

# **ADAM-6520**

**5-Port Industrial 10/100 Mbps  
Ethernet Switch**

**User Manual**

## **Copyright**

The documentation and the software included with this product are copyrighted 2005 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-6520
- ADAM-6520I
- ADAM-6520L

Part No. 2003652013

5th Edition

Printed in Taiwan

May 2006

## **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 merchandise 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.

## **Declaration of Conformity**

### **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](http://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](mailto:support@advantech.com)

# Contents

<b>Chapter 1</b>	<b>Overview .....</b>	<b>2</b>
1.1	Introduction .....	2
1.1.1	High-Speed Transmission .....	2
1.1.2	Flexible Mounting .....	2
1.1.3	Protection for Power Line & Ethernet Port .....	2
1.1.4	Wide Operating Temperature Range .....	3
1.1.5	Easy Troubleshooting .....	3
1.2	Features .....	3
1.3	Specifications .....	4
1.4	Ordering Information .....	5
<b>Chapter 2</b>	<b>Installation .....</b>	<b>8</b>
2.1	Packing List.....	8
2.2	Top / Front / Rear View .....	9
2.2.1	Dimensions (units:mm) .....	9
	Figure 2.1:Top View .....	9
	Figure 2.2:Front Panel .....	9
	Figure 2.3:Rear View .....	9
2.3	LED Indicators .....	10
	Table 2.1:ADAM-6520 Module LED Definitions .....	10
2.4	Mounting .....	11
	Figure 2.4:Panel Mounting .....	11
	Figure 2.5:DIN Rail Mounting .....	12
	Figure 2.6:Piggyback Stacking .....	12
2.5	Network Connection .....	13
2.5.1	Connection to Devices .....	13
2.5.2	Connection to other Hubs or Switches .....	13
2.6	Power Connection .....	13



## Overview

This chapter gives an overview of the ADAM-6520 series' features and full specifications.

Sections include:

- Introduction
- Features
- Specifications
- Ordering Information

# Chapter 1 Overview

## 1.1 Introduction

---

ADAM-6520 modules are a 5-port industrial-grade 10/100 Mbps Ethernet switch for fast and cost-efficient network expansion. They connect up to 5 workstations and auto-detect both 10 and 100 Mbps network speeds. Moreover, ADAM-6520 modules support auto crossover to provide a flexible networking environment, connecting to the network via any port.

ADAM-6520 modules provide three methods for mounting in an industrial environment: DIN rail, wall/panel, or piggyback stacking. ADAM-6520 modules have a flexible input voltage range of +10~30 V<sub>DC</sub> at the terminal block. ADAM-6520 operates from -10~70° C and ADAM-6520L from 0~60° C, while ADAM-6520I is from -40 to 85° C. The above features make ADAM-6520 modules more stable and reliable than normal Ethernet switches. Thus, ADAM-6520 modules are especially suitable for industrial environments with Ethernet networking like: semiconductor factories, warehouses, conveyer belt systems and more.

### 1.1.1 High-Speed Transmission

ADAM-6520 modules include a switch controller that automatically senses transmission speeds (10/100 Mbps). RJ-45 interface also supports auto-detection, so MDI or MDI-X is automatically selected and a crossover cable is not required. All Ethernet ports have memory buffers that support the store-and-forward mechanism, assuring that data is properly transmitted.

### 1.1.2 Flexible Mounting

Due to its versatility and innovative design, ADAM-6520 modules can be fixed in three ways: DIN rail, panel and piggyback mounting.

### 1.1.3 Protection for Power Line & Ethernet Port

The power line of ADAM-6520 modules support supports up to 3000 V<sub>DC</sub> surge protection, which secure equipment against unregulated voltage and make systems safer and more reliable. Meanwhile, 4000 V<sub>DC</sub> ESD protection for the Ethernet ports makes ADAM-6520 modules (not including ADAM-6520L) more suitable for harsh environments.



