Emerson – Wireless Hart devices HartIP protocol

The WirelessHart communication driver implements communication with Emerson devices using the HartIP protocol. It operates as a Master on TCP/IP networks.

Summary Information

Communication Driver Name: WirelessHart

Implementation DLL: T.ProtocolDriver. WirelessHart.dll

Protocol: HartIP

Interface: TCP/IP

PLC types supported: Emerson WirelessHart devices

Supported Commands:

Command	Read	Write
Command 0 – Read Unique Identifier		
Command 3 – Read Dynamic Variables and Loop Current		
Command 9 – Read Device Variables and Status		
Command 13 – Read Tag, Descriptor, and Date		
Command 20 – Read Long Tag		
Command 38 – Reset Configuration Changed Flag		
Command 48 – Read Device Additional Status		
Command 50 – Read Dynamic Variable Assignments		
Command 74 – Read I/O System Capabilities		
Command 84 – Read Sub-Device Identity Summary		
Command 101 – Read Sub-device to Burst Message Map		
Command 105 – Read Burst Mode Configuration		
Command 178 – Publish Dynamic Data		

Channel Configuration

Protocol Options

None

Node Configuration

Station Configuration

Station syntax: <IP address>;<Port number>

Where:

- **<IP address>** = The IP address of the Hart gateway

- **<Port number>** = The TCP port where the gateway is listening (default is 5094)

Ex: 192.168.0.107;5094

Point Configuration

The syntax for the communication points is: <DeviceTag>.<Command>:<Parameter>

Where:

- **DeviceTag** = It is from the Hart gateway
- **Command** = Hart Commands. See the table below for the available command

Command	Description
0	Read Unique Identifier
3	Read Dynamic Variables and Loop Current
9	Read Device Variables and Status
13	Read Tag, Descriptor, and Date
20	Read Long Tag
38	Reset Configuration Changed Flag
48	Read Device Additional Status
50	Read Dynamic Variable Assignments
74	Read I/O System Capabilities
84	Read Sub-Device Identity Summary
101	Read Sub-device to Burst Message Map
105	Read Burst Mode Configuration
178	Publish Dynamic Data

- **Parameter** = A number that represent each parameter of the command response. See the tables below:

Command 0
Parameters
Expansion Code
Expanded Device Type Code
Request Preambles
Universal Revision Level
Transmitter Revision Level
Software Revision
Hardware Revision Level / Physical Signing Code
Flags
Device Identification Code
Minimum# Response Preambles
Max# of Device Variable

Configuration Change Counter
Extended Field Device Status
Manufacture Identification Code
Private Label Distributor
Device Profile

Command 3
Parameters
PV Loop Current (many wireless devices return NaN, no analog output)
PV Units Code
PV
SV Units Code
SV
TV Units Code
TV
QV Units Code
QV

Command 9
Parameters
Slot 0: Device Variable Code
Slot 0: Device Variable Classification
Slot 0: Device Variable Units Code
Slot 0: Device Variable Value
Slot 0: Device Variable Status
Slot 1: Device Variable Code
Slot 1: Device Variable Classification
Slot 1: Device Variable Units Code
Slot 1: Device Variable Value
Slot 1: Device Variable Status
Slot 2: Device Variable Code
Slot 2: Device Variable Classification
Slot 2: Device Variable Units Code
Slot 2: Device Variable Value
Slot 2: Device Variable Status
Slot 3: Device Variable Code
Slot 3: Device Variable Classification
Slot 3: Device Variable Units Code
Slot 3: Device Variable Value
Slot 3: Device Variable Status
Slot 4: Device Variable Code

Slot 4: Device Variable Classification
Slot 4: Device Variable Units Code
Slot 4: Device Variable Value
Slot 4: Device Variable Status
Slot 5: Device Variable Code
Slot 5: Device Variable Classification
Slot 5: Device Variable Units Code
Slot 5: Device Variable Value
Slot 5: Device Variable Status
Slot 6: Device Variable Code
Slot 6: Device Variable Classification
Slot 6: Device Variable Units Code
Slot 6: Device Variable Value
Slot 6: Device Variable Status
Slot 7: Device Variable Code
Slot 7: Device Variable Classification
Slot 7: Device Variable Units Code
Slot 7: Device Variable Value
Slot 7: Device Variable Status
Slot 0: Time Stamp (units of 1/32 of a mS or 0.00003125 seconds or 31.25 S)

