PRODUCT MANUAL

Enclosure

A151

Single Sensor Terminal Case with M12 Connector, Vented with Desiccant

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RELIABLE MONITORING SINCE 1974

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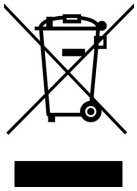
Please read first

About this manual

Please note that this manual was produced by Campbell Scientific Inc. primarily for the North American market. Some spellings, weights and measures may reflect this. 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 from Campbell Scientific it will be suitable for use in your country*.

Reference to some radio transmitters, digital cell phones and aerials (antennas) 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.

Recycling information for countries subject to WEEE regulations 2012/19/EU



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, per The Waste Electrical and Electronic Equipment (WEEE) Regulations 2012/19/EU. Campbell Scientific 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 support, please contact Campbell Scientific, or your local agent.

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1. Introduction

The A151 is a vented junction box with terminal blocks to connect sensors to the M12 8-pin connector. It has accessories to allow for various lengths of cable and termination options.

Figure 1-1. A151

The A151 allows sensors such as pressure transducers to be used without the need to run a ventilation tube all the way to a data logger enclosure. The sensor cable with a ventilation tube terminates at the A151, which contains a small vent and desiccant, while a second cable without a ventilation tube completes the connection to the Aspen™10 or other data logger depending on the cable options chosen.

2. Compatibility

2.1 Data loggers

The A151 is compatible with the Aspen 10. However, even though the A151 comes with the 8-pin M12 connector compatible with Aspen 10, accessories can be purchased so that the end of the cable is terminated in pig tails for use with other data loggers.

2.2 Sensors

The A151 is compatible with most sensors using 8 pins or less. The A151 is often used with pressure transducers. If the sensor is to be used with the Aspen 10, refer to the Aspen 10 documentation at www.campbellsci.com/aspen10 for compatibility.

3. Physical description

The A151 has an 8.0 x 8.2 x 5.5 cm (3.15 x 3.228 x 2.171 in) enclosure. Four screws secure the lid to the rest of the unit. A terminal block is mounted inside the enclosure. A small vent is located on the bottom of the enclosure. The vent is protected by a water-resistant filter, which prevents moisture and contaminants from entering the unit while equalizing the interior air pressure to the current atmospheric pressure. Connected to the enclosure is 3 feet of cable with a male A-coded M12 connector.

A mounting bracket is attached to the bottom of the chassis. The bracket is used to fasten the A151 inside an enclosure or, with the included zip ties, to another location of the user's choosing.

4. Specifications

Maximum voltage	30 V (AC or DC)
Dimensions:	8.0 x 8.2 x 5.5 cm (3.15 x 3.228 x 2.171 in)
Terminal block wire gauges:	28 to 12 AWG
Compression fitting:	Fits sensor cables with 4.6 to 7.9 mm (0.181 to 0.312 in) diameters
Internal protection rating:	IP66

For use with Extra Low Voltage (ELV) / NEC Class 2 or Class 3 Conductors only

5. Installation

5.1 Mounting

The A151 provides two options for mounting. The first is to use the 18-inch long zip ties included with the A151. This allows the A151 to be secured to a small mast, fencepost, or other location where it is not possible to use mounting screws.

The second option is to use the mounting bracket on the back of the A151. This bracket allows the A151 to be mounted inside an enclosure or to another flat surface, using two screws through the bracket to secure the A151.

5.2 Wiring

To wire a sensor to the A151, thread the sensor cable through the entry seal and connect to the terminal block as shown in Figure 5-1 (p. 3). Use a small, flat-head screwdriver to open the wire terminal. Consult the documentation included with the sensor, or contact Campbell Scientific technical support, for the correct placement of each wire.

Once all wires are attached, tighten the wire gland to prevent water or contaminants from entering the A151. Place a desiccant pack, included with the A151, inside the chassis. Also place the humidity indicator card inside the A151, and then secure the lid in place with the four captured screws.

