ED-549 ETHERNET TO ANALOGUE 8 INPUTS

ED-549

- Ideal for all kinds of industry standard sensors and transducers
- 8 Analogue Inputs + RS485 Gateway
- High-precision measurements of voltages and currents

- Great for process control applications
- -30°C to +80°C Temperature range
- +5V to +30V DC Input Power Supply

Key Specifications

- 8 analogue inputs, independently configurable as differential voltage inputs or current inputs
- Voltage input ranges: ±10V, ±5V, ±2.5V, ±1V, ±500mV, ±250mV, ±150mV or ±75mV
- Current input ranges: ±20mA, 0-20mA or 4-20mA
- Built-in current sense resistors for current measurement
- Analogue inputs are isolated from the power, network and RS-485 ports
- 16 bit resolution
- Measurement accuracy:
  - 0.1% of full-scale range at 25°C
  - 0.3% of full-scale range over -30 to +80°C
- Measurement rate: 12 measurements per second, divided between all enabled inputs
- Input impedance (voltage mode) > 10MΩ
- Low Noise: CMRR > 120dB
- Rejects Mains Hum: NMRR > 100dB at 50Hz and 60Hz
ED-549 Ethernet 8 Analogue In

**Easy to use Interface:**
Great features for remote monitoring

- **Integral DIN rail mount**
- **Analogue Inputs 0-3**
- **Analogue Inputs 4-7**
- **RS485 Gateway for NuDAM/ADAM Modules**
- **Ethernet port**
- **LED Status Indication**
- **+5V to +30V Power Supply**

**Ethernet to IO Device Server:**
The Ethernet to IO device is implemented using a Windows COM port driver that is completely compatible with all popular PC packages such as LabView, MATLAB and Agilent VEE and support a range of popular APIs. Continue to get value from your existing development and process control system.

**Slim Shape:**
Small footprint for when DIN rail space is a premium
Only 22.6mm wide

**Extended Temperature Range:**
-30°C to +80°C operating range copes with changing temperatures for harsh environments.
Monitor CPU temperature via the web interface or programatically using ASCII commands.

**Brainboxes’ Easy Wire Feature:**
Removable screw terminal blocks make installation easier and quicker
Colour coded blocks and ports prevents incorrect connection
Numbered Pins simplifies wiring and removes confusion

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**Grounding:**
Correctly wired grounds help cut down on electromagnetic interference
5 pin terminals allow a ground on the 5th pin of each block
Functional earth connection to the DIN rail

**Gateway RS485 Serial Port:**
Half duplex RS485 port allows connection and control of industry standard
NuDAM, eDAM and ADAM modules using ASCII protocols.

**Wide Range Redundant Dual Power Input:**
+5VDC to +30VDC accommodates variation in the +24VDC factory floor supply
and allows alternative power sources. A second power supply can be fitted as a
back-up to prevent down time should one power source fail.

**Power from any USB Port:**
Can use 5 Volt power from any computer USB port via optional accessory cable
PW-650 - Useful for configuring the device from a laptop in the field.

**Signed Drivers and Rigorous testing:**
We use continuous automated testing of our in-house drivers and software to
ensure when you install one of our devices ‘it just works’. Our software allows
hassle free installation, configuration and monitoring via our easy to use
webpage. The software gives local COM ports that are backwards compatible
enabling legacy applications and the device to work with a myriad of different
3rd party software. We make all our software versions available to download
from our website.

**Lifetime Warranty and Support:**
We can help with every aspect of your project, from getting you up and running
to custom application.
**Familiar ASCII Command Protocol:**
The ED range of devices uses the de facto industry standard ASCII command protocol implemented in the popular ADAM/NuDAM/EDAM modules.

Typical examples include:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$01M</td>
<td>Read the name of the device address 01</td>
</tr>
<tr>
<td>!01ED-549</td>
<td>Device with address 01 replies that its name is ED-549</td>
</tr>
<tr>
<td>$01F</td>
<td>Read firmware version number of device address 01</td>
</tr>
<tr>
<td>!013.50</td>
<td>Device with address 01 replies with the firmware version 3.50</td>
</tr>
<tr>
<td>#010</td>
<td>Reads the analogue input of channel 0 from device address 01</td>
</tr>
<tr>
<td>&gt; +04.987</td>
<td>Analogue input data from the channel specified</td>
</tr>
<tr>
<td>$0150F</td>
<td>Enable channels 0-3 and disable channels 4-7 of the device address 01</td>
</tr>
<tr>
<td>!01</td>
<td>Command was successfully sent to device address 01</td>
</tr>
</tbody>
</table>

The ED device’s webpage has an interactive console where any command can be entered and it is immediately executed showing the device’s response.

