

## Product Datasheet - Technical Specifications



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## ES-551 INDUSTRIAL ISOLATED ETHERNET TO SERIAL

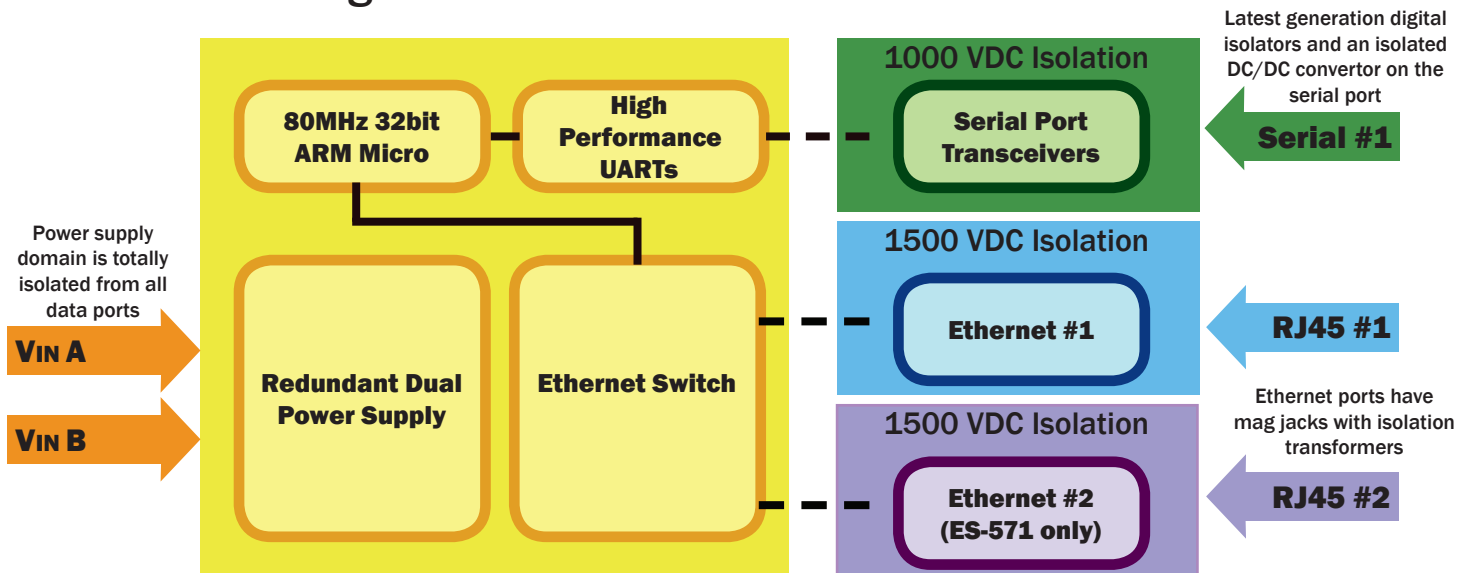
# ES-551

- **1 Serial port, Multiple Electronic Interface**  
Software Selectable as RS232, RS422 or RS485 Full/Half Duplex
- **Total Galvanic Isolation**
- **Max 1 MegaBaud, any Custom Baud Rate**
- **-40oC to +80oC/-40°C to +176°C**  
Temperature range



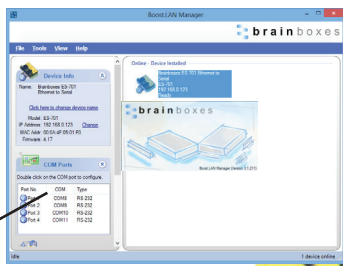
## With Total Galvanic Isolation

### Prevent Electromagnetic Interference Problems



This device has 4 galvanically isolated power domains each with a minimum of 1,000 VDC isolation, ensuring data communications and power lines are protected from damaging electromagnetic interference.

There is no direct conducting path between the 4 isolated domains. Physically breaking the current path in this way offers the highest grade of protection possible preventing damaging high voltage transient surges that would effect devices downstream. Users and devices are protected from possible differences in ground potentials.



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

**Serial Port selectable as  
RS-232/422/485**



**Ethernet port**

**Integral DIN rail mount**

**LED Status  
Indication**

**+5V to +30V Power Supply**



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



**Extended Temperature Range:**  
-40°C to +80°C / -40°C to +176°C operating range copes with changing temperatures for harsh environments. Monitor CPU temperature via the web interface.



**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



**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



## Total Galvanic Isolation and Grounding:

The power supply, Serial port and Ethernet ports are all mutually isolated. Prevents electromagnetic interference problems, this is useful for applications in electromagnetically noisy environments such as processes involving power generators, motors, arc furnaces, induction heaters etc. Correctly wired grounds help cut down on electromagnetic interference. The 5 pin terminals allow a ground on the 5th pin of each block and a Functional earth connection to the DIN rail.



