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Yamatake MA500 Interface Reference

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# Planning considerations for installing and configuring Yamatake MA500 controllers

This reference describes how to set up, configure, and test Yamatake MA500 controllers.

## Revision history

Revision	Date	Description
A	February 2015	Initial release of document.

## How to use this guide

Complete each step before commencing the next.

Steps	Go to
Set the communication parameters	Communication settings for Yamatake MA500
Connect the cables from the server to the MA500 controller	Serial connection settings for Yamatake MA500
Use Quick Builder to define channels	<ul style="list-style-type: none"><li>Yamatake MA500 channels and controllers configuration and addressing reference</li><li>"Build channels" topic in the <i>Quick Builder User's Guide</i></li></ul>
Use Quick Builder to define controllers	<ul style="list-style-type: none"><li>Yamatake MA500 channels and controllers configuration and addressing reference</li><li>"Build controllers" topic in the <i>Quick Builder User's Guide</i></li></ul>
Download channel and controller definitions to the server	"Downloading items" topic in the <i>Quick Builder User's Guide</i>
Test communications	Testing Yamatake MA500 communications with the server
Use Quick Builder to define points	Defining a Yamatake MA500 address for a point parameter

## Related topics

"Devices supported by the Yamatake MA500 interface" on page 6

"Other documentation for Yamatake MA500" on page 7

"Yamatake MA500-specific terms" on page 8

"Architectures for Yamatake MA500" on page 9

"Communication settings for Yamatake MA500" on page 11

"Serial connection settings for Yamatake MA500" on page 10

"Testing Yamatake MA500 communications with the server" on page 26

"Defining a Yamatake MA500 address for a point parameter" on page 22

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## Devices supported by the Yamatake MA500 interface

The server supports the following device:

- CNM7 (communication module)

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## Other documentation for Yamatake MA500

The following reference describes the address space of all the devices supported by this interface in great detail. It also provides information about the physical configuration of the Units. This reference is recommended reading when using this interface.

- Yamatake–Honeywell Factory Automation Controller—*MA500 Host Communications User Manual*; Part No: CP-UM-1231E

These manuals provide detailed information concerning the configuration of each type of Unit.

- Yamatake–Honeywell FA Controller—*MA500 Operation Manual Specifications and Installation*; Part No: CP-UM-1226E
- Yamatake–Honeywell FA Controller —*MA500 Operation Manual Programming*; Part No: CP-UM-1227E
- Yamatake–Honeywell FA Controller —*MA500 Operation Manual Personal Computer Loader*; Part No: CP-UM-1229E

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# Yamatake MA500-specific terms

<b>Master Station Number</b>	The station address of the CNM7 module. This is a dial setting on the front of the CNM7 card.
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## Architectures for Yamatake MA500

Yamatake MA500 controllers can be configured in two different ways:

- Standalone
- Networked

### Standalone

A standalone system consists of only the base unit.

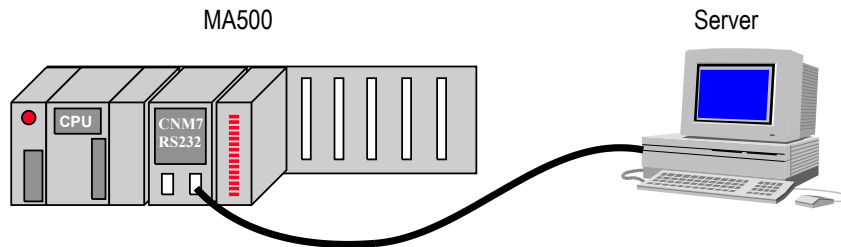


Figure 1: Yamatake MA500 standalone system architecture

### Networked

Yamatake MA500 controllers can be networked with the use of networking modules. Up to 63 Yamatake MA500 controllers can be networked in an ECL Network.

