

Building blocks BI systems / hardware platforms

Meeting BI forum 2

Rafael A. Baron
Bilbao - Spain
2016 - Oct

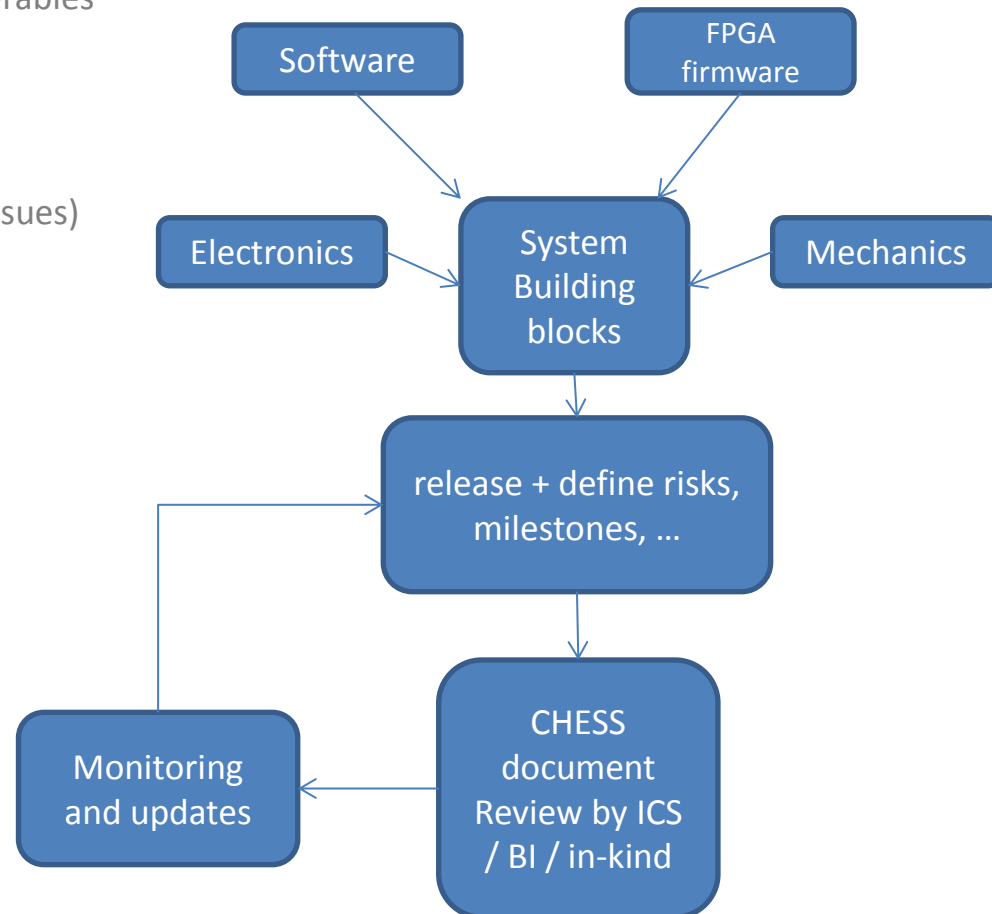
- Summary
 - BI systems Building blocks
 - MicroTCA.4 hardware platforms

Building Blocks BI Systems

- Building Blocks (<https://ess-ics.atlassian.net/wiki/display/BB/PBI+Building+Blocks>):

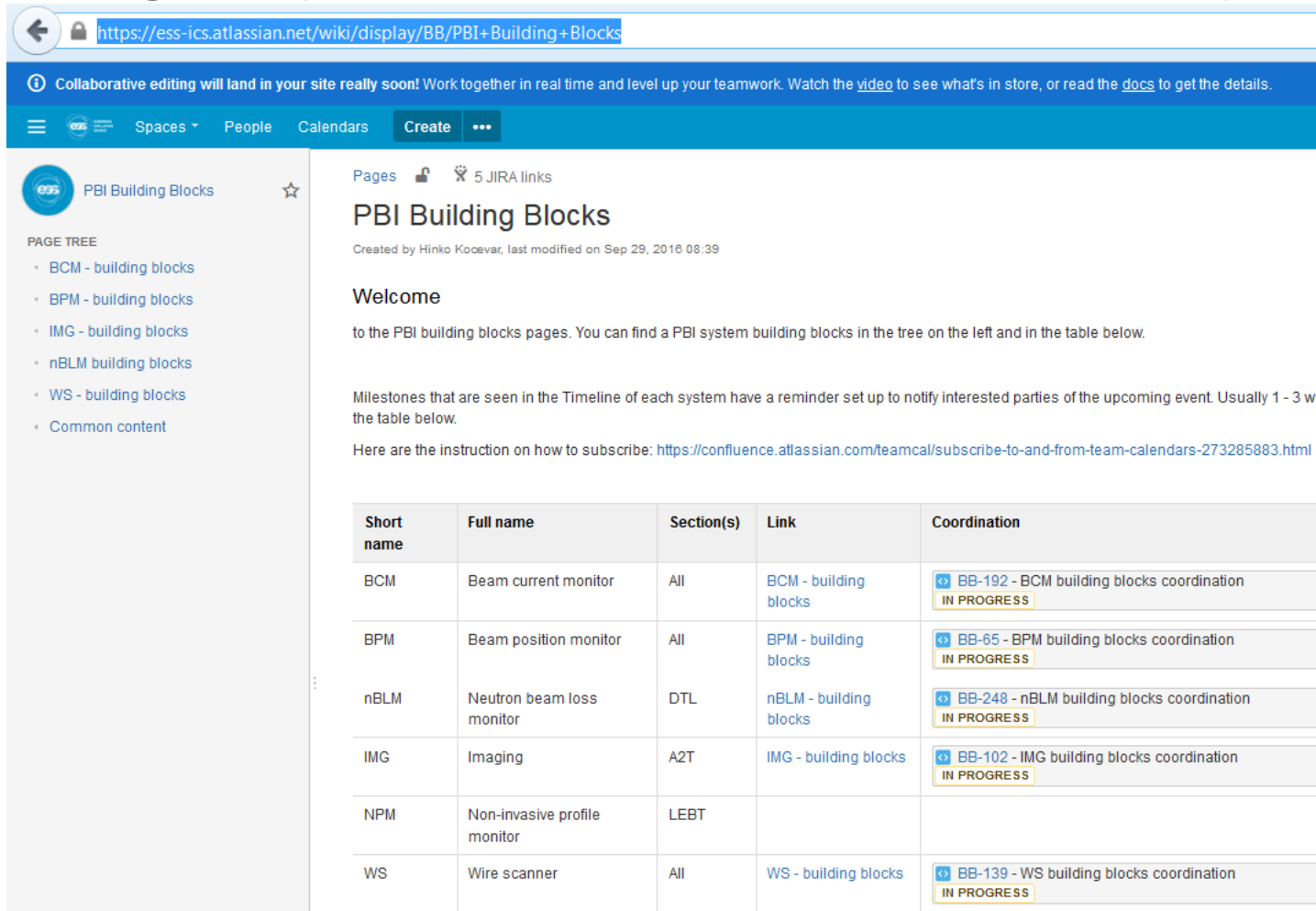
- Organize BI – ICS – In-kind partners deliverables
- Milestones
- Deliverables and responsibilities
- Risks and mitigation
- Improve communication (based on Jira issues)
- CHES document

System responsible / in-kind request BI to create a new Building block for the system



Building Blocks BI Systems

- Building Blocks (<https://ess-ics.atlassian.net/wiki/display/BB/PBI+Building+Blocks>):



Collaborative editing will land in your site really soon! Work together in real time and level up your teamwork. Watch the [video](#) to see what's in store, or read the [docs](#) to get the details.

