Discussion topics

Discussion topics over last 3 months

- **2020: 2x SRS production deliveries Systems & hybrids**
  - → answers to user feedback, see addendum
  - → all hybrids individually tested with serial Nr record in database
  - → VTC re-test of 1st batch 2020 hybrids: results awaited for upgrade or exchange
  - → Minicrate 2k manuals
- **VMM hybrids production 2021/22 , call to 22 teams has been sent**
  - → waiting for user feedback (3/22 so far)
  - → common production, new wafers, to be coordinated via WG5.1
- **SiPM frontend for SRS**
  - → talk Jose Toledo SiPM frontend card: raise arm for possible collaboration
  - → VMM hybrid adapter with SiPM / PM input for fiducial channels: common solution tbd
- **SRS ordering**
  - → SRStech orders: don't use CERN team accounts
  - → CERN store: SRS crates, VMM etc (tenders vs. sole source) discussions ongoing

…Discussion topics continued 1

- **Detector readout optimization**
  - → Online noise test (Lucian's talk)
  - → Note on S/N optimization (settings, PWR/GND connections, shield, filters) planned
  - → VMM configuration (slow controls, bit meanings, etc) dedicated note
- **Documentation SRS**
  - → SRS hardware: https://drive.google.com/drive/folders/1h5KLMAa7-bxbPoisnip5Adb4mYc2YMdq?usp=sharing
- **Firmware versions**
  - → SRS firmware: https://gitlab.cern.ch/SRS_firmware/bit_mcs_files
  - →Factory VMM firmware Version 2020 delivery: 02.09.2020
  - → Factory FEC firmware: ! Attention APV firmware! Re-programming FEC

…Discussion topics continued 2

- **VMM frontent links (DTCC)**

  → link status, how DTCC works over HDMI, config. registers: dedicated note

- **VMM firmware**

  → Overview, flowcharts, documentation : summary report (Marek Hradcek)

- **Realtime FEC Signal Interface (Busy, Start , Stop, Trig In/out, etc)**

  → Frontpanel I/O interface card for extended LVDS/NIM interface

  → HW design on request , Firmware tbd

- **VTC test device**

  → 6 VTC test boxes deployed and in use: reproduction possible on request

  → VTC manuals: summary report (Marek Hradcek)

  → Extension devices to VTC (I2C master, controlled pulsers or bias generators..) tbd

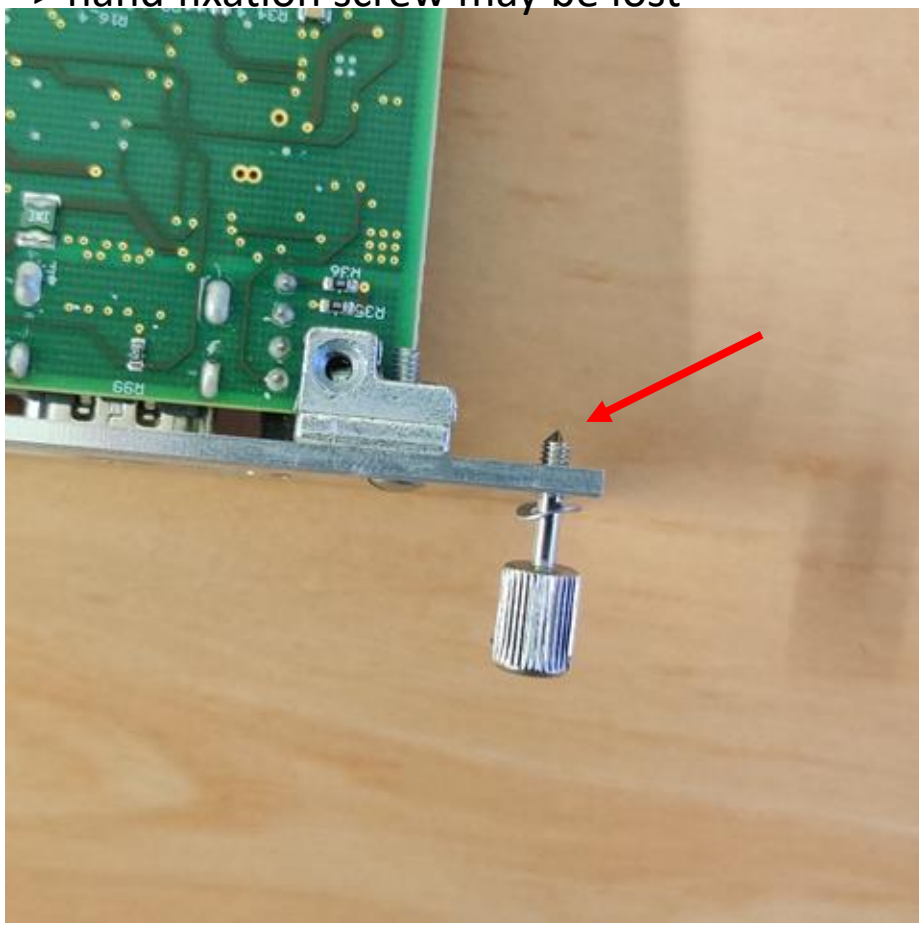
Addendum (if time)

