

Allen-Bradley Bulletin 900 Driver

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Allen-Bradley Bulletin 900 Driver

Help version 1.027

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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.

Driver 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](#).

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 parameter 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

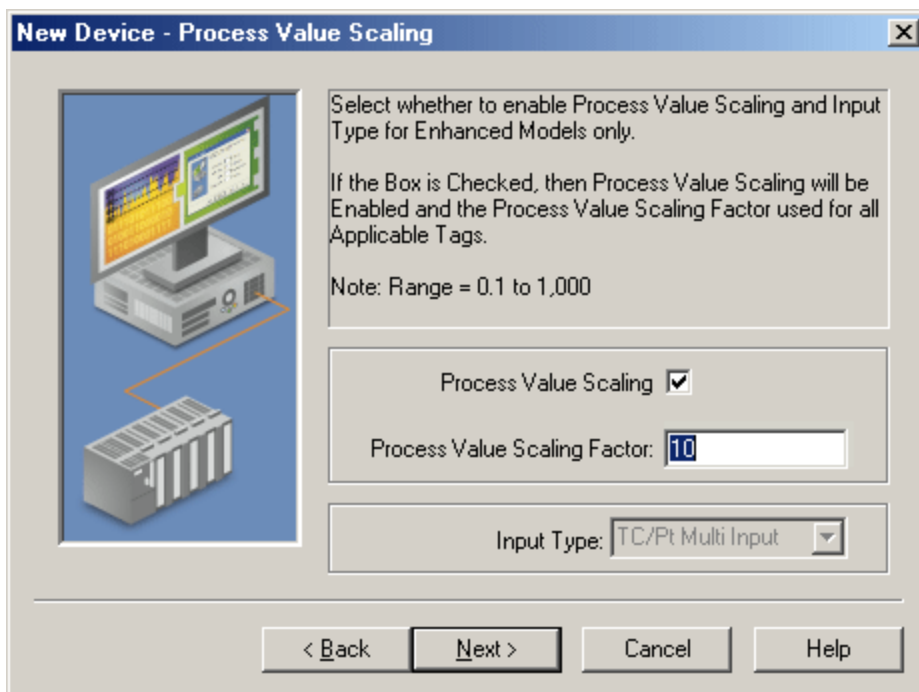
Refer to each individual controller's manual section on both Hardware Installation and Wiring in *Publication 900-UM004A-EN-E* or *900-UM004B-EN-E*.

Process 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 parameters are as follows:

- **Process Value Scaling:** When checked, this setting will be enabled along with the Process Value Scaling Factor used for all applicable tags. For a list of tags, refer to [Data Types Description](#).
- **Process Value Scaling Factor:** This parameter specifies the scaling factor. The valid range is from 0.1 to 1,000.
- **Input Type:** This parameter 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](#).

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 | Database Creation**. 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.

Tag Name	Address	Data Type	Scan Rate	Scaling
Heater_Overcurrent	C0:0001/0	Boolean	100	None
Input_Error	C0:0001/6	Boolean	100	None
Internal_Set_Point	C0:0002	Float	100	None
Lower_Limit_Alarm_1	C1:0006	Float	100	None
Lower_Limit_Alarm_2	C1:0009	Float	100	None
Lower_Limit_Alarm_3	C1:000C	Float	100	None
MV_Monitor_Out_1	C0:0004	Float	100	None
MV_Monitor_Out_2	C0:0005	Float	100	None
Process_Value	C0:0000	Float	100	None
Run_Stop	C0:0001/24	Boolean	100	None
Set_Point	C1:0003	Float	100	None
Setup_Area	C0:0001/22	Boolean	100	None
Status	C0:0001	DWord	100	None
Upper_Limit_Alarm_1	C1:0005	Float	100	None
Upper_Limit_Alarm_2	C1:0008	Float	100	None
Upper_Limit_Alarm_3	C1:000B	Float	100	None
Write_Mode	C0:0001/20	Boolean	100	None

Data Types Description

Data Type	Description
DWord	<p>Read: Unsigned 32 bit value read from the device.</p> <p>Write: Value passed directly on to the device.</p>
Long	<p>Read: Unsigned 32 bit value read from the device.</p> <p>Write: Value passed directly on to the device.</p>
Float	<p>A scaling algorithm may be applied to each data item. The following information details each variation of type Float.</p> <p>No Scaling/Process Value Scaling Disabled</p> <p>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.</p> <ol style="list-style-type: none"> 1. Rounded to the next whole number. 2. Fractional part is removed. 3. Integer part is sent to the device. <p>Note: No scaling items can be identified if the hexadecimal range is the same as the decimal range.</p> <p>For example, C0:0009, Soak time remain monitor, 00000000 to 0000270F (0 to 9999).</p> <p>Variable Scaling (By Process Value Scaling Factor)*</p> <p>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.</p> <ol style="list-style-type: none"> 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. <p>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.**</p> <p>Fixed Scaling (By an Address-Specific Scaling Factor)</p> <p>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.</p> <ol style="list-style-type: none"> 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. <p>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).</p>
Boolean	<p>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.</p> <p>Write: Value passed directly on to the device.</p>

