### Amplifiers

**AB1A** - is the standard, heavy duty amplifier, widely used.  
**AB1A-3U** - a board level AB1A amplifier card, in 3U format for motherboard interface.  
**AB2** - facilitates additional ultra high resolution capabilities (UHR), down to 1 nanometer, using the unique DC mode.  
**AB4** - a compact amplifier, powered by 12V supply.  
**AB5** - the innovative linearized amplifier, yields excellent motion performance with any standard controller firmware.  
**AB5-3U** - a board level AB5 amplifier card, in 3U format for motherboard interface.

<table>
<thead>
<tr>
<th>unique functionality</th>
<th>AB1A nanomotion basic</th>
<th>AB1A-3U board level 3U format</th>
<th>AB2 DC mode for ultra high resolution</th>
<th>AB4 compact amplifier package</th>
<th>AB5 linear response, operates with standard servo</th>
<th>AB5-3U linear response operates with standard servo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage (Vdc)</td>
<td>48</td>
<td>48</td>
<td>24</td>
<td>12</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>panel mount box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>board level 3u format</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>panel mount box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>small panel mount box</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>board level 3U format</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max # of HR Elements (1)</td>
<td>32</td>
<td>32</td>
<td>16</td>
<td>4</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Max Motor Cable Length (3)</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Input Signals (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>±10Vdc</td>
<td>±10Vdc</td>
<td>±10Vdc</td>
<td>±10Vdc spii digital</td>
<td>±10Vdc</td>
<td>±10Vdc</td>
<td>±10Vdc</td>
</tr>
<tr>
<td>Modes of Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>velocity step gate</td>
<td>velocity step gate</td>
<td>velocity step gate</td>
<td>velocity step gate UHR position</td>
<td>velocity step gate</td>
<td>velocity step gate</td>
<td>velocity step gate</td>
</tr>
</tbody>
</table>

### Available Cable Lengths

<table>
<thead>
<tr>
<th>1HR element</th>
<th>0.5 to 5</th>
<th>0.5 to 8</th>
<th>0.5 to 10</th>
<th>0.5 to 20</th>
<th>0.5 to 10</th>
<th>0.5 to 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>2HR elements</td>
<td>0.5 to 5</td>
<td>0.5 to 8</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
</tr>
<tr>
<td>4 HR elements</td>
<td>0.5 to 10</td>
<td>0.5 to 15</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
</tr>
<tr>
<td>8 HR elements</td>
<td>0.5 to 10</td>
<td>0.5 to 15</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>16 HR elements</td>
<td>0.5 to 10</td>
<td>0.5 to 15</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>32 HR elements</td>
<td>0.5 to 10</td>
<td>0.5 to 15</td>
<td>0.5 to 10</td>
<td>0.5 to 20</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>1 ST element</td>
<td>3</td>
<td>3</td>
<td>NA</td>
<td>0.5 to 10</td>
<td>NA</td>
<td>0.5 to 10m</td>
</tr>
<tr>
<td>2 LS elements</td>
<td>0.5 to 5</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
Piezo Motors

Electronic Drives

AB1A Amplifier

The AB1A amplifier is a single axis digital driver that can run one or multiple Nanomotion motors in parallel. While operating in a closed loop servo system, the driver works as a velocity amplifier, receiving a +/- 10 volt analog command from the controller. The controller signal translates into AC voltage at 39.6 kHz to run the motor. In an open loop mode the amplifier can receive a signal from an external joystick, providing motion in a continuous or stepping mode.

Features

- Digital drive handles up to 32 elements
- +/- 10V input from servo control
- 2 optically isolated limits
- Available in Eurocard 3µ format
- Joystick input for open loop operation
- Card interface is 48 pin 3 row connector

Amplifier Specifications

Environmental

Operating temperature: 0 to 50°C
Storage Temperature: -40°C to +70°C
Humidity: 0 to 80%

Electrical

Power Input: +48Vdc±5%
Max Motor Output: 270 to 280W rms
Power Consumption w/o Load: +48Vdc/0.125A
Power Consumption with Max Load: +48Vdc/6.5A max

Analog Control Input

Input Voltage Range: +/- 10V
Input Impedance: 10 KΩ
Input Low Pass Filter: 2.7 KHz
Input Sampling Resolution: 10 bits
Piezo Motors

Electronic Drives

AB2 Amplifier

The AB2 amplifier combines the normal Velocity mode of the AB1A amplifier, for servo operation, with the DC mode, for Ultra-High resolution positioning. The DC mode treats the motor as a traditional piezo actuator, providing the ability to make discrete moves at the 1 nanometer level.

The DC mode uses the same ±10v analog signal from the controller output and translates it to a ±300 nanometer position move capability, with 1 nanometer resolution. This function can be operated in an open loop or closed loop manner. The switching between the Velocity mode and DC mode is done seamlessly through a discrete input signal.

Features

- Ultra high resolution capability using DC mode
- Digital drive handles 16 HR motor elements
- Requires 24Vdc supply input
- Cable length up to 20m
- Over current and over voltage protection

Environmental

Operating Temperature: 0 to 50°C
Storage: -40°C to +70°C
Humidity: up to 80%, non condensing

Electrical

Power Supply Input: +24 Vdc ±5% (stabilized)
Max Motor Output Voltage: 280 Vrms
Power Consumption without Load: +24 Vdc/200 mA
Power Consumption with Max Load: +24 Vdc/5A
Piezo Motors

Electronic Drives

AB4 Amplifier

The AB4 amplifier offers the same performance as the AB1A, in a reduced package. The AB4 operates off of 12Vdc supply input and can drive up to 4 HR motor elements total, either (1) 4 element HR motor, or multiple HR motors totaling 4 elements.

The AB4 is the smallest standard motor amplifier and is provided with a 26-pin rear connector (26 pin, two row header). This connector provides access to all functionality (motor, power inputs, limits, and I/O functions), making it easy to integrate. Additional motor and power inputs are available with standard connections on the front.

Features

- Exceptionally compact mounting
- 12Vdc supply input
- Drives up to 4 HR motor elements
- Cable length up to 20m
- Over current and over voltage protection

Environmental

Operating Temperature: 0 to 50˚C
Storage: -40˚C to +70˚C
Humidity: up to 80%, non condensing

Electrical

Power Supply Input: +12 Vdc ±5% (stabilized)
Max Motor Output Voltage: 280 Vrms
Power Consumption without Load: +12 Vdc/300 mA
Power Consumption with Max Load: +12 Vdc/3.5A
AB5 Amplifier

The AB5 amplifier revolutionizes the driving concept for Nanomotion ceramic servo motors, enabling a frictionless and smooth motion throughout the entire velocity range. At stop the inherent brake is activated, maintaining the many advantages of brake at power off. Consequently the control scheme is simplified, facilitating the use of any low cost servo controller to achieve outstanding performance.

As a result the whole range of controllers in the market place can be used with Nanomotion motors, as well as generic control algorithms. No custom algorithm is needed to be used with Nanomotion motors.

In addition, exceptional control performance is achieved at servo systems, showing robust performance at various working conditions.

Features
- Compatible with any servo controller
- Linear velocity response at full command range
- Brake on or brake off upon command
- Drives up to 32 HR motor elements
- 24 Vdc supply input

Motor Performance Specifications

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Motor Performance Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature:</td>
<td>Driving Capability: up to 32 HR motor elements</td>
</tr>
<tr>
<td>Storage:</td>
<td></td>
</tr>
<tr>
<td>Humidity:</td>
<td></td>
</tr>
</tbody>
</table>

Analog Control Input

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range:</td>
<td>±10V</td>
</tr>
<tr>
<td>Input Impedance:</td>
<td>10KΩ</td>
</tr>
<tr>
<td>Input Low Pass Filter:</td>
<td>2.7 KHz</td>
</tr>
<tr>
<td>Input Sampling Resolution:</td>
<td>10 bits + direction</td>
</tr>
</tbody>
</table>

Environmental

- Operating Temperature: 0 to 50°C
- Storage: -40°C to +70°C
- Humidity: up to 80%, non condensing

Electrical

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Input:</td>
<td>+24 Vdc ±5% (stabilized)</td>
</tr>
<tr>
<td>Power Consumption without Load:</td>
<td>24 Vdc/200 mA</td>
</tr>
<tr>
<td>Power Consumption with Max Load:</td>
<td>24 Vdc/10A</td>
</tr>
</tbody>
</table>
Piezo Motors

Electronic Drives

XCD-EDGE-BD-03 Drive and Control

Application Recommendations

- Auto Focus/Zoom Modules
- Shutter & Aperture Control
- Filter Changers
- Pan and Tilt Modules

ORDERING INFORMATION

Part Number: XCD-EDGE-BD-03
Drive and Control

RELATED PRODUCTS/ACCESSORIES

Part Number: EM1-S-0
EM1-V-0
EDGE motor

Part Number: XCD-E150100-00
XCD EDGE Motherboard Assembly

Product Description

Nanomotion’s XCD – Drive & Control redefines the art of miniaturized drive and control electronics with the smallest hardware for operating piezo ceramic servo motors. The XCD provides complete servo control for the OEM market, coupled with the power stage and drive electronics on one board. XCD will have an OEM specific, motherboard for connecting to the motor, position sensor, communication and power.

