Allen-Bradley Bulletin 900 Driver

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Allen-Bradley Bulletin 900 Driver

Help version 1.032

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Overview

The Allen-Bradley Bulletin 900 Driver provides a reliable way to connect Allen-Bradley Bulletin 900 devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP, and countless custom applications.

Channel Setup

Channel Properties

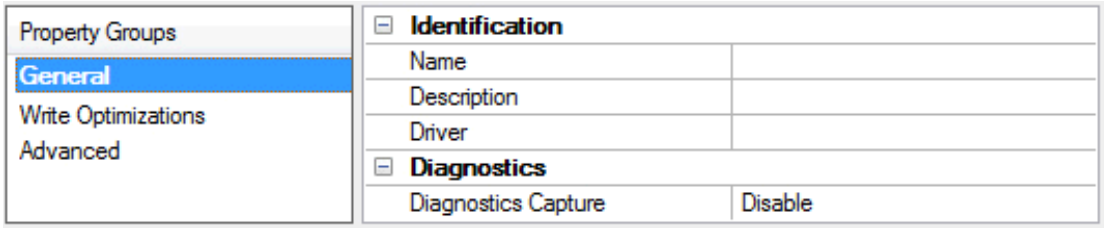
A channel represents a serial line connected to one of the computer's COM ports or an Ethernet network connected to the computer's default Network Interface Card (NIC). The Channel Properties allow users to specify the connection type and other properties that will be shared by devices on that network.

Device Properties

Each physical device to be polled must be represented by a device object in the server. For information on the Allen-Bradley Bulletin 900's device-specific dialog, refer to **Process Value Scaling**.

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.



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.

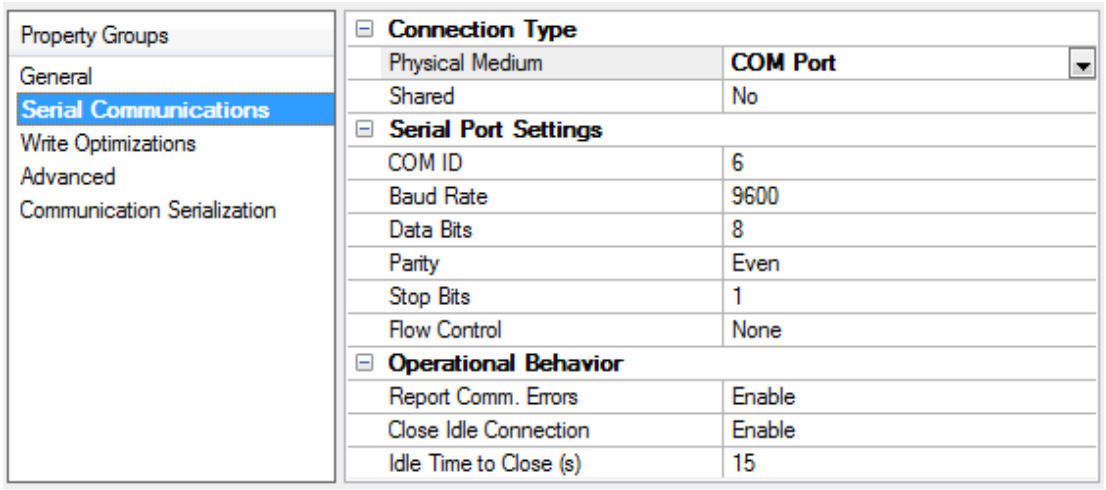
For more information, refer to "Communication Diagnostics" in the server help.

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.



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

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

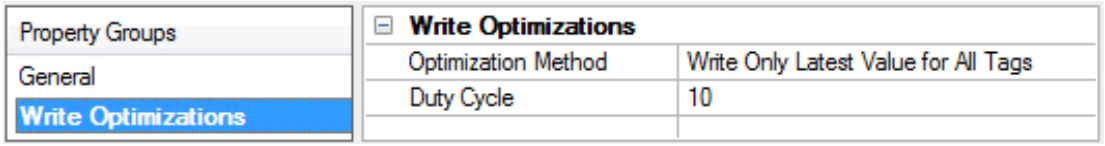
- **Modem**: Specify the installed modem to be used for communications.
- **Connect Timeout**: Specify the amount of time to wait for connections to be established before failing a read or write. The default is 60 seconds.
- **Modem Properties**: Configure the modem hardware. When clicked, it opens vendor-specific 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.



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.

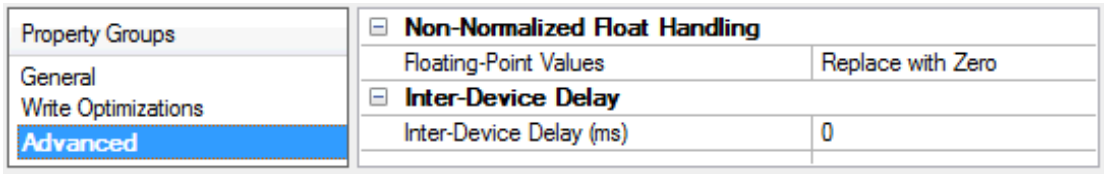
  Note: This option does not attempt to optimize writes to Boolean values. It allows users to optimize the operation of HMI data without causing problems with Boolean operations, such as a momentary push button.
- **Write Only Latest Value for All Tags**: This option takes the theory behind the second 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.



Non-Normalized Float Handling: Non-normalized float handling allows users to specify how a driver handles non-normalized IEEE-754 floating point data. 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. 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 Setup

Supported Devices

Allen-Bradley Bulletin 900-TC8
-TC8 w/Enhanced Features
-TC16
-TC16 w/Enhanced Features
-TC32

Communication Protocol

Allen-Bradley Bulletin 900-TCx Protocol as detailed in *Publication 900-UM004A-EN-E* -September 2003.
Allen-Bradley Bulletin 900-TCx Protocol as detailed in *Publication 900-UM004B-EN-E* -June 2005 (CompoWay/F(SYSWAY)).

Supported Communication Parameters

Baud Rate: 1200, 2400, 4800, 9600, 19200, 38400*
Parity: None, Even, or Odd
Data Bits: 7 or 8
Stop Bits: 1 or 2

*TC8 w/Enhanced Features and TC16 w/Enhanced Features only.

Ethernet Encapsulation

This driver supports Ethernet Encapsulation, which allows the driver to communicate with serial devices attached to an Ethernet network using a terminal server. It may be invoked through the COM ID dialog in Channel Properties. For more information, refer to the OPC server's help documentation.

Device IDs

This property specifies the unique ID that will be used in order to communicate with other devices. The valid range is 0 to 99.

Flow Control

When using an RS232/RS485 converter, the type of flow control that is required depends on the needs of the converter. Some converters do not require any flow control whereas others require RTS flow. Consult the converter's documentation in order to determine its flow requirements. An RS485 converter that provides automatic flow control is recommended.

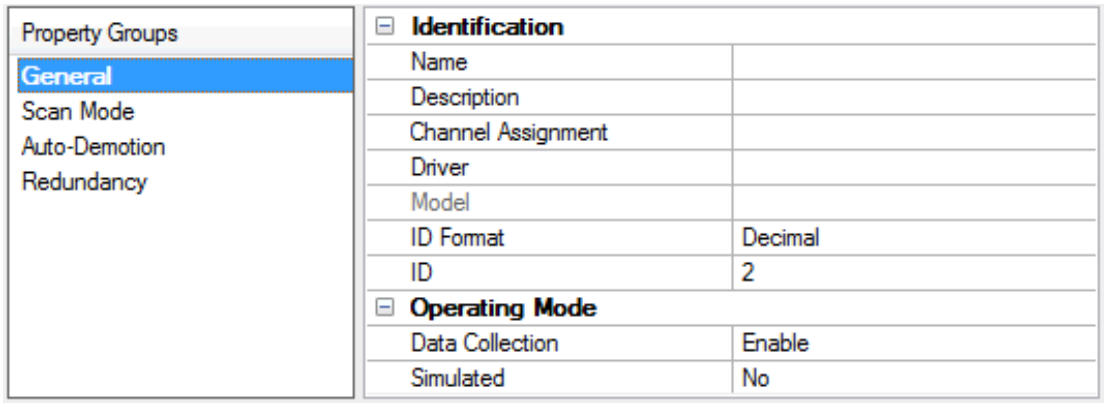
Note: When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control setting of **RTS** or **RTS Always** under the Channel Properties.

