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Experion PKS
Hitachi Interface Reference

EPDOC-XX53-en-431A
February 2015

Release 431

Honeywell

Document	Release	Issue	Date
EPDOC-XX53-en-431A	431	0	February 2015

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Contents

Planning considerations for installing and configuring Hitachi controllers

This reference provides the information you need to set up, configure, and test the interface to Hitachi controllers.

Revision history

Revision	Date	Description
A	February 2015	Initial release of document.

How to use this guide

These are the steps for connecting and configuring a Hitachi controller. Complete each step before commencing the next step.

Step	Go to
Configure communications to Hitachi controller	Communication settings for Hitachi
Use Quick Builder to define channels	• Hitachi channel and controller reference • "Build channels" topic in the *Quick Builder User's Guide*
Use Quick Builder to define controllers	• Hitachi channel and controller reference • "Build controllers" topic in the *Quick Builder User's Guide*
Download channel and controller definitions to the server	"Downloading items" topic in the *Quick Builder User's Guide*
Test communications	Testing Hitachi communications with the server
Use Quick Builder to define points	Defining a Hitachi address for a point parameter

Related topics

"Devices supported by the Hitachi interface" on page 6
"Other documentation for Hitachi" on page 7
"Architectures for Hitachi" on page 8
"Communication settings for Hitachi" on page 15
"Hitachi channel and controller reference" on page 17
"Testing Hitachi communications with the server" on page 32
"Defining a Hitachi address for a point parameter" on page 26

Devices supported by the Hitachi interface

The server communicates the range of Hitachi controllers that conform to the H-Series protocol:

- H252 (addresses up to 1 KB)
- H300 (addresses up to 8 KB)
- H700 (addresses up to 16 KB)
- H2000 (addresses up to 48 KB)

Other documentation for Hitachi

The following Hitachi documents contain more information.

- The *Hitachi Programmable Controller* manual for the H-Series PLCs.

Architectures for Hitachi

The server communicates with Hitachi H-Series controllers via:

- An RS-232 link to the CPU
- An RS-232 or RS-422 link to a COM-2H module

Attention
If you use an RS-422 link, the server requires a Stallion EasyConnect serial adapter.

The server treats each link as a channel, and each physical controller has three addressable logical controller types. The three logical controller types, segment the internal registers in the controller as follows:

Controller Type	Register Area(s)
0	External IO Link Area Data Area Internal Bit Output Timer Counters (TM,CL and TC) Edge Detection Master Control
1	Internal Word Output (Max 8K)
2	Remote External IO

A Type 1 Controller scans up to 8K of contiguous registers. Multiple Type 1 controllers are required to read more than 8K of contiguous registers.

The server supports the following Hitachi H-Series system architectures:

- Separate System
- Remote I/O System
- CPU Link System
- Host Link System
- Complex System

Separate System

A Separate System consists of only the base unit, or a combination of base and expansion units connected by extension cables.

The I/O on the expansion boards is known as *external I/O*. Controller Type 0 incorporates all external I/O off the base rack.

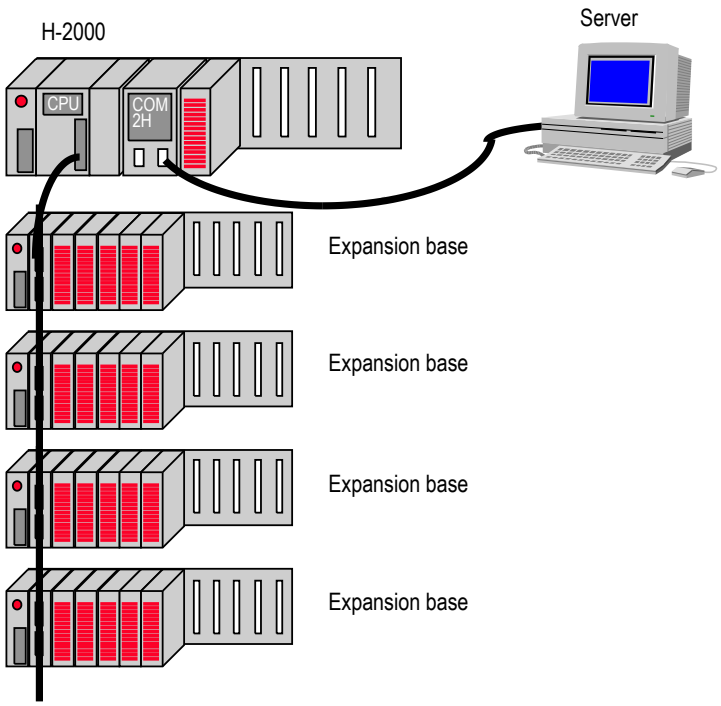

Figure 1: Separate System architecture

Remote I/O System

A Remote I/O System consists of the H-Series controllers with remote I/O expansion units connected via remote I/O modules.

The server treats each remote host station module (REM-MAH) as a separate Type 2 controller. You can mount a maximum of 4 REM-MAH modules onto a base rack of 9 slots. If communication to the server is via a COM-2H module, only 7 slots would be left, therefore only 3 remote host modules would be available.

You can multi-drop a maximum of 10 remote sub-station modules (REM-LOH) off a single remote host module.

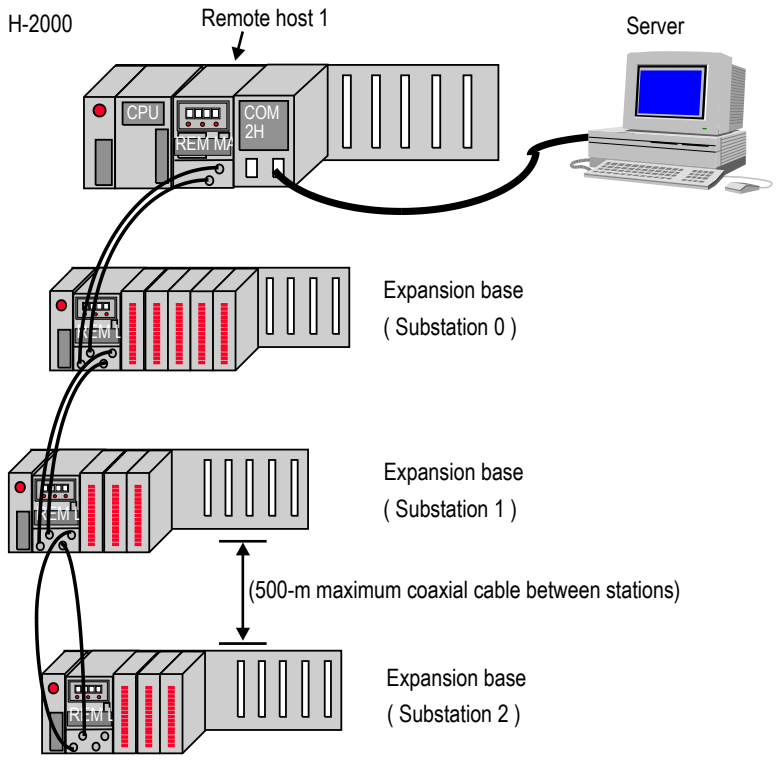

Figure 2: Remote I/O System architecture

CPU Link System

A CPU Link System consists of one or more H-Series controllers connected via the CPU link module.

The server treats each networked H-Series controller as a separate controller. The network address (LUMP) is configurable when defining a controller.

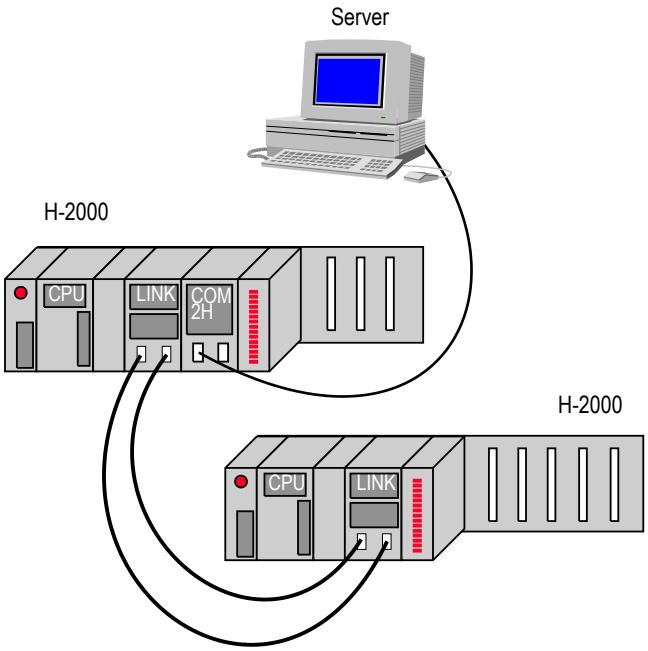

Figure 3: CPU Link System architecture

Host Link System

In a Host Link system the server is connected to the H-Series controller via the RS-232 or RS-422 port of the COM-2H module. An RS-422 cable provides a connection to other controllers. Each controller is addressed by the station number set switch, which ranges from 0 to 31.

The server treats each multi-dropped controller as a separate controller. The station number of the controller (also called *office number*) is configured when defining the controller.

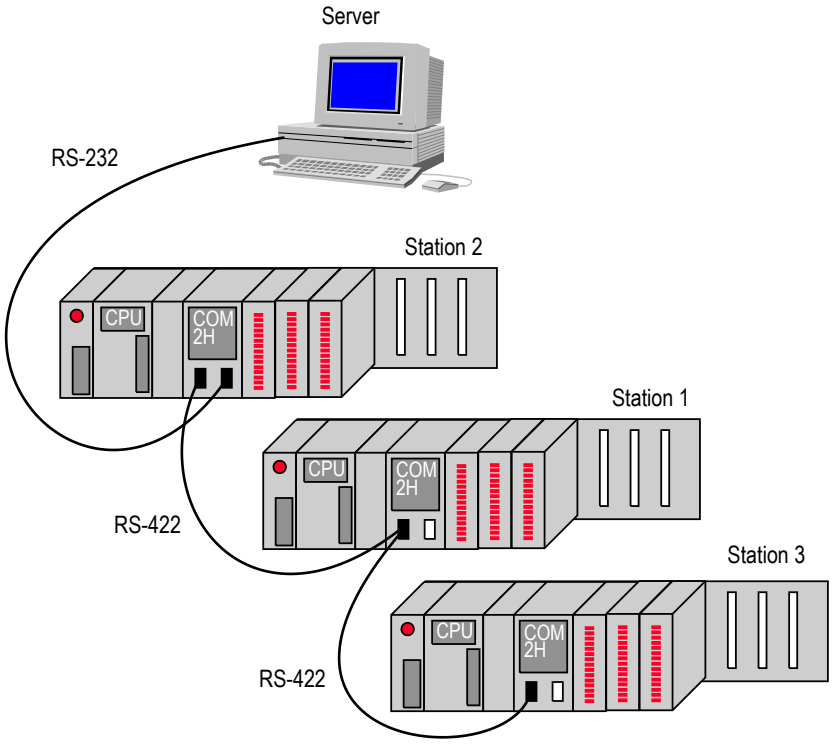

Figure 4: Host Link System architecture

Complex System

A Complex System consists of a CPU Link System and one or more Remote I/O Systems.

Hitachi networking

You can network Hitachi controllers using network modules (called *link modules*). You can have up to 64 link modules in a system. A system is defined as all of the devices contained within a loop. There is a maximum of two link modules per CPU. A host connected to a CPU with two link modules attached, has access to the data on all Hitachi controllers attached to the two network loops.

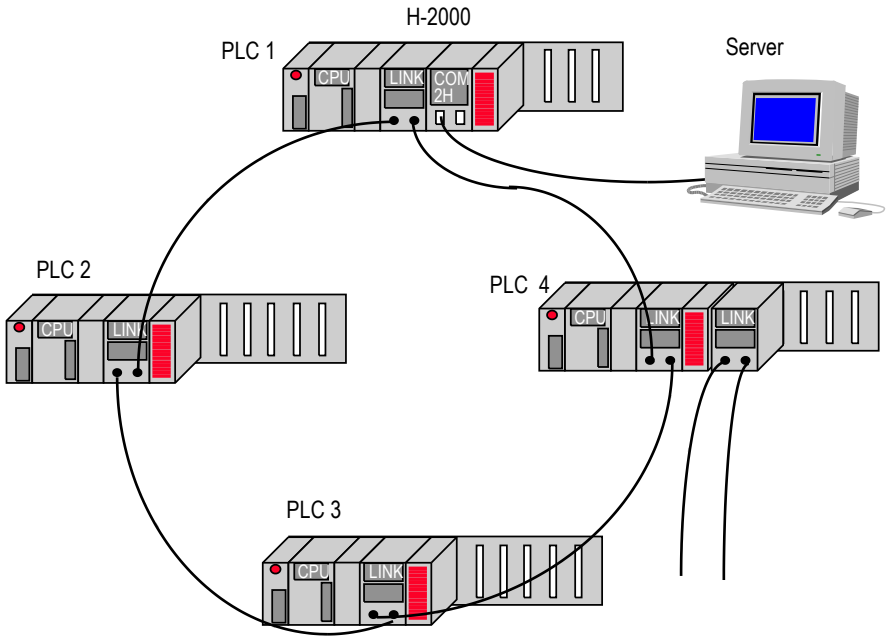

Figure 5: Networking system architecture

There are two methods of accessing data on different controllers:

- Link area
- Network addressing of the message packet

Link area

The link area in the CPUs memory is common to all attached controllers. Data required by another controller on the loop is copied to a specific address within the link area. CPUs can have two link areas. Link area 1 refers to link module 1 and link area 2 refers to link module 2.

Network addressing

Data is read from memory areas of connected controllers by assigning a network address to the message packet. You assign a network address to each link module. The network address is made up of the following:

- Loop Number
- Unit Number, which must be unique on a loop
- Module Number
- Port Number

In “Figure 5: Networking system architecture”, the server can read data from PLCs 1 to 4, but it cannot directly access the controllers attached to the second link module on PLC 4 because of H-Series protocol limitations. However, the server can access to the controllers on this network system using the second link area of PLC 4.

Hitachi controller address support

The following table shows the addressable areas for H-Series controllers. The **Supported** column indicates if the server can address the memory area.

Memory area	Addressable range	Size	Supported[1]
External I/O	See the section "External I/O" in the topic titled "Defining a Hitachi address for a point parameter."		Y
Remote external I/O	See the section "Remote external I/O" in the topic titled "Defining a Hitachi address for a point parameter."		Y
CPU Link Area 1	0–3FF (hexadecimal)	1,024 words	Y
CPU Link Area 2	1,000–13FF (hexadecimal)	1,024 words	Y
Internal Bit Area	0–7BF (hexadecimal)	1,984 points	Y
Internal Special Bit	7C0–7FF (hexadecimal)	64 points	Y
Internal Word Area	0–RAM module size (hexadecimal)[2]	1 K words	Y
		8 K words	Y
		16 K words	Y
		48 K words	Y
Internal Special Word	F000–F1FF (hexadecimal)	512 words	Y
Data Area	0–3FF (hexadecimal)	1,024 words	Y
Edge Detection	0–511 (decimal)	512 points	N
Master Control	0–49 (decimal)	50 points	N
Counter Clear	0–511 (decimal)	512 points	Y
Timer Reset	0–255 (decimal)	256 points	Y
Timer/Counter Value	0–511 (decimal)	512 words	Y

Related topics

“Defining a Hitachi address for a point parameter” on page 26

[1] **Y = supported, N = Not supported**

[2] Sizing of this memory area is dependent on installed RAM card and model: the H252 can address up to 1 KB; the H300 can address up to 8 KB; the H700 can address up to 16 KB; the H2000 can address up to 48 KB. Note that: 1 point = 1 bit of data, 1 word = 16 bits of data.

Communication settings for Hitachi

There are two methods of connecting Hitachi controllers:

- CPU module
- COM-2H module

CPU module

RS-232 must be used for connection to the CPU module. See the CPU Module manual for detailed communication parameters.

The standard setting of a Hitachi controller communications port is:

Setting	Value
Baud	19,200
Parity	Even
Data Bits	7
Stop Bits	1

COM-2H module

RS-232 or RS-422 can be used for connection to the COM-2H module and can also be supported simultaneously. See the following table for specification details.

Table 1: COM-2H specifications

Item	Specification
Interface	RS-232, RS-422
Baud	300, 600, 1200, 2400, 4800, 9600, 19,200
Communication	Half-duplex
Activation	One-way Asynchronous
Transmission	Serial
Transmission code	ASCII
Error Control	vertical parity, overrun, framing, sum
Maximum message length	503 bytes/message

Detailed pinout diagrams for RS-232 and RS-422 cabling, can be found in the H-Series COM-2H manual.

The following table details the operation mode set switch settings for RS-232 and RS-422 connections. The switch determines if the station number is sent to the controller in the header of packets by the host.

Table 2: Operation mode set switch

Switch	RS-232	RS-422
0	One-way activation (with station number)	
1	One-way activation (without station number)	Both-way activation (with station number)
2	One-way activation (without station number)	One-way activation (with station number)
3	Both-way activation (without station number)	Both-way activation (without station number)
4	Both-way activation (without station number)	One-way activation (with station number)

Only one-way communication with the controller is supported by the Hitachi interface. Non-Station mode is not provided when communicating one-way using RS-422.

