



Universal HART Commands

This document presents the various device-specific commands supported by the DeltaV, PROVOX and RS3 automation systems.

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Introduction

Various device-specific commands are supported by each Emerson Process Management automation system. Most of these pertain directly to read and write capabilities of the DVC valves. In the DeltaV system, these include command 129, 131, and 132. In the RS3 system, these commands include 129, 130, 141, and 144. PROVOX does not identify the commands by number, but they appear to correlate to 129 and 130 at a minimum. Device-specific commands are commonly kept proprietary by the vendor.

Field Device Status

Received by all Emerson Process Management systems

The information in this byte pertains to the operating status of the device as a whole and is sent with each command, assuming there is no communication error.

Bit #7 Field Device Malfunction	The device has detected a hardware error or failure. Further information may be available through the Read Additional Transmitter Status Command, #48.
Bit #6 Configuration Changed	A write or set command has been executed.
Bit #5 Cold Start	Power has been removed and reapplied resulting in the reinstallation of the setup information. The first command to recognize this condition will automatically reset this flag. This flag may also be set following a Master Reset or a Self Test.
Bit #4 More Status Available	More status information is available than can be returned in the Field Device Status. Command #48, Read Additional Status Information, will provide this additional status information.
Bit #3 Primary Variable Analog Output Fixed	The analog and digital analog outputs for the Primary Variable are held at the requested value. They will not respond to the applied process.
Bit #2 Primary Variable Analog Output Saturated	The analog and digital analog outputs for the Primary Variable are beyond their limits and no longer represent the true applied process.
Bit #1 Non Primary Variable Out of Limits	The process applied to a sensor, other than that of the Primary Variable, is beyond the operating limits of the device. The Read Additional Transmitter Status Command, #48, may be required to identify the variable.
Bit #0 Primary Variable Out of Limits	The process applied to the sensor for the Primary Variable is beyond the operating limits of the device.



Communications Error Summary

Received by all Emerson Process Management systems

Bit #7 = 1	This byte contains information pertaining to the reception of a message by a device. These flags indicate that an error was detected and the message was not accepted. The Response Data Bytes are not returned when errors are being reported.
Bit #6 Vertical Parity Error	The parity of one or more of the bytes received by the device was incorrect.
Bit #5 Overrun	Error—At least one byte of data in the receive buffer of the UART was overwritten before it was read.
Bit #4 Framing Error	The Stop Bit of one or more bytes received by the device was not detected by the UART.
Bit #3 Longitudinal Parity Error	The Longitudinal Parity calculated by the device did not match the Longitudinal Parity byte at the end of the message.
Bit #2 Reserved, set to zero.	
Bit #1 Buffer Overflow	The message was too long for the receive buffer of the device.
Bit #0 Undefined—Not defined at this time.	



Detailed Command Definitions

COMMAND #0 READ UNIQUE IDENTIFIER

This is a Data Link Layer Management Command.

Returns the Expanded Device Type Code, Revision Levels, and Device Identification Number.

COMMAND #1 READ PRIMARY VARIABLE

Read the Primary Variable. The Primary Variable is returned in floating point format.

COMMAND #2 P.V. CURRENT AND PERCENT OF RANGE

Reads the Primary Variable as Current and a percent of the Primary Variable Range. The Primary Variable Current always matches the Analog Output current of the device including alarm conditions and set values.

Percent of Range always follows the Primary Variable, even if the Primary Variable Current is in an alarm condition or set to a value. Also, the Percent of Range is not limited to values between 0% and 100%, but instead tracks the Primary Variable beyond the Range Values to the Sensor Limits when they are defined.

COMMAND #3 READ DYNAMIC VARIABLES AND P.V. CURRENT

Read the Primary Variable Current and up to four predefined Dynamic Variables. The Primary Variable Current always matches the Analog Output current of the device including alarm conditions and set values. The Secondary, Tertiary, and 4th Variables are defined by each device type (e.g. the Secondary Variable is the Sensor Temperature for the 3051 Pressure Transmitter).

COMMAND #4 RESERVED

COMMAND #5 RESERVED

COMMAND #6 WRITE POLLING ADDRESS

This is a Data Link Layer Management Command.

This command writes the Polling Address to the field device. The address is used to control the Primary Variable Analog Output and provide a means of device identification in Multidrop installations.

COMMAND #11 READ UNIQUE IDENTIFIER ASSOCIATED WITH TAG

This is a Data Link Layer Management Command.

