DATA ACQUISITION

FRONTDAQ: FD5

- From 5 top 15 synchronous differential and universal analogue inputs
- Embedded exploitation and programming software
- Web server
- Up to 400 samples per second per channel
- Calculation channels
- Data storage on internal mass storage or SD card or USB drive
- Ethernet communication port

Introduction:

Frontdaq family is the image of new generation of AOIP's data acquisition systems.
From any computer, without any dedicated software, a user can program and read data: all necessary software are embedded in the instrument.
Frontdaq is able to catch up to 400 data per second from one channel. The acquisition speed remains the same whatever is the number of channels. According to the model, 5, 10 or 15 channels are available.
In addition, a 5 channel module can be upgrade to offer 15 channels, adding 2 input boards.
Its internal memory of 1 000 000 data, can be expanded using SD card or USB drive, offering several months of storage.
Its 5 TTL inputs/outputs can e used to trigger acquisition, 2 output relays and one analogue output (0-10V)

Functions:

5, 10 or 15 universal analogue inputs (According to selected model) : : Name, scaling, and 4 alarm levels can be program for each channel. Each input channel is equipped with one ADC : whatever is the number of programmed inputs, the acquisition will remain the one programmed in opposition with multiplexed systems.
- **Voltage:** Standard (ranges: 0-10mV, 0-1V, 0-10V and 0-100V),
- **Current:** 0-20 mA and 4-20 mA with external shunts
- **Resistance:** 0-3000 ohms and 0 to 200KΩ
- **Thermocouples:** Thermocouples (type K/T/J/N/E/R/S/B, etc..) with or without cold junction compensation.
- **RTD:** Temperature sensors as Pt100, 500, 1000 ohms,… in 2, 3 or 4 wires.
- **Frequency:** up to 10KHz measuring frequency and counting

2 analogue outputs (0-10V),
5 TTL inputs/outputs
2 output relays
Calculation channels: Calculations between channels, or any calculation (Average, min, max,...)

Software and resources

* **Embedded Web server software** for programming, control and reading of data. Real-time data monitoring, using web browser.
* **File and data stamping**.
* **External memory extensions ; SD card or USB drives.**
* **Communications: TCP/IP** (RJ45 10/100), **RS232, USB, WIFI using external access point**
* **Power supply:** 9-30V powered by main or external rechargeable battery.

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TECHNICAL SPECIFICATIONS

Scanning rate

FD5 offers 3 scanning frequencies, in direct connection with accuracy levels
FD5 offers synchronous input channels, so the number of programmed channels is not influencing the scanning rate.

Accuracy level	Scanning rate	Scanning period	Number of sample/second/channel
High	4,17Hz	240ms	4 Sples/s/ch
Normal	123 Hz	8,13ms	123 Sples/s/ch
Low	470Hz	2,13ms	470 Sples/s/ch

Accuracy is given in ± % of reading + a fixed value. |.....| means absolute value.

DC voltage

Range Name	Measuring Range	1yr accuracy High Accuracy (4 m/s)	1yr accuracy Standard Accuracy (123 m/s)	1yr accuracy Low Accuracy (470 m/s)	Notes
100mV	+/-100mV	0,015% L + 3 µV	0,015% L + 7 µV	0,015% L + 15 µV	10 MΩ+/- 10%
1V	+/-1V	0,015% + 30 µV	0,015% L + 70 µV	0,015% L + 150 µV	10 MΩ+/ 10%
10V	+/-10V	0,015% + 300 µV	0,015% L + 700 µV	0,015% L + 1.5 mV	1 MΩ+/ 10%
50V	+/-50V	0,015% + 1 mV	0,015% L + 3 mV	0,015% L + 7 mV	1 MΩ+/ 10%
100V	+/-100V	0,015% + 3 mV	0,015% L + 7 mV	0,015% L + 15 mV	1 MΩ+/ 10%

