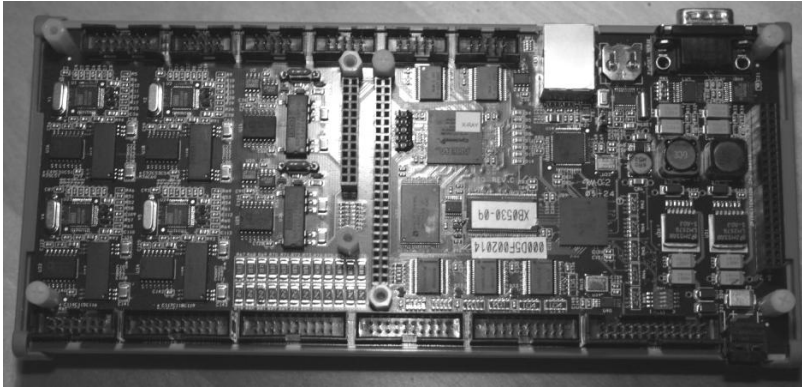


MULTIPLE INPUTS/OUTPUTS CONTROLLER



XIO (an acronym for multiple Inputs/Outputs) is the base of a new line of products dedicated to automation and control. XIO can be used standalone using a built-in control loop, or can be connected to another device through an Ethernet interface. In this

configuration the board behaves like a slave device and is controlled using PC software. At the heart is a Coldfire 5272 Microprocessor and sampling is performed by a slave CPU inside the FPGA. Both CPUs share data according to a master/slave method so the control loop time can be very small (less than 25ms) even when using all inputs/outputs. This dual processor architecture allows a faster firmware execution since one CPU does the data collection and the other handles TCP/IP communications. XIO runs an embedded version of Linux, which provides multitasking and TCP/IP communication. The board includes four (4) analog inputs that are configurable for span and offset, two (2) analog outputs, six (6) encoder inputs, 32 logic outputs to control external relays and 64 configurable logic inputs that can be used as analog inputs. Also included is a robust flash file system, a real-time clock, switches to configure IP addresses, a serial port and plenty of RAM to execute user applications.

Main features

- **Two (2) isolated analog outputs (6 with extension opt.)**
- **Four (4) isolated analog inputs (12 with extension opt.)**
- **32 up to 56 logic outputs**
- **40 up to 64 logic inputs (or analog inputs: individually configurable)**
- **Six (6) quadratures/12 single optical encoder inputs**
- **2500 V_{rms} isolation (1 min)**
- **Up to 16 IP addresses**
- **Ethernet communication**
- **DIN RAIL mounting**

Technical specifications

- Operating temperature: 0 to 50°C (32 to 122°F)
- Humidity: 5 to 95% non condensing
- Storage temperature: -40 to 85°C (-40 to 185°F)
- Dimensions mm (inches): 240 (9.4) x 105 (4.1) x 41 (1.6)

ANALOG OUTPUTS

- 12 bits, 0-10V, maximum load = 2k Ω
- Differential nonlinearity (DNL) = +/- 0.5 LSB
- Integral nonlinearity (INL) = +/- 3.5 LSB
- Offset error = +/- 4 mV
- Full scale error = +/- 2 LSB
- Accuracy = 10V +/- 0.1%
- Noise < 1ppm p-p (0.1Hz – 10Hz)
- Short circuit protection by fuse (62.5mA)

ANALOG INPUTS

- 24 bits (NO MISSING CODE)
- INL: 0.0012% of full scale
- Measuring Scale: 0-20 mV, 0-40 mV, 0-80 mV, 0-160 mV, 0-320 mV, 0-625 mV, 0-1.25 V, 0-2.5 V, 0-5 V, 0-10 V
- Automatic calibration
- Maximum common mode voltage = 50V (limited by ceramic capacitor)
- Common mode rejection = 120dB
- Normal mode rejection (60Hz or 50Hz) = 100dB
- Input impedance : 400k Ω

LOGIC OUTPUTS

- Open Drain output type
- Short circuit protection: 0.9A
- Over temperature protection
- Short circuit and open load detection for each output
- Over voltage protection

LOGIC INPUTS (XEL interface connected)

- 25ms switch debouncer
- 24V input with 4V threshold

NON ISOLATED ANALOG INPUTS (with the XEI interface connected)

- Possibility of 64 non-isolated current (4-20mA) inputs
- 12 bits (NO MISSING CODE)
- Integral Linearity Error = ± 2 LSB
- Differential Linearity Error = ± 0.8 LSB
- Offset Error = 10mV ± 3 LSB
- 2.5V Reference-Accuracy = 2.5V +/- 0.2%
 -Noise = 35 μ V_{rms} (typ) (10Hz – 10kHz)
- Maximum input voltage = 3.3V

OPTICAL ENCODER INPUTS

- Six (6) inputs over two (2) channels (quadrature decoder mode) or 12 inputs over one (1) channel
- Digital glitch filter on each input
- 16 bit counter
- Configuration: counter mode/frequency mode
- Accept all type of inputs (open drain, open emitter, totem pole, push pull)
- Input current = 10mA

MAIN BOARD COMPONENTS

- CPU 66MHz, Coldfire 32bits with 1kB cache memory
- 16 MB of SDRAM (32 bits)
- 8 MB of FLASH (16 bits)
- One (1) Ethernet port 100Mbits
- One (1) Serial port
- One (1) Real time clock
- One (1) Reprogrammable FPGA
- One (1) 3.3V 2A Power supply
- One (1) 5V 2A Power supply
- One (1) 1.5V 1.2A Power supply

ISOLATION

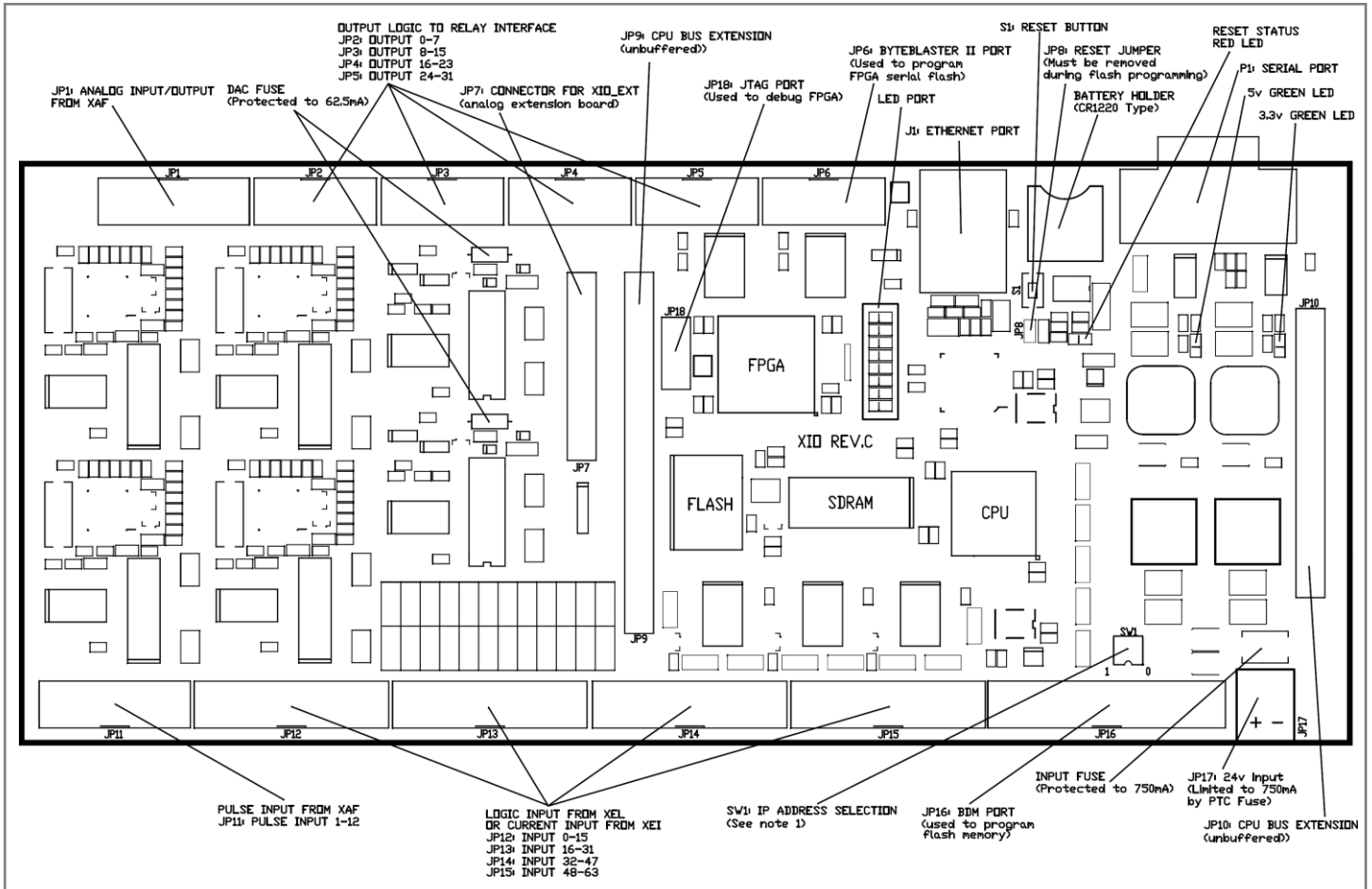
- Analog modules are isolated from one another
- Isolation barrier = 2500V_{rms}

EXTENSION

The board has two buses. The first is for CPU bus extensions where you can add a peripheral card like USB, touch screen, mouse, RS 485 etc.

The second bus is a SPI type and has the ability for connecting two external cards providing two (2) analog outputs and four (4) analog inputs each. The electrical characteristics of those modules are the same as the one on the motherboard.

Wiring diagram



Note 1: IP address selection is done during boot time.

Table 1 gives IP address regarding of switch position.

Switch #				IP address*
1	2	3	4	
0	0	0	0	192.168.1.201*
0	0	0	1	192.168.1.202
0	0	1	0	192.168.1.203
0	0	1	1	192.168.1.204
0	1	0	0	192.168.1.205
0	1	0	1	192.168.1.206
0	1	1	0	192.168.1.207
0	1	1	1	192.168.1.208
1	0	0	0	192.168.1.209
1	0	0	1	192.168.1.210
1	0	1	0	192.168.1.211
1	0	1	1	192.168.1.212
1	1	0	0	192.168.1.213
1	1	0	1	192.168.1.214
1	1	1	0	192.168.1.215
1	1	1	1	192.168.1.216

*Base IP address can be changed in XIO firmware.

Table 1

Ordering information

XIO - Multiple input/output controller