AirTouch 4
Communication Protocol

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version	data	content
V1.0	31/01/2019	Create
V1.1	24/06/2019	Added 4 e. Extended message
V1.2	03/09/2019	Added 4 e.iii. Group name
V1.3	29/11/2019	Change 4 c. Byte3 description
V1.4	26/02/2020	Added status report description(0x2B\0x2D)
V1.5	14/09/2020	Change 4 e.i. AC ability
V1.6	12/07/2022	Added 2 a Discovery Added 4 e.iv. Version message

Contents

1. Overview

AirTouch 4 allows connection through TCP to control the device. It supports querying the status of AC and groups and controlling the AC and groups.

2. Connection

Join AirTouch 4 console to local WiFi network.

Connect to AirTouch 4 console at port 9004 by TCP protocol. If there are two consoles, connect to the one whose address is 1. If failed, 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 icon (three dots) in the upper right corner, select “Advanced” in popped menu. This page shows the IP address of the console.

a. Discovery

AirTouch 4 support UDP broadcast to discover a device.

Broadcast “HF-A11ASSISTHREAD” to port 49004 to discover AirTouch 4 device on the local network.

AirTouch 4 will response a UDP message to 49004.

Message format is: [IP],[MAC],AirTouch4,[ID]

For hubs that integrate home smart devices, it is recommended this message be used only during setup. Fix the IP of the device in the router, to increase stability.

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 four message types: 0x2a – group control, 0x2b – group status, 0x2c – AC control, 0x2d – AC status.

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.

g. Check bytes

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

4. Messages

a. Group control message (0x2A)

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

4 bytes data (Data length: 0x00 0x04).

Byte1		Group number	Valid value 0 - 15(0x00 – 0x0F).
Byte2	Bit8-6	Group setting value	000: Keep setting value 010: Value decrease (-1℃ / -5%) 011: Value increase (+1℃ / +5%) 100: Set open percentage 101: Set target setpoint
	Bit5-4	Set percentage or temperature control	00: Keep control method 01: Change control method 10: Set to percentage control 11: Set to temperature control
	Bit3-1	Power	000: Keep power state 001: Change to next state 010: Set to off 011: Set to on 101: Set to turbo
Byte 3		Value	Valid when bit8-6 of byte2 are 100 or 101
Byte 4			Keep 0

Example:

Turn off the second group:

0x55 0x55	0x80 0xb0	0x01	0x2a	0x00 0x04	0x01 0x02 0x00 0x00	0xda 0x59
Header	Address	Id	Type	Length	Data	CRC

Set first group to percentage control:

0x55 0x55	0x80 0xb0	0x01	0x2a	0x00 0x04	0x00 0x10 0x00 0x00	0x23 0xf8

AirTouch will respond with a 0x2b message.(See next table)

b. Group status message(0x2B)

Sending this message to AirTouch without any data (data length: 0x00 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:

Byte1	Bit8-7	Group power state	00: Off 01: On 11: Turbo
	Bit6-1	Group number	0-15
Byte2	Bit8	control method	1: temperature control, 0: percentage control
	Bit7-1	Open percentage	Current open percentage setting
Byte3	Bit8	Battery low	1: battery low, 0: normal
	Bit7	Turbo support	1: Support turbo, 0: not support turbo
	Bit6-1	Target setpoint	Current target setpoint setting
Byte4	Bit8	Sensor	1: has sensor, 0: no sensor
	Bit7-1		*NOT USED*
Byte5		Temperature (Total: 11Bits)	Byte5=0xff, Not available Current Temperature = (VALUE - 500)/10
Byte6	Bit8-6		
	Bit5	Spill	1: Spill
	Bit4-1		*NOT USED*

If there are more than one group, the data will be repeated with relevant values. E.g. 2 groups will receive 12 bytes data, 3 groups will receive 18 bytes data.

Example:

Request status of groups:

0x55 0x55 0x80 0xb0 0x01 0x2b 0x00 0x00 0xf5 0x2f
Header Address Id Type Length CRC

AirTouch 4 response with data for 2 groups:

0x55 0x55 0xb0 0x80 0x01 0x2b 0x00 0x0c 0x40 0x64 0x00 0x00 0xff 0x00
0x41 0xe4 0x1a 0x80 0x61 0x80 0x65 0x79

Group 1 data:

0x40 0x64 0x00 0x00 0xff 0x00
01000000 01100100 00000000 0*****0 11111111 000*****0**
Current open percentage setting: 100 (1100100 = 0x64)

Group 2 data:

0x41 0xe4 0x1a 0x80 0x61 0x80
01000001 11100100 00011010 1*****0 01100001 100*****0**
Current open percentage setting: 100 (1100100 = 0x64)
Current target setpoint setting: 26(011010 = 0x1a)
Current Temperature: 28, VALUE=780(01100001100 = 0x30c), (780-500)/10 = 28.

c. AC control message(0x2C)

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

4 bytes data (Data length: 0x00 0x04).

Byte1	Bit8-7	Power	00: Keep power state 01: Change on/off state 10: Set to off 11: Set to on
	Bit6-1	AC number	Valid value 0 - 3(000000 – 000011).
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	Bit8-7	Setpoint control type	00: Keep current setpoint 01: Set setpoint to a specific value 10: Setpoint decrease 1℃ 11: Setpoint increase 1℃
	Bit6-1	Setpoint value	Set to 0x3f when bit8-7 in byte3 are not 01.
Byte 4			Keep 0

Example:

Turn off the second AC:

0x55 0x55	0x80 0xb0	0x01	0x2c	0x00 0x04	0x81 0xff 0x3f 0x00	0x1a 0x96
Header	Address	Id	Type	Length	Data	CRC

Set the first AC to cool mode:

0x55 0x55	0x80 0xb0	0x01	0x2c	0x00 0x04	0x00 0x40 0x3f 0x00	0xc2 0x8f

AirTouch will respond with a 0x2d message.(See next table)

d. AC status message(0x2D)

Sending this message to AirTouch without any data (data length: 0x00 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:

Byte1	Bit8-7	AC power state	00: Off 01: On 10/11: Not available
	Bit6-1	AC number	0-3
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	Bit8	Spill	1: Spill active, 0: Spill not active
	Bit7	AC Timer	1: Timer set, 0: Timer not set
	Bit6-1	Target setpoint	Current target setpoint setting
Byte4			*NOT USED*
Byte5		Temperature (Total: 11Bits)	Byte5=0xff, Not available Current Temperature = (VALUE - 500)/10
Byte6	Bit8-6		
	Bit5-1		*NOT USED*
Byte7		Error Code	0 means no error. Other codes mean there is an error about this AC.
Byte8			

If there are more than one AC, the data will be repeated with relevant values. E.g. 2 ACs will receive 16 bytes data, 3 ACs will receive 24 bytes data.

Example:

Request status of ACs:

0x55 0x55	0x80 0xb0	0x01	0x2d	0x00 0x00	0xf4 0xcf
Header	Address	Id	Type	Length	CRC

AirTouch 4 response with data for 2 ACs:

0x55 0x55 0xb0 0x80 0x01 0x2d 0x00 0x10 0x40 0x42 0x1a 0x00 0x61 0x80 0x00 0x00

0x01 0x00 0x1a 0x00 0x61 0x80 0xff 0xfe 0xca 0xcb

AC 0 data:

0x40 0x42 0x1a 0x00 0x61 0x80 0x00 0x00
01000000 01000010 00011010 ****** 01100001 000***** 00000000 00000000**
AC 0 is in cool mode and low fan speed and no error.
Current target setpoint setting: 26(011010 = 0x1a)
Current Temperature: 28, VALUE=780(01100001100 = 0x30c), (780-500)/10 = 28.

AC 1 data:

0x01 0x00 0x1a 0x00 0x61 0x80 0xff 0xfe
00000001 00000000 00011010 ****** 01100001 100***** 11111111 11111110**
AC 1 is off, and error occurred.
Current target setpoint setting: 26(011010 = 0x1a)
Current Temperature: 28, VALUE=780(01100001100 = 0x30c), (780-500)/10 = 28.

e. Extended message(0x1F)

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

This message is only available for console version 1.0.5 and above.

