MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ADVANTECH

ADAM-4520

ISOLATED SERIAL INTERFACE CONVERTER

Used with the applicable ADAM-4000 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Advantech ADAM-4510/4510S/4520 Startup Manual, Edition 9

ADAM-4510 RS-422/RS-485 Repeater
ADAM-4510S Isolated RS-422/485 Repeater
ADAM-4520 Isolated RS-232 to RS-422/485 Converter
Startup Manual

Packing List

Before you begin installing your module, make sure that the following materials have been included:

- 1 x ADAM-4510, 4510S, 4520
- 1 x DIN-rail mounting bracket (attached to module)
- 1 x ADAM-4510/4510S/4520 Startup Manual
- 1 x Panel mounting bracket

If any of the above items are missing or damaged, please contact your distributor or sales representative immediately.

Declaration of Conformity

CE Notification

ADAM-4510, 4510S and 4520 developed by Advantech Co., Ltd. has passed the CE test for environmental specifications. The test conditions for passing including the equipment being operated within an industrial enclosure. Therefore, in order to protect the ADAM module from being damaged by ESD, we strongly recommend that the use of CE-compliant industrial enclosure products.

Declaration of Conformity

- Automatic internal RS-485 bus supervision
- No external flow control signals for RS-485
- Minimum 3000 V_{DC} isolation (4510S/4520)
- Transient suppression on RS-485 data lines
- Baudrate up to 115.2 kbps
- Networking up to 4000 feet (1200 m)
- Reserved space for termination resistors
- Power and data flow indicator for troubleshooting
- Power requirement: +10 to +30 V_{DC}
- Mounts easily on DIN-rail or panel

For more information on this and other Advantech products, please visit our website at:

http://www.advantech.com/eAutomation

For technical support and service:

http://www.advantech.com/support/

This startup manual is for ADAM-4510, 4510S, 4520.
Part No. 2003452014 Edition 9
March 2022

Overview

ADAM-4520 transparently converts RS-232 signals into RS-422 or RS-485. ADAM-4510/4510S amplifies existing RS-485 signals.

Intelligent RS-485 Control

ADAM-4510, 4510S, and 4520 automatically senses the direction of the data flow and switches transmission direction.

Isolation (ADAM-4510S/4520 only)

ADAM-4510S and 4520's Opto-isolators provide 3000 V_{DC} isolation to protect the host computer from ground loops and voltage spikes.

Surge Protection

ADAM-4510/4510S and 4520 offer internal surge-protection on their data lines. Internal high speed transient suppressors on each data line protect the modules from dangerous voltages levels or spikes.

Specifications

Common

- **Power Requirements:** Unregulated +10 to +30 V_{DC}
- **Case:** ABS+PC with captive mounting hardware
- **Accessories (supplied):** DIN-rail mounting adapter, panel mounting bracket
- **Plug-in screw terminal wiring:** Accepts AWG 1-#12 to #22 (0.5 to 2.5 mm)
- **Operating Temperature:** -10~70°C (14~158° F)
- **Storage Temperature:** -25 ~ 85°C (-13~185° F)
- **Humidity:** 5 ~ 95%, non-condensing

ADAM-4510/4510S

- **Baudrate (bps):** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RS-422 (switchable)
- **Isolation Voltage:** 3000 V_{DC} (4510S only)
- **RS-422/RS-485 Interface:** plug-in screw terminal
- **Power Consumption:**
  - ADAM-4510
    Typical: 1.1 W @ 24 V_{DC}
    Max.: 1.2 W @ 24 V_{DC}
  - ADAM-4510S
    Typical: 1.5 W @ 24 V_{DC}
    Max.: 1.6 W @ 24 V_{DC}

Specifications (Cont.)

ADAM-4520

- **Baudrate (bps):** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 mode (switchable) Isolation Voltage: 3000 V_{DC} (4520 only)
- **RS-232 Interface:** Female DB-9
- **RS-422/RS-485 Interface:** Plug-in screw terminal
- **Power Consumption:**
  Typical: 0.8 W @ 24 V_{DC}
  Max.: 1 W @ 24 V_{DC}

Switch Setting

Intelligent RS-485 Control

DIP switches in the ADAM converter and repeater modules set the data format (number of bits) and baudrate for the ADAM network. You need to unpack ADAM module case to see the switches and jumpers. Your program and the PC's serial port should match the setting on the converter and repeater modules. When you change the setting on the converter or repeater module, please remember to change the data format or baudrate for all the connected modules accordingly.

