Partlow ASCII Driver

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This help center is the user documentation for Kepware Partlow ASCII Driver. This help center is updated regularly to reflect the latest functionality and information.

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Overview

The Partlow ASCII Driver provides an easy and reliable way to connect Partlow ASCII devices to OPC Client applications, including HMI, SCADA, Historian, MES, ERP and countless custom applications. It is intended for use with Partlow ASCII devices.

Setup

Supported Devices

Partlow ASCII Devices

Communication Protocol

Partlow ASCII

Supported Communication Parameters*

Baud Rate: 300, 600, 1200, 2400, 9600, 19200, or 38400
Parity: None, Even, or Odd
Data Bits: 5, 6, 7 or 8
Stop Bits: 1 or 2
*Not all devices support the listed configurations.

Ethernet Encapsulation

This driver supports Ethernet Encapsulation. Ethernet Encapsulation allows the driver to communicate with serial devices attached to an Ethernet network using a terminal server. Ethernet Encapsulation mode is invoked by selecting it from the COM ID property on the Channel Properties property group. More help on Ethernet Encapsulation can be found in the main OPC Server help file.

Channel and Device Limits

The maximum number of channels supported by this driver is 100. The maximum number of devices supported by this driver is 100 per channel. The range of Device IDs is 0-99.

Flow Control

When using an RS232/RS485 converter, the type of flow control that is required will depend upon the needs of the converter. Some converters do not require any flow control and others will require RTS flow. Consult the converter's documentation to determine its flow requirements. We recommend using an RS485 converter that provides automatic flow control.
Note: When using the manufacturer's supplied communications cable, it is sometimes necessary to choose a flow control property of **RTS** or **RTS Always** under the Channel Properties.

Channel Properties — General

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

Property Groups	Identification	
General	Name	
Write Optimizations	Description	
Advanced	Driver	
	Diagnostics	
	Diagnostics Capture	Disable
	Tag Counts	
	Static Tags	10

Identification

Name: Specify the 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. The property is required for creating a channel.
For information on reserved characters, refer to "How To... Properly Name a Channel, Device, Tag, and Tag Group" in the server help.

Description: Specify user-defined information about this channel.
Many of these properties, including Description, have an associated system tag.

Driver: Specify the protocol / driver for this channel. Specify the device driver that was selected during channel creation. It is a disabled setting in the channel properties. The property is required for creating a channel.
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. Changes to the properties should not be made once a large client application has been developed. Utilize proper user role and privilege management to prevent operators from changing properties or accessing 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 not available if the driver or operating system does not support diagnostics.
For more information, refer to Communication Diagnostics and Statistics Tags in server help.

Tag Counts

Static Tags: Provides the total number of defined static tags at this level (device or channel). This information can be helpful in troubleshooting and load balancing.

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.

Notes:

- With the server's online full-time operation, these properties can be changed at any time. Utilize proper user role and privilege management to prevent operators from changing properties or accessing server features.
- Users must define the specific communication parameters to be used. Depending on the driver, channels may or may not be able to share identical communication parameters. Only one shared serial connection can be configured for a Virtual Network *(see Channel Properties — Serial Communications)*.

Property Groups	Connection Type	
General	Physical Medium	COM Port
Serial Communications	**Serial Port Settings**	
Write Optimizations	COM ID	39
Advanced	Baud Rate	19200
	Data Bits	8
	Parity	None
	Stop Bits	1
	Flow Control	RTS Always
	Operational Behavior	
	Report Communication Errors	Enable
	Close Idle Connection	Enable
	Idle Time to Close (s)	15

Connection Type

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

1. **None**: Select None to indicate there is no physical connection, which displays the Operation with no Communications section.

2. **COM Port**: Select Com Port to display and configure the Serial Port Settings section.

3. **Modem**: Select Modem if phone lines are used for communications, which are configured in the Modem Settings section.

4. **Ethernet Encap.**: Select if Ethernet Encapsulation is used for communications, which displays the Ethernet Settings section.

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

Ethernet Settings

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

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

The server must ensure that the data written from the client application gets to the device on time. Given this goal, the server provides optimization properties to meet specific needs or improve application responsiveness.

