Solidyne

M2-HH Hand Held Commissioning/Air Balancing Tool

The M2-HH is a device that is to be used with the M2 family of controllers to adjust and configure certain parameters within the controller that it is attached to. It's primary use will be to configure network parameters such as Node ID, baud rate, date/time etc. When attached to the M2V controllers, the M2-HH becomes a VAV box balancing tool when the balancer can easily adjust parameters of the M2V controller to properly commission and balance the VAV box. The tool also has the ability to manually "force" inputs and outputs to any desired value so that diagnosis and system commissioning can be done easily.

Specifications

Input Power: Supplied by M2 controller
Operating Temperature: +23°F to +150°F (-5°C to +66°C)
Storage Temperature: -40°F to +230°F (-40°C to +110°C)
Operating Humidity: 10 to 95 %RH non-condensing
Storage Humidity: 10 to 95 %RH non-condensing
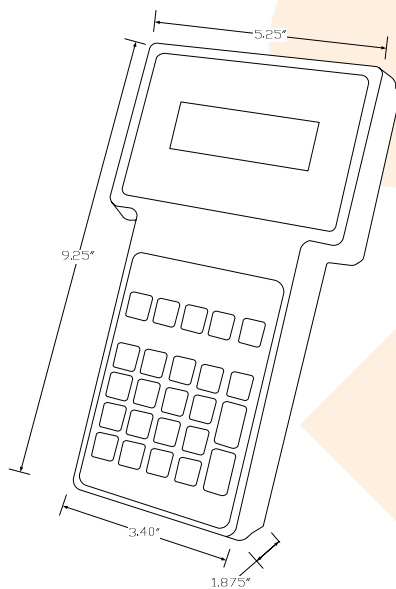
Physical Dimensions

Figure 1

Wiring

The M2-HH is wired to an M2 family controller via the CAT-5 connection on the top of the device. This method uses any straight through CAT-5 cable. See figure 2 for the proper RJ-45 crimping polarity. One end of the CAT-5 cable terminates into the RJ-45 terminal on the top of the M2-HH. The other end will terminate into the middle M2 RJ-45 female connector. See Figure 3, Method 1.

This connection is intended to be temporary so that the user can configure the necessary parameters of the controller and then disconnect the M2-HH from the controller.
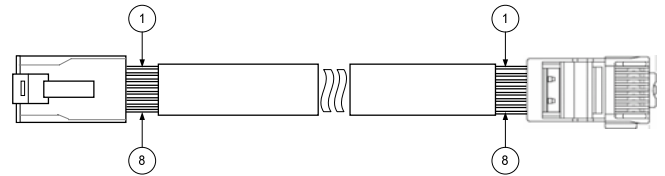

Figure 2

The M2-HH can also be attached to the controller via the WTS family of wall temperature sensors. Each of the WTS devices has a small connector on the bottom that allows the M2-HH to connect to the controller through the WTS sensor. Each M2-HH is shipped with this special cable where one end is CAT-5 and the other is the male connector for connecting to the WTS sensors. This method is primarily useful for VAV box commissioning where the M2-HH can be attached to the M2V controller through the zone sensor. See Figure 3, Method 2.

