**Driver Manual**

# FS-8704-22 Point Six Wireless

**APPLICABILITY & EFFECTIVITY**

Effective for all systems manufactured after April 2021.

Driver Revision: 1.00
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## Contents

## 1    Description

The Point Six Wireless Driver allows the FieldServer to record data from Point Six wireless sensors over Ethernet using protocol as per "ExtendedPointSensorPacketSpec.pdf" (1/19/2010) and "PointSensorPacketSpecs.doc".

The Driver acts as a Passive Client. This means that the driver will not send any polls or requests for information. It will listen for UDP packets addressed to itself at a configurable port (default port is 6767). Point Six Wireless sensors should be configured to send data messages to the FieldServer's IP address and port.

The Driver supports command2 (data) packets of 75 bytes from Point Six wireless sensors. Sensor Types supported are listed in **Section 8.1.2**.

The Driver acknowledges diagnostic command5 packets of 75 bytes from the Point Sensor Utility but does not process them further to decode or store any data.

**Max Nodes Supported**

| FieldServer Mode | Nodes | Comments |
|---|---|---|
| Client | Multiple | The FieldServer can communicate with multiple Point6 wireless devices. |
| Server | - | The FieldServer cannot emulate a Point6 Wireless Sensor. The Server side is implemented only to test the Client side of the Driver. |

## 2    Driver Scope of Supply

### 2.1    Supplied by MSA Safety

| Part # | Description |
|---|---|
| FS-8915-10 | UTP cable (7 foot) for Ethernet connection |

### 2.2    Provided by the Supplier of 3rd Party Equipment

#### 2.2.1    Required 3rd Party Hardware

| Part # | Description |
|---|---|
| | Ethernet 10/100 BaseT switch[1] |
| | Wireless Switch/Router |

#### 2.2.2    Required 3rd Party Software

Point Six Sensor Point Utility Software to configure and program Point Six wireless sensors.

#### 2.2.3    Required 3rd Party Configuration

- Point Six Wireless sensors must be configured to send data to the FieldServer IP and port.

- Point Six sensors are wireless, therefore a wireless-to-wired Ethernet connection to the FieldServer needs to be set up. Refer to **Section 7.2** for further information.

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[1] Not all FieldServer models support 100BaseT. Consult the appropriate instruction manual for details of the Ethernet speed supported by specific hardware.

## 3    Hardware Connections

The FieldServer is connected to the generic Router/Switch as shown in the connection drawing.
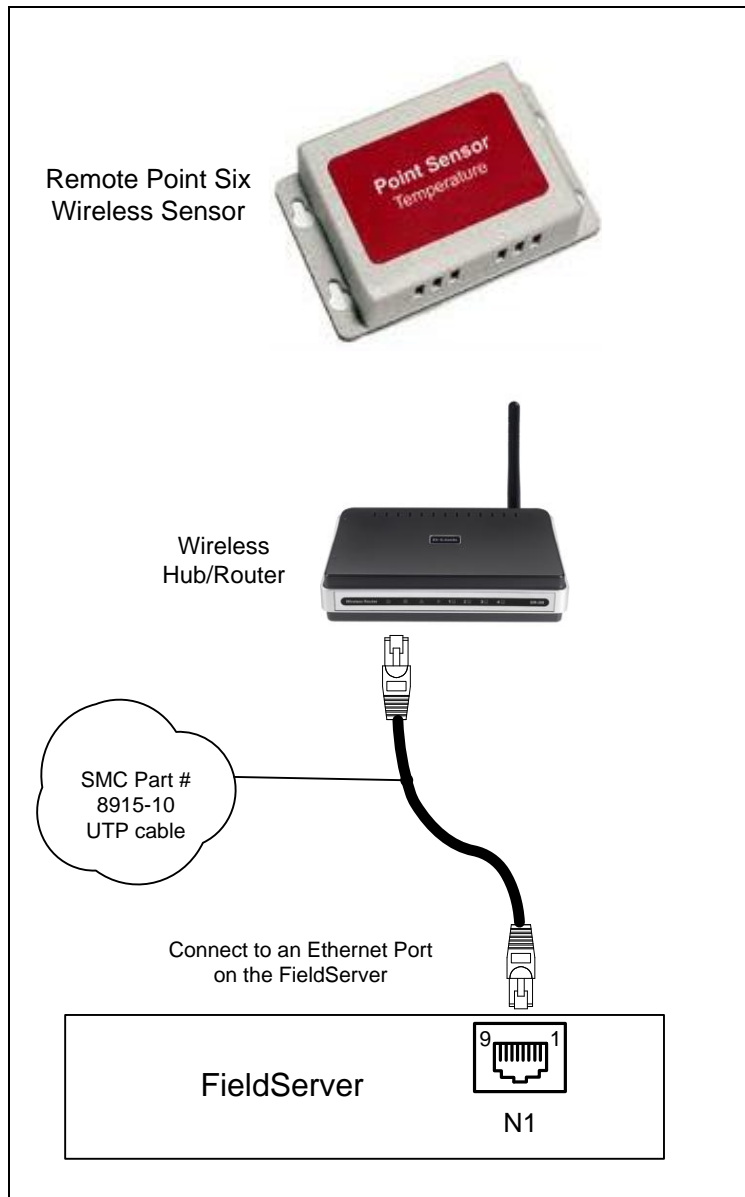


Configure the network devices according to manufacturer's instructions.

### 3.1    Hardware Connection Tips / Hints

- Point Six Wireless sensors must be configured to send data to FieldServer's IP and port.

- Point Six sensors are wireless, therefore a wireless-to-wired Ethernet connection to the FieldServer needs to be set up. Refer to **Section 7.2** for further information.

## 4    Data Array Parameters

Data Arrays are "protocol neutral" data buffers for storage of data to be passed between protocols. It is necessary to declare the data format of each of the Data Arrays to facilitate correct storage of the relevant data.

| Section Title | | |
|---|---|---|
| Data_Arrays | | |
| **Column Title** | **Function** | **Legal Values** |
| Data_Array_Name | Provide name for Data Array. | Up to 15 alphanumeric characters |
| Data_Array_Format | Provide data format. Each Data Array can only take on one format. | Float, Bit, Byte, Uint16, Uint32, Sint16, Sint32 |
| Data_Array_Length | Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array. | 1-10000 |

**Example**

```
//   Data Arrays
Data_Arrays
Data_Array_Name     , Data_Array_Format   , Data_Array_Length
DA_AI_01            , Float               , 20
DA_AI_02            , Float               , 20
DA_AI_03            , Float               , 20
```

## 5   Client Side Configuration

For detailed information on FieldServer configuration, refer to the FieldServer Configuration Manual. The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (see ".csv" sample files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Point Six Wireless Sensor.

The configuration file tells the FieldServer about its interfaces, and the routing of data required. In order to enable the FieldServer for Point Six Wireless Sensor communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the destination device addresses need to be declared in the "Client Side Nodes" section, and the data required from the servers needs to be mapped in the "Client Side Map Descriptors" section. Details on how to do this can be found below.

**NOTE:  In the tables below, * indicates an optional parameter, with the bold legal value as default.**

### 5.1   Client Side Connection Parameters

| Section Title | | |
|---|---|---|
| Connections | | |
| **Column Title** | **Function** | **Legal Values** |
| Connection/Adapter | Connection Name. | N1, N2, WLAN[2] |
| Protocol | Specify Protocol used. | Point6Wireless, Point6, Point_Six |
| IP_Port* | Specify port number at which FieldServer should start listening for messages from Point Six Wireless Sensors. Make sure this port should not be configured to use by other protocols on FieldServer. | 1025-65534, **6767** |

**Example**

```
//   Client Side Connections
Connections
Connection     , Protocol          , IP_Port
N1             , Point6Wireless    , 6767
```

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[2] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

## 5.2    Client Side Node Descriptors

| Section Title | |
|---|---|
| Nodes | |

| Column Title | Function | Legal Values |
|---|---|---|
| Node_Name | Provide name for node. | Up to 32 alphanumeric characters |
| Node_ID* | Identification number for the node. Not relevant for this driver. | Any Integer number |
| Protocol | Specify Protocol used. | Point6Wireless, Point6, Point_Six |
| Connection | Specify through which port the device is connected to the FieldServer. | N1-N2, WLAN[3] |
| IP_Address | IP address of the Point Six Wireless Sensor. | Any legal IP V4 address, **192.168.1.141** |
| Plc_Type | Type of Point Six Wireless Sensor. | Humidity2 (or Humidity/ Temperature), DualAnalog (or RTD), TEMP |
| Retries | The Driver provides a time interval in which we can expect a message. The retries parameter is the number of time intervals that will be allowed to pass before determining the Node "Offline" The default is 3 retries (4 tries). E.g. if the time interval is 60s, a total of 4x 60s will be allowed to pass. This is determined also by the transmission frequency. Refer to **Section 6.1**. | 0,1,2,**3s** |

**Example**

```
//   Client Side Nodes
Nodes
Node_Name          , Node_ID,    , Protocol    , Connection    , IP_Address       , Plc_Type
ND_DualAnalog      , 11          , Point6       , N1             , 192.168.1.141    , DualAnalog
```

## 5.3    Client Side Map Descriptor Parameters

### 5.3.1   FieldServer Specific Map Descriptor Parameters

| Column Title | Function | Legal Values |
|---|---|---|
| Map_Descriptor_Name | Name of this Map Descriptor. | Up to 32 alphanumeric characters |
| Data_Array_Name | Name of Data Array where data is to be stored in the FieldServer. | One of the Data Array names from "Data Array" section above |
| Data_Array_Offset | Starting location in Data Array. | 0 to maximum specified in "Data Array" section above |
| Function | Function of Client Map Descriptor. | Passive_Client |

### 5.3.2   Driver Related Map Descriptor Parameters

| Column Title | Function | Legal Values |
|---|---|---|
| Node_Name | Name of Node to fetch data from. | One of the node names specified in "Client Node Descriptor" above |
| Length | Length of Map Descriptor. | 1, 2, 3 etc.; **20** |

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[3] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

### 5.4   Map Descriptor Example

This Map Descriptor will record data from Sensor described by node name ND_DualAnalog. For data storage detail see **Section 8.1**.

```
//   Client Side Map Descriptors

Map_Descriptors
Map_Descriptor_Name    , Data_Array_Name   , Data_Array_Offset   , Function          , Node_Name          , Length
CMD_DualAnalog          , DA_AI_01              , 0                          , Passive_Client   , ND_DualAnalog      , 20
```

**Example comments:**

- Data_Array_Name – One of the Data Array Names specified in the Data Array section. This Map Descriptor will store data in this Data Array.

- Data_Array_Offset – Location in Data Array from where driver will start storing data.

- Function – Passive_Client means Driver won't poll for information but will wait for the message to arrive from the Wireless Sensor.

- Node_Name – The name of the Node defined in the Node section above. The Node describes the remote sensor from which the data will be recorded.

- Length – Number of sequential locations in Data Array reserved to store data from the specified sensor.

## 6    Useful Features

### 6.1    Node Status

On start-up the Node Status is "Startup". When a valid message is received from the remote sensor, the status is changed to "Online". If no valid message is received, the Node is marked as "Offline".

On start-up the FieldServer will wait (10x (Retries+1)) seconds before marking the Node Status "Offline".

Once the first valid message has been received by the FieldServer, the frequency of receipt of valid messages from the remote sensor is known, and the FieldServer will then wait (transmitting period x (Retries+1)) seconds for a new valid message to arrive before marking the Node status "Offline". Node Status will be changed to "Online" again upon receiving a valid message from the remote sensor.

"Retries" is a configurable Node parameter.

## 7   Troubleshooting

### 7.1   Driver Error Messages

| Message | Description | Suggested resolution |
|---|---|---|
| POINT6#01: Not enough space to store %u items in da %s. See Driver Manual for details. | Data array length too short. | Increase data array length. |
| POINT6#02: MOD256 checksum failed calculated=0x%X msg=0x%X. See Driver Manual for details. | Checksum failed, probably due to noise on the communications wire. | Occasional checksum failures are not a concern. However, if the checksum fails repeatedly, check the quality of the installation with respect to termination, network load, grounding, cable route, cable distances etc. |
| POINT6#03: Poll Failed MD<%s>. See Driver Manual for details. | A request for information from the Point6 device did not receive a response. | If there have been no successful responses to a poll, check addressing, wiring termination, and device configuration. If the communication is successful most of the time, then occasional poll failures are not a concern. However, if the poll fails repeatedly, check the quality of the installation with respect to termination, network load, grounding, cable route, cable distances, etc. |
| POINT6#04: ACK Transmission Failed MD<%s>. See Driver Manual for details. | Acknowledge of message received from Point6 was unsuccessful. | Occasional ACK failures are not a concern. However, if the ACK fails repeatedly but not all of the time, check the quality of the installation with respect to termination, network load, grounding, cable route, cable distances, etc. |

### 7.2   Establishing the Wireless Network

Since the Point Six devices are wireless devices, a 3rd party wireless network will need to be set up so that each Point Six device can communicate to the FieldServer. It is the responsibility of the integrator to create a Wireless network using a wireless access point or router. Follow the individual vendor's instructions on configuring the Wireless Router for wireless communications.

After the wireless network is created, both the FieldServer and any Point Six devices will need to have their IP addresses changed to be on the same IP subnet created by the router. The FieldServer IP address can be changed using the Remote User Interface program and the Point Six devices can be changed with their Point Six Plus software.

## 8   Reference

### 8.1   Data Storage

#### 8.1.1   Data Storage Structure

| Storage location in Data Array relative to Data_Array_Offset | Point Description |
|:---:|:---|
| 0 | I/O1 data value ( Note* ) |
| 1 | I/O2 data value ( Note* ) |
| 2 | I/O1 enumerated engineering units |
| 3 | I/O2 enumerated engineering units |
| 4 | Transmissions - Number of transmissions since last battery reset. 0 if no battery support |
| 5 | Max Transmissions - Maximum number of transmissions for the power source (0 to 16777216) |
| 6 | Period - Transmit period in seconds |
| 7 | I/O 1 – low alarm |
| 8 | I/O 1 – high alarm |
| 9 | I/O 2 – low alarm |
| 10 | I/O 2 – high alarm |
| 11 | I/O 1 – low alarm reset |
| 12 | I/O 1 – high alarm reset |
| 13 | I/O 2 – low alarm reset |
| 14 | I/O 2 – high alarm reset |
| 15 | Sensor has been configured via USB Programmer cable. |
| 16 | Data Logging capability |
| 17 | Battery Low |
| 18 | Alarm in the data log. |
| 19 | Running on line power |

**NOTE:**

- The Driver stores the value after applying the correct scaling. The Driver will store I/O 2 value only if it is available from the sensor, e.g. Humidity2 provides temperature and humidity but the Temp sensor provides temperature only.

- DualAnalog is a generic single or dual channel device. The Driver will store I/O 2 including its enumerated units if the sensor is dual channel.

- Enumerated units are applicable only for DualAnalog Sensors.

#### 8.1.2   Data Stored Per Sensor Type

| Sensor Type | I/O 1 | I/O 2 | Units for I/O 1 | Units for I/O 2 |
|:---|:---|:---|:---|:---|
| Humidity2 (Id 52/51) | temperature (DegC) | humidity (%RH) | - | - |
| Temp (Id 54/51) | temperature (DegC) | - | - | - |
| Dual Analog (Id 76/75) | Analog1 | Analog2 | Enumerated Eng. Units for Analog1 (0, 50, 58-63) | Enumerated Eng. Units for Analog2 (0, 50, 58-63) |

### 8.1.3   Data Stored for All Supported Sensors

| Transmissions | Alarms | Status |
|---|---|---|
| Max Transmissions | I/O 1 – low alarm | Sensor has been configured via USB Programmer cable. |
| Period – Transmit period in seconds | I/O 1 – high alarm | Data Logging capability |
| | I/O 2 – low alarm | Battery Low |
| | I/O 2 – high alarm | Alarm in the data log. |
| | I/O 1 – low alarm reset | Running on line power |
| | I/O 1 – high alarm reset | |
| | I/O 2 – low alarm reset | |
| | I/O 2 – high alarm reset | |

## 8.2   Compatibility Matrix

| FieldServer Model | Compatible |
|---|---|
| FS-B35 Series | Yes |
| ProtoNode/ProtoAir/ProtoCessor | No |
| QuickServer FS-QS-10xx | No |
| QuickServer FS-QS-12xx | Yes |
| QuickServer FS-QS-20xx | No |
| QuickServer FS-QS-22xx | Yes |