



Updates on the Multifunction Rack Control Unit

The Multifunction Rack Control Unit (MRCU)

Developed in IFIN-HH for the control system of HASC (NA62@CERN)

Features:

- On/Off switching of 230 V AC outlets;
- 230V AC current monitoring ;
- Rack Temperature & Humidity sensing near installed electronics;
- General purpose I/O port (reset, status, ..);
- Front-end electronics temperature monitoring.

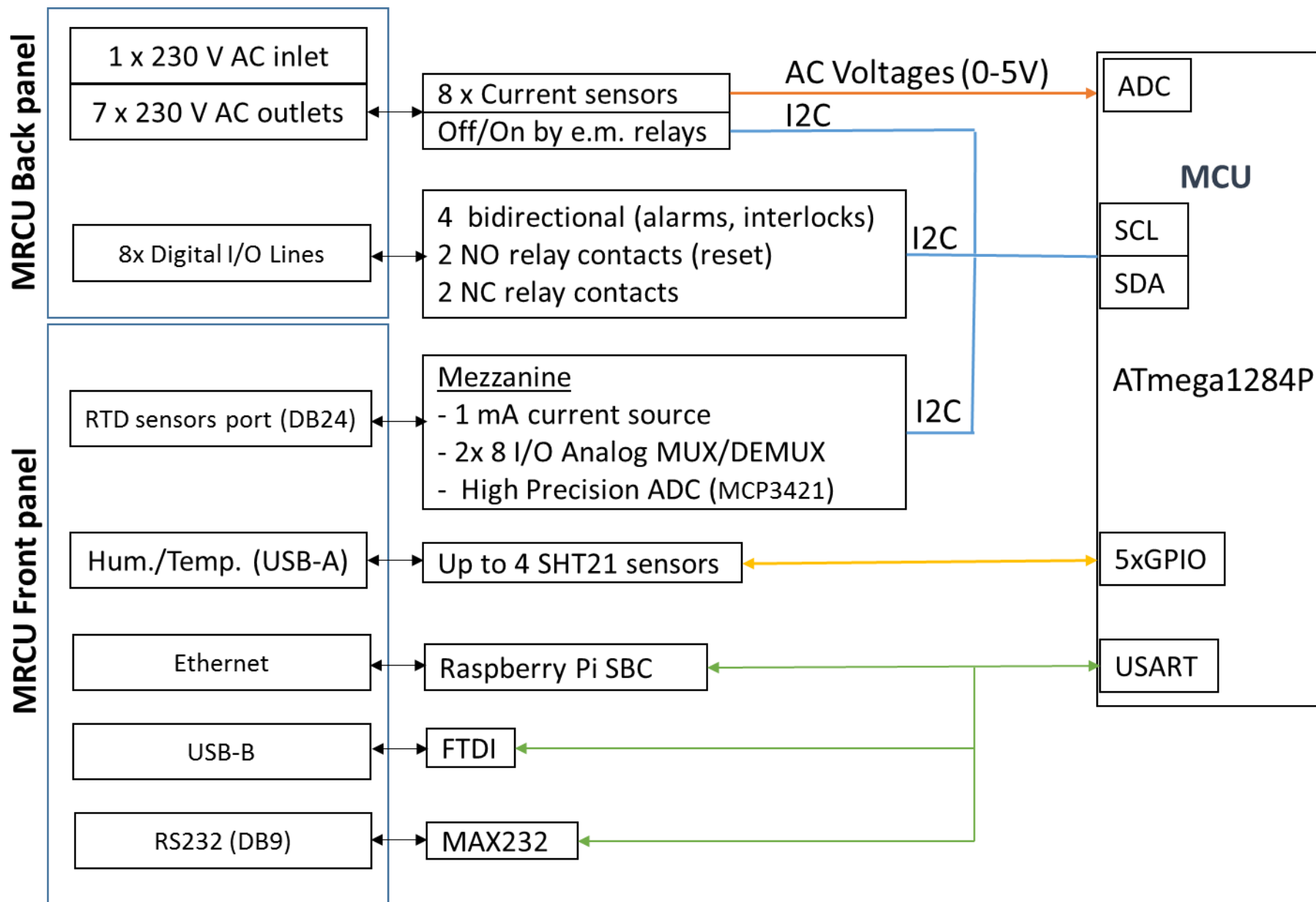
Other features (easy to implement on request):

- Water leakage and smoke detection;
- Open door alert;