## Redundant Dual Power Input:

A second power supply can be fitted as a back-up to prevent down time should one power source fail.



## Wide Range Input Power Supply:

+5VDC to +30VDC accommodates variation in the +24VDC factory floor and allows alternative power sources.

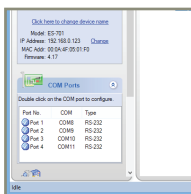
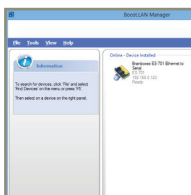


Can use 5 Volt power from any computer USB port via optional accessory cable PW-650 - Useful for configuring the device from a laptop in the field.



## 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.



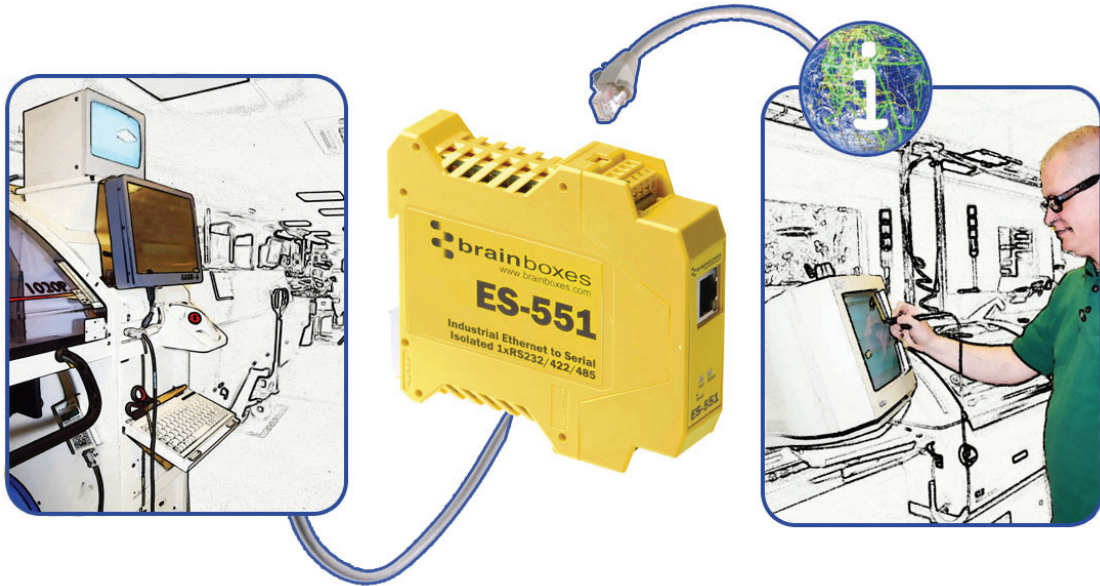
## Lifetime Warranty and Support:

We can help with every aspect of your project, from getting you up and running to custom application.





# ES-551 Factory Floor Application



Factory floors can be harsh environments. Extreme temperatures can be generated in the manufacturing process, machinery can be noisy and generate electromagnetic interference and space is a premium. But engineers still need to be able to access and maintain equipment safely and without downtime. As factories expand and modernise older equipment and remote devices need to be networked, but cabling can be expensive and impractical, especially over larger areas.



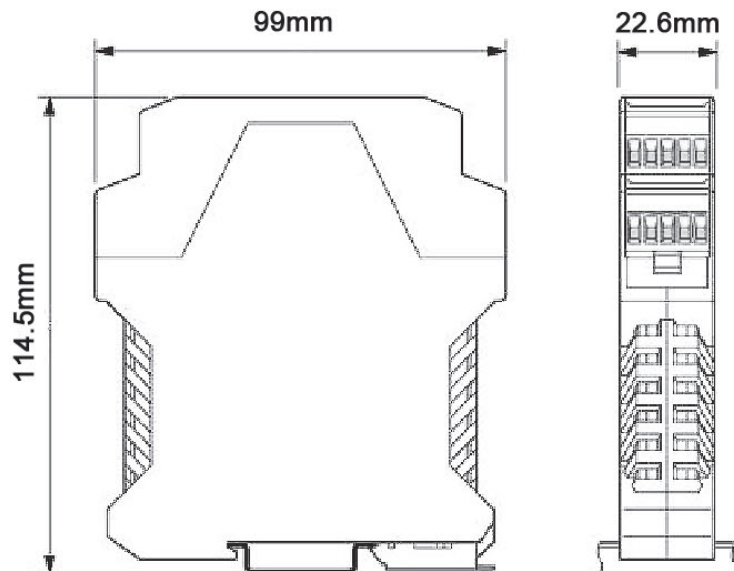
The ES-551 with total galvanic isolation has 1 serial port that is software selectable as either RS232, RS422 or RS485 and 1 Ethernet port. The 'Easy Wire' removable colour coded Screw Terminals Blocks are individually numbered for simple fast, error free wiring. The slim 'end on' case with integral mount clips straight on to a DIN Rail. The ES-551 has an operating temperature range of  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  and  $+5\text{VDC}$  to  $+30\text{VDC}$  Dual input reverse polarity protected power supply. Brainboxes proven technology supports legacy applications, whilst our Ethernet to Serial software ensures fast data transmission and a super easy installation whatever your operating system.



