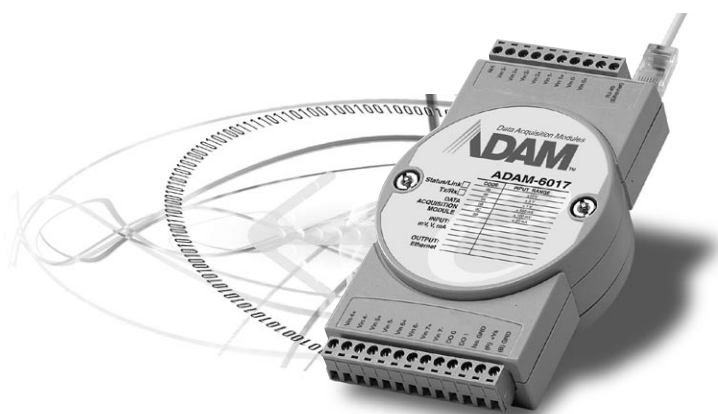


Smart Web Ethernet I/O Modules ADAM-6000 Series

| | | |
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ADAM-6000 Series



Features

- Ethernet-based smart I/O
- Mixed I/O in single module
- Pre-built HTTP server and web page in each module for data/ alarm monitoring
- User-defined web pages
- Active alarm/event handling
- Industrial Modbus/TCP protocol
- Remote F/W upgrade through the internet
- Pre-built mathematic functions in analog input modules

The Path to Seamless Integration

The integration of automation and enterprise systems require a change in the architecture of open control systems. From Advantech's point of view, the level of integration between automation and enterprise systems can only be accomplished through Internet technology. The seamless level of integration between plant floor and office floor has not been achieved in all automation systems. However, many enterprises are approaching this goal.

The key element of the seamless integration is a common network architecture, which breaks the traditional layers (enterprise layer, plant information layer, control layer and device level layer, sensor layer) that require a data gateway as an interface to communicate between different layers. Industrial Ethernet is regarded as the most appropriate network to accomplish the task in industrial automation.

It is believed that IP/Ethernet protocols will progress beyond the control layer, into the field layers. Placing remote I/O with IP/Ethernet connections on the shop floor is economical. Advantech believes that over the next five years, Internet protocols over Ethernet will dominate major field connections. The Advantech ADAM-6000 series comprises industrial-grade Ethernet hubs/switches/fiber optics for infrastructure Ethernet solutions in industrial automation environments.

Control Strategy Moves to Field Devices

It is a trend to move I/O to remote locations to reduce wiring costs. Remote I/O is becoming smarter and equipped with control functions as they move from today's 16 to 64 I/O multi-plexers to the smallest remote I/O units, with perhaps as few as four I/O in the near future as shown in Figure 1.

The ADAM-6000 series is designed to realize the concept of the smart I/O blocks. With control algorithms and mathematical functions built in, the ADAM-6000 series is a revolutionary smart I/O module close to the sensor layer in automation.

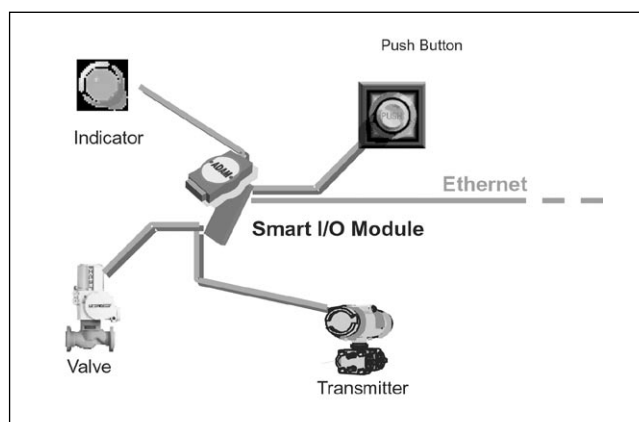


Figure 1: The Future Concept of Smart I/O Blocks

Web-Enabled Technology Becomes Popular on Factory Floors

As Internet technologies and standards have rapidly developed over the past decade, Web-based control methodologies now obviously represent a powerful opportunity for extending efficient network-based management techniques to encompass non-IT real-world assets.

The ADAM-6000 series is equipped with a built-in web server so that its data can be viewed, anytime-anywhere via the Internet. Moreover, ADAM-6000 allows users to configure user-defined web pages to meet the diverse needs in various applications. With this powerful function, the ADAM-6000 series breaks the boundary of traditional multi-layer automation architecture and allows users to access field data directly in real time, which enables seamless integration between the plant floor and the front office.

HMI has provided a friendly operator interface for discrete control and sharply reduced the cost and complexity of automation systems. A web server has been added to most HMI software and a browser allows access to HMI displays from remote locations via the network. The end user is able to see and use an identical HMI from any Internet connected computer anytime, anywhere. ADAM-6000 can be fully integrated with standard HMI software which supports Modbus TCP/IP, including Advantech Studio.

Smart Web Ethernet I/O Modules

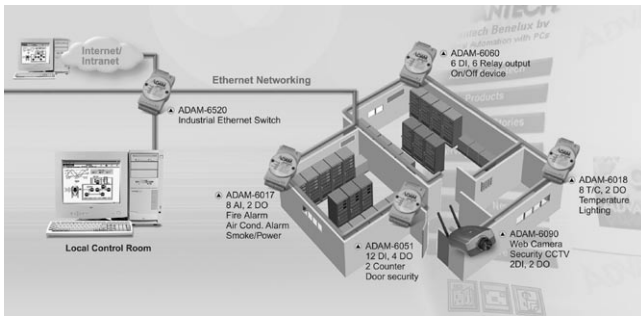


Figure 2: ADAM-6000 Application Architecture

ADAM-6000 Smart Web Ethernet I/O

The integration of automation and enterprise systems and the adoption of an e-manufacturing strategy requires a shift in the manufacturing system architecture. E-manufacturing demands open access to real-time production data from the field. To achieve a seamless level of integration between plant floors and the enterprise level, some fundamental changes have to occur in I/O systems. E-manufacturing means the power of the Internet and I/O systems are used to take things one step further by leveraging Internet technology. These revolutionary I/O systems are web-enabled, smart and are "just-fit" mixed I/O modules. Improvement of the PLC has been gradually moving from logic and I/O in a single chassis, to I/Os in remote locations. The ADAM-6000 series is based on the concept described above.

Why Smart I/O

To meet the requirements of future automation, smart I/O blocks have become popular in I/O system design. To implement the smart I/O blocks concept, I/O systems should be placed as close to the field sensors as possible. Therefore, intelligent control algorithms or basic mathematical functions are essential in I/O systems. ADAM-6000 provides intelligent functions that accelerate future automation development.

Why Web I/O

The Internet is the major technology that allows all levels of an organization to be able to communicate and make the sensor-to-boardroom model a reality. Access can be realized from any device that utilizes a standard web browser, so connections between remote manufacturing plants, production planners, plant managers, and the CEO can be made without having to create a dedicated proprietary network. Since a web page can be installed in the I/O system as a Web I/O, then not only a sensor-to-boardroom model can be practiced, but sensor-to-home, and a sensor-to-mobile display can also be realized. ADAM-6000 Smart Web Ethernet I/O modules provide built-in standard and customizable web pages, which truly demonstrate the power of Web I/O.

Why Mixed I/O

The impact of a tailor-made business model is spreading in automation, and I/O design is no exception. Over the past few years, the average size of PLCs have been reduced by the use of many small and micro PLCs to replace larger PLCs. A compact-sized and application-oriented mixed I/O is the trend. A just-fit mixed I/O module reduces the engineering effort, as well as installation and maintenance cost. It simplifies system architecture and increases system reliability. Obviously the ADAM-6000 series is the perfect choice to meet the specific requirements of many vertical markets.

Common Key Features

1. Industrial Ethernet Networking Based

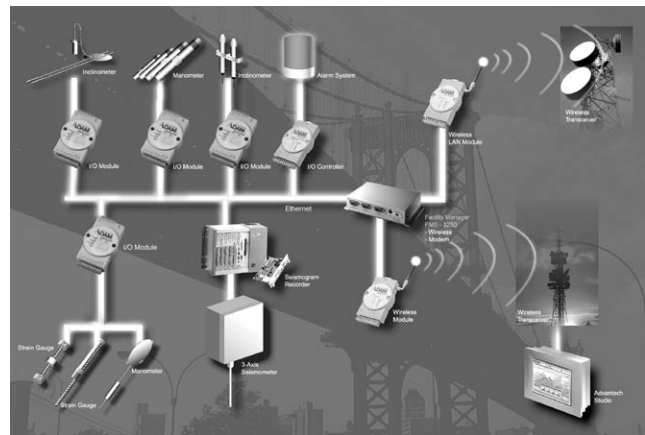
The ADAM-6000 series provides various communication modules such as Ethernet hubs, Ethernet switches and Ethernet switches with fiber ports. ADAM-6000 supports both Modbus/TCP and UDP. Embedded with a 10/100 Mbps Ethernet chip, ADAM-6000 supports industrial Modbus/TCP over TCP/IP networks which are commonly used in most business environments. ADAM-6000 also supports UDP, which allows users to develop their applications and handle events.

