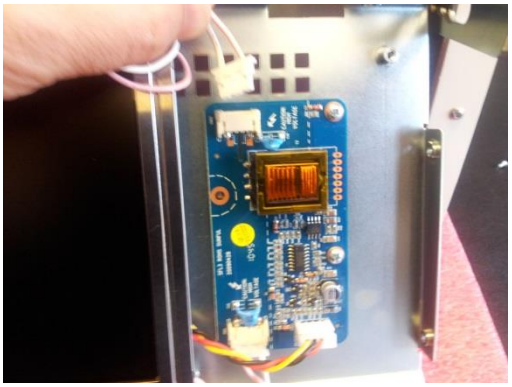
In addition, the video (or LVDS) cable is specific to the LCD screen and SBC combination used in Total Recall VR. Different model LCD screen will require different video cable.

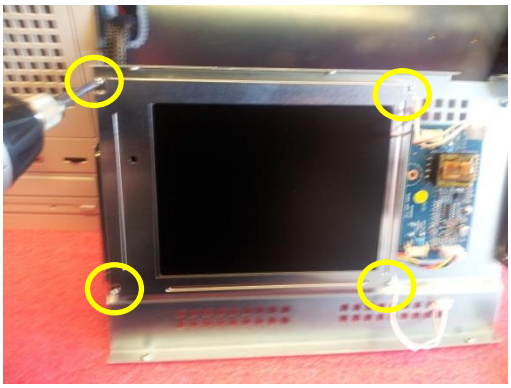
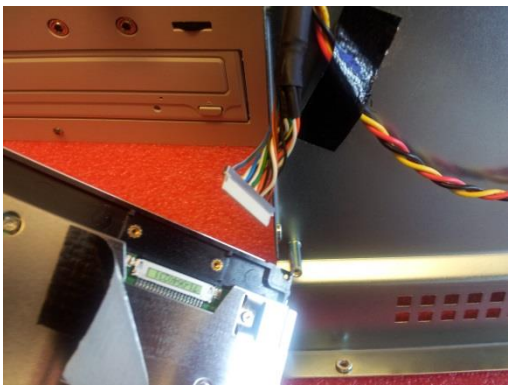
Before you begin:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Open the display flap – section 4.27.

Then:

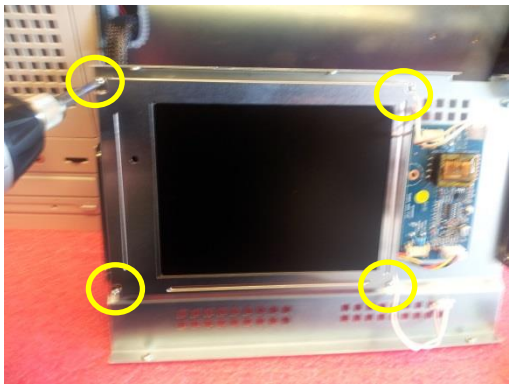
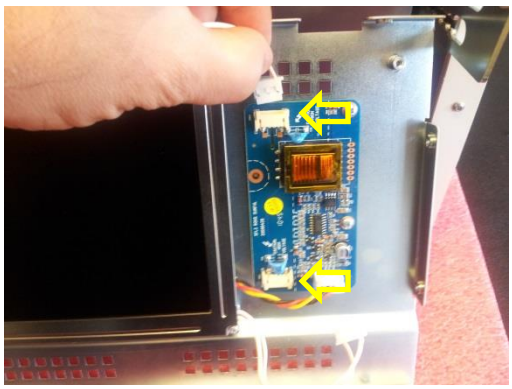
Step 1:

	Disconnect the LCD screen from the inverter.

	Remove the screws (4 in total) that bind the screen to the enclosure.
	Disconnect the video cable from the screen.

Step 2:

	Connect the video cable to the replacement screen.

	Place the screen in position and replace the screws (4 in total) that bind the screen to the enclosure.
	Connect the screen to the inverter. Note: there are two connections from the screen to the inverter. One connects to the top of the inverter and another to the bottom. Make sure to connect both,

To complete the procedure:

1. Close the display flap – section 4.28.
2. Fit the keyboard & LCD face plate – section 4.9.

4.30. Replace the inverter for the LCD panel – system with 6.4” panel

Technically, you can use any inverter that is suitable for the LCD panel model that is used in Total Recall VR.

