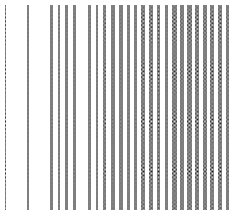


CHINO

IR-AH Series

**IR-AH Communications
(Options)**

(IR-AHS□, IR-AHT□, IR-AHU□)



INSTRUCTIONS

Always keep this instruction with your unit.

Please be sure to deliver this instruction manual with the unit to a final user.

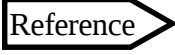
CHINO

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■ Symbols in this instruction manual

The symbols shown below are used depending on important degrees for using the communications safely and avoiding unexpected situations.

Important degree	Symbols	Contents
1		For avoiding injury or in physical damage to the communications.
2		Information that we suggest to read carefully.
3		Information that you can use as a reference.

1. General

This optional communications is for reading measured data, parameters, and storage data of IR-AH series handheld radiation thermometers by a personal computer.

By this communications, parameters cannot be programmed to your thermometer by a personal computer.

Caution

During measurement, any answer to the data being received is not executed due to the speed of the CPU.

2. Communications specifications

■ Start-stop synchronizing system	RS-232C
■ Half-duplex communications system	
■ Transmission speed	9600bps
■ Start bit	1 bit
■ Data length	7 bits
■ Parity bit	Even
■ Stop bit	1 bit
■ Character code	ASCII
■ BCC (Block check code)	None
■ Data transmission procedure	None

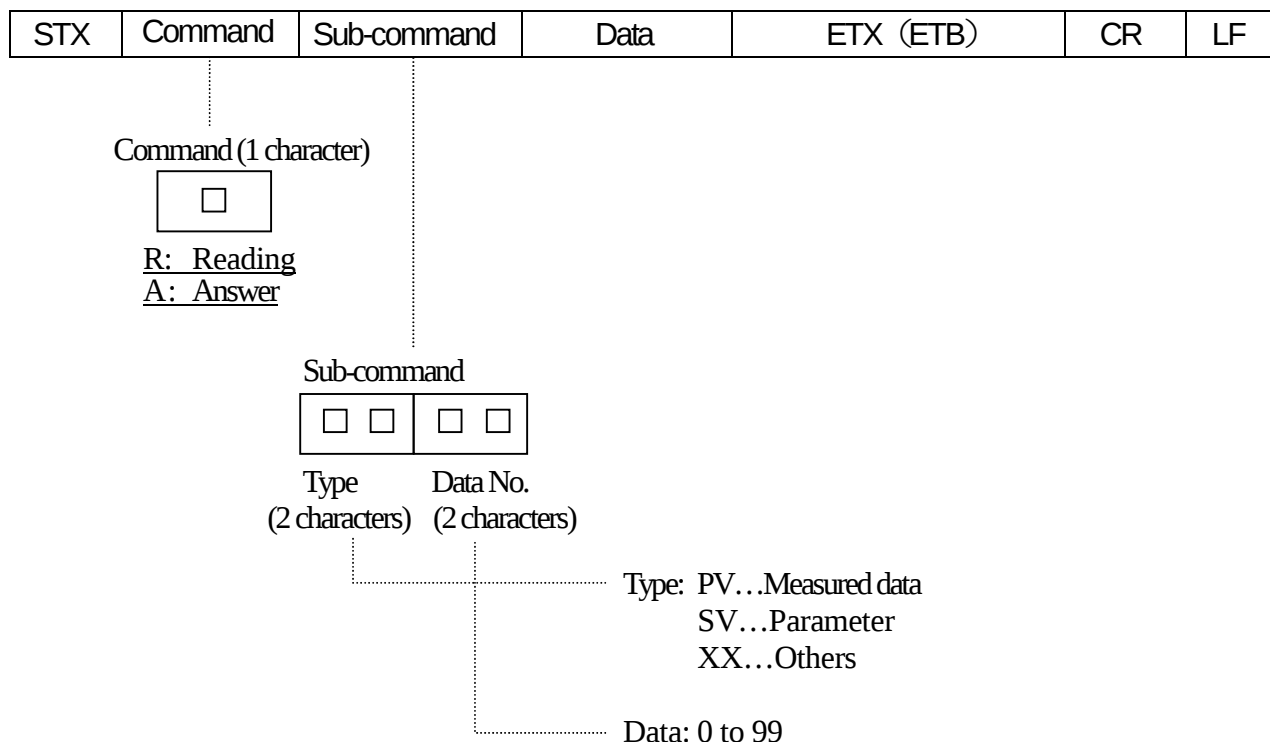
Caution

This communications is only for "Reading" and "Answer".

