

ADAM-6521 Series

**Industrial Switches with 4
10/100 Mbps Ethernet Ports
and 1 Fiber Port**

User Manual

Copyright

The documentation and the software included with this product are copyrighted 2006 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

This Manual Covers the Following Models

- ADAM-6521
- ADAM-6521S
- ADAM-6521/ST

Product Warranty (2 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

- Step 1. Visit the Advantech web site at **www.advantech.com/support** where you can find the latest information about the product.
- Step 2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Contents

Chapter	1	Overview	2
	1.1	Introduction	2
	1.2	Features	3
	1.3	Specifications	4
	1.4	Ordering Information	5
Chapter	2	Installation	8
	2.1	LED Indicators	8
		Table 2.1:LED Indicator Legend	8
	2.2	Dimensions (units:mm)	9
		Figure 2.1:Bottom	9
		Figure 2.2:Top	9
		Figure 2.3:Front	9
	2.3	Mounting the Module.....	10
	2.3.1	Choosing a Mounting Method	10
		Figure 2.4:Wall Mounting	10
		Figure 2.5:Attaching DIN Rail Bracket	11
		Figure 2.6:Piggyback Stacking	11
	2.4	Connections.....	12
	2.4.1	Connection to the Devices	12
	2.4.2	Connection to Other Hubs or Switches	12
	2.4.3	Connection to a Fiber Network	12
	2.4.4	Power Connection	13
		Figure 2.7:Power Wiring	13

Overview

This chapter gives an overview of ADAM-6521 modules.

Sections include:

- Introduction
- Features
- Specifications
- Ordering Information

Chapter 1 Overview

1.1 Introduction

The ADAM-6521 series consists of industrial-grade 10/100 Mbps Ethernet switches with fiber ports that make it possible to expand industrial networks fast and cost-effectively. In addition to four 10/100 Mbps Ethernet ports with RJ-45 connector, ADAM-6521 also provide one multi-mode fiber optic port, while ADAM-6521S provides one single-mode fiber optic port with a SC-type connector. Using fiber optics, you can prevent noise from interfering with your system and support high-speed (100 Mbps) and long-distance (ADAM-6521: 2km; ADAM-6521/ST: 2km; ADAM-6521S: 15km) transmissions.

ADAM-6521 modules can accept a input voltage range from +10 to 30 V_{DC} to the terminal block. In addition, the operating temperature is from -10 to 65° C. The above functions make the ADAM-6521 modules more stable and reliable, so they are especially suitable for industrial environments that require Ethernet networking, such as: semiconductor factories, warehouses, industrial conveyor systems and more.

High-Speed Transmission

ADAM-6521 modules have a switch controller that can automatically sense transmission speeds (10/100 Mbps). The RJ-45 interface can also be auto-detected, so MDI or MDI-X is automatically selected and a crossover cable is not required. All ports have memory buffers that support the store-and-forward mechanism. This assures that data is properly transmitted.

Flexible Mounting

Due to its versatility and innovative design, ADAM-6521 modules can be fixed in three ways: DIN rail, panel and piggyback mounting.

Advanced Protection for Power line

The power line of ADAM-6521 modules supports up to 3000 V_{DC} surge protection (EFT), which secure equipment against unregulated voltage and make systems safer and more reliable.

Easy Troubleshooting

There are 6 LED indicators supplied that aid troubleshooting for ADAM-6521 modules. Each port has a pair of LEDs to indicate link status and port activity. This makes it easy to monitor collisions, link status, power failure and data reception for on-site diagnostics.

