

Yokogawa Darwin Serial Driver

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Yokogawa Darwin Serial Driver

Help version 1.023

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Overview

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Overview

The Yokogawa Darwin Serial Driver provides a reliable way to connect Yokogawa Darwin Serial devices to OPC client applications; including HMI, SCADA, Historian, MES, ERP, and countless custom applications. It is intended for use with Yokogawa Data Acquisition and Data Recorder devices that support RS-232 and RS-422 communications.

Device Setup

Supported Yokogawa Devices

DA100-1
DA100-2
DR231
DR232
DR241
DR242
DC100-1
DC100-2

Supported Communication Properties

Baud Rate: 300, 600, 1200, 2400, 9600, 19200, 38400, 56000, 57600, 115200, 128000, or 256000.

Parity: None, Even, or Odd.

Data Bits: 5, 6, 7, or 8

Stop Bits: 1 or 2.

Flow Control: None, DTR, RTS, RTS.DTR, RTS Always

● Notes:

1. Software handshaking is not available.
2. This driver makes use of binary data formatting when reading information from Yokogawa devices. This requires that data bit setting 8 be used.

RS-232 and RS-422/485 Operation

Yokogawa Darwin devices can support RS-232 or RS-422/485 operation. The mode that is used depends on the configuration of the OPC server project.

If intending to connect to a Darwin device using RS-232, select a Device ID of zero (0). This tells the driver to use the RS-232 mode for communications. If intending to use either RS-422 or RS-485 communications, select a Device ID for each station that is between 1 and 16 for RS-422, and between 1 and 31 for RS-485. When using RS-232, only configure one device on the channel.

Request Timeout

This property specifies the amount of time that the driver will wait for a response from the device before giving up and going on to the next request. Long timeouts will only affect performance if a device is not responding. The valid range is 100 to 30000 milliseconds. The default setting is 5000 milliseconds.

Retry Attempts

This property specifies the number of times that the driver will retry a message before giving up and going on to the next message. The valid range is 1 to 10. The default setting is 3.

● *For more information, refer to the server's help documentation.*

Device ID

When operating in RS-232 mode, the Device ID has no meaning for this driver. When the driver is operating in the RS-422 mode, the Device ID has a valid range of 1 to 31. The default setting is 1.

● **See also:** Vendor notes.

Channel Properties — General

This server supports the use of simultaneous multiple communications drivers. Each protocol or driver used in a server project is called a channel. A server project may consist of many channels with the same communications driver or with unique communications drivers. A channel acts as the basic building block of an OPC link. This group is used to specify general channel properties, such as the identification attributes and operating mode.

Property Groups	<input type="checkbox"/> Identification	
General	Name	
Write Optimizations	Description	
Advanced	Driver	
	<input type="checkbox"/> Diagnostics	
	Diagnostics Capture	Disable

Identification

Name: User-defined identity of this channel. In each server project, each channel name must be unique. Although names can be up to 256 characters, some client applications have a limited display window when browsing the OPC server's tag space. The channel name is part of the OPC browser information.
 ● For information on reserved characters, refer to "How To... Properly Name a Channel, Device, Tag, and Tag Group" in the server help.

Description: User-defined information about this channel.

● Many of these properties, including Description, have an associated system tag.

Driver: Selected protocol / driver for this channel. This property specifies the device driver that was selected during channel creation. It is a disabled setting in the channel properties.

● **Note:** With the server's online full-time operation, these properties can be changed at any time. This includes changing the channel name to prevent clients from registering data with the server. If a client has already acquired an item from the server before the channel name is changed, the items are unaffected. If, after the channel name has been changed, the client application releases the item and attempts to re-acquire using the old channel name, the item is not accepted. With this in mind, changes to the properties should not be made once a large client application has been developed. Utilize the User Manager to prevent operators from changing properties and restrict access rights to server features.

Diagnostics

Diagnostics Capture: When enabled, this option makes the channel's diagnostic information available to OPC applications. Because the server's diagnostic features require a minimal amount of overhead processing, it is recommended that they be utilized when needed and disabled when not. The default is disabled.

● **Note:** This property is disabled if the driver does not support diagnostics.

● For more information, refer to "Communication Diagnostics" in the server help.

Channel Properties — Serial Communications

Serial communication properties are available to serial drivers and vary depending on the driver, connection type, and options selected. Below is a superset of the possible properties.

Click to jump to one of the sections: [Connection Type](#), [Serial Port Settings](#) or [Ethernet Settings](#), and [Operational Behavior](#).

● **Note:** With the server's online full-time operation, these properties can be changed at any time. Utilize the User Manager to restrict access rights to server features, as changes made to these properties can temporarily disrupt communications.

Property Groups	<input type="checkbox"/> Connection Type Physical Medium COM Port ▼ Shared No	
General	<input type="checkbox"/> Serial Port Settings COM ID 6 Baud Rate 9600 Data Bits 8 Parity Even Stop Bits 1 Flow Control None	
Serial Communications	<input type="checkbox"/> Operational Behavior Report Comm. Errors Enable Close Idle Connection Enable Idle Time to Close (s) 15	
Write Optimizations		
Advanced		
Communication Serialization		

Connection Type

Physical Medium: Choose the type of hardware device for data communications. Options include COM Port, None, Modem, and Ethernet Encapsulation. The default is COM Port.

- **None:** Select None to indicate there is no physical connection, which displays the [Operation with no Communications](#) section.
- **COM Port:** Select Com Port to display and configure the [Serial Port Settings](#) section.
- **Modem:** Select Modem if phone lines are used for communications, which are configured in the [Modem Settings](#) section.
- **Ethernet Encap.:** Select if Ethernet Encapsulation is used for communications, which displays the [Ethernet Settings](#) section.
- **Shared:** Verify the connection is correctly identified as sharing the current configuration with another channel. This is a read-only property.

Serial Port Settings

COM ID: Specify the Communications ID to be used when communicating with devices assigned to the channel. The valid range is 1 to 9991 to 16. The default is 1.