Property Groups		Write Optimizations	
General		Optimization Method	Write Only Latest Value for All Tags
Write Optimizations		Duty Cycle	10

Write Optimizations

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

- **Write All Values for All Tags**: This option forces the server to attempt to write every value to the controller. In this mode, the server continues to gather write requests and add them to the server's internal write queue. The server processes the write queue and attempts to empty it by writing data to the device as quickly as possible. This mode ensures that everything written from the client applications is sent to the target device. This mode should be selected if the write operation order or the write item's content must uniquely be seen at the target device.
- **Write Only Latest Value for Non-Boolean Tags**: Many consecutive writes to the same value can accumulate in the write queue due to the time required to actually send the data to the device. If the server updates a write value that has already been placed in the write queue, far fewer writes are needed to reach the same final output value. In this way, no extra writes accumulate in the server's queue. When the user stops moving the slide switch, the value in the device is at the correct value at virtually the same time. As the mode states, any value that is not a Boolean value is updated in the server's internal write queue and sent to the device at the next possible opportunity. This can greatly improve the application performance.
  ⬤ **Note**: This option does not attempt to optimize writes to Boolean values. It allows users to optimize the operation of HMI data without causing problems with Boolean operations, such as a momentary push button.
- **Write Only Latest Value for All Tags**: This option takes the theory behind the second optimization mode and applies it to all tags. It is especially useful if the application only needs to send the latest value to the device. This mode optimizes all writes by updating the tags currently in the write queue before they are sent. This is the default mode.

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

Channel Properties — Advanced

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

Property Groups	⊟ **Non-Normalized Float Handling**	
General	Floating-Point Values	Replace with Zero
Write Optimizations	⊟ **Inter-Device Delay**	
Advanced	Inter-Device Delay (ms)	0

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

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

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

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

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

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

Device Properties — General

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

Property Groups	Identification	
General	Name	
	Description	
	Channel Assignment	
	Driver	
	Model	
	ID Format	Decimal
	ID	2

Identification

Name: Specify 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: Specify the user-defined information about this device.
 Many of these properties, including Description, have an associated system tag.

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

Driver: Selected protocol driver for this device.

Model: Specify the type of device that is associated with this ID. The contents of the drop-down menu depend 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 documentation.*

ID: Specify 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 format is set by the driver by default. Options include 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.

Operating Mode

Property Groups	Identification	
General	**Operating Mode**	
	Data Collection	Enable
	Simulated	No

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: Place the device into or out of 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 data is not saved if the server removes the item (such as when the server is reinitialized). The default is No.

⬤ **Notes:**
1. Updates are not applied until clients disconnect and reconnect.

2. The 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.

3. 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.

4. When a device is simulated, updates may not appear faster than one (1) second in the client.

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

Tag Counts

Property Groups	⊟ **Identification**	
General	⊟ **Operating Mode**	
	⊟ **Tag Counts**	
	Static Tags	130

Static Tags: Provides the total number of defined static tags at this level (device or channel). This information can be helpful in troubleshooting and load balancing.

Device Properties — Scan Mode

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

Property Groups	⊟ **Scan Mode**	
General	Scan Mode	Respect Client-Specified Scan Rate ▾
Scan Mode	Initial Updates from Cache	Disable

Scan Mode: Specify how tags in the device are scanned for updates sent to subscribing 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 value set as the maximum scan rate. 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 OPC client's responsibility to poll for updates, either by writing to the _DemandPoll tag or by issuing explicit device reads for individual items. *For more information, refer to "Device Demand Poll" in server help.*
- **Respect Tag-Specified Scan Rate**: This mode forces static tags to be scanned at the rate specified in their static configuration tag properties. Dynamic tags are scanned at the client-specified scan rate.

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

Device Properties — Timing

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

Property Groups	Communication Timeouts	
General	Connect Timeout (s)	3
Scan Mode	Request Timeout (ms)	1000
Timing	Attempts Before Timeout	3

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: Specify 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 9999999 milliseconds (167 minutes). The default is usually 1000 milliseconds, but can vary depending on the driver. The default timeout for most serial drivers is based on a baud rate of 9600 baud or better. When using a driver at lower baud rates, increase the timeout to compensate for the increased time required to acquire data.

