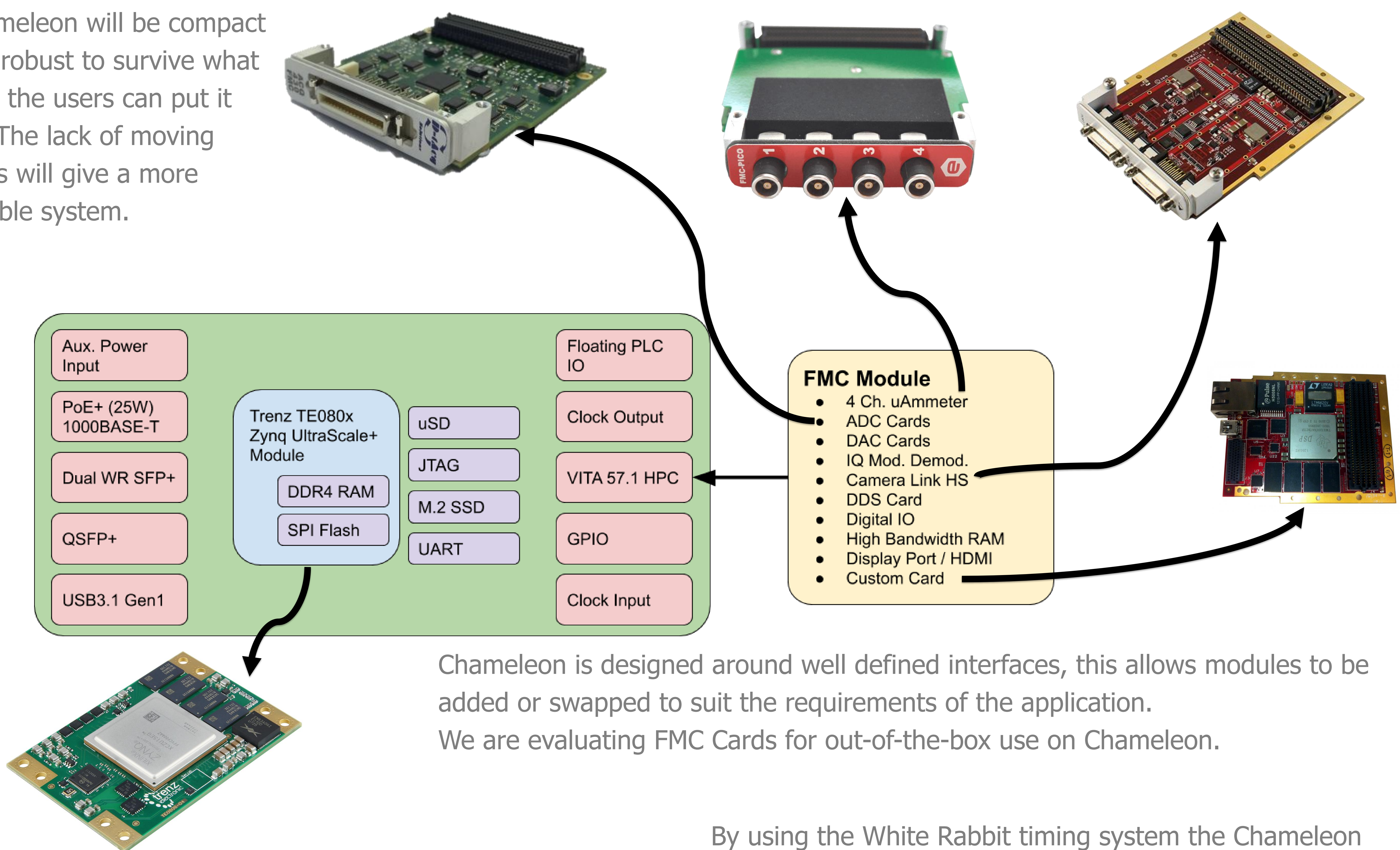


# Standardising of application specific implementations at the Australian Synchrotron

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There is a need for a flexible stand-alone device that can provide a synchronous standard interface, which can accept application specific add-ons. We are proposing the Chameleon device that will be designed around a Xilinx Zynq System on Module (SoM) and a standard VITA 57.1 HPC FMC. The proposed solution will allow the use of COTS or in-house designed FMC modules and interface with the control system through PoE+ interface. The Chameleon device will also be able to plug into a White Rabbit network to enable the high performance synchronisation capabilities. This device will reduce the cost of implementing application specific solutions to better support the growing demands of scientific research at the Australian Synchrotron. We intend to use the Chameleon device to retrofit and upgrade existing beamlines' equipment and equip our new suite of beamlines with it's functionality as part of a distributed control system.

The passively cooled Chameleon will be compact and robust to survive what ever the users can put it on. The lack of moving parts will give a more reliable system.



Chameleon is designed around well defined interfaces, this allows modules to be added or swapped to suit the requirements of the application. We are evaluating FMC Cards for out-of-the-box use on Chameleon.

In order to get the best Signal to Noise Ratio from the sensitive instruments, Chameleon is designed to be a standalone system that can be placed close to the signal source; to get the best data possible.

By using the White Rabbit timing system the Chameleon will support distributed synchronous data acquisition. Integration of the Timing System allows Chameleon to precisely trigger outputs as well as the read out of input signals. This can be used to enhance diagnostic functionality and facilitate improvements to the reliability of systems, through the absolute-time embedded in the metadata stream.

## FORCAST WORKS

Over the coming months we plan to evaluate a reference design which is expected to be available in Q3-Q4 2020. We are hoping to get funding commitment for a porotype implementation in 2021.

Chameleon will be available openly to broaden the usefulness of the project through collaboration with other groups.