Pages 5 JIRA links

PBI Building Blocks

Created by Hinko Koevar, last modified on Sep 29, 2016 08:39

Welcome

to the PBI building blocks pages. You can find a PBI system building blocks in the tree on the left and in the table below.

Milestones that are seen in the Timeline of each system have a reminder set up to notify interested parties of the upcoming event. Usually 1 - 3 wee the table below.

Here are the instruction on how to subscribe: <https://confluence.atlassian.com/teamcal/subscribe-to-and-from-team-calendars-273285883.html>

Short name	Full name	Section(s)	Link	Coordination
BCM	Beam current monitor	All	BCM - building blocks	BB-192 - BCM building blocks coordination IN PROGRESS
BPM	Beam position monitor	All	BPM - building blocks	BB-65 - BPM building blocks coordination IN PROGRESS
nBLM	Neutron beam loss monitor	DTL	nBLM - building blocks	BB-248 - nBLM building blocks coordination IN PROGRESS
IMG	Imaging	A2T	IMG - building blocks	BB-102 - IMG building blocks coordination IN PROGRESS
NPM	Non-invasive profile monitor	LEBT		
WS	Wire scanner	All	WS - building blocks	BB-139 - WS building blocks coordination IN PROGRESS

Building Blocks BI Systems

List of building blocks

Key	Summary	T	Due	Status	Group	Domain	Description	Affected Version/s	Linked Issues
BB-128	Calibration service	S	May 31, 2017 00:00	TO DO	ICS	Control room	Calibration service tool	Common final	ICSHWI-155
BB-127	Compare save and restore	S	Jan 31, 2017 00:00	TO DO	ICS	Control room	Handle snapshots of PVs	Common final	ICSHWI-155
BB-126	EEE server	S	Nov 30, 2016 00:00	DELIVERED	ICS	Control room	OS and DM for ESS or IKC EEE server	Common prototype	
BB-95	Platform management	S	Jun 30, 2017 00:00	TO DO	ICS	Control box	Remote monitoring and management of the MicroTCA system	Common final	
BB-85	Operating system	S	Jun 30, 2016 00:00	DELIVERED	ICS	Control box	Supported ICS Linux distribution	Common prototype	
BB-84	EEE	S	Jun 30, 2016 00:00	DELIVERED	ICS	Control box	EEE (NFS, CI, build, modules)	Common prototype	
BB-74	Naming database	S	Jan 31, 2017 00:00	TO DO	ICS	Control room	For storing PBI system information	Common final	
BB-70	RTM support	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	FPGA block, compatible to AXI-bus interface for IOxOS framework, that manage the necessary RTMs. The BPM RTM is the DESY DWC8300-LF	BPM final	BB-38
BB-69	Beam mode	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	FPGA block, compatible to AXI-bus interface for IOxOS framework, that manage the beam mode	BPM final	BB-38
BB-68	Timing	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	FPGA block, compatible to AXI-bus interface for IOxOS framework, that manage the timing (clocks, triggers)	BPM final	BB-38
BB-67	Data-on-Demand	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	configurable FPGA block, compatible to AXI-bus interface for IOxOS framework, that manage the data on demand	BPM final	BB-38
BB-66	Framework	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	FPGA framework design (TOSCA III) compatible to AXI-bus interface for IOxOS IFC1420	BPM final	BB-38
BB-63	DSP FPGA specific design	F	Nov 30, 2016 00:00	TO DO	BD	Control box	DSP firmware design on the IOxOS IFC1420 AXI bus compatible	BPM final	BB-38
BB-62	Application specific	S	Oct 31, 2016 00:00	TO DO	BD	Control box	BPM application specific functionality	BPM final	
BB-61	Digitizer	S	Oct 31, 2016 00:00	TO DO	ICS	Control box	EEE module for final digitizer	BPM final	
BB-60	Timing system	S	Oct 31, 2016 00:00	TO DO	ICS	Control box	EEE module for timing system	BPM final	
BB-59	Cables	H	Nov 30, 2016 00:00	TO DO	BD		BPM signal cables (RF generator to RFFE and RFFE-RTM)	BPM final	
BB-58	MicroTCA.4 crate	H	Nov 30, 2016 00:00	TO DO	ICS	Control box	MicroTCA.4 complete crate. Se Term table for explanation.	BPM final	
BB-57	Timing generator	H	Nov 30, 2016 00:00	LATE	ICS	Control box	Timing generator (crate, EVG and fanout).	Common prototype	
BB-56	RTM	H	Nov 30, 2016 00:00	TO DO	BD	Control box	DESY Struck RTM DWC10-LF	BPM final	
BB-55	AMC	H	Nov 30, 2016 00:00	TO DO	ICS	Control box	IOxOS IFC1420 ready for final production	BPM final	
BB-47	Ethernet Switch	H	Nov 30, 2016 00:00	TO DO	ICS	Control room	Ethernet Switch needed for the BPM electronics racks	BPM final	BB-44
BB-46	MPS	F	Nov 30, 2016 00:00	TO DO	ICS	Control box	MPS generic firmware design for MPS interface	BPM final	BB-38
BB-37	DSP FPGA specific design	F	Aug 31, 2016 00:00	DELIVERED	BD	Control box	LLRF modified firmware	BPM prototype	BB-38
BB-35	Migration	H	Nov 30, 2016 00:00	TO DO	BD, ICS	PBI system	Migration to IOxOS based platform	BPM final	BB-43