3. Communications procedures

3.1 Basic communications format

1) Commands



Reference

"ETX" is added when the data is one, or added to the last data when plural data are answered to 1 command.
 "ETB" is added to data before the last data when plural data are answered to 1 command.

Caution

Make sure not to use "BCC code" due to the specifications of CPU and capacities of ROM/RAM.

2) Positive answer

STX	A	Sub-command	=	Data	ETX(ETB)	CR	LF
-----	---	-------------	---	------	----------	----	----

Reference

A sub-command in the "Reading" command returns as the sub-command in the answer.
 This format is applied to the data positively transmitted from your thermometer, too.

3) Negative answer

STX	A	Error code	:	Error data No.	ETX	CR	LF
-----	---	------------	---	----------------	-----	----	----

Reference

Error data No.: First data position (the position counted from the position next to "STX") where an error was detected

3. Communication procedures

3.2 Data expression

Data is expressed by the format with fixed length of character between "=" , "," and "ETX (ETB)".

3.3 Numeric data

Data is characters with fixed length and right justified. (except Para. [4.3.1 Reading model number] with left justified)

Numeric figures exist before and after a decimal point.

The following list is for treatment of positive sign, negative sign, and "0" at receiving and transmitting.

Item	Condition	Contents
Sign	At receiving	Positive sign: " + " or "space (Δ)" is acceptable. Negative sign: " – ". " + " or " – " is placed just left to a numeric figure.
	At transmitting	Positive sign " + " is expressed by "space (Δ)" Negative sign " – " is placed just left to a numeric figure.
"0" at higher digits	At receiving	"0" (zero): "0" or "space (Δ)" is acceptable.
	At transmitting	"0" (zero): Zero-suppressed
Data length	At receiving	Variable length When no data exists, a positive answer returns assuming that no setting is changed.
	At transmitting	Fixed length Refer to [4. Communications format].

Caution

The following data are not acceptable as numeric figures.
 "12Δ3", "-Δ234", "-.123", "123Δ", "123." etc.
 ("Δ" mark means a space.)

3.4 Control code

ASCII commands	ASCII codes
STX	02h
ETX	03h
ETB	17h
LF	0Ah
CR	0Dh

4. Details of format

This followings are the descriptions of the "Command", "Sub-command" and "Data".

Reference

Add control codes when following commands are used for communications items (Refer to [3.1 Basic communications format].)
For numeric data, refer to [3.3 Numeric data].

4.1 PV command

4.1.1 Measured data (1st data: 1 byte, 2nd data: 4 bytes, 3rd data: 5 bytes, 4th data: 5 bytes)

Caution

PV command is not for reading. Data is transmitted from your thermometer positively.

Reference

In the standard measurement of your thermometer, PV command is transmitted at the releasing **Meas** key.
In the continuous measurement, PV command is transmitted at every display renewals.

APV01=□, □□□□, □□□□□, □□□□□

◆ 1st data: Data status

- 0: Normal
- 1: Overflow
- 2: Underflow
- 3: Hardware abnormal

◆ 2nd data: Emissivity

Integer: 1 digit, Decimal point: 1 digit, Decimal: 2 digits
Range : 0.01 to 1.99

◆ 3rd data : Temperature data

For less than 300°C or 300°F :
Integer : 3 digits, Decimal point: 1 digit, Decimal : 1 digit

Reference

If the integral includes a sign, it becomes 2 digits.

For 300°C or 300°F or more : Integer: 4 digits

Reference

A space is inserted in the most significant digit.
When the data status is "1" or "2", "99999" is inserted.

◆ 4th data : Not using

Caution

This is a dummy data.
"99999" is inserted as the dummy data.

