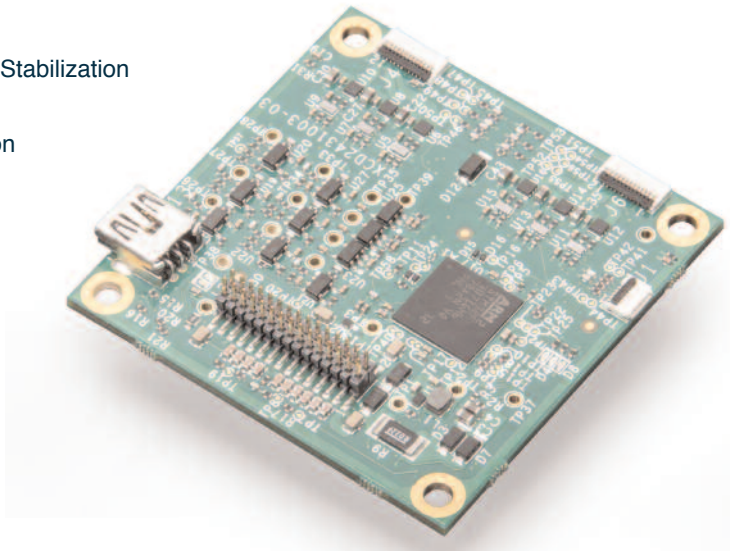
NANOMOTION
A Johnson Electric Company

XCD2

Dual Axis Drive and Control

Application Recommendations

- Auto Focus/Zoom Modules
- Pan & Tilt Gimbal with Gyro Stabilization
- Beam Steering & Stabilization
- Target Acquisition Devices



ORDERING INFORMATION

Part Number: XCD2150003-02
(main board)

RELATED PRODUCTS/ ACCESSORIES

Communication Host Adaptor Boards:
XCD215002A-00
RS232/485 HOST adapter
XCD215002B-00
General HOST adapter
XCD2150002C-00
USB to UART/SPI/I2C adapter

Motor Adaptor Boards:
XCD215002A-00
RS232/485 HOST adapter

Encoder Interface Boards
• A Quad B
• BiSS encoder

Product Description

XCD2 Multi axis amplifier & control board is a dual axis OEM amplifier and control board designed for applications using the Edge & Edge-4X motors. The board level product serves as a dual axis controller and can support a mixture of motor configurations, with multiple Edge motors or multiple Edge-4X motors per axis.

The XCD2 also supports Nanomotion's gyro input for dual axis stabilization. The XCD2 is programmed via IIC and can support quadrature (incremental) encoder input as well as BiSS (absolute) encoder input.

The XCD2 supports 2 axes of motion in the AB1 or AB5 mode of operation. It is an advanced 32-bit ARM 168MHz floating point processor with a configurable servo rate, up to 20KHz.

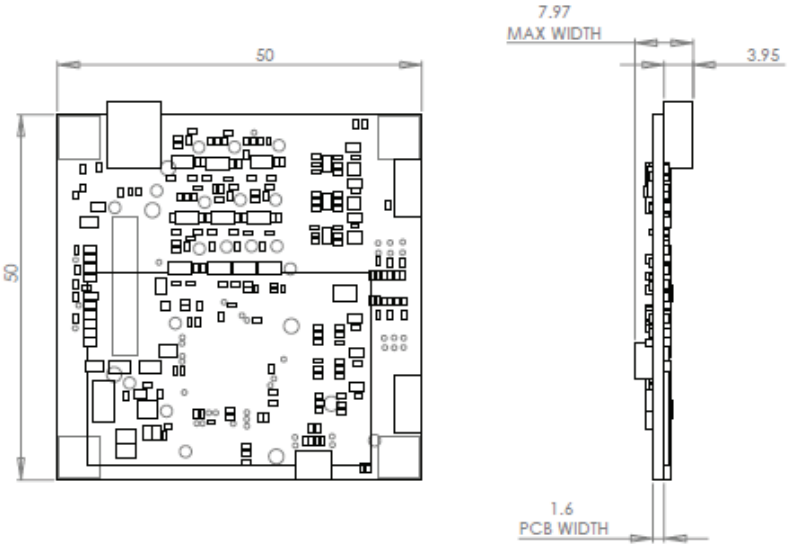
Communications via UART, I2C, SPI and USB are supported, along with an embedded gyro interface using the SPI port.

Advanced I/Os with (8)GPIO, (16) ADC and (2) DACs, with configurable parameters.