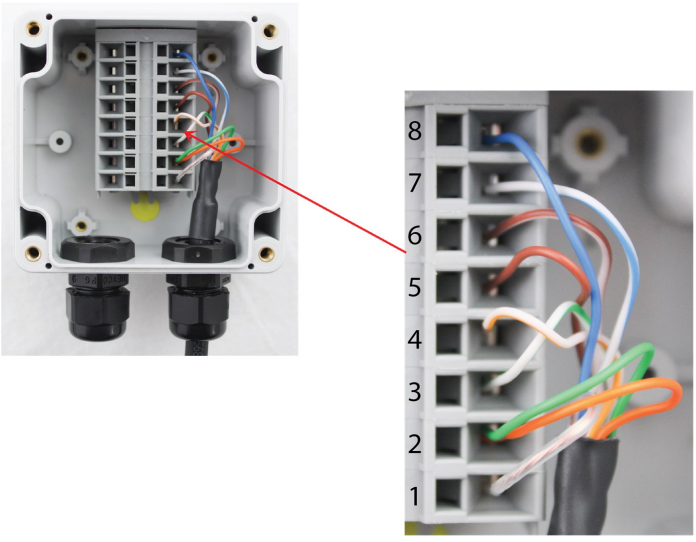

Figure 5-1. Terminal block wiring

Table 5-1 (p. 4) shows the pin-out, wire function, and suggested wire color for the terminal block.

Table 5-1: Terminal block wiring			
Terminal block position	Wire function	Wire color	M12 connector pin
8	M1	Blue	7
7	M2	White/Blue	1
6	M3	White/Brown	2
5	M4	Brown	3
4	Identify (1-Wire or SDI-12)	White/Orange	6
3	Power	White/Green	5
2	Detect & Ground	Green and Orange	8 (Green) and Orange (4)
1	Shield		

The M12 8-pin A-coded connector is shown in Figure 5-2 (p. 4).

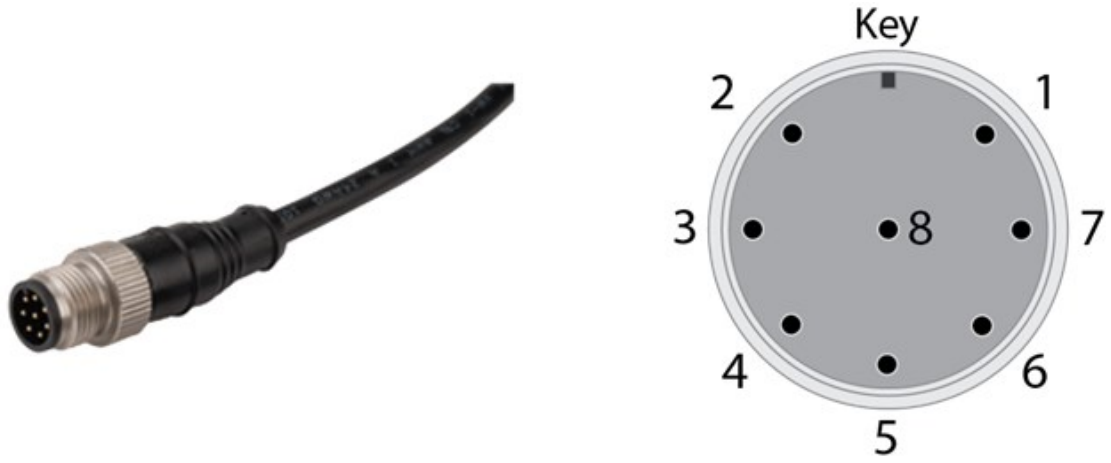

Figure 5-2. M12 Connector

Table 5-2 (p. 5) shows the wiring for some SDI-12/Aspen 10-compatible sensors. These sensors are commonly used with the A151.

Table 5-2: Example sensors

Sensor	Terminal block position and pin function/sensor wire color							
	8 M1	7 M2	6 M3	5 M4	4 Identify	3 Power	2 Detect	1 Shield
CS451/CS456	N/C	N/C	N/C	N/C	SDI-12/ White	Power/Red	Ground/Black	Shield/Clear
CS650/CS655	N/C	N/C	N/C	N/C	SDI-12/ Green	Power/Red	Ground/Black	Shield/Clear
ClariVue 10	N/C	N/C	N/C	N/C	SDI-12/ White	Power/Red	Ground/Black	Shield/Clear
TempVue 50 SDI-12	N/C	N/C	N/C	N/C	SDI-12/ White	Power/Brown	Ground/Black	Shield/Clear
Keller Acculevel SDI	N/C	N/C	N/C	N/C	SDI-12/ White	Power/Red	Ground/Black	Shield/Drain