Once your Serial equipment is connected to a Brainboxes Ethernet to Serial device you have the option of accessing it over a local network or connecting it to the internet. The devices can be fitted in areas where it would be dangerous for workers to monitor whilst the factory line is in operation. Manufacturing process and performance across a large site can be monitored and potential faults detected before they cause serious downtime costs. The total galvanic isolation prevents problems from sources of electromagnetic interference. Use two devices back to back for serial tunnelling over Ethernet, for when you need to extend the reach of your serial cables.

## Housing

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



Port 1 - Yellow	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
RS232	Iso GND	CTS	RxD	RTS	TxD
RS485 FD	Iso GND	RxD-	RxD+	TxD+	TxD-
RS485 HD	Iso GND			Data+	Data-
Power Input - Black	Power GND	+Vin A	+Vin B	Power GND	Func GND
Input		+5V to +30V DC 60mA@24V 1.6W Typical		120mA@24V 2.9W Max	

## Connectors

**Screw Terminals** 3.5mm pitch, #22 - #14, 0.5mm<sup>2</sup>-2.5mm<sup>2</sup> pin power supply  
**Wire Thickness** 0.150 inch, 3.81mm, 20 pins, 12+8 screw terminals, #26 - #16 AWG, 0.14mm<sup>2</sup>-1.3mm<sup>2</sup>

## 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** -40°C to +80°C, -40°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

<b>Status LED</b>	Green	Device Ready
	Flashing Yellow	Changing Settings
	Flashing between Red & Green	Querying IP
	Flashing Green/Red	User performing Hard Reset
	Flashing between Green & Red/Yellow	IP address diagnostic
	Flashing between Green & Yellow	Initialization diagnostic
<b>Serial Port LEDs</b>	Green light on	Port Open
	Flashing Green	Data RX/TX
<b>Network LED</b>	Green light on	Link Established
	Flashing Green	Data RX/TX
<b>Activity</b>	Flashing Green	Output set / Input Read
	Flashing Red	Output overload

## Port - Serial

<b>Ports</b>	1 port Software Selectable as RS232, RS422/485 Full Duplex, or RS485 Half Duplex
<b>Connector</b>	Removable Screw terminal block connector - 3.5 mm pitch
<b>Power Input</b>	Redundant DC Dual Power Inputs, reverse polarity protected +5 VDC to +30VDC
<b>Power Consumption</b>	1.6 Watt typical 60mA@24V - 2.9 Watt Max
<b>Conductor Wire</b>	28 to 16 AWG, 0.14mm to 1.5mm Max

## Port Settings - Software Selectable as RS232, RS422/485 Full Duplex, or RS485 Half Duplex

<b>Baud Rate</b>	Any custom Baud rate between 60 - 1,000,000 (1 MegaBaud) can be selected
<b>Data Bits</b>	5,6,7 or 8
<b>Parity</b>	Odd, Even, None, Mark or Space
<b>Stop Bits</b>	1, 1.5 or 2
<b>Flow Control</b>	RTS/CTS, DSR/DTR, XON/XOFF
<b>Tx/Rx Modes</b>	<p><b>RS232 Standard:</b> RS232 allows point to point communication between 2 devices.</p> <p><b>RS422 Standard:</b> RS422 allows one transmitter and up to 10 receivers with data transmitter rates up to 10 megabits per second for distances up to 40 feet and up to 100 Kilobits per second for distances up to 4,000 feet (1219 metres). To achieve good long distance noise immunity, 2 wires are used to carry each signal, configured as a twisted pair of cables. The TXD pair and RXD pair are used to carry the data whilst the RTS pair and CTS pair lines are used for handshaking. Thus 2 twisted pairs are used without handshaking and 4 twisted pair cable is used with handshaking both these schemes allow full duplex data communications.</p> <p><b>RS485 Standard:</b> RS485, based on the RS422 standard allows up to 32 driver/receivers pairs on a standard load or 128 low load devices per port can be connected. Whilst only one of these should be transmitting data at any time, the rest can all simultaneously listen to the data. Handshaking is performed by software protocol. Two twisted pairs form a full duplex system. Often only one twisted pair cable is used as the TXD and RXD lines are tied together; this is known as half duplex mode. Brainboxes RS422/485 products implement a state of the art hardware autogating circuit ensuring error free communications in half duplex configurations.</p> <p><b>Industrial Ethernet to Serial RS485:</b> receivers are 1/8<sup>th</sup> load allowing upto 256 nodes on the bus. Fail safe open circuit and short circuit protection, protects the Industrial Ethernet to Serial against wiring faults.</p> <p><b>Line Terminating Resistor:</b> On board RS485 line termination resistor can be enabled by a user selectable jumper. The RS422/485 line terminating resistor prevents signal reflections when the ES device is at the end of transmission line.</p> <p><b>Bias Resistors:</b> On board RS485 Half Duplex fail safe bias resistors enabled by user selectable jumpers. The fail safe biasing resistors pull the line to a known good state during idle times preventing phantom character detection.</p>