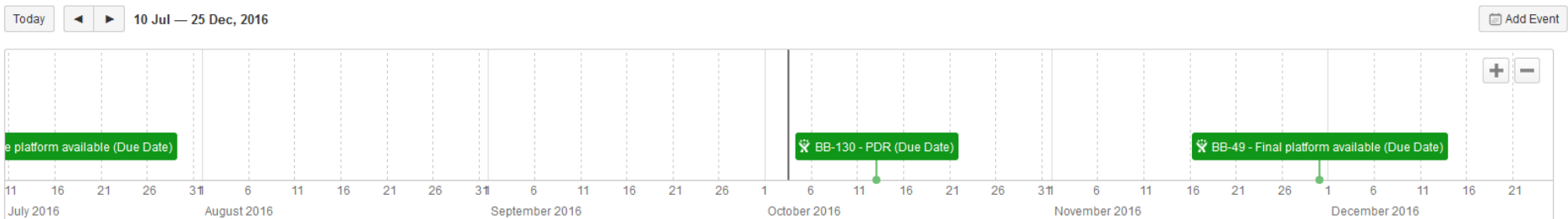
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Building Blocks BI Systems - milestones

Milestones

Key	Summary	T	Due	Status	Group	Domain	Description	Affected Version/s	Linked Issues
BB-130	PDR	📅	Oct 13, 2016 00:00	To Do	BD, ICS	PBI system	Decide on further activities leading to prototype system.	BPM prototype	
BB-53	Installation 2	📅	Mar 30, 2018 00:00	To Do	BD, ICS	PBI system	PBI system electronics are deployed in the gallery (rest of the Linac).	BPM final	
BB-52	Installation 1	📅	Nov 01, 2017 00:00	To Do	BD, ICS	PBI system	PBI system electronics are deployed in the gallery (MEBT and DTL).	BPM final	
BB-51	Manufacturing tests start	📅	Aug 31, 2017 00:00	To Do	BD, ICS	PBI system	Qualification and quality control of all the manufactured electronics for MEBT and DTL.	BPM final	
BB-50	CDR	📅	Jan 31, 2017 00:00	To Do	BD, ICS	PBI system	Approve the final design, start procurement of electronics hardware for installation (MEBT and DTL).	BPM final	
BB-49	Final platform available	📅	Nov 30, 2016 00:00	To Do	BD, ICS	PBI system	Final version of the platform is available, final PBI system application specific development can start.	BPM final	
BB-48	Prototype platform available	📅	Jun 30, 2016 00:00	Done	BD, ICS	PBI system	Prototype application specific PBI system development can commence.	BPM prototype	

