Yokogawa Darwin Ethernet Driver Help

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Overview

The Yokogawa Darwin Ethernet Driver provides an easy and reliable way to connect Yokogawa Darwin Ethernet 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 Ethernet TCP communications.

Device Setup

Supported Yokogawa Devices
DA100-1, DA100-2
DR131
DR231, DR232
DR241, DR242
DC100-1, DC100-2

Connection Timeout
This parameter specifies the time that the driver will wait for a connection to be made with a device. Depending on network load, the connect time may vary with each connection attempt. The valid range is 1 to 30 seconds. The default setting is 3 seconds.

Request Timeout
This parameter 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 default setting is 1000 milliseconds. The valid range is 100 to 30000 milliseconds.

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

Note: More detail on timeouts and retries is available in the main server help file.

Device Configuration Parameters
Port
This parameter specifies the port number the remote device is configured to use. The possible selections are the Ethernet

Exclusive Port and the Ethernet Shared Port
The Ethernet Exclusive port is port number 34150. This port supports only a single connected host such as this driver or the DAQ32 software. If a host is already attached to the 34150 port and the Ethernet Exclusive port is selected, the Darwin system may not be communicated with until the currently connected host releases the port. No other PCs or host can be connected to the Darwin system if the Ethernet Exclusive port is selected.

In order to connect more than one OPC server to the Darwin system, use the Ethernet Shared port. The Ethernet Shared port is port number 34151. This port supports up to four simultaneous connections. In order to use the Ethernet Shared port, this driver must be able to communicate with the Ethernet Exclusive port at least once to establish basic driver initialization. In an Ideal system, this driver should be configured to use the Ethernet Shared port and leave the Ethernet Exclusive port available for the DAQ32 software. The DAQ32 software must be taken offline to allow this driver to initialize during OPC server start.

Note: This driver requires Winsock V1.1 or higher.

Polling Interval
The Polling Interval allows a fixed time interval specified for all communications with a device. The Polling Interval can be used to prevent the driver from making excessive request to the device. In some cases the OPC client may force the driver to run at its maximum update rate. The Polling Interval can be used to prevent this condition.

Special Data Handling
The Special Data Handling setting allows the driver to be configured to return specific data values for numerical out of range and error conditions returned from the device.

Special Data Handling options are **none**, **+INF**, and **-INF**. If Special Data Handling is set to NONE, special data values will be 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).

If Special Data Handling is set to +INF, special data values will be returned as a numerical representation of positive infinity (#INF), with the exception of an Under Range condition that is always returned as negative infinity. When Special Data Handling is set to NEG INF, special data values will be returned as a numerical representation of negative infinity (-#INF), with the exception of an Over Range condition that is always returned as positive infinity.

Start Math When Start

When checked, this option will inform the driver to send a command to the device at communication startup that will start the math computation.

Date & Time
Specifies the origin of the data value of the Date and Time data types which represent the date and time of the latest data.

Date & Time options are **Device Time** and **System Time**. If Device Time is 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. If System Time is 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
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).

Set Clock When Start
When checked, this option will inform 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.

Generate Tag Database Using:
This parameter specifies the origin of the tag name used when auto generating a tag database. The options are **Physical Channel Number** and **Device Tag name**. If Physical Channel Number is selected, the driver will generate tag names based on the channel number of an item; for example: CH001 or CH001_alarm1. If Device Tag name is 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 ID
Yokogawa devices are networked using standard IP addressing. In general the Device ID has the following format YYY.YYY.YYY.YYY, where YYY designates the device IP address (each YYY byte should be in the range of 0 to 255).