SW1

Switch 1 controls the data format. Data can be 9, 10, 11 or 12 bits. The factory default is 10 bits: one start bit, eight data bits, no parity bit and one stop bit.

When using the converter in combination with other ADAM modules, do not change the default setting as ADAM modules have a fixed data format of ten data bits. The option of changing to 9, 11 or 12 bits is for use with other modules that have different data formats.

SW2

Switch 2 sets the baudrate. The options range from 1200 bps to 115.2 kbps. The default is 9600 bps. If the RS-422 mode is ON, the rate doesn't need to be set.

Default Settings

Since these modules are not addressable by the host computer, the baud rate and data format must be set using SW1 and SW2 located inside the module.

The default settings are:

Function	Setting
Baud rate	9600 bps
Data format	10 bits

Switch Settings (Cont.)

Data Format Settings (SW1)

9 bits	
10 bits (default)	
11 bits	
12 bits	

ADAM-4510/4510S

Data Flow Direction Indicator		LED Status
RS-485	Idle	Green
	DATA0 → DATA1	Dark
	DATA0 ← DATA1	Red
RS-422	Idle	Green
	Tx 0 → Rx 1	Dark
	Rx 0 ← Tx 1	Green+Red

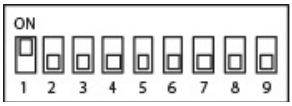
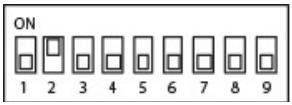
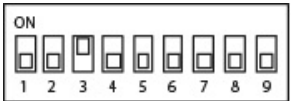
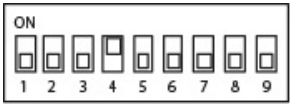
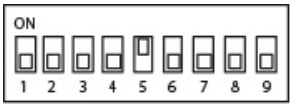
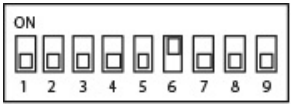
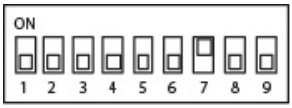
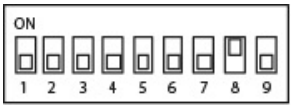
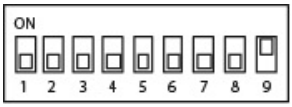
Refer to: Figure 2 ADAM-4510/4510S Connection Diagram

ADAM-4520

Data Flow Direction Indicator		LED Status
RS-485	Idle	Green
	RS-232 → RS-485	Dark
	RS-485 → RS-232	Red
RS-422	Idle	Dark
	RS-232 → RS-422	Green
	RS-422 → RS-232	Red

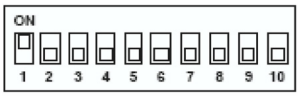
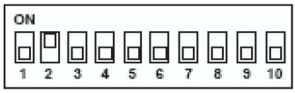
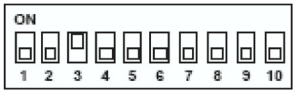
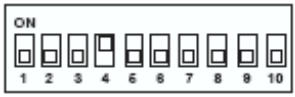
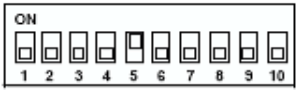
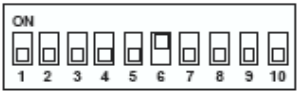
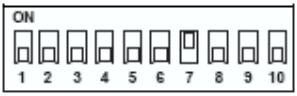
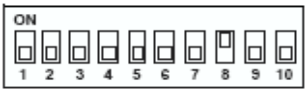
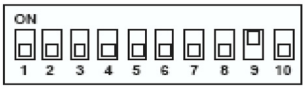
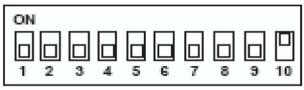
Switch Setting (Cont.)

ADAM-4510/4510S Repeater Module

1200 bps	
2400 bps	
4800 bps	
9600 bps (Default)	
19.2 kbps	
38.4 kbps	
57.6 kbps	
115.2 kbps	
RS-422	

Switch Setting (Cont.)

ADAM-4520 Converter Module

RTS Control	
1200 bps	
2400 bps	
4800 bps	
9600 bps (Default)	
19.2 kbps	
38.4 kbps	
57.6 kbps	
115.2 kbps	
RS-422	

Switch Setting (Cont.)