There are a number of LCD screen inverter models that are suitable for the LCD screen on the open market.

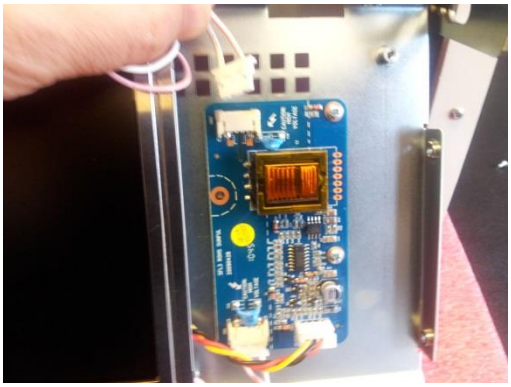
However, only the model that we install in Total Recall VR fits in the Total Recall VR enclosure. The mounting screw holes on all other models are in different position and if you attempt to install one of these models, then you will find that you will not be able to attach the inverter to the Total Recall VR enclosure.

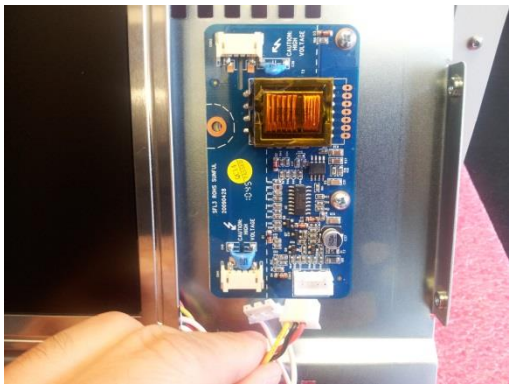
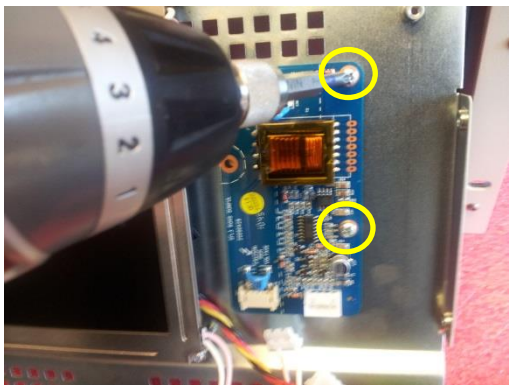
Before you begin:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Open the display flap – section 4.27.

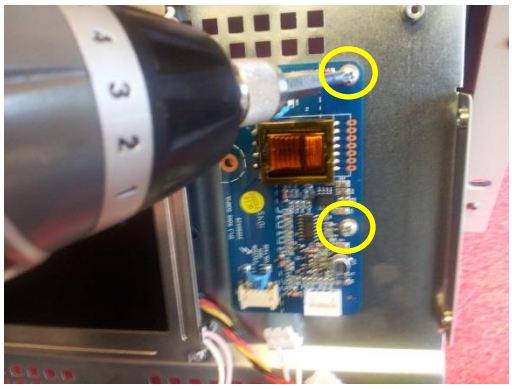
Then:

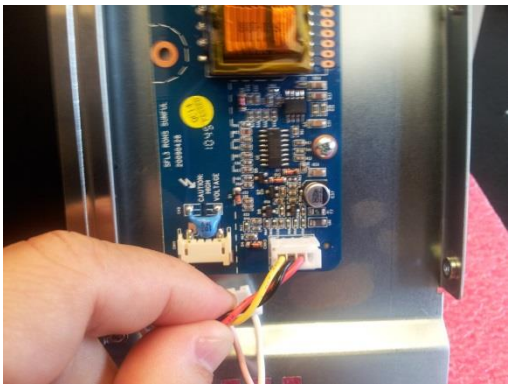
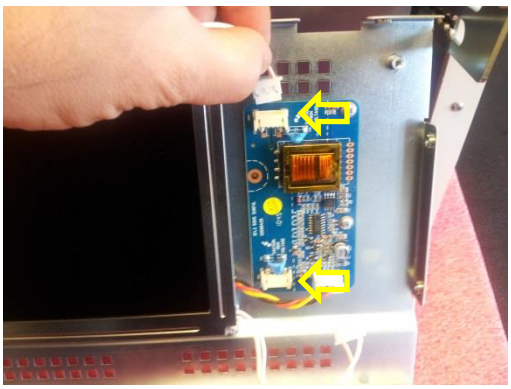
Step 1:

	Disconnect the LCD screen from the inverter.

	Disconnect power from the inverter.
	Remove the screws (2 in total) that bind the inverter to the enclosure.

Step 2:

	Place a new inverter in position and replace the screws (2 in total) that bind the inverter to the enclosure.

	Connect power to the inverter.
	Connect the screen to the inverter. Note: there are two connections from the screen to the inverter. One connects to the top of the inverter and another to the bottom. Make sure to connect both,

To complete the procedure:

1. Close the display flap – section 4.28.
2. Fit the keyboard & LCD face plate – section 4.9.

4.31. Replace the control keypad

Total Recall VR uses a custom control keypad.

> You must purchase a replacement keypad from your Total Recall VR distributor/reseller or directly from us.

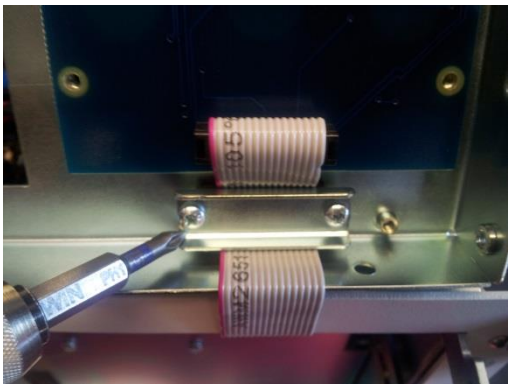
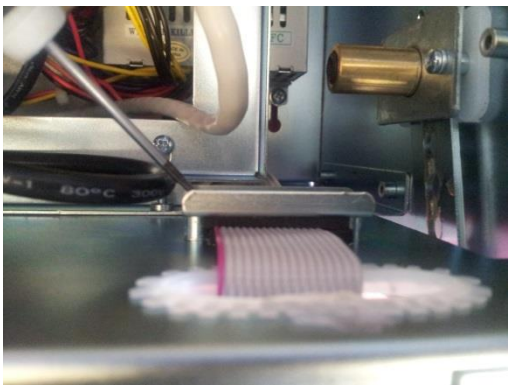
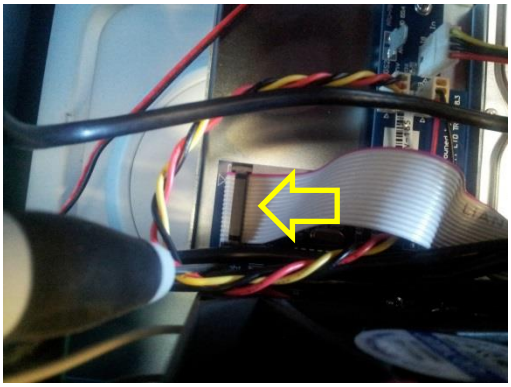
Before you begin:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Open the display flap – section 4.27.

