ACQ420FMC
Product Specification

High Performance Simultaneous Data Acquisition

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1 Product Description

1. ***ACQ420FMC*** is a 4 channel simultaneous analog input module.
2. Standard configuration : 4 channels, 1000kSPS/channel.
3. Complies with *VITA57 FMC* standard, *LPC* version.
4. 2-wire Differential inputs, high quality differential amplifier front end with switched input voltage ranges.
5. Compliant with D-TACQ *ELF* sites.

1.1 Product Variants

- ***ACQ420FMC-4-1000*** : 4 channels, 16 bit resolution, 1000kSPS/channel.
- ***ACQ420FMC-4-1000-18*** : 4 channels, 18 bit resolution, 1000kSPS/channel.
- ***ACQ420FMC-4-2000*** : 4 channels, 16 bit resolution, 2000kSPS/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 carriers include:

- D-TACQ **ACQ1001** : D-TACQ single slot FMC carrier, Z7020
- D-TACQ **ACQ1002** : D-TACQ dual slot FMC carrier, Z7020
- D-TACQ **ACQ2006** : D-TACQ 6 slot FMC carrier, Z7020
- D-TACQ **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030

- Xilinx ZC702 evaluation board with 2 FMC slots.
- Xilinx Zedboard with 1 FMC Slot.

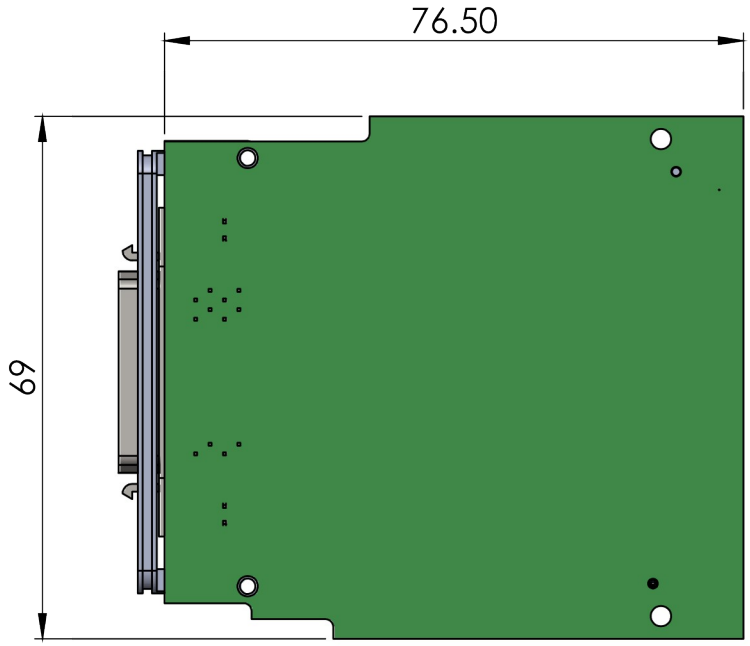
D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux. Evaluation boards are useful for evaluation, but for production use D-TACQ recommends use of a production-quality carrier such as ACQ1001.

1.4 Glossary

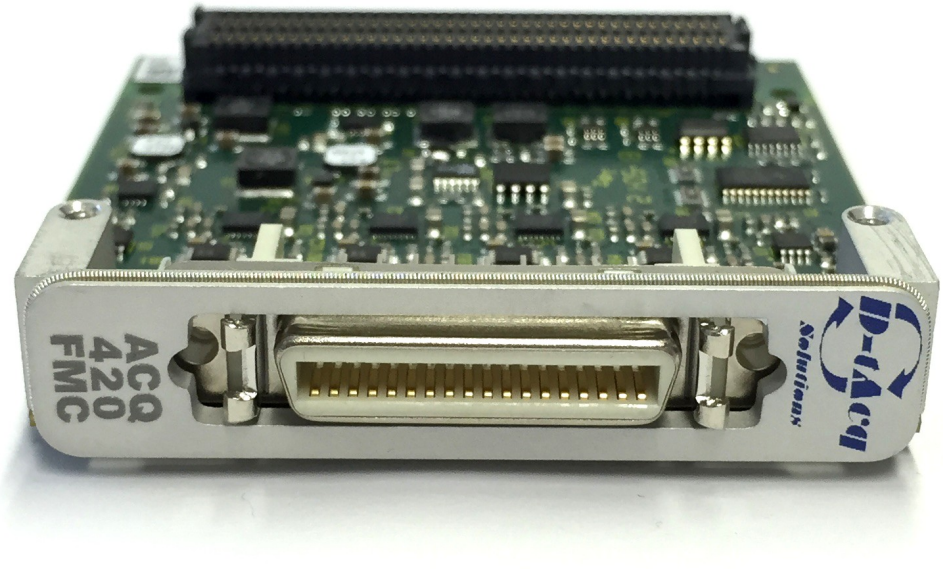
- *FMC*: VITA57 FPGA Mezzanine Card.
- Xilinx ZYNQ Soc
- *FPGA* : Field Programmable Gate Array.
- *LPC* : *FMC* Low pin count wiring standard.
- *ULPC*: *FMC* Ultra low pin count (D-TACQ).
- Extended, ELF : *FMC* Extended size module (D-TACQ).