4. Details of format

4.2 SV command

4.2.1 Alarm setpoint values (1st data: 5 bytes, 2nd data: 5 bytes)

Reading

RSV02

ASV02=□□□□□, □□□□□

◆ **1st data: High alarm setpoint value**

Integer: 4 digits

Range

IR-AHT□ : -49 to 1000°C (-57 to 1832°F)

IR-AHS□ : 601 to 3000°C (1114 to 5432°F)

IR-AHU□ : 901 to 3000°C (1654 to 5432°F)

◆ **2nd data : Low alarm setpoint value**

Integer: 4 digits

Range

IR-AHT□ : -50 to 999°C (-58 to 1832°F)

IR-AHS□ : 600 to 2999°C (1112 to 5431°F)

IR-AHU□ : 900 to 2999°C (1652 to 5431°F)

Reference

A space is inserted in the most significant digit of "High alarm setpoint value" and "Low alarm setpoint value".

Remarks

Each setpoint value is of 5 bytes.

4.2.2 Emissivity (Data: 4 bytes)

Reading

RSV51

ASV51=□□□□

◆ **Emissivity**

Integer: 1 digit, Decimal point: 1 digit, Decimal: 2 digits

Range : 0.01 to 1.99

4.2.3 Signal modulation mode (Data: 1 byte)

Reading

RSV61

ASV61=□

◆ **Signal modulation mode**

Integer: 1 digit

Range : 0 to 3

0 : Real

1 : Peak

2 : Delay

3 : Valley

4. Details of format

4.2.4 Modulation ratio (Data: 4 bytes)

Reading

RSV62

ASV62=

◆ **Modulation ratio**

Integer: 2 digits, Decimal point: 1 digit, Decimal: 1 digit

Range : -0.1 to 99.9

Caution

When "Hold" is programmed in your thermometer, the data becomes "-0.1".

4.2.5 Measurement unit (Data: 1 byte)

Reading

RSV91

ASV91=

◆ **Measurement unit**

Integer: 1 digit

0 : °C

1 : °F

4. Details of format

4.3 XX command

4.3.1 Model number (Data: 6 bytes)

Reading

RXX01

AXX01=□□□□□□

◆ Model number

IR-AHT□ : For IR-AHT

IR-AHS□ : For IR-AHS

IR-AHU□ : For IR-AHU

4.3.2 ROM version (Data: 5 bytes)

Reading

RXX02

AXX02=□□.□□

◆ ROM version

Integer: 2 digits, Decimal point: 1 digit, Decimal: 2 digits

(Example) Δ 1.00

4.3.3 Number of storage data (Data: 4 bytes)

Reading

RXX81

AXX81=□□□□

◆ Number of storage data

Integer: 4 digits

Range : 0 to 1000

Reference

Number of temperature data stored in your thermometer returns at communications.

