



A300

Power and Signal Converter



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
- Any product which has been subjected to misuse, neglect, acts of God or damage in transit.

Campbell Scientific will return guaranteed equipment by surface carrier prepaid. Campbell Scientific will not reimburse the claimant for costs incurred in removing and/or reinstalling equipment. This guarantee and the Company's obligation thereunder is in lieu of all other guarantees, expressed or implied, including those of suitability and fitness for a particular purpose. Campbell Scientific is not liable for consequential damage.

Please inform us before returning equipment and obtain a Repair Reference Number whether the repair is under guarantee or not. Please state the faults as clearly as possible, and if the product is out of the guarantee period it should be accompanied by a purchase order. Quotations for repairs can be given on request. It is the policy of Campbell Scientific to protect the health of its employees and provide a safe working environment, in support of this policy a "Declaration of Hazardous Material and Decontamination" form will be issued for completion.

When returning equipment, the Repair Reference Number must be clearly marked on the outside of the package. Complete the "Declaration of Hazardous Material and Decontamination" form and ensure a completed copy is returned with your goods. Please note your Repair may not be processed if you do not include a copy of this form and Campbell Scientific Ltd reserves the right to return goods at the customers' expense.

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.



Campbell Scientific Ltd,
80 Hathern Road,
Shepshed, Loughborough, LE12 9GX, UK
Tel: +44 (0) 1509 601141
Fax: +44 (0) 1509 270924
Email: support@campbellsci.co.uk
www.campbellsci.co.uk

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.



Campbell Scientific Ltd, 80 Hathern Road, Shepshed, Loughborough, LE12 9GX,
UK Tel: +44 (0) 1509 601141 Fax: +44 (0) 1509 270924
Email: support@campbellsci.co.uk
www.campbellsci.co.uk

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.

Table of Contents

PDF viewers: These page numbers refer to the printed version of this document. Use the PDF reader bookmarks tab for links to specific sections.

1. Overview	1
2. Precautions	1
3. Initial Inspection	1
4. Specifications	1
5. Installation	2
5.1 A300 Cable and Terminal Description.....	2
5.2 Using With GPS16X-HVS	2
5.3 Using With 3.3 V Serial Sensor	3
5.4 Mounting	3

Tables

5-1. GPS16X-HVS Wiring to A300 Terminals and Datalogger Terminals.	2
5-2. A300 Cable Wiring to Datalogger Terminals	2
5-3. Sensor Wiring to A300 Terminals and Datalogger Terminals	3
5-4. A300 Cable Wiring to Datalogger Terminals	3

A300 Power and Signal Converter

1. Overview

The A300 is a logic level shifter and voltage converter. It provides two level shifting channels; the first converting 5 V to 3.3 V, and the second converting 3.3 V to 5 V. Additionally, it provides a regulated 3.3 V power output.

2. Precautions

- READ AND UNDERSTAND the *Safety* section at the front of this manual.
- The black outer jacket of the cable is Santoprene® rubber. This compound was chosen for its resistance to temperature extremes, moisture, and UV degradation. However, this jacket will support combustion in air. It is rated as slow burning when tested according to U.L. 94 H.B. and will pass FMVSS302. Local fire codes may preclude its use inside buildings.

3. Initial Inspection

- Upon receipt of the A300, inspect the packaging and contents for damage. File damage claims with the shipping company.

4. Specifications

Dimensions:	78 x 46 x 9.3 mm (3.08 x 1.8 x 0.36 in)
Cable:	30.48 cm (12 in), 4 conductor, 22 AWG, Santoprene
Terminals:	4 screw terminals, 12-24 AWG, 0.2 inch pitch
Mounting:	2 mounting holes (1 in on centre), 1.9 mm (0.075 in) diameter
Packaging:	Wide temperature polyamide over-mould
Temperature:	-40 to 70 °C
Supply Voltage:	9 to 16 Vdc, for 12 Vdc nominal systems
Supply Current:	100 µA quiescent
Power Output:	3.3 Vdc, ±3%, up to 20 mA guaranteed
5 V Signal Input:	0 to 6 Vdc, logic low ≤ 1.4 V, logic high ≥ 3.4 V
5 V Signal Output:	5 Vdc, ±3%, 600 Ohms output impedance
3 V Signal Input:	0 to 6 Vdc, logic low ≤ 0.8 V, logic high ≥ 2 V
3 V Signal Output:	3 Vdc ±3%, 600 Ohms output impedance
Maximum Voltage Translation Rate:	210 Mbps