The XCD for the Edge motor is provided as a single axis board which can operate in the ‘AB5’ mode with brake on/off, or in the more traditional AB1A mode. The XCD for the Edge motors accepts a single ended encoder signal and is programmed via an IIC interface and the NanoCommander user software.
Piezo Motors

Electronic Drives

XCD-EDGE-BD-03 Drive and Control

**MECHANICAL DRAWINGS AND INTERFACE**

---

**TECHNICAL SPECIFICATIONS**

- Dimensions: 35.0 x 25.0 x 10.65 mm
- Motors supported: EDGE
- Input Power: 6 V
- Drive Mode: AB5 (brake on/off) or AB1A mode
- Communication: IIC
- Operating Temperature: -40 to 85 °C

**ELECTRICAL**

- Power Consumption: 500 mW (max)

---

**ELECTRICAL INTERFACE**

<table>
<thead>
<tr>
<th>pin number</th>
<th>pin name</th>
<th>pin description</th>
<th>pin number</th>
<th>pin name</th>
<th>pin description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5v</td>
<td>brake pin reset input</td>
<td>11</td>
<td>sda</td>
<td>12C serial data</td>
</tr>
<tr>
<td>2</td>
<td>+5v</td>
<td>brake pin reset output</td>
<td>12</td>
<td>sci</td>
<td>12C serial clock</td>
</tr>
<tr>
<td>3</td>
<td>spi clk</td>
<td>spio clock</td>
<td>13</td>
<td>gp101</td>
<td>pwm</td>
</tr>
<tr>
<td>4</td>
<td>spi en</td>
<td>spio enable</td>
<td>14</td>
<td>gp102</td>
<td>n/a</td>
</tr>
<tr>
<td>5</td>
<td>reso</td>
<td>master in slave out</td>
<td>15</td>
<td>gpw0</td>
<td>general purpose digital output 3</td>
</tr>
<tr>
<td>6</td>
<td>reso</td>
<td>master out slave in</td>
<td>16</td>
<td>gpw1</td>
<td>general purpose digital output 4</td>
</tr>
<tr>
<td>7</td>
<td>r.c.</td>
<td>not connected</td>
<td>17</td>
<td>sn2</td>
<td>analog input 1</td>
</tr>
<tr>
<td>8</td>
<td>r.c.</td>
<td>not connected</td>
<td>18</td>
<td>sn1</td>
<td>analog input 2</td>
</tr>
<tr>
<td>9</td>
<td>r.c.</td>
<td>not connected</td>
<td>19</td>
<td>emergency</td>
<td>emergency stop</td>
</tr>
<tr>
<td>10</td>
<td>r.c.</td>
<td>not connected</td>
<td>20</td>
<td>sn3</td>
<td>analog input 3</td>
</tr>
<tr>
<td>21</td>
<td>r.c.</td>
<td>not connected</td>
<td>21</td>
<td>aniq out2</td>
<td>analog output 2</td>
</tr>
<tr>
<td>22</td>
<td>r.c.</td>
<td>not connected</td>
<td>22</td>
<td>aniq out1</td>
<td>analog output 1</td>
</tr>
<tr>
<td>23</td>
<td>r.c.</td>
<td>not connected</td>
<td>23</td>
<td>pwm out</td>
<td>keep alive</td>
</tr>
<tr>
<td>24</td>
<td>r.c.</td>
<td>not connected</td>
<td>24</td>
<td>gnd</td>
<td>system ground</td>
</tr>
<tr>
<td>25</td>
<td>r.c.</td>
<td>not connected</td>
<td>25</td>
<td>gnd</td>
<td>system ground</td>
</tr>
</tbody>
</table>

---

**More information on Johnson Electric's Piezo Motors for Engineers**

**XCD-EDGE-BD-03 Drive and Control**

---
Piezo Motors

Electronic Drives

XCD-HRx-BD-03 Drive and Control

Application Recommendations

- Auto Focus/Zoom Modules
- Shutter & Aperture Control
- Filter Changers
- Pan and Tilt Modules
- OEM stages