2. Smart and Mixed I/O Modules

ADAM-6000 provides built-in mathematical functions, including MAX, MIN, AVG, and others in analog input/output modules. ADAM-6000's mixed I/O modular design optimizes the performance and usage of I/O and minimizes the engineering efforts and maintenance cost.

3. Built-in Standard Web Pages and User-defined Web pages

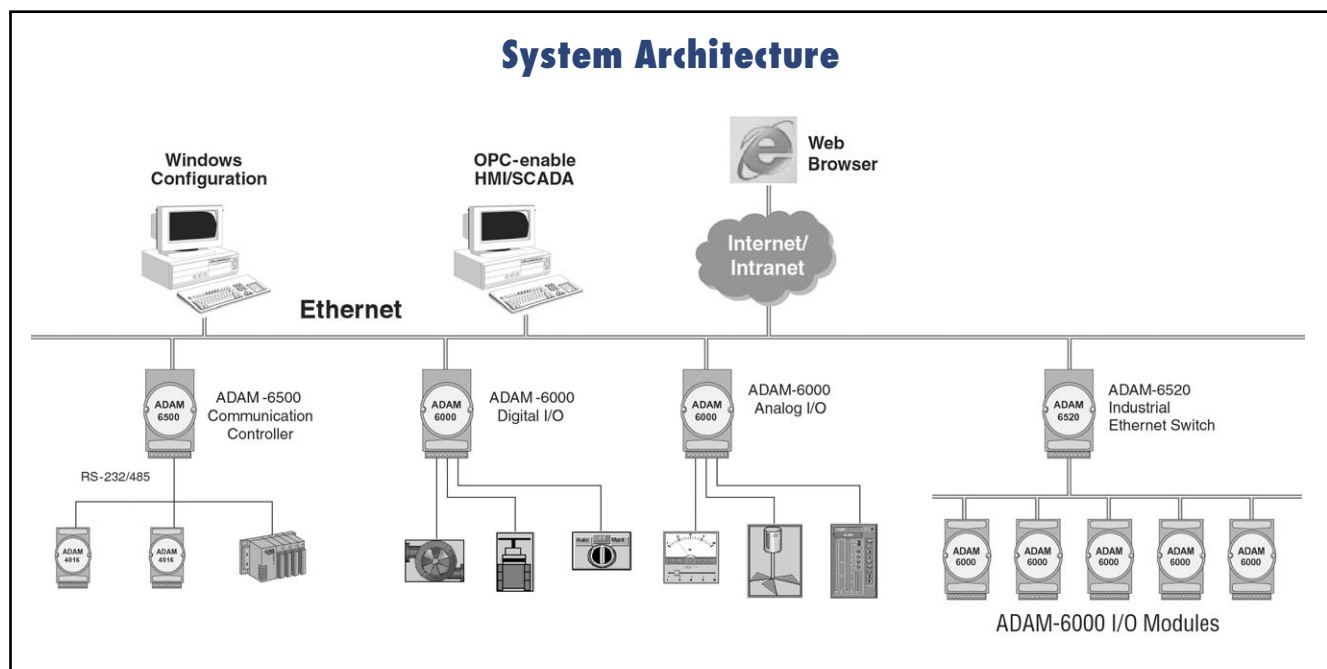
ADAM-6000 adopts web technology to enable remote monitoring via Internet. In addition to standard web pages, ADAM-6000 allows users to use the Java programming language to develop pages to meet their own requirements. ADAM-6000 supports standard HMI software with Modbus/TCP OPC drivers and ActiveX drivers.



ADAM-6000 Application Diagram

| | |
|----|----------------|
| 1 | Software |
| 2 | IPPC |
| 3 | TPC |
| 4 | FPM |
| 5 | ATM & AWS |
| 6 | DA&C |
| 7 | cPCI |
| 8 | ADAM-3000 |
| 9 | Motion Control |
| 10 | ICOM |
| 11 | eConnectivity |
| 12 | UNO |
| 13 | ADAM-4000 |
| 14 | ADAM-5000 |
| 15 | ADAM-6000 |
| 16 | ADAM-8000 |
| 17 | BAS |

ADAM-6000 Series



The ADAM-6000 is a controller independent, distributed I/O solution with modular design for maximum flexibility. Its powerful onboard intelligence makes it well suited to SCADA and stand-alone control applications.

Ethernet-Enabled Networking

The ADAM-6000 series Ethernet-enabled data acquisition and control module works as an Ethernet I/O data processing center. This new product is not only a standard I/O, but also an intelligent system designed with local control functions and a Modbus/TCP standard for users to easily develop various applications over Ethernet.

Analog Input Modules

The ADAM-6000 analog input modules use microprocessor-controlled, high-resolution, 16-bit, sigma-delta A/D converters to acquire sensor signals such as voltage, current, thermocouple or RTD. They translate analog data into two's complement. After the modules receive a request from the host, they send the data in the desired format over the Ethernet network. ADAM-6000 analog input modules protect your equipment from ground loops by providing 3000 V_{DC} isolation. The ADAM-6017 and ADAM-6018 modules feature digital outputs which may also be used for alarms and event counting. The analog input module's two digital output channels are open-collector transistor switches that you can control from the host computer. By switching solid state relays, the output channels can control heaters, pumps and other power equipment. The module can use its digital input channel to sense the state of a remote digital signal.

Programmable Alarm Output

Analog input modules include high and low alarm signals with remotely configurable boundary values. After each A/D conversion, the digital value is compared with the high and low limit. The module can change the state of a digital output depending on the result of this comparison. This function allows it to perform on/off control of a device independently of the host PC.

Independent Channel Input Type Configuration

The ADAM-6015 6-channel RTD module, provides independent channel input type configuration. You can configure PT-100, Pt-1000 or Balco mA for each channel. This independent channel input type configuration gives the ADAM-6015 more flexibility for versatile applications. This functionality saves customers the cost of buying multiple modules and reduces inventory as well.

I/O System Architecture & Product Catagory

Loop Controller Module

The ADAM-6022 offers two analog inputs, two analog outputs, two digital inputs and four digital outputs in one module. The ADAM-6022 is a two loop PID controller. Each loop may be configured as single loop, dual loop ratio, dual loop cascade or single loop with override. An auto tune function is provided to maximize the effectiveness of the control.

Analog Input Modules

The ADAM-6017/6018 are 16-bit, 8-channel analog input modules that provide programmable input ranges on all channels. These modules are an extremely cost-effective solution for industrial measurement and monitoring applications. 3000 V_{DC} optical isolation between the analog input and the modules protects the modules and peripherals from damage due to high input-line voltages.

The ADAM-6018 also supports thermocouple input in combination with the ADAM-6015 7 channels RTD input module. These two modules can offer a complete solution for temperature measurement applications.

Digital Input and Output Modules

The ADAM-6050 features twelve isolated digital input channels and six isolated digital output channels. The outputs are open-collector transistor switches that you can control from the host computer. You can also use the switches to control solid-state relays, which in turn can control heaters, pumps or other power equipment. The host computer can use the module's digital inputs to determine the state of limit switches, safety switches or remote digital signals. The ADAM-6051 provides twelve isolated digital input channels, two isolated digital output channels and two counter channels. All have 5000 V_{RMS} isolation to prevent ground loop effects and prevent damage from power surges on the input lines.

Digital Input

The ADAM-6050 & ADAM-6051 digital input channels provide three operational modes:

- Normal digital input with inverter setting,
- 1 kHz counter with digital filter,
- Hi-to-Lo, Lo-to-Hi latch.

Each digital input channel can set its operational mode independently.

Digital Output

The ADAM-6050 & ADAM-6051 digital output channels also provide three operational modes: normal digital output, pulse output with continuous or burst count mode, Hi-to-Lo, Lo-to-Hi delay. Each digital output channel can set its operational mode independently as well.

Counter/Frequency

The ADAM-6051 offers two 32-bit counter channels and a built-in programmable timer for frequency measurement.