XCD2

Drive and Control

MECHANICAL DRAWINGS AND INTERFACE (Dimensions in mm)



TECHNICAL SPECIFICATIONS

Mechanical
Dimensions: 50mm x 50mm

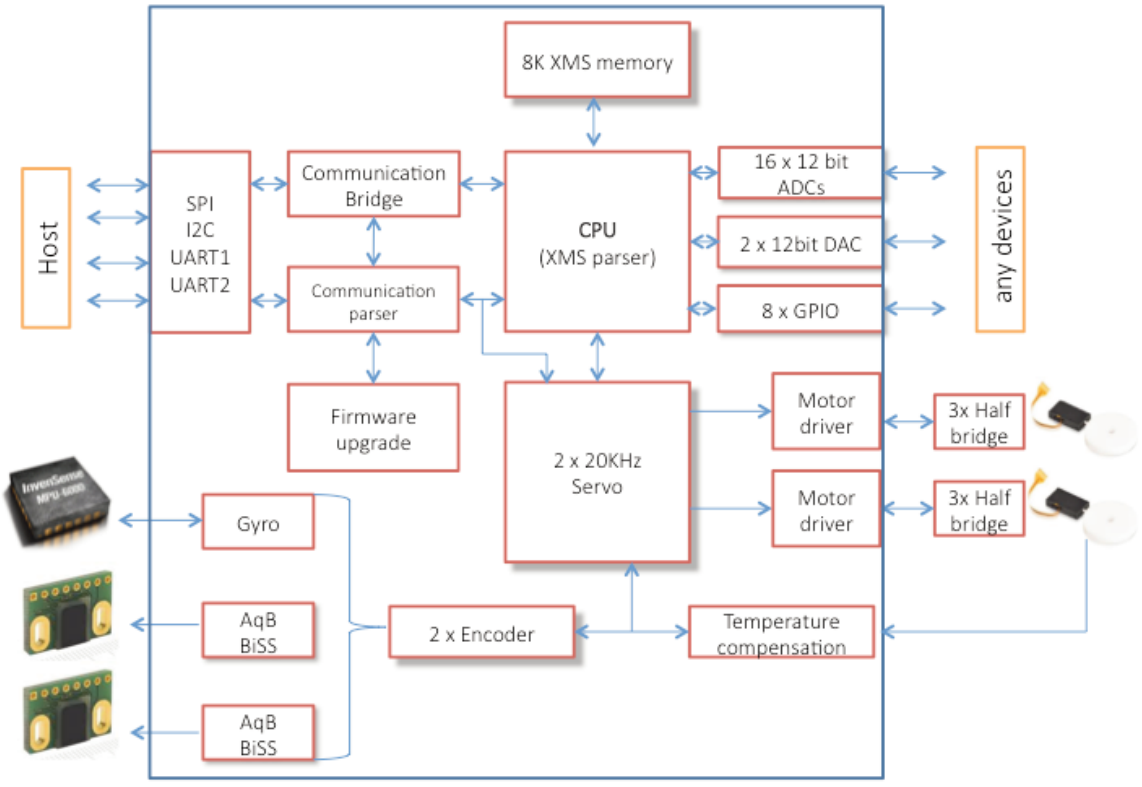
PERFORMANCE

- Motors Supported: 1, 2, 3, or 4 Edge Motors per axis
- 1 or 2 Edge-4X Motors per axis
- Drive mode : AB1 or AB5 (Brake on/off)
- Communication: IIC, UART, SPI and USB
- Operating Temperature: -40˚C to 70˚C

POWER CONSUMPTION

Input: 5V 5% tolerance
CPU: 100mA
Edge-4X: 300mA per motor
Edge: 100mA per motor
Inputs & Outputs are 3.3V

BLOCK DIAGRAM



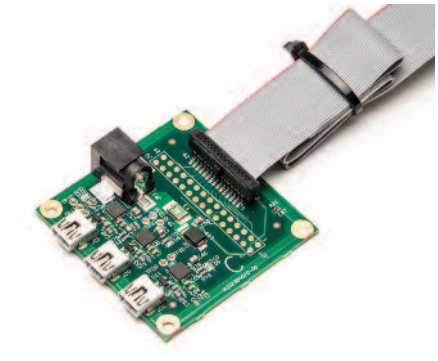
Drive and Control

POWER STAGE & CONNECTION OPTIONS

The XCD2 drive/control board offers a variety of options to connect:

- Host Adapter Board
- Motor power stage
- Incremental or Absolute Encoders
- Gyro (Nanomotion defined)

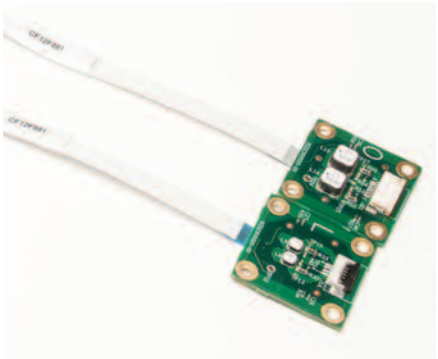
HOST ADAPTER BOARD



The host adaptor board provides an easy way to connect to the XCD2 main board. A standard header connector has pin to pin connection to HOST connector and has the same signals as the small HOST connector. In additional the board has a power jack connector to supply 5V.