This command returns the Expanded Device Type Code, Revision Levels, and Device Identification Number of a device containing the devices Tag. It will be executed when either the devices Extended Address or the Broadcast Address is received. The Extended Address in the Response message is the same as the request.

COMMAND #12 READ MESSAGE

Reads the Message contained within the device.

COMMAND #13 READ TAG, DESCRIPTOR, DATE

Read the Tag, Descriptor and Date contained within the device.



COMMAND #14 READ PRIMARY VARIABLE SENSOR INFORMATION

Reads the Primary Variable Sensor Serial Number, Primary Variable Sensor Limits/Minimum Span Units Code, Primary Variable Upper Sensor Limit, Primary Variable Lower Sensor Limit, and Primary Variable Minimum Span for the sensor.

COMMAND #15 READ PRIMARY VARIABLE OUTPUT INFORMATION

Reads the Primary Variable Alarm Selection Code, Primary Variable Transfer Function Code, Primary Variable Range Values Units Code, Primary Variable Upper Range Value, Primary Variable Lower Range Value, Primary Variable Damping Value, Write Protect Code, and Private Label Distributor Code associated with the device or the Primary Variable.

COMMAND #16 READ FINAL ASSEMBLY NUMBER

Read the Final Assembly Number associated with the device.

COMMAND #17 WRITE MESSAGE

Write the Message into the device.

COMMAND #18 WRITE TAG, DESCRIPTOR, DATE

Write the Tag, Descriptor, and Date into the device.

COMMAND #19 WRITE FINAL ASSEMBLY NUMBER

Write Final Assembly Number into the device.

COMMAND #33 READ TRANSMITTER VARIABLES

Read selected Transmitter Variables. Each slot will accept any Transmitter Variable Code defined by the device. This command is capable of Burst Mode Operation and is configured with Command #107, Write Burst Mode Transmitter Variables.

COMMAND #34 WRITE PRIMARY VARIABLE DAMPING VALUE

The Primary Variable Damping Value represents one time constant. (The output response to a step input is 63% of final steady-state value after this time has elapsed.) Both the analog and digital outputs of the Primary Variable utilize this value. The damping applied to these outputs may be also affected by other commands.

COMMAND #35 WRITE PRIMARY VARIABLE RANGE VALUES

The Primary Variable Upper Range Value is independent of the Primary Variable Lower Range Value. The Primary Variable Range Units received with this command do not affect the Primary Variable Units of the device. The Primary Variable Range Values will be returned in the same units as receive. Most devices allow the Primary Variable Upper Range Value to be lower than the Primary Variable Lower Range Value, enabling the device to be operated with a reversed output. The Transmitter-specific document will indicate whether this capability has been implemented.

COMMAND #36 SET PRIMARY VARIABLE UPPER RANGE VALUE

The magnitude of the process applied to the Primary Variable becomes the Primary Variable Upper Range Value. A change in the Primary Variable Upper Range Value will not affect Primary Variable Lower Range Value. This command performs the same function as pressing the Span button on the device. Most devices allow the Primary Variable Upper Range Value to be lower than the Primary Variable Lower Range Value, enabling the device to be



operated with a reversed output. The Transmitter-specific document will indicate whether this capability has not been implemented.

COMMAND #37 SET PRIMARY VARIABLE LOWER RANGE VALUE

This command performs the same function as does pressing the Zero button on the device. The magnitude of the process applied to the Primary Variable becomes the Primary Variable Lower Range Value. A change in the Primary Variable Lower Range Value will shift the Primary Variable Upper Range Value proportionately so that the Span remains constant. When a change pushes the Primary Variable Upper Range Value past either Primary Variable Sensor Limit, the Primary Variable Upper Range Value saturates and Response Code #14 (Warning: New Lower Range Value Pushed Upper Range Value over Sensor Limits) is returned. When the Primary Variable Lower Range Value pushes the Primary Variable Upper Range Value over the Primary Variable Sensor Limit, and if the resulting Span is less than the Primary Variable Minimum Span, Response Code #9 (Applied Process too High) or #10 (Applied Process too Low) is returned. Most devices allow the Primary Variable Upper Range Value to be lower than the Primary Variable Lower Range Value, enabling the device to be operated with a reversed output. The Transmitter-specific document will indicate whether this capability has not been implemented.

COMMAND #38 RESET CONFIGURATION CHANGED FLAG

Resets the Configuration Changed Response Code, Bit 36 of the Transmitter Status Byte. Secondary Master devices, address "0", should not issue this command. Primary Master devices, address "1", should issue this command only after the Configuration Changed Response Code has been detected and acted upon.

