D-TACQ Solutions
High Performance Simultaneous Data Acquisition

High Performance *Simultaneous* Data Acquisition
Boards/Systems/Appliances

Model	Channels	Sample Rate (per Channel)		Resolution
ACQ164CPCI	64 / 32	128	kHz	24 bit
ACQ196CPCI	96 / 64 / 32	500	kHz	16 bit
ACQ132CPCI-02C	32 / 24 / 16	02/03/04	MHz	14 bit
ACQ132CPCI-32F	32 / 16	(oversampling) 2	MHz	16 bit
ACQ132CPCI-65G	32 / 16	(burst) 65	MHz	14 bit
ACQ216CPCI	16 /12/ 8 / 4	16/22/33/50	MHz	14 bit
AO32CPCI/ER	32AO,64DO	(AWG) 1	MHz	16/18 bit

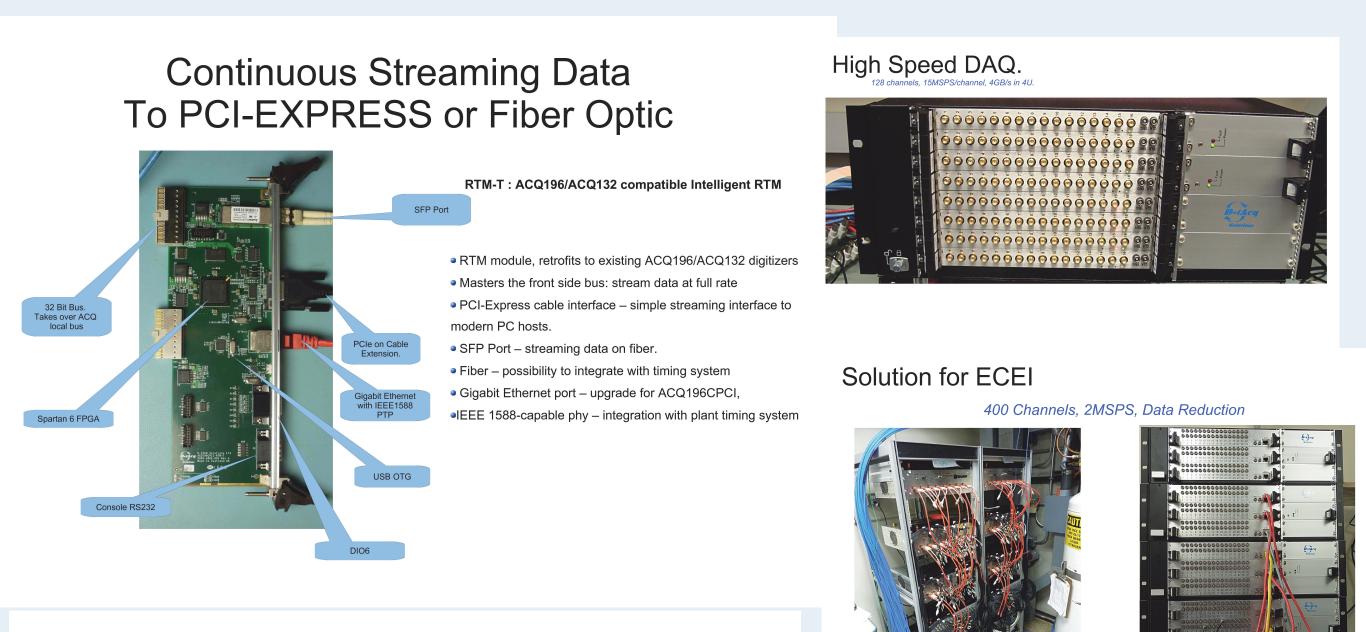*Standards-based, Intelligent modules, Ethernet and Linux® on board.*
Direct streaming to PCI-Express and optic fiber using **RTM-T**
Industrial Strength protected Buffered differential Inputs.
Digital and Analog triggers, Analog Outputs, FPGA DSP.
Many Operating modes - Transient, Continuous, Gated, Control.
High level software Integration - embedded system supports EPICS, MDSplus, Web Services, SOAP, HTTP, FTP, SSH, SMB, Labview ...
Low cost Autonomous Networked data acquisition appliances.
Multi-function, self hosting EPICS systems, comprising D-TACQ and third party modules. Maximum payload in minimum shelf-space.
One Gigabyte memory per Board on board.
Simultaneous between channels, boards, chassis.