Limited warranty

Covered equipment is warranted/guaranteed against defects in materials and workmanship under normal use and service for the period listed on your sales invoice or the product order information web page. The covered period begins on the date of shipment unless otherwise specified. For a repair to be covered under warranty, the following criteria must be met:

1. There must be a defect in materials or workmanship that affects form, fit, or function of the device.

2. The defect cannot be the result of misuse.

3. The defect must have occurred within a specified period of time; and

4. The determination must be made by a qualified technician at a Campbell Scientific Service Center/ repair facility.

The following is not covered:

1. Equipment which has been modified or altered in any way without the written permission of Campbell Scientific.

2. Batteries; and

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

Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of regional offices or visit www.campbellsci.com/contact to determine which Campbell Scientific office serves your country. For directions on how to return equipment, see Assistance.

Other manufacturer's products, that are resold by Campbell Scientific, are warranted only to the limits extended by the original manufacturer.

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MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Campbell Scientific hereby disclaims, to the fullest extent allowed by applicable law, any and all warranties and conditions with respect to the products, whether express, implied, or statutory, other than those expressly provided herein.

Campbell Scientific will, as a default, return warranted equipment by surface carrier prepaid. However, the method of return shipment is at Campbell Scientific's sole discretion. Campbell Scientific will not reimburse the claimant for costs incurred in removing and/or reinstalling equipment. This warranty and the Company's obligation thereunder is in lieu of all other

warranties, expressed or implied, including those of suitability and fitness for a particular purpose. Campbell Scientific is not liable for consequential damage.

In the event of any conflict or inconsistency between the provisions of this Warranty and the provisions of Campbell Scientific's Terms, the provisions of Campbell Scientific's Terms shall prevail. Furthermore, Campbell Scientific's Terms are hereby incorporated by reference into this Warranty. To view Terms and conditions that apply to Campbell Scientific, Logan, UT, USA, see Terms and Conditions. To view terms and conditions that apply to Campbell Scientific offices outside of the United States, contact the regional office that serves your country.

Assistance

Products may not be returned without prior authorization. Please inform us before returning equipment and obtain a **return material authorization (RMA) number** whether the repair is under warranty/guarantee or not. See Limited warranty for information on covered equipment.

Campbell Scientific regional offices handle repairs for customers within their territories. Please see the back page of the manual for a list of regional offices or visit www.campbellsci.com/contact to determine which Campbell Scientific office serves your country.

When returning equipment, a RMA number must be clearly marked on the outside of the package. Please state the faults as clearly as possible. 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, when equipment is returned to Campbell Scientific, Logan, UT, USA, it is mandatory that a "Declaration of Hazardous Material and Decontamination" form be received before the return can be processed. If the form is not received within 5 working days of product receipt or is incomplete, the product will be returned to the customer at the customer's expense. For details on decontamination standards specific to your country, please reach out to your regional Campbell Scientific office.

> NOTE:
> All goods that cross trade boundaries may be subject to some form of fee (customs clearance, duties or import tax). Also, some regional offices require a purchase order upfront if a product is out of the warranty period. Please contact your regional Campbell Scientific office for details.

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, 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, 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.

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.

Use and disposal of batteries

- Where batteries need to be transported to the installation site, ensure they are packed to prevent the battery terminals shorting which could cause a fire or explosion. Especially in the case of lithium batteries, ensure they are packed and transported in a way that complies with local shipping regulations and the safety requirements of the carriers involved.
- When installing the batteries follow the installation instructions very carefully. This is to avoid risk of damage to the equipment caused by installing the wrong type of battery or reverse connections.
- When disposing of used batteries, it is still important to avoid the risk of shorting. Do not dispose of the batteries in a fire as there is risk of explosion and leakage of harmful chemicals into the environment. Batteries should be disposed of at registered recycling facilities.

Avoiding unnecessary exposure to radio transmitter radiation

- Where the equipment includes a radio transmitter, precautions should be taken to avoid unnecessary exposure to radiation from the antenna. The degree of caution required varies with the power of the transmitter, but as a rule it is best to avoid getting closer to the antenna than 20 cm (8 inches) when the antenna is active. In particular keep your head away from the antenna. For higher power radios (in excess of 1 W ERP) turn the radio off when servicing the system, unless the antenna is installed away from the station, e.g. it is mounted above the system on an arm or pole.

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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