COMMAND #39 EEPROM CONTROL

This command causes data to be transferred from shadow RAM to nonvolatile memory (Burn) or from nonvolatile memory to shadow RAM (Restore). The Field Device Malfunction Response Code, Bit #7 of the Transmitter Status Byte, will be set if an EEPROM checksum error is detected. When this occurs, Command #48, Read Additional Transmitter Status, should be used to obtain specific information. Refer to the Transmitter-specific document to determine the error checking implemented by each device type. For Burn requests, the Burn may not begin until the response that acknowledges the receipt of the command has been sent. When errors occur in these cases, the Field Device Malfunction Response Code will be Set in the response of subsequent commands.

COMMAND #40 ENTER/EXIT FIXED PRIMARY VARIABLE CURRENT MODE

The device is placed in the Fixed Primary Variable Current Mode with the Primary Variable Current set to the value received. The value returned in the Response Bytes reflects the rounded or truncated value which was actually written to the digital to analog converter. A level of "0" exits the Fixed Primary Variable Current Mode. Fixed Primary Variable Current Mode is also exited when power is removed from the device.

COMMAND #41 PERFORM TRANSMITTER SELF TEST

Initiates the Self-Test function in the device. The device responds immediately to the command and then performs the Self Test. Refer to the Transmitter-specific document for the diagnostics performed and the results available through the Read Additional Transmitter Status Command, #48. The execution of this command may take a relatively long period of time to complete. If the device cannot execute a command during the Self Test, the device may not respond. If the device can execute commands during a Self Test, Command #48 can be used to determine when complete. Refer to the Transmitter-specific document for specific implementation details.



COMMAND #42 PERFORM MASTER RESET

Respond immediately and then Reset the microprocessor. The execution of this command may take a relatively long period of time to complete. The device may not be able to respond to another command until complete. Refer to the Transmitter-specific document for specific implementation details.

COMMAND #43 SET PRIMARY VARIABLE ZERO

Trim the Primary Variable so that it reads Zero with the existing process applied to the device. The resulting offset must be within limits defined by each device.

COMMAND #44 WRITE PRIMARY VARIABLE UNITS

Select the units in which the Primary Variable and Primary Variable Range will be returned. This will also select the units for Primary Variable Sensor Limits and Primary Variable Minimum Span.

COMMAND #45 TRIM PRIMARY VARIABLE CURRENT DAC ZERO

Trim the Zero or Lower Endpoint of the Primary Variable Analog Output so that the current at this output is set exactly to its minimum. This trim is typically performed by adjusting the associated digital to analog converter of a 4 to 20 milliampere device to 4.0 milliamperes. The value sent with the command may be rounded or truncated by the device. The Response Data Bytes contain the value from the request as used by the device. Use Command #40 (Enter/Exit Fixed Primary Variable Current Mode) to set the current to exactly the minimum value of the Primary Variable Analog Output before using this command. Response Code #9 (Not in Proper Current Mode) will be returned if the Fixed Primary Variable Current Mode has not been entered or the current is not set to exactly the minimum value.

COMMAND #46 TRIM PRIMARY VARIABLE CURRENT DAC GAIN

Trim the Gain for the Upper Endpoint of the Primary Variable Analog Output so that the current at this output is set exactly to its maximum. This trim is typically performed by adjusting the associated digital to analog converter of a 4 to 20 milliampere device to 4.0 milliampere. The value that is sent with the command may be rounded or truncated by the device. The Response Data Bytes contain the value from the request as used by the device. Use Command #40 (Enter/Exit Fixed Primary Variable Current Mode) to set the current to exactly the maximum value of the Primary Variable Analog Output before using this command. Response Code #9 (Not in Proper Current Mode) will be returned if the Fixed Primary Variable Current Mode has not been entered or the current is not set to exactly the maximum value.

COMMAND #47 WRITE PRIMARY VARIABLE TRANSFER FUNCTION

Select the Transfer Function for the Primary Variable Analog Output of the device.

COMMAND #48 READ ADDITIONAL TRANSMITTER STATUS

Returns Transmitter Status information not included in the Response Codes. This command also returns the results of the Transmitter Self Test, Command #41. Refer to the Transmitter-specific document for the information contained in each Transmitter-specific Status Byte. Response Code #8 (Warning: Update in Progress, will be returned whenever a response can be made and the Status information is pending the completion of a command that requires a relatively long time to complete. Refer to the Transmitter-specific document for specific implementation details.