Lowest Cost Per Channel in Class

D-tAcq Solutions

Working with Basic Energy Science and Plasma Fusion Research World Wide:

Machine Monitoring/Protection
Condition Monitoring
Equipment Test Stands
Plasma Diagnostics
Plasma Control System (PCS)
Power Supply control and Monitoring

www.d-tacq.com

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Continuous Streaming Data To PCI-EXPRESS or Fiber Optic

RTM-T : ACQ196/ACQ132 compatible Intelligent RTM
• RTM module, retrofits to existing ACQ196/ACQ132 digitizers
• Masters the front side bus: stream data at full rate
• PCI-Express cable interface – simple streaming interface to modern PC hosts.
• SFP Port – streaming data on fiber.
• Fiber – possibility to integrate with timing system
• Gigabit Ethernet port – upgrade for ACQ196CPCI,
• IEEE 1588-capable phy – integration with plant timing system

High Speed DAQ.

Solution for ECEI
400 Channels, 2MSPS, Data Reduction
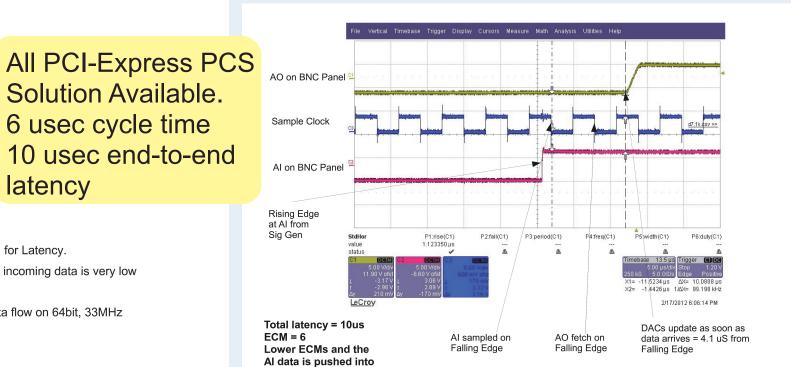
Solutions for Plasma Control PCS
Multiple Simultaneous AI, AO, DO with lowest latency