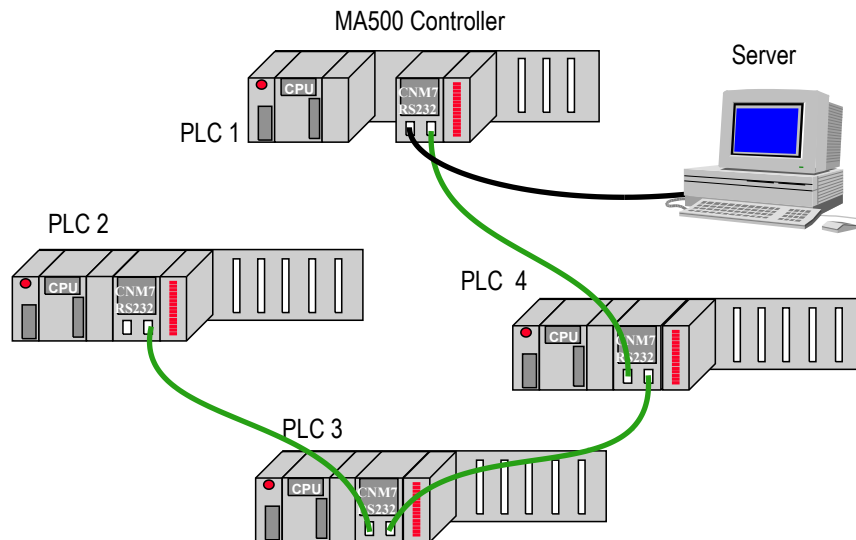


Figure 2: Yamatake MA500 network architecture

The server communicates with the CNM7 in PLC1 via a serial RS-232 link.

The other Yamatake MA500 controllers are connected to PLC1's CNM7 via the ECL network.

The server can access points in all controllers via the serial link by varying the *Master Station Number* in the Yamatake MA500 read and write commands.

### Multiple networking not supported

The server interface does not currently support a configuration having multiple CNM7 modules in a Yamatake MA500, each CNM7 module having its own network with multiple controllers on it.

## Serial connection settings for Yamatake MA500

Connect the CNM7 to the server using RS-232 cables. The *MA500 Host Communications User Manual* provides the pin-out diagrams for RS-232 cabling.

### Related topics

“Planning considerations for installing and configuring Yamatake MA500 controllers” on page 5

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## Communication settings for Yamatake MA500

The first step is to set up the Yamatake MA500 controllers. See the manufacturers' documentation for details on setting up these parameters.

Communication parameters are detailed in the *MA500 Host Communications User Manual*. The following table details the specifications for the CNM7 module.

Item	Specification
Interface	RS-232 port
Baud	2400, 4800, 9600, 19,200
Communication	Half-Duplex
Transmission	Serial
Transmission code	ASCII
Error Control	Parity, overrun, framing, checksum
Maximum message length	575 bytes/message (ECL limitation)



# Yamatake MA500 channel and controller reference

This section describes the configuration and addressing information specific to Yamatake MA500 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 Yamatake MA500 channel" on page 14

"Port properties for a Yamatake MA500 channel" on page 16

"Main properties for a Yamatake MA500 controller" on page 18

"Optimizing Yamatake MA500 scanning performance" on page 19

## Main properties for a Yamatake MA500 channel

The Main tab defines the basic properties for a Yamatake MA500 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.
Marginal Alarm Limit	<p>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 <i>Server and Client Configuration Guide</i>. 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 <i>Server and Client Configuration Guide</i>.</p> <p>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.</p> <p>To calculate an acceptable marginal alarm limit, use the formula: Square root of the number of controllers on the channel <math>\times</math> Marginal Alarm Limit defined on those controllers (Normally, you specify the same value for all controllers on a channel).</p> <p>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) <math>\times</math> 25 = 75.</p>
Fail Alarm Limit	<p>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 <i>Server and Client Configuration Guide</i>. 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 <i>Server and Client Configuration Guide</i>.</p> <p>Set this to double the value specified for the channel Marginal Alarm Limit.</p>
Connect Timeout	<p>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.</p> <p>Use the default value unless the communications line has a high error rate, or unless you are using modems.</p>
Read Timeout	<p>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.</p> <p>Use the default value unless the communications line has a high error rate, or unless you are using modems.</p>
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.

Property	Description
Item Number	<p>The unique item number currently assigned to this channel, in the format <i>CHNCC</i>, where <i>cc</i> is the channel number.</p> <p>You can change the item number if you need to match your current server database configuration. The number must be between <i>01</i> 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 <i>Supplementary Installation Tasks Guide</i>.</p>

## Port properties for a Yamatake MA500 channel

The Port tab defines the communication-related properties for a channel. The **Port Type** for MA500 controllers can be:

- *Serial*. A serial communications interface, such as RS-232.
- *TerminalServer*. Not applicable.
- *LANVendor*. Not applicable.

### Serial port properties



#### Attention

The Serial Port settings must match the settings on your communication devices.