COMMAND #49 WRITE PRIMARY VARIABLE SENSOR SERIAL NUMBER

Writes the Sensor Serial Number associated with the Primary Variable.



COMMAND #50 READ DYNAMIC VARIABLE ASSIGNMENTS

Responds with the Transmitter Variable numbers that are assigned to the Primary, Secondary, Tertiary, and 4th Variables.

COMMAND #51 WRITE DYNAMIC VARIABLE ASSIGNMENTS

Assigns Transmitter Variables to the Primary, Secondary, Tertiary, and 4th Variables. Each Dynamic Variable will accept any Transmitter Variable Code defined by the device.

COMMAND #52 SET TRANSMITTER VARIABLE ZERO

Trim the selected Transmitter Variable so that it reads Zero with the existing process applied to the device. The resulting offset must be within the limits assigned to each variable.

COMMAND #53 WRITE TRANSMITTER VARIABLE UNITS

Selects the units in which the selected Transmitter Variable will be returned.

COMMAND #54 READ TRANSMITTER VARIABLE INFORMATION

Responds with the Sensor Serial Number, Sensor Limits Units, Sensor Limits, Damping Value, and Minimum Span of the selected Transmitter Variable.

COMMAND #55 WRITE TRANSMITTER VARIABLE DAMPING VALUE

Writes the Damping Value in which the selected Transmitter Variable will operate.

The Damping Value represents one time constant. (The output response to a step input is 63% of final steady-state value after this time has elapsed.) Some devices implement only discrete damping values (e.g. 1,2,4). The value received with the command may be rounded or truncated by the device. The response message will return the actual value used by the device. A Warning is returned if the value is truncated or rounded.

COMMAND #57 READ UNIT TAG, DESCRIPTOR, DATE

This command reads the Tag, Descriptor, and Date of the Unit Device and not that of an individual sensor. A "Unit" Device is typically common hardware that supports multiple sensors.

COMMAND #58 WRITE UNIT TAG, DESCRIPTOR, DATE

This command writes the Tag, Descriptor, and Date to the Unit Device and not an individual sensor. A "Unit" Device is typically common hardware that supports multiple sensors.

COMMAND #59 WRITE NUMBER OF RESPONSE PREAMBLES

This is a Data Link Layer Management Command. This command selects the minimum number of preambles to be sent by a device before the start of a response packet. This number includes the two preambles contained in the Start of Message. Normally, a device will allow from 2 to 20 response preambles to be selected. Some devices cannot implement these limits. Refer to the Transmitter-specific Document to determine the actual limits for each device type.

COMMAND #60 READ ANALOG OUTPUT AND PERCENT OF RANGE

Read the Analog Output Level and Percent of Range of the selected Analog Output. The Analog Output Level always matches the associated, physical Analog Output of the device including alarm conditions and set values. The Percent of Range always follows the associated Dynamic or Transmitter Variable, even when the output is in an alarm condition or set to a value. Also, the Percent of Range is not limited to values between 0% and 100%, but tracks the Dynamic or Transmitter Variable beyond the Range Values to the Sensor Limits when they are defined.



COMMAND #61 READ DYNAMIC VARIABLES AND P.V. ANALOG OUTPUT

Read the Primary Variable Analog Output Level and up to four predefined Dynamic Variables. The Primary Variable Analog Output Level always matches the physical Primary Variable Analog Output of the device including alarm conditions and set values. The Secondary, Tertiary, and 4th Variables are defined by each device type (e.g. the Secondary Variable is the Sensor Temperature for the 3051 Pressure Transmitter).

COMMAND #62 READ ANALOG OUTPUTS

Read selected Analog Output Levels. Each slot will accept any Analog Output Number Code defined by the device.

COMMAND #63 READ ANALOG OUTPUT INFORMATION

Read the Alarm Selection Code, Transfer Function Code, Primary Variable/Range Units Code, Upper Range Value, Lower Range Value, and Damping Value associated with the selected Analog Output. The Damping Value is applied to the Analog Output in addition to the damping of the digital variable.

COMMAND #64 WRITE ANALOG OUTPUT ADDITIONAL DAMPING VALUE

Write the Additional Damping Value for the selected Analog Output. The Additional Damping Value represents one time constant. (The output response to a step input is 63% of final steady-state value after this time has elapsed.) Some devices implement only discrete damping values (e.g. 1,2,4). The value received with the command may be rounded or truncated by the device. The response message will return the actual value used by the device. A Warning is issued if value is truncated or rounded.