All PCI-Express PCS Solution Available. 6 usec cycle time 10 usec end-to-end latency
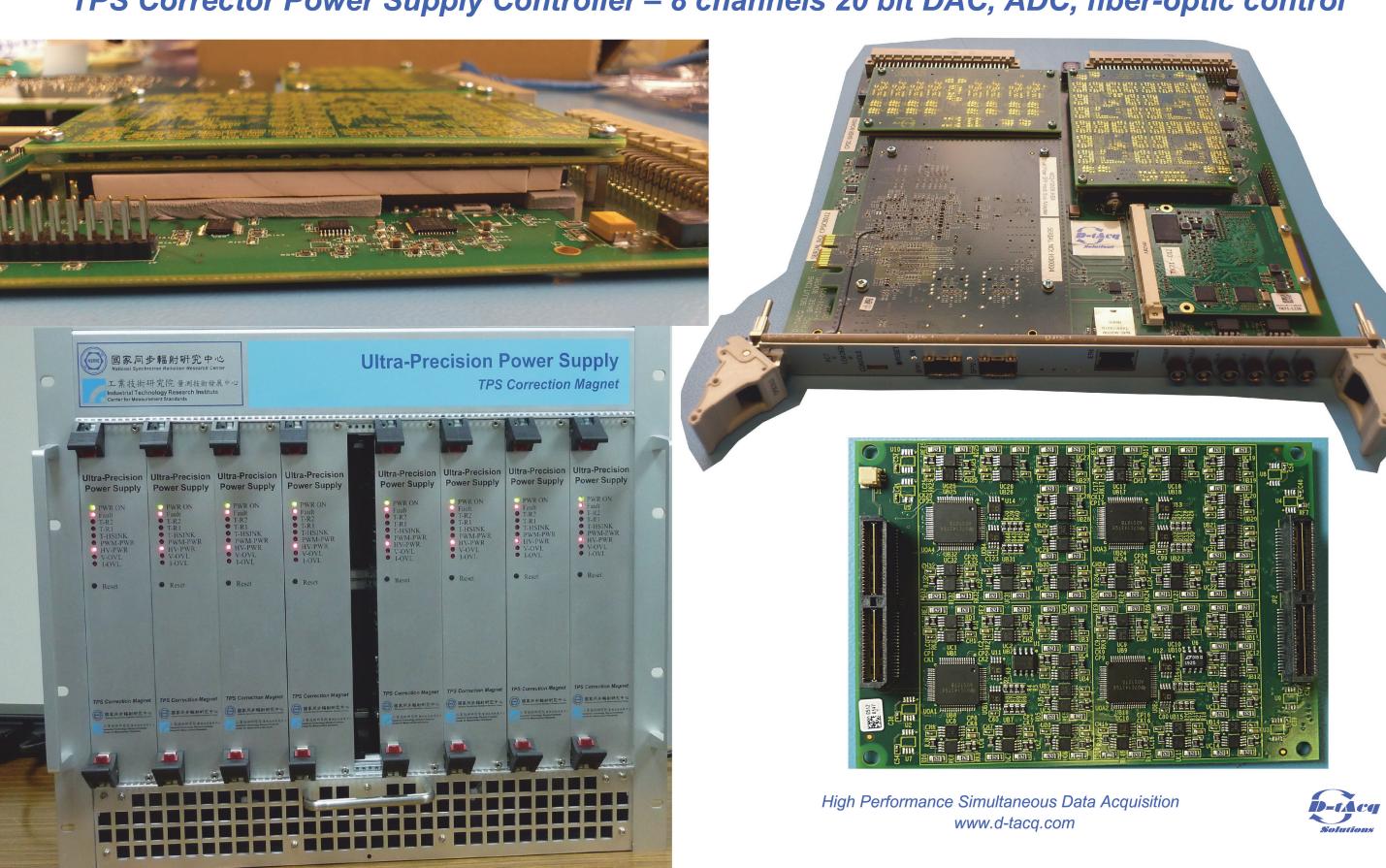
• CPCI backplane operation already used extensively for PCS. PCS applications are optimised for Latency.
• Data transfer is under the control of the ACQ196, so cpu usage on the host system to handle incoming data is very low (<1% per card), leaving 99% of cpu resource free for data processing, including storage.
• Scaleable implementation eg: 4 x ACQ196, 384 channels, 250kS/s/channel, 200MB total data flow on 64bit, 33MHz backplane.
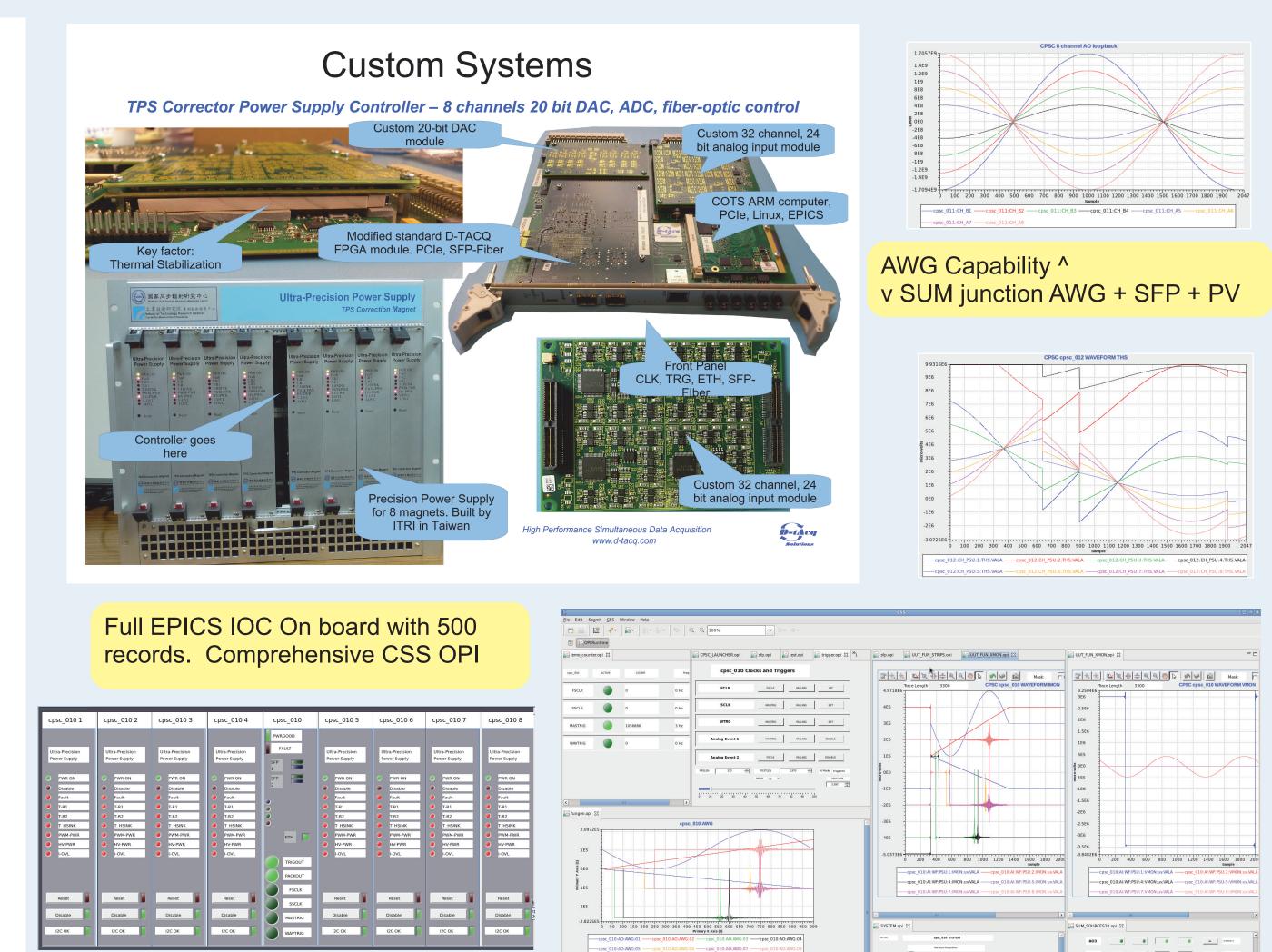• PCS system solution used on at least 7 tokamaks world wide.