First feedback on 2020 SRS production

Hans.Muller@cern.ch

DVMMcard: panel fixation screws

DVMM frontpanel 2 x holes may be too wide
-> hand fixation screw may be lost



Simple fix

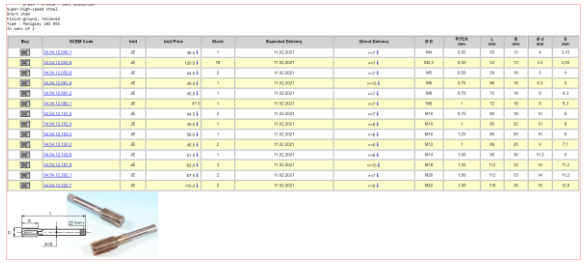
add M2.5 nut on backside of panel
if possible, mill nut thickness to < 1mm

Hans.Muller@cern.ch

DVMM panel Pro-fix:

Replace/upgrade hand screws

Need: M4.5 x 0.5 Tap drill + metal drill 3.7..3.8 mm dia



CERN store price 120 FS !!!!!!!

→market prices

CERN store: 10 hand screws with collars:

06.61.63.900.5 - BOUTON EXTRACT. CHASSIS EUROPE

1 PACKET CONTAINS 10 EXTRACTOR BUTTONS

Unit Price: 4.9 CHF / BAG(S)
Unit of distribution: 1 BAG(S)

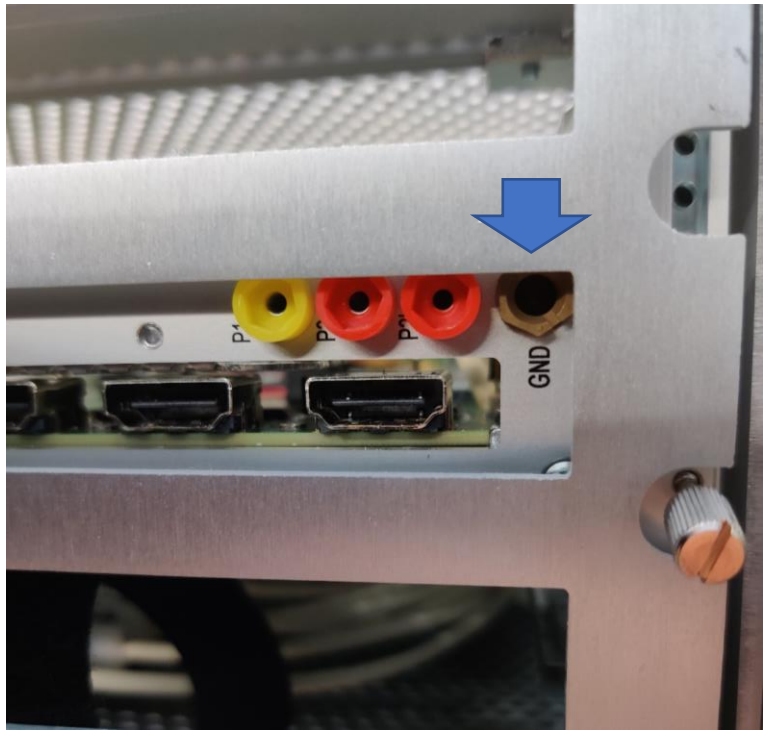
Buy	SCEM Code	Unit	Unit Price	Stock	Expected Delivery	Direct Delivery	DESCRIPTION	SURFACE TREATMENT
	06.61.63.900.5	SA	4.9	73	15.02.2021	>=57	EUROPA CHASSIS EXTRACTOR BUTTON	Chrome plated

Note: We will order 100 hand screws with collars for free distribution to DVMM users

