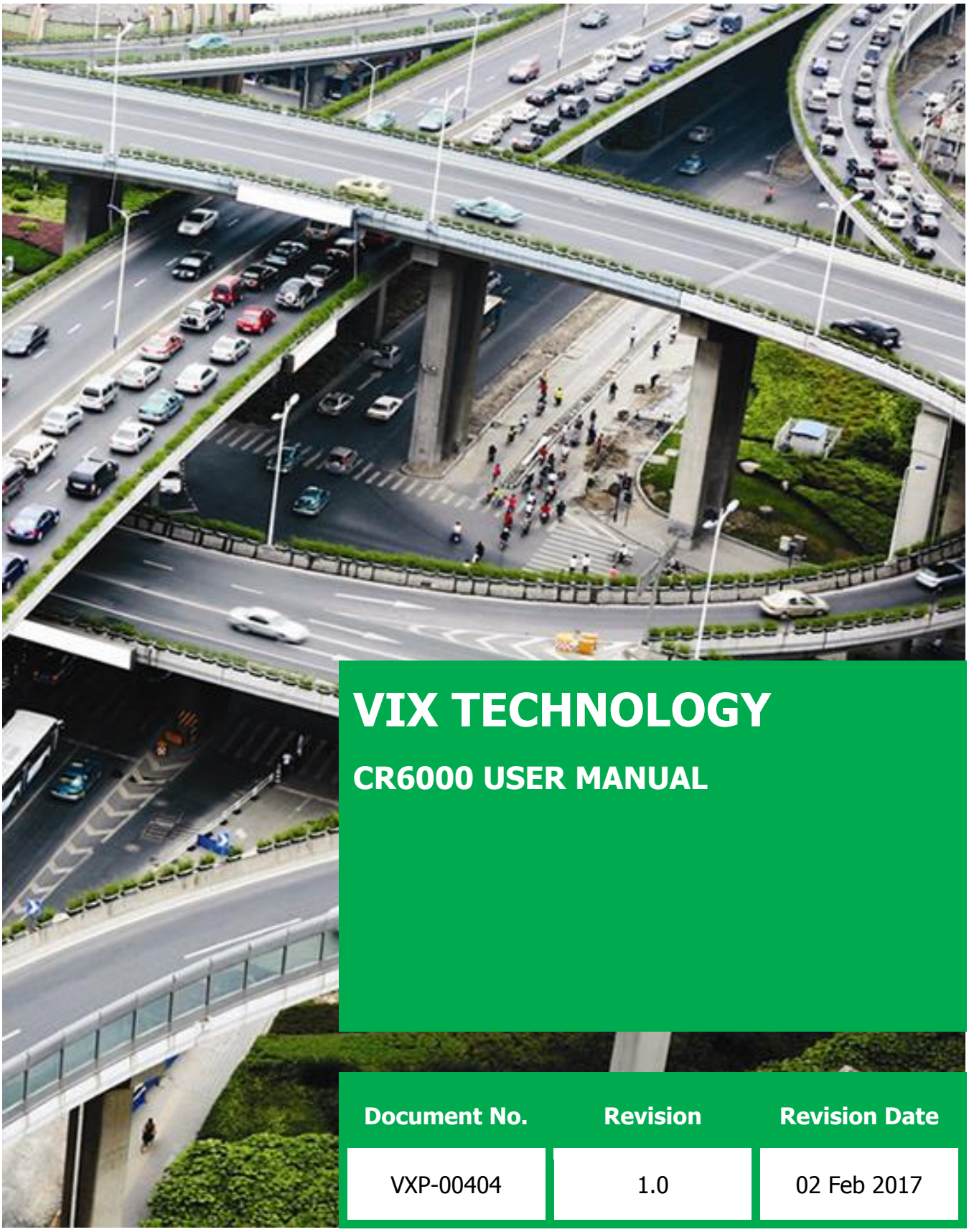

VIX TECHNOLOGY

CR6000 USER MANUAL

Document No.	Revision	Revision Date
VXP-00404	1.0	02 Feb 2017

Document History

Revision	Revision Date	Description	Author
0.1	08/05/13	First Draft	Chris Bailye
1.0	02/02/2017	Updated to include : FCC compliance statement FCC warning and RF exposure statement.	Atul Sharma

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1 Introduction

1.1 Purpose

This manual provides instructions for the users of CR6000 validator.

1.2 Scope

This manual is intended for members of teams carrying out the necessary setup and troubleshooting of CR6000 card reader. This document is divided into 3 parts as follows:

In the event of a problem or a malfunction, please contact Vix for any additional assistance and information.

1.3 Terminology

The following table contains a list of common acronyms/terms and their meanings.

Table 1: Terminology

Term	Definition
CSC	Contactless Smart Card
EMC	Electro Magnetic Compatibility
ESD	Electro Static Discharge
OEM	Original Equipment Manufacture
PCB	Printed Circuit Board
SAM	Security Access Module

1.4 Safety

All installation work must be carried out in accordance with relevant Safety Codes and Codes of Practice as well as recognized industry standards. The appropriate protective clothing must be worn where necessary. Tools must be used in accordance with manufacturers' instructions and suitable for the task.

Personnel attempting to perform any work on the electrical wiring must be trained and suitably qualified in the appropriate electrical codes of practice and must work in accordance with those codes.

1.4.1 Safety Precautions

This document presents important information that is intended to ensure the safe and effective use of this device. Please read this information carefully, and store it in an accessible location near your installation.

1.4.2 Warnings and Cautions

Warnings and cautions are used to call attention to potential hazards. Failure to observe the information provided with the warnings and cautions may result in injury or property damage. Be sure that you understand the meaning of each before you proceed.

WARNING:

Indicates a potentially lethal hazard. Failure to observe a WARNING may result in severe injury or death.

CAUTION:

Failure to observe a CAUTION may result in personal injury or damage to the device or other property.

WARNING:

- The device should only be installed, serviced and maintained by qualified service personnel. Improper repair work can be dangerous. Tampering with this device may result in injury, fire, or electric shock.
- In accordance with local requirements, the device should only be installed by a qualified electrician. Improper work can be dangerous. Tampering with this device may result in injury, fire or electric shock.
- Disconnect all power before carrying out repairs or service.
- Be sure to use the specified power source for the device. Connection to an improper power source may cause fire or electric shock.

CAUTION:

- This device must be earthed (grounded).
- The enclosure section of this device is heavy caution needs to be used when opening the device to avoid damage or injury.

1.4.3 EMC and Safety Standards Applied

Product Name: CR6000

The following standards have been applied to this device:

- CE Marking
- Safety: EN60950-1:2002
- FCC Part 15

1.4.3.1 FCC compliance statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourage to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

WARNING:

THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

1.4.3.2 Human exposure statement:

To meet human exposure requirements a separation distance of > 20cm should be maintained.