## Ethernet

<b>Ethernet Port</b>	1 x RJ45 jack, 10/100Mhz autosensing, crossover auto sensing (Auto MDIX)
<b>Protection</b>	1,500Volts magnetic isolation between I/O ports and network
<b>Data Rate</b>	10/100 Mega bits/second
<b>Cabling</b>	Normal / AUTO MDI/MDIX and IEEE Auto crossover support IEEE802.1q VLAN support for up to 128 VLAN groups. Broadcast storm protection. IEEE 802.1d rapid spanning tree protocol RSTP support.

## Software

<b>Network Protocols</b>	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, HTTP, RFC2217
<b>Connection to Network</b>	Ethernet 10BaseT / 100BaseTX
<b>Configuration Options</b>	Windows Utility, Web Interface
<b>OS Compatibility</b>	Microsoft Windows 8 32 bit & 64 bit Editions / Microsoft Windows 7 32 bit & 64 bit Editions / Windows Server 2008 32 bit & 64 bit Editions / Windows Server 2008 & Windows 2000 / Windows Vista 32 bit & 64 bit Editions / Windows Server 2003 32 bit & 64 bit Editions / Fully RFC2217 compliant / Interface for other OS's & Linux

## Performance

Industry leading Performance

Throughput guaranteed minimum of 95% of theoretical bi-direction full duplex band width at 1 MBaud

**Input**  
 CTS False to Transmitter stop: 3 characters max, 1.5 typical  
 XOFF received to Transmitter stop: 3 characters max, 1.5 typical  
 RS485 Autogating Turn around time: <1 bit time

**Isolation**  
 Power supply to Serial Port 2500V<sub>RMS</sub>, Power Supply to Ethernet 1500V<sub>RMS</sub>, Serial Port to Ethernet 2500V<sub>RMS</sub>

## Browser Interface

**Webserver Interface** Configure IP address, monitor state of i/o lines, set the Watchdog Timers Output Reset Value, Set Power on digital output value

**Programming Interface** No device driver needed, just open a TCP connection and send simple ASCII commands. Software drivers give local COM Port interface for configuration

**Utility Programs** Find device, configure IP address

## Packaging Information

**Packaging** Installation CD including manual, Microsoft signed drivers & utilities, Quick Start Guide

**Device** Ethernet 8 DI + 8 DO

**Packaged Weight** 0.204 kg, 7.20 ounces

**Packaged Dims** 160x145x45 mm, 6.3x5.7x1.8 inches

**GTIN Universal Code** 837324002898

## Approvals

**Industry Approvals** CCC-Mark, C-Tick, Microsoft Certified Gold Partner, WEEE, RoHS, METL

**Microsoft Approvals** AEO (C-TPAT)

**Microsoft Signed Drivers** Windows 8 32 bit & 64 bit Editions  
 Windows 7 32 bit & 64 bit Editions  
 Windows Server 2008 32 bit & 64 bit Editions  
 Windows Server 2008 & Windows 2000  
 Windows Vista 32 bit & 64 bit editions



## Product Support

**Warranty** Lifetime - online registration required

**Support** Lifetime Web, Email and Phone Support from fully qualified, friendly staff who work in and alongside the Product Development Team



## Additional Information

**OEM option** Available for bulk buy OEM

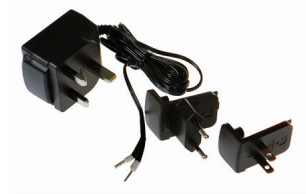
**Made In** Manufactured in the UK by Brainboxes Winner 2005 European Electronics Industry Awards 'Manufacturer of the Year'

**Customisable** Brainboxes operate a 'Perfect Fit Custom Design' policy for volume users.



## 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