EXCHANGE DAQ HARDWARE

This page should help you to exchange a piece of DAQ custom hardware in the USC55 . (Trick: print the part of the page needed for the intervention)

For each intervention, you should write in the logbook (inside the cupboard "DAQ SPARES" at the place S2B20 along the wall, the key is in a blue box close to the AUG SCX5)

- the date of the intervention
- the hardware serial number of the element you took and which you returned (use anti-static bag if necessary)
- if possible, indicate information about the faulty element you returned (burned, works intermittently...)
- your name and email

The board you return should be left in the cupboard on the shelf named FAULTY. Stick a red label "FAILED" on it. On your left there is also the logbook and tools!!!! 😊⚒

Where can you find spare hardware:

- FRL, FMM, SLINK CMC, CPCI Monitor, CompactPCI power supply, CompactPCI interface (2 cards): inside the cupboard "DAQ SPARES" at the place S2B20 along the wall(the key is in a blue box close to the AUG SCX5).
- CompactPCI crate and fan unit : in the cage of the SCX Computer room first floor.

Before you do something, read all the instructions, check if the cables you will unplug is labelled (if not, ask an expert). You should understand the logic of the labelling, ideally you should write on paper all the cable numbers and their location on the hardware before you exchange it (this will be explained in each topic).

Change a FRL card

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES" r

1. a small cross screwdriver
2. a new FRL
3. fiber protections for the FRL and fibers

- **The intervention :**

You have to inform DAQ shifter that you will power OFF a crate. As in all interventions, you should understand the labelling before you start to remove cable(s) (HELP⧉).

1. switch OFF the crate (at the back of the crate)
2. unplug SLINK cable(s) from the front of the card and do the same for some cards on the left and on the right
3. unplug the two fibers from the front of the card and **PROTECT them and the FRL optical transceiver too**
4. unscrew the 2 screws of the card extractor
5. remove the card and pay attention to the cables and fibers around.

Insert the new card and pay attention to the cables and fibers around. The card should be inserted in the crate guides (top and bottom of crate). You should finish the card insertion with the extractors and without force.

1. screw the 2 screws of the card extractor
2. remove the transceiver protection
3. remove the fibers protection and plug in them (remember the labels)
4. plug in all the slink cables (2 clicks should be heard per connector, if you didn't hear them, unplug and plug in again the connector)
5. power ON the crate.

The FRLPC corresponding to this crate should be rebooted (read the label on the top of the crate to know its name) **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.** The FPGAs (2) firmware should be updated with the last version (see UpdateFirmware).

Change a SLINK CMC

This can be done only with the help of the appropriate Subdetector. Then, contact the Subdetector shift person, and do the work with him/her. The spares are at the usual place (see above). The firmware should be probably updated (see UpdateFirmware).

Change a FMM card

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a small cross screwdriver
2. a new FMM

- **The intervention :**

You have to inform DAQ shifter that you will power OFF an FMM crate (indicate which crate because a crate can contain many partitions). As in all interventions, you should understand the labelling before you start to remove cable(s). It is especially important with FMMs as there are many cables. (HELP⧉).

1. switch OFF the crate (at the back of the crate)
2. unplug RJ45 cable(s) from the front of the card (be careful not to break the little knob that secure the RJ45 in its socket)
3. unscrew the 2 screws of the card extractor
4. remove the card and pay attention to the cables around.

Insert the new card and pay attention to the cables around. The card should be inserted in the crate guides (top and bottom of crate). You should finish the card insertion with the extractors and without force.

1. screw the 2 screws of the card extractor
2. plug in all the RJ45 cables (1 click should be heard per connector, if you didn't hear them, unplug and plug in again the connector)
3. power ON the crate.

The FMMPC corresponding to this crate should be rebooted (read the label on the top of the crate to know its name) **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.** The FPGAs (2) firmware should be updated with the last version (see UpdateFirmware).

Change a CPCI Monitor card

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a small cross screwdriver
2. a new CPCI Monitor card

- **The intervention :**

You have to inform DAQ shifter that you will power OFF a crate.