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

Timing

Inter-Request Delay: Specify how long the driver waits before sending the next request to the target device after receiving the response to the previous request. 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 turn-around 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 — Redundancy

Redundancy is available with the Media-Level Redundancy Plug-In.
● *Consult the website, a sales representative, or the* user manual *for more information.*

Data Types Description

Data Type	Description
DWord	Unsigned 32-bit value bit 0 is the low bit bit 31 is the high bit
Long	Signed 32-bit value bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit
Float	32-bit floating point value.

Address Descriptions

The Partlow ASCII protocol supports the following addresses. The default data types are shown in **bold**.

Address Range*	Data Type	Access**
000-999	Long, DWord, Float	Read/Write

*See the address list below.

**The actual address in the device may be Read Only. In this case, the device rejects the write and a message is posted to the event log. Address ranges 100 to 199 will be treated as write-only; any attempt to read from this range will echo back the last value written to the address.

Command/Parameter Codes

C/P Code	Description	Value/Range
0XX	Status Inquiry	See Status Word Notes
001	Status Word 1	See Status Word Notes
003	Status Word 2	See Status Word Notes
002	Status Word 3	See Status Word Notes
004	Error Status	0 Error Condition N Error Number
005	Engineering Units	0 = C 1 = F 2 = Units

1xxProcedure

C/P Code	Description	Value/Range
101	Set Mode	0=Off 1 = Control (or Operate) 2 = Manual (Stand-By)
102	Set Keypad Lock	0 = Unlocked 1 = Locked
103	Set Enable	See Appendix 4, Page 32
104	Set Local/Remote*	0 = Local 1 = Remote
105	Initiate Profile**	Continue N Profile Number 1 to 8
106	Set Run/Hold***	0 Hold 1 Run

*Invalid command if remote setpoint is not selected in Program Mode.

**Invalid command if a profile is being executed or the unit is not a profiler.

*** Invalid command if a profile is not being executed or the unit is not a profiler.

2xx Read Only Parameters

C/P Code	Description	Value/Range
201	Proc	Process Value-Filtered
202	inPS isil	Input Select Input Select, Input 1 (for MRC7700 only)
203	icor icil	Input Correction Input Correction, input 1 (for MRC7700 only)
204	outi	Output 1
205	out2	Output 2
206	out3 ALI	Output 3 Alarm 1 (for MRC7000, 7700 only)
207	AL2	Alarm 2 (for MRC7000, 7700 only)
208	dPoS	Decimal Position
209	Euu	Engineering Units Upper Value
210	EuL	Engineering Units Lower Value
211	rSP	Remote Setpoint (not applicable for MIC6000)
212	rSPu	Remote Setpoint Upper Value (N/A MIC6000)
213	RSPL	Remote Setpoint Lower Value (N/A MIC6000)
214	rrH	Remote Run/Hold (for MIC6000, MRC7000, 7700 only)
215	Crt	Chart Rotation Time (for MRC7000, 7700 only)
216	Cru	Chart Range Upper Value (for MRC7000, 7700 only)
217	CrL	Chart Range Lower Value (for MRC7000, 7700 only)
218	PENS	Pen Select (for MRC7700 only)
219	rHC	RH Correction (for MRC7700 only)
220	iSi2	Input Select Input 2 (for MRC 7700 only)
221	iCi2	Input Correction Input 2 (for MRC 7700 only)

3XX Read/Write Parameters

C/P Code	Description	Value/Range
301	SPrd sop	Spread/Second Output Pos. (for MIC2000, 6000) Spread/Seconds Output Pos. (for MIC8000, 8200, MRC7000, 7700 only)
302	PAL PAL1	Process Alarm Process Alarm (for MRC7000, 7700)
303	dAL dALI	Deviation Alarm Deviation Alarm (for MRC7000, 7700 only)
304	dbAL bALI	Deviation Alarm Deviation Alarm (for MRC7000, 7700 only)