Compliance Documents: View at www.campbellsci.eu/a300



5. Installation

5.1 A300 Cable and Terminal Description

Cable Wire Colour	Cable Wire Function	Direction	Terminal Label	Terminal Function
Red	+12 Vdc Power Input	➔	3.3V Power	+3.3 Vdc Power Output
Black	Ground	↔	G	Ground
Green	5 V Signal Input	➔	3.3V OUT	+3.3 Vdc Signal Output
White	5 V Signal Output	➔	3.3V IN	+3.3 Vdc Signal Input

5.2 Using With GPS16X-HVS

In 2014, Garmin changed the pulse-per-second (PPS) output of the GPS16X-HVS from 5 V to 3 V. Units with a serial number 1A4189318 or greater have a PPS output of 0 to 3 V. For those units, an A300 is needed to connect the PPS output to a CR800-series, CR1000, or CR3000 datalogger. Those dataloggers require the PPS line to have a voltage of 3.8 V or greater.

TABLE 5-1. GPS16X-HVS Wiring to A300 Terminals and Datalogger Terminals

GPS16X-HVS Wire Colour	GPS16X-HVS Wire Function	A300 Terminal	Datalogger
Red	12 V		12V
Black	Ground	G	
Yellow	Enable		Ground (or Control Port)
White	TXD (Output)		Control Port (Rx)
Grey	PPS	3.3V IN	
Blue	RXD (Input)		Ground
Shield	Shield		Ground

TABLE 5-2. A300 Cable Wiring to Datalogger Terminals

A300 Wire Colour	A300 Wire Function	Datalogger
Red	12 V	12V
Black	Ground	Ground
Green	5 V Signal Input	Ground
White	5 V Signal Output	Control Port (Tx)

5.3 Using With 3.3 V Serial Sensor

The A300 can be used to provide data line level shifting and a regulated 3.3 V power supply for some serial devices such as serial sensors that need to be connected to a datalogger that does not support 3.3 V power or communication levels. Example dataloggers include the CR800-series, CR1000, and CR3000.

TABLE 5-3. Sensor Wiring to A300 Terminals and Datalogger Terminals

Sensor	A300 Terminal
3.3 V Power In	3.3V PWR
Ground	G
TxD (Output)	3.3V IN
RxD (Input)	3.3V OUT

TABLE 5-4. A300 Cable Wiring to Datalogger Terminals

A300 Wire Colour	A300 Wire Function	Datalogger
Red	12 V	12V
Black	Ground	Ground
Green	5 V Signal Input	Tx (Output)
White	5 V Signal Output	Rx (Input)

5.4 Mounting

The A300 provides several features to aide in installation. It provides a tie-down loop for securing the sensor cable to the A300 with a zip tie. It also provides two mounting holes for securing the A300 to the backplate of an enclosure.



Global Sales & Support Network

A worldwide network to help meet your needs



Campbell Scientific Regional Offices

Australia

Location: Garbutt, QLD Australia
Phone: 61.7.4401.7700
Email: info@campbellsci.com.au
Website: www.campbellsci.com.au

Brazil

Location: São Paulo, SP Brazil
Phone: 11.3732.3399
Email: vendas@campbellsci.com.br
Website: www.campbellsci.com.br

Canada

Location: Edmonton, AB Canada
Phone: 780.454.2505
Email: dataloggers@campbellsci.ca
Website: www.campbellsci.ca

China

Location: Beijing, P. R. China
Phone: 86.10.6561.0080
Email: info@campbellsci.com.cn
Website: www.campbellsci.com.cn

Costa Rica

Location: San Pedro, Costa Rica
Phone: 506.2280.1564
Email: info@campbellsci.com
Website: www.campbellsci.com

France

Location: Vincennes, France
Phone: 0033.0.1.56.45.15.20
Email: info@campbellsci.fr
Website: www.campbellsci.fr

Germany

Location: Bremen, Germany
Phone: 49.0.421.460974.0
Email: info@campbellsci.de
Website: www.campbellsci.de

India

Location: New Delhi, DL India
Phone: 91.11.46500481.482
Email: info@campbellsci.in
Website: www.campbellsci.in

South Africa

Location: Stellenbosch, South Africa
Phone: 27.21.8809960
Email: sales@campbellsci.co.za
Website: www.campbellsci.co.za

Spain

Location: Barcelona, Spain
Phone: 34.93.2323938
Email: info@campbellsci.es
Website: www.campbellsci.es

Thailand

Location: Bangkok, Thailand
Phone: 66.2.719.3399
Email: info@campbellsci.asia
Website: www.campbellsci.asia

UK

Location: Shepshed, Loughborough, UK
Phone: 44.0.1509.601141
Email: sales@campbellsci.co.uk
Website: www.campbellsci.co.uk

USA

Location: Logan, UT USA
Phone: 435.227.9120
Email: info@campbellsci.com
Website: www.campbellsci.com