1. Switch OFF the crate.
2. Unplug the RJ45 connector from the back of the card (temp sensor)
3. Unplug lemo (2 or 4) and RJ45 cables from the front of the card
4. Unscrew the 2 screws of the card extractors
5. Remove the card.

Insert the new card and pay attention to the fibers around. The card should be inserted in the crate guides (top and bottom crate). You should finish the insertion with the extractors and without force.

1. Screw the 2 screws of the card extractors
2. Plug in the RJ45 and the LEMO cables (remember that label HELP⬚
3. Plug in the RJ45 connector at the back of the card
4. Power ON the crate.

The FRLPC corresponding to this crate should be rebooted. (read the label on the top right of the crate to know its name) **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.** The FPGA (1) firmware should be updated with the last version (see UpdateFirmware).

Change a interface

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a small cross screwdriver
2. a CompactPCI interface set (a PCI card and a "System Board" card)

- **The intervention :**

For this intervention, you need to power OFF the crate and the FRLPC/FMMPC corresponding to this crate (see top right of the crate). Both crate and PC interface should be change in case of problem. You have to inform DAQ shifter that you will power OFF a crate.

- ♦ For the PC intervention:

1. unplug cables at the back of PC (Ethernet, power, CompactPCI interface "2xRJ45")
2. unscrew the two screws at the front of the PC
3. remove PC from the rack (left it on its rails)
4. open it and exchange the PCI interface cards
5. close the PC
6. push it in the rack (on both sides, there is a clip that has to be pulled up)
7. plug in all cables (power, ethernet, crate interface : 2xRJ45 cables-the labelled one at the top)

nb: if you haven't yet power off the crate, the CompactPCI interface leds should blink. Don't reboot the PC yet.

- ♦ For the crate:

1. power OFF the crate.
2. unscrew the 2 screw of the System Board
3. remove the card **with the 2 RJ45 cables** (be careful, the card is guided on only 4 cm at the top)

Pay attention to the cables and fibers around.

1. unplug RJ45 cables from the card
2. plug in them in the new System Board (for the label there is a HELP⧉)
3. insert the new interface in the crate. Be careful because the card is guided only on the last 4 cm.
4. screw the extractors
5. power ON the crate

Check at the back of the PC (when it is ON) if CompactPCI interface leds blinked. If not you have to invert the 2 RJ45 connections. REBOOT the PC. **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.**

Change a power supply

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a small cross screwdriver
2. a CompactPCI power supply

- **The intervention :**

The power supplies are on the back of the crate. The CompactPCI power supplies are hot-swap and for each crate one is used as redundancy. As long as you remove only one power supply at the time, the crate will not be power OFF. Inform the DAQ shifter anyway if you do this kind of work! To change a power supply (led red status ON indicates error) :

1. unscrew the 2 screws
2. remove the 3U power supply (used the extractor)
3. insert a new one
4. screw the 2 screws

Normally the intervene doesn't disturb the operating. The status of the power supply can be check here: STATUS⧉

Change a Crate

You SHOULD be TWO persons to exchange a crate

* **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES" (1) and in the cage in SCX computer room first floor (2)

1. a small cross screwdriver (1)
2. a big cross screwdriver (1)
3. fiber protections for the FRL/Myrinet and fibers (1)
4. some cable ties (1)
5. a cutting pliers (1)
6. a crate "21 slots" or "2x10 slots" (2)

* **The intervention :** You have to inform DAQ shifter that you will power OFF a crate. As in all interventions, you should understand the labelling before you start to remove cables (HELP⬈).

1. Switch OFF the crate and the fan
2. unplug the power cord and the RJ45 temperature sensor cable at the back of the crate
3. unscrew the 2 screws of each power supplies, and remove them (3 PS, keep them in a save place)
4. at the front of the crate, unplug all fibers, SLINK cables, lemo cables and RJ45 cable (from CPCI Monitor card only)
5. protect fibers and FRL transceivers with appropriate materials
6. attach cables and fibers with cable ties out of the space need to remove the crate
7. unscrew all screw of cards extractors
8. remove the System Board **with the 2 RJ45 cables** (first board at the right, slot 0). Be careful, the card is guided on only 4 cm at the top. If the crate is a double backplanes, two cards have to be removed (slot 0 and 11).
9. unplug 2 RJ45 cables of the System Board, and keep the card(s) in a safe place
10. unscrew the 4 screws of the crate
11. remove the crate (pay attention to cables and fibers) (the FRL/FMM and or CPCI Monitor cards stay in the crate)