Cable Diagrams

Patch Cable (Straight Through)

TD +	1	OR/WHT	OR/WHT	1	TD +
TD −	2	OR	OR	2	TD −
RD +	3	GRN/WHT	GRN/WHT	3	RD +
	4	BLU	BLU	4	
	5	BLU/WHT	BLU/WHT	5	
RD −	6	GRN	GRN	6	RD −
	7	BRN/WHT	BRN/WHT	7	
	8	BRN	BRN	8	

RJ45   RJ45

10 BaseT

1 2 3 4 5 6 7 8
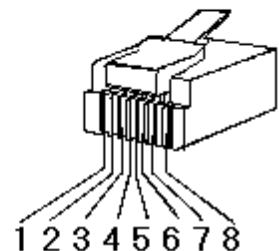
Crossover Cable

TD +	1	OR/WHT	GRN/WHT	1	TD +
TD −	2	OR	GRN	2	TD −
RD +	3	GRN/WHT	OR/WHT	3	RD +
	4	BLU	BLU	4	
	5	BLU/WHT	BLU/WHT	5	
RD −	6	GRN	OR	6	RD −
	7	BRN/WHT	BRN/WHT	7	
	8	BRN	BRN	8	

RJ45   RJ45

8-pin RJ45

DIP Switch Settings

Set the DIP switch settings on the Ethernet module as shown below.

For configuring the module:

For normal operation:

Switch Position 3 enables the keep alive function of the Ethernet port. This feature must be enabled for reliable operation.

Optimizing Ethernet Communications

The Yokogawa Darwin Ethernet driver has been designed to provide the best performance with the least amount of impact on the system's overall performance. While the Yokogawa Darwin Ethernet driver is fast, there are a couple of guidelines that can be used in order to control and optimize the application and gain maximum performance.

Our server refers to communications protocols like Yokogawa Darwin Ethernet as a channel. Each channel defined in the application represents a separate path of execution in the server. Once a channel has been defined, a series of devices must then be defined under that channel. Each of these devices represents a single ethernet device from which data will be collected. While this approach to defining the application will provide a high level of performance, it won't take full advantage of the Yokogawa Darwin Ethernet driver or the network. An example of how the application may appear when configured using a single channel is shown below.
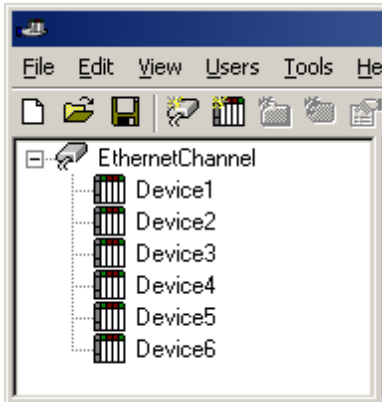
Each device appears under a single Yokogawa Darwin Ethernet channel. In this configuration, the driver must move from one device to the next as quickly as possible in order to gather information at an effective rate. As more devices are added or more information is requested from a single device, the overall update rate begins to suffer.

If the Yokogawa Darwin Ethernet driver could only define one single channel, then the example shown above would be the only option available; however, the Yokogawa Darwin Ethernet driver can define up to 16 channels. Using multiple channels distributes the data collection workload by simultaneously issuing multiple requests to the network. An example of how the same application may appear when configured using multiple channels to improve performance is shown below.
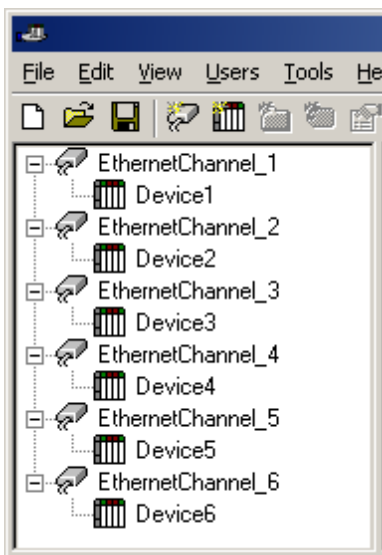
Each device has now been defined under its own channel. In this new configuration, a single path of execution is dedicated to the task of gathering data from each device. If the application has 16 or fewer devices, it can be optimized exactly how it is shown here.

The performance will improve even if the application has more than 16 devices. While 16 or fewer devices may be ideal, the application will still benefit from additional channels. Although by spreading the device load across all 16 channels will cause the server to move from device to device again, it can now do so with far less devices to process on a single channel.

Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value bit 0 is the low bit bit 7 is the high bit
Word	Unsigned 16 bit value bit 0 is the low bit bit 15 is the high bit
Short	Signed 16 bit value bit 0 is the low bit bit 14 is the high bit bit 15 is the sign bit
Float	32 bit floating point value bit 0 is the low bit bit 31 is the high bit
Double	64 bit floating point value bit 0 is the low bit bit 63 is the high bit
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
DR231 Addressing
DR232 Addressing
DR241 Addressing
DR242 Addressing
DR130 Addressing
DC100-1 Addressing
DC100-2 Addressing

DA100-1 Addressing

The driver supports the following addresses for this device. The default data 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-060	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-060	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-060	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-060	**String**	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	CHAxx or CHAxx.PV	01-30	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-30	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-30	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-30	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-30	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-30	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-30	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-30	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-30	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-30	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-30	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-30	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-30	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-30	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always dis-

play 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data
The CD address type is only valid for devices equipped with the math option and 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, a data value of 32000 written to a CD address location with a decimal point placement of .000 would be interpreted by the device as 32.000

Model Name of Device
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.

Control Math Execution
The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-560	**String**	Read Only

Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-560	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-560	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-560	**String**	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	CHAxx or CHAxx.PV	01-60	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-60	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-60	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-60	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-60	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-60	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-60	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-60	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-60	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-60	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-60	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-60	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-60	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-60	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*) are read from the device only 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.

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)	DOIxx	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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data
The CD address type is only valid for devices equipped with the math option and 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, a data value of 32000 written to a CD address location with a decimal point placement of .000 would be interpreted by the device as 32.000

Model Name of Device
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.

Control Math Execution
The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-040	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-040	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-040	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-040	**String**	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	CHAxx or CHAxx.PV	01-30	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-30	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-30	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-30	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-30	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-30	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-30	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-30	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-30	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-30	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-30	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-30	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-30	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-30	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data

The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device

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.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-560	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-560	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-560	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-560	**String**	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	CHAxx or CHAxx.PV	01-60	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-60	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-60	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-60	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-60	**Short**, Word, Byte	Read Only

Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-60	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-60	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-60	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-60	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-60	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-60	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-60	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-60	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-60	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data

The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device

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.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-040	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-040	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-040	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-040	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-040	**String**	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	CHAxx or CHAxx.PV	01-30	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-30	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-30	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-30	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-30	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-30	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-30	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-30	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-30	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-30	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-30	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-30	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-30	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-30	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always

display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data
The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device
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.

Control Math Execution
The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-560	**Short**, Word, Byte	Read Only

Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	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	CHAxx or CHAxx.PV	01-60	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-60	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-60	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-60	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-60	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-60	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-60	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-60	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-60	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-60	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-60	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-60	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-60	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-60	**String**	Read Only
Status of Math Channel*	CHAxx.status	01-60	**String**	Read Only
Lowest Math Channel*	CHA.Low		**Short**, Word, Byte	Read Only
Highest Math Channel*	CHA.High		**Short**, Word, Byte	ReadOnly

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data

The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device

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.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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 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
Alarm Type Level1 of Channel*	CHxxx.AlarmType1.Num	001-020	**Short**, Word, Byte	Read Only

(numeric, ex. 0 = Off)				
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-020	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-020	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-020	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-020	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-020	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-020	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-020	**String**	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	CHAxx or CHAxx.PV	01-30	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-30	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-30	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-30	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-30	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-30	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-30	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-30	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-30	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-30	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-30	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-30	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-30	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-30	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data

The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device

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.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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	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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-060	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-060	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-060	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-060	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-060	**String**	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	CHAxx or CHAxx.PV	01-30	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-30	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-30	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-30	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-30	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-30	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-30	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-30	**Double**, Float	Read/Write

Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-30	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-30	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-30	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-30	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-30	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-30	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data

The CD address type is only valid for devices equipped with the math option and 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, a data value of 32000 written to a CD address location with a decimal point placement of .000 would be interpreted by the device as 32.000