Cable Connections

Refer to each individual controller's manual section on both Hardware Installation and Wiring in *Publication 900-UM004A-EN-E* or *900-UM004B-EN-E*.

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.



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 driver-specific station or node. The type of ID entered depends on the communications driver being used. For many communication 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.

Note: 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. For more information, refer to the driver's help documentation.

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.

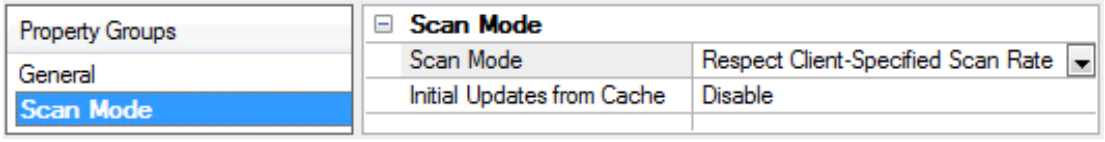
Notes:

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.



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

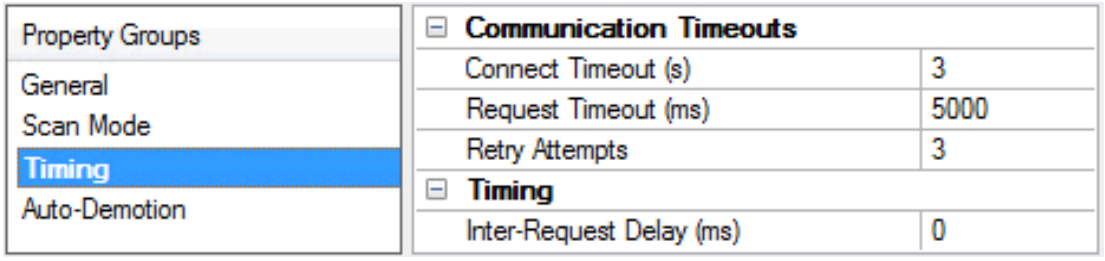
- **Respect Client-Specified Scan Rate**: This mode uses the scan rate requested by the client.
- **Request Data No Faster than Scan Rate**: This mode specifies the maximum scan rate to be used. The valid range is 10 to 99999990 milliseconds. The default is 1000 milliseconds.
  Note: When the server 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.



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.

Retry Attempts: This property specifies how many times the driver retries 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 retries configured for an application depends largely on the communications environment.

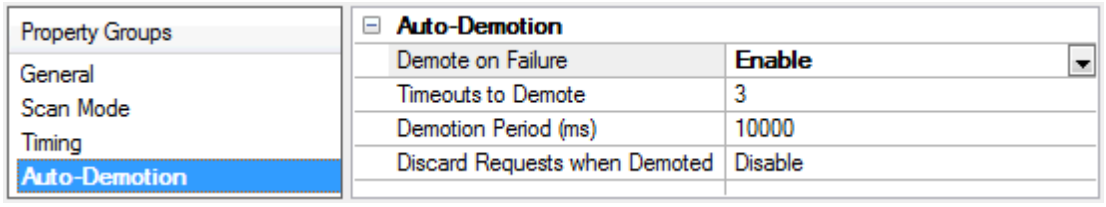
Timing

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.



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.

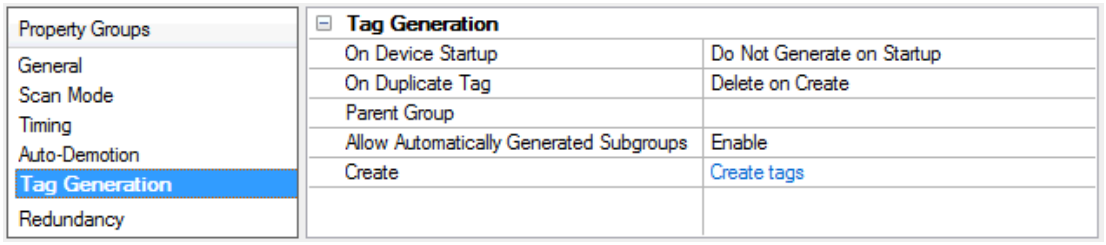
Device Properties - Tag Generation

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.

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.



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.

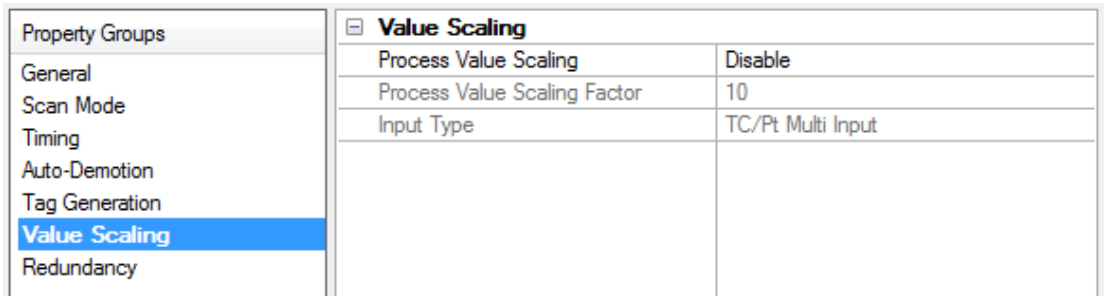
Note: **Create tags** is disabled if the Configuration edits a project offline.

Device Properties - Value Scaling

Process Value Scaling (and its related parameters) scales values according to the input type. For an input type that has no scaling, the value read from the device will match that of the display. For an input type that is scaled by 10, the value read from the device will be 10 times that of the value displayed on the front panel. A division by 10 is necessary. Input type selection is used for enhanced models only. Some addresses are scaled differently depending on the input type of device. If this item is set incorrectly, the value returned by the driver will not match what is displayed by the device.

Process value scaling allows the driver to automatically perform scaling for reading and writing process value related parameters. It is handled by the driver in a similar fashion as parameters with fixed scaling by 10.

Note: To determine if scaling is required for a given input type, refer to the controller's manual section on sensor input setting ranges.

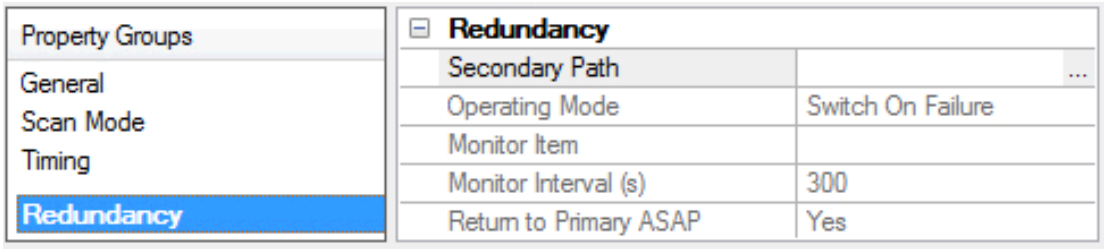


Descriptions of the properties are as follows:

- **Process Value Scaling:** When enabled, the Process Value Scaling Factor is used for all applicable tags. For a list of tags, refer to **Data Types Description**.
- **Process Value Scaling Factor:** This property specifies the scaling factor. The valid range is from 0.1 to 1,000.
- **Input Type:** This property specifies the type of input. There are two options: TC/Pt Multi Input or Analog Input.

Note: When process value scaling is disabled, it behaves the same as no scaling. For more information, refer to **Data Types Description**.

Device Properties - Redundancy



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

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

Automatic Tag Database Generation

The Allen-Bradley Bulletin 900 Driver utilizes the OPC server's automatic tag database generation feature, which enables drivers to automatically create tags to access data. This is accomplished either by querying the device for its configuration or by using a fixed database to access information to build a tag database.