NOTE: WTS devices must be connected to the controller via CAT-5 cabling to allow the M2-HH to properly connect to the controller.
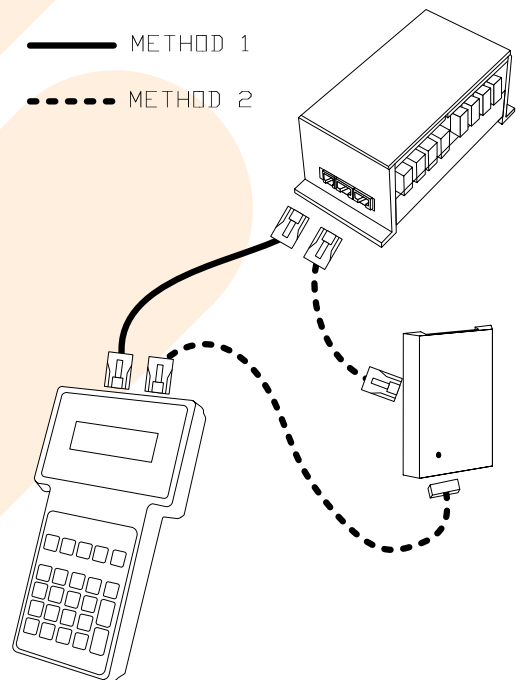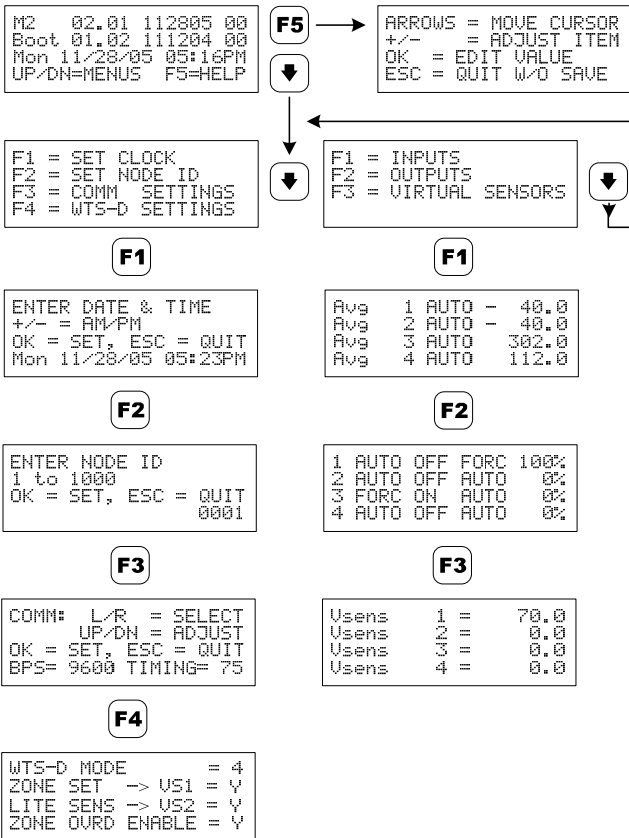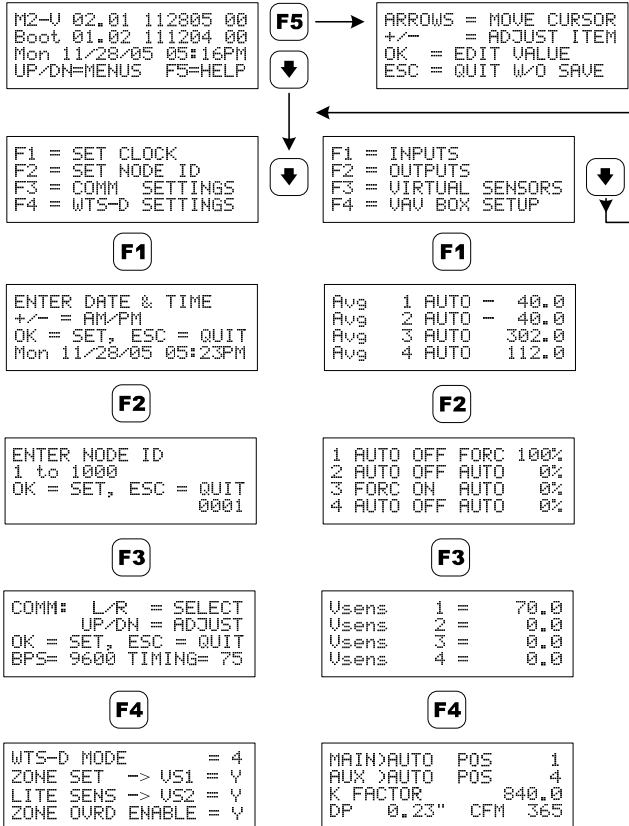

Figure 3

M2 Menu Reference Guide

```
M2   02.01 112805 00
Boot 01.02 111204 00
Mon 11/28/05 05:16PM
UP/DN=MENUS  F5=HELP
```
[F5] →
```
ARROWS = MOVE CURSOR
+/-    = ADJUST ITEM
OK   = EDIT VALUE
ESC = QUIT W/O SAVE
```
[↓]

```
F1 = SET CLOCK
F2 = SET NODE ID
F3 = COMM  SETTINGS
F4 = WTS-D SETTINGS
```
[↓]
```
F1 = INPUTS
F2 = OUTPUTS
F3 = VIRTUAL SENSORS
```
[↓]

[F1]
```
ENTER DATE & TIME
+/- = AM/PM
OK = SET, ESC = QUIT
Mon 11/28/05 05:23PM
```

[F1]
```
Avg   1 AUTO -  40.0
Avg   2 AUTO -  40.0
Avg   3 AUTO   302.0
Avg   4 AUTO   112.0
```

[F2]
```
ENTER NODE ID
1 to 1000
OK = SET, ESC = QUIT
                0001
```

[F2]
```
1 AUTO OFF FORC 100%
2 AUTO OFF AUTO   0%
3 FORC ON  AUTO   0%
4 AUTO OFF AUTO   0%
```

[F3]
```
COMM:  L/R = SELECT
       UP/DN = ADJUST
OK = SET, ESC = QUIT
BPS= 9600 TIMING= 75
```

[F3]
```
Vsens   1 =    70.0
Vsens   2 =     0.0
Vsens   3 =     0.0
Vsens   4 =     0.0
```

