

STEGBE4590 Gigabit & PoE Ethernet Interface



**Available as an STE I/O Option
or a Field Installable Upgrade!**

THE ULTIMATE I/O INTERFACE 90dB, 700 MHz TO 8 GHz!

- ✓ Passes 10/100/1000 Mbps Ethernet with greater than 90 dB RF isolation
- ✓ Provides 8 separate data or control lines for custom I/O applications
- ✓ Full rejection of 4G LTE and other 700 to 900 MHz service bands
- ✓ Automatic dual mode PoE power detection, LED identification, and pass-through
- ✓ Easy and convenient single hole mount for an RF tight installation on any RF chamber or screen room environment
- ✓ Rugged milled aluminum construction for optimal shielding and RF isolation
- ✓ Includes high-flex double shielded Cat5E interconnect cable

THE ULTIMATE ETHERNET SOLUTION!

There was a day when an Ethernet I/O into an RF isolated chamber or screen room was not overly challenging. In fact, it was rather simple, all things considered. There is the standard and simple low pass filter that provides 40 dB rejection of data above 100 MHz, as well as filters that claim to be designed for Ethernet but are actually based on a 480 MHz USB cut-off. Both of these are simple attenuators that also malfom the phase and integrity of the data.

We listened to our customers describe their application requirements and what they thought would be the ultimate Ethernet solution. It was quite the shopping list, but we love challenges, and met every one of the requirements!

- ✓ RF isolation greater than 90 dB down, all the way down to the 700 MHz 4G LTE bands
- ✓ Free of noise or self-induced emissions
- ✓ Truly transparent, end to end, 10/100,1000Mbit/s
- ✓ Auto detection and identification of both 802.3af and 802.3at PoE as well as non-standard PoE inserters
- ✓ Transparent PoE detection and pass-through
- ✓ Compact and RF-tight easy to field install form factor

The Ramsey Electronics® STEGBE4590 Ethernet Interface was designed from the ground up specifically for your Ethernet interface applications. Unlike typical 480 MHz based filters, our interface is tailored to Ethernet specifications all the way up to Gigabit, faithfully passing the signal amplitude as well as the phase, to maintain absolute Ethernet signal integrity while providing greater than 90 dB rejection from 700 MHz to beyond 8 GHz.

NOISELESS TRULY TRANSPARENT PASS-THROUGH!

That's a simple statement, but it goes deep in definition. In a perfect world, the goal for you to test your DUT is to emulate the same direct connection you would have during normal operation. Technically, that means maintaining a very low insertion loss, maintaining sharp signal edges, maintaining phase integrity and impedance, and to be transparent well beyond the 3rd harmonics.

The interface consists of 8 data lines making up 4 impedance-matched balanced pairs, minimizing signal reflection and ringing, and making it transparent to Ethernet equipment. Each channel passes bidirectional data up to 250 Mbps to exacting Ethernet specifications to allow a total throughput of 1,000 Mbps, or "Gigabit Ethernet".

In short, the perfect Ethernet interface needs to emulate a short length of CAT5E cable... but with >90 dB of isolation. Consider it done!



90 dB ISOLATION FROM 700 MHz TO 8 GHz!

The typical RF reject band in competitive filtered I/O devices is 1 GHz to 6 GHz. That was OK years ago, but technology does change! All you have to do is look at LTE coverage maps for any of the major carriers and you will see that there is probably a cell site at 700 Mhz in your back yard. That doesn't make it easy when you're trying to maintain complete isolation from these signals. It's not just LTE in the US, 9 of the UMTS operating bands fall below 900 MHz... as do 15 of the E-ULTRA bands. So much for the typical 1 GHz to 6 GHz low pass filter! At Ramsey Electronics® we planned ahead and typically provide you >90 dB rejection from 700 MHz to 8 GHz.

NOT YOUR EVERYDAY LOW-PASS FILTER!

In the past, the typical Ethernet I/O solution was a relatively simple RF filtered D-Sub connector with a pair of RJ45 adapters. The typical 100pf D-Sub Pi-network RF filter does a fine job of rejecting data above 95-100 MHz, at an attenuation level of approx. 40 dB. However, the design of such a filter, together with its broad reject band, begins to malform the Ethernet signal integrity. This, together with the typical 40 dB attenuation, has made such a solution for today's Ethernet and isolation requirements ineffective. Likewise, specialized filters that are based on 480 MHz USB design also have issues maintaining true Ethernet signal integrity.

