



AirTouch 2+

Communication Protocol

version	data	content
V1.0	24/08/2020	Create
V1.1	02/02/2023	Change 4.b.i, Add mode to setpoint limit

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1. Overview

AirTouch 2+ allows connection through TCP to control the device. It supports querying and controlling of the AC units and groups.

2. Connection

Join AirTouch 2+ console to local WiFi network.

Connect to AirTouch 2+ console at port 9200 by TCP protocol. If there are two consoles, connect to the one with touchpad address 1. If this fails, try to connect to the other one.

Page in "System Settings" -> "Installers" -> "Parameters" shows the address of the console.

To see the IP address of the console, go to "System Settings" -> "WiFi Settings", click the SSID which is connected, the IP address of the console will be shown.

3. Message Format

A message has following components:

- Header (2 bytes)
- Address (2 bytes)
- Message id (1 byte)
- Message type (1 byte)
- Data length (2 bytes)
- Data
- CRC16 check bytes (2 bytes)

a. Header

Header is always 0x55 0x55.

b. Address

Address should be 0x80 0xb0 or 0x90 0xb0 (for Extended message) when sending to AirTouch. When receiving from AirTouch, last byte of address will be 0x80 or 0x90 (for Extended message).

c. Message id

When sending message to AirTouch, message id can be any data. The response message should have the same message id.

d. Message type

There are two message types: 0xC0 – control command and status message, 0x1F – extended message.

Ignore any other received type.

e. Data length

Data length is the length of actual data. The first byte is the high byte, the second byte is the low byte.

f. Data

See section 4 Messages contents.

g. Check bytes

The algorithm of checksum is CRC16 MODBUS. Use all data except the header.

4. Messages

a. Control command and status message (0xC0)

This message contains sub message type (Group control, Group status, AC control and AC status), data length detail and sub data.

First 8 bytes are the sub message type and data length details.

Byte1	Sub message type
Byte2	Keep 0
Byte3	Normal data length
Byte4	
Byte5	Repeat data count
Byte6	
Byte7	Each repeat data length
Byte8	

For one (0xC0) message:

Data length (3.e.) = 8 + Normal data length + repeat data length * repeat data count

Sub data length = Normal data length + repeat data length * repeat data count = Data length - 8

i. Group control (0x20)

Group control messages are to control all groups. Each message to AirTouch is to control one or more specific groups.

No normal data (byte3 byte4: 0).

Each repeat data (4 bytes) control one specific group. (byte7 byte8: 0x00 0x04).

Byte in repeat data			
Byte1	Bit8-7		Keep 0
	Bit6-1	Group number	Valid value 0 - 15(0x00 – 0x0F).
Byte2	Bit8-6	Group setting value	010: Value decrease (-5%) 011: Value increase (+5%) 100: Set open percentage Other: Keep setting value
	Bit5-4		Keep 0
	Bit3-1	Power	001: Change to next state 010: Set to off 011: Set to on 101: Set to turbo Other: Keep power state
Byte3		Percentage to set	0-100: Open percentage to set Other: Keep setting value
Byte 4			Keep 0

Example:

Turn off the second group:

0x55 0x55 0x80 0xB0 0x01 0xC0 0x00 0x0C

Header Address Id Type Length

0x20 0x00 0x00 0x00 0x00 0x01 0x00 0x04

Sub Type normal length repeat count repeat length

0x01 0x02 0x00 0x00 0x64 0xFD

Data

CRC

Set first and second groups to open 10%:

0x55 0x55 0x80 0xB0 0x01 0xC0 0x00 0x10 0x20 0x00 0x00 0x00 0x00 0x02 0x00 0x04

0x00 0x80 0x0A 0x00 0x01 0x80 0x0A 0x00 0x2B 0xD2

AirTouch will respond a message with sub type 0x21. (See next table)

ii. Group status (0x21)

Sending this message to AirTouch without any sub data (data length: 0x00 0x08, repeat count: 0x00, repeat length: 0x00) to request group status from AirTouch.

Note: AirTouch will send a group status message automatically when group status is changed.

Data received from AirTouch:

No normal data (byte3 byte4: 0).

Repeat data count is the group count in this message.

Each repeat data (8 bytes) contains one group data. (byte7 byte8: 0x00 0x08).