1. insert the new crate
2. plug in the 2 RJ45 cables in the System Board (for the label there is an HELP⬈
3. insert the card (one or two) in the crate. Be careful because the card is guided only on the last 4 cm.
4. remove, one by one, each card from the old crate and insert it in the new crate
5. screw the two screws of all cards extractors
6. remove fiber protections and plug in fibers in the FRL transceivers (remember the label, HELP⬈).
7. plug in all SLINK cables (2 clicks should be heard per connector, if you didn't hear them, unplug and plug in again the connector)
8. plug in RJ45 and lemo cables
9. at the back of the crate, insert the 3 power supplies and screw their 2 screws
10. plug in the RJ45 sensor cable and the power supply
11. power on the crate and the fan

The FRLPC corresponding to this crate should be rebooted (read the label on the top of the crate to know its name). **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.**

Change a PDU (Spectrum)

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a big cross screwdriver
2. a portable PC
3. a 1 meter ethernet cable
4. a power cable (PDU plug and Swiss plug) to configure the PDU before the exchange
5. a new PDU Spectrum

- **The intervention :**

The intervention on a PDU is done in two steps:

1. Configure the new PDU
2. Exchange PDUs

A. To exchange a PDU , you need to know its name (ex: PDU-S1F09-01, where S1F09 represents the rack name). With the PDU name you can know its IP address, type in a linux console "host PDU-S1F09-01", outside of cms domain, you should add "--cms" at the end of the name (ip addr= W.Y.X.Z). You can deduct the gateway (W.Y.1.1).

The PDU IP address (when new or after a Hard Reset⧉) is 192.168.1.10. To configure it, connect a PC to it (with an ethernet cable) and configure the PC ethernet interface as indicated below:

- IP address : 192.168.1.30
- Sub net address: 255.255.255.0
- Default gateway: 192.168.1.1

1. Do a telnet to the IP address 192.168.1.10 at the port 9999.
2. hit ENTER, it will appear a menu. Choice 0.
3. You have to enter the IP address W.Y.X.Z and the default GATEway W.Y.1.1 as it is asked.
4. At the end, the menu is shown, type 99 to save and quit

The PDU is configured.

B. You will now intervene to exchange PDUs. INFORM concerning people that all the rack will be power OFF.

1. **Pull down all the main power switches of the rack**
2. Unplug all power cables at the back of the PDU and the ethernet cable at the front. Check if all PDU power cables are labelled.
3. Only 4 screws maintain the PDU in place (there is no rails), unscrew them and maintain the PDU (ask for help if necessary).
4. install the new PDU and screw the 4 screws
5. Plug in all the power cables (HELP⧉) and the ethernet cable.
6. Check if the PDU power switches are ON, and if the COMM. switch is on "remote".
7. Rearm all the main power switches of the rack

Ask expert to try to access it remotely.

The FRL/FMM PCs of the crates connected to this PDU should be rebooted. To have their name, read the label at the top right of each crate (half crate has two PCs).

Change a fan unit

- **Which material do you need to intervene :** This material can be found in the USC55-S1 cupboard "DAQ SPARES"

1. a big cross screwdriver
2. a 1' fan (in the cage in the SCX Computer room first floor)

- **The intervention :**

You have to inform DAQ shifter that you will power OFF a crate. The fan unit is powered in series with the FRL/FMM crate. This is done to avoid that the fan is OFF and the crate warms.

To exchange the fan unit:

1. unplug the 2 power cords at the back
2. remove the 4 screws at the front

3. remove the fan with care
4. insert the new one
5. screw the 4 screws
6. plug in the 2 power cords

Check that the crate is powered (if not, switch ON the fan unit). The FRL PC corresponding to this crate has to be rebooted. Read its name at the top right of the crate. **If the crate is a dual half-crate, two PCs have to be rebooted. Check the label on the top of the crate.**

-- DoGigi - 08 Sep 2008

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