### 1.1.4 Wide Operating Temperature Range

The operating temperature of ADAM-6520 is from -10~70° C, and ADAM-6520L is from 0~60° C, while ADAM-6520I offers a very wide range from -40 to 85° C. With such wide ranges you can use ADAM-6520 modules in some of the harshest industrial environments that exist.

### 1.1.5 Easy Troubleshooting

There are six LED indicators supplied to aid troubleshooting for ADAM-6520 modules. Besides one common collision LED, each port has a pair of LEDs to indicate link status and port activity. That makes it easy to indicate collisions, link status, power failure and data reception for on-site diagnostics.

## 1.2 Features

---

- Provides 5 x 10/100 Mbps Ethernet ports with RJ-45 connector
- Supports full/half duplex flow control
- Supports MDI/MDI-X auto crossover
- Provides broadcast storm protection
- Embedded switch controller, supports auto-negotiation
- Embedded memory buffer, supports store-and-forward transmission
- Supports +10 ~ 30 V<sub>DC</sub> voltage
- Provides 3000 V<sub>DC</sub> surge protection for power line
- Provides 4000 V<sub>DC</sub> Ethernet ESD protection (except ADAM 6520L)
- Provides flexible mountings: DIN rail, panel, piggyback stacking
- Supports wide-range operating temperature
- 64 KB of SRAM on chip for frame buffering (ADAM-6520L: 48KB)
- Integrated address Look-Up Engine, supports 1K absolute MAC addresses (ADAM-6520L: 2K)

# 1.3 Specifications

---

## Communications

<b>Standard</b>	IEEE 802.3, IEEE 802.3u
<b>LAN</b>	10/100Base-TX
<b>Transmission Distance</b>	100 m
<b>Transmission Speed</b>	up to 100 Mbps

## Interface

<b>Connectors</b>	5 x RJ-45
<b>LED Indicators</b>	Power, Link/Speed

## Power

<b>Power Connectors</b>	2-pin removable screw terminal
<b>Power Consumption</b>	ADAM-6520L: Max. 3W ADAM-6520/6520I: Max. 2.4W
<b>Power Input</b>	Unregulated 10 ~ 30 V DC

## Mechanism

<b>Dimensions (WxHxD)</b>	70x102x27 mm
<b>Enclosure</b>	IP30, ABS+PC with solid mounting kits
<b>Mounting</b>	DIN 35 rail, stack, wall

## Protection

<b>ESD Protection</b>	4,000 V DC (Ethernet) (ADAM-6520/6520I only)
<b>Surge Protection (EFT)</b>	3000 V DC (Power)

## Environment

<b>Operating Temperature</b>	ADAM-6520 : -10~70° C (14 ~ 158° F), Stack : -10 ~ 60° C (14 ~ 140° F) ADAM-6520L:-10 ~ 60° C (14~140° F) Stack:-10~55° C (14 ~ 131° F) ADAM-6520I: -40~85°C(-40~185° F), Stack : -40 ~ 75° C (-40 ~ 167° F)
<b>Storage Temperature</b>	ADAM-6520/ADAM-6520L : -20~80° C (-4 ~ 176° F) ADAM-6520I: -50~95°C(-58~203°F)
<b>Operating Humidity</b>	20 ~ 95% (non-condensing)
<b>Storage Humidity</b>	0 ~ 95% (non-condensing)
<b>MTBF</b>	1,580,000 hrs

## Certifications

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

## 1.4 Ordering Information

---

- **ADAM-6520** 5-Port Industrial 10/100 Mbps Ethernet Switch
- **ADAM-6520I** 5-Port Industrial 10/100 Mbps Ethernet Switch w/  
Wide Operating Temp.
- **ADAM-6520L** 5-Port Industrial 10/100 Mbps Unmanaged Ethernet  
Switch



## Installation

In this chapter, you will be given an overview of the ADAM-6520 series hardware installation procedure.