ORDERING INFORMATION

Part Number:  
XCD-HR1-BD-03  
XCD-HR2-BD-03  
XCD-HR4-BD-03

RELATED PRODUCTS/ACCESSORIES

Part Number:  
HR1-1, HR2-1, 
HR4-1 Motors

Part Number:  
XCDH150100-00 XCD  
HR Motherboard Assembly

Product Description

Nanomotion’s XCD – Drive & Control redefines the art of miniaturized drive and control electronics with the smallest hardware for operating piezo ceramic servo motors. The XCD provides complete servo control for the OEM market, coupled with the power stage and drive electronics on one board. XCD will have an OEM specific, motherboard for connecting to the motor, position sensor, communication and power.

The XCD for ST/HR motors is provided as a single axis board which can drive the ST, HR1, HR2, or HR4 motor. The XCD can operate in the ‘AB5’ mode with brake on/off, or in the more traditional AB1A mode. The XCD for ST/HR motors accepts a differential quadrature encoder signal and is programmed via an IIC interface and the Nano-Commander user software.
### Technical Specifications

**Mechanical**
- Dimensions: 52 mm x 72 mm x 28.4 mm

**Performance**
- Motors supported: HR1, HR2, HR4
- Drive mode: AB5, AB1
- Support AOB sensor (Differential Single ended 5V)
- Communication: SPI slave, Uart (LV3TTL)
- Safety: Limit switches, motor interlock, emergency
- 2 x input TTL (5V/3.3V)
- 2 x output LV3TTL (3.3V)
- 3 x Analog input: NTC, Joystick, Potentiometer (Vin range: 0V to 3V)
- 2 x Analog out (PWM)

### Electrical

- Drive voltage: 12V
- Power consumption: 13W

### Mechanical Drawings and Interface

#### Electrical Interface

<table>
<thead>
<tr>
<th>Pin number</th>
<th>Pin name</th>
<th>Main Connector</th>
<th>Motor Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+12V</td>
<td>12vdc power input</td>
<td>gnd</td>
</tr>
<tr>
<td>2</td>
<td>-12V</td>
<td>12vdc power input</td>
<td>n.c.</td>
</tr>
<tr>
<td>3</td>
<td>spl_clk</td>
<td>spi clock</td>
<td>motor_up</td>
</tr>
<tr>
<td>4</td>
<td>spl_en</td>
<td>spi enable</td>
<td>motor_common</td>
</tr>
<tr>
<td>5</td>
<td>mso</td>
<td>master out slave out</td>
<td>motor_down</td>
</tr>
<tr>
<td>6</td>
<td>mosi</td>
<td>master out slave in</td>
<td>high voltage output</td>
</tr>
<tr>
<td>7</td>
<td>rxd</td>
<td>rs232 receive</td>
<td>shield</td>
</tr>
<tr>
<td>8</td>
<td>bxd</td>
<td>rs232 transmit</td>
<td>n.c.</td>
</tr>
<tr>
<td>9</td>
<td>gnd</td>
<td>system ground</td>
<td>n.c.</td>
</tr>
<tr>
<td>10</td>
<td>gnd</td>
<td>system ground</td>
<td>n.c.</td>
</tr>
<tr>
<td>11</td>
<td>sda</td>
<td>12c serial data</td>
<td>shield</td>
</tr>
<tr>
<td>12</td>
<td>scl</td>
<td>12c serial clock</td>
<td>n.c.</td>
</tr>
<tr>
<td>13</td>
<td>gpio1</td>
<td>general purpose digital input 1</td>
<td>n.c.</td>
</tr>
<tr>
<td>14</td>
<td>gpio2</td>
<td>n/c</td>
<td>n.c.</td>
</tr>
<tr>
<td>15</td>
<td>gpio3</td>
<td>general purpose digital output 3</td>
<td>n.c.</td>
</tr>
<tr>
<td>16</td>
<td>gpio4</td>
<td>general purpose digital output 4</td>
<td>n.c.</td>
</tr>
<tr>
<td>17</td>
<td>ain1</td>
<td>analog input 1</td>
<td>n.c.</td>
</tr>
<tr>
<td>18</td>
<td>ain2</td>
<td>analog input 2</td>
<td>n.c.</td>
</tr>
<tr>
<td>19</td>
<td>ain3</td>
<td>analog input 3</td>
<td>n.c.</td>
</tr>
<tr>
<td>20</td>
<td>ain4</td>
<td>analog input 4</td>
<td>n.c.</td>
</tr>
<tr>
<td>21</td>
<td>sbio</td>
<td>analog input 5</td>
<td>n.c.</td>
</tr>
<tr>
<td>22</td>
<td>emergency</td>
<td>emergency stop</td>
<td>n.c.</td>
</tr>
<tr>
<td>23</td>
<td>+5v</td>
<td>5vdc power input</td>
<td>n.c.</td>
</tr>
<tr>
<td>24</td>
<td>pwm_out</td>
<td>keep alive</td>
<td>n.c.</td>
</tr>
<tr>
<td>25</td>
<td>a+</td>
<td>incremental signals</td>
<td>n.c.</td>
</tr>
<tr>
<td>26</td>
<td>limit_sw_left</td>
<td>limit switch left</td>
<td>n.c.</td>
</tr>
<tr>
<td>27</td>
<td>e</td>
<td>encoder incremental signals</td>
<td>n.c.</td>
</tr>
<tr>
<td>28</td>
<td>limit_sw_right</td>
<td>limit switch right</td>
<td>n.c.</td>
</tr>
<tr>
<td>29</td>
<td>b+</td>
<td>encoder incremental signals</td>
<td>n.c.</td>
</tr>
<tr>
<td>30</td>
<td>index+</td>
<td>encoder reference mark/positive signal</td>
<td>n.c.</td>
</tr>
<tr>
<td>31</td>
<td>b-</td>
<td>incremental signals</td>
<td>n.c.</td>
</tr>
<tr>
<td>32</td>
<td>index-</td>
<td>encoder reference mark/negative signal</td>
<td>n.c.</td>
</tr>
<tr>
<td>33</td>
<td>gnd</td>
<td>system ground</td>
<td>n.c.</td>
</tr>
<tr>
<td>34</td>
<td>gnd</td>
<td>system ground</td>
<td>n.c.</td>
</tr>
</tbody>
</table>
Piezo Motors