Model Name of Device

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.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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
Alarm Type Level1 of Channel* (numeric, ex. 0 = Off)	CHxxx.AlarmType1.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level2 of Channel* (numeric)	CHxxx.AlarmType2.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level3 of Channel* (numeric)	CHxxx.AlarmType3.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level4 of Channel* (numeric)	CHxxx.AlarmType4.Num	001-560	**Short**, Word, Byte	Read Only
Alarm Type Level1 of Channel* (string, ex. "OFF")	CHxxx.AlarmType1.String	001-560	**String**	Read Only
Alarm Type Level2 of Channel* (string)	CHxxx.AlarmType2.String	001-560	**String**	Read Only
Alarm Type Level3 of Channel* (string)	CHxxx.AlarmType3.String	001-560	**String**	Read Only
Alarm Type Level4 of Channel* (string)	CHxxx.AlarmType4.String	001-560	**String**	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	CHAxx or CHAxx.PV	01-60	**Double**, Float	Read Only
Alarm Summary of Math Channel	CHAxx.Alarm	01-60	**Short**, Word, Byte	Read Only
Alarm Level1 Status of Math Channel	CHAxx.Alarm1	01-60	**Short**, Word, Byte	Read Only
Alarm Level2 Status of Math Channel	CHAxx.Alarm2	01-60	**Short**, Word, Byte	Read Only
Alarm Level3 Status of Math Channel	CHAxx.Alarm3	01-60	**Short**, Word, Byte	Read Only
Alarm Level4 Status of Math Channel	CHAxx.Alarm4	01-60	**Short**, Word, Byte	Read Only
Set and Read Level1 Alarm Setpoint	CHAxx.ASP1	01-60	**Double**, Float	Read/Write
Set and Read Level2 Alarm Setpoint	CHAxx.ASP2	01-60	**Double**, Float	Read/Write
Set and Read Level3 Alarm Setpoint	CHAxx.ASP3	01-60	**Double**, Float	Read/Write
Set and Read Level4 Alarm Setpoint	CHAxx.ASP4	01-60	**Double**, Float	Read/Write
Upper Scale Value of Math Channel*	CHAxx.scale_Hi	01-60	**Double**, Float	Read Only
Lower Scale Value of Math Channel*	CHAxx.scale_Lo	01-60	**Double**, Float	Read Only
Unit String of Math Channel*	CHAxx.unit	01-60	**String**	Read Only
Tagname of Math Channel*	CHAxx.tag	01-60	**String**	Read Only
Status of Math Channel*	CHAxx.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

Status Data

Data associated with the addresses denoted by an (*), are read from the device only 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.

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
SetTime*	Tag		**Boolean**	Write Only

*SetTime Tag. The SetTime tag will cause the device time to be updated. Writing 0 or 1 to the tag will update the Device Date and Time which can be verified from the Date tag and the Time tag (the SetTime tag will always display 0 as it is a write only tag). After a successful update, the following message will be posted: "Device Clock set to system time [Device <device_name>]."

Note: The SetTime tag requires that "Ethernet Exclusive Port" is selected for the device on the Communications Parameters page of the Device Properties. For more information, refer to **Device Setup**.

Math Communication Data
The CD address type is only valid for devices equipped with the math option and 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

Model Name of Device
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.

Control Math Execution
The MathControl address type is only available for devices equipped with the math option and 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 allows the user to send any command to the device, including commands not directly supported by the driver. Write operations using the Command address should be performed with extreme caution!

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If at runtime the driver finds that an address is not present in the device, the driver will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses 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.

Automatic Tag Database Generation

The Automatic OPC Tag Database Generation features of this driver have been designed to make setting up the OPC application a Plug and Play operation. This driver can be configured to automatically build a list of OPC tags within the OPC Server that correspond to device specific data. The automatically generated OPC tags can then be browsed from the OPC client. The OPC tags that are generated depend on the nature of the driver.

If the target device supports its own local tag database, the driver will read the device's tag information and use this data to generate OPC tags within the OPC Server. If the device does not natively support its own named tags, the driver will create a list of tags based on information specific to the driver. An example of these two conditions may be as follows:

1. A data acquisition system that supports its own local tag database: The driver will use the tags names found in the device to build the OPC Server's OPC tags.

2. An Ethernet I/O system that supports detection of I/O module type: The driver in this case will automatically generate OPC tags in the OPC Server that are based on the types of I/O modules plugged into the Ethernet I/O rack.