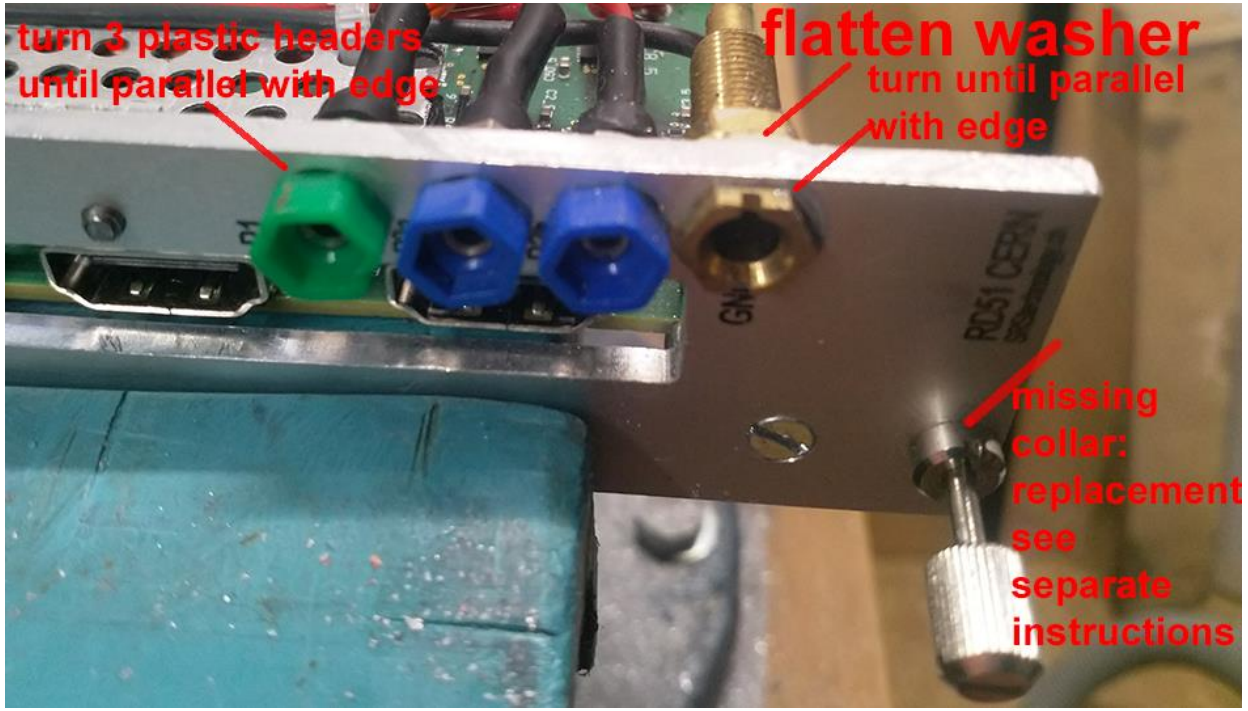
Hans.Muller@cern.ch

Minicrate 2k: rear door closure alignment needed

Adjustment problem 1:
panel hits hex GND plug + washer



Simple fix: rotate hex GND plug until parallel with panel
bend/flatten washer on backside of panel