DC Current

Range Name	Measuring Range	1yr accuracy High Accuracy (4 m/s)	1yr accuracy Standard Accuracy (123 m/s)	1yr accuracy Low Accuracy (470 m/s)	Notes
0-20 mA	0 mA to 20 mA	0,025% L + 6 µA	0,025% L + 13 µA	0,025% L + 30 µA	With shunt ER 44007-024
4-20 mA	4 mA to 20 mA	0,025% L + 6 µA	0,025% L + 13 µA	0,025% L + 30 µA	with shunt ER 44007-024

Resistance

Range Name	Measuring Range	1yr accuracy High Accuracy (4 m/s)	1yr accuracy Standard Accuracy (123 m/s)	1yr accuracy Low Accuracy (470 m/s)	Notes
400 Ω	0 Ω to 400 Ω	0,008% L + 10 m Ω	0,008% L + 20 m Ω	0,008% L + 40 m Ω	4 wires accuracy
3600 Ω	0 Ω to 3600 Ω	0,008% L + 100 m Ω	0,008% L + 200 m Ω	0,008% L + 400 m Ω	4 wires accuracy
200 KΩ	0 Ω to 200 KΩ	0,1% L + 5 Ω	0,3% L + 8 Ω	0,5% L + 10 Ω	4 wires accuracy (1)

(1)short and shielded wires

Frequency and counting

Range Name	Measuring Range	1yr accuracy High Accuracy (4 m/s)	Notes
10 kHz	1 Hz to 10 KHz	0,005%	Vin min = 1V

- Trigger level 1V
- Scale in pulse/min and Hz
- Measuring on frequency output or dry relays
- For counting measurement, the time can be defined or the counting can be performed on infinite time.