COMMAND #65 WRITE ANALOG OUTPUT RANGE VALUES

Write the Range Values for the selected Analog Output. The Upper Range Value is independent of the Lower Range Value. The Range Units received with this command do not affect the Dynamic nor Transmitter Variable Units of the device. The Range Values will be returned in the same units as received. Most devices allow the Upper Range Value to be lower than the Lower Range Value enabling the device to be operated with a reversed output. The Transmitter-specific document will indicate whether this capability has not been implemented.

COMMAND #66 ENTER/EXIT FIXED ANALOG OUTPUT MODE

The device is placed in the Fixed Analog Output Mode with the selected Analog Output set to the value received. The value returned in the Response Bytes reflects the rounded or truncated value which was actually used by the device. A level of "Not-a-Number" (7F AO 00 00) with any units code exits the Fixed Analog Output Mode. Fixed Analog Output Mode is also exited when power is removed from the device. Response Code #11 (In Multidrop Mode) will be returned if this command is received when the device is operating in the Multidrop Mode with a Polling Address other than 0.

COMMAND #67 TRIM ANALOG OUTPUT ZERO

Trim the Zero of the selected Analog Output so that the connected meter reads the Analog Output Lower Endpoint Value. The value sent with the command may be rounded or truncated by the device. The Response Data Bytes contain the value from the request as used by the device. Use Command #66 (Enter/Exit Fixed Analog Output Mode) to set the Analog Output exactly to the Lower Endpoint Value before using this command. Response

Code #9 (Not in Proper Analog Output Mode) will be returned if the Fixed Analog Output Mode has not been entered or the Analog Output is not set exactly to the Lower Endpoint Value. Response Code #11 (In Multidrop Mode) will be returned if this command is received when the device is operating in the Multidrop Mode with a Polling Address other than 0.

COMMAND #68 TRIM ANALOG OUTPUT GAIN



Trim the Gain of the selected Analog Output so that the connected meter reads the Analog Output Upper Endpoint Value. The value that is sent with the command may be rounded or truncated by the device. The value that is sent with the command may be rounded or truncated by the device. The Response Data Bytes contain the value from the request as used by the device. Use Command #66 (Enter/Exit Fixed Analog Output Mode) to Set the Analog Output exactly to the Upper Endpoint Value before using this command. Response Code (Not in Proper Analog Output Mode) will be returned if the Fixed Analog Output Mode has not been entered or the Analog Output is not set exactly to the Upper Endpoint Value. Response Code #11 (In Multidrop Mode) will be returned if this command is received when the device is operating in Multidrop Mode with a Polling Address other than 0.

COMMAND #69 WRITE ANALOG OUTPUT TRANSFER FUNCTION

Select the Transfer Function for the selected Analog Output of the device.

COMMAND #107 WRITE BURST TRANSMITTER VARIABLES

This is a Data Link Layer Management Command. Select the Transmitter Variables which will be used by Command #33 in Burst Mode.

COMMAND #108 WRITE BURST MODE COMMAND NUMBER

This is a Data Link Layer Management Command. This command selects the response message that the device transmits while in Burst Mode. Command #1, #2, and #3 are supported in all devices implementing Burst Mode. Refer to the Transmitter-specific Document to determine whether additional commands are supported for a specific device type.

COMMAND #109 BURST MODE CONTROL

This command is used to enter and exit the Burst Mode. The Response Data Bytes for Command #1 or the command number selected with Command #108 (Write Command Number to Burst) will be transmitted while in Burst Mode.

COMMAND #110 READ ALL DYNAMIC VARIABLES

Read up to four predefined Dynamic Variables. The Secondary, Tertiary, and 4th Variables are defined by each device type (e.g. the Secondary Variable is the Sensor Temperature for the 3051 Pressure Transmitter).

COMMAND #111 TRANSFER SERVICE CONTROL

This is a Data Link Layer Management Command.