4. Details of format

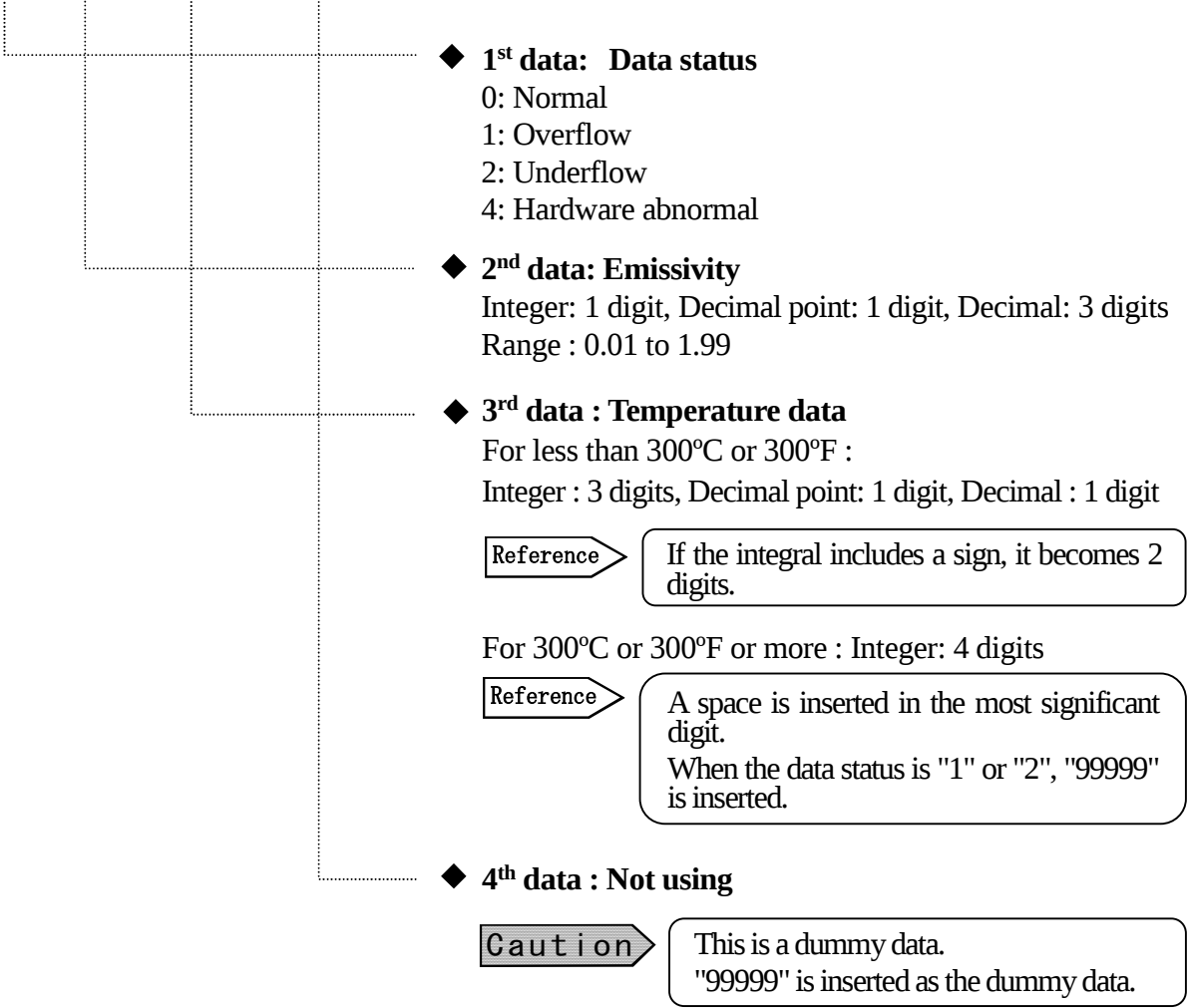
4.3.4 Stored temperature data (1st data: 1 byte, 2nd data: 4 bytes, 3rd data: 5 bytes, 4th data: 5 bytes)

By receiving the command, all data in order of storage are transmitted at intervals of 0.4 second.
Data before the last data is finished with "ETB" and the last data is finished with "ETX".
When any temperature data is not stored in your thermometer, the error command "A9999:0000" returns.

Reference

Even when a communications error is happened, you are required to receive all data up to the last data.
However, when “Break” is detected, the communications is cancelled.

RXX82
AXX82=□, □□□□, □□□□□, □□□□□ EB
AXX82=□, □□□□, □□□□□, □□□□□ EB
.
.
.
AXX82=□, □□□□, □□□□□, □□□□□ EB
AXX82=□, □□□□, □□□□□, □□□□□ EX



5. Error codes

Error No.	Error contents	Error answer
		Error code: Error data No.
1	Framing error	A0001 : 0000
2	Overrun error	A0002 : 0000
3	Parity error	A0003 : 0000
10	Command error (Undefined numbers other than R, PV, SV, XX)	A0010 : ****
14	"ETX" missing	A0014 : 0000
15	Receiving buffer overflow	A0015 : 0000
31	Data not stored	A0031 : 0000
32	Data not stored by EEPROM error	A0032 : 0000
9999	Other errors	A9999 : 0000
0	Positive answer except data reading at adjustment on shipment	A0000 : 0000

Reference

Asterisks "****" are filled with an error data position (the position counted from the position next to "STX").
If CRLF as a delimiter for data is not detected, the error code "9999" returns.

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