1.2 Features

- Provides 4 x 10/100 Mbps Ethernet ports with RJ-45 connector
- Provides 1 x 100 Mbps multi/single-mode fiber port with SC/ST connector
- Supports full/half duplex flow control
- Supports MDI/MDI-X auto crossover
- Provides broadcast storm protection
- Embedded with a switch controller, supports auto-negotiation
- Embedded with the memory buffer, supports store-and-forward transmission
- Supports +10 ~ 30 V_{DC} voltage
- Provides surge protection (EFT) 3000 V_{DC} for power line
- Supports ESD protection 4000 V_{DC} for Ethernet Ports
- Provides flexible mountings: DIN rail, stack, panel mounting
- Supports operating temperature: -10 ~ 65° C
- 64 KB of SRAM on chip for frame buffering
- Integrated address Look-Up Engine, supports 1K absolute MAC addresses

1.3 Specifications

Communications

Standard	IEEE 802.3, IEEE 802.3u, 802.3x
LAN	10/100Base-T, 100Base-FX
Transmission Distance	Ethernet: 100 m Fiber: ADAM-6521: 2 km ADAM-6521/ST: 2km ADAM-6521S: 15 km
Transmission Speed	Ethernet: up to 100 Mbps Fiber: 100 Mbps

Interface

Connectors	4 x RJ-45, 1 x SC type fiber connector (ADAM-6521, ADAM-6521S) or 1 x ST type fiber connector (ADAM-6521/ST)
LED Indicators	Power, Link (100Base-FX), 100/10M (Ethernet)

Power

Power Connectors	2-pin removable screw terminal
Power Consumption	ADAM-6521: Max. 3 W ADAM-6521/ST: Max. 3 W ADAM-6521S: Max. 4 W
Power Input	Unregulated 10 ~ 30 V _{DC}

Mechanism

Dimensions (W x H x D)	70 x 112 x 27 mm
Enclosure	IP30, ABS+PC with solid mounting kits
Mounting	DIN 35 rail, stack, wall

Protection

ESD Protection	4,000 V _{DC} (Ethernet)
Surge Protection (EFT)	3000 V _{DC} (Power)

Environment

Operating Temperature	-10~65°C (14~149°F), Stack : -10~60°C (14~140°F)
Storage Temperature	-20~80° C (-4~176°F)
Operating Humidity	20 ~ 95% (non-condensing)
Storage Humidity	0 ~ 95% (non-condensing)
MTBF	1,150,000 hrs

Certifications

Safety	UL 60950-1, CAN/CSA-C22.2 No.60950
EMC	U.S.A.: FCC Part 15 CISPR 22 EU: EN55011, EN55022 Class A, EN61000-3-2/3, EN55024 IEC61000-4-2/3/4/5/6/8/11

1.4 Ordering Information

- **ADAM-6521**
Industrial Switch with 4 10/100 Mbps Ethernet Ports & 1 Multi-mode SC Type Fiber Optic Port
- **ADAM-6521/ST**
Industrial Switch with 4 10/100 Mbps Ethernet Ports & 1 Multi-mode ST Type Fiber Optic Port
- **ADAM-6521S**
Industrial Switch with 4 10/100 Mbps Ethernet Ports & 1 Single-mode SC Type Fiber Optic Port

Installation

In this chapter, you will be given an overview of the ADAM-6521 series hardware installation procedure.

Sections include:

- LED Indicators
- Dimensions
- Mounting the Module
- Connections

Chapter 2 Installation

2.1 LED Indicators

There are six network status LEDs located on the top panel of the ADAM-6521 modules. Their meaning is displayed in Table 2.1 below.

Table 2.1: LED Indicator Legend			
LED Indicator	Color	Status	Description
Power	Green	On	Power is on
	Green	Off	Power is off
Link (100BASE-FX)	Green/ Orange	On	Connected to network
	Green/ Orange	Flashing	Networking is active
	Green/ Orange	Off	Not connected to network
100/10M (Ports 1 to 4)	Green (Link)	On	Connected to network
	Green (Link)	Flashing	Networking is active
	Green (Link)	Off	Not connected to network
	Orange (Speed)	On	Link to 100 Mbps network
	Orange (Speed)	Off	Link to 10 Mbps network