Three boards are available:

- A – RS232 and RS485 communication interfaces
- B – Contains pin to pin connection between the HOST connector and a 100mill header
- C – I2C, SPI and UART communication interfaces



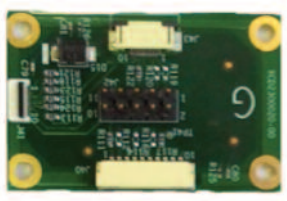
MOTOR POWER STAGE

The XCD2 is designed to work with Nanomotion's Edge and Edge-4X motors. The controller can support two axes with any configuration of 1 through 4 Edge motors and 1 to 2 Edge-4X motors.

Each power stage board is available with standard flat ribbon cables and connectors.

ENCODER INTERFACE

The XCD2 supports either an incremental, A-quad-B encoder or an absolution, BiSS encoder. Both connection boards are available.

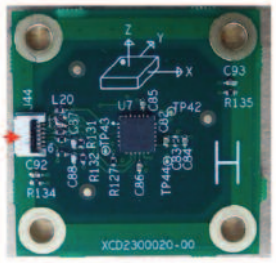


Drive and Control

GYRO INTERFACE

The embedded gyro interface uses the SPI port and provides (8) stabilized presets allowing for easy transition between modes (encoder + gyro).

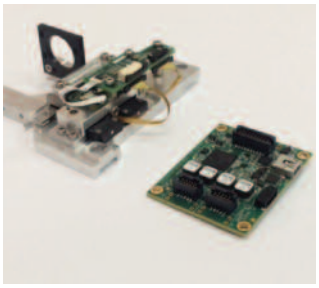
The gyro interface only supports the InvenSense MPU-6000 gyro.

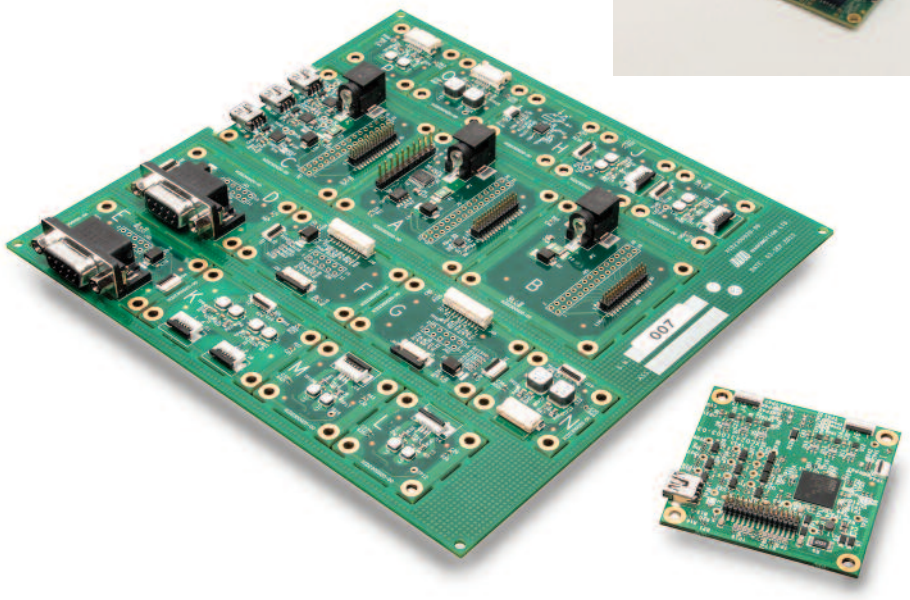


EVALUATION KITS

For application development, Nanomotion offers a variety of development kits that consist of both motor/mechanical axes and the various board configurations. Nanomotion can also supply a single XCD2 board, providing all of the component options, in a 'snap-off' board configuration, allowing flexibility to change between power stage, encoder choices and communications.

Most applications ultimately lead to the integration of our XCD2 chip or power stage being integrated into customer electronics, to save space. However, all applications can be supported through the use of various evaluation boards and even custom production board based on specific requirements.





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