



SC32B

Optically Isolated RS-232 Interface



Guarantee

This equipment is guaranteed against defects in materials and workmanship. We will repair or replace products which prove to be defective during the guarantee period as detailed on your invoice, provided they are returned to us prepaid. The guarantee will not apply to:

- Equipment which has been modified or altered in any way without the written permission of Campbell Scientific
- Batteries
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Note that goods sent air freight are subject to Customs clearance fees which Campbell Scientific will charge to customers. In many cases, these charges are greater than the cost of the repair.



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About this manual

Please note that this manual was originally produced by Campbell Scientific Inc. primarily for the North American market. Some spellings, weights and measures may reflect this origin.

Some useful conversion factors:

Area: 1 in ² (square inch) = 645 mm ²	Mass: 1 oz. (ounce) = 28.35 g 1 lb (pound weight) = 0.454 kg
Length: 1 in. (inch) = 25.4 mm 1 ft (foot) = 304.8 mm 1 yard = 0.914 m 1 mile = 1.609 km	Pressure: 1 psi (lb/in ²) = 68.95 mb
	Volume: 1 UK pint = 568.3 ml 1 UK gallon = 4.546 litres 1 US gallon = 3.785 litres

In addition, while most of the information in the manual is correct for all countries, certain information is specific to the North American market and so may not be applicable to European users.

Differences include the U.S standard external power supply details where some information (for example the AC transformer input voltage) will not be applicable for British/European use. *Please note, however, that when a power supply adapter is ordered it will be suitable for use in your country.*

Reference to some radio transmitters, digital cell phones and aerials may also not be applicable according to your locality.

Some brackets, shields and enclosure options, including wiring, are not sold as standard items in the European market; in some cases alternatives are offered. Details of the alternatives will be covered in separate manuals.

Part numbers prefixed with a “#” symbol are special order parts for use with non-EU variants or for special installations. Please quote the full part number with the # when ordering.

Recycling information



At the end of this product's life it should not be put in commercial or domestic refuse but sent for recycling. Any batteries contained within the product or used during the products life should be removed from the product and also be sent to an appropriate recycling facility.

Campbell Scientific Ltd can advise on the recycling of the equipment and in some cases arrange collection and the correct disposal of it, although charges may apply for some items or territories.

For further advice or support, please contact Campbell Scientific Ltd, or your local agent.



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Safety

DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND **TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.** FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at www.campbellsci.eu or by telephoning +44(0) 1509 828 888 (UK). You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

General

- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a **hardhat** and **eye protection**, and take **other appropriate safety precautions** while working on or around tripods and towers.
- **Do not climb** tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- **You can be killed** or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in **contact with overhead or underground utility lines.**
- Maintain a distance of at least one-and-one-half times structure height, or 20 feet, or the distance required by applicable law, **whichever is greater**, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.

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SC32B Optically Isolated RS-232 Interface

1. Function



FIGURE 1-1. SC32B Optically Isolated RS-232 Interface

The SC32B interfaces an RS-232 peripheral, commonly a computer or terminal, to the CS I/O port of a Campbell Scientific data logger. Functions include:

1. Converting data logger logic levels to RS-232 logic levels.
2. Optically isolating the data logger and the RS-232 peripheral. Optical isolation separates the SC32B into a data logger section and an RS-232 section. Signals entering from either side are electrically independent, protecting against ground loops, normal static discharge, and noise.
3. Passing data when modem enable pin 5 is high and SDE/printer enable pin 6 is low (normal telecommunications mode).

The SC32B blocks data sent out the data logger CS I/O port when the SDE/print enable pin 6 is high. This prevents data sent to an SDE device (for example, storage module) or printer output from being sent out the RS-232 port.

2. Specifications

Operating Temperature:	-25° to +50°C (typical)
Power:	Powered by data logger; see Section 4, <i>Operation</i>
Ports:	9 pin female RS-232 configured as DCE. 9 pin male CS I/O
Baud Rate:	1200 bps to 115.2 kbps; see Section 4, <i>Operation</i>
Size:	4.1 x 2.3 x 7.6 cm (1.6 x 0.9 x 3 in)
Weight:	45.4 g (1.6 oz)
Compliance Documents:	View at www.campbellsci.eu/sc32b



3. Connector Descriptions

RS-232 9 Pin Female Connector			CS I/O 9 Pin Male Connector		
Pin #	I/O	Description	Pin #	I/O	Description
1	Out	DCD	1	In	+5 V
2	Out	RXD	2		Ground
3	In	TXD	3	Out	Ring
4	In	DTR	4	Out	RX
5		Ground	5	In	ME
6	Out	DSR	6	In	PE (SDE)
7	In	RTS	7		No Connection
8	Out	CTS	8		No Connection
9		No Connection	9	In	TX

3.1 RS-232

The DB9 RS-232 port is configured as Data Communications Equipment (DCE) for direct cable connection to Data Terminal Equipment (DTE). Most computers are configured as DTE. For connection to DCE devices such as modems, the SC932A should be used in place of the SC32B.

3.2 9 Pin

The CS I/O port connects to the data logger through the SC12 Two Peripheral Cable supplied with the SC32B. Pin descriptions and direction (Input/Output) are given in TABLE 3-1.

4. Operation

Power for the SC32B data logger section comes from the 5 V supply on pin 1 of the data logger CS I/O. Communication logic levels to and from the data logger are referenced to this voltage, ranging from 0 to slightly less than 5 V.

Power for the RS-232 section is isolated from the data logger 5 V supply via a transformer/isolator. An on-board DC to DC converter supplies the negative voltage required for RS-232 signals.

When the SC32B first receives a character from the RS-232 peripheral (pin 3), 5 V is applied to the data logger Ring line (pin 3) until the data logger Modem Enable (ME) goes high, putting the data logger into the Telecommunications Mode.

The SC32B does not perform baud rate translation. The data speed going out will match the data speed coming in. If you are having trouble communicating, check that the data logger's CS I/O ME baud rate matches that being used by the computer/*LoggerNet*. When other devices are also connected to the data logger's CS I/O port, it may be necessary to lower the baud rate used for the SC32B. If you encounter communication issues, consider starting at 9600. If communication is successful, you can increase the baud rate until communication problems return.

5. Application

The SC32B provides a direct interface between the CS I/O port on a Campbell Scientific data logger and the RS-232 port on a computer. Some Campbell Scientific data loggers have a built-in RS-232 port in addition to the CS I/O port. With these data loggers, the SC32B is only necessary if you wish to connect to the CS I/O port instead of the RS-232 port.

The SC32B blocks data sent out the CS I/O port when the data logger sets the printer enable/SDE (pin 6) high. The SC932A (CS I/O to RS-232 DTE interface) can be used to interface to an RS-232 modem.



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