2 Physical

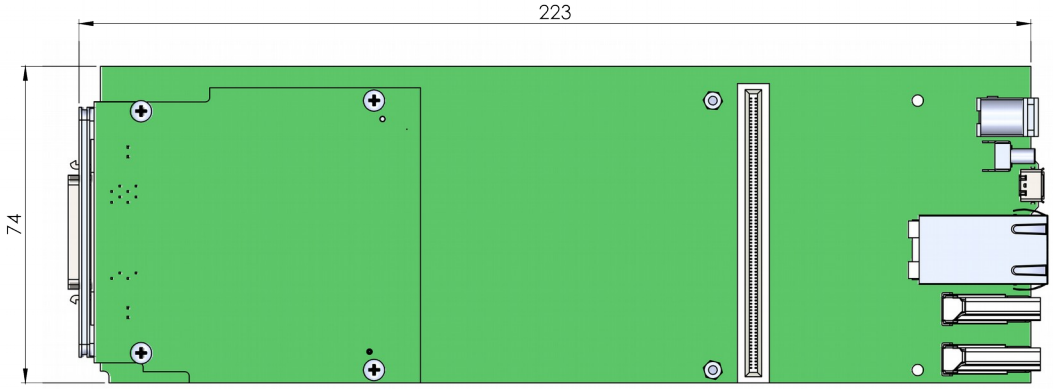
2.1 Standard FMC Module



2.2 Appearance



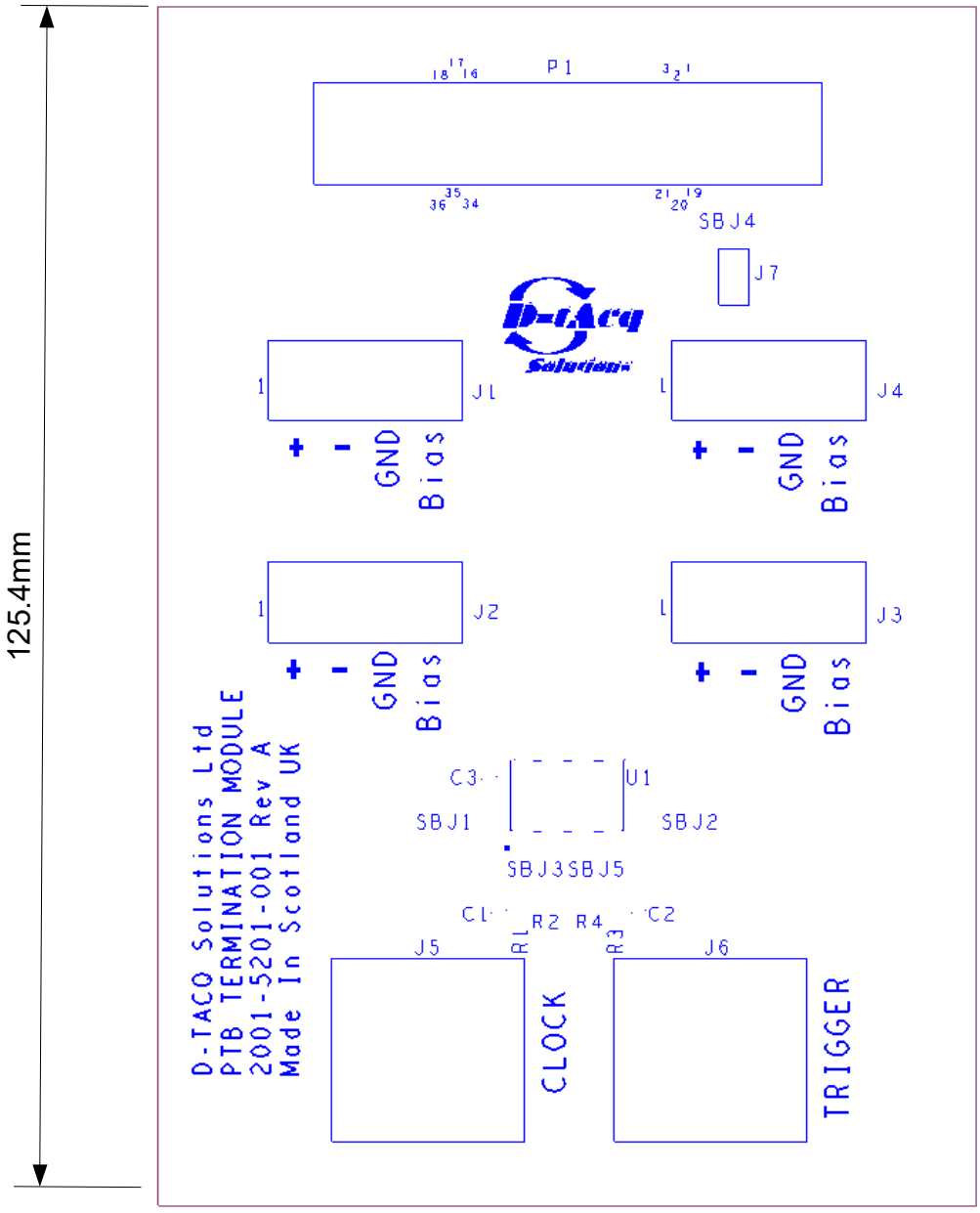
2.3 Example: Fitted to ACQ1001 Carrier



Carrier accommodates 1 x FMC e.g. ***ACQ420FMC*** or an extended size module.

2.4 ACQ420-TERM01 Termination – Physical

Optional DIN-RAIL termination accessory with 4-pin pluggable terminal blocks and opto-isolated CLK, TRG on BNC. Please contact D-TACQ for more information.



3 Interface Specification.

3.1 Front Panel Connector

- 36 Pin MDR (Centronics) 3M 10236-55G3PL
- Mating Part 3M 10136-6000EL
- Compatible cables include:
  - Videk 1082-2
- Compatible DIN-RAIL module ***ACQ420-TERM01*** available.

3.1.1 Pinout

Pin	Function	Pin	Function
1	EXT_CLK1	19	ACCESSORY_PRESENT
2	0VD	20	0VD
3	EXT_TRIG1	21	0VD
4	0VD	22	0VD
5	+12V	23	+5VA
6	+12V	24	+5VA
7	0VA	25	0VA
8	CH_4_BIAS	26	CH_4_GND
9	CH_4+	27	CH_4-
10	0VA	28	0VA
11	CH_3_BIAS	29	CH_3_GND
12	CH_3+	30	CH_3-
13	0VA	31	0VA
14	CH_2_BIAS	32	CH_2_GND
15	CH_2+	33	CH_2-
16	0VA	34	0VA
17	CH_1_BIAS	35	CH_1_GND
18	CH_1+	36	CH_1-

4 ACQ420FMC Electrical Specification.

#	**Parameter**	**Value**
1	Number of Channels	4
2	Sample Rate	-500: 500 kHz -1000: 1 MHz -2000: 2 MHz per channel simultaneous