OPC Server Configuration

The automatic tag database generation feature can be customized to fit a specific application's needs. The primary control options are set during the Database Creation step of the Device Wizard, but may be accessed later by clicking **Device Properties** | **Tag Generation**. For more information, refer to the OPC server's help documentation.

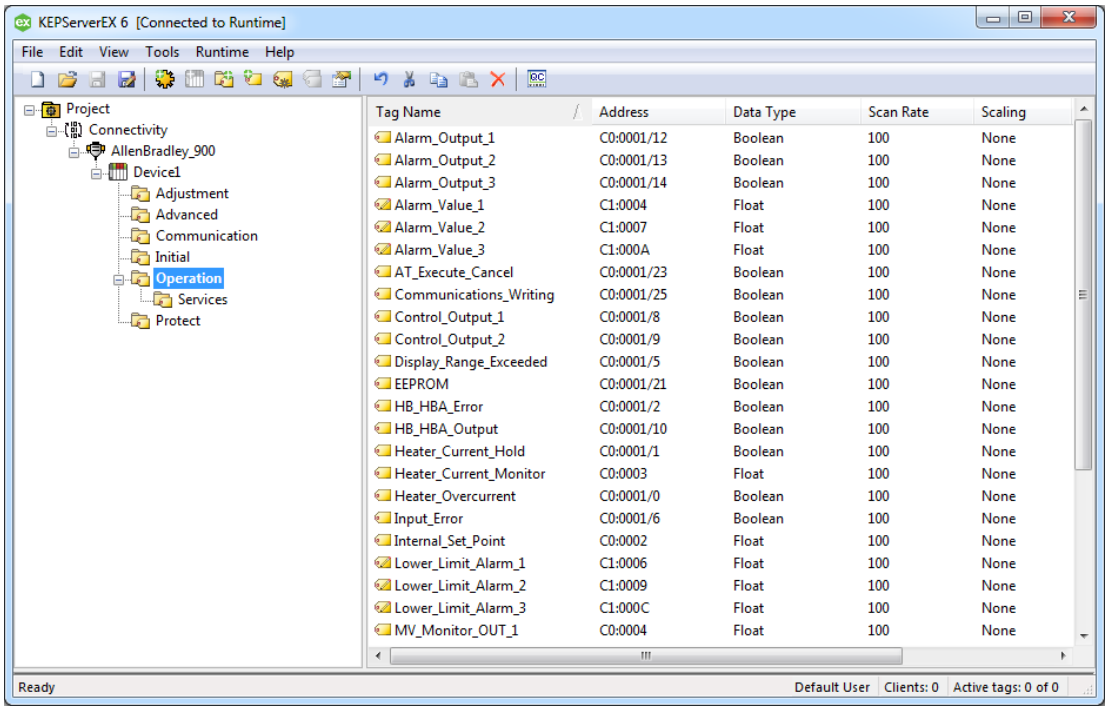
Operation

Depending on the configuration, tag generation may start automatically when the OPC server project starts or be initiated manually at some other time. The OPC server's Event Log will show when the tag generation process started, any errors that occurred while building the tag database and when the process was completed.

Group and Tag Naming

A group is created in the server for each group, excepting the operation and operational groups. These are combined into one Operation group. For more information (including the name that will be generated for each tag/address) refer to **Address Descriptions**.

The image below displays the results of automatic tag database creation for a TC-8.



Data Types Description

Data Type	Description
DWord	Read: Unsigned 32 bit value read from the device. Write: Value passed directly on to the device.
Long	Read: Unsigned 32 bit value read from the device. Write: Value passed directly on to the device.
Float	A scaling algorithm may be applied to each data item. The following information details each variation of type Float. **No Scaling/Process Value Scaling Disabled** Read: Value returned from the device is converted to Float. Write: Value written goes through the following conversion process before being sent to the device. 1. Rounded to the next whole number. 2. Fractional part is removed. 3. Integer part is sent to the device. **Note**: No scaling items can be identified if the hexadecimal range is the same as the decimal range. For example, C0:0009, Soak time remain monitor, 00000000 to 0000270F (0 to 9999). **Variable Scaling (By Process Value Scaling Factor)*** Read: Value returned from the device is converted to Float then divided by the process value scaling factor. Write: Value written goes through the following conversion process before being sent to the device. 1. Fractional part is rounded to the hundredths position. 2. Multiplied by the Process Value Scaling Factor. 3. Fractional part is removed. 4. Integer part is sent to the device. **Note**: Variable scaling items are all of the process and set point related items. This includes the following specific addresses: C0:0000, C0:0002, C1:0003, C1:000E, C1:000F, C1:0010, C1:0011, C3:0005 and C3:0006.** **Fixed Scaling (By an Address-Specific Scaling Factor)** Read: Value returned from the device is converted to Float then divided by the address's appropriate value. Write: Value written goes through the following conversion process before being sent to the device.

Data Type	Description
	1. Fractional part is rounded to the hundredths position. 2. Multiplied by the value appropriate for address. 3. Fractional part is removed. 4. Integer part is sent to the device. **Note**: Fixed scaling items have an implied decimal point in the actual value transferred by the device. These can be identified by whether or not the hexadecimal range is different than the decimal range. For example, C0:0005, MV monitor (OUT2), 00000000 to 0000041A (0.0 to 105.0).
Boolean	Read: If the value returned from the device is zero, then FALSE is returned. If the value returned from device is nonzero, then TRUE is returned. Write: Value passed directly on to the device.

*This is only true if process value scaling is enabled.
For information on setup, refer to **Process Value Scaling.

See Also: **Address Descriptions**.

Address Descriptions

To form a tag address, combine a variable type and address and then separate them with a colon. Tag addresses have the following syntax: *Variable_Type:Address*. For examples of tag addresses, refer to the table below.

Variable Type	Address	Tag Address
C0	0000	C0:0000
C0	0001	C0:0001

For the Status Item only (C0:0001), access to individual status bits listed in the Status Bits Table is provided using the following additional syntax: *Variable_Type:Address/Bit_Number.* For examples, refer to the table below. For more information, refer to **Status Bits Table**.

Variable Type	Address	Bit Number	Tag Address	Data Type
C0	0001	8	C0:0001/8	Boolean
C0	0001	9	C0:0001/9	Boolean

Note: For information on how each data type is treated by driver, refer to **Data Types Description**.

Bulletin 900-TCxx Groups

The tables below list the available tag addresses for each of the groups in the Bulletin 900-TCxx. Each group's setup area is detailed so that users will be able to determine whether a service command (to move to the appropriate setup area) is required when performing a write operation.

For example, before performing any write operation to a setup area 1 parameter, users must move to setup area 1 by using the Service 07 tag. To view the current setup area, refer to the corresponding bit in the status address. Before performing any write operation to a Protect Level Group parameter, users also need to move to protect level by using the Service 08 tag.

Setup Areas

Area	Description
Setup Area 0	This area groups together the protect, operation, operational and adjustment level/group.
Setup Area 1	This area groups together the initial setting, communications setting, advanced function setting and calibration level/group.

Note: Access to the Calibration Level Group is not provided by the driver.

Services Group

Services group tag addresses are primarily provided as a way to perform the same functionality as the front-panel keys. For example, pressing the level key for at least 3 seconds moves to the initial setting function group. This same functionality is provided by the Service 07 tag. Likewise, pressing the Level key for at least 1 second moves to the operations function group and displays the process value and set point. This same functionality is provided by Service 06 tag. For more information, refer to **Services Group table**.

Quick Links to Tables

Operational Level/Group (Setup Area 0)

Protect Level/Group (Setup Area 0)
Operation Level/Group (Setup Area 0)
Adjustment Level/Group (Setup Area 0)
Communications Setting Level/Group (Setup Area 1)
Initial Setting Level/Group (Setup Area 1)
Advanced Function Setting Level/Group (Setup Area 1)
Status Bits Table
Services Group

Operational Level/Group - (Setup Area 0)
Operational Function Group - (Setup Area 0)

> Variable Type	Address	"> Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C0	0000	Process value	Temperature: Follow the specified range of the sensor. Analog: Scaling lower limit -5%FS to scaling upper limit +5%FS	Read Only	All	**Float** DWord Long	Process_ Value
C0	0001	Status (1)	Refer to Status Bits Table	Read Only	All	**DWord** Long Float Boolean	Status
C0	0002	Internal set point (1)	SP lower limit to SP upper limit	Read Only	All	**Float** DWord Long	Internal_Set_ Point
C0	0003	Heater current monitor	00000000 to 00000226 (0.0 to 55.0)	Read Only	TC8, TC8 E TC16 TC16 E	**Float** DWord Long	Heater_ Current_ Monitor
C0	0004	MV monitor (OUT1)	Standard: FFFFFFCE to 0000041A (-5.0 to 105.0) Heating and cooling: 00000000 to 0000041A (0.0 to 105.0)	Read Only	All	**Float** DWord Long	MV_Monitor_ OUT_1
C0	0005	MV monitor (OUT2)	00000000 to 0000041A (0.0 to 105.0)	Read Only	All	**Float** DWord Long	MV_Monitor_ OUT_2

> Variable Type	Address	"> Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C0	0006	Heater current value 2 monitor	00000000 to 00000226 (0.0 to 55.0)	Read Only	TC8 E TC16 E	**Float** DWord Long	Heater_ Current_2_ Monitor
C0	0007	Leakage current value 1 monitor	00000000 to 00000226 (0.0 to 55.0)	Read Only	TC8 E TC16 E	**Float** DWord Long	Leakage_ Current_1_ Monitor
C0	0008	Leakage current value 2 monitor	00000000 to 00000226 (0.0 to 55.0)	Read Only	TC8 E TC16 E	**Float** DWord Long	Leakage_ Current_2_ Monitor
C0	0009	Soak time remain monitor	00000000 to 0000270F (0 to 9999)	Read Only	TC8 E TC16 E	**Float** DWord Long	Soak_Time_ Remain_ Monitor

Note: Not displayed on the controller's display.

Protect Level/Group - (Setup Area 0)

Protect Function Group - (Setup Area 0)

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C1	0000	Operation / adjustment protection	00000000(0) No restrictions in operation and adjustment levels 00000001(1) Move to adjustment level restricted 00000002(2) Display and change of only "PV" and "PV/SP" parameters enabled 00000003(3) Display of only "PV" and "PV/SP" parameters	Read/Write	All	**DWord** Long Float Boolean	Operation_ Adj_ Protect

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			enabled				
C1	0001	Initial setting / comms. protection	00000000(0) Move to initial setting/comms. setting level enabled (move to advanced function setting level displayed) 00000001(1) Move to initial setting/comms. setting level enabled (move to advanced function setting level not displayed) 00000002(2) Move to initial setting / comms. setting level restricted	Read/Write	All	**DWord** Long Float Boolean	Initial_Set_ Comm_ Protect
C1	0002	Setup change protection	00000000(0) OFF (changing of setup on controller display enabled) 00000001(1) ON (changing of setup on controller display disabled)	Read/Write	All	DWord Long Float **Boolean**	Setup_ Change_ Protect

Operation Level/Group - (Setup Area 0)
Operation Function Group - (Setup Area 0)

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C1	0003	Set point	SP lower limit to SP upper limit	Read/Write	All	**Float** DWord Long	Set_Point
C1	0004	Alarm value 1	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	All	**Float** DWord Long	Alarm_ Value1
C1	0005	Upper-limit	FFFFF831 to	Read/Write	All	**Float**	Upper_

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
		alarm 1	0000270F (-1999 to 9999)			DWord Long	Limit_ Alarm1
C1	0006	Lower-limit alarm 1	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	All	**Float** DWord Long	Lower_ Limit_ Alarm1
C1	0007	Alarm value 2	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Alarm_ Value2
C1	0008	Upper-limit alarm 2	FFFFF831 to 0000270F (-1999 to 9999	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Upper_ Limit_ Alarm2
C1	0009	Lower-limit alarm 2	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Lower_ Limit_ Alarm2
C1	000A	Alarm value 3 (1) (2)	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	TC8, TC8 E, TC16 E	**Float** DWord Long	Alarm_ Value3
C1	000B	Upper-limit alarm 3 (1) (2)	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	TC8, TC8 E, TC16 E	**Float** DWord Long	Upper_ Limit_ Alarm3
C1	000C	Lower-limit alarm 3 (1) (2)	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	TC8, TC8 E, TC16 E	**Float** DWord Long	Lower_ Limit_ Alarm3

Notes:

1. Only displayed on the 900-TC8. The alarm function can also be used on units without alarm outputs. In this case, confirm alarm occurrences via the status data.
2. When alarm 3 is not assigned to an output, the parameter will not be shown on the controller's display.

Adjustment Level/Group - (Setup Area 0)
Adjustment Function Group - (Setup Area 0

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
C1	000D	Heater burnout detection	00000000 to 000001F4 (0.0 to 50.0)	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Heater_ Burnout_ Detection
C1	000E	Set point 0	SP lower limit to SP upper limit	Read/Write	All	**Float** DWord	Set_Point0

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
						Long	
C1	000F	Set point 1	SP lower limit to SP upper limit	Read/Write	All	**Float** DWord Long	Set_Point1
C1	0010	Set point 2	SP lower limit to SP upper limit	Read/Write	All	**Float** DWord Long	Set_Point2
C1	0011	Set point 3	SP lower limit to SP upper limit	Read/Write	All	**Float** DWord Long	Set_Point3
C1	0012	Temperature input shift	FFFFF831 to 0000270F (-199.9 to 999.9)	Read/Write	All	**Float** DWord Long	Temp_Input_ Shift
C1	0013	Upper-limit temperature input shift value	FFFFF831 to 0000270F (-199.9 to 999.9)	Read/Write	All	**Float** DWord Long	Upp_Lim_ Temp_Input_ Shift
C1	0014	Lower-limit temperature input shift value	FFFFF831 to 0000270F (-199.9 to 999.9)	Read/Write	All	**Float** DWord Long	Low_Lim_ Temp_Input_ Shift
C1	0015	Proportional band	00000001 to 0000270F (0.1 to 999.9)	Read/Write	All	**Float** DWord Long	Proportional_ Band
C1	0016	Integral time	00000000 to 00000F9F (0 to 3999)	Read/Write	All	**Float** DWord Long	Integral_Time
C1	0017	Derivative time	00000000 to 00000F9F (0 to 3999) See Table 5.AF in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	All	**Float** DWord Long	Derivative_ Time
C1	0018	Cooling coefficient	00000001 to 0000270F (0.01 to 99.99)	Read/Write	All	**Float** DWord Long	Cooling_ Coefficient
C1	0019	Dead band	FFFFF831 to 0000270F (-199.9 to 999.9) See Table 5.AH in Bulletin 900-	Read/Write	All	**Float** DWord Long	Dead_Band

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
			TC8 and 900-TC16 User Manual				
C1	001A	Manual reset value	00000000 to 000003E8 (0.0 to 100.0)	Read/Write	All	**Float** DWord Long	Manual_Reset_Value
C1	001B	Hysteresis (OUT1)	00000001 to 0000270F (0.1 to 999.9) See Table 5.AJ in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	All	**Float** DWord Long	Hysteresis_OUT1
C1	001C	Hysteresis (OUT2)	00000001 to 0000270F (0.1 to 999.9) See Table 5.AJ in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	All	**Float** DWord Long	Hysteresis_OUT2
C1	001D	Heater burnout 2 detection	00000000 to 000001F4 (0.0 to 50.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Heater_Burnout_2_Detection
C1	001E	HS alarm 1	00000000 to 000001F4 (0.0 to 50.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	HS_Alarm_1
C1	001F	HS alarm 2	00000000 to 000001F4 (0.0 to 50.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	HS_Alarm_2
C1	0020	Soak time	00000001 to 0000270F (1 to 9999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Soak_Time
C1	0021	Wait Band	00000000 (0): OFF 00000001 to 0000270F (0.1 to 999.9 for TC/Pt multi-input models) (0.01 to 99.99 for Analog input models) See Table 5.AL in Bulletin 900-	Read/Write	TC8 E TC16 E	**Float** DWord Long	Wait_Band

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
			TC8 and 900-TC16 User Manual				
C1	0022	MV at stop	Standard: FFFFFFCE to 0000041A (−5.0 to 105.0) Heating and cooling: FFFFFBE6 to 0000041A (−105.0 to 105.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	MV_at_Stop
C1	0023	MV at PV error	Standard: FFFFFFCE to 0000041A (−5.0 to 105.0) Heating and cooling: FFFFFBE6 to 0000041A (−105.0 to 105.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	MV_at_PV_ Error
C1	0024	Manual manipulated variable	Standard: FFFFFFCE to 0000041A (−5.0 to 105.0) Heating and cooling: FFFFFBE6 to 0000041A (−105.0 to 105.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Manual_ Manipulated_ Variable
C1	0025	SP ramp set value	00000000 (0): OFF 00000001 to 0000270F (1 to 9999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	SP_Ramp_Set_ Value
C1	0026	MV upper limit	Standard: MV lower limit + 0.1 to 0000041A (MV lower limit + 0.1 to 105.0) Heating and cooling: 00000000 to 0000041A (0.0 to 105.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	MV_Upper_ Limit
C1	0027	MV lower limit	Standard:	Read/Write	TC8 E TC16 E	**Float**	MV_Lower_ Limit

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
			FFFFFFCE to MV upper limit − 0.1 (−5.0 to MV upper limit − 0.1) Heating and cooling: FFFFFBE6 to 00000000 (−105.0&0.0)			DWord Long	
C1	0028	Move Protect function group	FFFFF831 to 0000270F (−1999 to 9999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Move_Protect_ Group
C1	0029	Password to Move to Protect function group	FFFFF831 to 0000270F (−1999 to 9999) (Can only be set. The monitor value is always 00000000.)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Password_ Move2Protect_ Group
C1	002A	Parameter mask enable	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	Parameter_ Mask_Enable

Communications Setting Level/Group - (Setup Area 1)
Communications Setting Function Group - (Setup Area 1)

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0010	Communications unit number (1)	00000000 to 00000063 (0 to 99)	Read/Write	All	**DWord** Long Float Boolean	Comm_ Unit_ Number
C3	0011	Baud rate (1)	00000000(0) 1.2 00000001(1) 2.4 00000002(2) 4.8 00000003(3) 9.6 00000004(4) 19.2	Read/Write	All	**DWord** Long Float Boolean	Baud_Rate
C3	0012	Communications data length (1)	00000007(7) 7	Read/Write	All	**DWord** Long	Comm_ Data_ Length

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			00000008(88)			Float Boolean	
C3	0013	Communications stop bit (1)	00000001(11) 00000002(22)	Read/Write	All	**DWord** Long Float Boolean	Comm_ Stop_Bit
C3	0014	Communications parity (1)	00000000(0) None 00000001(1) Even 00000002(2) Odd	Read/Write	All	**DWord** Long Float Boolean	Comm_ Parity

Note: Communications parameters are enabled after they have been changed by resetting the controller.

Initial Setting Level/Group - (Setup Area 1)
Initial Setting Function Group - (Setup Area 1)

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0000	Input type (1)	For models TC8 and TC16: see AB Publication 900-UM004A-EN-E (Sept. 2003) Chapter 3 - Communications Data, Initial Setting Level/Group table.	Read/Write	All	**DWord** Long Float Boolean	Input_Type
C3	0001	Scaling upper limit	Scaling lower limit +1 to 0000270F (scaling lower limit +1 to 9999)	Read/Write	All	**Float** DWord Long	Scaling_ Upp_Limit
C3	0002	Scaling lower limit	FFFFF831 to Scaling upper limit -1 (-1999 to scaling upper limit -1)	Read/Write	All	**Float** DWord Long	Scaling_ Low_Limit
C3	0003	Decimal point position (TC/Pt multi-input models)	00000000 to 00000001 (0 to 1)	Read/Write	All	**DWord** Long Float Boolean	Decimal_ Point

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0004	°C/°F selection	00000000(0) °C 00000001(1) °F	Read/Write	All	**DWord** Long Float Boolean	Cels_Fahr_Select
C3	0005	SP upper limit	Temperature: SP lower limit +1 to Input range upper limit Analog: SP lower limit +1 to scaling upper limit	Read/Write	All	**Float** DWord Long	SP_Upp_Limit
C3	0006	SP lower limit	Temperature: Input range lower limit to SP upper limit -1 Analog: Scaling lower limit to SP upper limit -1	Read/Write	All	**Float** DWord Long	SP_Low_Limit
C3	0007	PID/ ON/OFF	00000000(0) ON/OFF 00000001(1) 2-PID	Read/Write	All	**DWord** Long Float Boolean	PID_OnOff_Select
C3	0008	Standard/Heating and cooling	00000000(0) Standard 00000001(1) Heating and cooling	Read/Write	All	**DWord** Long Float Boolean	Std_HeatCool_Select
C3	0009	ST	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Self_Tuning
C3	000A	Control period (OUT1)	00000001 to 00000063 (1 to 99)	Read/Write	All	**DWord** Long Float Boolean	Control_Period_OUT1
C3	000B	Control period (OUT2)	00000001 to 00000063 (1 to 99)	Read/Write	All	**DWord** Long Float	Control_Period_OUT2

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
						Boolean	
C3	000C	Direct/reverse operation	00000000(0) Reverse operation 00000001(1) Direct operation	Read/Write	All	**DWord** Long Float Boolean	Direct_ Reverse_ Select
C3	000D	Alarm 1 type	00000000(0) Alarm function OFF 00000001(1) Upper- and lower-limit alarm 00000002(2) Upper-limit alarm 00000003(3) Lower-limit alarm 00000004(4) Upper- and lower-limit range alarm 00000005(5) Upper- and lower-limit alarm with standby sequence 00000006(6) Upper-limit alarm with standby sequence 00000007(7) Lower-limit alarm with standby sequence 00000008(8) Absolute-value upper-limit alarm 00000009(9) Absolute-value lower-limit alarm	Read/Write	All	**DWord** Long Float Boolean	AlarmType-1

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			0000000A(10) Absolute-value upper-limit alarm with standby sequence 0000000B(11) Absolute-value lower-limit alarm with standby sequence 0000000C(12) LBA (Loop Burnout alarm				
C3	000E	Alarm 2 type	Same as alarm 1 type without Setting 12	Read/Write	TC8, TC8 E, TC16, TC16 E	**DWord** Long Float Boolean	AlarmType-2
C3	000F	Alarm 3 type (1) (2)	Same as alarm 1 type without Setting 12	Read/Write	TC8, TC8 E, TC16 E	**DWord** Long Float Boolean	AlarmType-3

Notes:

1. The input type can be selected according to the compatible sensor connected to the controller (depending on the controller catalog number).
2. The parameter will not be shown on the controller's display when alarm 3 is not assigned to an output.