*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	Read Only	All	Float DWord Long	Process_Value

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			range of the sensor. Analog: Scaling lower limit -5%FS to scaling upper limit +5%FS				
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: FFFFFFFE 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
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	Read/Write	All	DWord Long Float Boolean	Operation_Adj_Protect

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			00000002(2) Display and change of only "PV" and "PV/SP" parameters enabled 00000003(3) Display of only "PV" and "PV/SP" parameters 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 alarm 1	FFFFF831 to 0000270F (-1999 to 9999)	Read/Write	All	Float DWord Long	Upper_ 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	Read/Write	TC8, TC8 E,	Float DWord	Upper_ Limit_

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			(-1999 to 9999)		TC16, TC16 E	Long	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 Long	Set_Point0
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	Read/Write	All	Float DWord	Integral_Time

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
			(0 to 3999)			Long	
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	FFFFFF831 to 0000270F (-199.9 to 999.9) See Table 5.AH in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	All	Float DWord Long	Dead_Band
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	Read/Write	TC8 E TC16 E	Float DWord Long	Wait_Band

Variable Type	Address	Item Parameter)	Set Value	Access	Models	Data Types	ATG Name
			Bulletin 900-TC8 and 900-TC16 User Manual				
C1	0022	MV at stop	Standard: FFFFFFFE 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: FFFFFFFE 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: FFFFFFFE 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: FFFFFFFE to MV upper limit - 0.1 (-5.0 to MV upper limit - 0.1) Heating and cooling: FFFFFBE6 to 00000000 (-105.0&0.0)	Read/Write	TC8 E TC16 E	Float DWord Long	MV_Lower_Limit
C1	0028	Move Protect function group	FFFFFF831 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	FFFFFF831 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 00000008(8) 8	Read/Write	All	DWord Long Float Boolean	Comm_ Data_ Length
C3	0013	Communications stop bit (1)	00000001(1) 1 00000002(2) 2	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
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	Read/Write	All	Float DWord	SP_ Upp_ Limit

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			lower limit +1 to Input range upper limit Analog: SP lower limit +1 to scaling upper limit			Long	
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 Boolean	Control_Period_OUT2
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	Read/Write	All	DWord Long Float Boolean	AlarmType1

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			00000008(8) Absolute-value upper-limit alarm 00000009(9) Absolute-value lower-limit alarm 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	AlarmType2
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	AlarmType3

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): 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.)	Read/Write	TCE 8 TCE 16	DWord Long Float Boolean	Event_ Input_ Assignment_ 1
C3	0017	Event input assignment 2	00000000 (0): None 00000001 (1): RUN/STOP (Cannot be	Read/Write	TCE 8 TCE 16	DWord Long Float Boolean	Event_ Input_ Assignment_ 2

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
			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.)				
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 value	00000000(0) OFF 00000001 to 0000270F (1 to 9999)	Read/Write	All	Float DWord Long	SP_Ramp_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 <u>Bulletin 900-TC8 and 900-TC16 User Manual</u>	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 <u>Bulletin 900-TC8 and 900-TC16 User Manual</u>	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 <u>Bulletin 900-TC8 and 900-TC16 User Manual</u>	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
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: FFFFFFFCE to MV upper limit -0.1 (-5.0 to MV upper limit - 0.1) Heating and cooling: FFFFFFBE6 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
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	Alarm1_Latch

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
						Boolean	
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
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

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
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
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 and error addition	00000000 (0): OFF 00000001 (1): ON	Read/Write	TC8 E TC16 E	DWord Long Float Boolean	MV_at_ Stop_Error_ Add
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	HS_Alarm

Variable Type	Address	Item (Parameter)	Set Value	Access	Models	Data Types	ATG Name
						Boolean	
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) See Table 5.DA in Bulletin 900-TC8 and 900-TC16 User Manual	Read/Write	TC8 E TC16 E	Float DWord Long	LBA_Band
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
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
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	RAM Does	Read	All	Boolean	EEPROM

Bit Position	Status	Bit Description 0	Bit Description	Access	Models	Data Type	ATG Name
		EEPROM	Not Equal 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
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" 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.
- This is OFF whenever the control output is the current output.
- "Spare" bits are always OFF.
- 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 reset and Move to setup area 0	00: Perform Operation	Write	All	Byte	RESET_AND_MOVE2_SETUP

Variable Type	Address	Description	Set Value monitor value is always 0	Access	Models	Data Types	ATG Name
		(3)					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.

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

Solution:

- Verify the cabling between the PC and the device.
- Verify that the specified communication parameters match those of the device.
- 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	The number of data does not match the number of	7

Response Code	Name	Description	Error Detection Priority
	/ data mismatch	elements.	
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. Note: For more information, refer to Service Specific Causes.	11

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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