7 issues [Refresh](#)



Building Blocks BI Systems - risks

Key	Summary	Status	Description
BB-45	AFE / BFE delayed	TO DO	Cause: Not enough resources Response: Contract consultant / external company Severity: Low
BB-44	Hardware delayed / not purchased on time	TO DO	Cause: Internal delays / external company delays Response: Priority on the purchasing process. Re-schedule activities. Severity: Significant
BB-43	IOxOS IFC1420 delay	TO DO	Cause: IOxOS IFC1420 not available and not supported for production Response: Proceed with Struck SIS8300L2 board Severity: Low
BB-41	AFE / ABE hardware does not satisfy the specifications	TO DO	Cause: Not enough resources Response: Commercial hardware/support Severity: Significant
BB-40	Software developer not available	TO DO	Cause: Not enough resources Response: Contract consultant Severity: Significant
BB-39	Analog hardware designer not available	TO DO	Cause: Not enough resources Response: Contract consultant Severity: Significant
BB-38	FPGA firmware developer not available	TO DO	Cause: Not enough resources Response: Contract consultant Severity: Moderate

Building Blocks BI Systems – update status

Issue Subscription

Filter: [Late BB \(5 issues\)](#)

Subscriber: hinkokocevar

T	Summary	Due	Status	Affects Version/s	Components	Domain	Group	Description
H	MicroTCA.4 crate	30/Sep/16	LATE	nBLM prototype	nBLM	Control box	ICS	MicroTCA.4 electronics. See Terms table for explanation.
H	Cables	30/Sep/16	TO DO	nBLM prototype	nBLM	Control box	BD, IKC	nBLM signal cables
G	Prototype platform available	30/Sep/16	LATE	nBLM prototype	nBLM	PBI system	BD, ICS	Prototype application specific PBI system development can commence.
H	MicroTCA.4 crate	14/Mar/16	LATE	BCM prototype	BCM	Control box	ICS	MicroTCA.4 electronics. See Terms table for explanation.
H	MicroTCA.4 crate	31/Aug/16	LATE	BPM prototype	BPM	Control box	ICS	MicroTCA.4 electronics. See Terms table for explanation.

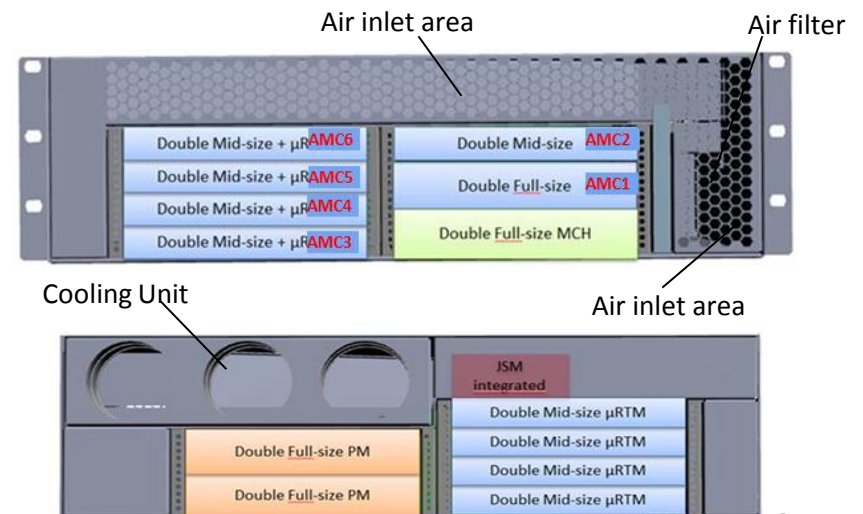
You may edit this subscription [here](#).

MicroTCA.4 Hardware Platform

MicroTCA.4 crate 9 U (12 AMC/RTM slots)



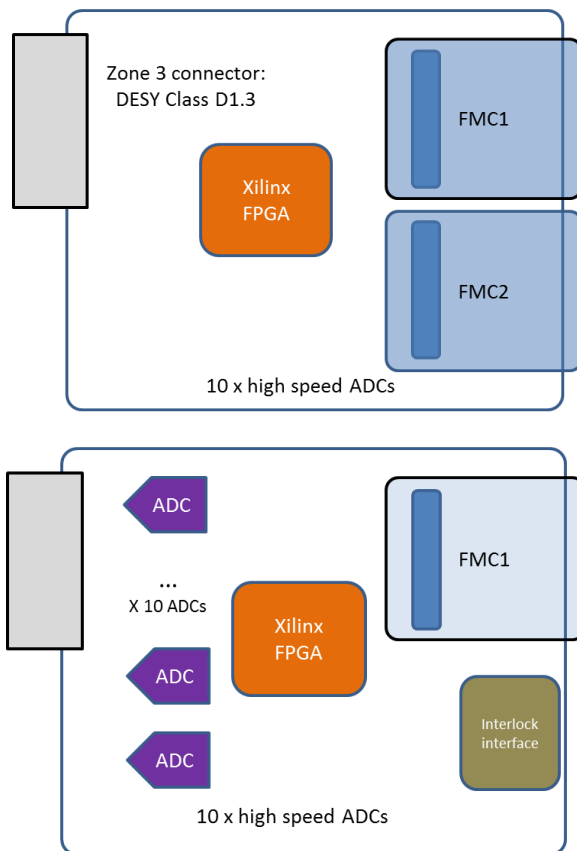
Compact 3U MicroTCA.4 (4 AMC/RTM slots)



MicroTCA.4 Hardware Platform

- AMC digitizer board:

- A Backup solution was agreed with ICS for RF RTM and FMC based applications:



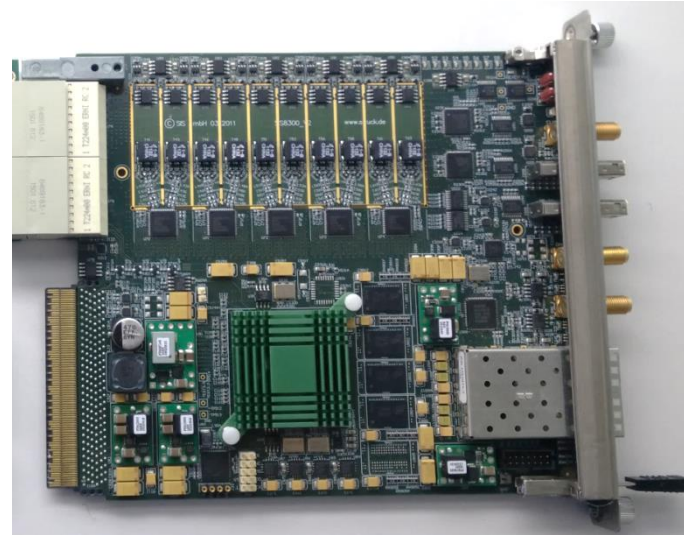
Platform	Application	FPGA	Status
Struck SIS8300-L2	High speed digitizers	Xilinx Virtex-6	COTS
Struck SIS8300-KU	High speed digitizers	Xilinx Kintex	COTS by Nov-16
		Ultrascale	
IOxOS IFC1420	High speed digitizers	Xilinx Kintex	First prototype 30-Oct-16
		Ultrascale	
IOxOS IFC1410	FMC applications	Xilinx Kintex Ultrascale	First prototype 30-Nov-16
CAENels DAMC25	FMC applications	Xilinx Virtex-5	COTS