Electronic Drives

IC000028XCD Component

Application Recommendations

- Auto Focus/Zoom Modules
- Shutter & Aperture Control
- Filter Changers
- Pan and Tilt Modules
- OEM Stages

ORDERING INFORMATION

Part Number: IC000028
NM XCD BLANK
Part Number: XCD-XX-03
XCD SW/Ver:1.4.0.7

RELATED PRODUCTS/ACCESSORIES

All Nanomotion motors
- EDGE motor
- ER-15-4 motor
- HR Motors

Product Description

Nanomotion’s XCD drive & control is a miniature closed loop servo control with the smallest hardware for operating piezo ceramic servo motors. The XCD provides complete servo control for Security market applications with a built in motor driver.

The XCD component is provided on a chip level and can be integrated into user electronics with the addition of a motor power stage. The component level product will accept single ended or differential encoder input (motor size dependent) and is programmed via an IIC interface and our NanoCommander user software.
Piezo Motors

Electronic Drives

IC000028XCD Component

TECHNICAL SPECIFICATIONS

Mechanical:
Dimensions: 12mm x 12mm
Height: 1.2 mm

Functional:
Motors supported:
All Nanomotion motors
Drive mode: AB5, AB1
Support AOB sensor
(Single ended 5V/3.3V)
Communication: I2C, SPI (slave, master), UART (LVTTL),
Limit switch: left limit, right limit
Emergency (optional)
2 x input TTL (5V/3.3V)
2 x Input/Output LVTTL (3.3V)
3 x Analog input: NTC, Joystick,
Potentiometer
(Vin range: 0V to 3.3V)
2 x Analog out (pwm)

ELECTRICAL
Main power: 5V

ENVIRONMENTAL
Operating Temperature:
-40°C to 85°C
Piezo Motors

Electronic Drives

FlexDC Motion Controller

**Technical Specifications**

- **Dimensions 2U Enclosure**: 123mm H x 361mm W x 308mmD
- **Weight**: 5.2 kg (depending on configuration)
- **Up to 2 axes integrated**: AB1A or AB5 driver cards, up to 16 elements per axis
- **Servo Rate**: 8kHz
- **DAC Output**: +/- 10V, 16 bit
- **A quad B Encoder Input**: One per axis
- **Sin/Cos Encoder with on board 8192 resolution interpolators**: Optional (one per axis)
- **Discrete Inputs**: One per axis

**I/O**

- **8 x Digital Isolated Inputs**
- **2 x Digital Isolated Outputs**
- **2 x Digital Fast Inputs**
- **2 x Digital Fast Outputs**

