AO420FMC Advance Product Specification

High Performance Simultaneous Data Acquisition

Preliminary Product Information
Subject to Change

1 Product Description.

1. ***AO420FMC*** is a standard D-TACQ product, 4 channels simultaneous AO with regular buffered output on SMA or LEMO 00 connector.

2. Standard configuration: 4 channels, 16 bit resolution, 1MSPS/channel

3. Complies with *VITA57 FMC* standard, *LPC* version.

4. +/-10V per channel 20mA drive.

5. DC and AWG modes.

6. 18- and 20- bit variants available as special build.

1.1 Product Variants

- ***AO420FMC-4-16*** : 4 channels, 16 bit resolution, 1000kSPS/channel.

- ***AO420FMC-4-18*** : 4 channels, 18 bit resolution, 1000kSPS/channel.

- ***AO420FMC-4-20*** : 4 channels, 20 bit resolution, 1000kSPS/channel.

1.2 Applications

- Instrumentation applications, control and monitoring.

1.3 Overview

The *FMC* module standard adds user IO to carrier modules fitted with *FPGA* resource. D-TACQ recommends modules based on the *Xilinx ZYNQ* system on chip, combining *FPGA* resource with a dual-core ARM Cortex A9 and gigabit Ethernet. Compatible modules include

- D-TACQ ***ACQ1001*** : D-TACQ single slot *FMC* carrier, Z7010

- D-TACQ ***ACQ2006*** : D-TACQ 6 slot *FMC* carrier, Z7020

- *Xilinx* ZC702 evaluation board with 2 *FMC* slots.

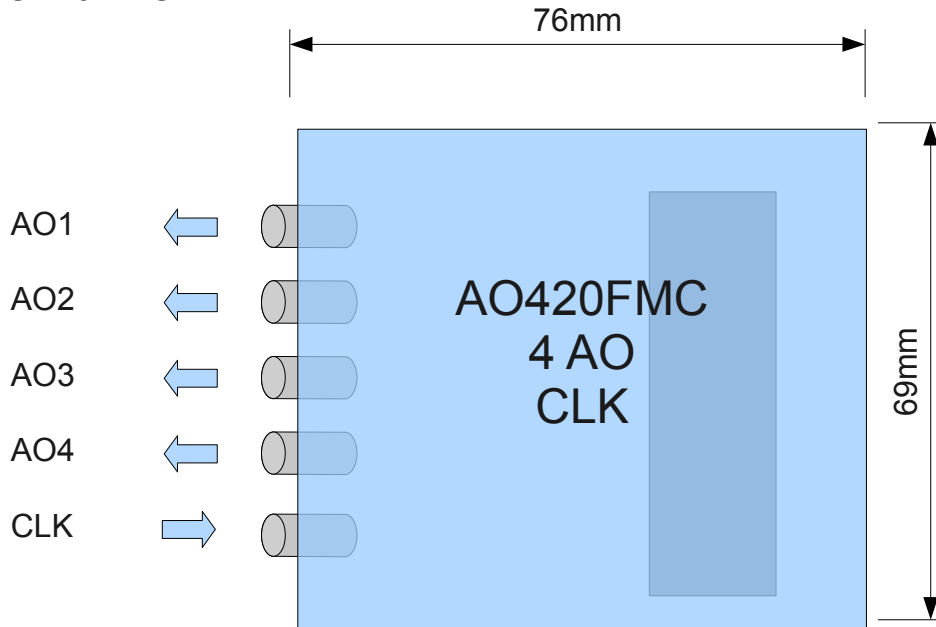- *Xilinx* Zedboard evaluation board with 1 *FMC* Slot.

D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux. Evaluation boards are useful for evaluation, but for production use, D-TACQ recommends use of a production-quality carrier such as ACQ1001.

1.4 Glossary

- *FMC*: VITA57 FPGA Mezzanine Card.

- Xilinx ZYNQ Soc

- *FPGA* : Field Programmable Gate Array.

- *LPC* : *FMC* Low pin count wiring standard.

- *ULPC*: *FMC* Ultra low pin count (D-TACQ).

2 Physical

2.1 AO420FMC

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                        76mm

   AO1  ⇐   ○

   AO2  ⇐   ○      AO420FMC
                     4 AO          69mm
   AO3  ⇐   ○        CLK

   AO4  ⇐   ○

   CLK  ⇒   ○
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- ◦ Single FMC Formfactor.
- ◦ Single SMA or LEMO per channel output
- ◦ Front panel CLK input, or use internal clock

3 Front Panel Connectors

Floating SMA or Single Pin Lemo (SPL) for each channel.

Optional isolated CLK input on SPL. Internal CLK available.

4 AO20FMC Electrical Specification.

#	Parameter	Value
1	Number of Channels	4
2	Sample Rate	Up to 1000 kHz, per channel simultaneous
3	Resolution	16 bits [18 bit]
4	Coupling	DC, Differential Input
5	Maximum output current	20mA
6	Output Voltage Range	±10 V
7	Output Impedance	10Ω
8	Offset Error	0.01% FS
9	Gain Error	0.1% FS
10	INL	±2 LSB
11	DNL	±1 LSB
12	CMR	TBD
13	THD	Better than 80dB
14	SINAD	74 dBc
15	SFDR	85 dBc
16	SNR	72 dB
17	Full Power BW	1 MHz
18	Small Signal BW	2 MHz
	Crosstalk	<80 dB @ 1 kHz FS Input
	Temperature Stability	<25 ppm/C

5 Full Customer Appliance Scenario

5.1 4 Channel Micro Appliance

- Uses D-TACQ ACQ1001 carrier
- Low cost, small form-factor networked appliance with GBE
- Stand-alone device with local data storage.
- "AWG on a Fiber" using ACQ1102 carrier.
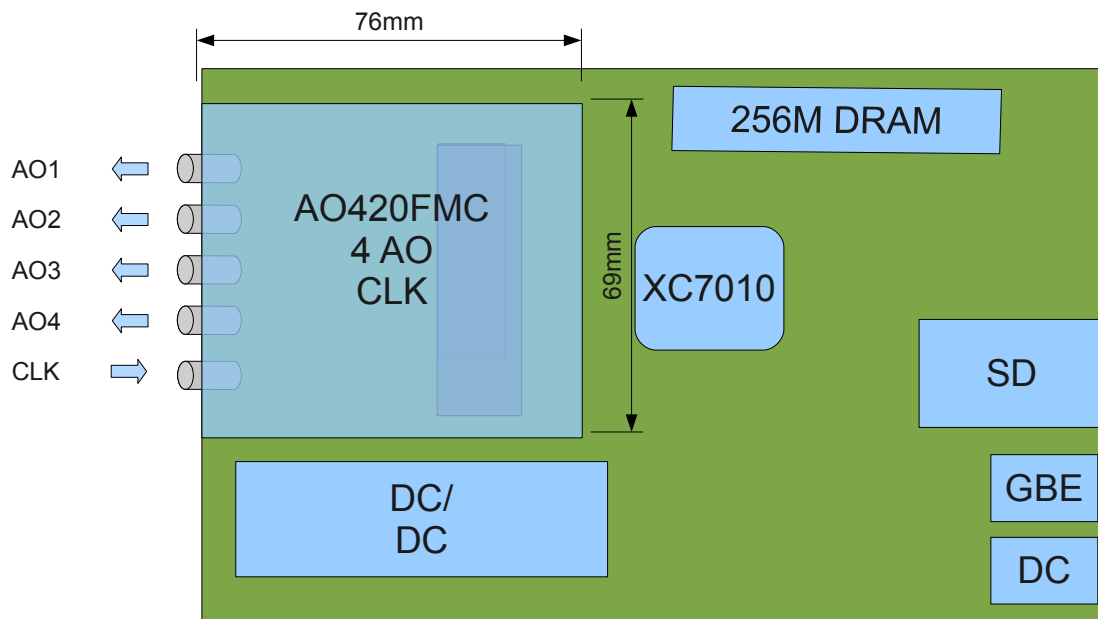
5.2 24 Channel 19", 1U Pizza box Appliance

- 24 channel networked appliance based on ACQ2006 carrier
- Fiber optic, PCIe comms upgrade wtih ACQ2106 carrier
- Mixed IO is of course possible – eg ACQ420FMC + AO420FMC.