MicroTCA.4 Hardware Platform – backup solutions

Struck SIS8300-L2

Currently used for:

- BPM (high speed digitizers)
- BCM
- LLRF



DESY / CAENels DAMC25 (2 FMC slots):

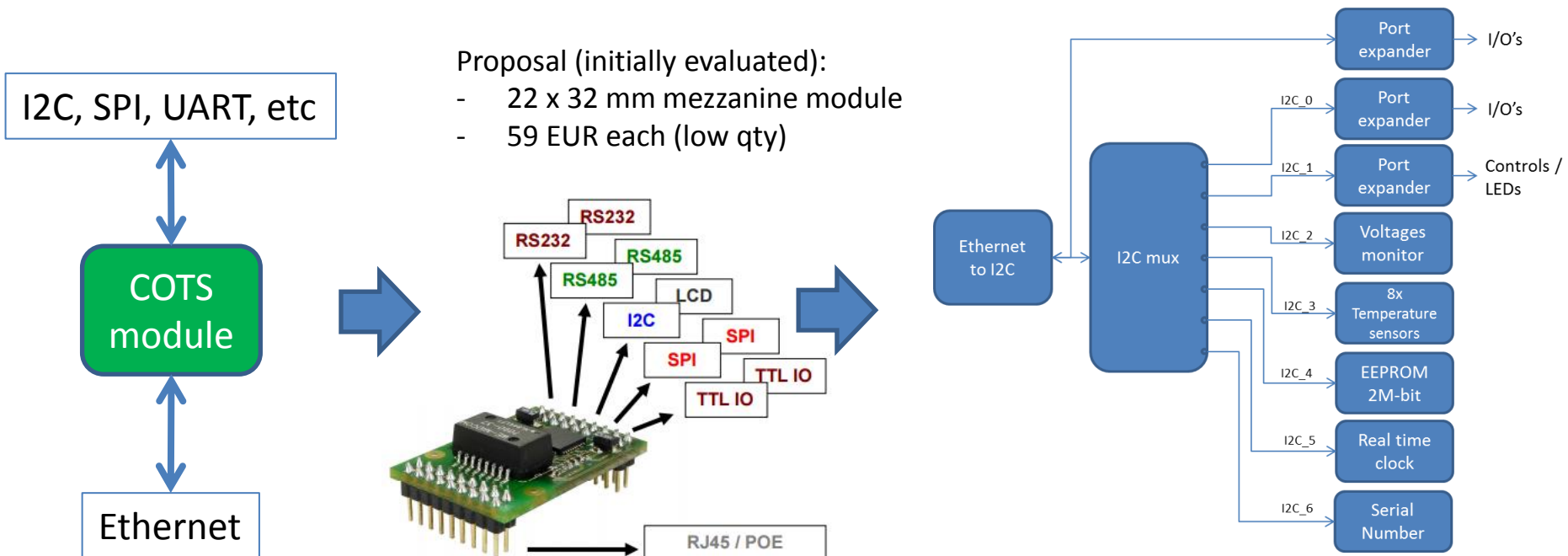
Currently used for:

- BLM (SFP interface)
- nBLM (high speed ADCs 500 MSPs)
- Current measurements (100 kHz bandwidth, 100 nA – 10 mA)
- RF Interlock (low latency I/O's and 10 MSPs ADCs)



Hardware Platform - Ethernet interface

- Proposal for use of common Ethernet interface hardware for standalone electronics:
 - Use of similar hardware design
 - Same support and software interfaces / libraries
 - Stock similar hardware units



Proposal (initially evaluated):

- 22 x 32 mm mezzanine module
- 59 EUR each (low qty)



http://www.ak-nord.de/en/daten/brochure_xtpico_xxl.pdf

- Thanks!
- Questions?