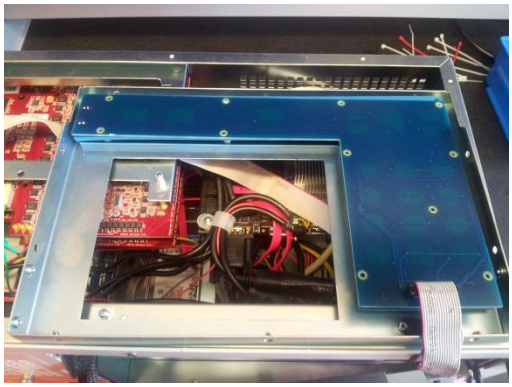
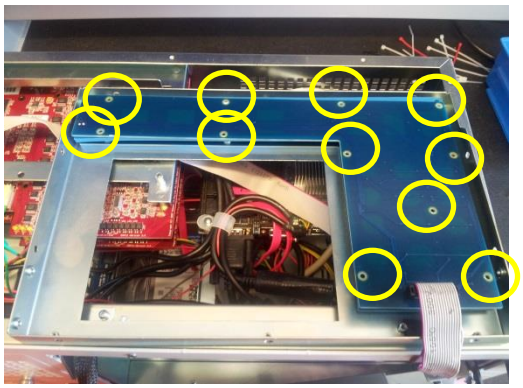
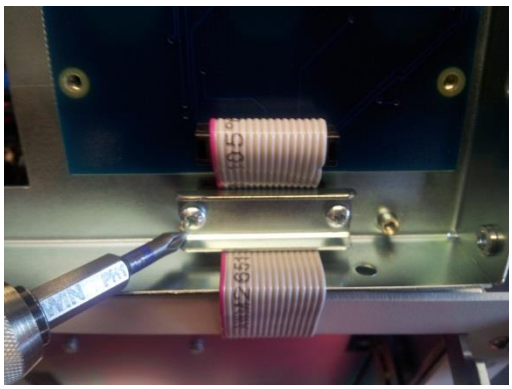
Then:

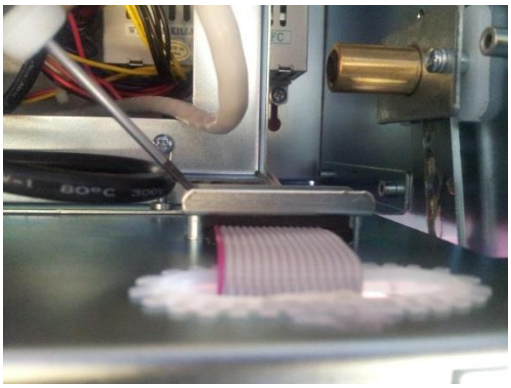
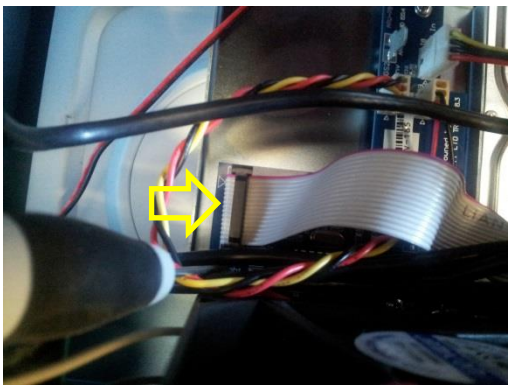
Step 1:

	Sit the top part of the sub-assembly (the part with the keyboard) on the top edge of the system.
	Remove the screws (11 in total) that bind the keyboard to the enclosure.

	Remove the cable clamp that holds the keyboard cable.
	Another clamp holds the keyboard cable on the inside wall of the enclosure. Remove it as well.
	Detach the keyboard cable from the mid-board.
	Slowly separate the keyboard from the enclosure. The cable may be attached to the inside wall of the enclosure with double sided sticky tape. So be careful to first separate the cable from the enclosure wall and then extract it from the enclosure.

Step 4:

	Place a replacement keyboard in position. Make sure that all rubber keys fit in their designated hole. Make sure that the LEDs fit properly in their holes. Feed the keyboard cable into the enclosure.
	Replace the screws (11 in total) that bind the keyboard to the enclosure.
	Replace the cable clamp that holds the keyboard cable.

	Replace the cable clamp that holds the keyboard cable on the inside wall of the enclosure.
	Attach the keyboard cable to the mid-board.