The mode of operation for automatic tag database generation is completely configurable. The following dialog is used to configure how the OPC Server and the associated communications driver will handle Automatic OPC Tag Database Generation.
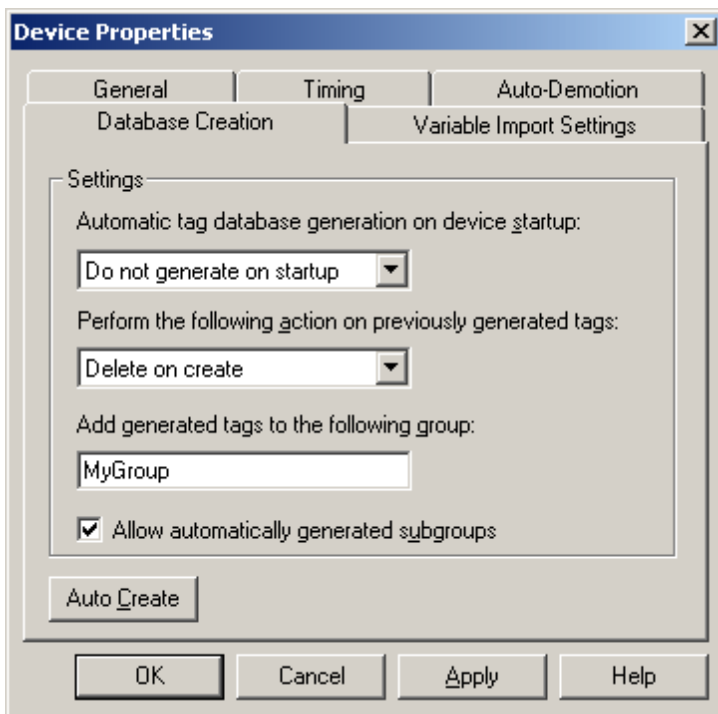
The **Automatic tag database generation on device startup** selection is used to configure when OPC tags will be automatically generated. There are three possible selections:

- **Do not generate on startup**, the default condition, prevents the driver from adding any OPC tags to tag space of the OPC Server.
- **Always generate on startup** causes the driver to always evaluate the device for tag information and to add OPC tags to the tag space of the server each time the server is launched.
- **Generate on first startup** causes the driver to evaluate the target device for tag information the first time this OPC Server project is run and to add any OPC tags to the server tag space as needed.

When the automatic generation of OPC tags is selected, any tags that are added to the server's tag space must be saved with the project. The OPC Server project can be configured to auto save from the **Tools|Options** menu.

When automatic tag generation is enabled, the server needs to know what to do with OPC tags that it may have added from a previous run or with OPC tags that have been added or modified after the communications driver added them originally.

Perform the following action is used to control how the server will handle OPC tags that were automatically generated and currently exist in the OPC Server project. This feature prevents automatically generated tags from piling up in the server. This would occur if, using the Ethernet I/O example above, you continued to change the I/O modules in the rack with the OPC Server configured to always generate new OPC tags on startup. Under this condition every time the communications driver detected a new I/O module, the tags would be added to the server. If the old tags are not removed, a number of unused tags could accumulate in the server's tag space. **Perform the following action** is used to tailor the server's operation to best fit the application's needs. The selections are as follows:

- The default condition, **Delete on create** allows the server to remove any tags that had previous been added to the tag space before the communications driver can add any new tags.
- **Overwrite as necessary** allows the server to remove only tags the communications driver is replacing with new tags. Any tags that are not being overwritten will remain in the server's tag space.
- **Do not overwrite** prevents the server from removing any tags that had been previous generated or may have already existed in the server. With this selection, the communications driver can only add tags that are completely new. The final selection, **Do not overwrite, log error**, has the same effect as the third with the addition of an error message being posted to the OPC Server's event log when a tag overwrite would have occurred.

Note: The removal of OPC tags affects tags that have been automatically generated by the communications driver and any tags that have been added using names that match generated tags. It is recommended that users avoid adding tags to the server using names that match tags that may be automatically generated by the driver.