To support one-way communication with the RS-232 and RS-422, set the operation mode set switch on the COM-2H module to 2. Only the host connected to the RS-422, will be able to communicate with the controllers in a host link configuration in this mode.

When the operation mode set switch is set to 0, a host connected via RS-232 will be able to communicate with controllers in a host link configuration, and the RS-422 port will be disabled.

Hitachi channel and controller reference

This section describes the configuration and addressing information specific to Hitachi channels and controllers.

In addition to the information contained in this reference, and for help to build channels and controllers, see the section titled "Building controllers or channels" in the *Quick Builder User's Guide*.

Related topics

“Main properties for a Hitachi channel” on page 18
“Port properties for a Hitachi channel” on page 20
“Main properties for a Hitachi controller” on page 22
“Optimizing Hitachi scanning performance” on page 24
“Planning considerations for installing and configuring Hitachi controllers” on page 5

Main properties for a Hitachi channel

The Main tab defines the basic properties for a Hitachi channel.

For information about how to create a channel, see the topic titled "Building controllers and channels" in the *Quick Builder User's Guide*.

Property	Description
Name	The unique name of the channel. A maximum of *10* alphanumeric characters (no spaces or double quotes). Note: In Station displays, underscore characters (_) appear as spaces.
Description	(Optional) A description of the channel. A maximum of *132* alphanumeric characters, including spaces.
Associated Asset	The Tag Name of the Asset to be associated with the alarm group.
Marginal Alarm Limit	The communications alarm marginal limit at which the channel is declared to be marginal. When this limit is reached, a high priority alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one channel, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. A channel barometer monitors the total number of requests and the number of times the controller did not respond or response was incorrect. The barometer increments by two or more, depending on the error, and decrements for each good call. To calculate an acceptable marginal alarm limit, use the formula: Square root of the number of controllers on the channel × Marginal Alarm Limit defined on those controllers (Normally, you specify the same value for all controllers on a channel). For example, if there are 9 controllers on the channel and their Marginal Alarm Limit is set to *25*, the value would be *3* (which is the square root of 9) *x 25 = 75*.
Fail Alarm Limit	The communications alarm fail limit at which the channel is declared to have failed. When this barometer limit is reached, an urgent alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one channel, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. Set this to double the value specified for the channel Marginal Alarm Limit.
Station Numbers	Select Used if the server uses station numbers to access controllers (for example, when networking controllers).
Write Delay	If the channel is on a serial port, the length of time (in milliseconds) that the server waits before writing to any controller on the channel. The default value is *10* milliseconds. A write delay is usually specified only if: • The server communicates to the controller over a half-duplex radio link and the radio system requires time to key in each direction before the server or controller can send data. • The radio system implements *RTS/CTS* handshaking. If there is a communications problem and the controller does not respond to writes from the server, try changing this setting to *11* milliseconds or more. This should allow the controller enough time to become ready to receive data from the server.
Connect Timeout	The length of time that the server attempts to connect to the controller. The server will stop trying to connect to the controller once the timeout period passes. The default value *10* seconds. Use the default value unless the communications line has a high error rate, or unless you are using modems.

Property	Description
Read Timeout	The length of time that the server will wait for a reply from the controller. The server will stop waiting once the timeout period passes. The default value is *2* seconds. Use the default value unless the communications line has a high error rate, or unless you are using modems.
Item Type	The type of channel specified when this item was created.
Last Modified	The date and time the channel properties were modified.
Last Downloaded	The date and time the channel was last downloaded to the server.
Item Number	The unique item number currently assigned to this channel, in the format *CHNcc*, where *cc* is the channel number. You can change the item number if you need to match your current server database configuration. The number must be between *01* and the maximum number of channels allowed for your system. For more information about setting the maximum value, see the topic titled "Adjusting sizing of non-licensed items" in the *Supplementary Installation Tasks Guide*.

Port properties for a Hitachi channel

The Port tab defines the communication-related properties for a channel. The properties vary according to the selected **Port Type**:

- *Serial*. Select this if you are using a Stallion EasyConnection adapter.
- *TerminalServer*. Select this if you want to connect the controller to the server via a LAN.
- *LANVendor*. Not applicable to Hitachi controllers.

Attention
Set the port properties to the same values as those specified when configuring the controller.