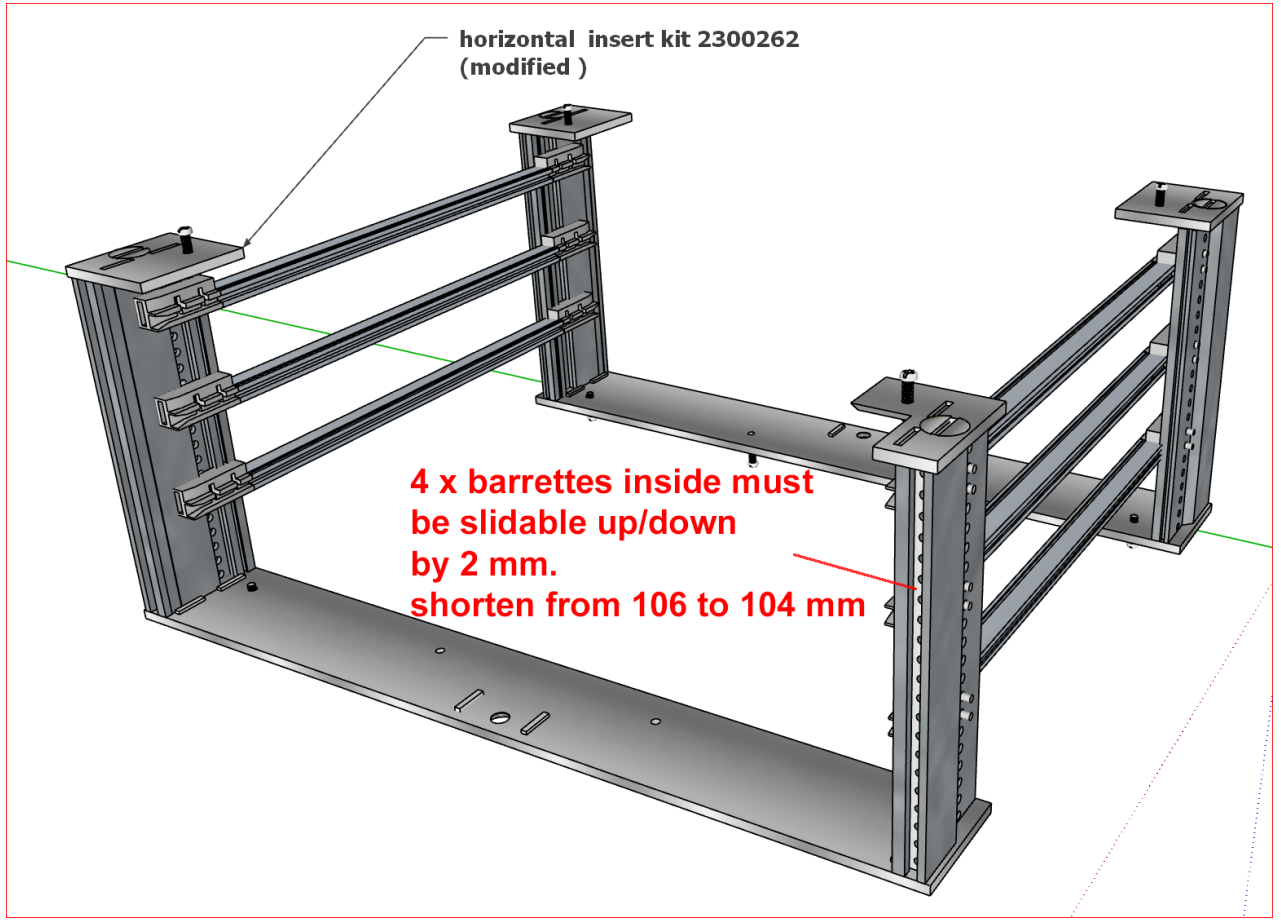


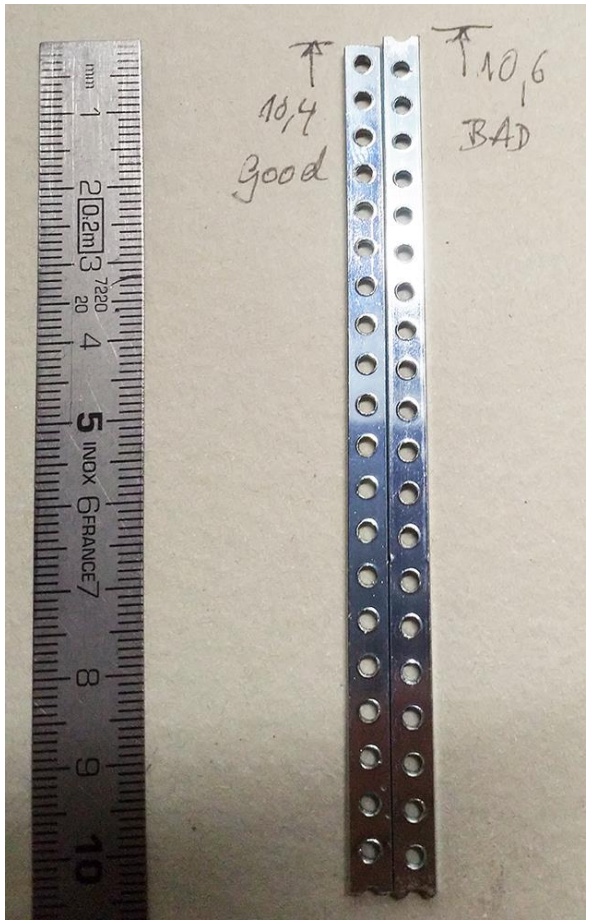
Hans.Muller@cern.ch

Minicrate Pro fix:

Vertical frontpanel alignment by +/- 1 mm

remove* 2 long Minicrate bars on top of crate to access insert kit
remove* 4 top fixation pieces (see below)
remove 4 barrettes and shorten each side by 1mm => 104 mm
re-insert 4 barrettes and re-assemble crate

