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FLUKE Biomedical
INCUII User Communication Interface

Version 1.0   05/06/2020

COM PORT SETTINGS
Settings for the COM port should be made by the program that opens and uses the COM port such as a terminal emulation program (HyperTerminal, Tera Term or other). The settings in Device Manager are usually irrelevant because they are overridden by the controlling program.

The COM port should be set to:
- 115,200 baud
- No parity
- 8 data bits
- 1 stop bit

READING FORMATS

1. Readings do not have leading zeroes, except when preceding the decimal point.
2. All reading values are preceded by a letter that specifies the type of reading.
3. The table below summarizes the reading formats.

Test	Character preceding reading value	Maximum number of digits before decimal point	Number of decimal places	Example
Air Convection Temperature	Txx.xx,yy.yy,zz.zz, uu.uu, ww.ww	3	2	"T22.33,22.52,22.12,22.32,22.15" For channels that are not connected do not return value. For example, if ch2 and ch3 are not connected, the return would be : "T22.33,,,22.12,22.15"
Humidity	H	3	1	"H99.1"
Sound	S	3	2	"S45.3"
Airflow	A	1	2	"A1.41"
Conduction Temperature	Rxx.xx,yy.yy,zz.zz, uu.uu, ww.ww	2	2	"R22.33,22.52,22.12,22.32,22.15" For channels that are not connected do not return value. For example, if ch3 is not connected, the return would be : "R22.33,22.52,,22.12,22.15"
K-type temperature	K	2	2	K23.45
Skin temperature	N	2	2	N25.33

Reading Formats

COMMAND SPECIFICATIONS

Unless specified otherwise:
- Commands return *****.

GENERAL COMMANDS

IDENT	Ask for the instrument identification and firmware version.
Legal modes:	All modes
Returns:	Model number: **INCUII**, followed by comma, followed by firmware version number, including build for example: "**INCUII,1.00.06**"

SN	Ask for instrument serial number.
Legal modes:	All modes
Returns:	Product serial number (alpha-numeric up to 10 characters). If no serial number is defined, returns "none".

RESET	Reset the instrument.
Legal modes:	All modes
Returns:	Does not return *, once reset the normal power on response is sent.

LOCAL	Go to Local control mode.
Legal modes:	**RMAIN**
Returns:	**LOCAL**

REMOTE	Go to Remote control **RMAIN** mode.
Legal modes:	**LOCAL**
Returns:	**RMAIN**

QMODE	Query the mode.
Legal modes:	All modes
Returns:	The Remote mode mnemonic per table above.

MEASUREMENT COMMANDS

Legal in **RMAIN, CAL** and **DIAG** Remote modes, unless power up error condition is present and unhandled:

SMPRATE=_param_	Set sampling time.
param	sampling time: 20 sec to 120 seconds (increments of 10 seconds)

SNSGRP=_param1, param2, param3, param4, …, all_	Set measurement sensor group. T1-5: Air convection temperature sensors H: Humidity K: K-type thermocouple S: Sound N: Skin temperature sensor R1-5: radiant warmer sensor Example: SNSGRP=T1, T2, H, S By sending the command above, the unit identifies these tests as one group and based on the sampling rate of the tests it will send out data to the COM port based on this info. When START command is sent, the unit starts sending results as one result group where readings are separated by ,. For example, if sampling rate for the test is 20 seconds, after START is sent, the unit will send result packet every 20 seconds: 25.3,24.9,75.1,65.2 After 20 seconds 25.4, 24.6, 75.2,65.3 … When ready to finish this test, send END
param	T1, T2, T3, T4, T5, H, S, A, K, N, R1, R2, R3, R4, R5

START	Start readings from measurement sensor group and send to COM port.

END	End readings from measurement sensor group.

SETTUNIT=_param_	Set temperature unit.
param	Temperature unit: F or C

SETAFUNIT= _param_	Set air flow unit.
param	Air flow unit: FT or MT

QTUNIT	Query temperature unit.
Returns	Temperature unit: F or C

QAFUNIT	Query air flow unit.
Returns	FT or MT

TEMPERATURE COMMANDS

QATEMP=ch1, ch2, ch3 , ch4, ch5	Select air convection temperature measurement.
ch	Temperature channel There are 5 different temperature sensor and the user should be able to retrieve data using this command. For example, QATEMP = 1 will return the temperature reading for channel 1. QATEMP = 2 will return the temperature reading for channel 2. And so on Also, QATEMP =1,2,3 will return the temperature readings for channel 1,2,3. In this case, 25.3,25.5, 25.2 will be returned. QATEMP =4,5 will return the temperature readings for channel 4 and 5. In this case, 25.6, 25.7 will be returned. And so on.
Returns	Air convection temperature measurement for each specified channel.

QCTEMP=ch1, ch2, ch3 , ch4, ch5	Select conduction temperature measurement.
ch	Temperature channel
Returns	Conduction temperature reading for each specified channel.

HUMIDITY COMMANDS

QRHUM	Take humidity measurement.
Returns	Humidity reading.

SOUND COMMANDS

QSOUND	Take sound measurement.
Returns	Sound reading.

AIRFLOW COMMANDS

QAFLOW	Take air flow measurement.
Returns	Air flow reading.

SKIN TEMPERATURE

QSKTEMP	Take skin temperature measurement.
Returns	Skin temperature reading.