Command 13
Parameters
Tag
Descriptor
Day
Month
Year since 1900

Command 20
Parameter
Long Tag

Command 38
Parameter
Configuration Change Counter (previously read value)

Command 48
Parameters
Transmitter Status 0

Transmitter Status 1
Transmitter Status 2
Transmitter Status 3
Transmitter Status 4
Transmitter Status 5
Extended Device Status
Device Operating Mode
Standardize Status 0
Standardize Status 1
Analog Channel Saturated
Standardize Status 2
Standardize Status 3

Command 50
Parameters
Device Variable mapped to PV
Device Variable mapped to SV
Device Variable mapped to TV
Device Variable mapped to QV

Command 74
Parameters
Maximum Number of I/O Cards (must be 1)
Maximum Number of Channels per I/O Card (must be 1)
Maximum Number of Sub-Devices per Channel (must be 1)
Number of Devices Detected (the count includes the I/O system itself)
Maximum Number of Delayed Responses Supported by the I/O system (must be 2)
Master Mode for Communication on Channels 1 = Primary Master (default)
Retry Count to Use When Sending Commands to a Sub-Device (Range 2 value 5)

Command 84
Parameters
Sub-device index
I/O Card
Channel
Manufacturer Id
Expanded Device Type Code
Device Id
Universal Command Revision
Long Tag
Device Revision

Device Profile
Private Label Distributor

Command 101
Parameters
Burst Message
Sub-device Index (index 0 indicates the I/O System itself)

Command 105
Parameters
Burst Mode Control Code
Command Number (usually 31 for HART 7 devices, see Extended Command Number)
Device Variable Code Assigned to Slot 0
Device Variable Code Assigned to Slot 1
Device Variable Code Assigned to Slot 2
Device Variable Code Assigned to Slot 3
Device Variable Code Assigned to Slot 4
Device Variable Code Assigned to Slot 5
Device Variable Code Assigned to Slot 6
Device Variable Code Assigned to Slot 7
Burst Message
Maximum number of burst messages supported by this device
Extended Command Number
Update Time (burst period)
Maximum Update Time
Burst Trigger Mode
Device Variable Classification
Trigger Units Code
Trigger Level

Command 178
Parameters
Number of Commands in the Structure (typically 2 for cmd 9 and cmd 48)
Command Number 1 (typically 9)
Command Number 1 Byte Count (varies depending on command payload)
Command Number 1 Response Code
Extended Device Status
PV Device Variable Code

PV Device Variable Classification
PV Device Variable Units Code
PV Device Variable Value
PV Device Variable Status
SV Device Variable Code
SV Device Variable Classification
SV Device Variable Units Code
SV Device Variable Value
SV Device Variable Status
TV Device Variable Code
TV Device Variable Classification
TV Device Variable Units Code
TV Device Variable Value
TV Device Variable Status
QV Device Variable Code
QV Device Variable Classification
QV Device Variable Units Code
QV Device Variable Value
QV Device Variable Status
PV % Range Device Variable Code (variable code = 244 typically)
PV % Range Device Variable Classification
PV % Range Device Variable Units Code (typically 57 = %)
PV % Range Device Variable Value
PV % Range Device Variable Status
PV Loop Current Device Variable Code (variable code = 245 typically)
PV Loop Current Device Variable Classification
PV Loop Current Device Variable Units Code (typically 39 = mA)
PV Loop Current Device Variable Value
PV Loop Current Device Variable Status
PV Time Stamp
Command Number 2 (typically 48)
Command Number 2 Byte Count (varies depending on command payload)
Command Number 2 Response code
Transmitter status byte 0
Transmitter status byte 1
Transmitter status byte 2
Transmitter status byte 3
Transmitter status byte 4
Transmitter status byte 5
Extended Device Status
Device Operating Mode

Standardized Status 0
Standardized Status 1
Analog Channel Saturated (usually 0)
Standardized Status 2
Standardized Status 3

Troubleshoot

The status of the driver's execution can be observed through the diagnostic tools, which are:

- Trace window
- Property Watch
- Module Information

The above tools indicate if the operations have succeeded or have failed. A status of 0 (zero) means communication is successful. Negative values indicate internal driver errors, and positive values indicate protocol error codes.