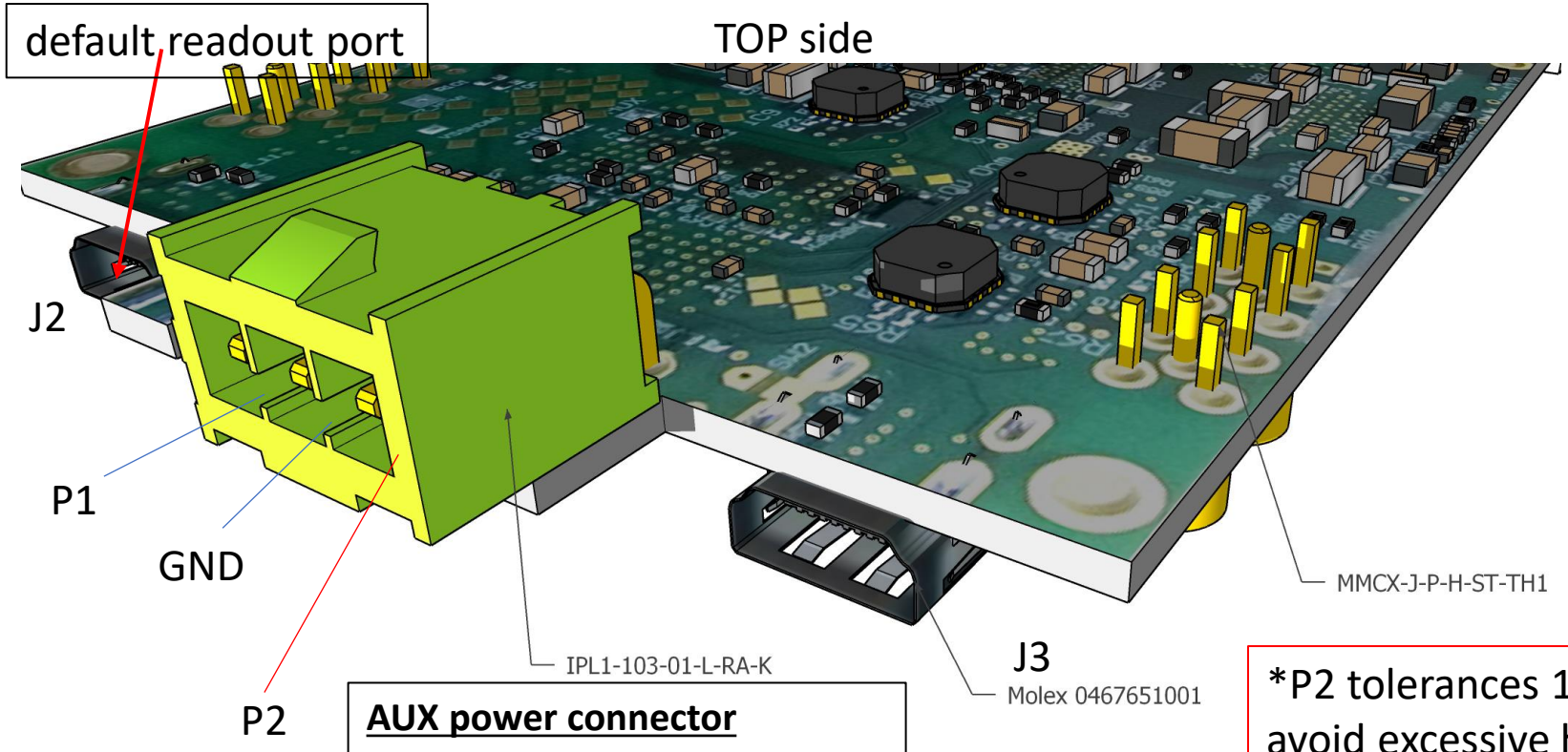




* removal difficult, proper tools required to not damage screws

Hans.Muller@cern.ch

VMM voltage: check on AUX connector



AUX power connector
IPL-103-01-L-RA-K
mount only for auxiliary power.
matches with cable connector
IPD1-03-S-K (with latch)

Voltages on AUX VMM power connector (after reset)

P2 = **min. 2V*** -> IC5,6,7,9 -> 1.2V
2x VMM ~ 1.75A

measured versus middle GND pin

P1 = **min 3.1 V**** ->IC8 -> 2.5V
FPGA/Flash/ADC ~ 0.14A

*P2 tolerances 1.75V < 2V < 2.1 Volt, keep <2.1V to avoid excessive heat. P2 setting via trimmers on DVMM
** P1 tolerances 3V <P1 <3.3V, keep below 3.6 V max LDO voltage. Increase P1 by putting ST16 jumper on DVMM