Serial port properties

Property	Description
Serial Port Name	The device name of the serial port.
Baud	The number of data bits per second. The default is *9600*.
Number of Data Bits	The number of data bits used for transmission. The default is *8*.
Stop Bits	The number of stop bits used for transmission The default is *1*.
Parity	Defines parity verification of each character and must match configuration on the end device. The default is *NONE*.
Checksum	The type of checksum error detection used for the port. Select the value that matches the setting on the communication device.
XON/XOFF	The type of XON/XOFF software flow control used to stop a receiver from being overrun with messages from a sender. The types are: • *Input* (use XON/XOFF to control the flow of data on the receive line) • *None* (default) • *Output* (use XON/XOFF to control the flow of data on the transmit line)
RS-232	Not applicable. (The RS-232 and RS-485 settings are mutually exclusive.)
RS-485	Select **Enable Stallion RS-485 Half Duplex** and **Echo**. (**Echo** indicates that the server expects messages it sends to the port on the transmit line to be echoed back on the receive line.)

Terminal server port properties

Property	Description
Terminal Server TCP Host Name Terminal Server TCP Port No	The name and port number of terminal server to which the channel is connected. You can specify either a TCP host name or an IP address, but it must match the TCP host name used when you installed and internally configured the terminal server.
Idle Timeout	The time, in seconds, the channel waits for a successful connection to the server before closing the connection. A value of *0* indicates that the connection is never closed.

Property	Description
Checksum	The type of checksum error detection used for the port. Not applicable for this channel. Select *NONE*.

Main properties for a Hitachi controller

The **Main** tab defines the basic properties for a Hitachi controller.

For information about how to create a controller, see the topic titled "Building controllers and channels" in the *Quick Builder User's Guide*.

Property	Description
Name	The unique name of the controller. A maximum of *10* alphanumeric characters (no spaces or double quotes). Note: In Station displays, underscore characters (_) appear as spaces.
Description	(Optional) A description of the controller. A maximum of *132* alphanumeric characters, including spaces.
Associated Asset	The Tag Name of the Asset to be associated with the alarm group.
Channel Name	The name of the channel on which the controller communicates with the server. (You must have already defined a channel for it to appear in this list.)
Marginal Alarm Limit	The communications alarm marginal limit at which the controller is declared to be marginal. When this limit is reached, a high priority alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one controller, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. A controller barometer monitors the total number of requests and the number of times the controller did not respond or response was incorrect. The barometer increments by two or more, depending on the error, and decrements for each good call. The default value is *25*.
Fail Alarm Limit	The communications alarm fail limit at which the controller is declared to have failed. When this barometer limit is reached, an urgent alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one controller, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. Set this to double the value specified for the controller Marginal Alarm Limit. The default is *50*.
Controller Type	Specifies the Hitachi controller type. For: • Type 0, select *All PLC register areas except areas covered by types 1 and 2* • Type 1, select *Internal Word Output* • Type 2, select *Remote External I/O*
Controller ID	The ID of the controller. The format of the ID is: *ID.LoopNumber.UnitNumber.0.0* Where: *ID* = Only applicable for a multi-dropped controller (if **Station Numbers** in the channel is set to *Used*). A unique number between 0 and 31. *LoopNumber* = Number of CPU link, which is either *1* or *2*. *UnitNumber* = Unit number in CPU link (Also known as station number). A unique number between 1 and 63.
Offset	The address offset into WR register area default is *0*. Each controller has an 8 KB address limitation. For example: to address WR20170, the controller offset of 20000 could be used, with the point built at WR170.

Property	Description
Item Type	The type of controller specified when this item was created.
Last Modified	The date and time the controller properties were modified.
Last Downloaded	The date and time the controller was last downloaded to the server.
Item Number	The unique item number currently assigned to this controller, in the format *RTUnnnnn*. You can change the item number if you need to match your current server database configuration. The number must be between *01* and the maximum number of controllers allowed for your system. For more information about setting the maximum value, see the topic titled "Adjusting sizing of non-licensed items" in the *Supplementary Installation Tasks Guide*.

Optimizing Hitachi scanning performance

Two types of scan packets are built for Hitachi controllers:

- **Hardware diagnostic scan**. One scan per controller every 60 seconds is initiated automatically by the server to verify communications integrity with the controller. One hardware diagnostic scan is automatically created per scan packet.
- **Periodic data acquisition scan**. Periodically, the server acquires a value from a controller and processes the value as a point parameter.