Byte in repeat data			
Byte1	Bit8-7	Group power state	00: Off 01: On 11: Turbo
	Bit6-1	Group number	0-15
Byte2	Bit8		<i>NOT USED</i>
	Bit7-1	Open percentage	Current open percentage setting
Byte3			<i>NOT USED</i>
Byte4			
Byte5			
Byte6			
Byte7	Bit8	Turbo support	1: Support turbo, 0: not support turbo
	Bit7-3		<i>NOT USED</i>
	Bit2	Spill	1: Spill active, 0: Spill inactive.
	Bit1		<i>NOT USED</i>
Byte8			<i>NOT USED</i>

Example:

Request status of groups:

```

0x55 0x55 0x80 0xB0 0x01 0xC0 0x00 0x08
Header  Address  Id  Type  Length
0x21 0x00 0x00 0x00 0x00 0x00 0x00 0x31
Sub type                                     CRC

```

AirTouch 2+ response with data for 2 groups:

```

0x55 0x55 0xB0 0x80 0x01 0xC0 0x00 0x18 0x21 0x00 0x00 0x00 0x00 0x02 0x00 0x08
0x00 0x00 0x00 0x00 0x00 0x00 0x80 0x00 0x41 0x32 0x00 0x00 0x00 0x00 0x02 0x00 0x83 0x2F

```

Group 1 data:

```

0x00 0x00 0x00 0x00 0x00 0x00 0x80 0x00
00000000 00000000 00000000...00000000 10000000 00000000

```

Power off, Current open percentage setting: 0, Support turbo.

Group 2 data:

0x41 0x32 0x00 0x00 0x00 0x00 0x02 0x00
01000001 10011010 00000000...00000000 00000010 00000000

Power on, Current open percentage setting: 50 (0011010 = 0x32) .

Not support turbo, spill active.

iii. AC control (0x22)

AC control messages are to control all ACs. Each message to AirTouch is to control one or more specific ACs.

No normal data (byte3 byte4: 0).

Each repeat data (4 bytes) control one specific group. (byte7 byte8: 0x00 0x04).

Byte in repeat data			
Byte1	Bit8-5	Power setting	0001: Change on/off status 0010: Set to off 0011: Set to on 0100: Set to away 0101: Set to sleep Other: Keep power setting
	Bit4-1	AC number	Valid value 0 - 7.
Byte2	Bit8-5	AC mode	0000: Set to auto 0001: Set to heat 0010: Set to dry 0011: Set to fan 0100: Set to cool Other: Keep mode setting
	Bit4-1	AC fan speed	0000: Set to auto 0001: Set to quite 0010: Set to low 0011: Set to medium 0100: Set to high 0101: Set to powerful 0110: Set to turbo Other: Keep fan speed setting
Byte3		Setpoint control	0x40: Change setpoint. 0x00: Keep setpoint value Other: Invalidate data.
Byte 4		Setpoint value	Available when byte3 is 0x40 Setpoint = (data+100)/10. Range [10.0-35.0]

Example:

Turn off the second AC:

```

0x55 0x55 0x80 0xb0 0x01 0xC0 0x00 0x0C
Header  Address  Id   Type  Length
0x22 0x00 0x00 0x00 0x00 0x01 0x00 0x04
Sub Type  normal length repeat count repeat length
0x21 0xFF 0x00 0xFF 0xD3 0xDE
Data      CRC
  
```

Set the first to cool mode and second AC 26 degree:

```

0x55 0x55 0x80 0xb0 0x01 0xC0 0x00 0x10
0x22 0x00 0x00 0x00 0x00 0x02 0x00 0x04
  
```

0x00 0x4F 0x00 0xFF 0x01 0xFF 0x40 0xA0 0x38 0x7E

AirTouch will respond a message with sub type 0x23. (See next table)

iv. AC status message (0x23)

Sending this message to AirTouch without any sub data (data length: 0x00 0x08, repeat count: 0x00, repeat length: 0x00) to request AC status from AirTouch.

Note: AirTouch will send an AC status message automatically when AC status is changed.

Data received from AirTouch:

No normal data (byte3 byte4: 0).

Repeat data count is the AC count in this message.

Each repeat data (10 bytes) contains one AC data. (byte7 byte8: 0x00 0x0A).

