Product Datasheet - Technical Specifications

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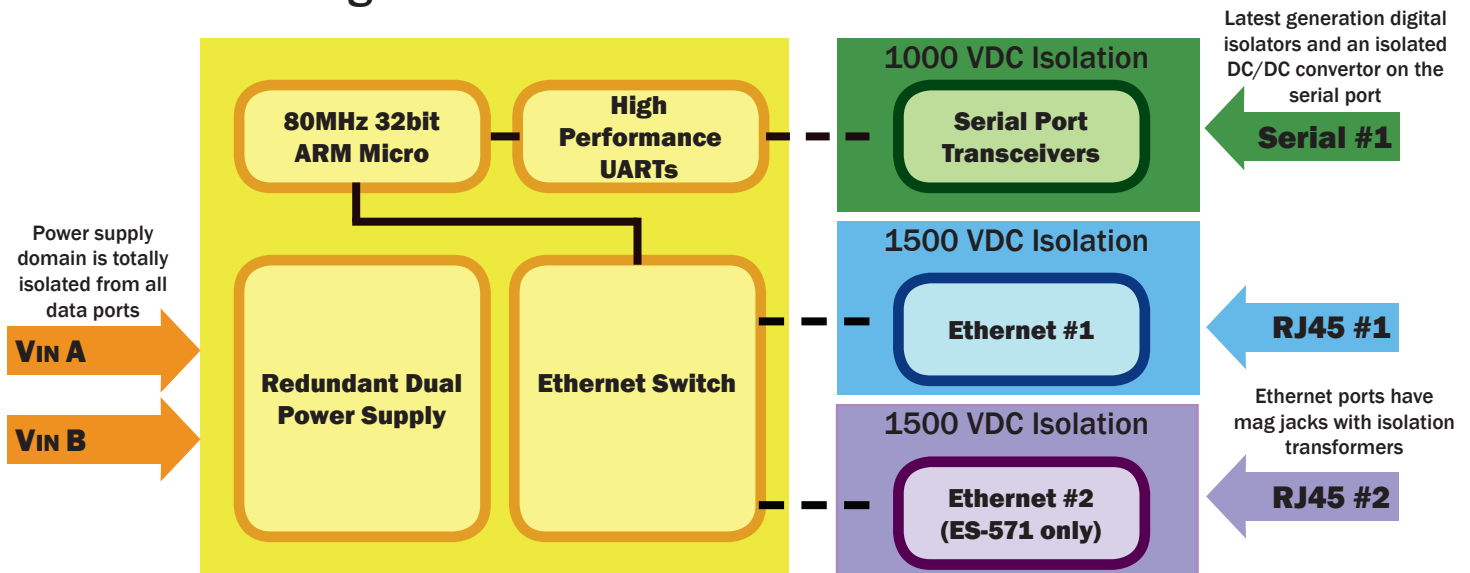# ES-571 INDUSTRIAL ISOLATED ETHERNET TO SERIAL + SWITCH

ES-571

- Integrated 2 port Ethernet Switch
- 1 Serial port, Multiple Electronic Interface
  Software Selectable as RS232, RS422 or RS485 Full/Half Duplex
- Max 1 MegaBaud, any Custom Baud Rate
- Total Galvanic Isolation
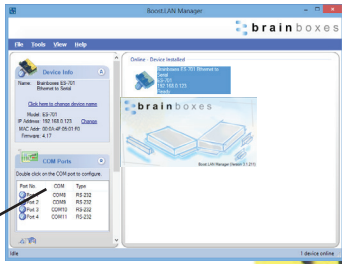- -40oC to +80oC/-40ºF to +176ºF Temperature range

With Total Galvanic Isolation
Prevent Electromagnetic Interference Problems

Latest generation digital isolators and an isolated DC/DC convertor on the serial port

80MHz 32bit ARM Micro

High Performance UARTs

1000 VDC Isolation

Serial Port Transceivers

Serial #1

Power supply domain is totally isolated from all data ports

VIN A

VIN B

Redundant Dual Power Supply

Ethernet Switch

1500 VDC Isolation

Ethernet #1

RJ45 #1

Ethernet ports have mag jacks with isolation transformers

1500 VDC Isolation

Ethernet #2 (ES-571 only)

RJ45 #2

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.

