

## Opto-Isolators

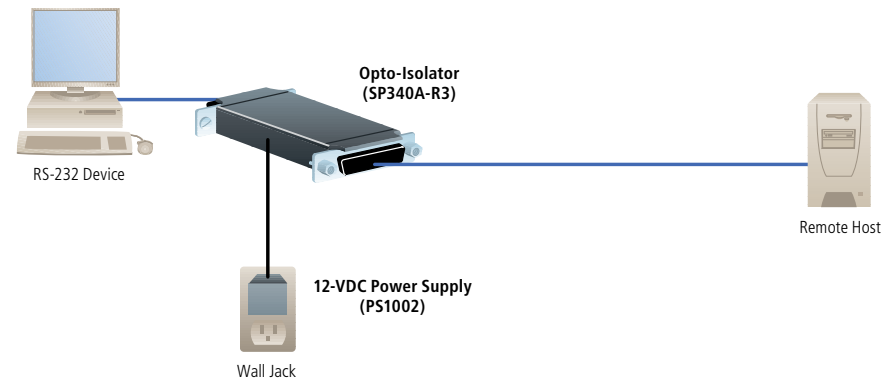
Protect your high-speed equipment and data from ground-loop problems.



## FEATURES

- » Fiber optic circuitry.
- » Stops ground-potential differences up to 2500 volts.
- » Small and lightweight.
- » Choose from models for RS-232 and RS-422/RS-485 protection.
- » SP340A-R3 supports data rates up to 115.2 kbps.
- » SP401A–SP402A maximum speed is 19.2 kbps.
- » Optional power supply available for RS-232 model.
- » Use the RS-422/RS-485 isolators in 4-wire applications.
- » Transparent operation.

## A typical application using a High-Speed Opto-Isolator and a 12-VDC Power Supply.



## OVERVIEW

Guard your asynchronous data and equipment from ground loops between buildings with BLACK BOX® Opto-Isolators.

A ground loop occurs when the ground potential is different on each end of the cable. These often occur from one floor to another, from one building to another, or anywhere there are widely spaced sites that have different earth-grounding systems or characteristics and dissimilar electrical demands.

The difference in potential causes dangerous currents that can fry your equipment. An Opto-Isolator, however, stops those currents dead—they simply can't get across the optical barrier. It keeps any difference in ground potential at each end of a data link from interfering with data integrity or damaging the attached equipment. The device does this by creating two electrical circuits (where otherwise there would have been only one) and separating these circuits with an "air gap" that electrical energy can't cross, but RS-232, RS-422, or RS-485 signals—translated into pulses of light—can.

Each model offered provides up to 2500 volts of optical isolation between a DTE and a DCE device in a point-to-point setup. Because it's small (less than an inch high) and lightweight (at less than a pound), it doesn't get in your way.

### SP340A-R3, PS1002

For RS-232 serial equipment that's running at a high rate of speed (up to 115.2 kbps), use the High-Speed Opto-Isolator (SP340A-R3). It plugs directly into the DTE and connects to the DCE by a short cable.

The device isolates four RS-232 signals. In addition to two data line signals (TD and RD), the High-Speed Opto-Isolator passes one user-configurable control signal in each direction. These isolation capabilities make the device perfect for hardware flow control.

Two 8-position, easy-to-access DIP switches enable you to configure the two user-configurable leads for the device to work in a wide range of applications.

Designed to operate transparently, the High-Speed Opto-Isolator begins operating as soon as it receives power. It usually requires no external power supply for operation because it draws its power from the RS-232 interface. But if the interface doesn't give you enough power, you can add an optional power supply: the 12-VDC Power Supply (PS1002). This 120-VAC, 60-Hz unit can provide 12 VDC of secondary voltage to Pin 9 of the isolators.

You also need to use the PS1002 with the SP340A-R3 if you want to protect equipment separated by greater distances against ground loops.

### SP401A–SP402A

These Opto-Isolators protect against ground loops between equipment with RS-422/485 interfaces, isolating four signals (XMT+, XMT-, RCV+, and RCV-) in the process.

Both support async data rates up to 19.2 kbps and draw their power from the receive pair of the RS-422/RS-485 interface.

The Opto-Isolator II (SP402A) differs from the SP401A in that it has a 4-screw terminal block with strain relief instead of an RJ-45 jack on each side. Both models support 4-wire operation only.

As with the RS-232 High-Speed Opto-Isolator, the RS-422/RS-485 models have DIP switches for configuration purposes.

## TECH SPECS



SP340A-R3

### SP340A-R3, SP401A–SP402A:

**Approvals** — 89/336/EEC; FCC Part 15, Class A

**Isolation** — 2500 V RMS maximum load capacity

**Protocol** — Asynchronous, full or half-duplex

**Speed (Maximum)** — SP340A-R3: 115.2 kbps;

SP401A–SP402A: 19.2 kbps

**User Controls** — (2) 8-position DIP switches

**Interface** — SP340A-R3: RS-232;

SP401A–SP402A: RS-422/RS-485

**Connectors** — For DCE and DTE:

SP340A-R3: (1) DB25 F, (1) DB25 M;

SP401A: (2) RJ-45 F;

SP402A: (2) 4-screw terminal blocks

**Temperature Tolerance** — SP340A-R3: 32 to 122°F (0 to 50°C);

SP401A–SP402A: 32 to 140°F (0 to 60°C)

**Humidity Tolerance** — 5 to 95% noncondensing

**Power** — SP340A-R3: Interface powered; may also require optional power supply (PS1002);

SP401A–SP402A: Interface powered only

**Size** — 0.8"H x 2.1"W x 3.8"D (2 x 5.3 x 9.7 cm)

**Weight** — 0.8 lb (0.4 kg)

### PS1002:

**Approvals** — FCC Part 15, Class A, UL®; cUL

**Connectors** — Input: (1) Wallmount 2-prong plug;

Output: 1/8 jack

**Power** — Input: 120 VAC, 60 Hz, 0.1 A;

Output: 12 VDC, 100 mA

**Size** — 1.5"H x 1.5"W x 2"D (3.8 x 3.8 x 5.1 cm)

**Weight** — 0.1 lb. (<0.1 kg)

Item	Code
<b>For RS-232 applications, order...</b>	
High-Speed Opto-Isolator (115.2 kbps)	<b>SP340A-R3</b>
<b>You may also need...</b>	
12-VDC Power Supply	<b>PS1002</b>
<b>For 4-wire RS-422/RS-485 applications using RJ-45 connectors, order...</b>	
RS-422/RS-485 Opto-Isolator (19 kbps)	<b>SP401A</b>
<b>For 4-wire RS-422/RS-485 applications using screw terminal connectors, order...</b>	
Opto-Isolator II (19 kbps)	<b>SP402A</b>

## Why Buy From Black Box? Exceptional Value. Exceptional Tech Support. Period.

Recognize any of these situations?

- You wait more than 30 minutes to get through to a vendor's tech support.
- The so-called "tech" can't help you or gives you the wrong answer.
- You don't have a purchase order number and the tech refuses to help you.
- It's 9 p.m. and you need help, but your vendor's tech support line is closed.

According to a survey by *Data Communications* magazine, 90% of network managers surveyed say that getting the technical support they need is extremely important when choosing a vendor. But even though network managers pay anywhere from 10 to 20% of their overall purchase price for a basic service and support contract, the technical support and service they receive falls far short of their expectations—and certainly isn't worth what they paid.

At Black Box, we guarantee the best value and the best support. You can even consult our Technical Support Experts before you buy if you need help selecting just the right component for your application.

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