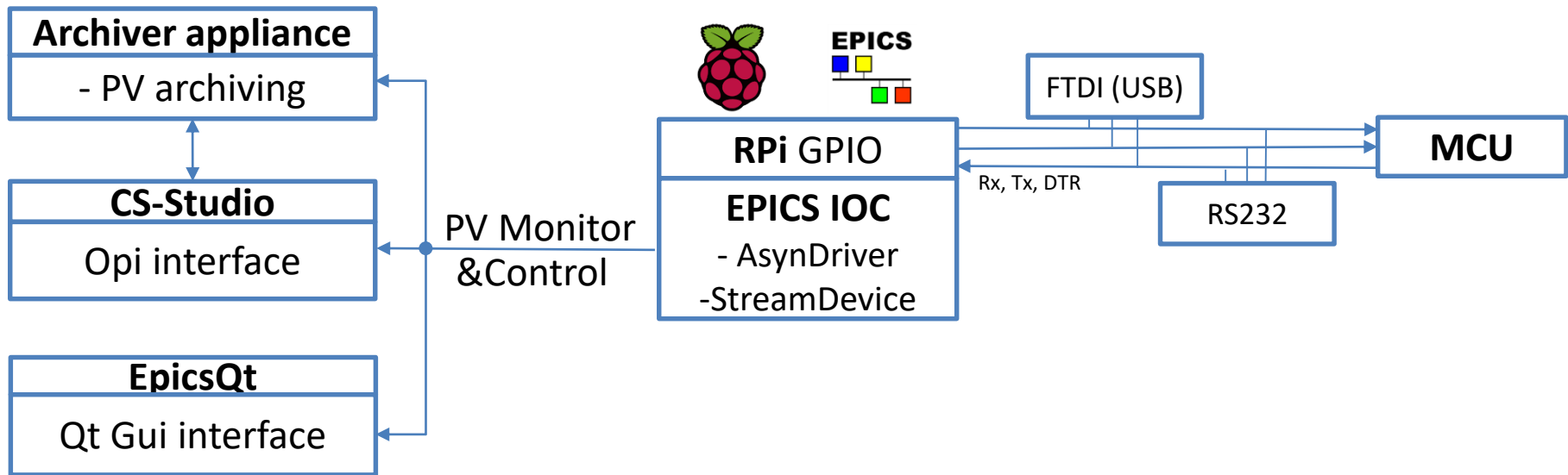
1st prototype successfully used for about 4 months at CERN SPS during NA62-HASC commissioning



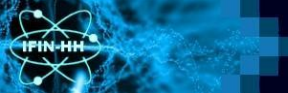
Multifunction Rack Control Unit (MRCU) architecture



Multifunction Rack Control Unit (MRCU) EPICS software



Experimental Physics and Industrial Control System, <http://www.aps.anl.gov/epics/>
 asynDriver: Asynchronous Driver Support, <http://www.aps.anl.gov/epics/modules/soft/asyn/>
 StreamDevice2, <http://epics.web.psi.ch/software/streamdevice/>
 Epics Archiver Appliance, https://slacmshankar.github.io/epicsarchiver_docs/details.html
 Control Systems Studio, <https://github.com/ControlSystemStudio/cs-studio>
 Cross-platform software development for embedded & desktop, <https://www.qt.io/>
 Epics Qt framework, <https://sourceforge.net/projects/epicsqt/>



Multifunction Rack Control Unit (MRCU) Qt GUI

Multifunction Rack Control
- □ ×

File Edit Tools Options Help Windows

Current (A)

ACS 1	0.03
ACS 2	0.03
ACS 3	0.00
ACS 4	0.00
ACS 5	0.03
ACS 6	0.05
ACS 7	0.00
ACS 8	0.03

PORT 1 Controls (AC SW)

ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ALL ON	ALL OFF	■■■■

PORT2 Controls

ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ON	OFF	■
ALL ON	ALL OFF	■■■■

PORT2 Input Status

DI 7-4

■	■	■	■
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T (C)	R/H (%)
S1	22.78 41.85
S2	-42.65 41.85
S3	-42.65 41.85
S4	-42.65 41.85

T (C)	
PT100_1	23.59
PT100_2	-0.16
PT100_3	0.32
PT100_4	1.12
PT100_5	-0.32
PT100_6	-0.32
PT100_7	0.00
PT100_8	0.00
PT100_9	-0.32

U (V)

SRV 1	0.00
SRV 2	0.82
SRV 3	0.00
SRV 4	1.24
SRV 5	2.63
SRV 6	2.45
SRV 7	0.00

Rack Temperature

Temperature (C)

time

Rack Humidity

Humidity (%)

time

FEE Temperature- Module 1

Temperature (C)

time

MRCU Monitor 2

Voltage(V)

time

Information: Opening C:/Users/Mario/Desktop/mrcu-qt/mrcu.ui



Multifunction Rack Control Unit (MRCU) CSS opi

MRCU status

MRCU control

Temperature trends

Humidity trends

0.000	AC current consumption line 1 (A)		PT100 #1 tension (°C)	23.75
0.000	AC current consumption line 2 (A)		PT100 #2 tension (°C)	0.00
0.000	AC current consumption line 3 (A)		PT100 #3 tension (°C)	0.32
0.030	AC current consumption line 4 (A)		PT100 #4 tension (°C)	1.12
0.000	AC current consumption line 5 (A)		PT100 #5 tension (°C)	-0.32
0.050	AC current consumption line 6 (A)		PT100 #6 tension (°C)	-0.32
0.000	AC current consumption line 7 (A)		PT100 #7 tension (°C)	-0.16
0.000	AC current consumption line 8 (A)		PT100 #8 tension (°C)	-0.32
			PT100 #9 tension (°C)	-0.32

Sensor 1 Temp.	24	°C	Humidity	38	%
Sensor 2 Temp.	23	°C	Humidity	38	%
Sensor 3 Temp.	-43	°C	Humidity	38	%
Sensor 4 Temp.	-43	°C	Humidity	38	%

0.00	Tension for accus (~ 8.4 V)
0.82	+3VDC (~ 3.3 V)
0.00	Presence of AC line voltage (~ 220 V)
1.24	+5VDC (~ 5 V)
2.64	A1284 temp. thermistor tension (V)
2.50	Ambient temp. thermistor tension (V)
0.00	P. Supp. temp. thermistor tension (V)

PORT1 bits

7

0

PORT2 bits

Multifunction Rack Control Unit (MRCU) PV archiving

Archiver Appliance installed using the instructions from:

https://slacmshankar.github.io/epicsarchiver_docs/quickstart.html

Monitoring of PV's:

- Quick visualization tool included in the Archiver Appliance;
- CS-Studio Appliance archiver reader plugin.