Total latency = 10us
ECM = 6
Lower ECMs and the AI data is pushed into the next clock

AO sampled as soon as data arrives = 4.1 uS from Falling Edge

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Custom Systems

TPS Corrector Power Supply Controller – 8 channels 20 bit DAC, ADC, fiber-optic control

Ultra-Precision Power Supply
TPS Correction Magnet

High Performance Simultaneous Data Acquisition
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Custom Systems

TPS Corrector Power Supply Controller – 8 channels 20 bit DAC, ADC, fiber-optic control

Custom 20-bit DAC module
Custom 32 channel, 24 bit analog input module
COTS ARM computer, PCIe, Linux, EPICS
Key factor: Thermal Stabilization
Modified standard D-TACQ FPGA module. PCIe, SFP-Fiber
Front Panel CLK, TRG, ETH, SFP-
Controller goes here
Precision Power Supply for 8 magnets. Built by ITRI in Taiwan
Custom 32 channel, 24 bit analog input module

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AWG Capability ^
v SUM junction AWG + SFP + PV

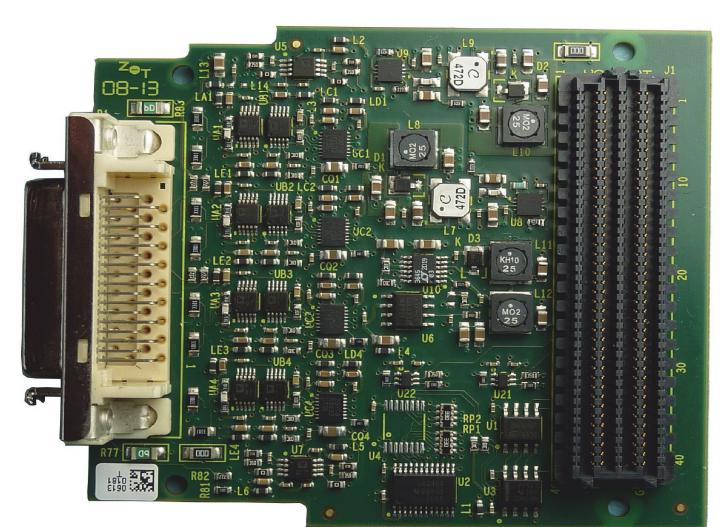Full EPICS IOC On board with 500 records. Comprehensive CSS OPI