Baud Rate: Specify the baud rate to be used to configure the selected communications port.


Data Bits: Specify the number of data bits per data word. Options include 5, 6, 7, or 8.

Parity: Specify the type of parity for the data. Options include Odd, Even, or None.

Stop Bits: Specify the number of stop bits per data word. Options include 1 or 2.

Flow Control: Select how the RTS and DTR control lines are utilized. Flow control is required to communicate with some serial devices. Options are:


- **None:** This option does not toggle or assert control lines.
- **DTR:** This option asserts the DTR line when the communications port is opened and remains on.
- **RTS:** This option specifies that the RTS line is high if bytes are available for transmission. After all buffered bytes have been sent, the RTS line is low. This is normally used with RS232/RS485 converter hardware.
- **RTS, DTR:** This option is a combination of DTR and RTS.
- **RTS Always:** This option asserts the RTS line when the communication port is opened and remains on.
- **RTS Manual:** This option asserts the RTS line based on the timing properties entered for RTS Line Control. It is only available when the driver supports manual RTS line control (or when the properties are shared and at least one of the channels belongs to a driver that provides this support).
RTS Manual adds an **RTS Line Control** property with options as follows:
 - **Raise:** This property specifies the amount of time that the RTS line is raised prior to data transmission. The valid range is 0 to 9999 milliseconds. The default is 10 milliseconds.
 - **Drop:** This property specifies the amount of time that the RTS line remains high after data transmission. The valid range is 0 to 9999 milliseconds. The default is 10 milliseconds.
 - **Poll Delay:** This property specifies the amount of time that polling for communications is delayed. The valid range is 0 to 9999. The default is 10 milliseconds.

 **Tip:** When using two-wire RS-485, "echoes" may occur on the communication lines. Since this communication does not support echo suppression, it is recommended that echoes be disabled or a RS-485 converter be used.


Operational Behavior

- **Report Comm. Errors:** Enable or disable reporting of low-level communications errors. When enabled, low-level errors are posted to the Event Log as they occur. When disabled, these same errors are not posted even though normal request failures are. The default is Enable.
- **Close Idle Connection:** Choose to close the connection when there are no longer any tags being referenced by a client on the channel. The default is Enable.
- **Idle Time to Close:** Specify the amount of time that the server waits once all tags have been removed before closing the COM port. The default is 15 seconds.

Ethernet Settings

 **Note:** Not all serial drivers support Ethernet Encapsulation. If this group does not appear, the functionality is not supported.

Ethernet Encapsulation provides communication with serial devices connected to terminal servers on the Ethernet network. A terminal server is essentially a virtual serial port that converts TCP/IP messages on the Ethernet network to serial data. Once the message has been converted, users can connect standard devices that support serial communications to the terminal server. The terminal server's serial port must be properly configured to match the requirements of the serial device to which it is attached. *For more information, refer to "How To... Use Ethernet Encapsulation" in the server help.*

- **Network Adapter:** Indicate a network adapter to bind for Ethernet devices in this channel. Choose a network adapter to bind to or allow the OS to select the default.
 *Specific drivers may display additional Ethernet Encapsulation properties. For more information, refer to Channel Properties — Ethernet Encapsulation.*

Modem Settings

- **Modem:** Specify the installed modem to be used for communications.
- **Connect Timeout:** Specify the amount of time to wait for connections to be established before failing a read or write. The default is 60 seconds.
- **Modem Properties:** Configure the modem hardware. When clicked, it opens vendor-specific modem properties.
- **Auto-Dial:** Enables the automatic dialing of entries in the Phonebook. The default is Disable. *For more information, refer to "Modem Auto-Dial" in the server help.*
- **Report Comm. Errors:** Enable or disable reporting of low-level communications errors. When enabled, low-level errors are posted to the Event Log as they occur. When disabled, these same errors are not posted even though normal request failures are. The default is Enable.
- **Close Idle Connection:** Choose to close the modem connection when there are no longer any tags being referenced by a client on the channel. The default is Enable.
- **Idle Time to Close:** Specify the amount of time that the server waits once all tags have been removed before closing the modem connection. The default is 15 seconds.

Operation with no Communications

- **Read Processing:** Select the action to be taken when an explicit device read is requested. Options include Ignore and Fail. Ignore does nothing; Fail provides the client with an update that indicates failure. The default setting is Ignore.

Channel Properties — Write Optimizations

As with any OPC server, writing data to the device may be the application's most important aspect. The server intends to ensure that the data written from the client application gets to the device on time. Given this goal, the server provides optimization properties that can be used to meet specific needs or improve application responsiveness.

Property Groups	<input type="checkbox"/> Write Optimizations	
General	Optimization Method	Write Only Latest Value for All Tags
Write Optimizations	Duty Cycle	10

Write Optimizations

Optimization Method: controls how write data is passed to the underlying communications driver. The options are:

- **Write All Values for All Tags:** This option forces the server to attempt to write every value to the controller. In this mode, the server continues to gather write requests and add them to the server's internal write queue. The server processes the write queue and attempts to empty it by writing data to the device as quickly as possible. This mode ensures that everything written from the client applications is sent to the target device. This mode should be selected if the write operation order or the write item's content must uniquely be seen at the target device.
- **Write Only Latest Value for Non-Boolean Tags:** Many consecutive writes to the same value can accumulate in the write queue due to the time required to actually send the data to the device. If the server updates a write value that has already been placed in the write queue, far fewer writes are

needed to reach the same final output value. In this way, no extra writes accumulate in the server's queue. When the user stops moving the slide switch, the value in the device is at the correct value at virtually the same time. As the mode states, any value that is not a Boolean value is updated in the server's internal write queue and sent to the device at the next possible opportunity. This can greatly improve the application performance.

● **Note:** This option does not attempt to optimize writes to Boolean values. It allows users to optimize the operation of HMI data without causing problems with Boolean operations, such as a momentary push button.

