Em# Future Requirements

List of wishes at ALBA

Priority	Nw	need description	Benefit in facility	workload	Reporter
1	**NEEDED**	Script to automatically validate the basic SCPI functionality of Em#, to pre-check new versions	Agile the developement of new versions	2month	manolo
1	needed	Assembly 2 calibrator (old model) (1 MAXIV + 1 ALBA)	Allow to calibrate Em# in MAX IV. Allow to develop testig scrips in MAX IV	3WK	Peter
1/x	to check	Do a new Linux release to include NTP (chrony)	Synchronization of em#	1WK (check)	Antonio
2	Needed	A way to know by SCPI and web which kind of Em# is (LV or HV)		1Wk*2	xserra
2	Easy	When DAC gain changes. Set DAC value to 0	Avoid to have a strange value at DAC output	2 WK	Peter
2	Easy	Blink display and beep Nuc to identify the Em#	Idendify the em#	1 WK	Peter
2	Easy	Add timestamp information to triggers.	ID Lab. To mesure the time between triggers for calculations	1 WK	xserra
2	needed	Allow to remove data on NUC once it is read by a client	Speed up the NUC and allow longer adquisitions	2WKs	
2	needed	Autotrigger HW. allow to initiate a autotriguer by a Hardware trigger	BL11. Kind of adquisition needed in a experiment	2months*2	xserra
2	needed	Study speed improvement	Allow to define a strategy for speed improvement	2 months	
3	Needed	New Calibrator.	It should isolate the ground between channels to reduce noise at low currents	Calibrator redesign (3WK) + production	xserra
3	**As much as possible**	Improve the speed data transfer between FPGA and NUC (One direct way is implementing DMA) . 2kS/s continously. considerer a fast adquisition mode with limited features		Redesign	Peter/xserra
3	**As much as possible**	Increase internal memory to allow longer acquisitions.Two options are available: block memory or internal DDR3 RAM implementation.	Allow more samples on fast adquisitions	Block memory (1WK), DDR3 (4months). Risk of Redesign	xserra
x	ND	Upgrade HV bias measurements to 3kV.	This is to mesure the current of a chaneltron polarized, needed 2.2kV in Lorea, Mistral, ...	new equip	xserra
x	ND	Include Zeromq and gRPC as alternative to SCPI			Antonio
x	ND	Increase the bandwith of current Amplifiers, and allow mesurements at high frequency(300kHz for higher gains 10^8, Some mega-hertzs up to 10^6).	Faster acquisitions. Requested for BL22 upgrade plan.(2019-29)	redesign (> 200kHS)	omatilla
x	not need	Change the Software of Em# to Python3			Antonio
x	not need	Allow to update automatically the operative system by ethernet	None in ALBA	?	xserra
x	duplicated	Allow to disable channels to increase sampling rate	BL11	2months *2	manolo
x	done not tested	PID and data processing to generate close-loops(MOCO)			Peter/xserra
x	not priority	New Current Amplifier design with a range of 10pA	Higher accuracy for extreme-low current measures.	redesign	javila
x	Not needed	Em# with independent HW trigger for each of the 4 channels	reduce number of electrometers. BL11	(8months*2)	xserra
x	ND	Increase synchronitzation requeriments			Jean-Paul /omatilla
x	not needed	Control of SPEC EEPROM by one-wire	Register and control each SPEC board	2months	xserra
x	Not needed	Control of FMC EEPROM by I2C	Register and control each ADC, allow calibration of ADC	1month	manolo

| x | Not needed | Autotrigger with variable integration times. And HW trigger with different integration times | BL22. needed to compensate that some times more resolution zones are needed in some adquisitions | 3months*2 | javila |
| x | ND | Bias Voltage independent for each channel | More flexibility, reduce number of em and issolation between channels | redesign | Solaris |

Priorities due date:

1: Oct 2019 (15th Oct Skype mtg at 15:00)

2: Jan 2020 (21st Jan Skype mtg at 15:00)

3: Jun 2020 (9-10 Annual Mtg in Lund)