Add generated tags to the following group can be used to keep automatically generated tags from mixing with tags that have been entered manually. This parameter is used to specify a sub group that will be used when adding all automatically generated tags for this device. The name of the sub group can be up to 31 characters in length. The following displays demonstrate how this parameter affects where automatically generated tags are placed in the server's tag space. As shown below, this parameter provides a root branch to which all automatically generated tags will be added.
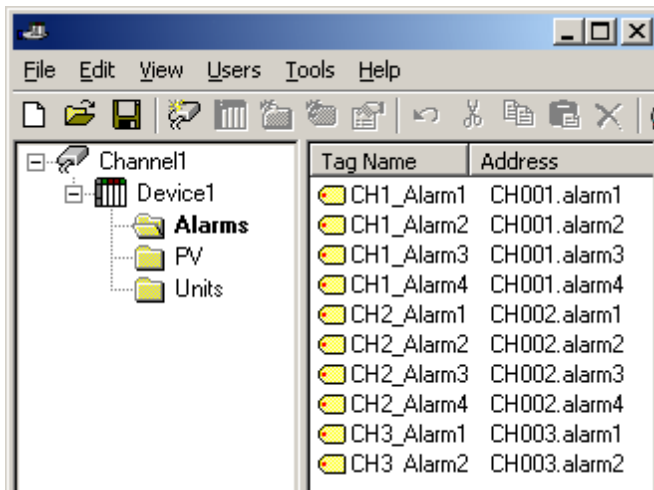
No sub group specified.
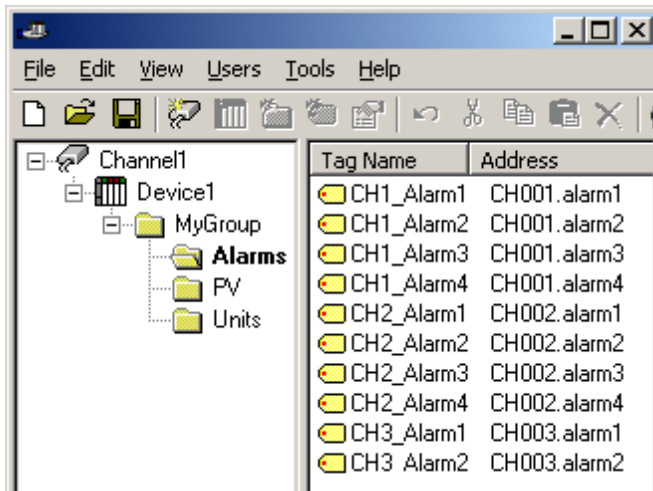
Sub group named MyGroup specified.

Auto Create is used to manually initiate the creation of automatically generated OPC tags. It can be used to force the communications driver to reevaluate the device for possible tag changes. Auto Create can also be accessed from the System Tags for this device, allowing the OPC client application to initiate tag database creation.

Error Descriptions

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

Address Validation
Missing address
Device address '<address>' contains a syntax error
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>' is Read Only

Device Status Messages
Device '<device name>' is not responding
Unable to write to '<address>' on device '<device name>

Driver Error Messages
Winsock initialization failed (OS Error = n)
Winsock V1.1 or higher must be installed to use the Yokogawa Darwin Ethernet device driver

Address Validation

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

Address Validation
Missing address
Device address '<address>' contains a syntax error
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>' is Read Only

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.

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.

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 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>' 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.

Device Status Messages

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

Device Status Messages
Device '<device name>' is not responding
Unable to write to '<address>' on device '<device name>

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 from the device took longer to receive than the amount of time specified in the "Request Timeout" device setting.

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 setting 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 that the IP address given to the named device matches that of the actual device.
3. Check address availability for the device.

Driver Error Messages

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

Driver Error Messages
Winsock initialization failed (OS Error = n)
Winsock V1.1 or higher must be installed to use the Yokogawa Darwin Ethernet device driver

Winsock initialization failed (OS Error = n)

Error Type:
Fatal

OS Error	Indication	Possible Solution
10091	Indicates that the underlying network subsystem is not ready for network communication.	Wait a few seconds and restart the driver.
10067	Limit on the number of tasks supported by the Windows Sockets implementation has been reached.	Close one or more applications that may be using Winsock and restart the driver.

Winsock V1.1 or higher must be installed to use the Yokogawa Darwin Ethernet device driver

Error Type:
Fatal

Possible Cause:
The version number of the Winsock DLL found on the system is less than 1.1.

Solution:
Upgrade Winsock to version 1.1 or higher.

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