To complete the procedure:

1. Close the display flap – section 4.28.
2. Fit the keyboard & LCD face plate – section 4.9.

4.32. Replace the LCD panel – system with 7” panel

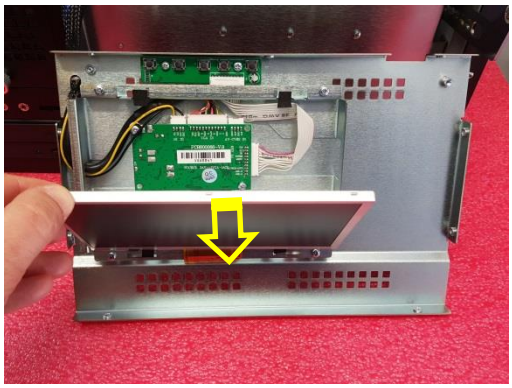
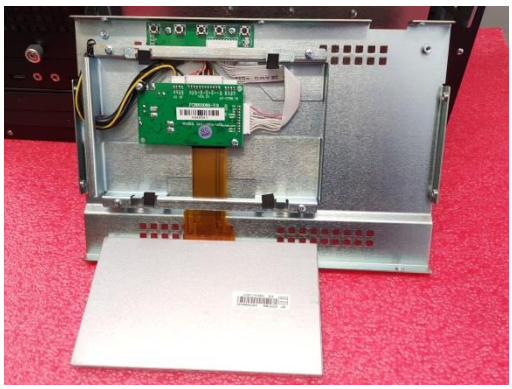
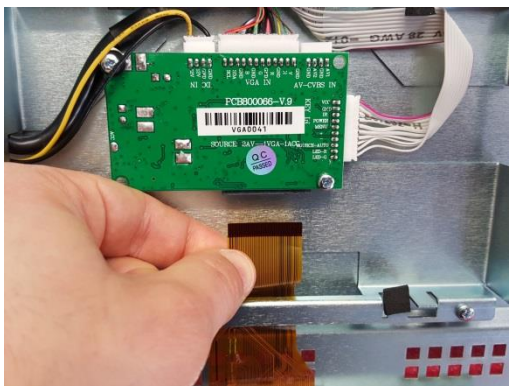
Total Recall VR uses a 7” wide screen LCD panel that is capable of displaying the 640x480 resolution.

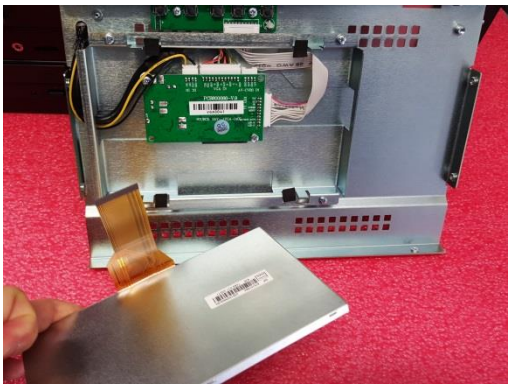
Before you begin:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Open the display flap – section 4.27.

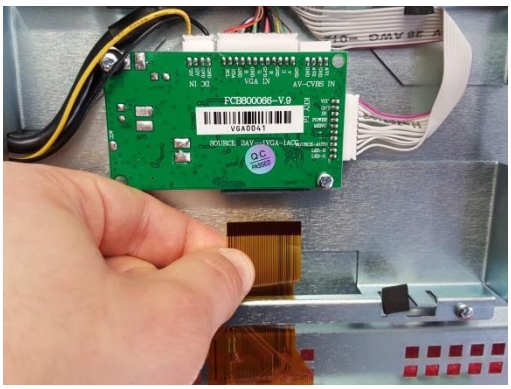
Then:

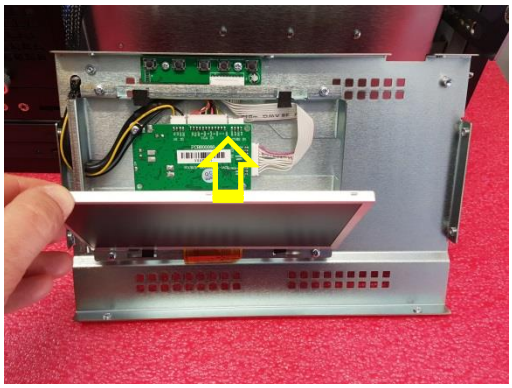
Step 1:

	Separate the LCD panel from the frame by lowering the top edge and keeping the bottom edge on the fame.
	Sit the panel on the table.
	Disconnect the TTL cable from the VGA driver board.