Hans.Muller@cern.ch

DVMM: P2 Voltage trimmers

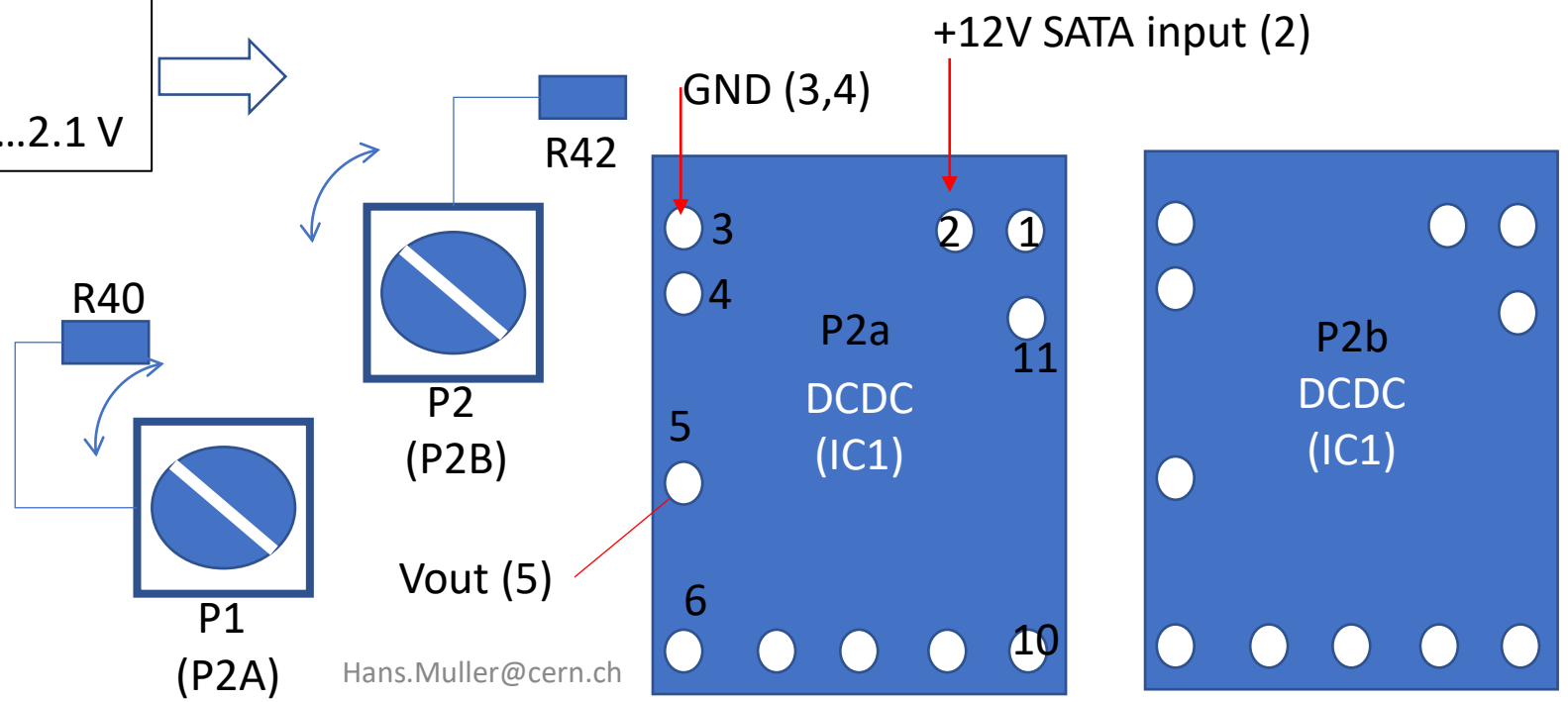
Tested with:
2m: HDMI cables Molex 68786-0003 +GND cable
5 m: HMDI cables SEA5003-20A + GND cable
… unfortunately obsolete

5m cable: turn **right** to set up to P2~ **4.4 V** **(pin 5 or frontpanel Banana plug)**
After reset, VMM AUX connector P2 –GND should read ~ 2.05…2.1 V

2m cable: turn **left** to set **P2 ~ 3.2V**
(pin 5 or frontpanel Banana plug)
After reset, VMM AUX
connector should read P2-GND ~ 2.05…2.1 V