- **Write Only Latest Value for All Tags:** This option takes the theory behind the second optimization mode and applies it to all tags. It is especially useful if the application only needs to send the latest value to the device. This mode optimizes all writes by updating the tags currently in the write queue before they are sent. This is the default mode.

Duty Cycle: is used to control the ratio of write to read operations. The ratio is always based on one read for every one to ten writes. The duty cycle is set to ten by default, meaning that ten writes occur for each read operation. Although the application is performing a large number of continuous writes, it must be ensured that read data is still given time to process. A setting of one results in one read operation for every write operation. If there are no write operations to perform, reads are processed continuously. This allows optimization for applications with continuous writes versus a more balanced back and forth data flow.

● **Note:** It is recommended that the application be characterized for compatibility with the write optimization enhancements before being used in a production environment.

Channel Properties — Advanced

This group is used to specify advanced channel properties. Not all drivers support all properties; so the Advanced group does not appear for those devices.

Property Groups	<input type="checkbox"/> Non-Normalized Float Handling	
General	Floating-Point Values	Replace with Zero
Write Optimizations	<input type="checkbox"/> Inter-Device Delay	
Advanced	Inter-Device Delay (ms)	0

Non-Normalized Float Handling: A non-normalized value is defined as Infinity, Not-a-Number (NaN), or as a Denormalized Number. The default is Replace with Zero. Drivers that have native float handling may default to Unmodified. Non-normalized float handling allows users to specify how a driver handles non-normalized IEEE-754 floating point data. Descriptions of the options are as follows:

- **Replace with Zero:** This option allows a driver to replace non-normalized IEEE-754 floating point values with zero before being transferred to clients.
- **Unmodified:** This option allows a driver to transfer IEEE-754 denormalized, normalized, non-number, and infinity values to clients without any conversion or changes.

● **Note:** This property is disabled if the driver does not support floating point values or if it only supports the option that is displayed. According to the channel's float normalization setting, only real-time driver tags (such as values and arrays) are subject to float normalization. For example, EFM data is not affected by this setting.

● *For more information on the floating point values, refer to "How To ... Work with Non-Normalized Floating Point Values" in the server help.*

Inter-Device Delay: Specify the amount of time the communications channel waits to send new requests to the next device after data is received from the current device on the same channel. Zero (0) disables the delay.

● **Note:** This property is not available for all drivers, models, and dependent settings.

Device Properties — General

A device represents a single target on a communications channel. If the driver supports multiple controllers, users must enter a device ID for each controller.

Property Groups	Identification	
General	Name	
Scan Mode	Description	
	Channel Assignment	
	Driver	
	Model	
	ID Format	Decimal
	ID	2
	Operating Mode	
	Data Collection	Enable
	Simulated	No

Identification

Name: This property specifies the name of the device. It is a logical user-defined name that can be up to 256 characters long, and may be used on multiple channels.

● **Note:** Although descriptive names are generally a good idea, some OPC client applications may have a limited display window when browsing the OPC server's tag space. The device name and channel name become part of the browse tree information as well. Within an OPC client, the combination of channel name and device name would appear as "ChannelName.DeviceName".

● *For more information, refer to "How To... Properly Name a Channel, Device, Tag, and Tag Group" in server help.*

Description: User-defined information about this device.

● Many of these properties, including Description, have an associated system tag.

Channel Assignment: User-defined name of the channel to which this device currently belongs.

Driver: Selected protocol driver for this device. This property specifies the driver selected during channel creation. It is disabled in the channel properties.

Model: This property specifies the specific type of device that is associated with this ID. The contents of the drop-down menu depends on the type of communications driver being used. Models that are not supported by a driver are disabled. If the communications driver supports multiple device models, the model selection can only be changed when there are no client applications connected to the device.

● **Note:** If the communication driver supports multiple models, users should try to match the model selection to the physical device. If the device is not represented in the drop-down menu, select a model that conforms closest to the target device. Some drivers support a model selection called "Open," which allows users to communicate without knowing the specific details of the target device. For more information, refer to the driver help documentation.

ID: This property specifies the device's station / node / identity / address. The type of ID entered depends on the communications driver being used. For many drivers, the ID is a numeric value. Drivers that support a Numeric ID provide users with the option to enter a numeric value whose format can be changed to suit the needs of the application or the characteristics of the selected communications driver. The ID format can be Decimal, Octal, and Hexadecimal. If the driver is Ethernet-based or supports an unconventional station or node name, the device's TCP/IP address may be used as the device ID. TCP/IP addresses consist of four values that are separated by periods, with each value in the range of 0 to 255. Some device IDs are string based. There may be additional properties to configure within the ID field, depending on the driver.

Operating Mode

Data Collection: This property controls the device's active state. Although device communications are enabled by default, this property can be used to disable a physical device. Communications are not attempted when a device is disabled. From a client standpoint, the data is marked as invalid and write operations are not accepted. This property can be changed at any time through this property or the device system tags.

Simulated: This option places the device into Simulation Mode. In this mode, the driver does not attempt to communicate with the physical device, but the server continues to return valid OPC data. Simulated stops physical communications with the device, but allows OPC data to be returned to the OPC client as valid data. While in Simulation Mode, the server treats all device data as reflective: whatever is written to the simulated device is read back and each OPC item is treated individually. The item's memory map is based on the group Update Rate. The data is not saved if the server removes the item (such as when the server is reinitialized). The default is No.

Notes:

1. This System tag (_Simulated) is read only and cannot be written to for runtime protection. The System tag allows this property to be monitored from the client.
2. In Simulation mode, the item's memory map is based on client update rate(s) (Group Update Rate for OPC clients or Scan Rate for native and DDE interfaces). This means that two clients that reference the same item with different update rates return different data.

Simulation Mode is for test and simulation purposes only. It should never be used in a production environment.

Device Properties — Scan Mode

The Scan Mode specifies the subscribed-client requested scan rate for tags that require device communications. Synchronous and asynchronous device reads and writes are processed as soon as possible; unaffected by the Scan Mode properties.