	Now you can separate the LCD panel from the rest of the assembly.

Step 2:

	Pass the TTL cable of the replacement panel through the bottom hole of the panel frame.
	Attach the TTL cable to the VGA driver board.

	Lift the LCD panel and place it its frame.
	The adjacent image shows the final result.

To complete the procedure:

1. Close the display flap – section 4.28.
2. Fit the keyboard & LCD face plate – section 4.9.

4.33. Replace the video driver board for the LCD panel – system with 7" panel

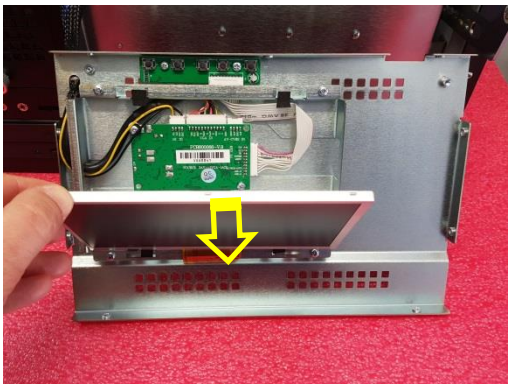
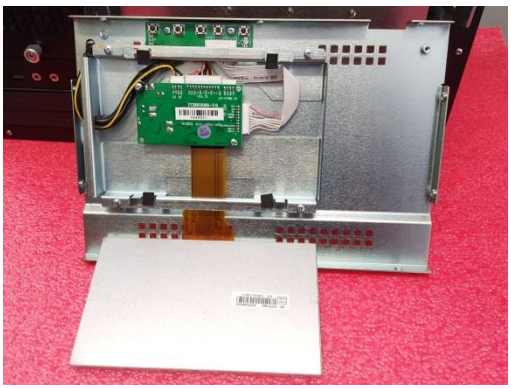
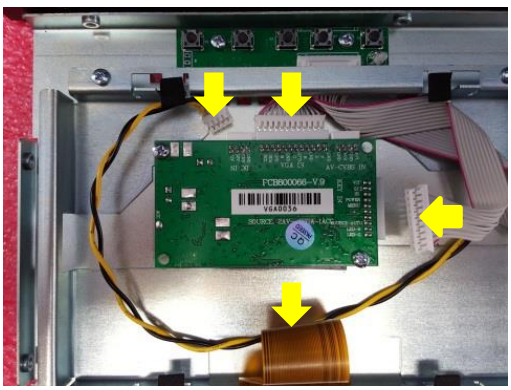
Total Recall VR uses a VGA to TTL driver board that support the Innolux LCD panels.

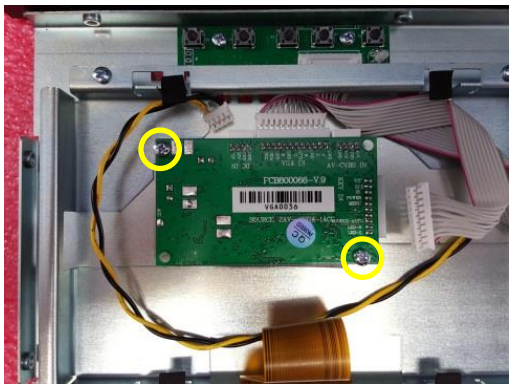
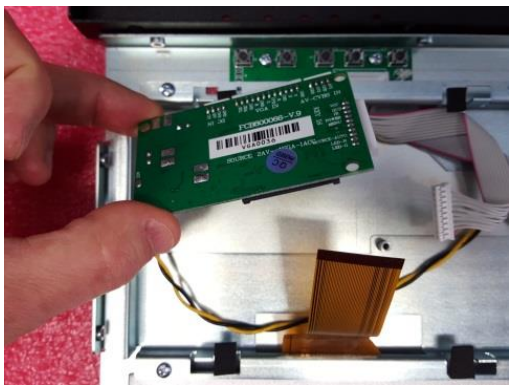
Before you begin:

1. Remove the keyboard & LCD face plate – section 4.8.
2. Open the display flap – section 4.27.

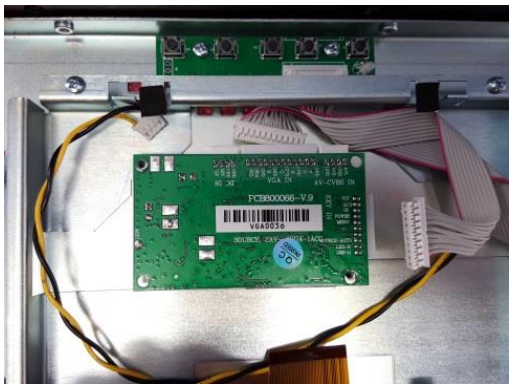
Then:

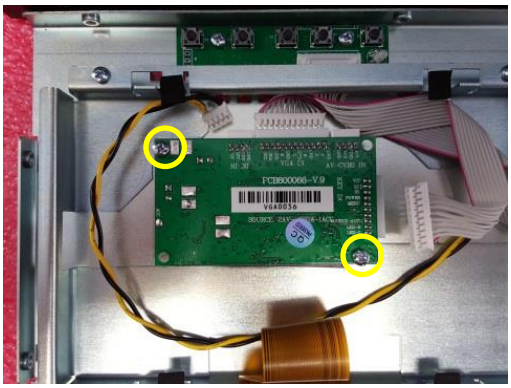
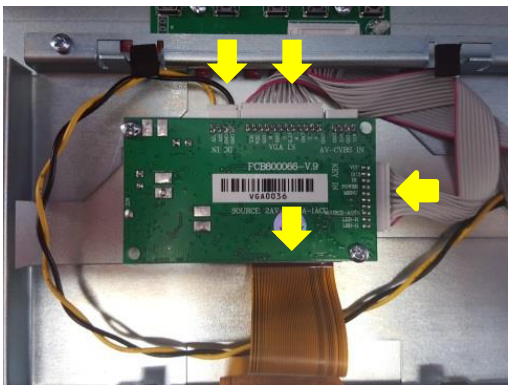
Step 1:

	Separate the LCD panel from the frame by lowering the top edge and keeping the bottom edge on the fame.
	Sit the panel on the table.
	Disconnect the all cables from the VGA driver board.

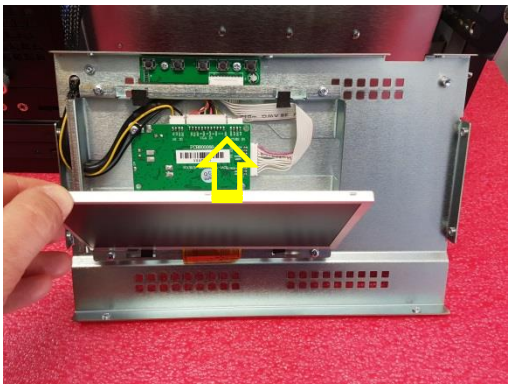
	Detach the driver board from the frame. Remove 2 screws.
	Separate the driver board from the frame.

Step 2:

	Place a new driver board in position on the frame.

	Attach the driver board to the frame. Replace 2 screws.
	Connect the all cables to the VGA driver board.

Step 3:

	Lift the LCD panel and place it its frame.

	The adjacent image shows the final result.

To complete the procedure:

1. Close the display flap – section 4.28.
2. Fit the keyboard & LCD face plate – section 4.9.

4.34. Upgrade the application

See the Total Recall VR Embedded GUI User Guide [3] for details on how to upgrade the application on your system.

4.35. Rebuild the system from scratch

We strongly recommend you order a disk with Total Recall VR OS and application from your Total Recall VR distributor/reseller or directly from us instead of following this procedure. This will save you time and frustration.

DO NOT install a release prior to 10.x.y on your system.