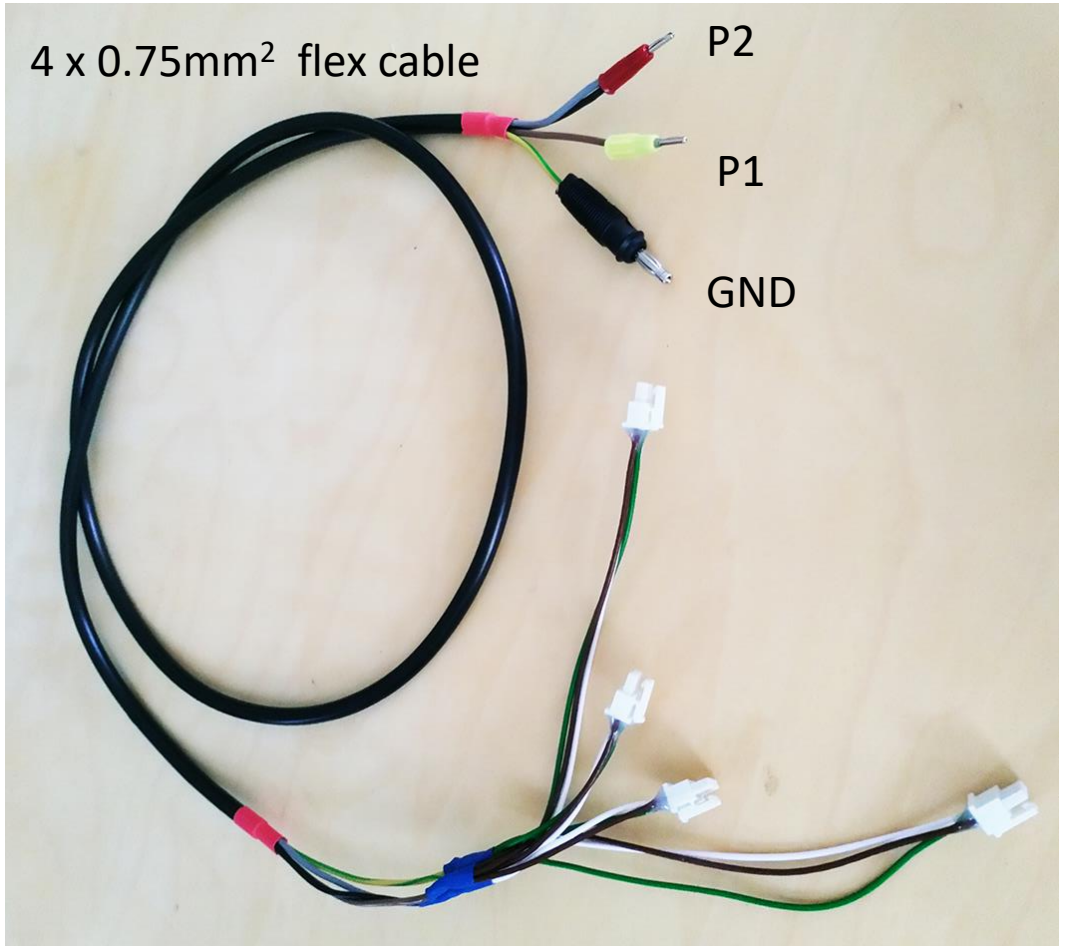
NB: P2 voltages on DVMM can be reduced if Power/GND cables are used between DVMM and AUX

TOP VIEW DVMM card:



Hans.Muller@cern.ch

AUX power/Gnd cable (DVMM-> 4x hybrid)



Voltage drop from DVMM to VMM hybrid
over HDMI cables depends on length and type of cable.

good HDMI cables becoming obsolete

Mitigate the length + type (ohmic) dependence
by using power/GND cable.

AUX cable (4x 0.75mm2, length >= HMDI cable
Each single IPD1 cable connector has 3 crimped wires P2,GND,P1

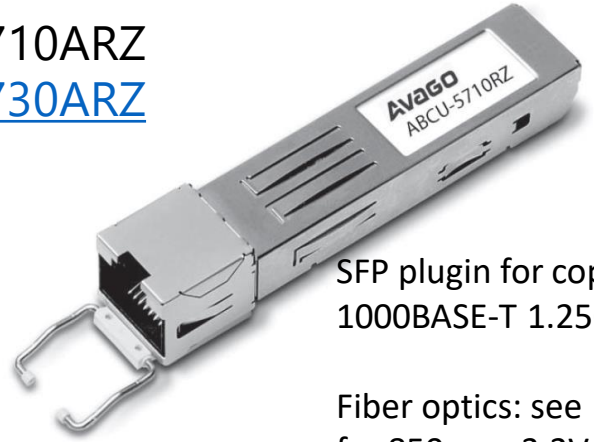
-> 2x GND wires fan out: single wire to 4 x center GND on AUX pin
-> 1x P1 wire fan out to 4x P1 pins
-> 1x P2 wire fan out to 4 x P2 pins

3 wires on each IPD1 connector to be seal/glued
soldered 1->4 wire slices to be insulated with shrinktubes

Hans.Muller@cern.ch

In case of ping problem:

AVAGO 5710ARZ
AVAGO 5730ARZ

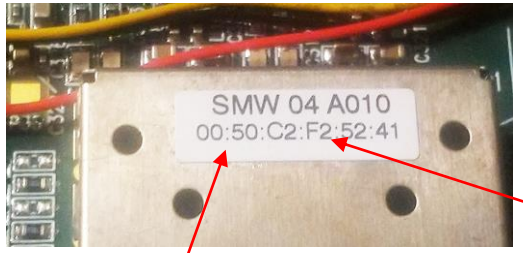


SFP plugin for copper network cables: 1000BASE-T 1.25GBd , 3.3V transceiver

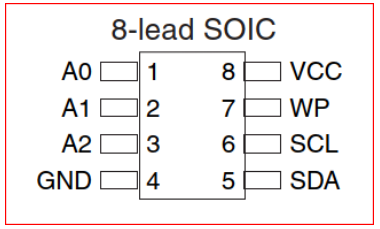
Fiber optics: see AFBR-5710Z Family for 850nm +3.3V SFP optical transceivers for Gigabit Ethernet

- default SPF plugin: (AVAGO 5730ARZ with RX_LOS enabled protocol , -5..+70C)
  Don't use SFP plugins with SGMII protocol.
  use quality CAT6 network cable, don't use crossed cables.
  SFP for optical fiber, default 850nm see AFBR-5710Z family.