  For each source address scanned, a scan period can be specified. The period specified depends on the nature of the parameter. A fast changing or critical parameter uses a fast rate; an infrequent or non-critical parameter (for example, SP) should use a slower rate.

Tip

- All external I/O board values can be written to data area registers and thus reduce the number of scan packets.
- External remote I/O board values can also be written to data area registers reducing the number of controllers.
- Closely blocking the scanned registers will minimize the scanning of registers not being used by the system.
- Ensure that all points within a scanning block have the same scanning period.

Hitachi points reference

This section describes how to configure points for a Hitachi controller using Quick Builder.

In addition to the information contained in this reference, and for help to build points, see the section titled "Building and configuring points" in the *Quick Builder User's Guide*.

Related topics

“Defining a Hitachi address for a point parameter” on page 26

Defining a Hitachi address for a point parameter

For **PV Source Address**, **Source Address**, and **Destination Address** the format for a Hitachi controller address is:

ControllerName Address

Part	Description
ControllerName	The name of the Hitachi controller.
Address	The address within the controller where the value is stored. See the section below titled "Address syntax."

If you would like help when defining an address, click ... next to **Address** to display Address Builder.

Address syntax

The format for the address is:

Address [*DataFormat*|*BitNumber*]

Part	Description
Address	The address within the controller register tables. See the section below titled "Hitachi register address format."
DataFormat	Only applicable to analog and accumulator values. See the section below titled "Data formats."
BitNumber	If the controller table code is a word code, you must specify the bit number.

Hitachi register address format

The address format varies according to register type:

- Internal bit area
- Internal word area
- Data area
- Timer counter area
- External I/O
- Remote external I/O
- CPU link area

Internal bit area

Numbers are hexadecimal.

Name	Point address	Examples
Internal bit area	R 0 to 7BF	*R 01F*
Internal special bit area	R 7C0 to 7FF	*R 7DF*

Internal word area

Numbers are hexadecimal.

Name	Point address	Examples
Internal word area	WR 0 to 3FF WR 0 to 43FF WR 0 to C3FF	*W R01F* *WR 41FF* *WR C3DF*
Internal double-word area	DR 0 to 3FE DR 0 to 43FE DR 0 to C3FE	*DR 3E1* *DR 03FE* *DR 23FE*
Internal special word area	WR F000 to F1FF	*WR F11F*
Internal special double-word area	DR F000 to F1FE	*DR F11A*

Data area

Numbers are hexadecimal.

Name	Point address	Examples
Bit data area	M 0 to 3FFF	*M 301F*
Word data area	WM 0 to 3FF	*WM 20F*
Double-word data area	DM 0 to 3FE	*DM 010*

Timer counter area

Numbers are in decimal notation.

Name	Point address	Examples
On-delay timer	TD 0 to 255	*TD 25*
Re-triggerable timer	SS 0 to 255	*SS 2*
Watchdog timer	WDT 0 to 255	*WDT 23*
Monostable timer	MS 0 to 255	*MS 255*
Accumulation timer	TMR 0 to 255	*TMR 45*
Up counter	CU 0 to 511	*CU 1*
Ring counter	RCU 0 to 511	*RCU 311*
Up/Down counter's up input	CTU 0 to 511	*CTU 511*
Up/Down counter's down input	CTD 0 to 511	*CTD 17*
Up/Down counter's output	CT 0 to 511	*CT 411*
Elapsed counter clear	CL 0 to 511	*CL 509*
Timer counter elapsed time	TC 0 to 511	*TC 261*

Where:

TC = 512 words

CL = 512 points

The remaining values are uniquely numbered and form the same address space.

Attention

Timer area points are back-built to a TM code, except tables CL and TC.

External I/O

Name	Point address
External bit input	*X u s b*
External bit output	*Y u s b*
External word input	*WX u s m*
External word output	*WY u s m*
External double word input	*DX u s m*
External double word output	*DY u s m*

Where:

u = Unit No. (0–5)

s = Slot No. (0–A hexadecimal notation)

b = Bit No. (00–95 decimal notation)

m = Word No. (0–9)

The following table lists the maximum number of I/O points allowed by each controller model.

Type	H2000	H700	H300	H100m
32 point I/O	2,048	640	288	160
64 point I/O	4,096	1,280	576	160
64 point I/O& remote I/O	5,632	2,816	2,112	2,112

Maximum No. of expansion units = 5

Maximum no of mounted I/O modules = 64 (The maximum size for an expansion rack is 11 slots. The base rack is a 9-slot rack. Maximum number of I/O modules is therefore 11*5+9 = 64.)