The installation of the Total Recall VR OS and application on a Total Recall VR system comprises of the following activities:

1. Prepare installation discs
2. Prepare the hardware for installation
3. Install the operating system
4. Install the application
5. Complete the hardware for operation
6. Apply channel and feature licenses

4.35.1. Prepare installation discs

During this activity you will download ISO images and create an OS DVD disc and an application CD disc.

1. Download the DVD disc image (ISO file) for the OS.
    a. DVD disc image for the latest 10.x.y release: http://www.totalrecallvr.com/sites/totalrecallvr.com/files/download/latest.linx/TRVROS-x86_64.zip
2. Create a DVD disc using your favourite disc burning program such as Nero or Roxio.
3. NOTE: do not copy the ISO file to the disc. You need to create a disc with the ISO file.
4. Download the CD disc image (ISO file) for the application.

a. CD disc image for the latest 10.x.y release: http://www.totalrecallvr.com/sites/totalrecallvr.com/files/download/latest.linx/TRVRApplication.zip

5. Create a CD disc using your favourite disc burning program such as Nero or Roxio.
6. NOTE: do not copy the ISO file to the disc. You need to create a disc with the ISO file.

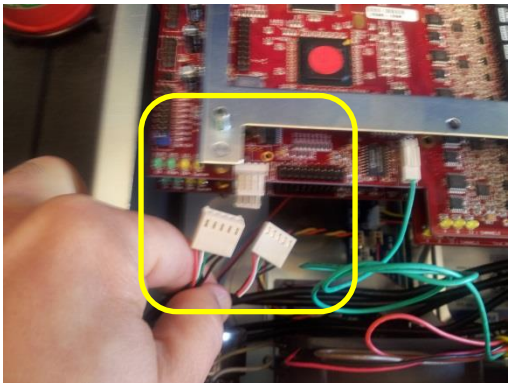
Label the disks so it is not possible to mix them up in subsequent steps.

4.35.2. Prepare the hardware for installation

Before you begin:

1. Attach a USB keyboard to the system.
2. Remove the top cover plate – section 4.2.

Then:

	Disconnect the USB cables from all analogue channel cards. **Note: this step is critical. Do not install the Total Recall VR OS with USB cables connected to the analogue channel cards.**

4.35.3. Install the operating system

Use the OS DVD disc to install the operating system.

1. Power up the system and insert the OS DVD disc in the disc drive so that the system boots from it.
2. The system will display the **boot:** prompt allowing you to specify the correct OS configuration for the model that you are building. Enter:
   a. **trvr-ln05** if your system does NOT have the RAID-1 option
   b. **trvr-rln05** if your system has the RAID-1 option
3. Press Enter to start the installation. It is time for a cup of coffee or other work. The installation takes 15-20 minutes.
4. The system will ask you to remove the DVD disc and reboot when the installation is complete. Remove the DVD disc and press **Enter** to reboot the system. The system will:

a. Reboot, and then

b. Shutdown.

5. This is intentional and an integral part of the installation process.
6. Power down the system, wait for 10 seconds and then power up and make sure that you see a GUI window showing the **bash-3.2#** prompt.

4.35.4. Install the application

Use the application CD disc to install the application.

1. Insert the application CD disc in the DVD drive and execute the following commands on the **bash-3.2#** prompt:

```
mount /media/dvd

/media/dvd/doUpgrade.sh

eject
```

2. Remove the CD disc from the DVD drive and shutdown the system using the following command:

```
shutdown –H now
```

3. Power down, wait for 10 seconds and then power up the system.

The application will be running when the system starts. The screen will show the application interface on the screen.

Shut down the system before proceeding to the next step.

4.35.5. Complete the hardware for operation

The system must be off.

To prepare the system for normal operation:

1. Remove the USB keyboard.
2. Attach the USB cables to the analogue channel cards.
3. Fit the top cover plate – section 4.3.

4.35.6. Apply channel and feature licenses

If you have a copy of your Channel and Feature licenses you can re-use them by simply entering the license keys using the Options Menu -> License Key button.

Otherwise send us the serial number of the system and the Hardware Key and we will issue you with new Channel and Feature license keys.

For more details on license keys see the Total Recall VR Embedded UI User Guide [3].

[End of Document]