Programmable Alarm Output

The ADAM-6051 modules include two digital output channels for alarm functions. You can set alarm values (32-bit) into the module from your host computer.

Relay Output Module

The ADAM-6060 offers six isolated digital input channels and six isolated relay channels. The digital input channel accepts 10 ~ 30 V_{DC} input. Just like other ADAM modules, the ADAM-6060 relay module is controlled remotely and stores its configuration data in EEPROM. It provides six Form A relay channels with 24 V_{AC} output. This module is excellent for on/off control or low-power switching applications.

12-channels Universal Input/Output Module

The ADAM-6024 offers six analog inputs, two analog outputs, two digital inputs and two digital outputs. This module is especially cost-effective for applications that require various signal type I/O points. The ADAM-6000 series also offers analog output functions.

| | |
|----|----------------|
| 1 | Software |
| 2 | IPPC |
| 3 | TPC |
| 4 | FPM |
| 5 | ATM & AWS |
| 6 | DA&C |
| 7 | cPCI |
| 8 | ADAM-3000 |
| 9 | Motion Control |
| 10 | ICOM |
| 11 | eConnectivity |
| 12 | UNO |
| 13 | ADAM-4000 |
| 14 | ADAM-5000 |
| 15 | ADAM-6000 |
| 16 | ADAM-8000 |
| 17 | BAS |

ADAM-6000 Series

Software Support

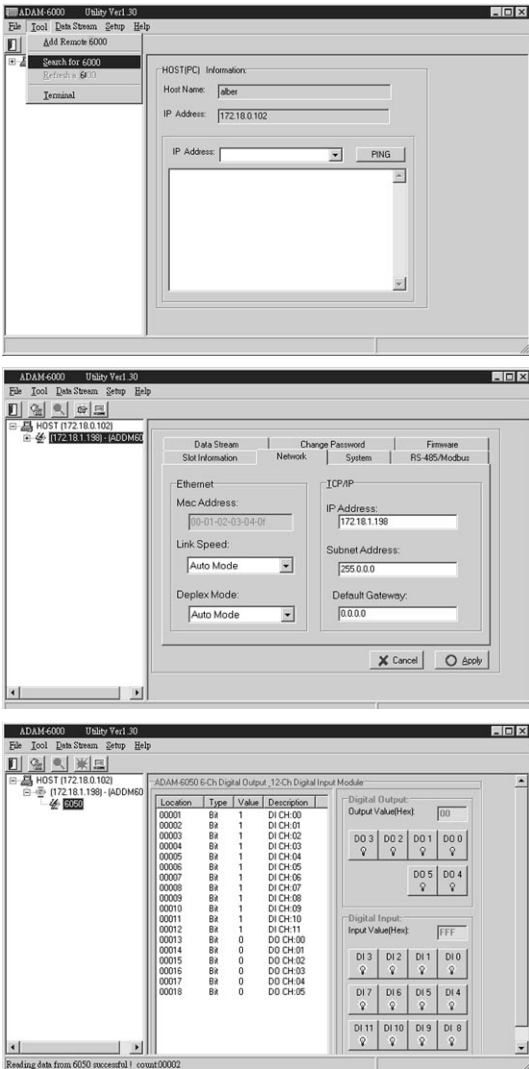
Based on the Modbus/TCP standard, the ADAM-6000 firmware has a built-in Modbus/TCP server. Advantech provides the necessary DLL drivers, OPC Server, and Windows Utility for the ADAM-6000. You can configure this DA&C system via Windows Utility and integrate it with a HMI software package via Modbus/TCP driver or Modbus/TCP OPC Server. Furthermore, you can use the DLL driver to develop your own applications.

Windows Utility

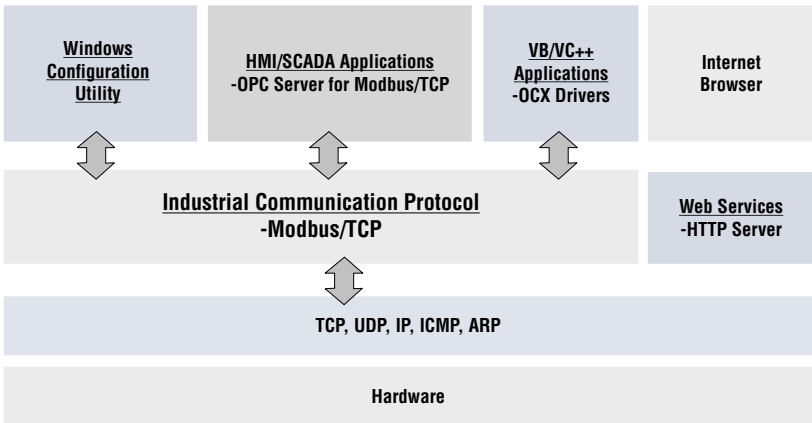
For system configuration, Windows utility offers a friendly operating environment to calibrate I/O modules, monitor current data, set IP addresses etc. As you execute this program, it will automatically search each ADAM-6000 device on the network. There are also some advanced functions, such as the scaling function, which helps users convert various field signals to engineering units, and a latch output function, which forces data or status to create system simulations.

Browser-Based Online Monitoring

Each ADAM-6000 module features an embedded HTTP server for remote monitoring and diagnostics. The ADAM-6000 also pre-builds a default html page in each module for online support for monitoring analog input/output, digital input/output, alarm/event, counter, or real-time values, all done remotely via the Intranet/Internet. Just enter the IP address of the ADAM-6000 module in any standard browser, and you can get dynamic, real-time values of ADAM-6000 I/O modules immediately, without any required programming.



How to Develop Applications



System Configuration & Application Development Tool

Modbus/TCP OPC Server

OPC is a common data exchange tool worldwide. Almost all hardware and software vendors support this standard. Modbus/TCP OPC servers are designed for connecting Modbus devices via the Ethernet. It acquires data from the ADAM-5000/TCP, then links with the OPC client from HMI. In this way, HMI software packages can be used and easily integrated with ADAM Ethernet solutions.

ActiveX Controls

Advantech offers an easy-to-use integration tool, Modbus/TCP ActiveX Controls for ADAM-6000 I/O data access. This can be used for users to develop applications with VB, VC, and other Windows development kits. (Note: The UDP function isn't fully supported in the existing version.)

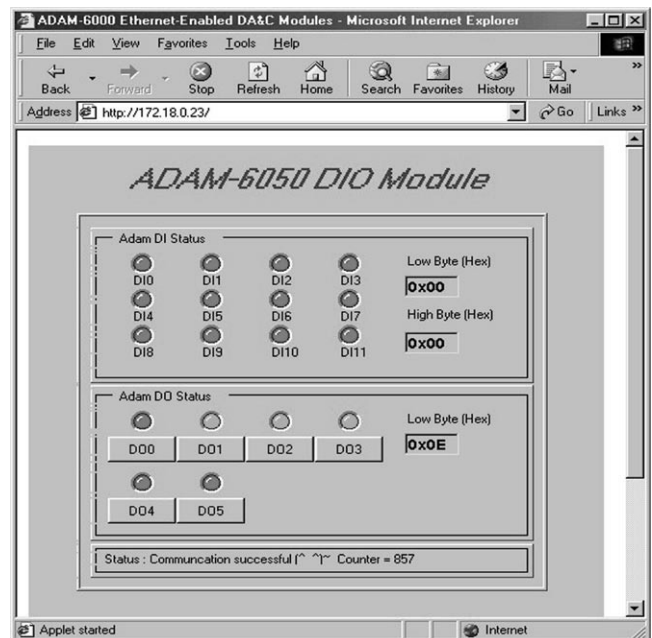
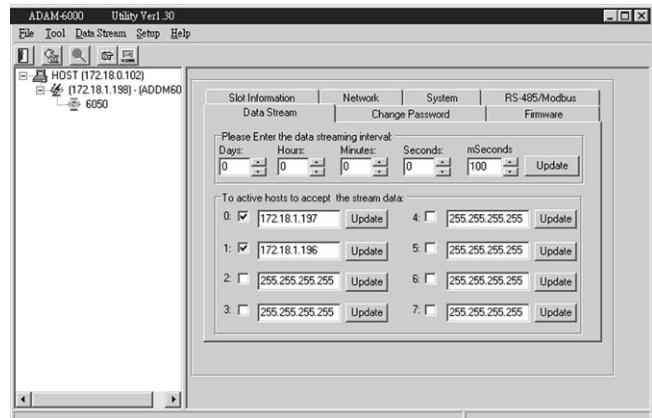
DLL Driver

Advantech also offers another easy-to-use integration tool, the ADAM-6000 DLL driver, for users to develop their own applications with VB, VC, BCB, Delphi, and other Windows development kits.