Sections include:

- Packing List
- Top / Front / Rear View
- LED Indicators
- Connecting the Hardware
- Network Connection
- Power Connection

# Chapter 2 Installation

## 2.1 Packing List

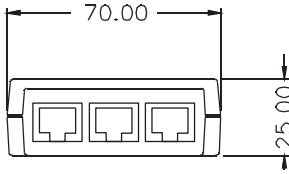
---

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

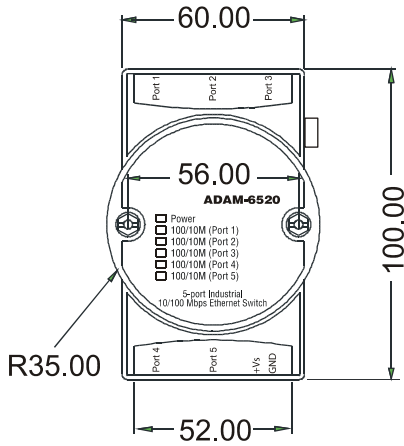
- 1 x ADAM-6520
- 1 x INET CD-ROM
- 1 x DIN rail mounting kit
- 1 x Panel mounting bracket

## 2.2 Top / Front / Rear View

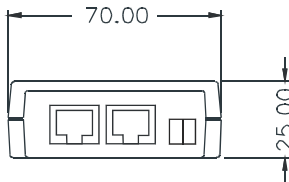
### 2.2.1 Dimensions (units:mm)



**Figure 2.1: Top View**



**Figure 2.2: Front Panel**



**Figure 2.3: Rear View**

## 2.3 LED Indicators

---

There are six network status LEDs located on the top panel of ADAM-6520 modules, one for power, and one for each of the network ports.

**Table 2.1: ADAM-6520 Module LED Definitions**

<b>LED</b>	<b>Color</b>	<b>State</b>	<b>Description</b>
Power	Green	On	Power is on
		Off	Power is off
Link/Speed (Port 1 ~5)	Green (link)	On	Connect to network
		Flashing	Networking is active
		Off	Disconnected from network
	Orange (speed)	On	Link to 100 Mbps network
		Off	Link to 10 Mbps network



## 2.4 Mounting

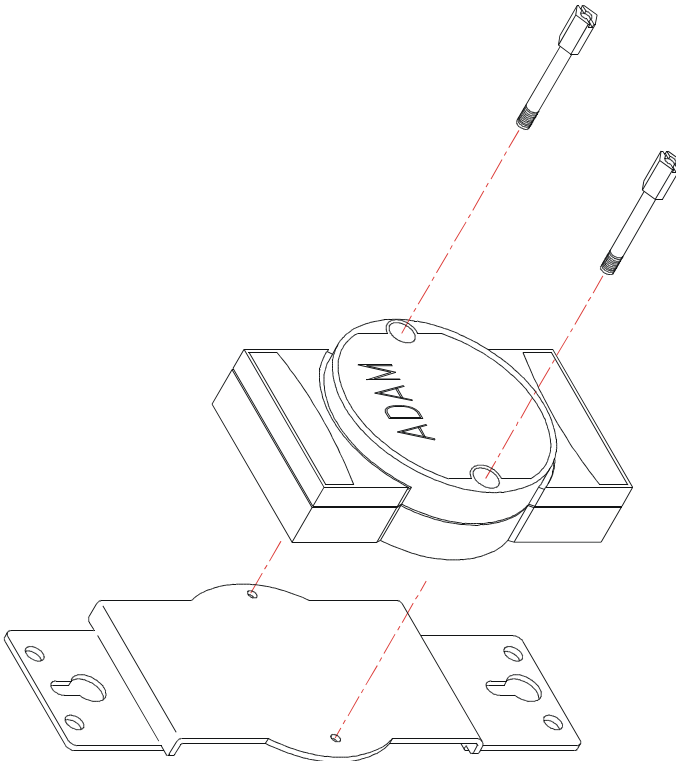
---

Through versatility and innovative design, ADAM-6520 modules can be:

- Fixed to a wall or panel
- Fixed to a DIN Rail.
- “Piggyback” stacked

### Panel Mounting

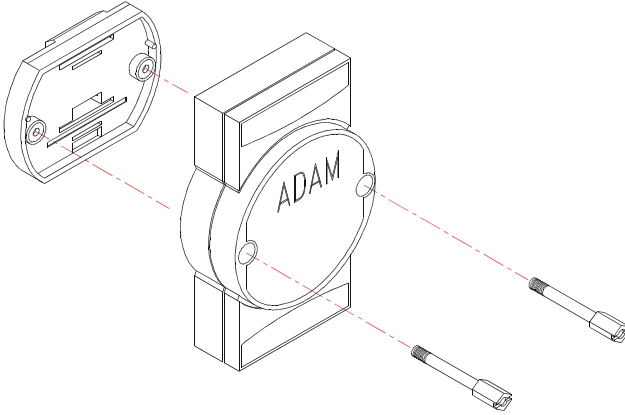
ADAM-6520 modules can be attached to a wall using the included brackets. Each bracket comes with four screws; first attach the bracket to the bottom of ADAM-6520 modules. Next, screw the bracket to the wall.



*Figure 2.4: Panel Mounting*

## DIN Rail Mounting

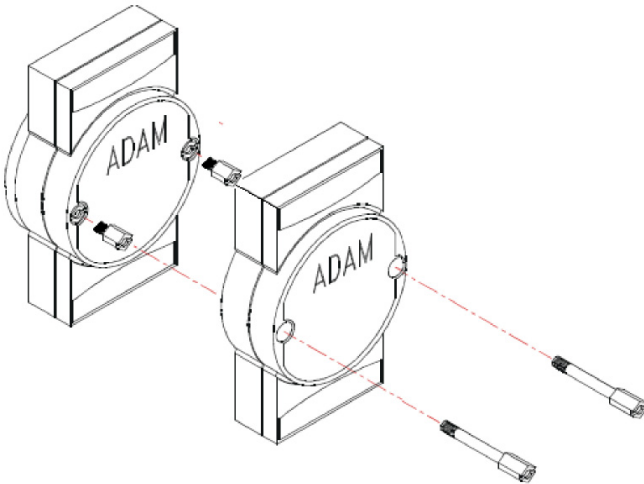
You can mount ADAM-6520 modules on a standard 35 mm DIN Rail. First, use two screws to attach the DIN rail bracket to the ADAM-6520 modules. Because ADAM-6520 modules use special hex head slotted shoulder screws, the tops of the screws will be even with the front of the module. Snap the module onto the DIN rail.



*Figure 2.5: DIN Rail Mounting*

## Piggyback Stack

Several ADAM-6520 modules can be stacked as seen in the figure below



*Figure 2.6: Piggyback Stacking*

## 2.5 Network Connection

---

### 2.5.1 Connection to Devices

Each of the switch's twisted-pair ports can be used to connect to a controller 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". 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.

### 2.5.2 Connection to other Hubs or Switches

ADAM-6520 modules have five RJ-45 ports that support connections to 10 or 100 Mbps Ethernet networks, and half or full-duplex operation. ADAM-6520 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-6520 modules (MDI-X) to other hubs or switches by either their MDI-X port or uplink MDI port.

ADAM-6520 modules support auto-crossover, so each port allows you to connect switches together and expand an existing network easily using either straight through or a crossover Ethernet cable. You can connect any RJ-45(MDI-X) port on the switch to a device like a switch, bridge or router.

## 2.6 Power Connection

---

Follow these simple steps to connect ADAM-6520 to power supplies.

1. Connect the power cable to the two connectors.
2. Connect the power cable to a power adapter.