2 Organization & maintenance program

There are three categories of maintenance activities for devices, namely:

- First level maintenance (in-situ maintenance);
- Second level maintenance;
- Third level maintenance (repair shop maintenance).

The factors that differentiate these three categories include:

- The skill level required;
- The complexity of test equipment and tools;
- The feasibility of on-site maintenance activities.

2.1 First level maintenance (in-situ maintenance)

In-situ maintenance is done on site and does not require workshop facilities or tools or specialized testing equipment. Only basic technical knowledge is required and the work is done according to established procedures.

2.2 Second level maintenance

Second level maintenance is performed by properly trained technicians and undertaken in a workshop with the required test equipment and tools.

2.3 Third level maintenance (repair shop maintenance)

Level 3 maintenance must be carried out by Vix and activities belonging to this category are normally done in a workshop. They require a degree of technical knowledge and may require the use of certain specialized tools. These activities are undertaken by qualified electronic or software engineers with detailed knowledge of the Device.

3 CR6000 overview

The CR6000 validator has the following functions:

- Validating contactless cards;
- Data transfer management between different devices (e.g. Driver Console)

The CR6000 is composed of a passenger interface with a TFT display and LEDs.

Figure 1: CR6000 card reader

3.1 Internal structure of the CR6000 validator

The following diagram represents the interconnection of different electronic boards with processed signals.

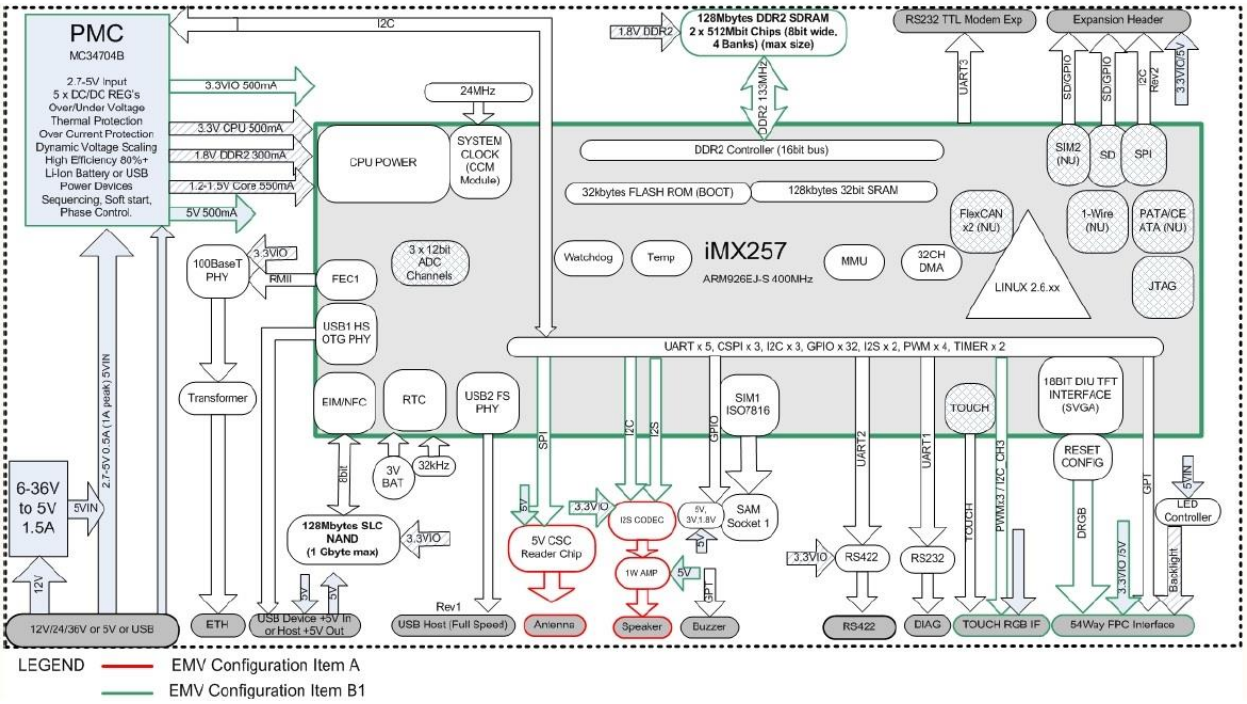


Figure 2: CR6000 block diagram

4 Instructions for users

4.1 Torque settings

The tightening torques of all fasteners must correspond to standards defined by Vix this being 2.0 Nm for the cradle locking nuts and 0.6 Nm for all fasteners.

4.2 Tools

4.2.1 Standard tools

The following list represents tools and consumables required:

This list is only shown as reference and can be extended depending on the nature of the task:

- Air pressure can - oil free.
- Plastic cleaning foam.
- Screwdriver cross-shaped head screws G n°1, n°2, n°3 Philips.
- Screwdriver for 5 and 5.5 hexagonal screws.
- Allen screwdriver 5/64.
- Set of slotted screwdrivers.
- Dry cloth or lint free cloth

4.3 External cleaning of the CR6000 card reader

4.3.1 Required staff and time

1 agent for 2 minutes (once the preliminary instructions are completed).

4.3.2 Preliminary instructions

Switch the card reader off. (Following the version, switch the vehicle off or unplug the power supply)

4.3.3 Procedure

1. Spray some plastic cleaning foam on the CR6000 card reader.
2. Clean and take out all the residues with a dry cloth or a lint free cloth.

Never use alcohol and avoid any abusive water splash. Excessive use of water or alcoholic cleanser can damage the CR6000.

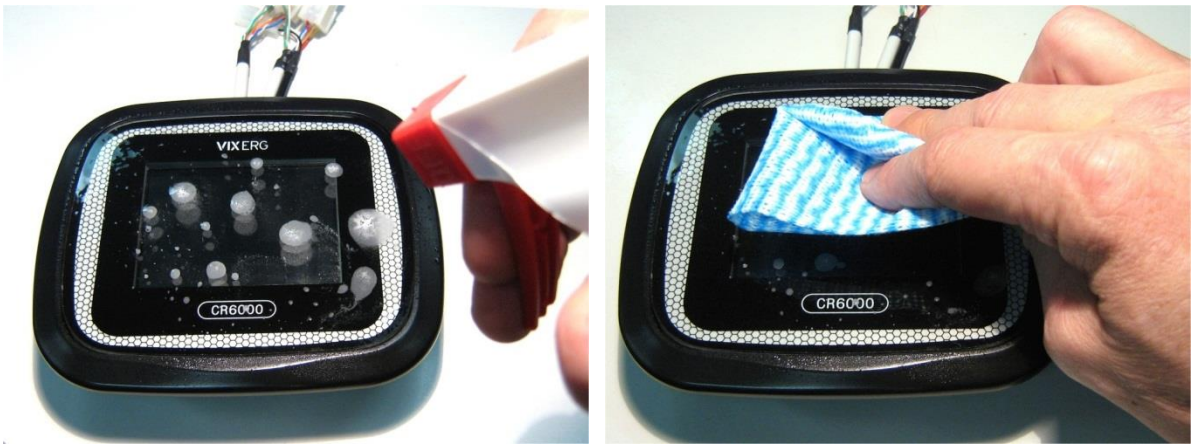


Figure 3 : External cleaning of the CR6000 card reader

4.4 Opening the CR6000 Panel mount card reader

4.4.1 Required staff and time

1 agent for 10 minutes (once the preliminary instructions are completed).