Advanced Function Setting Level/Group - (Setup Area 1)
Advanced Function Setting Function Group - (Setup Area 1)

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0015	Number of multi-SP uses	00000000 (0): No multi-SP 00000001 (1): 2SP 00000002 (2): 4SP	Read/Write	TCE 8 TCE 16	**DWord** Long Float Boolean	Number_ MultiSP_ Uses
C3	0016	Event input assignment 1	00000000 (0): None 00000001 (1):	Read/Write	TCE 8 TCE 16	**DWord** Long Float	Event_Input_ Assignment_ 1

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			RUN/STOP (Cannot be set if the Number of Multi-SP Uses is set to 1 or 2.) 00000002 (2): Auto/Manual (Cannot be set if the Number of Multi-SP Uses is set to 1 or 2.) 00000003 (3): Program Start (Cannot be set if the Number of Multi-SP Uses is set to 1 or 2.)			Boolean	
C3	0017	Event input assignment 2	00000000 (0): None 00000001 (1): RUN/STOP (Cannot be set if the Number of Multi-SP Uses is set to 2.) 00000002 (2): Auto/Manual (Cannot be set if the Number of Multi-SP Uses is set to 2.) 00000003 (3): Program Start (Cannot be set if the Number of Multi-SP Uses is set to 2.)	Read/Write	TCE 8 TCE 16	**DWord** Long Float Boolean	Event_Input_Assignment_2
C3	001A	Multi-SP	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Multi_SP
C3	001B	SP ramp time unit	00000000(0) EU/second 00000001(1) EU/minute	Read/Write	All	DWord **Long** Float Boolean	Spare/SP_Ramp_Time_Unit
C3	001C	SP ramp set	00000000(0) OFF	Read/Write	All	**Float**	SP_Ramp_

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
		value	00000001 to 0000270F (1 to 9999)			DWord Long	Set_Value
C3	001D	Standby sequence reset method	00000000(0) Condition A 00000001(1) Condition B	Read/Write	All	**DWord** Long Float Boolean	Standby_ Seq_Reset_ Method
C3	001E	Alarm 1 open in alarm	00000000(0) Close in alarm 00000001(1) Open in alarm	Read/Write	All	**DWord** Long Float Boolean	Alarm1_ Open_In_ Alarm
C3	001F	Alarm 1 hysteresis	00000001 to 0000270F (0.1 to 999.9) See Table 5.BY in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	All	**Float** DWord Long	Alarm1_ Hysteresis
C3	0020	Alarm 2 open in alarm	00000000(0) Close in alarm 00000001(1) Open in alarm	Read/Write	TC8, TC8 E, TC16, TC16 E	**DWord** Long Float Boolean	Alarm2_ Open_In_ Alarm
C3	0021	Alarm 2 hysteresis	00000001 to 0000270F (0.1 to 999.9) See Table 5.BY in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Alarm2_ Hysteresis
C3	0022	Alarm 3 open in alarm (1) (2)	00000000(0) Close in alarm 00000001(1) Open in alarm	Read/Write	TC8, TC8 E, TC16 E	**DWord** Long Float Boolean	Alarm3_ Open_In_ Alarm
C3	0023	Alarm 3 hysteresis (1) (2)	00000001 to 0000270F (0.1 to 999.9) See Table 5.BY in Bulletin 900-TC8 and 900-TC16 User	Read/Write	TC8, TC8 E, TC16 E	**Float** DWord Long	Alarm3_ Hysteresis

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			Manual				
C3	0024	HBA used	00000000(0) OFF 00000001(1) ON	Read/Write	TC8, TC8 E, TC16, TC16 E	DWord Long Float **Boolean**	HBA_Used
C3	0025	Heater burnout latch	00000000(0) OFF 00000001(1) ON	Read/Write	TC8, TC8 E, TC16, TC16 E	DWord Long Float **Boolean**	Heater_ Burnout_ Latch
C3	0026	Heater burnout hysteresis	00000001 to 00001F4 (0.1 to 50.0)	Read/Write	TC8, TC8 E, TC16, TC16 E	**Float** DWord Long	Heater_ Burnout_ Hysteresis
C3	0027	ST stable range	00000001 to 0000270F (0.1 to 999.9)	Read/Write	All	**Float** DWord Long	ST_Stable_ Range
C3	0028	α	00000000 to 00000064 (0.00 to 1.00)	Read/Write	All	**Float** DWord Long	Alpha
C3	0029	MV upper limit	Standard: MV lower limit +0.1 to 000041A (MV lower limit +0.1 to 105.0) Heating and cooling: 00000000 to 0000041A (0.0 to 105.0)	Read/Write	All	**Float** DWord Long	MV_Upper_ Limit
C3	002A	MV lower limit	Standard: FFFFFFCE to MV upper limit -0.1 (-5.0 to MV upper limit -0.1) Heating and cooling: FFFFFBE6 to 00000000 (-105.0 to 0.0)	Read/Write	All	**Float** DWord Long	MV_Lower_ Limit
C3	002B	Input digital filter	00000000 to 0000270F (0.0 to 999.9)	Read/Write	All	**Float** DWord Long	Input_ Digital_Filter

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	002C	Additional PV display	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Additional_ PV_Display
C3	002D	MV display	00000000(0) OFF (display of manipulated variable OFF) 00000001(1) ON (display of manipulated variable ON)	Read/Write	All	DWord Long Float **Boolean**	MV_Display
C3	002E	Automatic return of display mode	00000000(0) OFF 00000001 to 00000063 (1 to 99)	Read/Write	All	**DWord** Long Float Boolean	Auto_ Return_ Display_ Mode
C3	002F	Alarm 1 latch	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Alarm1_ Latch
C3	0030	Alarm 2 latch	00000000(0) OFF 00000001(1) ON	Read/Write	TC8, TC8 E, TC16, TC16 E	DWord Long Float **Boolean**	Alarm2_ Latch
C3	0031	Alarm 3 latch (1) (2)	00000000(0) OFF 00000001(1) ON	Read/Write	TC8, TC8 E, TC16 E	DWord Long Float **Boolean**	Alarm3_ Latch
C3	0032	Protect level move time	00000001 to 0000001E (1 to 30)	Read/Write	All	**DWord** Long Float Boolean	Protect_ Level_Move_ Time
C3	0033	Input error output	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Input_Error_ Output
C3	0034	Cold junction compensation method	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	Cold_ Junction_ Comp_ Method
C3	0035	MB command logic switching 1 (3)	00000000(0) OFF 00000001(1) ON	Read/Write	All	DWord Long Float **Boolean**	MB_Cmd_ Logic_ Switching1

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0036	PV color change 2 (4)	For models TC8 and TC16: see AB Publication 900-UM004A-EN-E (Sept. 2003) Chapter 3 - Communications Data, Advanced Function Setting Level/Group table. For models TC8 Enhanced and TC16 Enhanced: see AB Publication 900-UM004B-EN-E (June 2005) Chapter 3 - Communications Data, Advanced Function Setting Function Group table.	Read/Write	TC8 E, TC16, TC16 E	**DWord** Long Float Boolean	PV_Color_ Change2
C3	0037	PV stable band 2	00000001 to 0000270F (0.1 to 999.9) See Table 5.CO in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8 E, TC16, TC16 E	**Float** DWord Long	PV_Stable_ Band2
C3	0038	Alarm 1 ON delay	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_1_ ON_Delay
C3	0039	Alarm 2 ON delay	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_2_ ON_Delay
C3	003A	Alarm 3 ON delay (2) (5)	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_3_ ON_Delay
C3	003B	Alarm 1 OFF delay	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_1_ OFF_Delay
C3	003C	Alarm 2 OFF delay	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_2_ OFF_Delay

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	003D	Alarm 3 OFF delay (2) (5)	00000000 to 000003E7 (0 to 999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Alarm_3_ OFF_Delay
C3	003E	Transfer output type	00000000 (0): OFF 00000001 (1): Set point 00000002 (2): Set point during SP ramp 00000003 (3): PV 00000004 (4): MV monitor (heating) 00000005 (5): MV monitor (cooling)	Read/Write	TC8 E TC16 E	**Float** DWord Long	Transfer_ Output_Type
C3	003F	Transfer output upper limit	FFFFF831 to H'0000270F (−1999 to 9999) (See note 7 below) See Table 5.BJ in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8 E TC16 E	**Float** DWord Long	Transfer_ Output_ Upper_Limit
C3	0040	Transfer output lower limit	FFFFF831 to H'0000270F (−1999 to 9999) (See note 7 below) See Table 5.BJ in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8 E TC16 E	**Float** DWord Long	Transfer_ Output_ Lower_Limit
C3	0041	Linear current output	00000000 (0): 4 to 20 mA 00000001 (1): 0 to 20 mA	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Linear_ Current_ Output
C3	0042	Input shift type	00000000 (0): Temperature input 1-point shift 00000001 (1): Temperature input 2-point shift	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Input_Shift_ Type
C3	0043	MV at stop	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord	MV_at_Stop_ Error_Add