C/P Code	Description	Value/Range
305	PAL2	Process Alarm 2 (for MRC7000, 7700 only)
306	dAL2	Deviation Alarm 2 (for MRC7000, 7700 only)
307	bAL2	Deviation Band Alarm 2 (for MRC7000, 7700 only)
308	Pbl	1st Out Band Width
309	Pb2	2nd Out Band Width
310	rSEt	Manual Reset
311	ArSt ArSl	Auto Reset Auto Reset, Output 1 (for MIC8000, 8200, MRC7000, 7700 only)
312	rAtE rt1	Rate Rate, Output 1 (for MIC8000, 8200, MRC7000, 7700 only)
313	Cti	Cycle Time-1st Output
314	Ct2	Cycle Time-2nd Output
315	SENS	P.P.Sensitivity
316	FoP	First Out Position
317	ol PL olul	Output 1 Percent Upper Limit Output 1 Percent Upper Limit (for MIC8000, 8200, MRC7000, 7700 only)
318	ol LL	Output 1 Percent Lower Limit (for MIC8000, 8200, MRC7000, 7700 only)
319	o2PL o2uL	Output 2 Percent Upper Limit Output 2 Percent Upper Limit (for MIC8000, 8200, MRC7000, 7700 only)
320	o2LL	Output 2 Percent Lower Limit (for MIC8000, 8200, MRC7000, 7700 only)
321	diSP	Display Select
322	HySt HyCo	Hysteresis Hysteresis (for MRC7000, 7700 only)
323	HyAo	Hysteresis For Alarm Outputs
324	SPL SPUL	Setpoint Upper Limit Setpoint Upper Limit (for MIC8000, 8200, MRC7000, 7700 only)
325	SPLL	Setpoint Lower Limit
326	AtFr	Automatic Transfer
327	-	Not Assigned
328	-	Not Assigned
329	SPrr	Setpoint Ramp Rate (for MIC2000, 8000, 8200only)
330	PFF	Process Filter Factor
331	P1EC	Proportional Output 1 Action on Error (for MIC8000, 8200, MRC7000, 7700 only)
332	P2EC	Proportional Output 2 Action on Error (for MIC8000, 8200, MRC7000, 7700 only)
333	ArS2	Auto Reset-Output 2
334	rt2	Rate Output 2
335	baro	Barometric Pressure

C/P Code	Description	Value/Range
336	CCon	Communication Configuration

4XXREAD/WRITE-SOMETIMES PARAMETERS*

C/P Code	Description	Value/Range
401	SP	Setpoint
402	Pol	Percent Output 1
403	Po2	Percent Output 2
404	SP2	Setpoint 2 (8200 only)

*See conditions below.

5xx READ/WRITE-SOMETIMES PARAMETERS

C/P Code	Description	Value/Range
501	rtr	Ramp Time Remaining
502	Str	Soak Time Remaining
503	Pn	Profile Number
504	Sn	Segment Number
505*	PLCT	Profile Loop Count
506	Ptb	Profile Time Base
507	PiA	Profile Interrupt Action

*For Profile Continue Only.

Conditions Under Which Write is Permitted

C/P Code	Description
401	Remote Setpoint Not Active
402	Operating in Manual Mode
403	Operating in Manual Mode
404	No Profile Active
501	No Profile Active
502	No Profile Active
503	No Profile Active
504	No Profile Active
505	No Profile Active
506	No Profile Active
507	No Profile Active

Notes:

- Parameters that do not apply to a particular instrument will be considered invalid.
- This Profile Loop Count applies to the profile status or Profile Continue Mode and not the value stored in the profile data table accessible by Profile Entry mode.

6xx Read/Write Profile Data Parameters

C/P Code	Description	Value/Range
601	Pn	Profile Number
602	nS	Number of Segments
603	PLCT	Profile Loop Count

C/P Code	Description	Value/Range
604	dhru	Deviation Hold After Ramp Up For Pen 1
605	dhrd	Deviation Hold After Ramp Down For Pen 1
606	dhru	Deviation Hold After Ramp Up For Pen 2
607	dhrd	Deviation Hold After Ramp Down For Pen 2
608	PEnd	Profile End Control
609	*	Segment Number
610	rt	Ramp Time
611	SP	Setpoint (For Pen 1 on 7XXX)
612	SP	Setpoint For Pen 2**
613	EI	Event Output 2 During Ramp 0 = Off 1 = On
614	E2	Event Output 2 During Ramp 0 = Off 1 = On
615	E3	Event Output 3 During Ramp 0 =Off 1 =On
616	St	Soak Time
617	EI	Event Output 1 During Soak 0 =Off 1 =On
618	E2	Event Output 2 During Soak 0 =Off 1 =On
619	E3	Event Output 3 During Soak 0 = Off 1 = On
620**	E4	Event Output 4 During Ramp 0 = Off 1 = On
621**	E5	Event Output 5 During Ramp 0 = Off 1 = On
622**	E6	Event Output 6 During Ramp 0 = Off 1 = On
623**	E4	Event Output 4 During Soak 0 = Off 1 = On
624**	E5	Event Output 5 During Soak 0 = Off 1 = On
625**	E6	Event Output 6 During Soak 0 = Off 1 = On