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Thermocouples

Sensor type	Measuring range	Resolution	1yr accuracy High Accuracy (4 m/s) Periodic mode	1yr accuracy Standard Accuracy (123 m/s) Periodic mode	1yr accuracy Low Accuracy (470 m/s) Continuous mode
K	- 250 to - 200°C - 200 to - 120°C - 120 to - 0°C + 0 to + 1372°C	0,2°C 0,1°C 0,05°C 0,05°C	|1.1%R+1.9|°C |0.12%R| °C |0.04%R| + 0.1°C |0.015%R| + 0.1°C	|1.1%R + 1.9|*1.79°C |0.12%R|*2.2°C (|0.04%R| + 0.1)*2°C (0.021%R| + 0.2) °C	|1.11%R + 1.9|*3.85°C |0.12%R|*4.5°C (|0.04%R| + 0.1)*4°C (0.025%R| + 0.4) °C
T	- 250 to - 200°C - 200 to - 100°C - 100 to - 0°C - 0 to + 400°C	0,2°C 0,05°C 0,05°C 0,05°C	|0.75%R + 1.25|°C |0.13%R|°C |550ppmR| + 0.09°C 0.09°C	(|0.75%R + 1.25)*2°C |0.13%R|*2°C (|550ppmR| + 0.09)*2°C 0.18°C	(|0.75%R + 1.25)*4°C |0.13%R|*4°C (|550ppmR| + 0.09)*4 0.39°C
J	- 210 to - 120°C - 120 to - 0°C + 0 to + 1200°C	0,05°C 0,05°C 0,05°C	|800ppmR| + 0.05°C |300ppmR| + 0.08°C |100ppmR| + 0.08°C	(|800ppmR| + 0.05)*2°C (|300ppmR|+0.08)*1.9°C (|100ppmR|+0.08)*1.9°C	(|800ppmR|+0.05)*4°C (|300ppmR|+0.08)*3.8°C (|100ppmR|+0.08)*3.8°C
E	- 250 to - 200°C - 200 to - 100°C - 100 to - 0°C + 0 to + 1000°C	0,1°C 0,05°C 0,05°C 0,05°C	|0.6%R + 1|°C |760ppmR| + 0.03°C |270ppmR| + 0.07°C 150ppmR + 0.07°C	(|0.6%R + 1|)*1.8°C (|760ppmR|+0.03)*1.9°C (|270ppmR|+0.07)*1.9°C (|150ppmR| + 0.13) °C	(|0.6%R + 1|)*3.6°C (|760ppmR|+0.03)*3.7°C (|270ppmR|+0.07)*3.7°C (|150ppmR| + 0.26) °C
R	- 50 to + 150°C + 150 to + 550°C + 550 to + 1768°C	0,5°C 0,2°C 0,1°C	1°C 0.4°C 0.5°C	2°C 0.9°C 0.9°C	4°C 1.9°C 1.5°C
S	- 50 to + 150°C + 150 to + 550°C + 550 to + 1450°C +1450 to 1768°C	0,5°C 0,2°C 0,1°C 0,1°C	1°C 0.4°C 0.45°C 0.6°C	2°C 0.8°C 0.8°C 1°C	4°C 1.6°C 1.6°C 1.8°C
B	+ 400 to + 900°C + 900 to + 1820°C	0,2°C 0,1°C	0.9°C 0.65°C	1.8°C 1°C	3.8°C 1.95°C
U	- 200 to - 100°C - 100 to + 50°C - 100 to + 600°C	0,05°C 0,05°C 0,05°C	0.25°C 0.15°C 0.15°C	0.45°C 0.25°C 0.2°C	0.85°C 0.55°C 0.4°C
L	- 200 to - 40°C - 40 to + 900°C	0,05°C	0.2°C 0.17°C	0.3°C 0.22°C	0.55°C 0.35°C
C	- 20 to + 300°C +300 to + 900°C + 900 to + 2310°C	0,1°C 0,1°C 0,1°C	0.25°C 250ppm+0.15°C 400ppm°C	0.55°C 250ppm+0.4°C 600ppm°C	1.15°C 250ppm+0.95°C 1000ppm°C
N	- 240 to - 190°C - 190 to - 110°C - 110 to – 0°C + 0 to + 1 300°C	0,2°C 0,1°C 0,05°C 0,05°C	|0.8%R+1|°C |0.7%R+1|°C 0.17°C 150ppmR + 0.15°C	|2%R+3|°C |0.7R%+1|*2.1°C 0.2°C 100ppmR + 0.3°C	|4%R+6|°C |0.7%+1|*4.2°C 0.4°C 80ppmR + 0.6°C
PlatineL	- 100 to + 850°C 8 850 to + 1400°C	0,05°C 0,05°C	0.2°C 0.02%R + 0.1	0.3°C 0.028%R + 0.2	0.5°C 0.03%R + 0.4°C
Mo	0 to + 1 375°C	0,05°C	0,02 %R + 0,1°C	0,02 %R + 0,2°C	0,02 %R + 0,4°C
NiMo/NiCo	- 50 to + 400°C +400 to+1410°C	0,05°C	0.35°C 0.25°C	0.45°C 0.3°C	0.55°C 0.45°C
D	+ 0 to + 310°C + 310 to + 1000°C + 1000 to+2315°C	0,1°C 0,05°C 0,05°C	0.3°C 0.3°C 0.04%°C	0.50°C 0.30°C 0.06%°C	1.6°C 0.9°C 0.1%°C
G	+ 0 to + 50°C + 50 to + 100°C + 100 to + 200°C + 200 to + 300°C + 300 to + 1400°C + 1400 to+2315°C	0,5°C 0,2°C 0,05°C 0,05°C 0,05°C 0,05°C	2.3°C 0.95°C 0.6°C 0.35°C 0.3°C 300ppm°C	5.4°C 2.1°C 1.35°C 0.8°C 0.65°C 450ppm°C	11.5°C 4.5°C 2.9°C 1.7°C 1.3°C 750ppm°C

Sensors types :
- According to CEI 584-1/1995 (K, T, J, E, S, B, N).
- According to Din 43710 (U and L).
- According to ENGELHARD (PlatineL)
- According to ASTM E 1751-00 (G)
- According to ASTM E 988-96 (D W3Re/W25Re ; C W5Re/W26Re)

When using Cold Junction Compensation, (CJC), add an additional uncertainty at 0°C of
+/- 0.5°C (High and standard accuracy scanning level).
+/- 0.8 (Low accuracy scanning level).