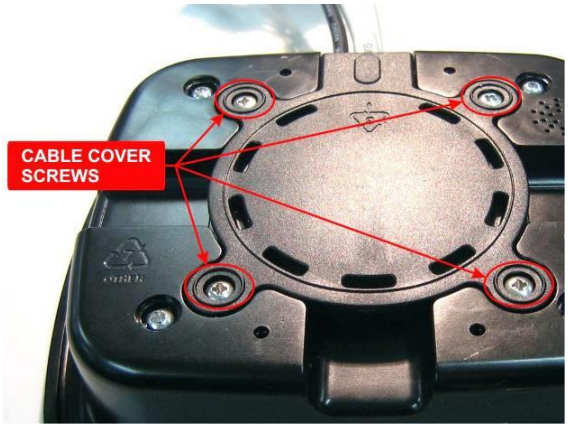
4.4.2 Preliminary instructions

Switch the card reader off. (Following the version, switch the vehicle off or unplug the power supply)

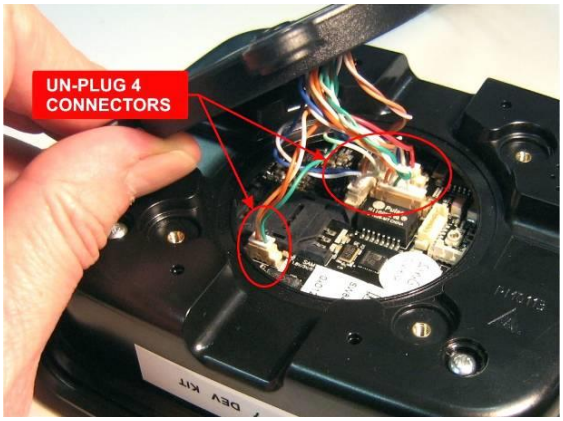
4.4.3 Procedure

Please consult following drawings along with these instruction :

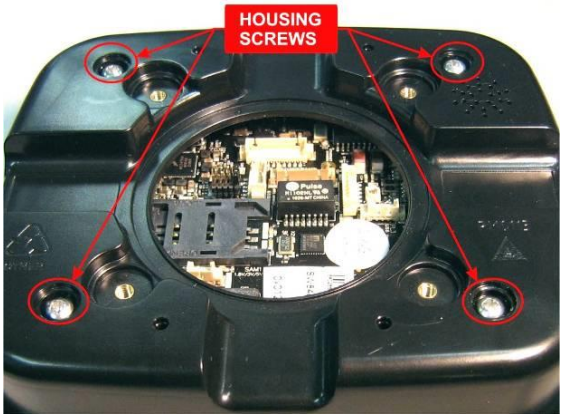
- 45-0720
- 45-0721
- 40-1079



a) Remove the 4 cable assembly and cover screws.

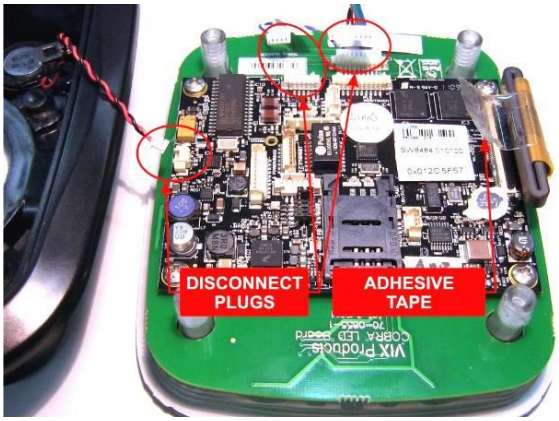


b) Un-plug the cable connectors from the PCB



c) Remove the 4 housing screws.

d) Push the PCB, Display and window assembly out the front of the housing as shown.



e) Disconnect the 3 plugs.

f) Peel back the adhesive tape from the PCB assembly.

4.5 Opening the CR6000 Desktop Mount card reader

4.5.1 Required staff and time

1 agent for 10 minutes (once the preliminary instructions are completed).

4.5.2 Preliminary instructions

Switch the card reader off. (Following the version, switch the vehicle off or unplug the power supply)

4.5.3 Procedure

Please consult following drawings along with these instructions:

- 45-0720
- 45-0721
- 40-1079

Turn the card reader over, front case on the work surface; put a clean foam coating between the screen and the work surface to prevent your CR6000 from being scratched.

a) Remove 6 srews shown as 1 which hold the window.

b) Remove 4 screws shown as 2 which hold the frame.

c) Lift the window up, notice the direction of assembly.

d) Un-plug the cable connectors from the PCB.

4.5.4 Installing and removing the SAM card

4.5.4.1 Tools and consumables

Standard tools.

4.5.4.2 Required staff and time

1 agent for 2 minutes (once the preliminary instructions are completed).

4.5.4.3 Preliminary instructions

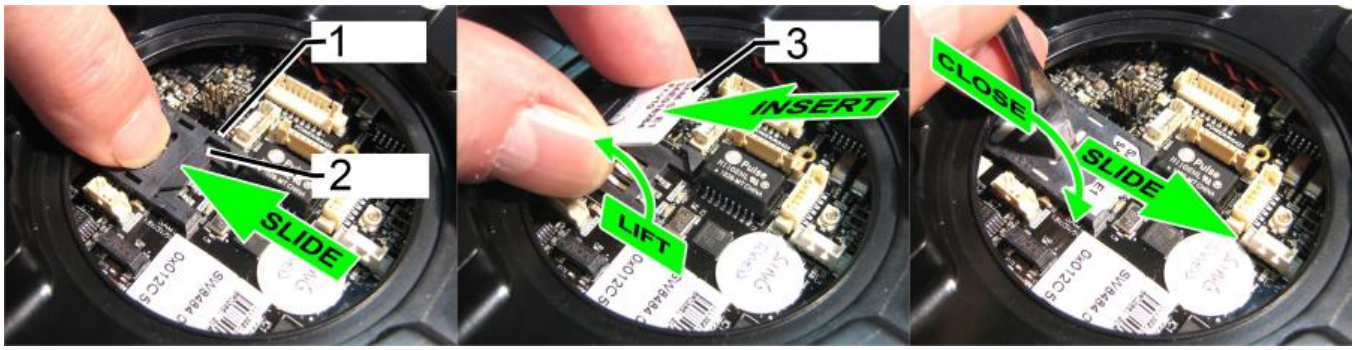
Open the reader (cf. § **Error! Reference source not found.**).