NOT AN ACTIVE OPTICAL DEVICE!

Another alternative solution for an Ethernet I/O has been an optical or fiber optic device. Isolation wise, this is a great solution, providing >90 dB isolation. However, fiber solutions are an active Ethernet device, similar to a hub or a switch, inserting itself into the DUT test process. As an active device, there WILL be self-generated radiated emissions introduced into the data stream by the device as it re-transmits your data. The device now becomes another piece of data transmission equipment between your DUT and your test bench, making it difficult to verify proper communications between the two. On top of that, being active, the devices require external power, adding yet another indirect factor into the mix. Certainly not a transparent solution.

AUTOMATIC PoE DETECTION, IDENTIFICATION, AND PASS-THROUGH!



We designed the PoE function of our I/O interface to automatically detect the presence of a PoE power from your power sourcing equipment. It will then display via front panel LEDs, whether it is detecting Mode-A or Mode-B. However, to preserve the protocols set forth in 802.3xx, it becomes more involved.

There MUST be a PoE powered device (PD) connected to one side of the Ethernet Interface for your power sourcing equipment (PSE) to detect. When the other side of the interface is connected to the power sourcing equipment, the PD is interrogated transparently through the interface, and if properly negotiated, your PSE is allowed to enable PoE DC voltage. At that point, the PoE DC power from your PSE is passively fed through the Ethernet Interface to your PD, and the mode of the circuit detected is displayed on the front of the interface as Mode-A or Mode-B. If the PD is unplugged from the circuit, it will no longer be detected by the PSE, and PoE DC will be disabled. All of this is done transparently through our Ethernet Interface! Passive inserters are simply detected, typically as Mode-B, and passed through to the PD.

CUSTOM APPLICATIONS!

While the Ramsey Electronics® STEGBE4590 Ethernet Interface is primarily designed for RJ45 terminated Ethernet applications, it is perfect for custom data interface applications into an RF test environment. With a conductive insertion loss on all 8 data lines >90 dB, you simply need to assign your choice of pins on a standard RJ45 shielded connector. And with a DC resistance of less than 1.5 ohms and a maximum current rating of half an amp per channel, you can also use any of the available pairs for your DC or other control circuits.

SIMPLE RF-TIGHT INSTALLATION... ANYWHERE!

RF leakage must be kept in check with any RF isolation environment interface, and shielding becomes paramount. Therefore, just like we did with our USB interface, we designed the Ethernet Interface inside a solid finely milled block of aluminum. That, along with precision gasketing, assures a radiated isolation also greater than 90 dB.



Then we looked at the mounting and installation process. The typical vendor filter has multiple perimeter mounting holes whose centers and pattern need to be precisely matched to the mounting surface. This not only requires a mounting template, but also requires exact multiple-hole drilling or milling. And even with tightly spaced perimeter mounting holes, unless it is installed and bonded to a perfect mounting surface, there will be RF egress and ingress. If such a unit was mounted on a painted or powder coat surface, the entire surface would need to be burnished to remove the paint, or the leakage would be even worse.



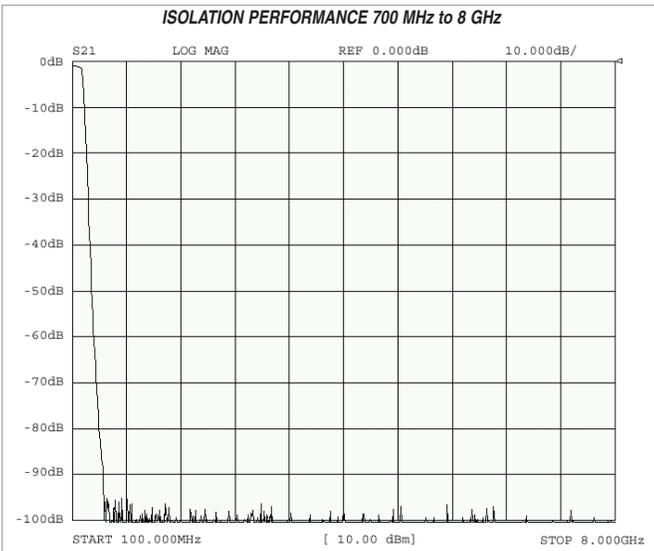
To solve this we designed and machined the Ethernet Interface around a single-hole mount, just like our USB2.0 interface! The entire filter can be installed on your RF Test Enclosure, or your screen room I/O panel with one single 1.25" hole. With the provided oversized nut, lockwasher, and mesh EMI gasket, the filter is 100% bonded to your mounting surface. Whether you use it with one of our RF Shielded Test Enclosures, a third party test enclosure, or as a screen room interface, it simply doesn't get any better... or easier than that.