Examples

Bit input Unit 0, Slot 4, Bit 6:	`X 0 4 6`
Bit output Unit 2, Slot 10, Bit 12:	`Y 2 A 12`
Word input Unit 5, Slot 0, Word 8:	`WX 0 5 8`
Word output Unit 0, Slot 2, Word 1:	`WY 0 2 1`
Double word input Unit 4, Slot 10, Word 0:	`DX 4 A 0`
Double word output Unit 2, Slot 10, Word 6:	`DY 2 A 6`

Remote external I/O

Name	Point address
Remote External bit input	*X r St s b*
Remote External bit output	*Y r St s b*
Remote External word input	*WX r St s m*
Remote External word output	*WY r St s m*

Name	Point address
Remote External double word input	*DX r St s m*
Remote External double word output	*DY r St s m*

Where:

r = Remote host station no. (1 - 4)

St = Remote substation No (0 - 9)

s = Slot No. (0 - A Hexadecimal notation)

b = Bit No. (00 - 95 Decimal notation)

m = Word No. (0 - 9)

Max No. of remote host stations	4
Max No. of remote substations/host station	10
Max No of points/host station	512
Max No of Points	2048

Examples

Bit input remote host 1, substation 3, Slot 9, Bit 6:	`X 1 3 9 6`
Bit output remote host 4, substation 4, Slot 10, Bit 12:	`Y 4 4 A 12`
Word input remote host 1, substation 2, Slot 9, Word 8:	`WX 1 2 9 8`
Word output remote host 1, substation 2, Slot 0, Word 1:	`WY 1 2 0 1`
Double word input remote host 1, substation 1, Slot 10, Word 0:	`DX 1 1 A 0`
Double word output remote host 3, substation 2, Slot 10, Word 7:	`DY 3 2 A 7`

CPU link area

Numbers are hexadecimal.

Name	Point address	Examples
Bit CPU link area 1	L 0 to 3FFF	*L 001FF*
Word CPU link area 1	WL 0 to 3FF	*WL 02F3*
Double-word CPU link area 1	DL 0 to 3FE	*DL 000A*
Bit CPU link area 2	L 10000 to 13FFF	*L 101FF*
Word CPU link area 2	WL 1000 to 13FF	*WL 12F3*
Double-word CPU link area 2	DL 1000 to 13FE	*DL 100A*

Data formats

The data format is only valid for analog and accumulator points. The standard formats are shown in the following table.

Data Format	Description	Counts	Scaled
S16B	16-bit, signed	–32,767–32,768	Yes
U15B	15-bit, unsigned	0–32,767	Yes
U16B	16-bit, unsigned	0–65,535	Yes
U3BCD	12-bit, BCD	0–999	Yes
U4095	12-bit, unsigned	0–4,095	Yes
U4BCD	16-bit, BCD	0-9,999	Yes
U8BCD	32-bit, BCD	0–99,999,999	Yes

'U' range format types are scaled by the 0% and 100% of the HOST range values.

Example

```
HITWM10 02 WM 100 U4095
```

Related topics

“Planning considerations for installing and configuring Hitachi controllers” on page 5
“Hitachi controller address support” on page 13

Troubleshooting Hitachi issues

This section describes troubleshooting tasks for Hitachi that you can perform either on the server or from any Station.

Related topics

“Testing Hitachi communications with the server” on page 32

Testing Hitachi communications with the server

You use the Hitachi test utility, **hittst**, to test communications between the server and the Hitachi controller after you have downloaded channel and controller definitions to the server database.

CAUTION
Do not run the utility while the channel is enabled.

Prerequisites

- Set up the controller.
- Connect all cables.
- Define the controller and channel in Quick Builder.
- Download the Quick Builder definitions to the server, without errors.
- Ensure the channel is out of service.

To run the hittst utility

1. Open a Command Prompt window.
2. Type **hittst** and then press Enter.
3. Follow the directions as prompted.
   You can read and write data to all registers that can be addressed by the server.

   If you are using a COM-2H module, the transmit and receive LEDs flash during transactions.

Related topics

“Planning considerations for installing and configuring Hitachi controllers” on page 5

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  or

- Contact your local Honeywell Process Solutions Customer Contact Center (CCC) or Honeywell Technical Assistance Center (TAC) listed in the “Support and other contacts” section of this document.

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