Property Groups	<input type="checkbox"/> Scan Mode	
General	Scan Mode	Respect Client-Specified Scan Rate ▼
Scan Mode	Initial Updates from Cache	Disable

Scan Mode: specifies how tags in the device are scanned for updates sent to subscribed clients. Descriptions of the options are:

- **Respect Client-Specified Scan Rate:** This mode uses the scan rate requested by the client.
- **Request Data No Faster than Scan Rate:** This mode specifies the maximum scan rate to be used. The valid range is 10 to 99999990 milliseconds. The default is 1000 milliseconds.
 - **Note:** When the server has an active client and items for the device and the scan rate value is increased, the changes take effect immediately. When the scan rate value is decreased, the changes do not take effect until all client applications have been disconnected.
- **Request All Data at Scan Rate:** This mode forces tags to be scanned at the specified rate for subscribed clients. The valid range is 10 to 99999990 milliseconds. The default is 1000 milliseconds.
- **Do Not Scan, Demand Poll Only:** This mode does not periodically poll tags that belong to the device nor perform a read to get an item's initial value once it becomes active. It is the client's responsibility to poll for updates, either by writing to the `_DemandPoll` tag or by issuing explicit device reads for individual items. *For more information, refer to "Device Demand Poll" in server help.*
- **Respect Tag-Specified Scan Rate:** This mode forces static tags to be scanned at the rate specified in their static configuration tag properties. Dynamic tags are scanned at the client-specified scan rate.

Initial Updates from Cache: When enabled, this option allows the server to provide the first updates for newly activated tag references from stored (cached) data. Cache updates can only be provided when the new item reference shares the same address, scan rate, data type, client access, and scaling properties. A device read is used for the initial update for the first client reference only. The default is disabled; any time a client activates a tag reference the server attempts to read the initial value from the device.

Device Properties — Timing

The device Timing properties allow the driver's response to error conditions to be tailored to fit the application's needs. In many cases, the environment requires changes to these properties for optimum performance. Factors such as electrically generated noise, modem delays, and poor physical connections can influence how many errors or timeouts a communications driver encounters. Timing properties are specific to each configured device.

Property Groups	<input type="checkbox"/> Communication Timeouts	
General	Connect Timeout (s)	3
Scan Mode	Request Timeout (ms)	5000
Timing	Retry Attempts	3
Auto-Demotion	<input type="checkbox"/> Timing	
	Inter-Request Delay (ms)	0

Communications Timeouts

Connect Timeout: This property (which is used primarily by Ethernet based drivers) controls the amount of time required to establish a socket connection to a remote device. The device's connection time often takes longer than normal communications requests to that same device. The valid range is 1 to 30 seconds. The default is typically 3 seconds, but can vary depending on the driver's specific nature. If this setting is not supported by the driver, it is disabled.

● **Note:** Due to the nature of UDP connections, the connection timeout setting is not applicable when communicating via UDP.

Request Timeout: This property specifies an interval used by all drivers to determine how long the driver waits for a response from the target device to complete. The valid range is 50 to 9,999,999 milliseconds (167.6667 minutes). The default is usually 1000 milliseconds, but can vary depending on the driver. The

default timeout for most serial drivers is based on a baud rate of 9600 baud or better. When using a driver at lower baud rates, increase the timeout to compensate for the increased time required to acquire data.

Attempts Before Timeout: This property specifies how many times the driver issues a communications request before considering the request to have failed and the device to be in error. The valid range is 1 to 10. The default is typically 3, but can vary depending on the driver's specific nature. The number of attempts configured for an application depends largely on the communications environment. This property applies to both connection attempts and request attempts.

Timing

Inter-Request Delay: This property specifies how long the driver waits before sending the next request to the target device. It overrides the normal polling frequency of tags associated with the device, as well as one-time reads and writes. This delay can be useful when dealing with devices with slow turnaround times and in cases where network load is a concern. Configuring a delay for a device affects communications with all other devices on the channel. It is recommended that users separate any device that requires an inter-request delay to a separate channel if possible. Other communications properties (such as communication serialization) can extend this delay. The valid range is 0 to 300,000 milliseconds; however, some drivers may limit the maximum value due to a function of their particular design. The default is 0, which indicates no delay between requests with the target device.

● **Note:** Not all drivers support Inter-Request Delay. This setting does not appear if it is not available.

Device Properties — Auto-Demotion

The Auto-Demotion properties can temporarily place a device off-scan in the event that a device is not responding. By placing a non-responsive device offline for a specific time period, the driver can continue to optimize its communications with other devices on the same channel. After the time period has been reached, the driver re-attempts to communicate with the non-responsive device. If the device is responsive, the device is placed on-scan; otherwise, it restarts its off-scan time period.

Property Groups	Auto-Demotion	
General	Demote on Failure	Enable
Scan Mode	Timeouts to Demote	3
Timing	Demotion Period (ms)	10000
Auto-Demotion	Discard Requests when Demoted	Disable

Demote on Failure: When enabled, the device is automatically taken off-scan until it is responding again.

● **Tip:** Determine when a device is off-scan by monitoring its demoted state using the `_AutoDemoted` system tag.

Timeouts to Demote: Specify how many successive cycles of request timeouts and retries occur before the device is placed off-scan. The valid range is 1 to 30 successive failures. The default is 3.

Demotion Period: Indicate how long the device should be placed off-scan when the timeouts value is reached. During this period, no read requests are sent to the device and all data associated with the read requests are set to bad quality. When this period expires, the driver places the device on-scan and allows for another attempt at communications. The valid range is 100 to 3600000 milliseconds. The default is 10000 milliseconds.

Discard Requests when Demoted: Select whether or not write requests should be attempted during the off-scan period. Disable to always send write requests regardless of the demotion period. Enable to discard writes; the server automatically fails any write request received from a client and does not post a message to the Event Log.