Customizeable Web Page

Since the ADAM-6000 modules have a built-in web server with a default web page, users can monitor and control the I/O status everywhere, through any web browser that supports Java applets. The ADAM-6000 modules data can also be downloaded to a user-defined web page for custom applications. Advantech has provided sample JAVA applets to use as a reference if you want to design your own operator interfaces. These interfaces can be downloaded into ADAM-6000 modules via Windows Utility.

To create an applet web page for ADAM-6000 modules is quick and easy. The following steps show a simple method to configure your own web page in short time.



How to Configure Your Own Web Page

Step 1

Free Download J2EE Development Kit via Internet

Step 2

Write JAVA Applet Program

Step 3

Pack as JAR File

Step 4

Download to ADAM-6000 Module through Windows Utility

1
Software

2
IPPC

3
TPC

4
FPM

5
ATM & AWS

6
DA&C

7
cPCI

8
ADAM-3000

9
Motion Control

10
ICOM

11
eConnectivity

12
UNO

13
ADAM-4000

14
ADAM-5000

15
ADAM-6000

16
ADAM-8000

17
BAS

ADAM-6000 Series

| Module | | ADAM-6015 | ADAM-6017 | ADAM-6018 | ADAM-6022 | ADAM-6024 | ADAM-6050 | ADAM-6051 | ADAM-6052 | ADAM-6060 | ADAM-6066 | ADAM-6050W | ADAM-6060W |
|--------------------------|-----------------------------------|--|--|-----------------------------|--|-----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Interface* | | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 10/100 Mbps Ethernet | 802.11 b wireless LAN | 802.11 b wireless LAN |
| Resolution | | 16 bit | 16 bit | 16 bit | 16 bit for AI 12 bit for AO | 16 bit for AI 12 bit for AO | - | - | - | - | - | - | - |
| Analog | Input | Input channels | 7 differential | 8 differential | 6 differential | 6 diff. AI | - | - | - | - | - | - | - |
| | Sampling Rate | 10 samples/sec | 10 samples/sec | 10 samples/sec | 10 samples/sec | 10 samples/sec | - | - | - | - | - | - | - |
| | Input Type | PT-50 PT-100 PT-200 PT-1000 Balco 500 NI 50 | ±150 mV ±500 mV 0 ~ 5 V ±10 V | - | ±2.5 V | 0 ~ 10 V _{DC} | - | - | - | - | - | - | - |
| | Current Input | | 0 ~ 20 mA 4 ~ 20 mA | 0 ~ 20 mA 4 ~ 20 mA | 0 ~ 20 mA 4 ~ 20 mA | 0 ~ 20 mA 4 ~ 20 mA | - | - | - | - | - | - | - |
| | Direct Sensor Input | Pt, Balco and Ni RTD | - | J.K.T.E.R.S.B. Thermocouple | - | - | - | - | - | - | - | - | - |
| | Burn-out Detection | Yes | - | Yes | - | - | - | - | - | - | - | - | - |
| | Channel Independent Configuration | Yes | Yes | Yes | Yes | Yes | - | - | - | - | - | - | - |
| | Math. Functions | Max. Min. Avg. | Max. Min. Avg. | Max. Min. Avg. | - | - | - | - | - | - | - | - | - |
| Analog Output | Output Channels | - | - | - | 2 AO | 2 AO | - | - | - | - | - | - | - |
| | Voltage Output | - | - | - | 4 ~ 20 mA with 15 V _{DC} | 4 ~ 20 mA with 15 V _{DC} | - | - | - | - | - | - | - |
| | Drive Current | - | - | - | 0 ~ 10 V _{DC} with 30 mA | 0 ~ 10 V _{DC} with 30 mA | - | - | - | - | - | - | - |
| Digital Input and Output | Digital Input Channels | - | - | - | 2 (Sink) | 2 (Sink) | 12 (Sink) | 12 (Sink) | 8 (Source) | 6 (Sink) | 6 (Sink) | 12 (Sink) | 6 (Sink) |
| | Digital Output Channels | - | 2 (Sink) | 8 (Sink) | 2 (Sink) | 2 (Sink) | 6 (Sink) | 2 (Sink) | 8 (Source) | 6-channel relay | 6-channel power relay | 6 (Sink) | 6-channel relay |
| | Event Counter | - | - | - | - | - | - | 2 (5 kHz) | - | - | - | - | - |
| | High/Low Alarm Settings | Yes | Yes | Yes | - | - | - | - | - | - | - | - | - |
| Isolation | | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} | 2000 V _{RMS} |
| Watchdog Timer | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Remark | | - | - | - | Built-in Dual Loop PID Control Algorithm | - | - | - | - | - | - | - | - |
| Page | | 15-16 | 15-17 | 15-17 | 15-18 | 15-17 | 15-15 | 15-15 | 15-15 | 15-16 | 15-16 | 15-12 | 15-12 |

Selection Guide

| Name | ADAM-6500 | ADAM-6501 | ADAM-6510 | ADAM-6520 | ADAM-6521 |
|-----------------------|---|--|---------------------------|--|----------------------------------|
| Interface | 10Base-T | 10/100Base-T | 10Base-T | 10/100Base-T | 10/100Base-T, 100Base-FX |
| Ethernet Port | 1 | 1 | 4 | 5 | 5 |
| Serial Port | 5 | 2 | - | - | - |
| Speed | 10 Mbps | 10/100 Mbps | 10 Mbps | 10/100 Mbps | 10/100 Mbps |
| Surge Protection | 1500 V _{RMS} | 1500 V _{RMS} | 3000 V _{ESD} | 3000 V _{ESD} | 3000 V _{ESD} |
| Parity | Even, odd, none, space, mark | Even, odd, none, space, mark | | | |
| Data Bit | 5, 6, 7, 8 | 5, 6, 7, 8 | | | |
| Stop Bit | 1, 1.5, 2 | 1, 1.5, 2 | | | |
| S/W | Configuration/ port mapping utility | Configuration/ port mapping utility | | | |
| Connector | Network: RJ-45 Serial: Sub-D9 & Screw Terminator | Network: RJ-45 Serial: RJ-48 & Screw Terminator | Network: RJ-45 | Network: RJ-45 Serial: terminal block | Network: RJ-45 Fiber: SC type |
| Mounting | DIN-Rail, Wall, Piggyback | DIN-Rail, Wall, Piggyback | DIN-Rail, Wall, Piggyback | DIN-Rail, Wall, Piggyback | DIN-Rail, Wall, Piggyback |
| Power Requirement | 10 - 30 V | 10 - 30 V | 10 - 30 V | 10 - 30 V | 10 - 30 V |
| Power Consumption | 4 W | 4 W | 1 W | 2.4 W | 3.6 W |
| Operating Temperature | 0 ~ 55° C | 0 ~ 55° C | -10 ~ 70° C | -10 ~ 70° C | -10 ~ 65° C |
| Page | 15-10 | 15-10 | 15-14 | 15-14 | 15-14 |

| | |
|----|----------------|
| 1 | Software |
| 2 | IPPC |
| 3 | TPC |
| 4 | FPM |
| 5 | ATM & AWS |
| 6 | DA&C |
| 7 | cPCI |
| 8 | ADAM-3000 |
| 9 | Motion Control |
| 10 | ICOM |
| 11 | eConnectivity |
| 12 | UNO |
| 13 | ADAM-4000 |
| 14 | ADAM-5000 |
| 15 | ADAM-6000 |
| 16 | ADAM-8000 |
| 17 | BAS |

ADAM-6500 ADAM-6501

Web-enabled Communication Controller Web-enabled Universal Communication Controller



CE FCC

Features

- Powerful Ethernet-enabled communication controller in a small package
- Built-in Windows CE .NET to run embedded Ethernet applications
- Built-in web server
- Microsoft embedded VC++ development environment supported
- Built-in CompactFlash® slot
- Flash disk for WinCE and user's AP (ADAM-6500: 16 MB, ADAM-6501: 32 MB)
- Built-in real-time clock and watchdog timer
- Offers RS-232 and RS-485 series communication port (ADAM-6500: 3 x RS-232, 2 x RS-485; ADAM-6501: 1 x RS-232, 1 x RS-485)
- Automatic data flow control in RS-485 mode
- Communication speed up to 115.2 kbps
- Easy to mount on a DIN-rail or panel

Introduction

ADAM-6500 and ADAM-6501 are fully functional Ethernet-enabled controllers for industrial automation and control. They provide an ideal environment to develop applications converting RS-232/485 devices/equipment data to the Ethernet/Internet world with minimum effort. Their built-in Windows CE .NET operating system lets users run new programs produced in Microsoft embedded VC++. The Windows environment also includes a web server to allow the designer to develop web-enabled applications.

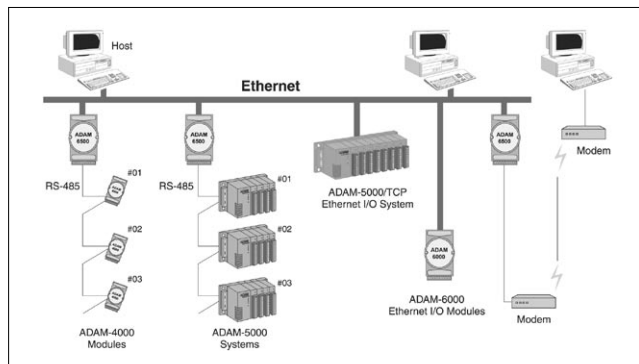
Specifications

- **CPU** ADAM-6500: 32 bit Intel® StrongArm® 206 MHz
ADAM-6501: 32 bit Intel® XScale® 400 MHz
- **Flash Memory** 16 MB flash memory for ADAM-6500
32MB flash memory for ADAM-6501
- **Memory** 64 MB SDRAM
- **Operating System** Windows CE .NET
- **Ethernet Port** ADAM-6500: One 10Base-T
ADAM-6501: One 10/100Base-T
- **Serial Ports (isolated)** ADAM-6500: 3 RS-232, 2 RS-485
ADAM-6501: 1 RS-232 (RJ-48), 1 RS-485
Speed: 115.2 kbps
- **Built-in Watchdog Timer** Yes
- **Real-time Clock** Yes
- **LED Indicators** Power, diagnostics, communication
- **Protocols Supported** TCP/IP, UDP
- **System Management** Web-based remote configuration via standard browser with Java® support.
Console mode command line configuration.
- **Mounting** DIN-rail, panel, wall, piggyback stack
- **Default Setting** Onboard
- **Recovery**
- **Power Supply Voltage** +24 V_{DC} (Range: 10 ~ 30 V_{DC})
- **Max. Power** +24 V_{DC} @ 0.25 A
- **Requirements**
- **Operating Temperature** 0 ~ 55° C
- **Storage Temperature** -20~ 80° C

Feature Details

Built-in Ethernet and RS-232/485 COM Ports

The ADAM-6500 has one Ethernet (10BASE-T), and four communication ports (3 x RS-232 and 2 x RS-485). The ADAM-6501 has one Ethernet (10/100BASE-T), one RS-232 and one RS-232/485 ports. These provide easy communication between the controller and devices in your applications, and has been designed for program downloading, debugging and linking serial devices with the Ethernet/Internet. Both ADAM-6500 and 6501 is equipped with a COM1 port (RS-232) supporting full RS-232 signals for applications such as modem connections, while the 3-pin RS-232 and RS-485 are designed as the interface for traditional RS-232/485 devices/equipment. This design allows the controller to be used in a variety of applications. For example, the user may download a data logging application into the ADAM-6500/6501's memory while the ADAM-6500/6501 is connected to a RS-485 network, and then collect the data over the network.



Built-in Real-time Clock and Watchdog Timer

The real-time clock in the controller ensures accurate time recording when the system operates. The watchdog timer is designed to automatically reset the CPU if the system fails.

Ordering Information

- **ADAM-6500** Web-enabled Communication Controller
- **ADAM-6501** Web-enabled Universal Communication Controller

ADAM-6500 ADAM-6501

Feature Details Cont.

ADAM-6500/6501AS PC-Based HMI Station/SCADA

The ADAM-6500/6501AS embeds Advantech Studio into ADAM-6500/6501 hardware. So you can easily develop the required application in a desktop PC, then download it into ADAM-6500/6501AS as a cost effective, compact size SCADA/HMI station. Advantech Studio (AStudio), a powerful, integrated collection of automation tools that includes all the building blocks required to develop modern Human Machine Interfaces (HMI), and Supervisory Control and Data Acquisition System (SCADA) applications. AStudio in ADAM-6500/6501AS can run native on Windows CE.NET or in an Internet and Intranet environment. A simple drag and drop, point and click development environment mimics the most complex behavior of your live processes. AStudio is an eAutomation solution that allows designers to develop web-enabled applications.

ADAM-6500/6501KW PC-Based Softlogic Controller

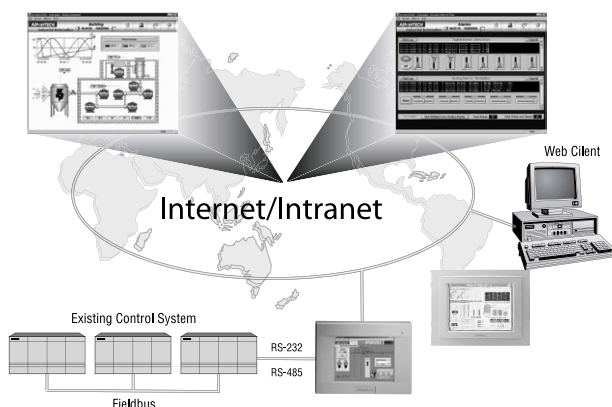
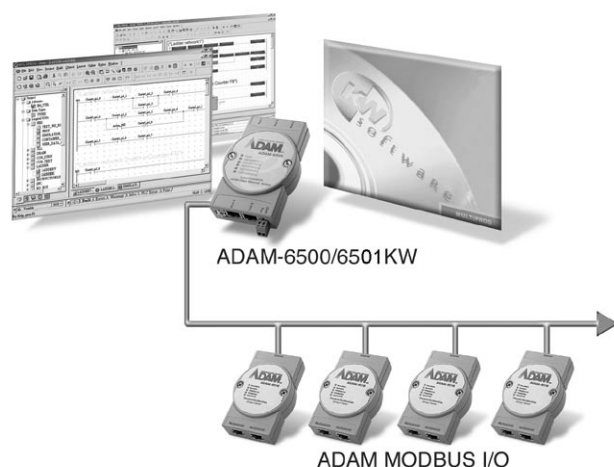
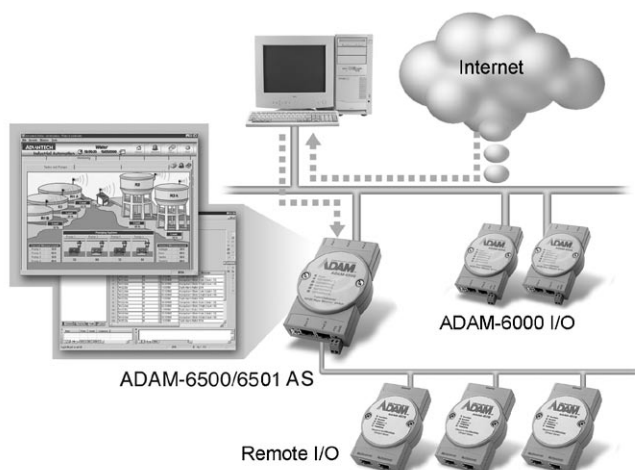
As PC-based automation has developed, Advantech PC-based controllers have been widely applied in variety of industrial automation applications. In order to empower the PC-based controllers, Advantech has allied with KW software to develop a new generation of softlogic controllers with MULTIPROG - IEC 61131 complied softlogic control engine. Evolved from the ADAM-6500/6501, the ADAM-6500/6501KW is a new softlogic controller that features with large memory capacity, multi communication interfaces, user-friendly configuration tools and much more.

ADAM-6500/6501KW is not only a cost-effective micro-controller, but also features several powerful control functions that improve on traditional programmable logic controllers.

- Process IEC-61131 standard with rich development environment
- Cross-Language programming
- Large memory for programming and storage
- Real time multi-tasking engine
- Free pre-defined function library
- Powerful debug / diagnostic / simulation / force tools
- Open Standard connection - Modbus standard Interface
- Online editing & partial download
- RS-232/485 communication ability
- Built-in ROM and RAM disk for programming
- Built-in real-time clock and watchdog timer

Applications

- Distributed data acquisition and control
- Embedded control application (Advantech AStudio SCADA Software and KW Softlogic)
- Data logging applications
- Serial to Ethernet conversion
- Web-enabled data acquisition and control



- 1 Software
- 2 IPCC
- 3 TPC
- 4 FPM
- 5 ATM & AWS
- 6 DA&C
- 7 cPCI
- 8 ADAM-3000
- 9 Motion Control
- 10 ICOM
- 11 eConnectivity
- 12 UNO
- 13 ADAM-4000
- 14 ADAM-5000
- 15 ADAM-6000
- 16 ADAM-8000
- 17 BAS

ADAM-6050W ADAM-6060W

Wireless Web-enabled 18-channel DI/O Module

Wireless Web-enabled 6-channel Relay Output

NEW



Features

- Supports IEEE802.11b wireless LAN
- Built-in web page
- Supports Modbus/TCP & UDP protocols
- Supports event trigger function

Introduction

ADAM-6050W and ADAM-6060W are new ADAM-6000 I/O modules bundled with wireless LAN technology. The hardware design of these two modules were based on ADAM-6050 and ADAM-6060, but a wireless LAN interface replaces the RJ-45 Ethernet port. ADAM-6050W and ADAM-6060W Wireless Web-enabled modules support IEEE802.11b. They can be accessed via wireless LAN without any hardwiring for environments with wiring limitations.

Specifications

ADAM-6050W

- **Communication Port** IEEE802.11b Wireless LAN
- **Channels** 18
- **I/O Type** 12 DI & 6 DO
- **Digital Input** Dry Contact:
Logic level 0: Close to GND
Logic level 1: Open (Logic level status can be inverted by Utility)
- **Digital Output** Open Collector to 30 V
200 mA max. load
- **Optical Isolation** 5000 V_{RMS}
- **Built-in Watchdog Timer**
- **Built-in Web Page**
- **Support Protocol** Modbus/TCP and UDP
- **Power Requirement** 24 V_{AC}
- **Power Consumption** 2 W (typical)
- **Environment** Operating Temp. : -10 ~ 60 °C (14 ~ 140 °F)
Storage Temp. : 25 ~ 85 °C (-13 ~ 185 °F)
Humidity : 5 ~ 95% non-condensing

Ordering Information

- **ADAM-6050W-A** 18 channel Web-enabled Wireless LAN Digital Input/Output Module
- **ADAM-6060W-A** 12 channel Web-enabled Wireless LAN Digital Input/Relay Output Module

Specifications

ADAM-6060W

- **Channels** 12
- **I/O Type** 6 Relay & 6 DI
- **Relay Output (Form A)** Contact rating: AC: 120 V @ 0.5 A, DC: 30 V @ 1 A
Breakdown voltage: 500 V_{AC} (50/60 Hz)
Relay on time: 7 msec; Relay off time: 3 ms
Total switching time: 10 ms
Insulation resistance: 1000 MΩ minimum at 500 V_{DC}
- **Digital Input** Dry Contact:
Logic level 0: Close to GND
Logic level 1: Open
(Logic level status can be inverted by Utility)
- **Optical Isolation** 2000 V_{RMS}
- **Built-in Watchdog Timer**
- **Built-in Web Page**
- **Support Protocol** Modbus/TCP and UDP
- **Power Requirement** 24 V_{AC}
- **Power Consumption** 2 W (Typical)
- **Environment** Operating Temp. : -10 ~ 60 °C (14 ~ 140 °F)
Storage Temp. : -25 ~ 85 °C (-13 ~ 185 °F)
Humidity : 5 ~ 95% non-condensing

ADAM-6050W ADAM-6060W

Feature Details

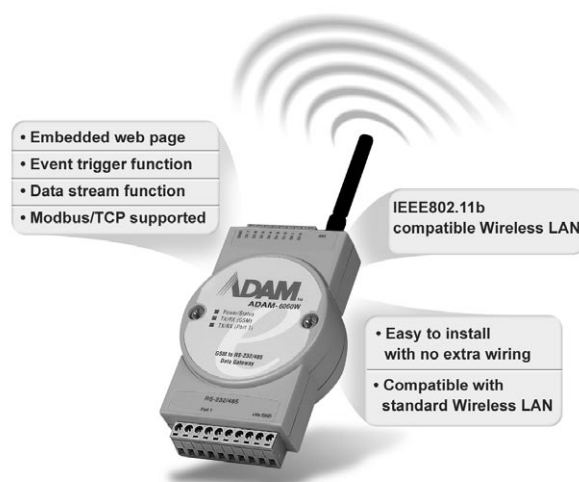
ADAM-6050W and ADAM-6060W support IEEE802.11b, the most popular wireless LAN standard. So ADAM-6050W and ADAM-6060W can be connected through most wireless LAN Access Points (AP).

Communication

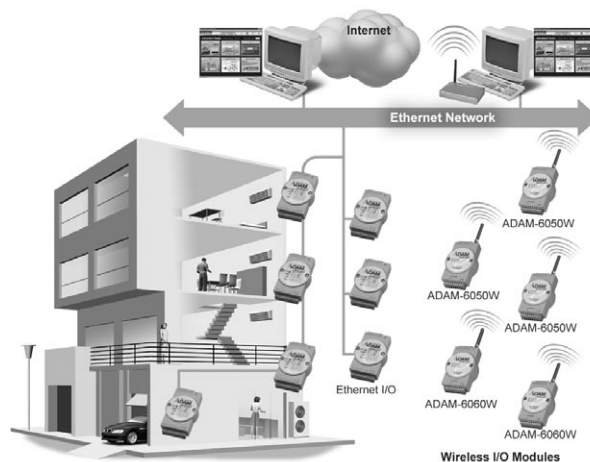
Like other ADAM-6000 modules, ADAM-6050W and ADAM-6060W also support the Modbus/TCP and UDP protocols. You can use the HMI/SCADA software to communicate with ADAM-6050W and ADAM-6060W through Modbus/TCP. The pre-built UDP protocol supports event trigger and data streaming functions for critical and real time responses.

All New Built-in Web Page

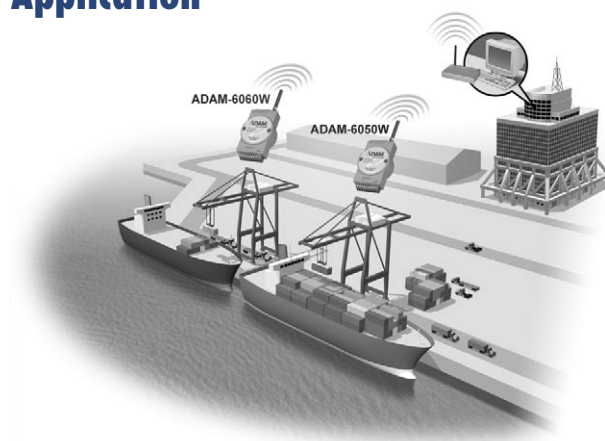
ADAM-6050W and ADAM-6060W has a built-in webpage that can be configured by an utility for: Tag Name, Status Label (for example, Start/Stop, Run/Stop, Enable/Disable and Alarm/Normal), and Channel Enable. There is no need to learn how to write Java applets to design a customized web page. By using ADAM-6000 utility software, the webpage can be customized to exact requirements.



Home/Building Application



Port Crane Monitoring & Control Application



1
Software

2
IPPC

3
TPC

4
FPM

5
ATM & AWS

6
DA&C

7
cPCI

8
ADAM-3000

9
Motion Control

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ICOM

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eConnectivity

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UNO

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ADAM-4000

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ADAM-5000

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ADAM-6000

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ADAM-8000

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BAS

ADAM-6521 ADAM-6541 ADAM-6542

5-port Industrial 10/100 Mbps Ethernet Switch with Fiber Optic Ethernet to Multi-Mode Fiber Optic Converter Ethernet to WDM Single Strand Fiber Optic Converter



ADAM-6520/6521

CE FCC

Specifications

- **Interface** 10/100Base-T & 10/100 Base-FX standard
- **Port** 4 x 10/100 Mbps (RJ-45), 1 x 100 Mbps (Fiber)
- **Connector** 4 x RJ-45 & 1 x Fiber (SC type)
- **Compatibility** IEEE 802.3, IEEE 802.3u
- **Surge Protection (Power)** 3000 V_{DC}
- **LED** Power, 10/100 Mbps
- **Transmission Distance (Fiber)** 2000 m
- **Power Requirements** Unregulated 10 ~ 30 V_{DC}
- **Power Consumption** 3.5 W (typical)
- **Case** ABS with captive mounting hardware
- **Mounting** DIN-rail, panel mounting, piggyback stack
- **Operating Temperature** -10 ~ 65° C
- **Storage Temperature** -20 ~ 80° C
- **Operating Humidity** 20 ~ 95% (non-condensing)
- **Storage Humidity** 0 ~ 95% (non-condensing)

Ordering Information

- **ADAM-6521** 5-port Industrial 10/100 Mbps Ethernet Switch with Fiber port



ADAM-6541

CE FCC

Specifications

- **Interface** 10/100Base-TX & 100Base-FX standard
- **Port** 1 x 10/100 Mbps (RJ-45), 1 x 100 Mbps (Fiber)
- **Connector** 1 x RJ-45 & 1 x Fiber (SC type)
- **Compatibility** IEEE 802.3, IEEE 802.3u
- **Surge Protection (Power)** 3,000 V_{DC}
- **Isolation (Ethernet port)** 1,500 V_{RMS}
- **LED** Power, LNK/ACT, 10/100 Mbps
- **Transmission Distance (Ethernet)** 100 m
- **Communication Distance (Multi mode fiber)** 50/125, 62.5/125 or 100/140 μm multi mode fiber, 412 m for half duplex, 2 km for full duplex.
- **Power Requirement** Unregulated 10 ~ 30 V_{DC}
- **Power Consumption** 3 W
- **Case** ABS/PC with captive mounting hardware.
- **Mounting** DIN-rail, panel mounting, piggyback stack
- **Operating Temperature** -10 ~ 70° C
- **Storage Temperature** -20 ~ 80° C
- **Operating Humidity** 20 ~ 95% (non-condensing)
- **Storage Humidity** 0 ~ 95% (non-condensing)

Ordering Information

- **ADAM-6541** Ethernet to Multi-Mode Fiber Optics Converter



ADAM-6542

CE FCC

Specifications

- **Interface** 10/100Base-TX & 100Base-FX standard
- **Port** 1 x 10/100 Mbps (RJ-45), 1 x 100 Mbps (Fiber)
- **Connector** 1 x RJ-45 & 1 x Fiber (SC type)
- **Compatibility** IEEE 802.3, IEEE 802.3u
- **Surge Protection (Power)** 3,000 V_{DC}
- **Isolation (Ethernet port)** 1,500 V_{RMS}
- **LED** Power, LNK/ACT, 10/100 Mbps
- **Transmission Distance (Ethernet)** 100 m
- **Communication Distance (Single mode fiber)** 8.3/125, 8.7/125, 9/125 or 10/125 μm single mode fiber, 20 km for WDM (Wavelength Division Multiplexing)
- **Power Requirement** Unregulated 10 ~ 30 V_{DC}
- **Power Consumption** 3 W
- **Case** ABS/PC with captive mounting hardware.
- **Mounting** DIN-rail, panel mounting, piggyback stack
- **Operating Temperature** -10 ~ 70° C
- **Storage Temperature** -20 ~ 80° C
- **Operating Humidity** 20 ~ 95% (non-condensing)
- **Storage Humidity** 0 ~ 95% (non-condensing)

Ordering Information

- **ADAM-6542** Ethernet to WDM Single Strand Fiber Optics Converter

ADAM-6050 ADAM-6051 ADAM-6052

18-channel Isolated Digital I/O Module

16-channel Isolated Digital I/O w/Counter Module

16-channel Source Type Digital I/O Module



ADAM-6050

CE FCC

Specifications

- **Channels** 18
- **I/O Type** 12 DI & 6 DO
- **Digital Input** Dry Contact:
Logic level 0: close to GND
Logic level 1: open
Wet Contact:
Logic level 0: +3 V max
Logic level 1: +10 V to 30 VDC
- **Digital Output** Open Collector to 30 V
200 mA max. load
- **Optical Isolation** 2000 V_{RMS}
- **Power Consumption** 2 W (typical)

Ordering Information

- **ADAM-6050** 18-channel isolated Digital I/O module



ADAM-6051

CE FCC

Specifications

- **Channels** 16
- **I/O Type** 12 DI / 2 DO / 2 Counter
- **Digital Input** Dry Contact:
Logic level 0: close to GND
Logic level 1: open
Wet Contact:
Logic level 0: +3 V max
Logic level 1: +10 V to 30 V_{DC}
- **Digital Output** Open Collector to 30 V
200 mA max. load
- **Optical Isolation** 2000V_{RMS}
- **Counter** Maximum Count:
4,294,967,285(32 bit)
Input frequency:
0.3 ~ 1000 Hz max.
(frequency mode)
5000 Hz max. (counter mode)
Isolation voltage: 2000 V_{RMS}
Mode: Counter,
Frequency
- **Power Consumption** 2 W (typical)

Ordering Information

- **ADAM-6051** 16-channel isolated Digital I/O with counter module



ADAM-6052

CE FCC

Specifications

- **Channels** 16
- **I/O Type** 8 DI/ 8 DO
- **Digital Input** Dry Contact:
Logic level 0: close to GND
Logic level 1: open
Wet Contact:
Logic level 0: +3 V max
Logic level 1: +10 V to 30 V_{DC}
- **Digital Output:** (Source Type)
V_{DC}: 35 V
Current: 1 A
- **Optical Isolation** 2000 V_{RMS}
- **Power Consumption** 2 W (typical)

Ordering Information

- **ADAM-6052** 16-channel Source Type Digital I/O module

1
Software

2
IPPC

3
TPC

4
FPM

5
ATM & AWS

6
DA&C

7
cPCI

8
ADAM-3000

9
Motion Control

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ICOM

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eConnectivity

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UNO

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ADAM-4000

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ADAM-5000

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ADAM-6000

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ADAM-8000

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BAS

ADAM-6060 ADAM-6066 ADAM-6015

6 DI/6 Relay Module

6 DI/6 Power Relay Module

7-channel RTD Module



ADAM-6060

CE FCC

Specifications

- **Channels** 12
- **I/O Type** 6 Relay & 6 DI
- **Relay Output (Form A)** Contact Rating:
AC: 120 V @ 0.5 A
DC: 30 V @ 1 A
Breakdown voltage: 500 V_{AC} (50/60 Hz)
Relay on time: 7 ms
Relay off time: 3 ms
Total switching time: 10 ms
Insulation resistance: 1000 MΩ minimum at 500V_{DC}
- **Digital Input** Dry Contact:
Logic level 0: close to GND
Logic level 1: open
Wet Contact:
Logic level 0: +3Vmax
Logic level 1: +10 V to 30 V_{DC}
- **Optical Isolation** 2000V_{RMS}
- **Power Consumption** 2 W (Typical)



ADAM-6066

CE FCC

Specifications

- **Channels** 12
- **I/O Type** 6 Relay & 6 DI
- **Relay Output (Form A)** Contact Rating:
AC: 250 V @ 5 A
DC: 30 V @ 5 A
Breakdown voltage: 500 V_{AC} (50/60 Hz)
Relay on time: 7 ms
Relay off time: 3 ms
Total switching time: 10 ms
Insulation resistance: 1000 MΩ minimum at 500V_{DC}
- **Digital Input** Dry Contact:
Logic level 0: close to GND
Logic level 1: open
Wet Contact:
Logic level 0: +3Vmax
Logic level 1: +10 V to 30 V_{DC}
- **Optical Isolation** 2000V_{RMS}
- **Power Consumption** 2.5 W (Typical)



ADAM-6015

CE FCC

Specifications

- **Channels** 7 differential
- **Effective Resolution** 16-bit
- **Input Type** Pt, Balco and Ni RTD
- **RTD Types and Temperature Ranges**
 - Pt-100 RTD
 - Pt-50° C to 150° C
 - Pt 0° C to 100° C
 - Pt 0° C to 200° C
 - Pt 0° C to 400° C
 - Pt-200° C to 200° C
 - IEC RTD 100 ohms = 0.00385
 - JIS RTD 100 ohms = 0.00392
 - Pt 1000 RTD
 - Pt -40° C to 160° C
 - Balco 500 RTD
 - 30° C to 120° C
 - Ni 50 RTD
 - 100° C
 - Ni 508 RTD
 - Ni 0° C to 100° C
- **Isolation Voltage** 2000 V_{DC}
- **Sampling Rate** 10 samples / sec.
- **Input Impedance** 10 kΩ
- **Input Connections** 2 or 3 wire
- **Accuracy** ± 0.05 % or better
- **Zero Drift** ± 3 μV/° C
- **Span Drift** ± 25 ppm/° C
- **CMR @ 50/60 Hz** 150 dB
- **NMR @ 50/60 Hz** 100 dB
- **Built-in Watchdog Timer**
- **Individual Wire Burn-out Detection**
- **Power Requirements** Unregulated
+10 ~ +30 V_{DC}
- **Power Consumption** 2 W

Ordering Information

- **ADAM-6060** 6 Isolated Digital Inputs & 6 Relays Module

Ordering Information

- **ADAM-6066** 6 Isolated Digital Inputs & 6 Power Relays Module

Ordering Information

- **ADAM-6015** 7-channel RTD Input Module

ADAM-6017 ADAM-6018 ADAM-6024

8-channel Analog Input w/DO Module

8-channel Thermocouple Input w/DO Module

12-channel Universal Input Output Module



ADAM-6017

CE FCC

Specifications

Analog Input

- Effective Resolution 16-bit
- Channels 8 differential
- Input Type mV, V, mA
- Input Range ± 150 mV, ± 500 mV, ± 5 V, ± 10 V, 0-20 mA, 4-20 mA
- Isolation Voltage 2000 V_{DC}
- Fault and Overvoltage Protection Withstands overvoltage up to ± 35 V
- Sampling Rate 10 samples/sec.
- Input Impedance 20 M Ω
- Bandwidth 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- Accuracy $\pm 0.1\%$ or better
- Zero Drift ± 6 μ V/ $^{\circ}$ C
- Span Drift ± 25 ppm/ $^{\circ}$ C
- CMR @ 50/60 Hz 92 dB min.

Digital Output

- Channels 2
Open Collector to 30 V
100 mA max. load
- Optical Isolation 2000V_{RMS}

Power

- Power Requirements Unregulated +10 ~ +30 V_{DC}
- Power Consumption 2 W
- Built-in Watchdog Timer

Ordering Information

- ADAM-6017 8-channel Analog Input with DO Module



ADAM-6018

CE FCC

Specifications

Analog Input

- Effective Resolution 16-bit
- Channels 8 differential
- Input Type Thermocouple
- Thermocouple Type and Range:

| | | | |
|---|------|---|-------------------|
| J | 0 | ~ | 760 $^{\circ}$ C |
| K | 0 | ~ | 1370 $^{\circ}$ C |
| T | -100 | ~ | 400 $^{\circ}$ C |
| E | 0 | ~ | 1000 $^{\circ}$ C |
| R | 500 | ~ | 1750 $^{\circ}$ C |
| S | 500 | ~ | 1750 $^{\circ}$ C |
| B | 500 | ~ | 1800 $^{\circ}$ C |
- Isolation Voltage 2000 V_{DC}
- Fault and Overvoltage Protection Withstands overvoltage up to ± 35 V
- Sampling Rate 10 samples/sec.
- Input Impedance 10 k Ω
- Bandwidth 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- Accuracy $\pm 0.1\%$ or better
- Zero Drift ± 6 μ V/ $^{\circ}$ C
- Span Drift ± 25 ppm/ $^{\circ}$ C
- CMR @ 50/60 Hz 92 dB min.

Digital Output

- Channels 8
Open Collector to 30 V
100 mA max. load
- Optical Isolation 2000 V_{RMS}

Power

- Power Requirements Unregulated +10 ~ +30 V_{DC}
- Power Consumption 2 W
- Built-in Watchdog Timer

Ordering Information

- ADAM-6018 8-ch. Thermocouple Input with DO Module



ADAM-6024

CE FCC

Specifications

Analog Input

- Channels 6 differential
- Effective Resolution 16-bit
- Input Range ± 10 V_{DC}, 0 ~ 20 mA, 4 ~ 20 mA
- Isolation Voltage 2,000 V_{DC}
- Sampling Rate 10 samples/sec.
- Input Impedance 20 M Ω
- Bandwidth 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- Accuracy $\pm 0.1\%$ or better
- Zero Drift ± 6 μ V/ $^{\circ}$ C
- Span Drift ± 25 ppm/ $^{\circ}$ C
- CMR @ 50/60 Hz 92 dB min.

Analog Output

- Channels 2
- Effective Resolution 12-bit
- Output Range 0 ~ 10 V_{DC}, 4 ~ 20 mA, 0 ~ 20 mA
- Drive Voltage 15 V_{DC} (for current output)
- Isolation Voltage 2,000 V_{DC}
- Accuracy 0.05% of FSR
- Drift ± 50 ppm/ $^{\circ}$ C

Digital Inputs

- Channels 2
- Dry Contact logic level 0: close to GND
- Wet Contact: logic level 1: open
- Logic level 0: +3Vmax
- Logic level 1: +10 V to 30 V_{DC}

Digital Outputs

- Channels 2
- Open Collector to 30 V
100 mA max. load

Power

- Power Consumption 4 W (typical)

Ordering Information

- ADAM-6024 12-channel Universal Input/Output Module

1
Software

2
IPPC

3
TPC

4
FPM

5
ATM & AWS

6
DA&C

7
cPCI

8
ADAM-3000

9
Motion Control

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ICOM

11
eConnectivity

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UNO

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ADAM-4000

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ADAM-5000

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ADAM-6000

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ADAM-8000

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BAS

ADAM-6022 ADAM-6000

Ethernet-based Dual-loop PID Controller

Series Common Specifications



ADAM-6022

CE FCC

Specifications

- Loop Number** 2 (3 AI, 1 AO, 1 DI, 1 DO for each control loop)

Analog Input

- Channels** 6 differential
- Effective Resolution** 16-bit
- Input Range** 0 ~ 10 V_{DC}, 0 ~ 20 mA, 4 ~ 20 mA
- Isolation Voltage** 2,000 V_{DC}
- Sampling Rate** 10 samples/sec.
- Input Impedance** 20 MΩ
- Bandwidth** 13.1 Hz @ 50 Hz
15.72 Hz @ 60 Hz
- Accuracy** ±0.1 % or better
- Zero Drift** ±6 μV/°C
- Span Drift** ±25 ppm/°C
- CMR @ 50/60 Hz** 92 dB min.

Analog Output

- Channels** 2
- Effective Resolution** 12-bit
- Output Range** 0 ~ 10 V_{DC}, 4 ~ 20 mA, 0 ~ 20 mA
- Drive Voltage** 15 V_{DC} (for current output)
- Isolation Voltage** 2,000 V_{DC}
- Accuracy** 0.05% of FSR
- Drift** ±50 ppm/°C

Digital Inputs

- Channels** 2
- Dry Contact:
logic level 0: close to GND
logic level 1: open
- Wet Contact:
Logic level 0: +3Vmax
Logic level 1:
+10 V to 30 V_{DC}

Digital Outputs

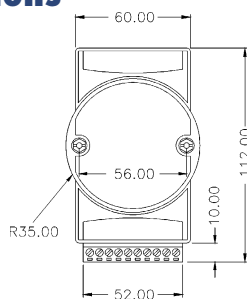
- Channels** 2
- Open Collector to 30 V
100 mA max. load
- Power Consumption** 4 W (typical)

Ordering Information

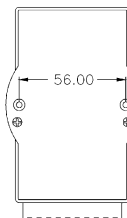
- ADAM-6022** Dual-loop PID Controller

Dimensions

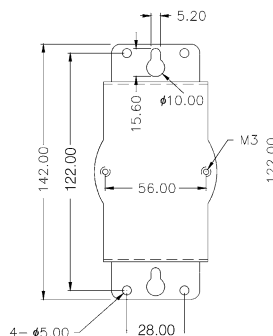
Unit: mm



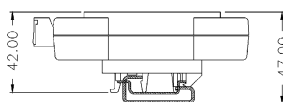
FRONT VIEW



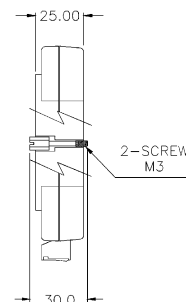
REAR VIEW



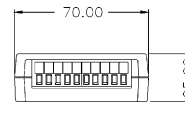
PANEL MOUNTING
BRACKET



DIN - RAIL MOUNTING
ADAPTER



SIDE VIEW



TOP VIEW

Common Specifications

Communication

- Ethernet Interface (RJ-45)
- Speeds** 10/100 Mbps
- Max. communication distance** 333 feet (100 m), can be extended by using switch hub
- Power and communication LED indicator
- TCP/IP, UDP, MODBUS/TCP supported
- Online module insertion and removal

Power Requirements

- Unregulated +10 ~ +30 V_{DC}
- Protected against power reversal

Mechanical

- Case** ABS with captive mounting hardware

Plug-in Screw

Accepts 0.5 mm² to 2.5 mm², 1 - #12 or 2 - #22 AWG

Terminal Block

Environment

- Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- EMI** Meets FCC Class A
- Storage Temperature** -20 ~ -80° C (-13 ~ 185° F)
- Humidity** 5 ~ 95%, non-condensing

Software Ordering Information

- PCLS-OPC/MTP** Modbus/TCP OPC Server
- AStudio-WNT/DEV** AStudio-WNI/PRO Web-enabled HMI/SCADA Software