**Communications**

- **RS232, CAN-open, Ethernet**: ASCII Based RS232 Communication protocol
- **Full Binary, high baud rate, CAN Bus communication protocol**

**Environmental**

- **Ambient Operating Temperature**: 0°C to 45°C
- **Storage Temperature**: Up to 70°C
- **Operating Humidity**: Up to 80% non-condensing

**Power**

- **Universal Input Voltage**: 100-240VAC 50-60 Hz
- **Power Consumptions**: 130VA max
Piezo Motors

Electronic Drives

ASIC-1E-00 ASIC Component

Application Recommendations

- Auto Focus/Zoom Modules
- Shutter & Aperture Control
- Filter Changers
- Pan and Tilt Modules

ORDERING INFORMATION

Part Number: ASIC-1E-00
ASIC Driver For 1 EDGE Motor

Part Number: ASIC-1E-01
ASIC Controller Driver For S787 Shutter

Part Number: ASIC-E2-00
ASIC Driver For 2 Axis EDGE Motors

RELATED PRODUCTS/ACCESSORIES

Part Number: EM1-S-0
EM1-V-0

Product Description

Nanomotion's ASIC controller/driver component can support the Edge motor and Edge based modules working in either the traditional AB1A mode or in AB5 mode (linear voltage to velocity profile). The AB1A mode supports up to two motors in parallel, doubling the force output.

The ASIC component can be provided for integration in customer electronics and supports open loop operation, as a driver only or closed loop operation based on Nanomotion's proprietary analog position sensor.

The ASIC driver board is configured for open loop, driver operation only.
Piezo Motors

Electronic Drives

ASIC-1E-00 ASIC Component

**MECHANICAL DRAWINGS AND INTERFACE**

**ELECTRICAL INTERFACE**

**TECHNICAL SPECIFICATIONS**

**Mechanical**
- Package: 32-pin QFN, 5mm x 5mm height 1.2mm

**Functional**
- Controller/Driver, or driver only
- Motors supported: up to 2 EDGE motors
- Drive mode: AB5, AB1
- IIC interface at max 100 kHz
- 3 OPAMPs inputs
- 2 A/D inputs

**ELECTRICAL**
- Supply voltage: 2.7V to 4.2V
- 25us leakage current at sleep mode (at 3.7V)

**ENVIRONMENTAL**
- Operating Temperature: -40°C – 85°C
Piezo Motors

Electronic Drives

ASIC-1E-BD-00 Driver

Application Recommendations

- Auto Focus/Zoom Modules
- Shutter & Aperture Control
- Filter Changers
- Pan and Tilt Modules

ORDERING INFORMATION
Part Number: ASIC-E1-BD-00

RELATED PRODUCTS/ACCESSORIES
Part Number: EM1-S-0
EM1-V-0

Product Description

ASIC-1E-BD-XX is a driver designated to drive single EDGE motor, as a driver only. Open loop operation can be controlled via an IIC interface and the use of limit switches. The board can also be incorporated onto an interface board that will support a ±10 analog input to the drive, from an external closed loop control system.

Modified versions of the ASIC-E1-BD-00 board have been configured to drive dual Edge motors in parallel or two discrete axes. Please contact Nanomotion for further details.
Piezo Motors

Electronic Drives

ASIC-1E-BD-00 Driver

TECHNICAL SPECIFICATIONS
Dimensions: 28.4 x 17.9 x 11.5 mm
Motors supported:
- EDGE Drive Mode AB5 (brake on/off) or AB1A mode
Input Power: 4.2 V
Power Consumption: 500 mW (max)
Communication:
- IIC / Analog
Operating Temperature:
- 0 °C to 50 °C

MECHANICAL DRAWINGS AND INTERFACE

ELECTRICAL INTERFACE

<table>
<thead>
<tr>
<th>pin type</th>
<th>9pin 20mil str trim series</th>
<th>9pin 20mil str trim series</th>
<th>J4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ycc</td>
<td>Code</td>
<td>VIN</td>
</tr>
<tr>
<td>2</td>
<td>SDATA</td>
<td>Code</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>SCLK</td>
<td>Code</td>
<td>O8</td>
</tr>
<tr>
<td>4</td>
<td>Fault</td>
<td>Com</td>
<td>Reset</td>
</tr>
<tr>
<td>5</td>
<td>–VIn</td>
<td>Com</td>
<td>–</td>
</tr>
<tr>
<td>6</td>
<td>–Vin</td>
<td>PR</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>UHR</td>
<td>PL</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>Enable</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>