4.5.4.4 Assembling/disassembling the SAM card

The CR6000 must be switched off before adding or removing a SAM card.

Figure 4: Location of SAM slot

1. Slide the SAM hood to open it.
2. Insert the SAM.
3. Close the SAM hood and slide it to lock it.



1. SAM support 2. SAM hood/lock 3. SAM

Figure 5 : SAM board support.

5 Troubleshooting

If you detect an eventual problem, first, try to solve it with the following table.

N°	Diagnosis	Repairing
1	The CR6000 reader does not switch on	Check if the validator is plugged to the power connector of the support. Check the vehicle power (on board installation). Check the power supply (desktop installation). If the problem remains, please contact VIX TECHNOLOGY
2	The card reader screen is frozen on the VIX logo	Wait for a few minutes, a software update might be running. Disconnect the power for 30 seconds then connect it back. If the problem remains, please contact VIX TECHNOLOGY
3	The CR6000 reader does not read contactless cards anymore	Check with another contactless card (a card might be damaged). Check if the validator software is still working (The clock display has to change) Check if there is a SAM board (if used) Check the connections between the BRD0851 board and the antenna board. Test with another SAM (if used). If the problem remains, please contact VIX TECHNOLOGY
4	The CR6000 reader does not communicate with other devices	When you're having an Ethernet communication problem: Check the software version of the different devices. If you have a ticketing console make sure its blocking function is not on. Check the wiring of the different supports. If the problem remains, please contact VIX TECHNOLOGY
5	The CR6000 reader reboots after a power cut	If the reader has been unplugged for more than 30days, plug it for an hour in order to charge its battery. If the reader works every day, check the software version. The battery might be old; it has to be replaced by VIX TECHNOLOGY. If the problem remains, please contact VIX TECHNOLOGY

Table 1 : breakdowns and solutions

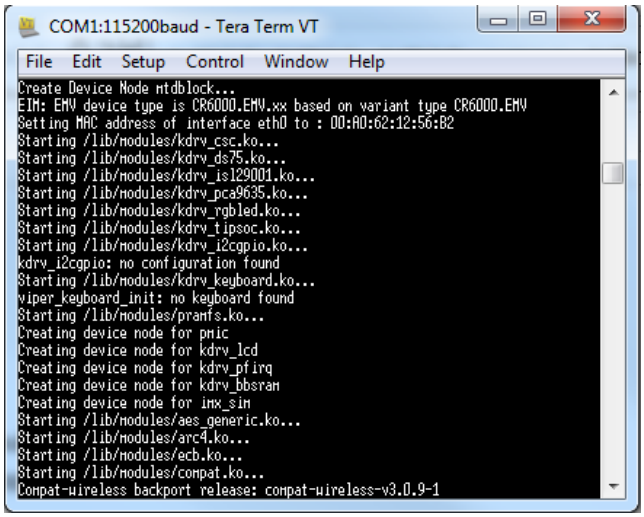
5.1 Serial Port Logging

Prerequisites:

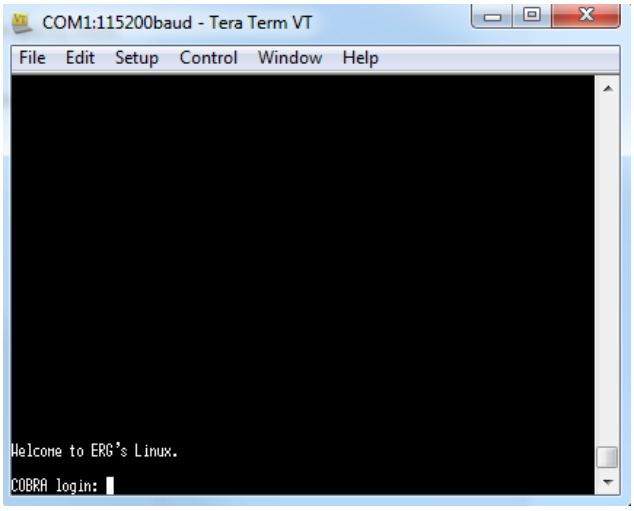
- Terminal Emulator such as TeraTerm or HyperTerminal.
- A PC or laptop with Serial port connection.

Procedure:

1. Invoke a terminal emulator (such as HyperTerminal or Tera Term) on the PC, with the following settings: 115200bps, 8 data bits, no parity, 1 stop bit, no flow control.
2. Apply power to the CR6000.
3. The device will start to boot and on the terminal Emulator following should be seen:



4. After the device finishes booting, it will stop at a Login prompt.



5. Now login with the user name "root" (all small letters) and project specific password.

6 APPENDICES

Appendix 1: pin out configuration for CR6000.AAAA

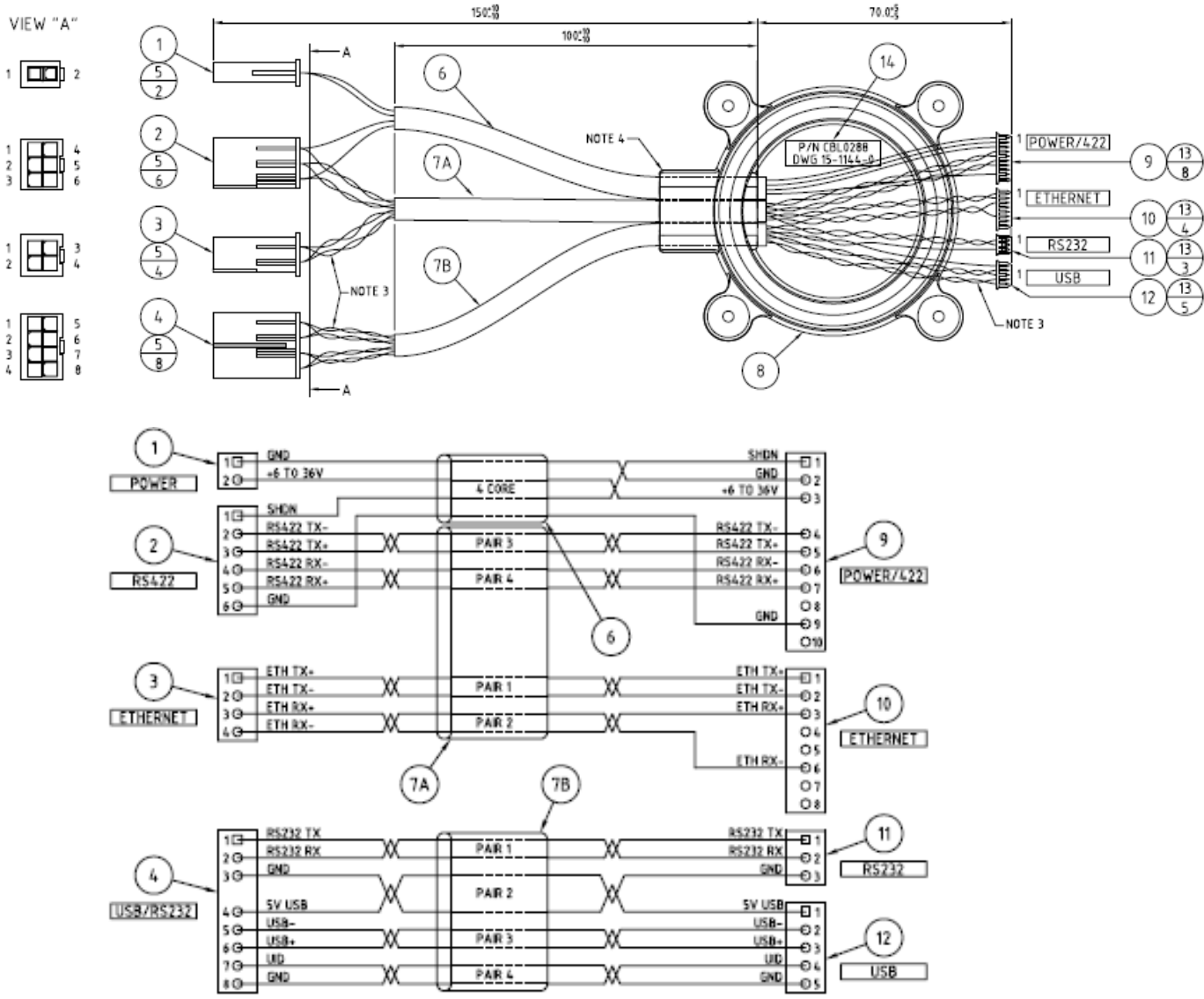


Figure 6 : Pin out configuration CR6000.AAAA