Device Properties — Tag Generation

The automatic tag database generation features make setting up an application a plug-and-play operation. Select communications drivers can be configured to automatically build a list of tags that correspond to device-specific data. These automatically generated tags (which depend on the nature of the supporting driver) can be browsed from the clients.

● *Not all devices and drivers support full automatic tag database generation and not all support the same data types. Consult the data types descriptions or the supported data type lists for each driver for specifics.*

If the target device supports its own local tag database, the driver reads the device's tag information and uses the data to generate tags within the server. If the device does not natively support named tags, the driver creates a list of tags based on driver-specific information. An example of these two conditions is as follows:

1. If a data acquisition system supports its own local tag database, the communications driver uses the tag names found in the device to build the server's tags.
2. If an Ethernet I/O system supports detection of its own available I/O module types, the communications driver automatically generates tags in the server that are based on the types of I/O modules plugged into the Ethernet I/O rack.

● **Note:** Automatic tag database generation's mode of operation is completely configurable. For more information, refer to the property descriptions below.

Property Groups	Tag Generation	
General	On Property Change	Yes
Scan Mode	On Device Startup	Do Not Generate on Startup
Timing	On Duplicate Tag	Delete on Create
Auto-Demotion	Parent Group	
Tag Generation	Allow Automatically Generated Subgroups	Enable
Tag Import	Create	Create tags
Redundancy		

On Property Change: If the device supports automatic tag generation when certain properties change, the **On Property Change** option is shown. It is set to **Yes** by default, but it can be set to **No** to control over when tag generation is performed. In this case, the **Create tags** action must be manually invoked to perform tag generation.

On Device Startup: This property specifies when OPC tags are automatically generated. Descriptions of the options are as follows:

- **Do Not Generate on Startup:** This option prevents the driver from adding any OPC tags to the tag space of the server. This is the default setting.
- **Always Generate on Startup:** This option causes the driver to evaluate the device for tag information. It also adds tags to the tag space of the server every time the server is launched.

- **Generate on First Startup:** This option causes the driver to evaluate the target device for tag information the first time the project is run. It also adds any OPC tags to the server tag space as needed.

● **Note:** When the option to automatically generate OPC tags is selected, any tags that are added to the server's tag space must be saved with the project. Users can configure the project to automatically save from the **Tools | Options** menu.

On Duplicate Tag: When automatic tag database generation is enabled, the server needs to know what to do with the tags that it may have previously added or with tags that have been added or modified after the communications driver since their original creation. This setting controls how the server handles OPC tags that were automatically generated and currently exist in the project. It also prevents automatically generated tags from accumulating in the server.

For example, if a user changes the I/O modules in the rack with the server configured to **Always Generate on Startup**, new tags would be added to the server every time the communications driver detected a new I/O module. If the old tags were not removed, many unused tags could accumulate in the server's tag space. The options are:

- **Delete on Create:** This option deletes any tags that were previously added to the tag space before any new tags are added. This is the default setting.
- **Overwrite as Necessary:** This option instructs the server to only remove the tags that the communications driver is replacing with new tags. Any tags that are not being overwritten remain in the server's tag space.
- **Do not Overwrite:** This option prevents the server from removing any tags that were previously generated or already existed in the server. The communications driver can only add tags that are completely new.
- **Do not Overwrite, Log Error:** This option has the same effect as the prior option, and also posts an error message to the server's Event Log when a tag overwrite would have occurred.

● **Note:** Removing OPC tags affects tags that have been automatically generated by the communications driver as well as any tags that have been added using names that match generated tags. Users should avoid adding tags to the server using names that may match tags that are automatically generated by the driver.

Parent Group: This property keeps automatically generated tags from mixing with tags that have been entered manually by specifying a group to be used for automatically generated tags. The name of the group can be up to 256 characters. This parent group provides a root branch to which all automatically generated tags are added.

Allow Automatically Generated Subgroups: This property controls whether the server automatically creates subgroups for the automatically generated tags. This is the default setting. If disabled, the server generates the device's tags in a flat list without any grouping. In the server project, the resulting tags are named with the address value. For example, the tag names are not retained during the generation process.

● **Note:** If, as the server is generating tags, a tag is assigned the same name as an existing tag, the system automatically increments to the next highest number so that the tag name is not duplicated. For example, if the generation process creates a tag named "AI22" that already exists, it creates the tag as "AI23" instead.

Create: Initiates the creation of automatically generated OPC tags. If the device's configuration has been modified, **Create tags** forces the driver to reevaluate the device for possible tag changes. Its ability to be accessed from the System tags allows a client application to initiate tag database creation.

- **Note:** **Create tags** is disabled if the Configuration edits a project offline.

Device Properties — Device Configuration

Property Groups	<input type="checkbox"/> General	
General	Special Data Handling	None
Scan Mode	Start Math on Start	Disable
Timing	<input type="checkbox"/> Time Settings	
Auto-Demotion	Date and Time	Device Time
Tag Generation	Date Format	MM/DD/YY
Device Configuration	Set Clock on Start	Disable
Redundancy	<input type="checkbox"/> Tagnames	
	Generate Tag Database Using	Physical Channel Number

General

- **Special Data Handling:** This property allows the driver to be configured to return specific data values for the numerical out of range and error conditions returned from the device. Options include None, +INF, and -INF. The default setting is None.
 - **None:** When selected, special data values are returned with the actual data value received from the device. For example, the data value of a measuring channel Over Range would be returned as 32,767 and the data value of a math channel Over Range would be returned as 2,147,450,879.
 - **+INF:** When selected, special data values are returned as a numerical representation of positive infinity (#INF). The exception is an Under Range condition that is always returned as negative infinity.
 - **-INF:** When selected, special data values are returned as a numerical representation of negative infinity (-#INF). The exception is an Over Range condition that is always returned as positive infinity.
- **Start Math on Start:** When enabled, this option informs the driver to send a command to the device at communication startup that starts the math computation. The default setting is disabled.