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**Software Development**

**COM Port on Windows**

On a PC running the Microsoft Windows family of OS’s the ED Boost.IO Manager provides a standard COM port interface so enabling thousands of proven legacy applications to work straight out of the box. COM port compatibility allows you to continue to get value from your existing application software investment. Moreover your engineers don’t need to retrain to use the Brainboxes ED range of I/O devices.

**Industry Standard Packages**

The COM port based driver means that ED-xxx devices are completely compatible with all popular packages such as: LabView, MATLAB, Agilent VEE. You can continue to get value from your existing development and process control system. Hundreds of thousands program with these packages every day.

**Software Platforms**

The future is mobile, with data available everywhere on demand; Brainboxes has designed a software suite which allows you to design your new systems with mobile in mind with most popular platforms and development environments supported. With APIs and sample program code for: Microsoft .NET, C#, Visual Basic, C++, JavaScript, PHP, Java, Objective-C...

**Devices Supported**

The ED sample codes running on Operating Systems such as Windows XP, Server 2008, Server 2012, Windows 7, Windows 8, and Linux based systems such as Android and Raspberry Pi allow you to run your applications on Servers, Desktops, Laptops, Tablets, Phones or low cost embedded devices, almost any device you wish.

**Configuration Options**

Windows Utility, Web Interface: Boost.IO driver provides familiar Serial COM port interface

**OS Compatibility**

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Browser Interface
- **Webserver Interface**: Configure IP address, monitor state of i/o lines
- **Programming Interface**: No device driver needed, just open a TCP connection and send simple ASCII commands.
- **Utility Programs**: Find device, configure IP address

Ethernet
- **Ethernet Port**: 1 x RJ45 jack, 10/100Mhz autosensing, crossover auto sensing (Auto MDIX)
- **Protection**: 1,500Volts magnetic isolation between I/O ports and network
- **Network Protocols**: ICMP, IP, TCP, DHCP, HTTP
- **Connection to Network**: Ethernet 10BaseT / 100BaseTX

Housing
- IP-20 rated non-conducting polyamide case with integrated DIN rail mount

### Terminal Block

<table>
<thead>
<tr>
<th>Terminal Block</th>
<th>Pin 1</th>
<th>Pin 2</th>
<th>Pin 3</th>
<th>Pin 4</th>
<th>Pin 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>AGND</td>
<td>Aln 0-</td>
<td>Aln 0+</td>
<td>Aln 1-</td>
<td>Aln 1+</td>
</tr>
<tr>
<td>Orange</td>
<td>AGND</td>
<td>Aln 2-</td>
<td>Aln 2+</td>
<td>Aln 3-</td>
<td>Aln 3+</td>
</tr>
<tr>
<td>Grey</td>
<td>GND</td>
<td>RS-485 D-</td>
<td>RS-485 D+</td>
<td>RS-485 D+</td>
<td>RS-485 D-</td>
</tr>
<tr>
<td>Green</td>
<td>AGND</td>
<td>Aln 4-</td>
<td>Aln 4+</td>
<td>Aln 5-</td>
<td>Aln 5+</td>
</tr>
<tr>
<td>Blue</td>
<td>AGND</td>
<td>Aln 6-</td>
<td>Aln 6+</td>
<td>Aln 7-</td>
<td>Aln 7+</td>
</tr>
<tr>
<td>Black</td>
<td>Power GND</td>
<td>+Vin A</td>
<td>+Vin B</td>
<td>Power GND</td>
<td>Func GND</td>
</tr>
</tbody>
</table>

**Input**: +5V to +30V DC 100mA@24V 2.5W Max
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Connectors

- **Screw Terminals**: 3.5mm pitch, #22 - #14, 0.5mm²-2.5mm² pin power supply
- **Wire Thickness**: 0.150 inch, 3.81mm, 20 pins, 12+8 screw terminals, #26 - #16 AWG, 0.14mm²-1.3mm²