Byte1	Bit8-5	AC powerstate	0000: Off 0001: On 0010: Away(Off) 0011: Away(On) 0101: Sleep Other: Not available
	Bit4-1	AC number	0-7
Byte2	Bit8-5	AC mode	0000: auto 0001: heat 0010: dry 0011: fan 0100: cool 1000: auto heat 1001: auto cool Other: Not available
	Bit4-1	AC fan speed	0000: auto 0001: quiet 0010: low 0011: med 0100: high 0101: powerful 0110: turbo Other: Not available
Byte3		Setpoint	0-250: Setpoint = (VALUE + 100)/10. Other: Not available
Byte4	Bit8-5		<i>NOT USED</i>
	Bit4	Turbo	1: Turbo active, 0: Turbo inactive
	Bit3	Bypass	1: Bypass active, 0: Bypass inactive
	Bit2	Spill	1: Spill active, 0: Spill inactive
	Bit1	Timer status	1: Timer set, 0: Timer not set
Byte5		Temperature	0-2000: Temperature=(VALUE – 500)/10.
Byte6			Other: Not available
Byte7		Error code	0:No error
Byte8			Other: Error code of this AC
Byte9			<i>NOT USED</i>
Byte10			

Example:

Request status of ACs:

<u>0x55 0x55</u>	<u>0x80 0xB0</u>	<u>0x01</u>	<u>0xC0</u>	<u>0x00 0x08</u>	
Header	Address	Id	Type	Length	
<u>0x23 0x00</u>	<u>0x00 0x00</u>	<u>0x00 0x00</u>	<u>0x00 0x00</u>	<u>0x7D 0xB0</u>	
Sub type				CRC	

AirTouch 2+ response with data for 2 ACs:

<u>0x55 0x55</u>	<u>0xB0 0x80</u>	<u>0x01</u>	<u>0xC0</u>	<u>0x00 0x1C</u>	
<u>0x23 0x00</u>	<u>0x00 0x00</u>	<u>0x00 0x02</u>	<u>0x00 0x0A</u>		
<u>0x10 0x12</u>	<u>0x78 0xC0</u>	<u>0x02 0xDA</u>	<u>0x00 0x00</u>	<u>0x80 0x00</u>	
<u>0x01 0x42</u>	<u>0x64 0xC0</u>	<u>0x02 0xE4</u>	<u>0x00 0x00</u>	<u>0x80 0x00</u>	<u>0xD3 0x97</u>

AC 0 data:

<u>0x10</u>	<u>0x12</u>	<u>0x78</u>	<u>0xC0</u>	<u>0x02DA</u>	<u>0x0000</u>	<u>0x0000</u>
<u>00010000</u>	<u>00010010</u>	<u>01111000</u>	1100 0000	00000010	11011010	0000000000000000 ...

AC 0 is on, in heat mode and low fan speed and no error.

Current target setpoint setting: 22, VALUE=120(01111000 = 0x78), (120 + 100)/10 = 22

Current Temperature: 23, VALUE=730(0000001011011010 = 0x02DA), (730-500)/10 = 23.

AC 1 data:

<u>0x01</u>	<u>0x42</u>	<u>0x64</u>	<u>0xC0</u>	<u>0x02E4</u>	<u>0x0000</u>	<u>0x0000</u>
<u>00000001</u>	<u>01000010</u>	<u>01100100</u>	1100 0000	00000010	11001010	0000000000000000 ...

AC 1 is off, in cool mode and low fan speed and no error.

Current target setpoint setting: 20, VALUE=100(01100100 = 0x64), (100+100)/10 = 20

Current Temperature: 24, VALUE=740(0000001011100100 = 0x02E4), (740-500)/10 = 24.

b. Extended message(0x1F)

Extended messages are used to obtain the available modes, fan speeds, error codes of the ACs and name of groups.

When sending an extended message, **the address should be 0x90 0xb0**. When receiving the data for the extended message, **the last byte of address will be 0x90**.

The first two bytes of the data are used to specify the specific command.

i. AC ability (0xFF 0x11)

Sending an extended message with data 0xFF 0x11 or (0xFF 0x11 [0-3]) to request the ability of all ACs or one specific AC.

Data received from AirTouch:

Byte1			Fixed 0xFF
Byte2			Fixed 0x11
Byte3		AC number	0-3
Byte4		Following data length	This data shows the count of following bytes belong to the ability of this AC.(24 at this moment)
Byte5-20		AC Name	16 bytes in total. If less than 16 bytes, end with 0.
Byte21		Start group number	
Byte22		Group count	
Byte23	Bit8-6		<i>NOT USED</i>
	Bit5	Cool mode	1: support, 0: not support
	Bit4	Fan mode	1: support, 0: not support
	Bit3	Dry mode	1: support, 0: not support
	Bit2	Heat mode	1: support, 0: not support
	Bit1	Auto mode	1: support, 0: not support
Byte24	Bit8		<i>NOT USED</i>
	Bit7	Fan speed turbo	1: support, 0: not support
	Bit6	Fan speed powerful	1: support, 0: not support
	Bit5	Fan speed high	1: support, 0: not support
	Bit4	Fan speed medium	1: support, 0: not support
	Bit3	Fan speed low	1: support, 0: not support
	Bit2	Fan speed quite	1: support, 0: not support
	Bit1	Fan speed auto	1: support, 0: not support
Byte25		Minimum set point	For Cool Mode
Byte26		Maximum set point	For Cool Mode
Byte27		Minimum set point	For Heat Mode
Byte28		Maximum set point	For Heat Mode

