

ADAM-4515

Isolated CAN Repeater

Introduction

Most industrial computer systems come with standard RS-232 serial ports. Though widely used and accepted, RS-232 connections have limited transmission speed and networking capabilities. CAN (Controller Area Network) is a serial bus system with multimaster and real-time capability. It is a cost-effective Fieldbus for device networking in manufacturing plants. The ADAM-4515 repeater is a family of products that extend a communication cable's length in CAN V2.0 systems. By allowing the user to extend the bus length at any given speed, ADAM-4515 repeaters assist the user to cost-effectively implement I/O or other nodes on these buses at remote locations. Implementing I/O or other nodes without an ADAM-4515 would be more difficult and expensive. The ADAM-4515 repeater simply amplifies or boosts existing CAN signals to enable them to cover long distances from 40 m to 1000 m according to the data transfer rate. ADAM-4515 repeaters also allow users to increase the maximum number of connected nodes up to 64.

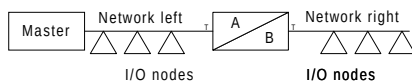
Features

- Expands the usefulness of CAN-bus systems
- Enables faster operation over longer distances
- Supports speeds up to 1 Mbps for CAN
- Automatic speed selection - no configuration required
- Transmission distance = 80 m at 1 MHz, up to 1000 m depending on baud rate
- Jumper selected
- Power and data flow indicator for trouble shooting
- Power requirements: +10 to +30 V_{DC}
- Mounts easily on DIN-rail or panel

Specifications

- **Power requirements**
Unregulated +10 to +30 V_{DC} with protection from power reversals
- **Case:** ABS with captive mounting
- **Accessories (included):**
 - Nylon DIN-rail mounting adapter
 - SECC panel mounting bracket
 - Plug-in screw terminal wiring :
- Accepts AWG 1-#12 to #22 (0.5 to 2.5mm) wires
- **Baud rate:** up to 1Mbps (automatic selection)
- **Address selection:** not applicable
- **Bus connection**
 - Repeater: 5-pin male header 2.5/5-ST-5.08/AU (included)
 - CAN-bus: 5-contact female plug 2.5/5-ST-5.08/AU (included)
- **Status indicators**
Module status: green/red bi-color LED
Network status: green/red bi-color LED
- **Maximum power:**
Voltage: +10 to 30 V_{DC}
Current: 140 mA @ 11 V_{DC}, 60 mA @ 25 V_{DC},
20 mA @ 11 V_{DC}, 10 mA @ 25 V_{DC}
- **Power:** 1 W
- **Operating temperature:** -10 to 70° C
- **Dimensions:** 2.36" x 4.41" (60 mm x 120 mm)

Function diagram



Installation

Initial inspection

We carefully inspect ADAM-4515 modules both mechanically and electrically before shipping. They should be free of marks and scratches and in perfect order on receipt.

As you unpack the modules, check them for signs of shipping damage (damaged box, scratches, dents, etc.). If it is damaged or fails to meet our specifications, notify our service department or your local sales representative immediately. Also, call the carrier immediately and retain the shipping carton and packing material for inspection by the carrier. We will then make arrangements to repair or replace the unit.

LED operation

LED status	Module status	Meaning
OFF	No power	There is no power to the ADAM-4515
Green	Power on	ADAM-4515 is operating normally
Flashing green	Module is operating	Data flow from network is left to right
Flashing red	Module is operating	Data flow from network is right to left

Cable lengths

The following provide cable length limits for DeviceNet and SDS systems:

Network maximum lengths - DeviceNet

Baud rate	Trunk line length		Drop length			
	Maximum distance		Maximum		Cumulative	
	Meters	Feet	Meters	Feet	Meters	Feet
125 Kbits/s	500 m	1640 ft	6 m	20 ft	156 m	512 ft
250 Kbits/s	250 m	820 ft	6 m	20 ft	78 m	256 ft
500 Kbits/s	100 m	328 ft	6 m	20 ft	39 m	128 ft

DeviceNet has a limit of 64 nodes per network for any baud rate.

Network maximum lengths - SDS

Baud rate	Trunk line length (maximum)		Drop length (maximum)		Number of nodes
	Meters	Feet	Meters	Feet	
125 Kbits/s	457.2 m	1500 ft	3.6 m	12 ft	64
250 Kbits/s	182.8 m	600 ft	1.8 m	6 ft	64
500 Kbits/s	91.4 m	300 ft	0.9 m	3 ft	64
1 Mbit/s	22.8	75	0.3	1	32

SDS has a limit of 32 nodes per network for any baud rate.

Network termination

A CAN-bus system must be terminated at each end of the trunk line. The host controller and the last CAN-bus repeater or other DeviceNet device on the network must always be terminated to eliminate reflections, even if only two nodes are present. Follow the information below when using an ADAM-4515

Trunk line use:

For the purpose of network termination, the ADAM-4515 is treated as the last node on the section of the trunk network to which it is connected. Therefore, when an ADAM-4515 is used directly in a trunk line, it must be terminated on both the Network A and Network B sides. You must also place a terminating resistor on the other end of the device of Network A and on the last device on the Network B side of the trunk line.

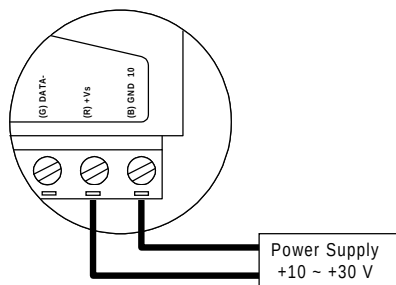
Drop line use:

When the ADAM-4515 is used in a drop line (with the Network A side towards the main trunk), the Network A connection is not terminated. The Network B side is now considered as an independent bus line electrically. The ADAM-4515, as the first node in this new bus line, must be terminated and the last device on the line must also be terminated.

Power Supply

For the ease of use in industrial environments the ADAM modules are designed to accept industry standard +24 V_{DC} unregulated power. Operation is guaranteed when using any power supply between +10 and +30 V_{DC}. Power ripples must be limited to 5 V peak to peak while the voltage in all cases must be maintained between +10 and +30 V_{DC}. All power supply specifications are referenced at the module connector.

The power cables should be selected according to the number of modules connected and the length of the power lines. When using a network with long cables, we advise the use of thicker wire to limit the line voltage drop. In addition to serious voltage drops, long voltage lines can also cause interference with communication wires.

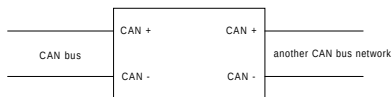


We advise that the following standard colors (as indicated on the modules) be used for power lines:

+Vs → (R) Red
GND → (B) Black

Basic Configuration

Before placing a module in an existing network, the module should be properly configured. The following diagrams show a typical layout for the ADAM-4515.



ADAM Dimensions

Unit: mm