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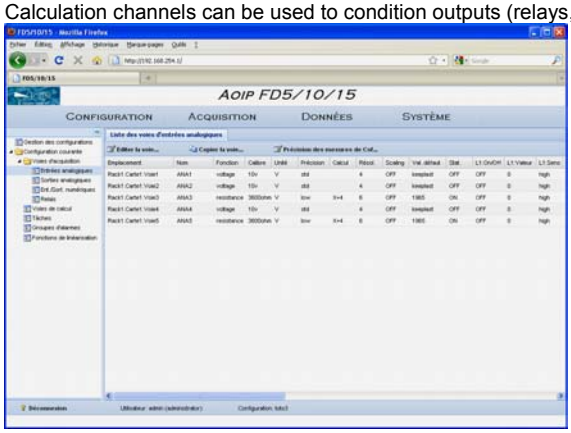
Sensor type	Measuring range	Resolution	1yr accuracy High Accuracy (4 m/s) Periodic mode	1yr accuracy Standard Accuracy (123 m/s) Periodic mode	1yr accuracy Low Accuracy (470 m/s) Continuous mode
Pt 50 (α = 3851)	- 220°C to + 850°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Pt 100 (α = 3851)	- 220°C to + 850°C	0,01°C	0.08%R +0.035°C	0.08%R +0.06°C	0.08%R +0.12°C
Pt 100 (α = 3916)	- 200°C to + 510°C	0,01°C	0.08%R +0.035°C	0.08%R +0.06°C	0.08%R +0.12°C
Pt 100 (α = 3926)	- 210°C to + 850°C	0,01°C	0.08%R +0.035°C	0.08%R +0.06°C	0.08%R +0.12°C
Pt 200 (α = 3851)	- 220°C to + 850°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Pt 500 (α = 3851)	- 220°C to + 850°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Pt 1 000 (α = 3851)	- 220°C to + 850°C	0,01°C	0.08%R +0.035°C	0.08%R +0.06°C	0.08%R +0.12°C
Ni 100 (α = 618)	- 60°C to + 180°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Ni 120 (α = 672)	- 40°C to + 205°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Ni 1 000 (α = 618)	- 60°C to + 180°C	0,01°C	0.08%R +0.04°C	0.08%R +0.07°C	0.08%R +0.14°C
Cu 10 (α = 427)	- 70°C to + 150°C	0,01°C	0.2°C	0.3°C	0.55°C
Cu 50 (α = 428)	- 50°C to + 150°C	0,01°C	0.08%R +0.06°C	0.08%R +0.08°C	0.08%R +0.11°C

Calculation channels

FD5 is able to perform data calculations and store calculation results. (Data processing, statistics, conditioning, Boolean calculations).
Calculation channels can be used to condition outputs (relays, analogue outputs).



Alarms :

Each channel can be configured with 4 alarms levels for monitoring purpose. Alarms events are stored in a dedicated file (alarm file). Only allowed users can access to the file.

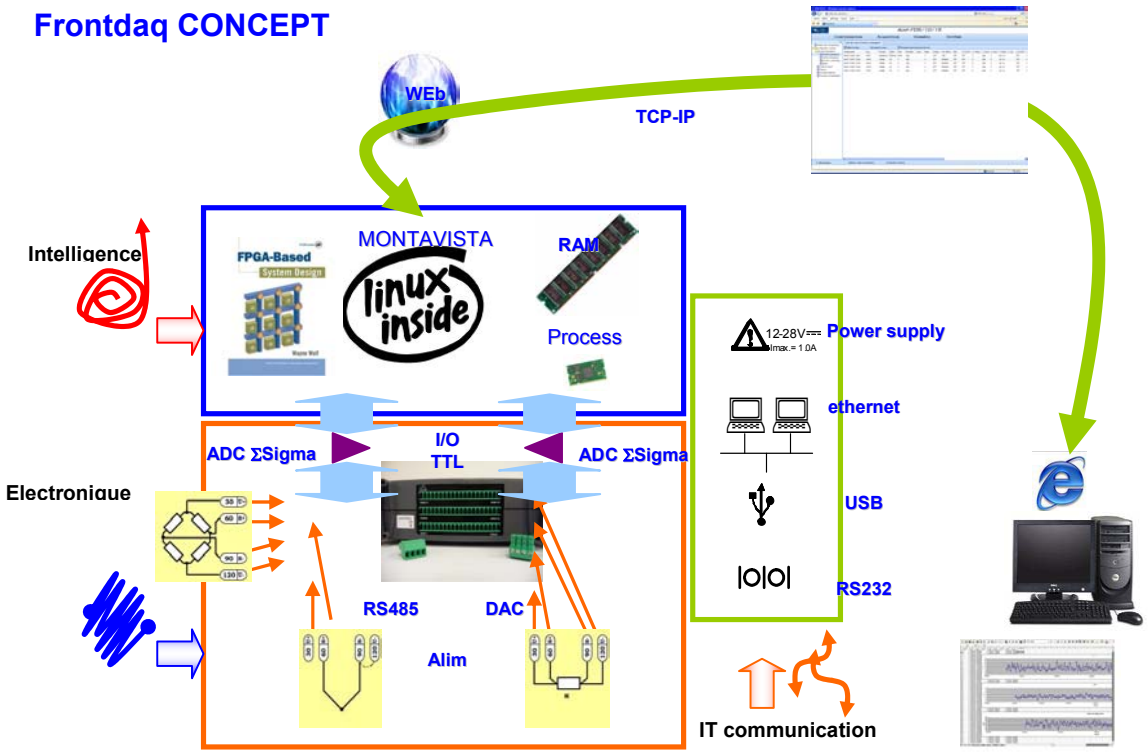
Scaling

Each channel can be scaled for sensor correction or to apply a special scale for 4-20mA or 0-10 V sensors.

Mechanical dimensions and technical specifications

CLOCK	**Accuracy: 3,85 $^{-07}$ (de 0°C to 50°C)**	
POWER SUPPLY: 12-28 V (9-32V)		**POWER 6 Watts per hour without sensor power supply**
WORKING CONDITIONS-10°C to 50°C		**CONDITIONS DE STOCKAGE : -40°C to 80°C**
MEMORY		
INTERNAL (RAM) : FIFO or LIFO	**256 Mo:>1 000 000 Données.**	**EXTERNAL :sd card, usb drive**
DIMENSIONS and WEIGHT :L211,5 x l194,7 x H57 mm - 800 grammes approx		**MATERIAU: ABS**
COMMUNICATION	**TCP/IP / WiFi (802.11g) , USB, RS 485**	

DATA ACQUISITION



DATA ACQUISITION

Software

STANDARD SOFTWARE – Access with Web Server(embedded in FrontDAQ.
- Access with Internet browser (Internet Explorer, Mozilla Firefox, Opera…). No need for DLL, exe, driver ....
- Allows programming, data viewing, instrument start/stop, memory management,…
- Works with Windows, Linux, MacOS.

XML Protocol (commands for customer interfaces (Labview, C++...)).

OPTIONAL SOFTWARE

VISULOG: Visulog will help to follow data and to store them on a computer in real-time, with a maximum acquisition rate of 10 HZ. Visulog can be used also to download data from the FD5.

Accessories

ACCESSOIRIES

- **External rechargeable Battery (Nimh type).**
- **Additional 24V power supply (Allows to supply 5 transducers.**
- **Carrying Case.**
- **DIN RAIL for cabinet mounting.**

CONFORMITY - CE.
- 1 year warranty

Other models in the FRONTDAQ FAMILY:

FRONTDAQ FD20 :.

20 synchronous channels with up to 7480 samples/second/channel. Webserver

FRONTDAQ FD10ISO::

Same as Frontdaq 20 but with 10 400V isolated channels Shown with battery option.

FRONTDAQ 20HT:

20 channels for extended temperature range applications(-40°C-80°C). Shown as a board for direct integration

AOIP
BP 182
91133 RIS ORANGIS CEDEX
FRANCE
+33 1 69 02 88 88

www.aoip.com