*The Profile Number and Segment Number parameter values specify to which profile and segment subsequent data, via commands 602 thru 625 apply. None of the above codes or parameters apply to profile status or the Profile Continue mode. They only apply to sending or retrieving profile data as ft is stored via the Profile Entry mode.

**MRC 7XXX instruments only.

7xx and 8xx Commands Apply to the Total Access Communications Option Only

C/P Code	Description	Value/Range
701	-	Tab Number Verification
702	-	Matrix Number
703	-	Matrix Number
704	-	Matrix Number
705	dPoS	Decimal Position
706	inPS	Input Select
707	icor	Input Correction
708	PENS	Pen Select
709	rHC	Relative Humidity
710	outl	Output 1
711	ol PL	Output 1 (percent upper limit)
	olul	Output 1 (percent upper limit)
712	ol LL	Output 1 (percent lower limit)
713	out2	Output 2
714	o2PL	Output 2 (percent upper limit)
	o2uL	Output 2 (percent upper limit)

C/P Code	Description	Value/Range
715	o2LL	Output 2 (percent lower limit)
716	out3 ALI	Output 3 Alarm 1
717	AL2	Alarm 2
718	diSP	Display Select
719	Euu	Engineering Units Upper
720	EuL	Engineering Units Lower
721	HySt HyCo	Hysteresis, Control outputs Hysteresis, Control outputs
722	HyAo	Hysteresis, Alarm Outputs
723	rSP SPC	Remote Setpoint Setpoint Configuration
724	rSPu	Remote Setpoint Upper Value
725	RSPL	Remote Setpoint Lower Value
726	SPL SPUL	Setpoint Limit Setpoint Upper Limit
727	SPLL	Setpoint Lower Limit
728	AtFr	Auto Transfer
729	FSCN	Fast Scan
730	Prnd	Process Value Rounding
731	dFF	Display Filter Factor
732	PFF	Process Filter Factor
733	Pout	Process Output
734	Pou	Process Output Upper Value
735	PoL	Process Output Lower Value
736	Cru	Chart Range Upper
737	CrL	Chart Range Lower
738	PorA	Percent Output Relay Actuation
739	POAP	Percent Output Actuation Point
740	PI EC	Percent Output 1 on error condition
741	P2EC	Percent Output 1 on error condition
742	PAEC	Pen Action on Error Condition
743	SPrr	Setpoint Ramp Rate
744	rLyA	Relay A Assignment
745	rlyb	Relay A Assignment
746	rLyC	Relay C Assignment
747	rlyd	Relay D Assignment
748	rLyE	Relay E Assignment
749	rLyF	Relay F Assignment
750	rlyg	Relay G Assignment
751	rlyh	Relay H Assignment
752	CurA	Current Output A Assignment
753	Curb	Current Output B Assignment

C/P Code	Description	Value/Range
754	CurC	Current Output C Assignment
755	Curd	Current Output D Assignment
756	Colr CoAr	Current Output 1 range Current Output A range
757	Co2r Cobr	Current Output 2 range Current Output B range
758	CoCr	Current Output C Range
759	Codr	Current Output D Range
760	Ptb	Profile Time Base
761	PiA	Profile Interrupt Action
762	rrh	Remote Run Hold
763	PPC	Pen Profile Configuration
764	Crt	Chart Rotation Time
765	Coo	Chart Operation in OFF mode
766	SPrd SoP	Spread Spread
767	PAL PALL	Process Alarm Process Alarm Pen 1
768	dAL dALI	Deviation Alarm Deviation Alarm Pen 1
769	dbAL bALI	Deviation Band Alarm Deviation Band Alarm 1
770	PAL2	Process Alarm 2
771	dAL2	Deviation Alarm 2
772	bAL2	Deviation Band Alarm 2
773	Pbl	lst Out Bandwidth
774	Pb2	2nd Out Bandwidth
775	rSEt	Manual Reset
776	ArSt ArSI	Auto Reset Auto Reset Output 1
777	ArS2	Auto Reset Output 2
778	rAtE rtl	Rate Rate Output 1
779	rt2	Rate Output 2
780	Ctl	Cycle Time 1st Output
781	Ct2	Cycle Time 2nd Output
782	SENS	Position Prop. Sensitivity
783	FoP	First Output Position
784	baro	Barometric Pressure
785	isil	Input Select for Input 1
786	icil	Input Correction for Input 1