Terminal Resistance Settings (CN3~ CN6)

ADAM-4510/4510S Repeater Module

	RS-485 Communication		RS-422 Communication	
Jumper	120 ohm	Floating	120 ohm	Floating
CN3	Pin 1-2 Short	Pin 2-3 Short	Pin 1-2 Short	Pin 2-3 Short
CN4	-	-	Pin 1-2 Short	Pin 2-3 Short
CN5	Pin 1-2 Short	Pin 2-3 Short	Pin 1-2 Short	Pin 2-3 Short
CN6	-	--	Pin 1-2 Short	Pin 2-3 Short

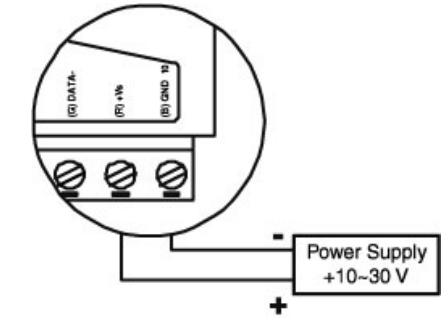
The default settings of CN3~CN6 are Pin 2-3 short.

Application Wiring

Power Supply

ADAM-4510/4510S Repeater Module

ADAM modules are designed to accept industry standard +24 VDC unregulated power. Operation is guaranteed when using any power supply between +10 and +30 V_{DC}. Power ripples must be limited to 200 mV peak to peak while the voltage in all cases must be maintained between +10 to +30 V_{DC}. All power supply specifications are referenced at 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:
(R) + Vs -> Red

(B) GND -> Black

Application Wiring (Cont.)

Communication Wiring

We recommend that shielded-twisted-pair cables that comply with the EIA RS-485 standard be used with the ADAM network to reduce interference. Only one set of twisted-pair cables is required to transmit both data and RTS signals. We advise that the following standard colors (as indicated on the modules) be used for the communication lines:

DATA + -> Yellow

DATA - -> Green

Basic Configuration Hook-up

Before placing a module in an existing network, the module should be properly configured. The two following diagrams show typical layouts for both modules.

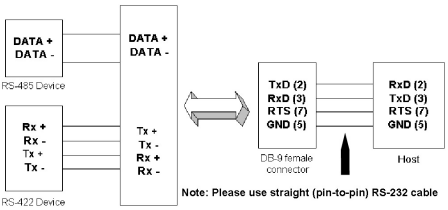


Figure 1 ADAM-4520 Connection Diagram

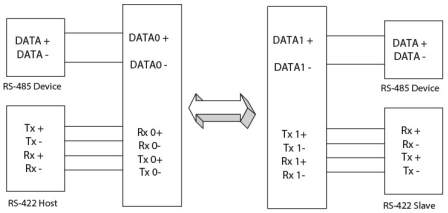
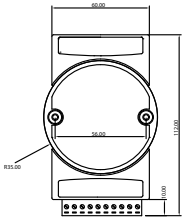
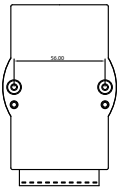


Figure 2 ADAM-4510/4510S Connection Diagram

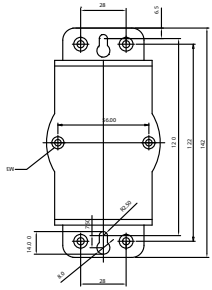
ADAM Dimensions



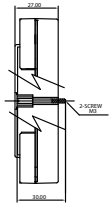
Front View



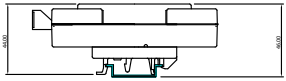
Rear View



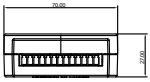
Panel Mounting Bracket



Side View



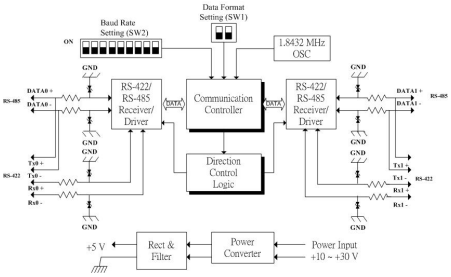
Din-Rail Mounting Adapter



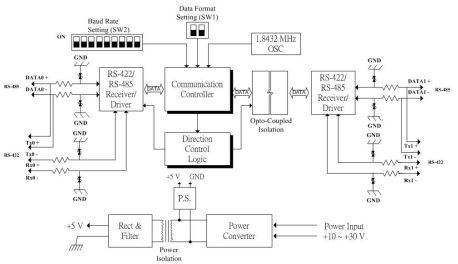
Top View

Function Diagrams

ADAM-4510 Repeater



ADAM-4510S Repeater



ADAM-4520 Converter