Property	Description
Serial Port Name	The device name of the serial port.
Baud	The number of data bits per second. The default is <i>9600</i> .
Number of Data Bits	The number of data bits used for transmission. The default is <i>8</i> .
Stop Bits	The number of stop bits used for transmission The default is <i>1</i> .
Parity	Defines parity verification of each character and must match configuration on the end device. The default is <i>NONE</i> .
Checksum	The type of checksum error detection used for the port. Select the value that matches the setting on the communication device. <ul style="list-style-type: none"> <li>• <i>CRC16_0</i> or <i>CRC16_1</i> (if Cyclic Redundancy Check (CRC) is set)</li> <li>• <i>ONESCOMP</i> or <i>TWOSCOMP</i> (if Longitudinal Redundancy Check (LRC) is set)</li> <li>• <i>XOR</i> (If exclusive or is set)</li> </ul>
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: <ul style="list-style-type: none"> <li>• <i>Input</i> (use XON/XOFF to control the flow of data on the receive line)</li> <li>• <i>None</i> (default)</li> <li>• <i>Output</i> (use XON/XOFF to control the flow of data on the transmit line)</li> </ul>
RS-232	These options are applicable to the RS-232 link: <ul style="list-style-type: none"> <li>• <b>Enable RTS/CTS flow control.</b> Select this if you want to use RTS/CTS for flow control to stop a receiver from being overrun with messages from a sender.</li> <li>• <b>Detect DCD.</b> Select this if the Data Carrier Detect communication status line of the COM port requires monitoring (usually when using modem or microwave linking). When selected, the communications fails if the desired COM status line is not high—for example, on a dial-up link connection for a modem.</li> <li>• <b>Detect DSR.</b> Select this if the Data Set Ready communication status line of the COM port requires monitoring (usually when using modem or microwave linking). When selected, the communications fails if the desired COM status is not achieved.</li> </ul>



Property	Description
RS-485	<p>These options are applicable to the RS-485 link:</p> <ul style="list-style-type: none"><li>• <b>Enable Stallion RS-485 Half Duplex.</b> Select if RS-232 to RS-485 is done using a Stallion EasyConnection adapter.</li><li>• <b>Echo (Required for Stallion RS-485 ports).</b> Select so that the server expects the messages it sends to the port on the transmit line to be echoed back on the receive line. Select for a Stallion EasyConnection adapter or a Black Box converter.</li></ul>

## Main properties for a Yamatake MA500 controller

The **Main** tab defines the basic properties for a Yamatake MA500 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 <i>10</i> alphanumeric characters (no spaces or double quotes). Note: In Station displays, underscore characters ( <i>_</i> ) appear as spaces.
Description	(Optional) A description of the controller. A maximum of <i>132</i> alphanumeric characters, including spaces.
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 <i>Server and Client Configuration Guide</i> . 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 <i>Server and Client Configuration Guide</i> .  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 <i>25</i> .
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 <i>Server and Client Configuration Guide</i> . 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 <i>Server and Client Configuration Guide</i> .  Set this to double the value specified for the controller Marginal Alarm Limit.  The default is <i>50</i> .
Station Number	Enter the station number of the MA500 controller, that is, the Master Station Number.
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 <i>RTUnnnnn</i> .  You can change the item number if you need to match your current server database configuration. The number must be between <i>01</i> 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 <i>Supplementary Installation Tasks Guide</i> .

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## Optimizing Yamatake MA500 scanning performance

The maximum amount of data that can be acquired from a controller is influenced by the rate of sending scan packets to the controller. An understanding of the Yamatake MA500 scan packets will help you configure points so that optimal data acquisition performance can be achieved by maximizing the amount of data acquired with each scan packet.

The scan packets that have been built can be listed by using the utility **lisscn** (list scan). Listing scan packets helps verify the scanning strategy.

For more information about **lisscn**, see the section titled "Command Reference" in the *Server and Client Configuration Guide*.

### Yamatake MA500 scan packets

A Yamatake MA500 scan packet can consist of up to 32 16-bit words. It can be located anywhere along the full address range of the controller. In order to be in a scan packet, within the block, points must reside in the one controller and have the same scan period. In addition they must be addressed within the 32-word range that defines the block.

Scan packets can consist of up to 32 consecutive registers in any area of the address space. Registers can contain status, accumulator and analog points.

Types of scan packets built for a Yamatake MA500 interface:

- Hardware diagnostic

One scan per controller every 60 seconds to verify communications integrity with the controller.

- Periodic data acquisition

One per scan packet enter the PV scan value for the desired rate at which the server should scan the Yamatake MA500 controller value. If it is a fast changing or critical parameter, use a fast rate. If the parameter changes infrequently or is non-critical, use a slower rate.



# Yamatake MA500 points reference

This section describes how to configure points for a Yamatake MA500 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 Yamatake MA500 address for a point parameter" on page 22

## Defining a Yamatake MA500 address for a point parameter

For **PV Source Address**, **Source Address**, and **Destination Address**, the format for a Yamatake MA500 controller address is:

*ControllerName Address*

Part	Description
<i>ControllerName</i>	The name of the Yamatake MA500 controller.
<i>Address</i>	The address in the controller where the value is recorded.