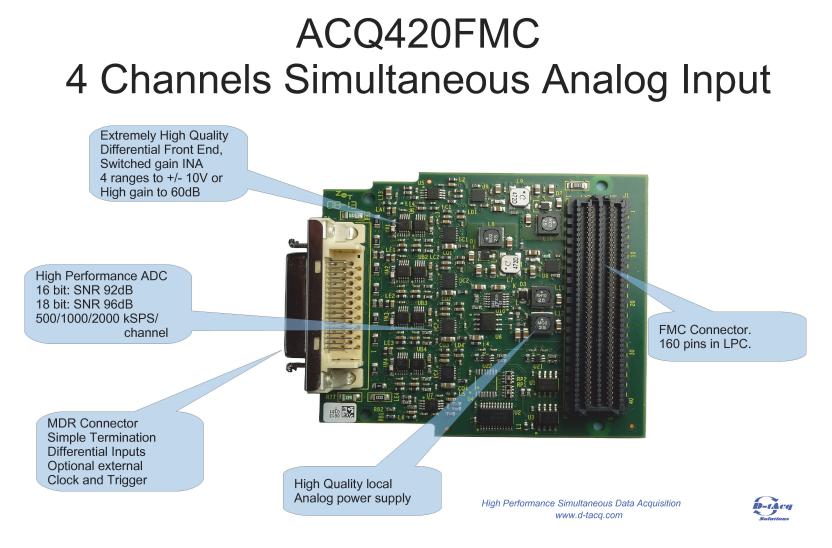## High Performance *Modular* Data Acquisition

ACQ400 Series

• New series of FMC Modules and Carriers
• FMC Provides a simple standard way to connect IO to an FPGA with low overhead.
• D-TACQ modules allow IO customization without compromising analog quality.
• ACQ420FMC : 4ch, 16/18 bit to 2MSPS, now shipping
• AO420FMC, 4ch output, 16 bit to 1MSPS, in development.
• A range of modules with additional capability is planned, as well as a range of FMC carrier boards in both CPCI and Networked Appliance formfactors.

High Performance Simultaneous Data Acquisition
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ACQ420FMC
4 Channels Simultaneous Analog Input

Extremely High Quality Differential Front End, Switched gain INA 4 ranges to +/- 10V or High gain to 60dB
High Performance ADC 16 bit: SNR 92dB 18 bit: SNR 96dB 500/1000/2000 kSPS/ channel
FMC Connector, 160 pins in LPC.
MDR Connector Simple Termination Differential Inputs Optional external Clock and Trigger
High Quality local Analog power supply

High Performance Simultaneous Data Acquisition
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ACQ464-64-T : 64 x 1MSPS, 6U CPCI, Fiber-Optic front panel comms

EXTENDED-FMC (D-TACQ Special) Eg 32 x 1MSPS/16bit
EXTENDED-FMC (D-TACQ Special) Eg 32 x 1MSPS/16bit
FMC D-TACQ Comms SFP PCIe-cable
1Gbit DRAM
XC7020
GBE
DC to DC

Recommended Host: ZYNQ

ZYNQ New system on chip from Xilinx. Dual Core ARM A9 FPGA Fabric Dual Big Ethernet FMC Site
ACQ420FMC Works with: ZEDBOARD, Low cost evaluation board. D-TACQ carrier boards recommended for deployment ** COMING SOON **
ACQ420FMC Connects to single FMC Site. D-TACQ multiple site carriers ** COMING SOON **

FMC Modules:
• Modularity with direct interface to FPGA
• Low cost to provide multi function.
• Standards compliant -
• D-TACQ ELF module with compatible connector
• Local clean power required for Analog
• Provide from carrier board for maximum payload

Scenario for Customer "Mike" - 80 Channels ACQ2006 : 8 Slots ULPC

FMC 4 x 2MHz 16 bit ACQ420FMC
ELF Eg 32 x 1MSPS/16bit ACQ420FMC

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