If there are more than one AC, the data will be repeated with relevant values. E.g. 2 ACs will receive 54(2+26+26) bytes data, 3 ACs will receive 80(2+26+26+26) bytes data.

It is recommended to request the AC ability when an AC back to normal state from any abnormal state.

Example:

Request ability of AC 0:

0x55 0x55 0x90 0xb0 0x01 0x1f 0x00 0x03 0xff 0x11 0x00 CRC Bytes
Header Address Id Type Length Data

AirTouch 2+ response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x1a 0xff 0x11 0x00 0x18
0x55 0x4e 0x49 0x54 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x04 0x17 0x1d 0x11 0x1f 0x11 0x1f CRC Bytes

AC 0 data:

0x00 0x18 0x55 0x4e 0x49 0x54 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00

AC0 24 U N I T

0x00 0x00 0x00 0x04 0x17 0x1d 0x11 0x1f 0x11 0x1f
0 4 00010111 00011101 17 31 17 31

Name of AC0 is "UNIT" and it has 4 groups, start with group 0.

It has cool, heat, fan, auto modes and has low, mid, high, auto fan speeds.

Cool mode: Minimum setpoint is 17, maximum setpoint is 31.

Heat mode: Minimum setpoint is 17, maximum setpoint is 31.

ii. AC error information (0xFF 0x10)

Sending an extended message with data 0xFF 0x10 [0-3] to request the error code of one specific AC.

Data received from AirTouch:

Byte1		Fixed 0xFF
Byte2		Fixed 0x10
Byte3	AC number	0-3
Byte4	Error info length	Error info length(If no error, will be 0)
Byte5..	Error info	String

Example:

Request Error of AC 0:

0x55 0x55 0x90 0xb0 0x01 0x1f 0x00 0x03 0xff 0x10 0x00 0x99 0x82
Header Address Id Type Length Data CRC

AirTouch 2+ response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x1a 0xff 0x10 0x00 0x08
0x45 0x52 0x3a 0x20 0x46 0x46 0x46 0x45 0x60 0xd3

Data:

0xff 0x10 0x00 0x08 0x45 0x52 0x3a 0x20 0x46 0x46 0x46 0x45
AC0 Len:8 E R : F F F E

iii. Group name (0xFF 0x12)

Sending an extended message with data 0xFF 0x12 [0-15] to request the name all groups or one specific group.

Data received from AirTouch:

Byte1		Fixed 0xFF
Byte2		Fixed 0x12
Byte3	Group number	0-15
Byte4-11	Group name	8 bytes in total. If less than 8 bytes, end with 0.

If there are more than one group, the data will be repeated with relevant values. E.g. 2 groups will receive 20(2+9+9) bytes data, 3 groups will receive 29(2+9+9+9) bytes data.

Example:

Request name of group 0:

0x55 0x55 0xb0 0xb0 0x01 0x1f 0x00 0x03 0xff 0x12 0x00 0xf9 0x83
Header Address Id Type Length Data CRC

AirTouch 2+ response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x0b 0xff 0x12
0x00 0x47 0x72 0x6f 0x75 0x70 0x31 0x00 0x00 0xfd 0x18
Group0 G r o u p 1

Name of Group 0 is "Group1"

Request name of all groups:

0x55 0x55 0xb0 0xb0 0x01 0x1f 0x00 0x02 0xff 0x12 0x82 0x0c
Header Address Id Type Length Data CRC

AirTouch 2+ response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x0b 0xff 0x12
0x00 0x4c 0x69 0x76 0x69 0x6e 0x67 0x00 0x00
Group0 L i v i n g
0x01 0x4b 0x69 0x74 0x63 0x68 0x65 0x6e 0x00
Group1 K i t c h e n
0x02 0x42 0x65 0x64 0x72 0x6f 0x6f 0x6d 0x00 0x39 0x93
Group2 B e d r o o m

Name of group0 is "Living".

Name of group1 is "Kitchen".

Name of group2 is "Bedroom".