If you would like help with the address, you can use the Address Builder. To display the Address Builder, click  next to **Address**.

### Address syntax

The syntax for the address is:

*Address [Format | BitNumber]*

Part	Description
<i>Address</i>	The byte to read from the PLC.  The entire Yamatake MA500 address space is accessible for point source addressing. There is a <i>special area</i> (250 to 265) that is read only and so unavailable for destination addresses. The Relay area and the Register area are available for destination addresses.
<i>Format</i>	(Optional) Valid for analog and accumulator points only. In the case of an analogue point, the data format must be defined. See the section below titled "Data formats."
<i>BitNumber</i>	(Optional) Valid for status points only. The valid range for bit number is 0 (default) to 15, where 0 is the right-most bit in the register.

### Examples

Analog point example

TIC-101 002 1000 U4095

Status point example

FCE-PRESS 002 202 6

Accumulator point example

PVSOURCE FCE-KWH 002 2001

### Data formats

A data format is valid for analog and accumulator points only. Valid data format descriptors are shown below. The default format is C16.

Data Format	Description	Counts	Scaled
U4095	12-bit unsigned	0 to 4,095	Yes
U16B	16-bit unsigned	0 to 65,535	Yes
S16B	16-bit signed	-32,767 to 32,768	Yes

Data Format	Description	Counts	Scaled
U15B	15-bit unsigned	0 to 32,768	Yes
C16	16-bit signed	-32,767 to 32,768	No

'U' range format types are scaled by the 0% and 100% of the HOST range values. 'C' types are not scaled and the 0% and 100% range values are used for adjusting the height of the display bar only.

**Related topics**

“Planning considerations for installing and configuring Yamatake MA500 controllers” on page 5





# Troubleshooting Yamatake MA500 issues

This section describes troubleshooting tasks for Yamatake MA500 that you can perform either on the server or from any Station.

## **Related topics**

“Testing Yamatake MA500 communications with the server” on page 26

“Troubleshooting Yamatake MA500 point configuration errors” on page 27

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## Testing Yamatake MA500 communications with the server

You use the Yamatake MA500 test utility, **ma5tst**, to test communications between the server and the Yamatake MA500 controller after you have downloaded channel and controller definitions to the server database.

### 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.



### Attention

- If there is a Loader Terminal with the system, this should be used to ensure that MA500 is operating correctly.
- 

### To run the ma5tst utility

- 1 Open a Command Prompt window.
- 2 Type **ma5tst** 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.

### Next steps

After you have verified that the server is communicating with the Yamatake MA500 controller, you can build points to reference Yamatake MA500 addresses.

### Related topics

“Planning considerations for installing and configuring Yamatake MA500 controllers” on page 5

## Troubleshooting Yamatake MA500 point configuration errors

Incorrectly configured points may reveal themselves in one of two ways.

### Errors while downloading to host

If points are configured with illegal configuration details this may cause problems when they are downloaded to the host. If this occurs read the out file created and correct the errors.

### Errors when scanning

If points are built with addresses which are valid but not configured in the controller, then these will not be reported as errors until the server attempts to acquire data from the points. They will be evident by the point detail showing a bad value (indicated by inverse video).

The most common errors are:

84E0            invalid address

Check that the address lies within the correct range. For MA500 this is 0–4095. Also check that an xxDESTIN has not been requested in the *special area* (250–265).

84E7            invalid bit number

Check that the bit number lies in the valid range (0 to 15). Also check that a read or write has not been requested across a word boundary.

For example, the following statements will produce such an error:

Case 1:

```
&
RANGE      MA5ERR1      0      7.0
PVSOURCE   MA5ERR1      008    2000    14
&
```

Case 2:

```
&
OPWIDTH    MA5ERR2      2
OPDESTIN   MA5ERR2      008    2001    15
&
```

When this occurs the points should be checked for references to addresses in the controller that are not configured within the controller.



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If you have comments about Honeywell Process Solutions documentation, send your feedback to:

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## How to report a security vulnerability

For the purpose of submission, a security vulnerability is defined as a software defect or weakness that can be exploited to reduce the operational or security capabilities of the software.

Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services.

To report a potential security vulnerability against any Honeywell product, please follow the instructions at:

<https://honeywell.com/pages/vulnerabilityreporting.aspx>

Submit the requested information to Honeywell using one of the following methods:

- Send an email to [security@honeywell.com](mailto:security@honeywell.com).
- 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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## Support

For support, contact your local Honeywell Process Solutions Customer Contact Center (CCC). To find your local CCC visit the website, <https://www.honeywellprocess.com/en-US/contact-us/customer-support-contacts/Pages/default.aspx>.



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## Training classes

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