- MAC / IP address in EEPROM (IC9 ,AT24C01BN) *
  Prom address:
  A0F10078 = 8b FEC firmware version
  A0F2007A = upper 14b MAC base address Samway (0050C2)
  A0F2007D = lower 14b MAC addr = FEC serial Nr
  A0F30000 = 16b hex. IP address for DAQ



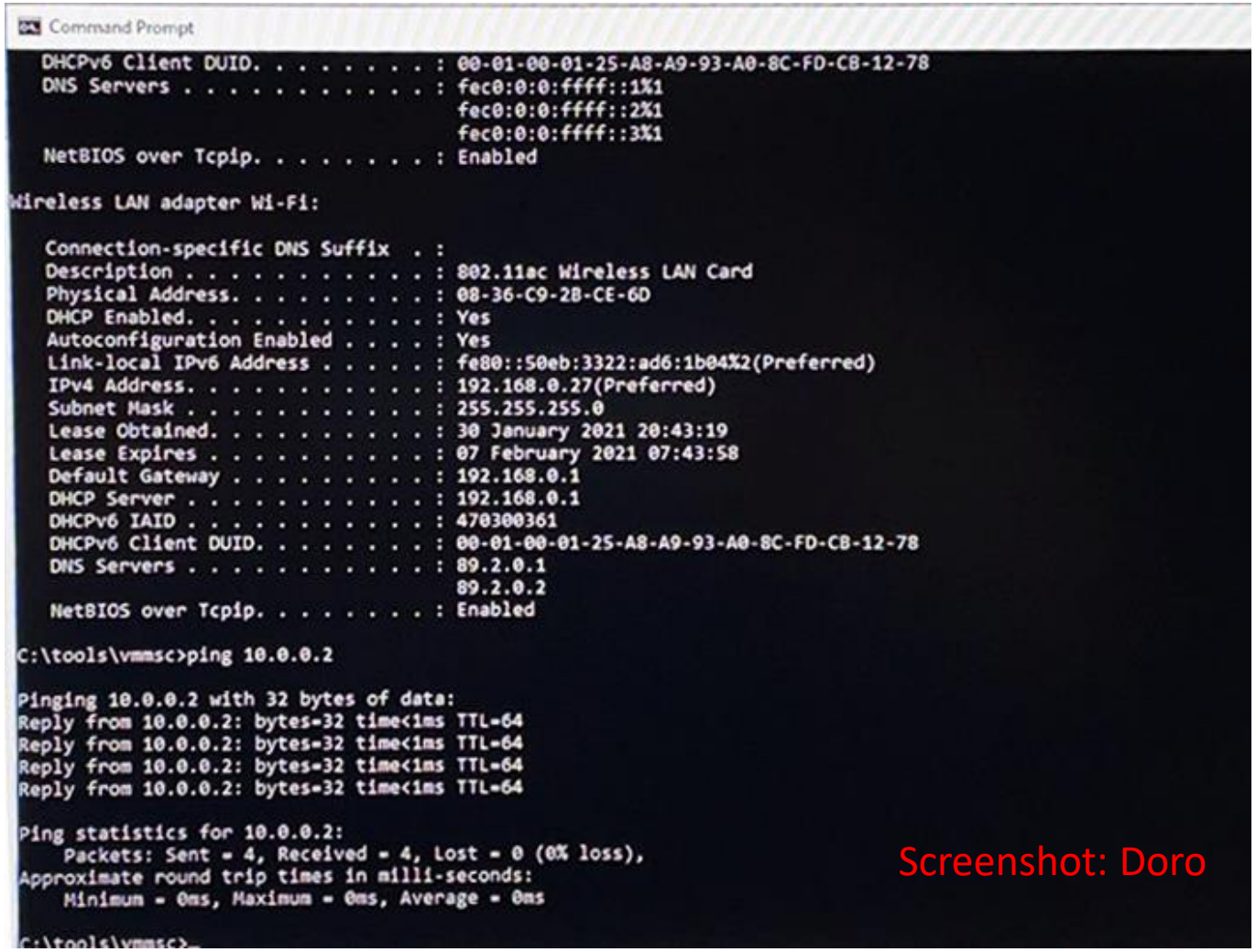
IC9 EEPROM on FEC



MAC address label: 00.50.C2= SAMWAY, F2.52.41= FEC serial Nr

- For reprogramming the PROM, see Samway F-47 FEC module test procedure document

Network alive test & ping



Screenshot: Doro