CAMPBELL SCIENTIFIC®

WHEN MEASUREMENTS MATTER

AM16/32A
Relay Multiplexer

Add up to 32 (2-wire) or 16 (4-wire) differential input channels to your Campbell Scientific Datalogger

Description

The AM16/32A is used with Campbell Scientific's CR800, CR850, CR10/10X, CR1000, CR3000, CR5000 and CR7 dataloggers to increase the number of sensors which can be scanned. It is positioned between the sensors and the datalogger. Using relays, it can be manually switched to sequentially connect either sixteen groups of four lines or thirty-two groups of two lines to the common output terminals.

Many different sensor types can be multiplexed, including thermo-couples, thermistors, potentiometers, strain gauges, soil moisture blocks, full and half bridges and vibrating wire sensors. Different sensor types can also be connected to a single AM16/32A – please contact Campbell Scientific for further details.

Scanning Multiple AM16/32As

Several AM16/32As can be connected to a single datalogger for totally independent analogue readings.

It is possible to connect up to six AM16/32As to one datalogger. This assumes that adequate analogue inputs, plus eight control ports (two for clock lines and six for enable lines) are available. Please contact us for further details.

Maximum Number of Sensors

The AM16/32A can multiplex a total of 64 lines (32 x 2-wire or 16 x 4-wire), four of which are connected through to the datalogger at any one time. The actual number of sensors which can be multiplexed will depend on the system configuration and the sensor type. Maximum numbers for various sensor types are given over-leaf.

Typical Applications

Automotive testing

Structural monitoring

Scientific and environmental research

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Maximum Number of Sensors

The AM16/32A sequentially multiplexes 16 groups of four lines (a total of 64 lines) through four common (COM) terminals. A manual switch setting allows it to multiplex 32 groups of two lines (also a total of 64 lines) through two COM terminals.

The maximum number of sensors that can be multiplexed through one AM16/32A depends on the type(s) of sensors measured.

Some typical examples, assuming identical sensors, that one AM16/32A can multiplex are shown below:

- Up to 32 single-ended or differential sensors that require two wires (e.g. thermistors, half bridges)
- Up to 16 single-ended or differential sensors that require four wires (e.g. full bridges, 4-wire half bridges)
- Up to 48 half bridge measurements (assumes common excitation and completion resistors at the datalogger)
- Up to 32 vibrating wire sensors (16 with temperature) in conjunction with a CR800, CR850, CR10/10X, CR3000 or CR5000 and AVW1, AVW4 or AVW100 Vibrating Wire Sensor Interface
- Up to 32 gypsum soil moisture blocks (model 223 or 253). DC-blocking capacitors are not required, significantly reducing sensor cost.
- Up to 48 CS615 Water Content Reflectometers (assumes common excitation)

Environmental Enclosures

The AM16/32A operates in most field conditions but requires a non-condensing environment. Outdoor applications require a weather-resistant enclosure with desiccant.

A remote AM16/32A can be housed in the ENC 10/12 enclosure, which is constructed from white fibreglass. It can be mounted to pipework or bolted to a flat surface, with the appropriate brackets.

The AM16/32A can also be fitted with the datalogger in a standard ENC 12/14 or ENC 16/18 enclosure.

For more information on enclosure options, please call Campbell Scientific or your local representative.

Specifications

Electrical
Power: 11 to 16V DC (under load) unregulated

Current Drain: <210µA quiescent, <10mA active

Reset Levels: <0.9V inactive, 3.5V to 16V active

Clock Levels: Scan advance occurs on the leading edge of the clock pulse (from below 1.5V to above 3.5V).

Minimum Clock Pulse Width: 1ms

Initial Relay Resistance (closed): <0.1Ω

Maximum Switching Current: 500mA – switching currents greater than 30mA (occasional 50mA is acceptable) degrades the suitability of that channel for switching low signal voltages

Contact Life: 5×10^7 closures (optimum)

Connections to a Datalogger
When used in the 4 x 16 mode, a four-conductor cable (with shield) connects the measurement/ excitation channels of the datalogger to the COM terminals of the multiplexer. When used in the 2 x 32 mode, a two-conductor cable (with shield) is required. Suitable cable can be supplied by Campbell Scientific Ltd.

A four-conductor cable (with shield) supplies power and control signals from the datalogger. The AM16/32A requires one datalogger control port for enable (reset terminal) and a second control port to advance through the channels (clock terminal). Either the datalogger's power supply or a separate 12V supply is used to power the multiplexer. Suitable cable can be supplied by Campbell Scientific Ltd.

Physical
Construction: Anodised aluminium case, designed to reduce temperature gradients across terminal strips. Built in strain relief flange on top edge of case. Sensor inputs do not have spark gaps.

CE Compliance
Tested and conforms to:
EN 61326:1998 and EN 55022 1998 Class B
(Performance criteria applied are available on request.)

Transient protection - all inputs designed to meet IEC-61000-4-5 level 4 transients.

Standard Operating Temp: -25°C to +50°C

Extended Temperature Range: -55°C to +85°C

Operating Humidity: 0 to 95% non-condensing
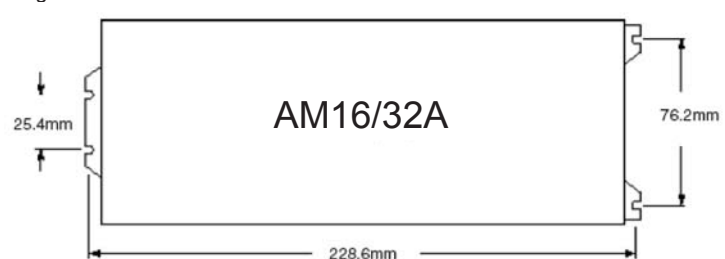
Dimensions: 102 x 239 x 46mm

Weight: 0.7kg

Grounding
Each differential channel has a ground terminal for connection of sensor shields. These ground terminals are connected to the AM16/32A's main grounding terminal, which should be connected to the datalogger's power ground.

Maximum Cable Length
Maximum cable length is sensor and scan rate dependent (longer leads necessitate longer measurement delays). See the datalogger manual for more specific information.

AM16/32A — 25.4mm, 76.2mm, 228.6mm

Please call for assistance in configuring the AM16/32A in your application

Campbell Scientific products are available from: