

I/A Series[®] Information Suite AIM*AT I/O Gate for BASEstar



The AIM*AT I/O Gate for BASEstar acts as a bridge between the I/O gate data collector and your control process. It is one of a series of I/O gate drivers provided as part of the AIM*AT Suite.

OVERVIEW

The efficiency of today's plant floor is increasing in direct proportion to the availability of more automated devices and systems. To tap this potential, the process engineer is faced with the need to integrate these modern hardware devices, as well as older, existing devices, with an automated software system to maximize process efficiency and to make plant floor information available on an enterprise-wide basis. The AIM*AT Suite utilizes the I/O gate architecture with an integrated device driver capability. Each I/O gate provides a connection capability between the AIM*Historian and plant/mill process devices using a specific connection mechanism, such as BASEstar. The BASEstar I/O gate communicates with Compaq's BASEstar server.



I/O GATE ARCHITECTURE

The AIM*AT I/O gates provide connectivity between AIM*Historian and a wide range of distributed control systems, programmable logic controllers, and other control systems. The I/O gate is configured within the AIM*Historian instance to receive data from specific protocol drivers. The BASEstar I/O gate uses remote procedure calls as the connection mechanism between AIM*Historian and the I/O gate.

Each I/O gate driver is optimized for plant floor integration and uses a COM-like internal design. It integrates to the AIM*Historian allowing a user to control the connection to each device independently. An I/O gate can be local or remote from the AIM*Historian software instances it supports. To make a single connection, you need an I/O gate collector and an I/O gate driver operating on the same computer. If a network is used, more than one connection can be made using a single network connection. If dedicated connections are used, each requires a separate driver, but a single I/O gate collector can be used for all drivers using the same connection mechanism, such as BASEstar. The BASEstar I/O gate driver and the I/O gate collector can be installed separately on a Windows NT platform to provide data collection from BASEstarcompliant devices (Figure 1).



Figure 1. Open Device Integration Architecture Showing a BASEstar I/O Gate with Other I/O Gates

EXPANSION CAPABILITIES

The practical limitations in a system are determined by the host hardware being used and the implementations of the applications connected through the BASEstar I/O gate. This means that as more powerful workstations and faster media become available, an application can be upgraded to take advantage of the increased capability without running into logical limitations or changing the database for the existing connections.

The practical limitations in an application are determined by:

- Processing power and available memory of the PC where the I/O gate is installed
- Specified limitations of the device protocol. For example, if a specific protocol is the limiting factor in your data throughput, upgrading the driver to a higher performance driver with the BASEstar I/O gate enhances the system throughput without changing the BASEstar I/O gate.
- Memory size, processing speed, and other restrictions of the connected device.
 For example, a given programmable logic controller may only handle 100 points and may only be able to process 25 points per second.

WIDE VARIETY OF DRIVERS

The BASEstar mechanism is supported by any available connection mechanism, from any vendor of plant-floor devices and their drivers. Any driver implemented as a BASEstar server that presents data in a form compatible with the AIM*Historian can connect those points using the BASEstar I/O gate. The compatible formats are:

- Float
- Boolean
- Integer
- Long.

The BASEstar I/O gate supports direct connections to devices on subnetworks from a main network when the BASEstar server supports these features. Since installation and setup of the server is generally unique to each vendor, the vendor must supply a means of setting up and configuring the driver.

SIMPLIFIED CONNECTION CONFIGURATION

Once a BASEstar server is set up, a short series of dialog boxes walks you through the task of configuring the connections for each device and each point on the device. Real-time points (RTPs) are configured, within the AIM*Historian software instance, to include the unique I/O gate driver (Figure 2) and item names.

Driver List		×
ſ	Applicom	
	BASEstar	
	CHIP DDE	
	ModbusPlus ModbusTCP	
	nemio	
1		
	OK Cancel	
	Applicom BASE star CHIP DDE ModbusPlus ModbusTCP OPC REMIO	



Configuration is quick and easy since you are not required to provide any protocol-specific information, but simply a list of data points to be connected. You do not need to become an I/O expert or know each protocol inside and out to configure interfaces.

Once a connection is configured, the BASEstar I/O gate collector uses the port name, device name, and item name to form a path that identifies a given data point. The AIM*Historian Configurator constructs the item name from information you enter, via the common tab, in the BASEstar dialog box (Figure 3).

SESTAR	
COMMON BASESTAR	
Node:	
I/O Gate ID + Clone Number:	BASESTARIO1
Port Name:	portA
Station Address:	
Device Name:	devicePER
I/O Gate Item Name:	TEST2
Conversion Number:	
Device Type:	per 💌
Continue to work on BASEstar	OK Cancel

Figure 3. BASEstar Dialog Box, Common Tab

The BASEstar tab, of the BASEstar dialog box (Figure 4), allows you to enter additional address components.

BASESTAR	×
COMMON BASESTAR	
Delta:	0.0
BASEstar Object Name	/demo_domain/units
BASEstar Data Type:	INTEGER_16
Continue to work on BASEstar	OK Cancel

Figure 4. BASEstar Tab

All configured information is retained, so if your PC loses power and is then restored, or is rebooted for any reason, the connection is automatically restored.

CONSISTENT INSTALLATION

The I/O gate driver setup program provides a consistent installation sequence for the different I/O gate drivers. Although BASEstar grouping names, such as Application and Topic, are replaced by other names when using different connection mechanisms, connection concepts are represented consistently. The I/O gate collector is installed as part of AIM*Historian setup.

DATA INTEGRITY AND SECURITY

The I/O gate data collector employs a store-andforward mechanism that collects real-time data into a configurable circular file. In the event of a communication loss to a remote AIM*Historian, the I/O gate continues to collect data in a local file. When communication is restored, all collected RTP values are transmitted to the AIM*Historian with no loss of information.

CONSIDERATIONS

Available PCI and ISA Card Slots

Most drivers require that you use a particular interface card, such as an Ethernet card. Therefore, it is necessary that you check all the interfaces to the I/O gate processor and determine which of the available PCI or ISA slots each interface is using. The availability of card slots can also limit the number of interfaces a processor can support. If the driver requires a specific interface card, it must be able to use one of the remaining interrupts after the other cards have been assigned their interrupts.

Driver Limitations

When you select a driver, you need to determine how many machines can be connected to its interface bus or network.

Limitations can be caused by:

- · Loading limits on an RS-485 bus
- The number of available addresses in a network
- The amount of traffic on the bus or driver.

The vendor supplying the driver is the best source of information concerning the limitations of the driver and the network or bus to which it interfaces.

Platform Processing Power

The processing power of the platform can be the determining factor for the number of BASEstar points that can be connected. As faster processors with deeper cache continually become available, more data points can be processed.

Processor loading of all applications running on the platform needs to be considered in determining how many machines a given processor can integrate. For specific requirements, refer to "Processing Load for the BASEstar I/O Gate".

FUNCTIONAL SPECIFICATIONS

Supported Platform

- Pentium PC
- Microsoft Windows NT 4.0 server or workstation with Service Pack 4
- 300 MHz, 128 MB RAM
- 4 GB hard drive
- CD-ROM drive

Supported Physical Connections

Generally unrestricted, including serial, Ethernet, and ARCnet

Installation

One BASEstar I/O gate driver per processor

Data Types

Float, boolean, integer, and long

Number of Servers (applications supported)

Platform dependent based on available card slots and processing power

Number of Topics Supported Platform/server dependent

Number of Items Supported

Platform/application dependent

Maximum Update Rates

Data scan update every half-second

Processing Load for the BASEstar I/O Gate

The BASEstar I/O gate uses less than 5% of the available CPU power of a 300 MHz processor to connect up to 100 connections, assuming every point changed at least once per second. If values change on the average of once per minute, the connections load the processor by less than 5% several times.

Shipped Components

- Components that are shipped include:
 - CD-ROM containing both the I/O gate software and a setup program.
 - AIM*AT Suite I/O Gate Drivers User's Guide (B0193YU) describing how to install, operate, and maintain AIM*AT Suite I/O gate. A support contract for your application can be purchased from The Foxboro Company.
- At your request, The Foxboro Company provides:
 - A list of drivers which have been tested by The Foxboro Company. They are available for purchase through The Foxboro Company.

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MB 021

Printed in U.S.A.