3	Resolution	16 bits [18 bit]
4	Coupling	DC, Differential Input
5	Input Impedance	1 MΩ
6	 Input Voltage Range Standard (1,2,4,8) High Gain (1,10,100,1000)	Software selectable ranges. ±10V,±5V,±2.5V,±1.25V ±10V,±1V,±100mV,±10mV
7	Input Voltage Withstand	±30V
8	Offset Error	0.01% FS with numerical calibration
9	Gain Error	0.01% FS with numerical calibration
10	INL	16 bit ±0.2 LSB 18 bit ±0.5 LSB
11	DNL	16 bit ±0.1 LSB 18 bit ±0.1 LSB
12	CMRR	>80dB FS @ 1 kHz
13	THD	-98 dB* at gain 1
14	SINAD	-93 dB* at gain 1
15	SFDR	100 dBc*
16	SNR Gain *1 SNR Gain *2 SNR Gain *4 SNR Gain *8	94 dB* 94 dB* 92 dB* 90 dB*
17	Power BW (-3 dB)**	-500: 250 kHz -1000: 450 kHz -2000: 450 kHz
18	Small Signal BW**	-500: 250 kHz -1000: 500 kHz -2000: 800 kHz
19	Crosstalk	<90 dB @ 1 kHz FS Input
20	Temperature Stability	<25 ppm/C

Typical values

* Typical values measured at full scale with a 9.76kHz input
** Bandwidth is reduced in High Gain configuration. Contact factory for details

5 ACQ420FMC Specification

#	Parameter	Value
1	Form Factor	Standard FMC
2	Power source	External DC 12V, 150mA External DC 3.3V, 75mA
3	Environmental	0°C-50°C Operational -10°C-85°C Non-Operational
4	FMC Socket	Standard FMC, Low Pin Count LPC
5	Digital Signal IO	CLK, TRG inputs 5V TTL