Universal HART Commands

DeltaV	PROVOX	RS3		
X	X	X	COMMAND #0	READ UNIQUE IDENTIFIER
	X	X	COMMAND #1	READ PRIMARY VARIABLE
		X	COMMAND #2	READ P.V. CURRENT AND PERCENT OF RANGE
X	X	X	COMMAND #3	READ DYNAMIC VARIABLES AND P.V. CURRENT
		X	COMMAND #4	RESERVED
		X	COMMAND #5	RESERVED
		X	COMMAND #6	WRITE POLLING ADDRESS
			COMMAND #11	READ UNIQUE IDENTIFIER ASSOCIATED WITH TAG
		X	COMMAND #12	READ MESSAGE
		X	COMMAND #13	READ TAG, DESCRIPTOR, DATE
		X	COMMAND #14	READ PRIMARY VARIABLE SENSOR INFORMATION
X	X	X	COMMAND #15	READ PRIMARY VARIABLE OUTPUT INFORMATION
		X	COMMAND #16	READ FINAL ASSEMBLY NUMBER
		X	COMMAND #17	WRITE MESSAGE
		X	COMMAND #18	WRITE TAG, DESCRIPTOR, DATE
			COMMAND #19	WRITE FINAL ASSEMBLY NUMBER



Common Practice HART Commands

DeltaV	PROVOX	RS3		
X	X	X	COMMAND #33	READ TRANSMITTER VARIABLES
		X	COMMAND #34	WRITE PRIMARY VARIABLE DAMPING VALUE
X	X	X	COMMAND #35	WRITE PRIMARY VARIABLE RANGE VALUES
			COMMAND #36	SET PRIMARY VARIABLE UPPER RANGE VALUE
			COMMAND #37	SET PRIMARY VARIABLE LOWER RANGE VALUE
X	X	X	COMMAND #38	RESET CONFIGURATION CHANGED FLAG
		X	COMMAND #39	EEPROM CONTROL
		X	COMMAND #40	ENTER/EXIT FIXED PRIMARY VARIABLE CURRENT MODE
		X	COMMAND #41	PERFORM TRANSMITTER SELF TEST
			COMMAND #42	PERFORM MASTER RESET
		X	COMMAND #43	SET PRIMARY VARIABLE ZERO
X		X	COMMAND #44	WRITE PRIMARY VARIABLE UNITS
		X	COMMAND #45	TRIM PRIMARY VARIABLE CURRENT DAC ZERO
		X	COMMAND #46	TRIM PRIMARY VARIABLE CURRENT
		X	COMMAND #47	WRITE PRIMARY VARIABLE CURRENT DAC GAIN
	X	X	COMMAND #48	READ ADDITIONAL TRANSMITTER STATUS
			COMMAND #49	WRITE PRIMARY VARIABLE SENSOR SERIAL NUMBER
	X		COMMAND #50	READ DYNAMIC VARIABLE ASSIGNMENTS
			COMMAND #51	WRITE DYNAMIC VARIABLE ASSIGNMENTS
			COMMAND #52	SET TRANSMITTER VARIABLE ZERO
			COMMAND #53	WRITE TRANSMITTER VARIABLE UNITS
X	X	X	COMMAND #54	READ TRANSMITTER VARIABLE INFORMATION
			COMMAND #55	WRITE TRANSMITTER VARIABLE DAMPING VALUE



Common Practice HART Commands

DeltaV	PROVOX	RS3		
			COMMAND #56	WRITE TRANSMITTER VARIABLE SENSOR SERIAL NO.
			COMMAND #57	READ UNIT TAG, DESCRIPTOR, DATE
			COMMAND #58	WRITE UNIT TAG, DESCRIPTOR, DATE
X	X	X		WRITE NUMBER OF RESPONSE PREAMBLES
			COMMAND #60	READ ANALOG OUTPUT AND PERCENT OF RANGE
			COMMAND #61	READ DYNAMIC VARIABLES AND P.V. ANALOG OUTPUT
			COMMAND #62	READ ANALOG OUTPUTS
			COMMAND #63	READ ANALOG OUTPUT INFORM-ON
			COMMAND #64	WRITE ANALOG OUTPUT ADDITIONAL DAMPING VALUE
			COMMAND #65	WRITE ANALOG OUTPUT RANGE VALUES
			COMMAND #66	ENTER/EXIT FIXED ANALOG OUTPUT MODE
			COMMAND #67	TRIM ANALOG OUTPUT ZERO
			COMMAND #68	TRIM ANALOG OUTPUT GAIN
			COMMAND #69	WRITE ANALOG OUTPUT TRANSFER FUNCTION
			COMMAND #70	READ ANALOG OUTPUT ENDPOINT VALUES
			COMMAND #107	WRITE BURST TRANSMITTER VARIABLES
			COMMAND #108	WRITE BURST MODE COMMAND NUMBER
			COMMAND #109	BURST MODE CONTROL
			COMMAND #110	READ ALL DYNAMIC VARIABLES
			COMMAND #111	TRANSFER SERVICE CONTROL