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
		and error addition				Long Float **Boolean**	
C3	0044	Auto/manual switching display addition	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	Auto_ Manual_ Switch_ Display_Add
C3	0045	RT	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	RT
C3	0046	HS alarm	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	HS_Alarm
C3	0047	HS alarm latch	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	HS_Alarm_ Latch
C3	0048	HS alarm hysteresis	00000001 to 000001F4 (0.1 to 50.0)	Read/Write	TC8 E TC16 E	**Float** DWord Long	HS_Alarm_ Hysteresis
C3	0049	LBA detection time	00000000 to 0000270F (0 to 9999)	Read/Write	TC8 E TC16 E	**Float** DWord Long	LBA_ Detection_ Time
C3	004A	LBA function group	00000001 to 0000270F (0.1 to 999.9 for TC/Pt multi-input models) (0.01 to 99.99 for Analog input models) See Table 5.CZ in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8 E TC16 E	**Float** DWord Long	LBA_ Function_ Group
C3	004B	LBA band	00000000 to 0000270F (0.0 to 999.9 for TC/Pt multi-input models) (0.00 to 99.99 for Analog input models)	Read/Write	TC8 E TC16 E	**Float** DWord Long	LBA_Band

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			See Table 5.DA in Bulletin 900-TC8 and 900-TC16 User Manual				
C3	004C	Protocol Setting (6)	00000000 (0): CompoWay/F (SYSWAY) 00000001 (1): Modbus	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Protocol_ Setting
C3	004D	Send data wait time (6)	00000000 to 00000063 (0 to 99)	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Send_Data_ Wait_time
C3	004E	Control output 1 assignment	When control output 1 is a linear output: 00000000 (0): Not assigned. 00000001 (1): Control output (heating) 00000002 (2): Control output (cooling) When control output 1 is a pulse output: 00000000 (0): Not assigned. 00000001 (1): Control output (heating) 00000002 (2): Control output (cooling) 00000003 (3): Alarm 1 00000004 (4): Alarm 2 00000005 (5): Alarm 3 00000006 (6): Program end output (7)	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Control_ Output_1_ Assignment

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	004F	Control output 2 assignment	00000000 (0): Not assigned. 00000001 (1): Control output (heating) 00000002 (2): Control output (cooling) 00000003 (3): Alarm 1 00000004 (4): Alarm 2 00000005 (5): Alarm 3 00000006 (6): Program end output (7)	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Control_ Output_2_ Assignment
C3	0050	Alarm 1 assignment	00000000 to 00000006 (0 to 6) * Same settings as control output 2 assignments	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Alarm_1_ Assignment
C3	0051	Alarm 2 assignment	00000000 to 00000006 (0 to 6) * Same settings as control output 2 assignments	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Alarm_2_ Assignment
C3	0052	Display character switch	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float **Boolean**	Display_ Character_ Switch
C3	0053	Program pattern	00000000 (0): OFF 00000001 (1): STOP 00000002 (2): CONT	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Program_ Pattern
C3	0054	Soak time units	00000000 (0): Minutes 00000001 (1): Hours	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Soak_Time_ Units
C3	0055	Alarm SP selection	00000000 (0): Set point during SP ramp 00000001 (1): Set point	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Alarm_SP_ Selection

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
C3	0056	Alarm 3 assignment	00000000 to 00000006 (0 to 6) * Same settings as control output 2 assignments	Read/Write	TC8 E TC16 E	**DWord** Long Float Boolean	Alarm_3_ Assignment

Notes:

1. This applies only to 900-TCB.
2. The parameter will not be shown on the controller's display when Alarm 3 is not assigned to an output.
3. This does not apply to 900TCx protocol.
4. The logic is switched only in the MB command (SYSWAY). The logic of CompoWay/F operation command code 00 (communications writing) is not influenced.
5. This does not apply to 900-TCx protocol.
6. After communication parameters have been changed, they are enabled by resetting the controller.
7. The program end output can be set when the Program Pattern is not set to 0 (off).

Status Bits Table

Bit Position	Status	Bit Description 0	Bit Description	Access	Models	Data Type	ATG Name
0	Heater over current	Not generated	Generated	Read	TC8, TC8 E, TC16, TC16 E	**Boolean**	Heater_ Overcurrent
1	Heater current hold (1)	Updated	Hold	Read	TC8, TC8 E, TC16, TC16 E	**Boolean**	Heater_Current_ Hold
2	HB (HBA) error	Not generated	Generated	Read	TC8, TC8 E, TC16, TC16 E	**Boolean**	HB_HBA_Error
3	HS alarm output (CT1)	OFF	ON	Read	TC8 E TC16 E	**Boolean**	HS_Alarm_ Output_CT1
4	Spare (3)						
5	Display range exceeded	Not generated	Generated	Read	All	**Boolean**	Display_Range_ Exceeded
6	Input error	Not generated	Generated	Read	All	**Boolean**	Input_Error

Bit Position	Status	Bit Description 0	Bit Description	Access	Models	Data Type	ATG Name
7	Spare						
8	Control output 1 (2)	OFF	ON	Read	All	**Boolean**	Control_Output1
9	Control output 2	OFF	ON	Read	All	**Boolean**	Control_Output2
10	HB (HBA) output	OFF	ON	Read	TC8, TC8 E, TC16, TC16 E	**Boolean**	HB_HBA_Output
11	HB (heater burnout) alarm output (CT2)	OFF	ON	Read	TC8 E TC16 E	**Boolean**	HB_HBA_Output_CT2
12	Alarm output 1	OFF	ON	Read	All	**Boolean**	Alarm_Output1
13	Alarm output 2	OFF	ON	Read	TC8, TC8 E, TC16, TC16 E	**Boolean**	Alarm_Output2
14	Alarm output 3	OFF	ON	Read	TC8 TC8 E TC16 E	**Boolean**	Alarm_Output3
15	Program end output	OFF	ON	Read	TC8 E TC16 E	**Boolean**	Program_End_Output
16	Event input 1	OFF	ON	Read	TC8 E TC16 E	**Boolean**	Event_Input_1
17	Event input 2	OFF	ON	Read	TC8 E TC16 E	**Boolean**	Event_Input_2
18	Spare						
19	Spare						
20	Write mode (4)	Backup mode	RAM write mode	Read	All	**Boolean**	Write_Mode
21	EEPROM	RAM Equals EEPROM	RAM Does Not Equal EEPROM	Read	All	**Boolean**	EEPROM
22	Setup area	Setup area 0	Setup area 1	Read	All	**Boolean**	Setup_Area
23	AT execute/cancel	AT canceled	AT execution in progress	Read	All	**Boolean**	AT_Execute_Cancel
24	Run/Stop	Run	Stop	Read	All	**Boolean**	Run_Stop
25	Communications writing (4)	OFF (disabled)	ON (enabled)	Read	All	**Boolean**	Communications_Writing

Bit Position	Status	Bit Description 0	Bit Description	Access	Models	Data Type	ATG Name
26	Auto/manual	Automatic mode	Manual mode	Read	TC8 E TC16 E	**Boolean**	Auto_Manual_ Switch
27	Spare						
28	Heater over current (CT2)	Not generated	Generated	Read	TC8 E TC16 E	**Boolean**	Heater_ Overcurrent_CT2
29	Heater current hold (CT2) (1)	Update	Hold	Read	TC8 E TC16 E	**Boolean**	Heater_Current_ Hold_CT2
30	Spare						
31	HS alarm output (CT2)	OFF	ON	Read	TC8 E TC16 E	**Boolean**	HS_Alarm_ Output_CT2

Notes:

1. "1" is set and the heater current is held at the immediately previous current value when the control output ON time is less than 190 ms.
2. This is OFF whenever the control output is the current output.
3. "Spare" bits are always OFF.
4. The driver sends a command to set communications writing to On and a command to set write mode to RAM as part of the process of establishing communications with the device. This is why users will see the CMW front-panel indicator light when Communication is established with the device for the 1st time. The driver does not set Communications writing to off at any time. Setting write mode to RAM and providing a service tag to save the data in RAM is necessary to prevent premature failure of the controller's EEPROM if the write mode was always set to EEPROM / backup.