Time Settings

- **Date and Time:** This property specifies the origin of the data value of the Date and Time data types (which represent the date and time of the latest data). Options include Device Time and System Time. The default setting is Device Time. Descriptions of the options are as follows:
 - **Device Time:** When selected, the Date and Time tags will return the date and time read from the device. This date and time represents the date and time that the latest data was measured or computed based on the internal device clock.
 - **System Time:** When selected, the Date and Time tags will return the date and time that the requested data was returned from the device based on the PC system clock.
- **Date Format:** This property specifies the format of the return string for the Date data type. Date formats can be specified as MM/DD/YY (month/day/year), YY/MM/DD (year/month/day), or DD/MM/YY (day/month/year). The default setting is MM/DD/YY.

- **Set Clock on Start:** When enabled, this option informs the driver to send a command to the device at communication startup that will set the device clock to the date and time settings of the system clock. The default setting is disabled.

Tagnames

- **Generate Tag Database Using:** This property specifies the origin of the tag name used when automatically generating a tag database. Options include Physical Channel Number and Device Tagname. The default setting is Physical Channel Number. Descriptions of the options are as follows:
 - **Physical Channel Number:** When selected, the driver will generate tag names based on the channel number of an item. For example, "CH001" or "CH001_alarm1".
 - **Device Tagname:** When selected, the driver will generate tag names using the tag name returned by the device for a channel. For example, "Flow" or "Flow_alarm1".

Device Properties — Redundancy

Property Groups	<input type="checkbox"/> Redundancy	
General	Secondary Path	...
Scan Mode	Operating Mode	Switch On Failure
Timing	Monitor Item	
Redundancy	Monitor Interval (s)	300
	Return to Primary ASAP	Yes

Redundancy is available with the Media-Level Redundancy Plug-In.

- Consult the website, a sales representative, or the user manual for more information.

Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8-bit value
Word	Unsigned 16-bit value
Short	Signed 16-bit value
Float	32-bit floating point value
Double	64-bit floating point value
String	Null terminated ASCII string

Address Descriptions

Address specifications vary depending on the model in use. Select a link from the following list to obtain specific address information for the model of interest.

[DA100-1 Addressing](#)

[DA100-2 Addressing](#)

[DR130 Addressing](#)

[DR231 Addressing](#)

[DR232 Addressing](#)

[DR241 Addressing](#)

[DR242 Addressing](#)

[DC100-1 Addressing](#)

[DC100-2 Addressing](#)

DA100-1 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-060	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-060	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-060	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-060	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-060	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-060	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-060	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-060	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-060	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-060	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-060	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-060	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-060	String	Read Only
Tagname of Channel*	CHxxx.tag	001-060	String	Read Only
Status of Channel*	CHxxx.status	001-060	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-30	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-30	Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Alarm Level1 Status of Math Channel	CHAx Alarm1	01-30	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx Alarm2	01-30	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx Alarm3	01-30	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx Alarm4	01-30	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-30	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-30	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-30	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.ASP4	01-30	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-30	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-30	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-30	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-30	String	Read Only
Status of Math Channel*	CHAx.status	01-30	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Digital Output (Main Unit)	DOxxx	001-060	Boolean	Read/Write
Digital Output (Internal Switch)	DOSxx	01-60	Boolean	Read/Write
Math Communication Data**	CDxx	01-30	Short , Word, Byte	Write Only

Address Type	Format	Range	Data Types	Access
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DA100-2 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxx or CHxx.PV	001-560	Double , Float	Read Only
Alarm Summary of Channel	CHxx.Alarm	001-560	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxx.Alarm1	001-560	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxx.Alarm2	001-560	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxx.Alarm3	001-560	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxx.Alarm4	001-560	Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-560	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-560	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-560	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-560	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-560	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-560	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-560	String	Read Only
Tagname of Channel*	CHxxx.tag	001-560	String	Read Only
Status of Channel*	CHxxx.status	001-560	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-60	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-60	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-60	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-60	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-60	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-60	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.ASP4	01-60	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-60	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-60	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-60	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-60	String	Read Only
Status of Math Channel*	CHAx.status	01-60	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large

number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Digital Output (Main Unit)	DOlxx	01-60	Boolean	Read/Write
Digital Output (Internal Switch)	DOSxx	01-60	Boolean	Read/Write
Digital Output (Sub Units)	DOxxx	001-560	Boolean	Read/Write
Math Communication Data**	CDxx	01-60	Short, Word, Byte	Write Only
Control Math Execution	MathControl		Short, Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an

error message and remove the tag from its scan list.

- Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DR130 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-020	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-020	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-020	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-020	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-020	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-020	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-020	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-020	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-020	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-020	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-020	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-020	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-020	String	Read Only
Tagname of Channel*	CHxxx.tag	001-020	String	Read Only
Status of Channel*	CHxxx.status	001-020	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-30	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-30	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-30	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-30	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-30	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-30	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-30	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-30	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-30	Double , Float	Read/Write

Address Type	Format	Range	Data Types	Access
Set and Read Level4 Alarm Setpoint	CHAx ASP4	01-30	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-30	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-30	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-30	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-30	String	Read Only
Status of Math Channel*	CHAx.status	01-30	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-30	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number

