



A300

Power and Signal Converter



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 back 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 center), 1.9 mm (0.075 in) diameter
Packaging:	Wide temperature polyamide over-mold
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.com/a300



5. Installation

5.1 A300 Cable and Terminal Description

Cable Wire Color	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 Color	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)
Gray	PPS	3.3V IN	
Blue	RXD (Input)		Ground
Shield	Shield		Ground

TABLE 5-2. A300 Cable Wiring to Datalogger Terminals

A300 Wire Color	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 Color	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.

Limited Warranty

Products manufactured by Campbell Scientific are warranted by Campbell Scientific to be free from defects in materials and workmanship under normal use and service for twelve months from the date of shipment unless otherwise specified on the corresponding product webpage. See Product Details on the Ordering Information pages at www.campbellsci.com. Other manufacturer's products, that are resold by Campbell Scientific, are warranted only to the limits extended by the original manufacturer.

Refer to www.campbellsci.com/terms#warranty for more information.

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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.com. 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

- Protect from over-voltage.
- Protect electrical equipment from water.
- Protect from electrostatic discharge (ESD).
- Protect from lightning.
- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations.
- 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, 6 meters (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.
- Only use power sources approved for use in the country of installation to power Campbell Scientific devices.

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.

Internal Battery

- Be aware of fire, explosion, and severe-burn hazards.
- Misuse or improper installation of the internal lithium battery can cause severe injury.
- Do not recharge, disassemble, heat above 100 °C (212 °F), solder directly to the cell, incinerate, or expose contents to water. Dispose of spent batteries properly.

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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Website: www.campbellsci.com

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Website: www.campbellsci.fr

Germany

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Email: info@campbellsci.de
Website: www.campbellsci.de

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Website: www.campbellsci.in

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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

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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