Services Group

Variable Type	Address	Description	Set Value monitor value is always 0	Access	Models	Data Types	ATG Name
SV	0001	Run/Stop (2)	00: Run 01: Stop	Write	All	**Byte**	RUN_STOP
SV	0002	Multi-SP	00: Set point 0 01: Set point 1 02: Set point 2 03: Set point 3	Write	All	**Byte**	MULTI_SP_ SELECT
SV	0003	AT execute /cancel (2)	00: Cancel 01: AT execute	Write	All	**Byte**	AUTOTUNE_ EXEC_CANCEL
SV	0005	Save RAM data (1) (2)	00: Perform Operation	Write	All	**Byte**	SAVE_SETUP_ AREA_0_AND_ 1_ CHANGES
SV	0006	Software	00: Perform	Write	All	**Byte**	RESET_AND_

Variable Type	Address	Description	Set Value monitor value is always 0	Access	Models	Data Types	ATG Name
		reset and Move to setup area 0 (3)	Operation				MOVE2_ SETUP_ AREA_0
SV	0007	Move to setup area 1 (2)	00: Perform Operation	Write	All	**Byte**	MOVE2_ SETUP_AREA_1
SV	0008	Move to protect level	00: Perform Operation	Write	All	**Byte**	MOVE2_ PROTECT_ LEVEL
SV	0009	Auto/manual switch	00: Automatic mode 01: Manual mode	Write	TC8 E TC16 E	**Byte**	AUTO_ MANUAL_ SWITCH
SV	000B	Parameter initialization	00: Initialize to defaults	Write	TC8 E TC16 E	**Byte**	PARAMETER_ INITIALIZATION
SV	0011	Program start	00: Reset 01: Start	Write	TC8 E TC16 E	**Byte**	PROGRAM START
SV	0503	This service reads the model number (see note at right).	The model number is expressed in 10-byte ASCII. For example, model 900-TC8VGTH3Z2S is expressed as 900-TC8VGT.	Read	TC8 E TC16 E	**String**	READ_ CONTROLLER_ ATTRIBUTES

Notes:

1. Use Service 05 tag to save any changes made to the configuration to nonvolatile memory (EEPROM) within the device.
2. Users can check to see if RAM equals EPROM, Run/Stop state, Auto Tune execute/cancel state and the current setup area by looking at the corresponding bit in the status address.
3. No response is returned for this service. This means that if a write request is received before the driver can detect a loss of communications with device, then the write will complete successfully.

Error Descriptions

The following 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 not supported by model <model name>.
Device address <address> is read only.
Missing address.

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 parameters on COMn.

Device Status Messages

Device <device name> is not responding.
Device <device name> responded with error. (Tag <tag address>).
Unable to write to <address> on device <device name>.

Automatic Tag Database Generation Messages

Unable to generate a tag database for device <device name>.

See Also:

Allen-Bradley 900 Error Codes List

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

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically 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.

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 communication parameters for the serial connection are incorrect.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communication parameters 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 in the Channel Properties.

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:

Verify that the correct port has been assigned to the channel.

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

Error Type:

Warning

Possible Cause:

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

Solution:
Re-enter the address in the client application.

Device address <address> is not supported by model <model name>.

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically references a location that is valid for the communications protocol but not supported by the target device.

Solution:
Verify that the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model name for the device is correct.

Device address <address> is read only.

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically 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 <device name> is not responding.

Error Type:
Serious

Possible Cause:

1. The serial connection between the device and the Host PC is broken.
2. The communication parameters for the serial connection are incorrect.
3. The named device may have been assigned an incorrect Network ID.
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 device.
2. Verify that the specified communication parameters match those of the device.
3. Verify that the Network ID given to the named device matches that of the actual device.
4. Increase the Request Timeout setting so that the entire response can be handled.

Device <device name> responded with error. (Tag <tag address>).

Error Type:
Serious

Possible Cause:

1. The connection between the device and the Host PC is intermittent.
2. The communication parameters for the serial connection are incorrect.
3. Value written is out of range or write was performed while in incorrect setup area.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communication parameters match those of the device.
3. Look up the meaning of end code and the response code. The most common response code is "1100" (write value is out of range) and "2203" (which has a different meanings depending on the operation that was performed).

See Also:
Allen-Bradley 900 Error Codes List

Error opening COMn.

Error Type:
Fatal

Possible Cause:
The specified COM port could not be opened due to 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.

Missing address.

Error Type:
Warning

Possible Cause:
A tag address that has been specified dynamically has no length.

Solution:
Re-enter the address in the client application.

Unable to generate a tag database for device <device name>.

Error Type:
Warning

Possible Cause:
Memory required for database generation could not be allocated. The process is aborted.

Solution:
Close any unused application and/or increase the amount of virtual memory. Then, try again.

Unable to set comm parameters on COMn.

Error Type:
Fatal

Possible Cause:
The serial parameters for the specified COM port are not valid.

Solution:
Verify the serial parameters and make any necessary changes.

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

Error Type:
Serious

Possible Cause:

1. The serial connection between the device and the Host PC is broken.
2. The communication parameters for the serial connection are incorrect.

3. The named device may have been assigned an incorrect Network ID.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communication parameters match those of the device.
3. Verify that the Network ID given to the named device matches that of the actual device.

Allen-Bradley 900 Error Codes List

End Codes

End Code	Name	Description	Error Detection Priority
00	Normal completion	The command ended normally without error.	None
0F	Command Text Error	The command text could not be executed.*	8
10	Parity error	The sum total of bits whose received data is "1" does not match the set value of communications parity.	2
11	Framing error	Stop bit is "0".	1
12	Overrun error	An attempt was made to transfer new data when the reception data was already full.	3
13	BCC error	The calculated BCC value is different from the received BCC value.	5
14	Format error	The command text contains characters other than 0 to 9, and A to F. This error is not applicable to the echoback test. Refer to Echoback Test on page 2-14 for more information. No SID and command text. Or, no command text. MRC/SRC not included in command text.	7
16	Sub-address error	Illegal (unsupported) sub-address. No sub-address, SID and command text. Sub-address less than two characters, and no SID and command text.	6
12	Frame length error	The received frame exceeds the fixed (supported) number of bytes.	4

*For information on the cause of the command failure, refer to the Response Code table below.

Response Codes

Response Code	Name	Description	Error Detection Priority
0000	Normal completion	No errors were found.	None
0401	Unsupported command	The service function for the relevant command is not supported.	1
1001	Command too long	The command is too long.	2
1002	Command too short	The command is too short.	3
1101	Area type error	The variable type is wrong.	4
1103	Start address out-of-range	The Read/Write start address is out of range.	5
1104	End address out-of-range	The write end address (write start address + number of elements) exceeds the final address of the variable area.	6
1003	Number of elements / data mismatch	The number of data does not match the number of elements.	7
110B	Response too long	The response exceeds the communications buffer size (when larger than number of elements 0002).	8
1100	Parameter error	The bit position is other than "00". Variable Types C0, C1, C3. The write data is out of the setting range. Variable Types C1, C3. The instruction code and related information in the operating instruction is wrong. Variable Type SV.	9
3003	Read Only error	Variable type "CO" was written to.	10
2203	Operation error	The communications writing parameter is set to "OFF" (disabled). Writing was carried out on a parameter in setup area 1 when in setup area 0. Writing was carried out on a protect level parameter when not in protect level. Writing was carried out during AT execution. EEPROM error. Processing is not possible by operating instruction/service.	11

Response Code	Name	Description	Error Detection Priority
		Note: For more information, refer to Service Specific Causes.	

Service Specific Causes

SV:0003

An error is generated in the following instances:

- When the run/stop parameter is set to stop.
- When the instruction is issued in setup area 1.
- When the ON/OFF control mode is configured.

SV:0007

An operation error is generated when the initial setup/communications protection is set to "2". The move to setup area 1 is forbidden. When this move is carried out from setup area 0, the display indicates the input type in the initial setting level. When this operation instruction is issued in setup area 1, the display will not change.

SV:0008

This can be accepted only in setup area 0. An operation error is generated when this instruction command is issued in setup area 1. The move to setup area 1 is forbidden.

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