[F4]
```
WTS-D MODE       = 4
ZONE SET  -> VS1 = Y
LITE SENS -> VS2 = Y
ZONE OVRD ENABLE = Y
```

M2V Menu Reference Guide

```
M2-V 02.01 112805 00
Boot 01.02 111204 00
Mon 11/28/05 05:16PM
UP/DN=MENUS  F5=HELP
```
[F5] →
```
ARROWS = MOVE CURSOR
+/-    = ADJUST ITEM
OK   = EDIT VALUE
ESC = QUIT W/O SAVE
```
[↓]

```
F1 = SET CLOCK
F2 = SET NODE ID
F3 = COMM  SETTINGS
F4 = WTS-D SETTINGS
```
[↓]
```
F1 = INPUTS
F2 = OUTPUTS
F3 = VIRTUAL SENSORS
F4 = VAV BOX SETUP
```
[↓]

[F1]
```
ENTER DATE & TIME
+/- = AM/PM
OK = SET, ESC = QUIT
Mon 11/28/05 05:23PM
```

[F1]
```
Avg   1 AUTO -  40.0
Avg   2 AUTO -  40.0
Avg   3 AUTO   302.0
Avg   4 AUTO   112.0
```

[F2]
```
ENTER NODE ID
1 to 1000
OK = SET, ESC = QUIT
                0001
```

[F2]
```
1 AUTO OFF FORC 100%
2 AUTO OFF AUTO   0%
3 FORC ON  AUTO   0%
4 AUTO OFF AUTO   0%
```

[F3]
```
COMM:  L/R = SELECT
       UP/DN = ADJUST
OK = SET, ESC = QUIT
BPS= 9600 TIMING= 75
```

[F3]
```
Vsens   1 =    70.0
Vsens   2 =     0.0
Vsens   3 =     0.0
Vsens   4 =     0.0
```

[F4]
```
WTS-D MODE       = 4
ZONE SET  -> VS1 = Y
LITE SENS -> VS2 = Y
ZONE OVRD ENABLE = Y
```

[F4]
```
MAIN>AUTO  POS    1
AUX >AUTO  POS    4
K FACTOR        840.0
DP  0.23"  CFM  365
```

WTS-D Settings

The M2-HH is used to configure and setup the WTS-D wall temperature sensors. Please reference the WTS-D tech/datasheet for more information.

Forcing Input/Output Values

The M2-HH has the ability to manually "force" any Input (Average or Instantaneous) or Output (Digital or Analog) to any desired value. When an input or output is put into forced mode, the user can choose any value for that point. This is very useful for testing you control program and also for on site commissioning of control sequences. Forcing a value into an input or output will stay in that position until the force has been removed from the point.

Forcing Input Values

To change an input value to any desired value, you will need to select F1 from the second menu to first view the input you would like to force to a different value. All inputs will be in AUTO mode by default. To change them from AUTO to FORC mode, just select the input you would like to force by using the UP and DOWN arrows, then push the +/- button to toggle the input from AUTO to FORC. After the value has been changed to FORC, then you can push the RIGHT ARROW button, then the OK button. This will bring up a menu for you to select the forced value of the input. After the forced value has been entered, push the OK button to complete the forced value. Keep in mind the M2 inputs have an average (Avg) and an instantaneous (Ins) value which can be forced individually. To access the instantaneous values, continuing to select the DOWN ARROW button will bring you to the 3rd and 4th inputs page which displays the instantaneous values.

Forcing Output Values

To change an output value to any desired value, you will need to select F2 from the second menu to first view the output you would like to force to a different value. All outputs will be in AUTO mode by default. To change them from AUTO to FORC mode, just select the output and type you would like to force by using the UP/DOWN, LEFT/RIGHT arrows, then push the +/- button to toggle the input from AUTO to FORC. After the value has been changed to FORC, then you can push the RIGHT ARROW button, then the +/- button to change the ON/OFF value of the digital output. When forcing the analog output value, use the +/- button change the analog output to FORC, then push the RIGHT ARROW button, then the OK button. This will bring up a menu for you to select the forced value of the analog output from 0-100%. After the forced value has been entered, push the OK button to complete the forced value.

VAV Box Setup

The M2-HH is also a VAV box balancing tool which calibrates the onboard flow sensor. This is done through entering the amount of CFM at 1″ W.C. for the VAV box you are balancing into the K Factor field on the M2-HH. The VAV box setup page also displays the Main and Aux actuator control points, the actuators position (if actuator has feedback), actual flow sensor DP and the current calculated CFM. There are 3 items that can be changed in this menu. Both the Main and Aux actuators CW and CCW outputs can be toggled by pushing the +/- button. There are 4 override modes for this feature; AUTO, OFF, CW, CCW, which can be toggled through by pushing the +/- button repeatedly. The amount of CFM at 1″ W.C. value must be entered into the K Factor field by pushing the OK button. Please see the M2-FS Application Note and M2-FS tech/datasheet for more information.