Appendix 2: Pin out configuration for CR6000.BABA

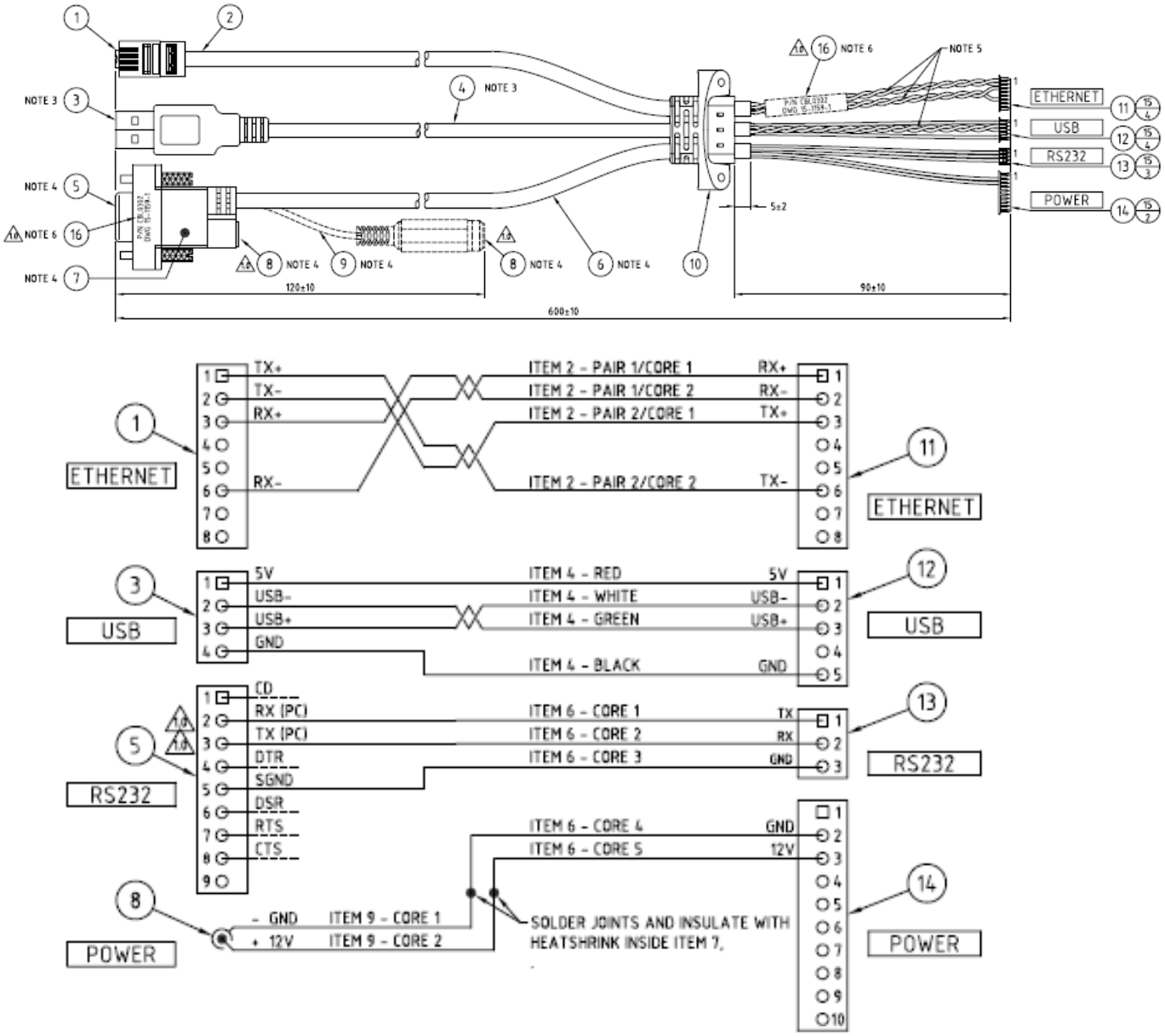


Figure 7 : Pin out configuration CR6000.BABA

Appendix 3: Pin out configuration for CR6000.BACA

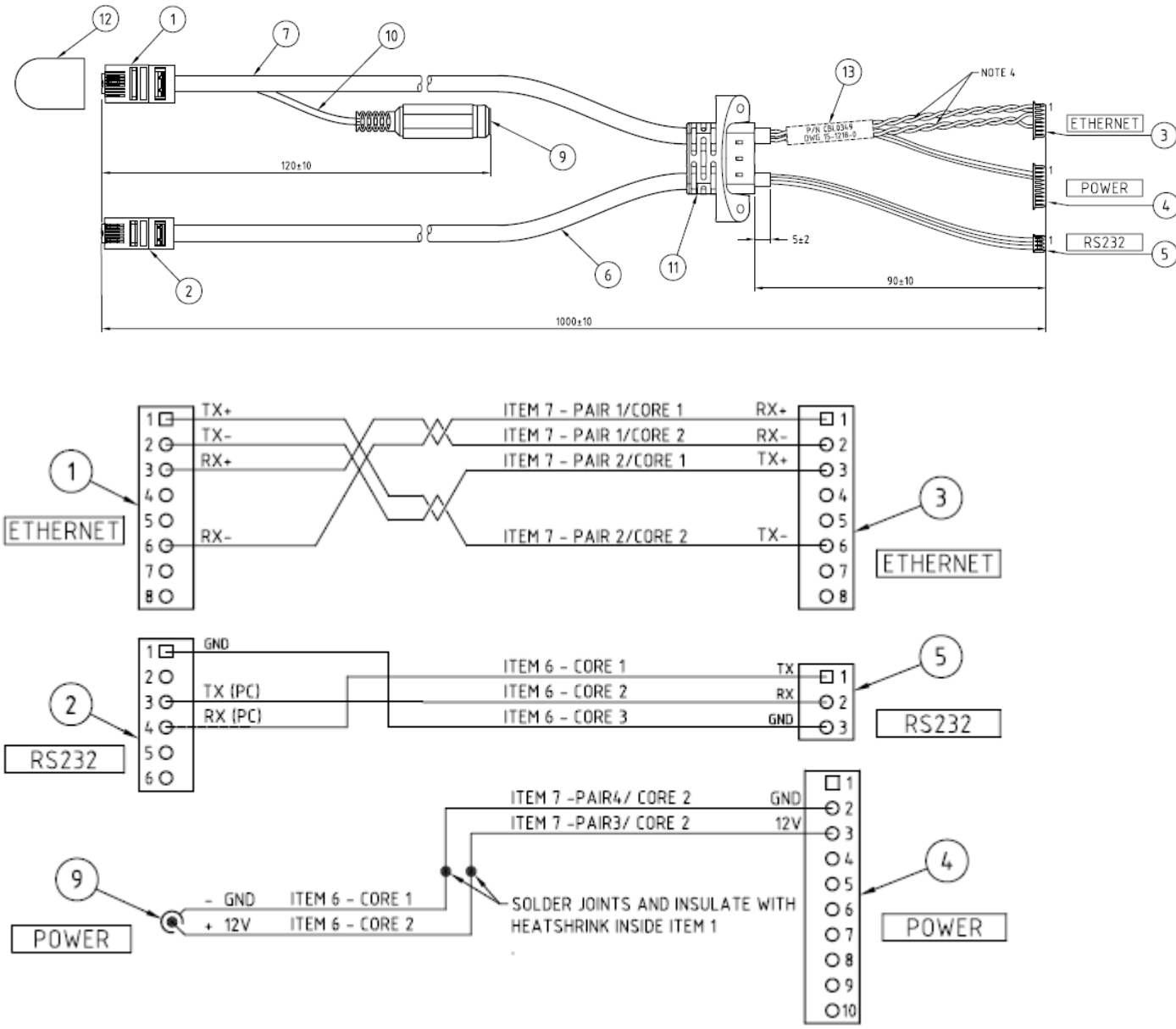


Figure 8 : Pin out configuration CR6000.BACA