Connect, Configure, Control

brain boxes

Serial Port selectable as RS-232/422/485

Easy to use Interface: Great features for remote monitoring

Ethernet Switch

LED Status Indication

Integral DIN rail mount

+5V to +30V Power Supply

100m   100m   100m   100m   100m

Daisy chain devices using the two Ethernet ports

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

Extended Temperature Range:
-40oC to +80oC/-40°F to +176°F 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

brainboxes

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.
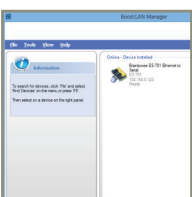
Wide Range Redundant Dual Power Input:
+5VDC to +30VDC accommodates variation in the +24VDC factory floor and allows alternative power sources. A second power supply can be fitted as a back-up to prevent down time should one power source fail.
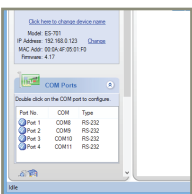
Can use 5 Volt power from any computer USB port via optional accessory cable PW-650 - Useful for configuring the device from a laptop in the field.

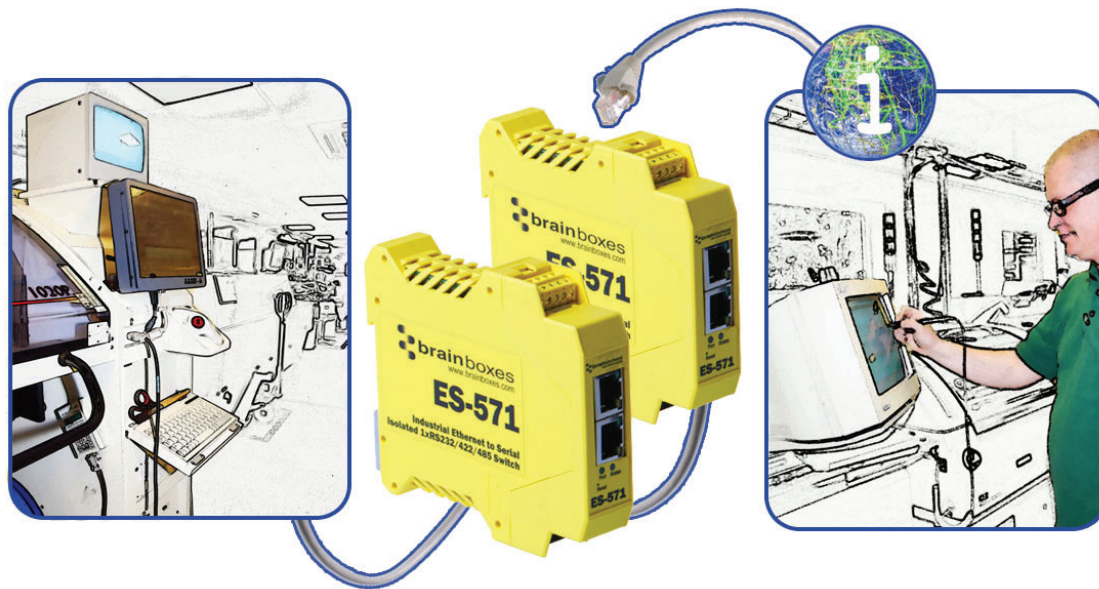**Signed Drivers and Rigorous testing:**
We use continuous automated testing of our in-house drivers and software to ensure when you install one of our devices 'it just works'. Our software allows hassle free installation, configuration and monitoring via our easy to use webpage. The software gives local 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-571 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.
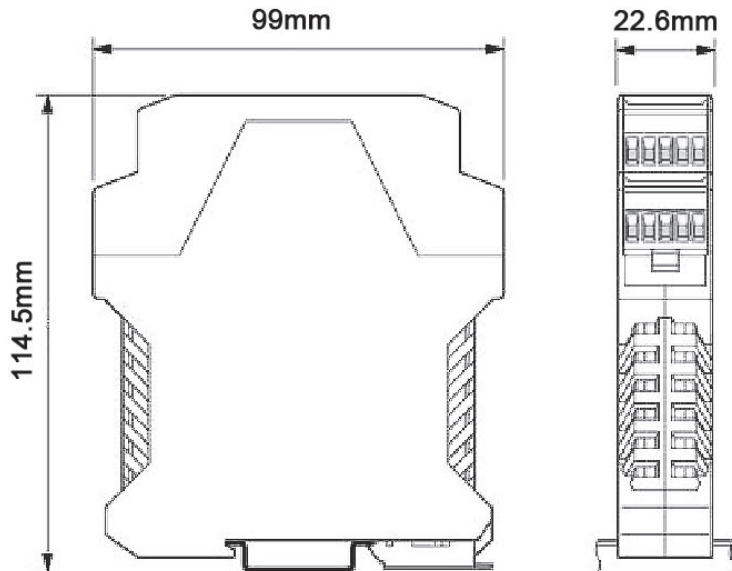
The ES-571 with total galvanic isolation has 1 serial port that is software selectable as either RS232, RS422 or RS485 and 2 Ethernet ports. The 'Easy Wire' removable colour coded Screw Terminals Blocks are individually numbered for simple fast, error free wiring. The slim 'end on' case with integral mount clips straight on to a DIN Rail. The ES-571 has an operating temperature range of -40ºC to +80ºC and +5VDC to +30VDC Dual input reverse polarity protected power supply. The two port 10/100Mbps unmanaged Ethernet Switch assures fast packet delivery by utilising a 1k MAC address lookup table and a store and forward architecture.