based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DR231 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-040	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-040	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-040	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-040	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-040	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-040	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-040	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-040	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-040	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-040	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-040	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-040	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-040	String	Read Only
Tagname of Channel*	CHxxx.tag	001-040	String	Read Only
Status of Channel*	CHxxx.status	001-040	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Highest Measuring Channel*	CH.High		Short, Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx.x or CHAx.x.PV	01-30	Double, Float	Read Only
Alarm Summary of Math Channel	CHAx.x.Alarm	01-30	Short, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.x.Alarm1	01-30	Short, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.x.Alarm2	01-30	Short, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.x.Alarm3	01-30	Short, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.x.Alarm4	01-30	Short, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.x.ASP1	01-30	Double, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.x.ASP2	01-30	Double, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.x.ASP3	01-30	Double, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.x.ASP4	01-30	Double, Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.x.scale_Hi	01-30	Double, Float	Read Only
Lower Scale Value of Math Channel*	CHAx.x.scale_Lo	01-30	Double, Float	Read Only
Unit String of Math Channel*	CHAx.x.unit	01-30	String	Read Only
Tagname of Math Channel*	CHAx.x.tag	01-30	String	Read Only
Status of Math Channel*	CHAx.x.status	01-30	String	Read Only
Lowest Math Channel*	CHA.Low		Short, Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short, Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-30	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DR232 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-560	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-560	Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-560	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-560	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-560	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-560	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-560	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-560	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-560	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-560	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-560	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-560	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-560	String	Read Only
Tagname of Channel*	CHxxx.tag	001-560	String	Read Only
Status of Channel*	CHxxx.status	001-560	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-60	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-60	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-60	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-60	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-60	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-60	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.ASP4	01-60	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-60	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-60	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-60	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-60	String	Read Only
Status of Math Channel*	CHAx.status	01-60	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, a non zero value must be written to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-60	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an

error message and remove the tag from its scan list.

- Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DR241 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-040	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-040	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-040	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-040	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-040	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-040	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-040	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-040	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-040	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-040	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-040	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-040	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-040	String	Read Only
Tagname of Channel*	CHxxx.tag	001-040	String	Read Only
Status of Channel*	CHxxx.status	001-040	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-30	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-30	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-30	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-30	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-30	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-30	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-30	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-30	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-30	Double , Float	Read/Write

Address Type	Format	Range	Data Types	Access
Set and Read Level4 Alarm Setpoint	CHAx ASP4	01-30	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-30	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-30	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-30	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-30	String	Read Only
Status of Math Channel*	CHAx.status	01-30	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-30	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number

based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DR242 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-560	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-560	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-560	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-560	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-560	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-560	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-560	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-560	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-560	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-560	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-560	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-560	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-560	String	Read Only
Tagname of Channel*	CHxxx.tag	001-560	String	Read Only
Status of Channel*	CHxxx.status	001-560	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Highest Measuring Channel*	CH.High		Short, Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx.x or CHAx.x.PV	01-60	Double, Float	Read Only
Alarm Summary of Math Channel	CHAx.x.Alarm	01-60	Short, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.x.Alarm1	01-60	Short, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.x.Alarm2	01-60	Short, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.x.Alarm3	01-60	Short, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.x.Alarm4	01-60	Short, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.x.ASP1	01-60	Double, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.x.ASP2	01-60	Double, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.x.ASP3	01-60	Double, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.x.ASP4	01-60	Double, Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.x.scale_Hi	01-60	Double, Float	Read Only
Lower Scale Value of Math Channel*	CHAx.x.scale_Lo	01-60	Double, Float	Read Only
Unit String of Math Channel*	CHAx.x.unit	01-60	String	Read Only
Tagname of Math Channel*	CHAx.x.tag	01-60	String	Read Only
Status of Math Channel*	CHAx.x.status	01-60	String	Read Only
Lowest Math Channel*	CHA.Low		Short, Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short, Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-60	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DC100-1 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxx or CHxx.PV	001-060	Double , Float	Read Only
Alarm Summary of Channel	CHxx.Alarm	001-060	Short , Word, Byte	Read Only

Address Type	Format	Range	Data Types	Access
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-060	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-060	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-060	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-060	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-060	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-060	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-060	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-060	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-060	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-060	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-060	String	Read Only
Tagname of Channel*	CHxxx.tag	001-060	String	Read Only
Status of Channel*	CHxxx.status	001-060	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-30	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-30	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-30	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-30	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-30	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-30	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-30	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-30	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-30	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAx.ASP4	01-30	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-30	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-30	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-30	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-30	String	Read Only
Status of Math Channel*	CHAx.status	01-30	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-30	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an

error message and remove the tag from its scan list.

- Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

DC100-2 Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measured Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxxx or CHxxx.PV	001-560	Double , Float	Read Only
Alarm Summary of Channel	CHxxx.Alarm	001-560	Short , Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxxx.Alarm1	001-560	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxxx.Alarm2	001-560	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxxx.Alarm3	001-560	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxxx.Alarm4	001-560	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHxxx.ASP1	001-560	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHxxx.ASP2	001-560	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHxxx.ASP3	001-560	Double , Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHxxx.ASP4	001-560	Double , Float	Read/Write
Upper Scale Value of Channel*	CHxxx.scale_Hi	001-560	Double , Float	Read Only
Lower Scale Value of Channel*	CHxxx.scale_Lo	001-560	Double , Float	Read Only
Unit String of Channel*	CHxxx.unit	001-560	String	Read Only
Tagname of Channel*	CHxxx.tag	001-560	String	Read Only
Status of Channel*	CHxxx.status	001-560	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only

Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Math Channel	CHAx or CHAx.PV	01-60	Double , Float	Read Only
Alarm Summary of Math Channel	CHAx.Alarm	01-60	Short , Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAx.Alarm1	01-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAx.Alarm2	01-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAx.Alarm3	01-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAx.Alarm4	01-60	Short , Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAx.ASP1	01-60	Double , Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAx.ASP2	01-60	Double , Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAx.ASP3	01-60	Double , Float	Read/Write

Address Type	Format	Range	Data Types	Access
Set and Read Level4 Alarm Setpoint	CHAx ASP4	01-60	Double , Float	Read/Write
Upper Scale Value of Math Channel*	CHAx.scale_Hi	01-60	Double , Float	Read Only
Lower Scale Value of Math Channel*	CHAx.scale_Lo	01-60	Double , Float	Read Only
Unit String of Math Channel*	CHAx.unit	01-60	String	Read Only
Tagname of Math Channel*	CHAx.tag	01-60	String	Read Only
Status of Math Channel*	CHAx.status	01-60	String	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*The data associated with these addresses is only read from the device at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, write a non-zero value to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for alarm setpoints that are undefined in the device will be returned as +INF. Data values can only be written to alarm setpoints that are defined in the device. Write operations to undefined alarm setpoints will return an error. Alarm setpoint values are read one channel at a time. For devices with a large number of channels, increasing the scan rate of ASP items and/or reducing the number of active ASP items will increase the read performance of the PV and alarm data.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names (and channels that have unspecified tag names) the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH001' will be returned as 'CH001'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data**	CDxx	01-60	Short , Word, Byte	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Control Command and Response	Command		String	Read/Write
Direct Reloading of Configuration	Reset		Boolean	Write Only

*The model address type that returns the model name of the device may return 'DR231' for models of type DR241 and 'DR232' for models of type DR242.