Appendix 4: Opening /closing the Panel Mount reader

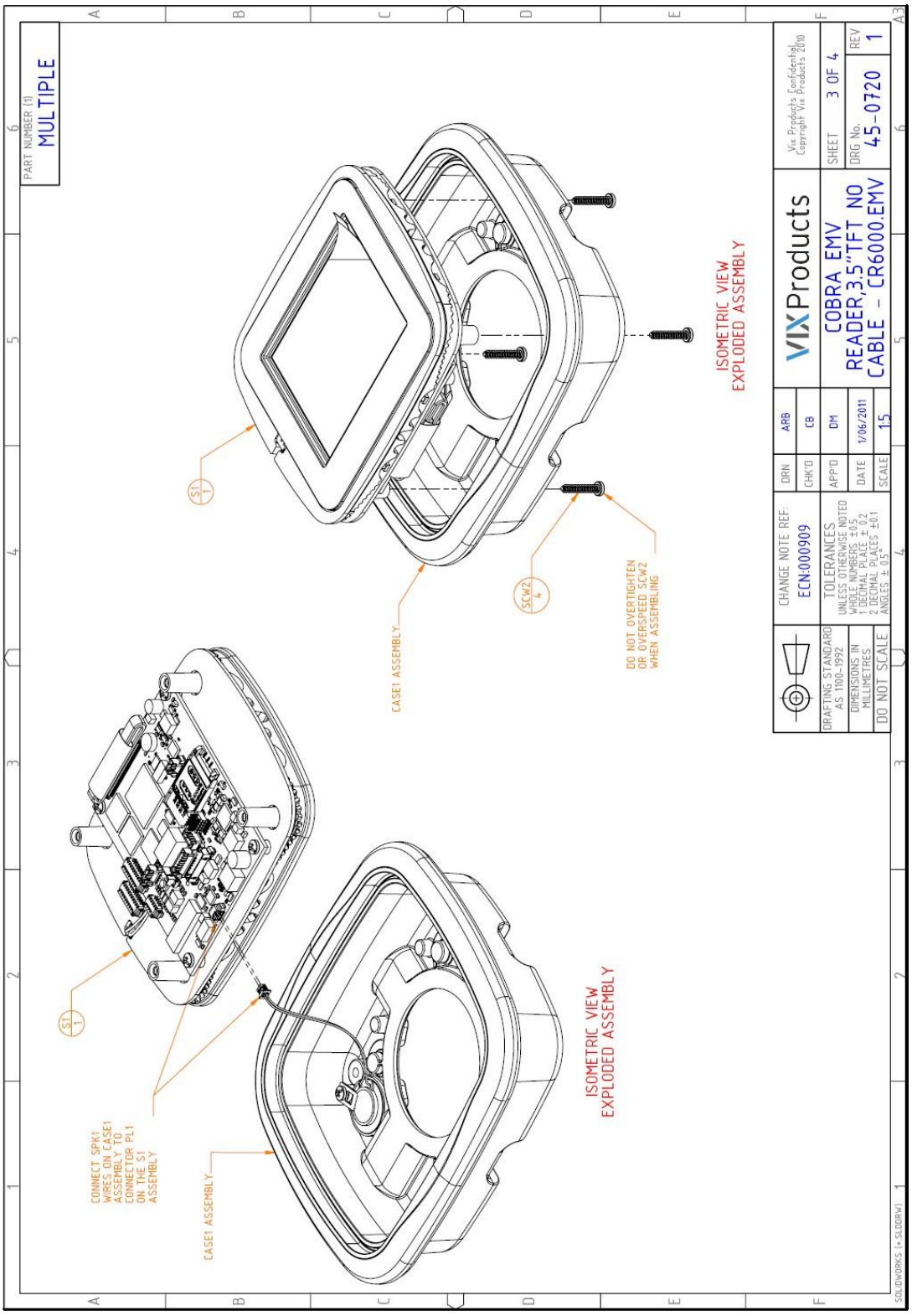


Figure 9 : Assembling CR6000 (wall/bus)

Appendix 5: Opening/closing the desktop mount reader

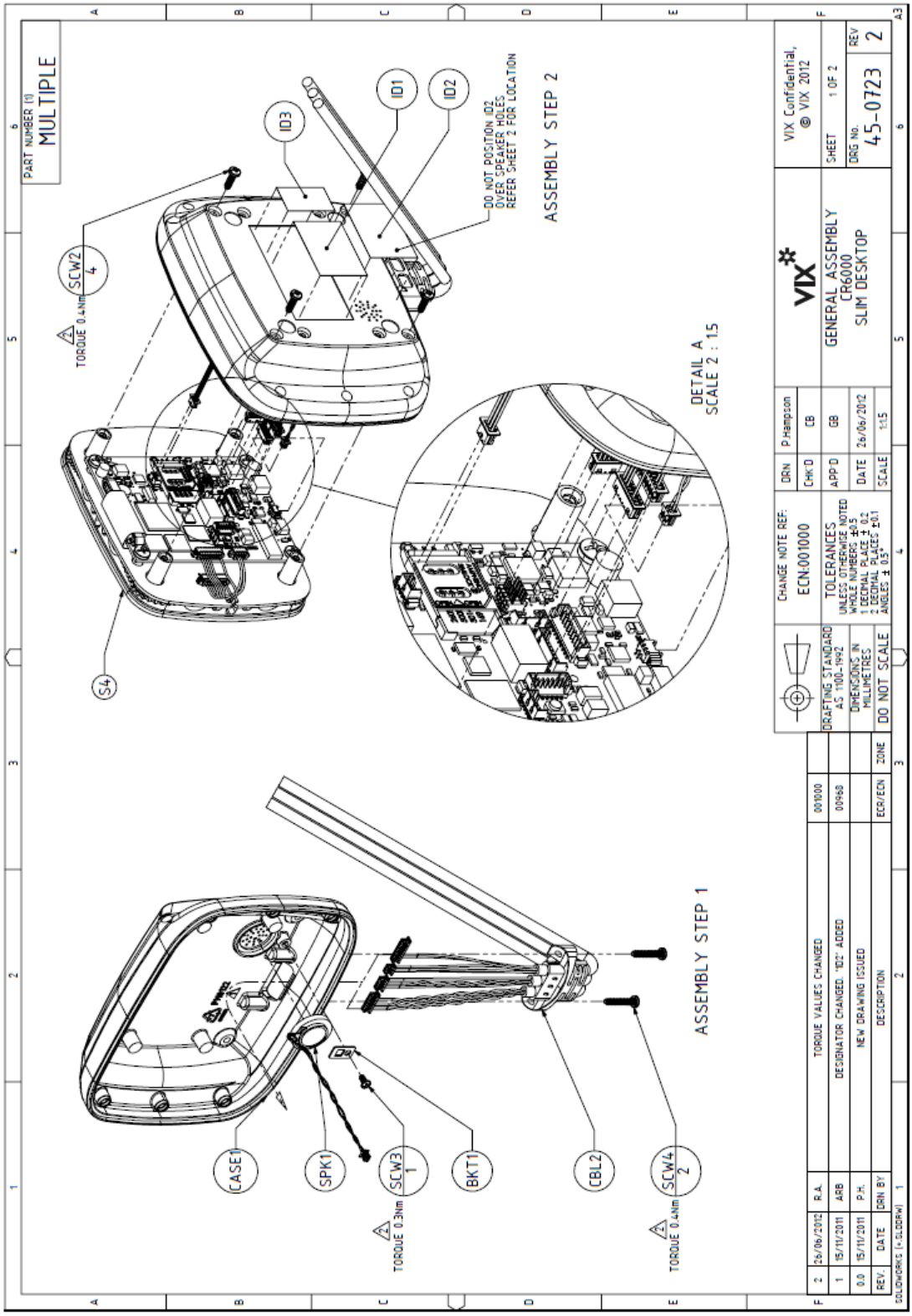


Figure 10: Assembling CR6000 (desktop)

Appendix 6: Mounting the window (desktop)