C/P Code	Description	Value/Range
787	iSi2	Input Select for Input 2
788	iCi2	Input Correction for Input 2
789	AduL	Autotune Deviation Upper Limit
790	ADLL	Autotune Deviation Lower Limit
791	ASUL	Autotune Setpoint Upper Limit
792	ASLL	Autotune Setpoint Lower Limit
793	CrC	Control Response Criteria
794	CAC	Control Algorithm
795	AAo	Autotune Cancel Option
796	AtL	Autotune Time Limit
797	ASo	Autotune Selection Option
798	SET ENABLE	*
799	SET LOCAL/REMOTE	2 0=Local, 1=Remote**
899	-	PRG CHK SUM Program Parameter Checksum

*Command 798, Set Enable is transmitted and received as a decimal number from 000 to 255.

**Command 799 is transmitted as a single byte 0 or 1.

Status Word Notes

C/P Code	Description	Value/Range
001 Status Word 1	7 6 5 4 3 2 1 0	1= Error Exist 0= No Errors 1= Alarm 1 On 1= Alarm 2 On 1= Remote Setpoint 0= Local Setpoint 1= In Off Mode 0= In Control Mode 1= In Manual 1= Profiling 1= Run 0= Hold
002 Status Word 2	7 6 5 4 3 2 1 0	1= Keypad locked 1= Setpoint2* 0= Setpoint1 1= Event6 On** 1= Event5 On** 1= Event4 On** 1= Event3 On 1= Event2 On 1= Event1 On
003 Status Word 3	7 6 5 4 3 2 1 0	1= Test Mode Enabled 1= Calibration Mode Enabled 1= Program Mode Enabled 1= Tune Mode Enabled 1= Stand-By Mode Enabled 1= Profile Continue Mode Enabled for (6000, 73XX, 773X, 776X) = Setpoint Select Mode Enabled for (2000, and all other 7XXX, 8000, 8200) 1= Profile Entry Mode Enabled for (6000, 73XX, 773X, 776X) = Setpoint Changes Enabled for 8000, 8200 1= Setpoint Changes Enabled for (2000, 6000, 7XXX) = Autotune Enabled for 8000,8200

Error Descriptions

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

Address Validation

Missing address
Device address '<address>' contains a syntax error
Address '<address>' is out of range for the specified device or register
Device address '<address>' is not supported by model '<model name>'
Data Type '<type>' is not valid for device address '<address>'
Device address '<address>' is Read Only

Serial Communications

COMn does not exist
Error opening COMn
COMn is in use by another application
Unable to set comm parameters on COMn
Communications error on '<channel name>' [<error mask>]

Device Status Messages

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

Device Specific Messages

Read request rejected for tag '<tag address>' on device '<device name'>. Deactivating tag
Write request rejected for tag '<tag address>' on device '<device name>'

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.

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.

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 the address is correct; if it is not, re-enter it 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.

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>' 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.

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.

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.

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.

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.

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.

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 property.

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 property so that the entire response can be handled.

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

Error Type:
Serious

Possible Cause:

1. The 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.

Read request rejected for tag '<tag address>' on device '<device name'>. Deactivating tag

Error Type:
Warning

Possible Cause:
The device does not support the tag address.

Solution:
Verify that the requested address exists within the device.

Write request rejected for tag '<tag address>' on device '<device name>'

Error Type:
Warning

Possible Cause:

1. The device does not support the tag address.

2. The address is a Read Only address in the controller.

3. The device mode does not allow modifications to be made via a serial link.

Solution:

1. Verify that the requested address exists within the device.

2. Verify that the devices address is writeable.

3. Verify that the current mode of the device allows for serial link modifications.

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