PASSIVE SINGLE CONNECTION

Even with its advanced PoE capabilities, the Ethernet Filter is completely passive, noise free, and does not require any additional source of power. That means no more walwarts, no power supply connections, and one simple CAT5E inline connection! Both sides of the interface feature a female shielded RJ45 connector, so connect your DUT inside the enclosure with a short CAT5E cable, and connect your test bench outside the enclosure with another short CAT5E patch cable. It's that simple.



Plus, to assure shielding, we even provide a super-flex double shielded 3' patch cable with the interface! And in regards to both data and PoE functions, the interface is truly bidirectional. Either side can be the input or output, and either side can be the power sourcing equipment or powered device, it simply doesn't matter.



THE LEGACY CONTINUES!

In 1997 Ramsey Electronics® took the technician out of the large expensive shielded screen room and put his hands and eyes into a portable benchtop RF Shielded Test Enclosure. With thousands placed in service worldwide, our patented STE design and technologies became the standard for efficient and cost effective RF isolated device testing.

With over 30 models to choose from, with literally thousands of available configurations, that legacy continues. But our commitment doesn't stop there. A chamber or shielded screen room is only as efficient as the I/O's going in and coming out of it. As technology changes, our 15+ years as the leading manufacturer of RF benchtop test enclosures assures you compatibility with the latest technologies.

If a gigabit and PoE compatible noise-free Ethernet interface is required for your application, the STEGBE4590 is your high performance choice. It is the one interface designed for both today's technology as well as tomorrow's.

SPECIFICATIONS	
Product Part Number:	STEGBE4590
UPC	871183005966
Outside Dimensions:	3.4"H x 3.25"W x .675"D (86.36mmH x 82.55mmW x 17.145mmD)
Weight:	1.0 lbs (.34kg) with nut, washer, and RF gasket
Construction:	Milled aluminum
Mounting:	Single 1.25" OD hole with provided EMI collar gasket, internal lockwasher and 1.25-12 UNF nut
External Connection:	RJ45 shielded female
Internal Connection:	RJ45 shielded female
Ethernet Cable Provided:	3' double shielded stranded superflex CAT5E patch cable
Availability:	In-stock for immediate delivery
Available Versions:	STE RF Test Enclosure installed option Individual stand-alone accessory for customer installation OEM bulk (Contact Ramsey Electronics®)
Ethernet Standards:	10/100/1000BASE-T
Data Lines:	8
Impedance:	100 ohm
DC Resistance:	<1.5 ohm per data line
DC Current Limit:	.5A per data line
Insertion Loss, DC - 100 MHz:	<0.8 dB per data line
Insertion Loss, 250 MHz:	<1.6 dB per data line
Insertion Loss, 350 MHz:	>27 dB per data line
Insertion Loss, 450 MHz:	>55 dB per data line
Insertion Loss, 700 MHz - 8 GHz:	>90 dB per data line
PoE Modes:	802.3.af/at Mode-A, Mode-B, Passive
PoE Detection:	Mode-A and Mode-B LEDs upon PD detection by PSE
PoE Power Pass-Through:	Passive, between PSE and PD

Note: Specifications are average achieved and certified final test measurement values. Subject to change and revisions. Not responsible for typographical errors and omissions.



LOOKING FOR A HIGH SPEED USB2.0 INTERFACE?

Check out our STEUSB2071 USB2.0 High Speed Interface. Just like the matching Ethernet Interface, it is designed to be fully compatible down to the 4G LTE 700 MHz frequency bands, providing >80 dB of conductive and radiated isolation.

The USB Interface also features automatic USB power detection with a front panel LED indication when power is present. And mounting of the interface is as easy as a single 1" hole anywhere on your I/O panel, enclosure wall, or screen room panel. Visit www.ramseytest.com for details.



Test Equipment Solutions for the Wireless Industry

RAMSEY ELECTRONICS®, 590 Fishers Station Drive, Victor NY USA, (585) 924-4560 (585) 924-4555 FAX
www.ramseytest.com

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