2.2 Dimensions (units:mm)

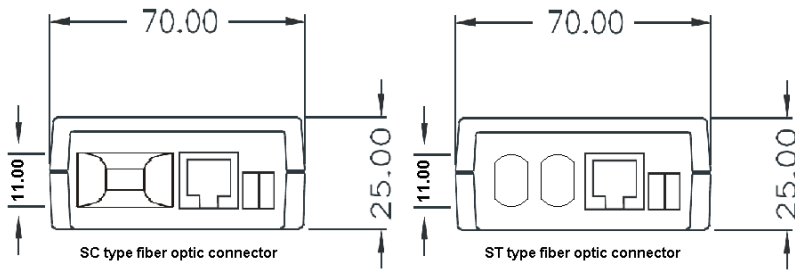


Figure 2.1: Bottom

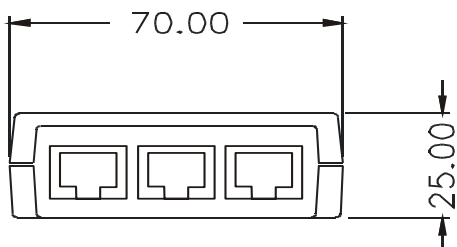


Figure 2.2: Top

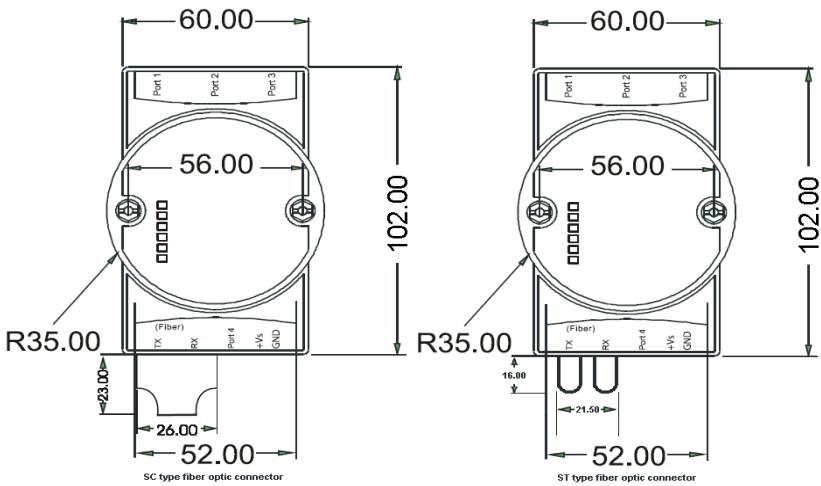


Figure 2.3: Front

2.3 Mounting the Module

2.3.1 Choosing a Mounting Method

Due to its versatile and innovative design, the ADAM-6521 modules can be:

- Fixed to a wall
- Fixed to a DIN Rail
- Piggyback Stacked

Panel Mounting

ADAM-6521 modules can be attached to a wall using the included brackets. Each bracket comes with four screws; first attach the bracket to the bottom of the ADAM-6521 module. Next, screw the bracket to the wall.

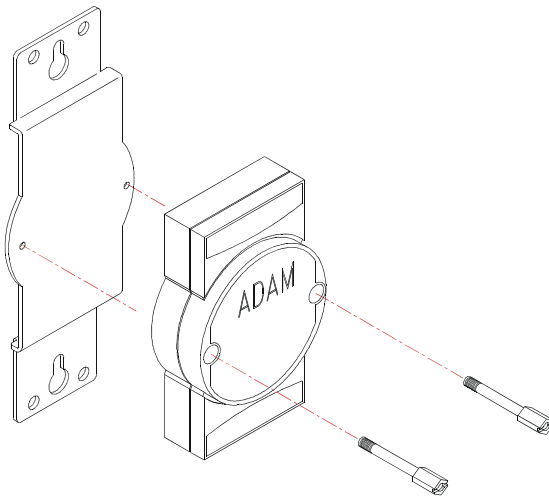


Figure 2.4: Wall Mounting

DIN-rail Mounting

You can mount ADAM-6521 modules on a standard 35 mm DIN-rail. First, use two screws to attach the DIN-rail bracket to the ADAM module. Because ADAM-6521 modules use special hex head slotted shoulder screws, the tops of the screws will be even with the front of the module. Snap the module onto the DIN-rail.

