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 malform 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!

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 only provide <40 dB reject attenuation at 1-6 GHz and less than 29 dB at the 700 MHz service bands. In addition, 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.
RF ISOLATION... CAN ONLY BE AS EFFECTIVE AS YOUR WORST I/O!

If you’re using 100pF filtered DB9’s for your Ethernet feedthroughs, the effective RF isolation will be less than 43 dB. Likewise if you’re using 10pF filtered DB9’s for your USB applications, the effective isolation will be less than 9dB! In today’s crowded RF spectrum, with high power WAPs literally everywhere, that just doesn’t cut it.

For greater than 90 dB Ethernet isolation, with automatic PoE, move up to our STEGBE4590 Ethernet Interface. Looking for 10GbE Ethernet or HDMI? No problem, check out our full line of high performances interfaces! We’ll keep you isolated... regardless!

**SPECIFICATIONS**

**GENERAL**
- Product Part Number: STEGBE4590
- UPC: 871183005997
- Outside Dimensions: 3.4”H x 3.25”W x 1.1”D (86.36mmH x 82.55mmW x 27.94mmD)
- Weight: .75 lbs (.3kg) with nut, and RF gasket
- Construction: Milled aluminum
- Mounting: Single 1.25” OD hole with provided EMI collar gasket, and 1.25-18 UNF nut (.625”/15.9mm max panel thickness)
- External Connection: RJ45 shielded female
- Internal Connection: RJ45 shielded female
- Ethernet Cable Provided: 7’ double shielded stranded superflex CAT7 patch cable

**TECHNICAL**
- 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.at/af 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
- Availability: In-stock for immediate delivery
- OEM bulk (Contact Ramsey Electronics®)

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

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**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 and machined it around a single-hole mount! The entire interface can be installed on your RF Test Enclosure, or your screen room I/O panel with one single 1.25” hole.

With the provided flange nut, lockwasher, and mesh EMI gasket, the interface is 100% bonded to your mounting surface. That, along with precision gasketing, assures a radiated isolation also greater than 90 dB.

Then we added integral solid milled tension surrounds on both sides, and a threaded cable strain relief post on the front side, to accommodate the duty cycle of repetitive lab insertions and connections as well as accidental cable over-tensions. This puts an end to broken Ethernet I/O ports and connectors! It simply doesn't get any better than that. A double shielded CAT7 superflex cable is included.

**AUTOMATIC PoE DETECTION, IDENTIFICATION, AND PASS-THROUGH!**

We designed the PoE function of our I/O interface to automatically detect the presence of 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.

**RF ISOLATION PERFORMANCE 700 MHz to 8 GHz**

![Graph showing RF isolation performance from 700 MHz to 8 GHz](image)

**GLOBAL**
- 10GbE PoE Ethernet
- HDMI 4K Video
- USB2.0 High Speed
- Global Power Interface
- Universal DC Power Interface