When sending an extended message, **the address should be 0x90 0xb0**. When receiving the date 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.*
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		*NOT USED*
	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		*NOT USED*

	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	
Byte26		Maximum set point	
Byte27	Bit8	Group display option	Group8. 1: show, 0: hide
	Bit7	Group display option	Group7. 1: show, 0: hide
	Bit6	Group display option	Group6. 1: show, 0: hide
	Bit5	Group display option	Group5. 1: show, 0: hide
	Bit4	Group display option	Group4. 1: show, 0: hide
	Bit3	Group display option	Group3. 1: show, 0: hide
	Bit2	Group display option	Group2. 1: show, 0: hide
	Bit1	Group display option	Group1. 1: show, 0: hide
Byte28	Bit8	Group display option	Group16. 1: show, 0: hide
	Bit7	Group display option	Group15. 1: show, 0: hide
	Bit6	Group display option	Group14. 1: show, 0: hide
	Bit5	Group display option	Group13. 1: show, 0: hide
	Bit4	Group display option	Group12. 1: show, 0: hide
	Bit3	Group display option	Group11. 1: show, 0: hide
	Bit2	Group display option	Group10. 1: show, 0: hide
	Bit1	Group display option	Group9. 1: show, 0: hide

***Following data length: Console version 1.2.3 changed from 22 to 24. Added last 2 bytes(Group display option).**

Byte27 and Byte28 are only available for console version 1.2.3 and above. If there is no byte27/28, all groups will be displayed.

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	0x09 0x83
Header	Address	Id	Type	Length	Data	CRC

AirTouch 4 response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x1a 0xff 0x11 0x00 0x16
0x55 0x4e 0x49 0x54 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
0x00 0x00 0x00 0x00 0x04 0x17 0x1d 0x11 0x1f 0x07 0x00 0xdf 0xbc

AC 0 data:

0x00 0x16 0x55 0x4e 0x49 0x54 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
AC0 22 U N I T

0x00 0x00 0x00 0x04 0x17 0x1d 0x11 0x1f 0x07 0x00

0 4 00010111 00011101 17 31 00000111 00000000

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.
Minimum setpoint is 17, maximum setpoint is 31.
Group 1, 2, 3 are visible for this AC. All other groups are invisible.

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 4 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)

This message is only available for console version 1.1.0 and above.

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 16 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 0x90 0xb0 0x01 0x1f 0x00 0x03 0xff 0x12 0x00 0xf9 0x83
Header Address Id Type Length Data CRC

AirTouch 4 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 0x90 0xb0 0x01 0x1f 0x00 0x02 0xff 0x12 0x82 0x0c
Header Address Id Type Length Data CRC

AirTouch 4 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”.

iv. Console Version(0xFF 0x30)

This message is only available for console version 1.1.0 and above.

Sending an extended message with data 0xFF 0x30 to request the version of the console.

Data received from AirTouch:

Byte1		Fixed 0xFF
Byte2		Fixed 0x30
Byte3	Update sign	0-latest version, Other-new version available.
Byte4	Version string length	
Byte5..	Versions	Two consoles separated by “|”. The first one is the master.

If airtouch has two consoles, the first value is the version of the one that communicates with.

Example:

Request Error of AC 0:

0x55 0x55 0x90 0xb0 0x01 0x1f 0x00 0x02 0xff 0x30 0x9b 0x8c
Header Address Id Type Length Data CRC

AirTouch 4 response:

0x55 0x55 0xb0 0x90 0x01 0x1f 0x00 0x1a 0xff 0x30 0x00 0x0b
0x31 0x2e 0x33 0x2e 0x33 0x7c 0x31 0x2e 0x33 0x2e 0x33 0x2c 0x0e

Data:

0xff 0x30 0x00 0x0b 0x31 0x2e 0x33 0x2e 0x33 0x7c 0x31 0x2e 0x33 0x2e 0x33
Latest Len:11 1 . 3 . 3 | 1 . 3 . 3