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 inbuilt Ethernet Switch allows daisy-chaining of devices without extra cabling or external Ethernet Switch being required for an instant economic upgrade. 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

99mm   22.6mm

114.5mm

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, 0.5mm²-2.5mm² 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	-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

Status LED	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
Serial Port LEDs	Green light on	Port Open
	Flashing Green	Data RX/TX
Network LED	Green light on	Link Established
	Flashing Green	Data RX/TX
Activity	**Flashing Green**	**Output set / Input Read**
	Flashing Red	**Output overload**

Ethernet to Serial

Port - Serial

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

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

Baud Rate	Any custom Baud rate between 60 - 1,000,000 (1 MegaBaud) can be selected
Data Bits	5,6,7 or 8
Parity	Odd, Even, None, Mark or Space
Stop Bits	1, 1.5 or 2
Flow Control	RTS/CTS, DSR/DTR, XON/XOFF
Tx/Rx Modes	*RS232 Standard:* RS232 allows point to point communication between 2 devices.
	RS422 Standard: 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.
	RS485 Standard: 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.
	Industrial Ethernet to Serial RS485: recievers are 1/8th 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.
	Line Terminating Resistor: On board RS485 line termination resistor can be enabled by a user selectable jumper. The RS422/485 line terminating resister prevents signal reflections when the ES device is at the end of transmission line.
	Bias Resistors: 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.

Ethernet

Ethernet Port	**2 x RJ45 jack, 10/100Mhz autosensing, crossover auto sensing (Auto MDIX)**
Protection	**1,500Volts magnetic isolation between I/O ports and network**
Data Rate	10/100 Mega bits/second
Cabling	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

Network Protocols	ICMP, IP, TCP, UDP, DHCP, BOOTP, Telnet, HTTP, RFC2217
Connection to Network	Ethernet 10BaseT / 100BaseTX
Configuration Options	Windows Utility, Web Interface
OS Compatibility	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

Input	Industry leading Performance
	Throughput guaranteed minimum of 95% of theoretical bi-direction full duplex band width at 1 MBaud
	CTS False to Transmitter stop: 3 characters max, 1.5 typical
	XOFF recieved to Transmitter stop: 3 characters max, 1.5 typical
	RS485 Autogating Turn around time: <1 bit time
Isolation	Power supply to Serial Port 2500V$_{RMS}$, Power Supply to Ethernet 1500V$_{RMS}$, Serial Port to Ethernet 2500V$_{RMS}$

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	0.211 kg, 7.44 ounces
Packaged Dims	160x145x45 mm, 6.3x5.7x1.8 inches
GTIN Universal Code	**837324002904**

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**

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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

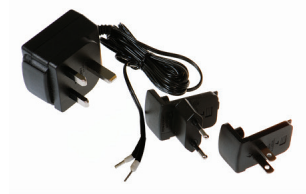|	
OEM option	**Available for bulk buy OEM**
Made In	**Manufactured in the UK by Brainboxes Winner 2005 European Electronics Industry Awards 'Manufacturer of the Year'**
Customisable	**Brainboxes operate a 'Perfect Fit Custom Design' policy for volume users.**

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