

# **WMP Protocol Specification**

**Issue date: 0/2020**  
r1.8

## HMS Industrial Networks S.L.U

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## Welcome

New WMP protocol will allow third party applications to get in touch with Intesis wireless devices through an IP connection using an ASCII protocol.

Among others, this protocol will allow control and monitoring of:

- On/Off
- Mode
- Set Point Temperature
- Room Temperature
- Fan Speed
- Vane Position.

## About this document

This document contains the basis of the WMP protocol for Intesis devices and assumes that the reader has deep knowledge on IP, ASCII, wireless and programming concepts.

## 1. Description

Intesis WMP devices establish a TCP connection (**Port 3310**) between the device itself and the BMS, smart hub, home control or any other controller (from now on client) with IP connection enabled. Communication is done through ASCII telegrams.

The Intesis device works as a server. That means that it just waits for the client to ask for specific data and it serves this data.

Intesis devices allow up to two simultaneous TCP connections using the WMP protocol.

Intesis devices close the TCP communication if no communication is received during 2 minutes. To avoid unexpected TCP communication losses with the device, it is highly recommended to periodically ping the device or demand a value (e.g. ambient temperature) with an appropriate period of time ( $30s \leq t \leq 1min$ ).

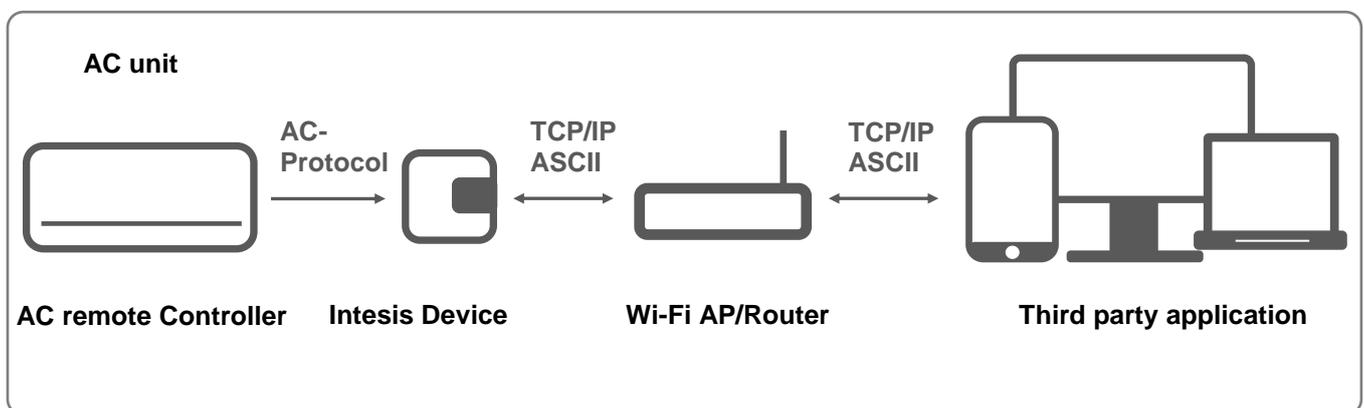


Figure 1-1 System figure

## 2. Physical connection

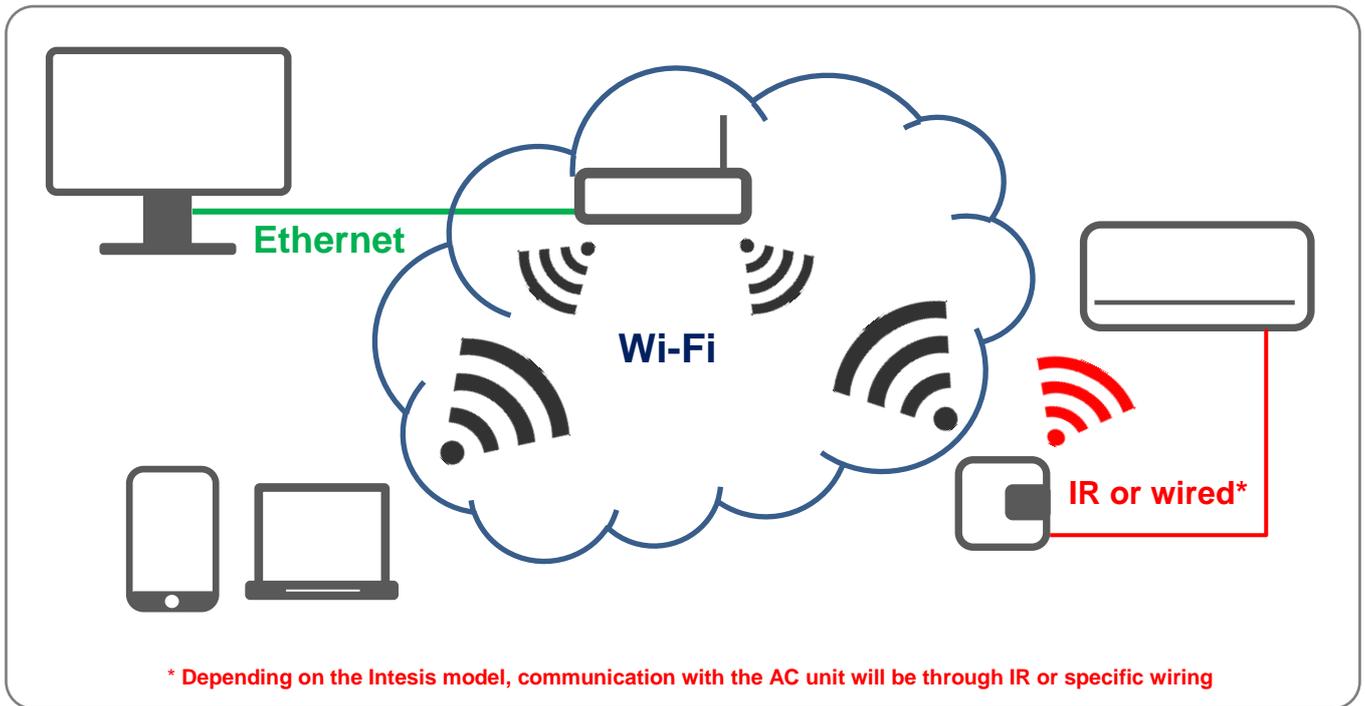


Figure 2-1 Device description

### 3. ASCII messages

Communication between the Intesis device and the client (third party control) is done through ASCII messages.

These messages are composed by a single line with '\r', '\n' or '\r\n' at the end of each line. Capital and non-capital letters are accepted, making no distinction between them.

Each message comes with an example of use.

> character indicates that the message is sent from the client (third party control).

< character indicates that the message is sent from the server (Intesis).

Notice that these characters are only shown for a better understanding of the examples and communication procedure, but those are never sent between the Intesis and the third party control.

Next, you can find all different types of messages available.

#### 3.1 Considerations before integrating this protocol

- i. The proper way to integrate WMP devices is by opening a TCP socket and keep it open while there is something to communicate or to receive from the device. This way, we would be avoiding a continuous opening/closing TCP sockets constantly.
- ii. WMP devices close a TCP socket if there is no communication during 1 minute. This time might be extended by sending any command to the WMP periodically (<1 min. period). Although any command might be used for this purpose, the following command might be used for this purpose, as there is no link between the command and the control of the AC unit.

PING

- iii. In any case, the period of time between opening/closing TCP sockets during the normal operation must be over 1 second. Decreasing this time during the normal operation of the device can cause malfunctioning of the device.

#### 3.2 ID

This command is used to obtain an identification from the Intesis device and is sent by the client.

**Command sent by the client:**

ID

## Answer from the Intesis:

```
ID:Model,MAC,IP,Protocol,Version,RSSI
```

Where

- **Model** corresponds to the Intesis device model reference
- **MAC** corresponds to the 6 bytes of the MAC address
- **IP** corresponds to the IP address of the Intesis
- **Protocol** corresponds to the external protocol supported
- **Version** corresponds to the firmware version running in the device
- **RSSI** corresponds to the Received Signal Strength Indication for the Wi-Fi connection

## Example:

```
> ID  
< ID: INWMPUNI001I000,001DC9A2C911,192.168.100.246,ASCII,v0.0.1,-44
```

### 3.3 INFO

This command is used to obtain information from the Intesis device and is sent by the client.

This is not required for communication, but for troubleshooting or when contacting the support department.

## Command sent by the client:

```
INFO
```

## Answer from the Intesis:

```
> INFO  
< INFO:RUNVERSION,  
< INFO:CFGVERSION,  
< INFO:HASH,
```

Where

- **RUNVERSION** corresponds to the Runtime firmware version
- **CFGVERSION** corresponds to the Configuration firmware version
- **HASH** corresponds to internal information of the device

**Example:**

```
> INFO
< INFO:RUNVERSION,1.0.1
< INFO:CFGVERSION,1.0.1
< INFO:HASH,2000:0106:001F:0104:F4DE
```

### 3.4 SET

This command is used to control the AC unit through the Intesis device and is sent by the client.

**Command sent by the client:**

```
SET,acNum:function,value
```

Where

- **acNum** is the number of the AC unit to control.<sup>1</sup>
- **function** is the name of the function we want to modify. It has to be one of the following:
  - ONOFF: Turns the AC unit On or Off
  - MODE: Sets the mode (heat, cool, fan, dry or auto)<sup>2</sup>
  - SETPTEMP: Sets the set point temperature<sup>3</sup>
  - FANSP: Sets the fan speed<sup>2</sup>
  - VANEUD: Sets the Up/Down vane position<sup>2</sup>
  - VANELR: Sets the Left/Right vane position<sup>2</sup>
- **value** is the value that you want to apply to each function (check section 4 for detailed values).

<sup>1</sup> Currently only 1 is enabled.

<sup>2</sup> Availability for each mode will depend on your AC unit. Please check your AC user manual for more information.

<sup>3</sup> Valid temperature values may depend on your AC unit. Please check your AC user manual for more information.

**Answer from the Intesis (only if change is applied):**

```
< CHN,acNum:function,value
```

Where

- **CHN** corresponds to the change message identifier
- **acNum** corresponds to the AC unit we are controlling
- **function** corresponds to the function controlled
- **value** corresponds to the value applied (check section 4 for detailed values)

**Example:**

```
< SET,1:ONOFF,ON
< ACK
< CHN,1:ONOFF,ON
```

**NOTE:** The “<CHN, 1:ONOFF,ON” message will only appear if the status really changes.

**3.5 CHN**

This command is used to get notifications of changes in the current status of a specific function of the Intesis device. This message is sent spontaneously by the Intesis itself.

**Message sent from the Intesis (only if change is applied):**

Where

- **acNum** corresponds to the AC unit we are controlling
- **function** corresponds to the function monitored. It has to be one of the following:
  - ONOFF: Shows the AC unit On or Off
  - MODE: Shows the mode (heat, cool, fan, dry or auto)<sup>4</sup>
  - SETPTMP: Shows the set point temperature
  - FANSP: Shows the fan speed <sup>4</sup>
  - VANEUD: Shows the Up/Down vane position <sup>4</sup>
  - VANELR: Shows the Left/Right vane position <sup>4</sup>
  - AMBTMP: Shows the ambient temperature
  - ERRSTATUS: Shows if any error occurs. Responds is “OK” if there is not error, “ERR” if any error occurs. (Not available for INWMPUNI001I000)

<sup>4</sup> Availability for each mode, fan speed or vane positions will depend on your AC unit. Please check your AC user manual for more information.

- ERRCODE: Shows the error code. (Not available for INWMPUNI001I000)
- **value** corresponds to the current value (check section 4 for detailed values)

## Example:



< CHN,1:AMBTEMP,275

### 3.6 GET

This command is used to get the current status of a specific function. It is sent by the client.

#### Command sent by the client:

```
GET,acNum:function
```

#### Answer from the Intesis:

```
> GET,acNum:function  
< CHN,acNum:function,value
```

#### Where

- **acNum** corresponds to the AC unit we are controlling
- **function** corresponds to the function monitored. It has to be one of the following:
  - ONOFF: Shows the AC unit On or Off
  - MODE: Shows the mode (heat, cool, fan, dry or auto)<sup>5</sup>
  - SETPTMP: Shows the set point temperature
  - FANSP: Shows the fan speed 7
  - VANEUD: Shows the Up/Down vane position 7
  - VANELR: Shows the Left/Right vane position 7
  - AMBTMP: Shows the ambient temperature
  - ERRSTATUS: Shows if any error occurs. Responds is “OK” if there is not error, “ERR” if any error occurs. (Not available for INWMPUNI001I000)
  - ERRCODE: Shows the error code. (Not available for INWMPUNI001I000)
  - \* : Show all previous function status
- **value** corresponds to the current function value (check section 4 for detailed values)

#### Example:

```
> GET,1:MODE  
< CHN,1:MODE,AUTO
```

<sup>5</sup> Availability for each mode will depend on your AC unit. Please check your AC user manual for more information.

## 3.7 LOGIN

This command is used to start secure communication between the Intesis interface and the client and it is sent by the client.

Notice that secure communication is **only required** if an extra security encryption mode is required apart from the Wi-Fi standard encryption used by the Wi-Fi Access Point or Router.

### Command sent by the client:

```
LOGIN:password
```

#### Where

- **password** stands for a 128 bits number expressed in hex mode.

### Answer from the Intesis:

```
> LOGIN:3B673FB91600D7E42FB5A59BA3DDB5F8  
< M0:858AB0E03E80BC069E292A78047575FF  
> M1:56435713ECA6546A7E250504BEE059D5  
< OK
```

For more information about encryption and security levels, please contact us through <https://mysupport.hms.se/>

## 3.8 LOGOUT

This command is used to close the secure session opened between the Intesis device and the client. It is sent by the client.

### Command sent by the client:

```
LOGOUT
```

### Answer from the Intesis:

If there was an opened session, device will ask with an OK. Otherwise it will answer with an ERR.

```
> LOGOUT  
< OK
```

If the logout has been successful, communications will be again on a non-secure mode.

### Example:

```
> LOGOUT  
< OK
```

For more information about encryption and security levels, please contact us through <https://mysupport.hms.se/>

### 3.9 CFG

This command is used to get or modify configuration parameters. It is sent by the client.

**Command sent to modify a configuration parameter is:**

```
CFG:configItem,value
```

Where

- **configItem** corresponds to the configuration item.
- **value** corresponds to the current value on the configuration item.

**Command sent by the client to get a configuration parameter:**

```
CFG:configItem
```

Item	Value	Description
RDOMAIN <sup>6</sup>	FCC	FCC Regulation Domain. Channels 1 to 11.
	ETSI	ETSI v1.8.1 Regulation Domain. Channels 1 to 13.
	JAPAN	Japan Regulation Domain. Channels 1 to 14.
	Default	FCC Regulation domain.
PIN	Any 8 decimal digit combination	PIN to be used when starting the session.
	*	Special value to stablish the default PIN.
SECURITYLEVEL	NONE	Security not enabled.
	CFGONLY	Security enabled only for configuration messages.
	ALL	Security enabled for all messages
DATETIME	DD/MM/YYYY HH:NN:SS	Current date and time, without time zone.

### Examples:

<sup>6</sup> Intesis device needs to be reset in order to apply this setting. Simply unplug and plug the device so the new settings apply.

## Setting a new PIN

```
> CFG:PIN,12345678  
< OK
```

## Setting the default PIN

```
> CFG:PIN,*  
< ACK
```

## Getting the current Regulation Domain

```
> CFG:RDOMAIN  
< CFG:RDOMAIN,ETSI
```

## Getting the current time stamp

```
> CFG:DATETIME  
< CFG:DATETIME,17/07/2015 09:38:44
```

**NOTE:** Default PIN is provided along with the device and is individual for each device.

**IMPORTANT:** Changing the security level implies having a secure communication established by the login procedure (see section 3.7).

### 3.10 LIMITS

This command is used to get or modify the data point ranges. It is sent by the client.

#### Command for modifying the ranges:

```
LIMITS:function,range
```

#### Command for getting the ranges:

```
LIMITS:function
```

Where

- **function** corresponds to the function to limit
- **range** corresponds to limit value for each function

Function	Type	Example	Description
ONOFF	ENUM	[OFF,ON]	ON and OFF values
MODE	ENUM	[AUTO,HEAT,COOL]	AUTO,HEAT and COOL values
FANSP	ENUM	[AUTO,1,2]	AUTO,1 and 2 values
VANEUD	ENUM	[AUTO,SWING]	AUTO and SWING values
VANELR	ENUM	[AUTO,SWING]	AUTO and SWING values
SETPTEMP	SCALAR	[160,280]	Inferior limit (16°C) and superior limit (28°C), both included

#### Answer from the Intesis:

```
LIMITS:function,range
```

#### Examples:

Set point limitation between 18°C and 28°C

```
> LIMITS:SETPTEMP,[180,280]
< ACK
```

Horizontal vanes can only be set from 1 to 5 positions, with Swing and Auto

```
> LIMITS:VANELR,[AUTO,1,2,3,4,5,SWING]
< ACK
```

Find out the horizontal vanes limits

```
> LIMITS:VANELR
< LIMITS:VANELR,[AUTO,1,2,3,4,5,SWING]
```

### 3.11 DISCOVER

This command is used to discover Intesis gateways in the same network. Notice that this command uses UDP, so UPD ports should be enabled. The specific port where the Intesis device is listening to is the 3310, so messages need to be sent into that port. The discover message is sent by the client.

#### Command sent is:

```
DISCOVER
```

#### Answer is:

```
> DISCOVER
< Model,MAC,IP,Protocol,Version,RSSI
```

Where

- **Model** corresponds to the Intesis device model reference
- **MAC** corresponds to the 6 bytes of the MAC address
- **IP** corresponds to the IP address of the Intesis
- **Protocol** corresponds to the external protocol supported
- **Version** corresponds to the firmware version running in the device
- **RSSI** corresponds to the Received Signal Strength Indication for the Wi-Fi connection

#### Example:

```
> DISCOVER
< INWMPUNI001I000,001DC9A2C911,192.168.100.246,ASCII,v0.0.1,-44
```

## 4. Functions and Values

Function	Value	Description
ONOFF	ON	AC unit ON
	OFF	AC unit OFF
MODE	AUTO	AUTO mode
	HEAT	HEAT mode
	DRY	DRY mode
	FAN	FAN mode
	COOL	COOL mode
SETPTEMP	See note <sup>7</sup>	Set Point Temperature (Temp values are multiplied by 10)
FANSP	AUTO	Fan Speed AUTO
	1	Fan Speed 1
	2	Fan Speed 2
	3	Fan Speed 3
	4	Fan Speed 4
	5	Fan Speed 5
	6	Fan Speed 6
	7	Fan Speed 7
	8	Fan Speed 8
	9	Fan Speed 9
VANEUD	AUTO	Vertical Vane Position AUTO
	1	Vertical Vane Position 1
	2	Vertical Vane Position 2
	3	Vertical Vane Position 3
	4	Vertical Vane Position 4
	5	Vertical Vane Position 5
	6	Vertical Vane Position 6
	7	Vertical Vane Position 7
	8	Vertical Vane Position 8
	9	Vertical Vane Position 9
	SWING	Vertical Vane Position Swing
VANELR	AUTO	Horizontal Vane Position Auto
	1	Horizontal Vane Position 1
	2	Horizontal Vane Position 2
	3	Horizontal Vane Position 3
	4	Horizontal Vane Position 4
	5	Horizontal Vane Position 5
	6	Horizontal Vane Position 6
	7	Horizontal Vane Position 7
	8	Horizontal Vane Position 8
	9	Horizontal Vane Position 9
	SWING	Horizontal Vane Position Swing
AMBTEMP	See note <sup>8</sup>	Ambient Temperature (Temp values are multiplied by 10)

<sup>7</sup> Valid temperature values may depend on your AC unit. Please check your AC user manual for more information.

<sup>8</sup> This is a read only register.

## 5. FAQs and Troubleshooting

### 5.1 What if a non-existing command is sent to the Intesis device?

If a non existing command is sent or if there is a mistake on the syntaxis, the Intesis will discard this command and will no notify this error.

### 5.2 What if a non valid value is sent to the Intesis device?

If a non valid value is sent, the Intesis will discard this command and will report an error message.

Example:

```
> SET,1:ONOFF,Hello  
< ERR
```

### 5.3 Which is the meaning of the RSSI values?

The RSSI value will provide information about the signal level at the Intesis device location. If RSSI is lower than "Good", we would recommend you to change the Intesis location or to improve the Wi-Fi signal with a Wi-Fi repeater.

RSSI Value	Meaning
<-96	Bad
-86 to -95	Weak
-81 to -85	Good
-71 to -81	Very Good
> -70	Excelent

### 5.4 What if a write request is sent to a read only function?

If a write request is sent to a read only function the Intesis will answer as if it was a non valid value sent.

Example:

```
> SET,1:AMBTEMP,210  
< ERR
```

## 5.5 Is it possible to set multiple commands at the same time?

No, currently you need to set each command individually. That means that if you want to set the AC unit ON at 21°C you need to send one command to turn the AC unit ON and another one to set the Set Point temperature at 21°C.

## 5.6 Is it possible to disable the spontaneous messages sent from the Intesis?

No, currently the spontaneous messages generated by the Intesis can't be disabled. That means that all changes on the AC unit will always be reported from the Intesis to the client.

## 5.7 Do I need to set the limits everytime the device loses connection or power?

No, limit values are stored in a non volatile memory, so no need of setting them again after a power failure is required.

## 5.8 How to prevent Intesis device to end the TCP communication?

Currently, Intesis devices close the TCP communication if no communication is received during 2 minutes. To avoid unexpected TCP communication losses, you can ping the device or periodically demand a value (for instance, every 30 seconds demand ambient temperature to the device).

This TCP connection lost is usually linked to user error messages (connection lost...).