Power Supply

- **Power Consumption**: 2.5 Watt Max
- **Power Supply input**: unregulated +5V to +30Volts DC, reverse polarity protection
- **Isolation**: 1500VRMS Magnetic isolation from Ethernet

Environmental

- **Operating Temperature**: -30°C to +80°C, -22°F to +176°F
- **Storage Temperature**: -40°C to +85°C, -40°F to +185°F
- **Ambient Relative Humidity**: 5 to 95% (non-condensing)

LED Information

<table>
<thead>
<tr>
<th>Status LED</th>
<th>Device Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Device Ready</td>
</tr>
<tr>
<td>Flashing Yellow</td>
<td>Changing Settings</td>
</tr>
<tr>
<td>Flashing between Red &amp; Green</td>
<td>Querying IP</td>
</tr>
<tr>
<td>Flashing Green/Red</td>
<td>User performing Hard Reset</td>
</tr>
<tr>
<td>Flashing between Green &amp; Red/Yellow</td>
<td>IP address diagnostic</td>
</tr>
<tr>
<td>Flashing between Green &amp; Yellow</td>
<td>Initialization diagnostic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gateway</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashing Red</td>
<td>RS-485 Comms error</td>
</tr>
<tr>
<td>Flashing Green</td>
<td>RS-485</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Link LED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Green light on</td>
<td>Network Link Established</td>
</tr>
<tr>
<td>Flashing Green</td>
<td>Network Data RX/TX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashing Green</td>
<td>Input Read</td>
</tr>
<tr>
<td>Flashing Red</td>
<td>Input Error</td>
</tr>
</tbody>
</table>

Approvals

- **Industry Approvals**: C-Tick, AEO (C-TPAT), WEEE, RoHS
- **Microsoft Approvals**: Microsoft Certified Gold Partner
- **Microsoft Signed Drivers**:
  - Windows 8 & 8.1 32 bit & 64 bit Editions
  - Windows 7 32 bit & 64 bit Editions
  - Windows XP 32 bit & 64 bit Editions
  - Windows Server 2012 & R2 32 bit & 64 bit Editions
  - Windows Server 2008 32 bit & 64 bit Editions
  - Windows Server 2008 R2 & Windows 2000
  - Windows Vista 32 bit & 64 bit editions

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**ED-549 Ethernet 8 Analogue In**

**Packaging Information**

<table>
<thead>
<tr>
<th>Packaging</th>
<th>Installation CD including manual, Microsoft signed drivers &amp; utilities, Quick Start Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>Ethernet 8 AI</td>
</tr>
<tr>
<td>Packaged Weight</td>
<td>0.215 kg, 0.47 pounds</td>
</tr>
<tr>
<td>Packaged Dims</td>
<td>235(l) x 170(w) x 62(h) mm, 9.25(l) x 6.69(w) x 2.44(h) inches</td>
</tr>
<tr>
<td>GTIN Universal Code</td>
<td>837324003369</td>
</tr>
</tbody>
</table>

**Product Support**

<table>
<thead>
<tr>
<th>Warranty</th>
<th>Lifetime - online registration required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>Lifetime Web, Email and Phone Support from fully qualified, friendly staff who work in and alongside the Product Development Team</td>
</tr>
</tbody>
</table>

**Additional Information**

<table>
<thead>
<tr>
<th>OEM option</th>
<th>Available for bulk buy OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Made In</td>
<td>Manufactured in the UK by Brainboxes Winner 2005 European Electronics Industry Awards ‘Manufacturer of the Year’</td>
</tr>
<tr>
<td>Customisable</td>
<td>Brainboxes operate a ‘Perfect Fit Custom Design’ policy for volume users. More info: <a href="mailto:sales@brainboxes.com">sales@brainboxes.com</a></td>
</tr>
</tbody>
</table>

**Optional Accessory Items**

**PW-600 Global Power supply**

- Power supply with connectors for UK, USA, EU and AUS mains socket. ‘Tails’ are suitable for connecting to screw terminal blocks.

**PW-650 5V from USB Power supply**

- USB connector fits any standard USB port, such as on a laptop or desktop PC, providing 5V power to a prewired screw terminal block useful for when you are configuring your ED device.

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