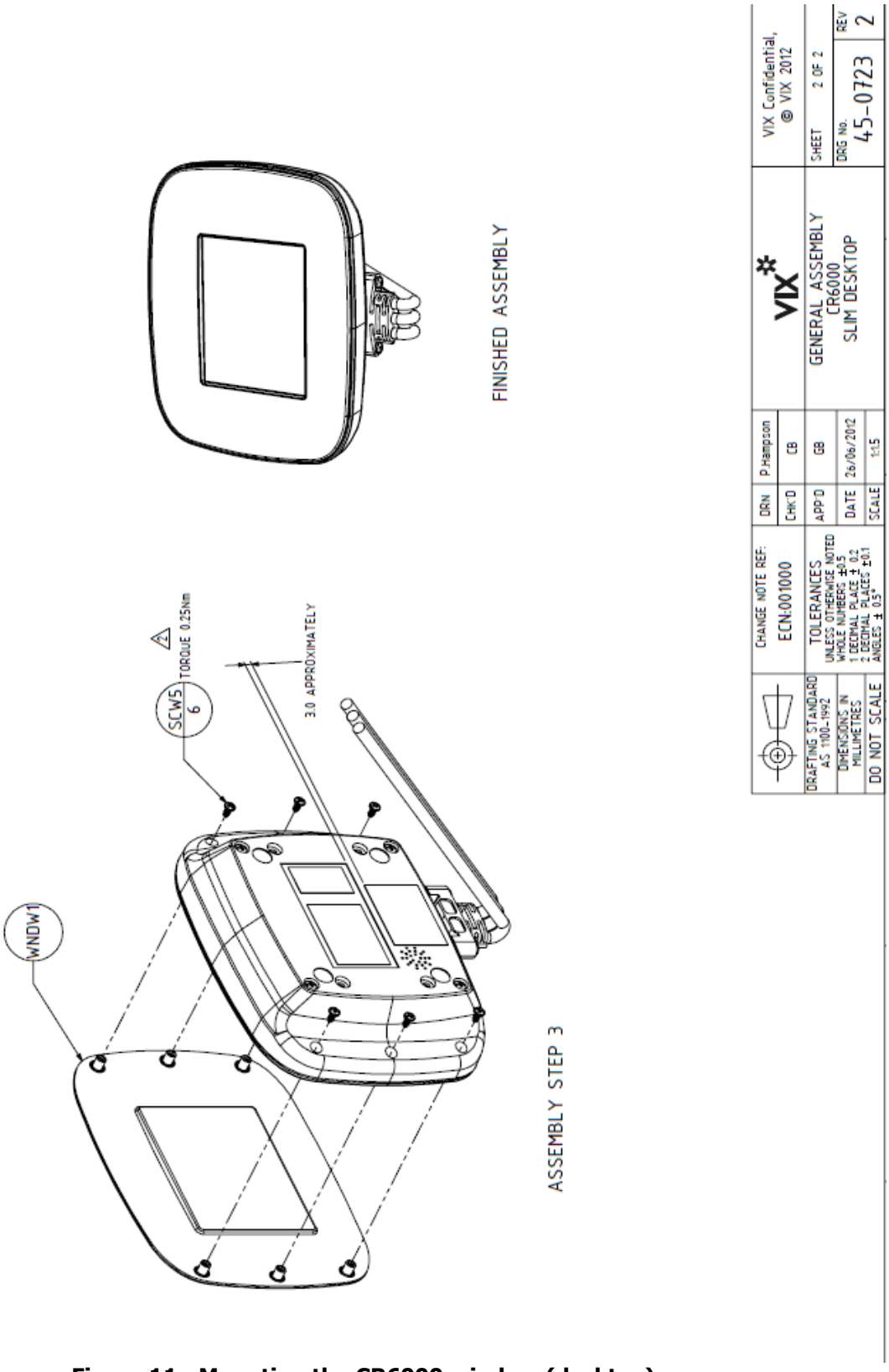


Figure 11 : Mounting the CR6000 window (desktop)

Appendix 7: assembling connectors of panel mount reader

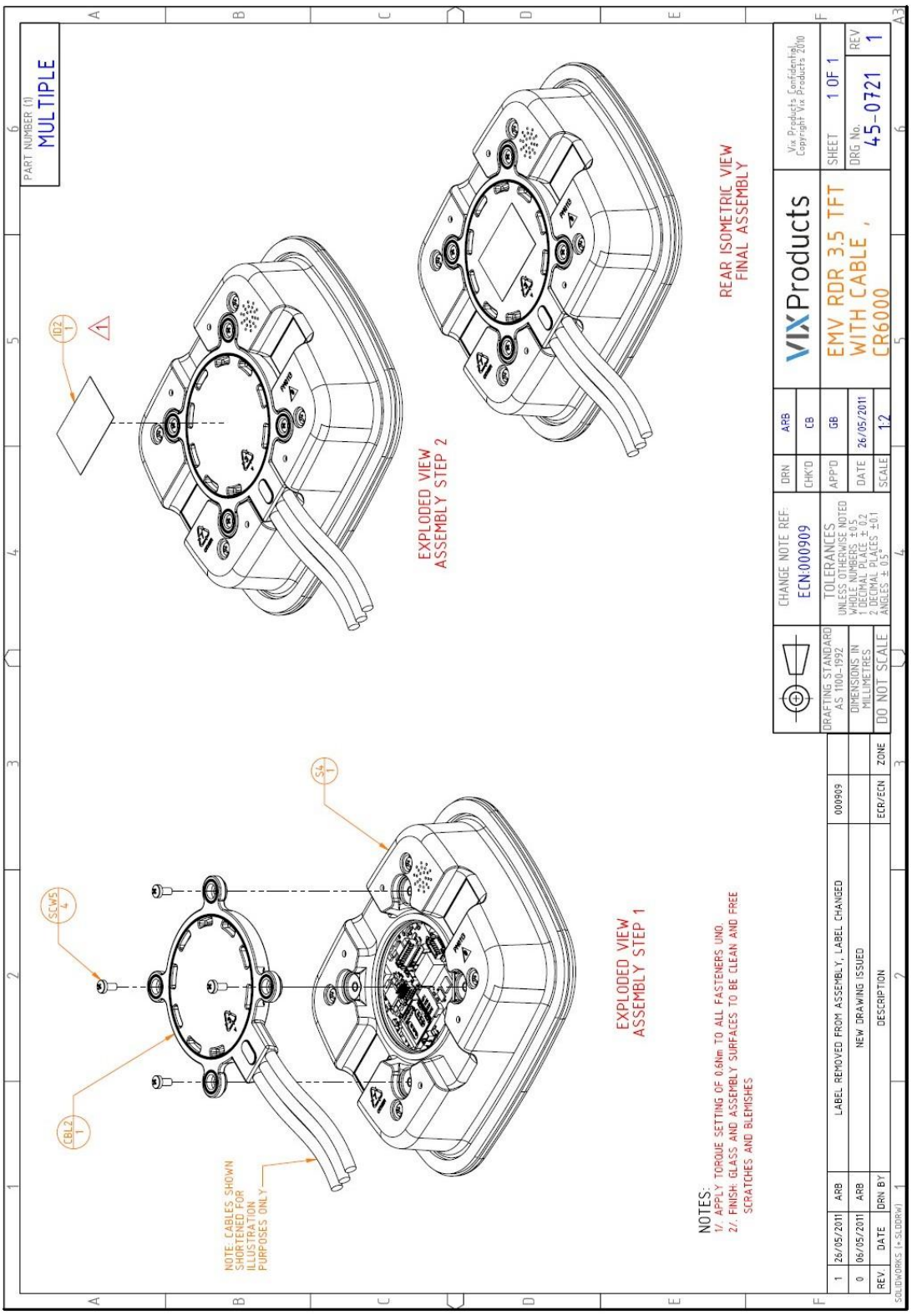


Figure 12 : assembling connectors of the CR6000 reader (bus/wall)