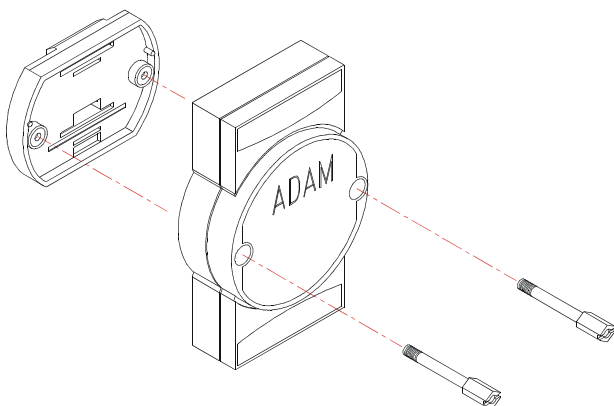


Figure 2.5: Attaching DIN Rail Bracket

Piggyback Stack

Several ADAM-6521 modules can be stacked as seen in the figure below.

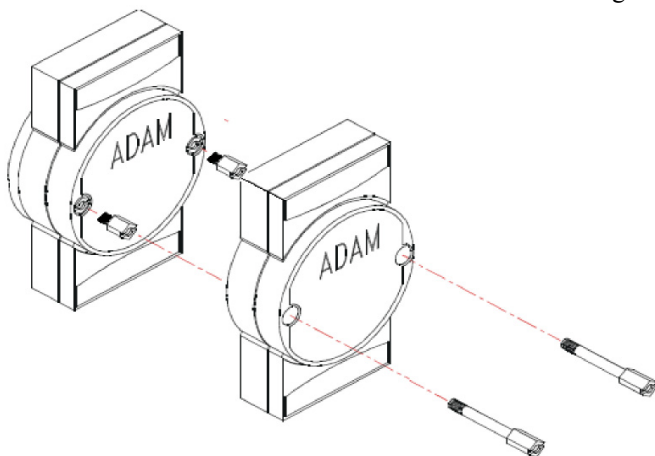


Figure 2.6: Piggyback Stacking

2.4 Connections

2.4.1 Connection to the Devices

ADAM-6521 modules have one fiber and four RJ-45 ports. Each of the switch's twisted-pair ports can be used to connect a station or other devices. Use a straight-through twisted-pair cable with RJ-45 connectors on both ends. The twisted-pair cable extended from a twisted-pair port is called a “twisted-pair segment,” and it can be up to 100 meters long. You can connect any RJ-45 (MDI-X) station port on the switch to any device that uses a standard network interface such as a workstation or server.

2.4.2 Connection to Other Hubs or Switches

ADAM-6521 modules have four RJ-45 ports that support connection to 10Mbps Ethernet or 100Mbps Fast Ethernet, and half or full-duplex operation. ADAM-6521 modules can be connected to other hubs or switches via a two-pair straight-through cable or crossover cable. The connection can be made from any port on ADAM-6521 modules (MDI-X) to other hubs or switches either by either an MDI-X port or uplink MDI port.

ADAM-6521 modules support auto crossover to make networking easier and more flexible. You can connect any RJ-45 (MDI-X) station port on the switch to any device such as a switch or a bridge or router .

2.4.3 Connection to a Fiber Network

Connect to a fiber network segment with a two strand fiber. All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II.

With fiber optic transmissions you can reach speeds up to 100 Mbps, you can block all noise interference from the system, and the transmission distance goes up to 2km for multi-mode fiber, or 15km for single-mode fiber.

Note	<i>Please use the dust cover that was shipped with your ADAM-6521 modules on the fiber-optic port if it is not being used.</i>
------	--

2.4.4 Power Connection

You should take the following steps to connect ADAM-6521 modules to a power supply.

1. Connect the power cable to a 2-pin connector.
2. Connect the power cable to a power adapter.

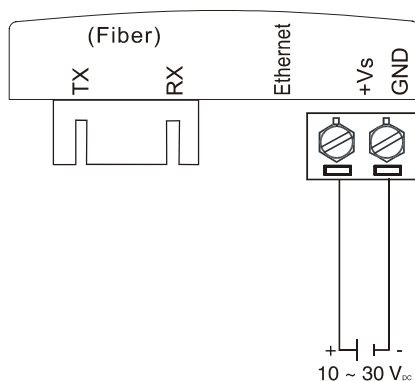


Figure 2.7: Power Wiring