**The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error. The range of valid data for addresses 'CDxx' is -32000 to 32000. CD data values are converted in the device from a whole number to a real number

based on the decimal point placement specified for the associated math channel. For example, the device would interpret a data value of 32000 written to a CD address location with a decimal point placement of .000 as 32.000.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Control Command and Response

The Command address allows the user to send a string command and receive a string response to and from the device. This means that any command can be sent to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution.

Notes:

1. The actual number of addresses available for of each type depends on the Yokogawa device's configuration. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.
2. Addresses that have Write Only access are assigned a default access of Read/Write. Data values are unreadable for these addresses, however, and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

Error Descriptions

The following error / warning messages may be generated. Click on the link for a description of the message.

Address Validation

[Address '<address>' is out of range for the specified device or register](#)

[Data Type '<type>' is not valid for device address '<address>'](#)

[Device address '<address>' contains a syntax error](#)

[Device address '<address>' is read only](#)

[Missing address](#)

[The device '<device name>' responded with a NAK to a read request starting at address '<address>'. The requested address may not exist in the device](#)

Serial Communications

[Communications error on '<channel name>' \[<error mask>\]](#)

[COMn does not exist](#)

[COMn is in use by another application](#)

[Error opening COMn](#)

[Unable to set comm properties on COMn](#)

Device Status Messages

[Device '<device name>' is not responding](#)

[Unable to write to '<address>' on device '<device name>'](#)

Address '<address>' is out of range for the specified device or register

Error Type:

Warning

Possible Cause:

A tag address that has been specified statically references a location that is beyond the range of supported locations for the device.

Solution:

Verify that the address is correct; if it is not, re-enter it in the client application.

Data Type '<type>' is not valid for device address '<address>'

Error Type:

Warning

Possible Cause:

A tag address that has been specified statically has been assigned an invalid data type.

Solution:

Modify the requested data type in the client application.

Device address '<address>' contains a syntax error

Error Type:

Warning

Possible Cause:

A tag address that has been specified statically contains one or more invalid characters.

Solution:

Re-enter the address in the client application.

Device address '<address>' is read only

Error Type:

Warning

Possible Cause:

A tag address that has been specified statically has a requested access mode that is not compatible with what the device supports for that address.

Solution:

Change the access mode in the client application.

Missing address

Error Type:

Warning

Possible Cause:

A tag address that has been specified statically has no length.

Solution:

Re-enter the address in the client application.

The device '<device name>' responded with a NAK to a read request starting at address '<address>'. The requested address may not exist in the device

Error Type:

Warning

Possible Cause:

The requested address may not exist in the device.

Solution:

Verify that the address is correct; if it is not, re-enter it in the client application.

Communications error on '<channel name>' [<error mask>]

Error Type:

Serious

Error Mask Definitions:

B = Hardware break detected.
F = Framing error.
E = I/O error.
O = Character buffer overrun.
R = RX buffer overrun.
P = Received byte parity error.
T = TX buffer full.

Possible Cause:

1. The serial connection between the device and the Host PC is bad.
2. The communications properties for the serial connection are incorrect.

Solution:

1. Verify the cabling between the PC and the PLC device.
2. Verify that the specified communications properties match those of the device.

COMn does not exist

Error Type:

Fatal

Possible Cause:

The specified COM port is not present on the target computer.

Solution:

Verify that the proper COM port has been selected.

COMn is in use by another application

Error Type:

Fatal

Possible Cause:

The serial port assigned to a device is being used by another application.

Solution:

1. Verify that the correct port has been assigned to the channel.
2. Verify that only one copy of the current project is running.

Error opening COMn

Error Type:

Fatal

Possible Cause:

The specified COM port could not be opened due an internal hardware or software problem on the target computer.

Solution:

Verify that the COM port is functional and may be accessed by other Windows applications.

Unable to set comm properties on COMn

Error Type:

Fatal

Possible Cause:

The serial properties for the specified COM port are not valid.

Solution:

Verify the serial properties and make any necessary changes.

Device '<device name>' is not responding

Error Type:

Serious

Possible Cause:

1. The connection between the device and the Host PC is broken.
2. The IP address assigned to the device is incorrect.
3. The connection cannot be established in the specified timeout period.
4. The response cannot be received in the specified timeout period.
5. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device property.

Solution:

1. Verify the cabling between the PC and the PLC device.
2. Verify the IP address given to the named device matches that of the actual device.
3. Increase the Connect Timeout value in the Timeout page of Device Properties.
4. Increase the Request Timeout value in the Timeout page of Device Properties.
5. Increase the Request Timeout property so that the entire response can be handled.

Unable to write to '<address>' on device '<device name>'

Error Type:

Serious

Possible Cause:

1. The connection between the device and the Host PC is broken.
2. The named device may have been assigned an incorrect IP address.
3. The address specified may be Read Only or may not exist in the current device.

Solution:

1. Verify the cabling between the PC and the PLC device.
2. Verify the IP address given to the named device matches that of the actual device.
3. Check address availability for the device.

Resources

In addition to this user manual, there are a variety of resources available to assist customers, answer questions, provide more detail about specific implementations, or help with troubleshooting specific issues.

[Knowledge Base](#)

[Whitepapers](#)

[Connectivity Guides](#)

[Technical Notes](#)

[Training Programs](#)

[Training Videos](#)

[Kepware Technical Support](#)

[PTC Technical Support](#)

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