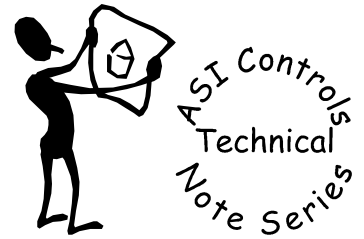




Wet Bulb Calculation

Affects: ASIC/2 Controllers

Date: May 26, 2000



Note No. TE-019

The ASIC/2 Controller series is very versatile. We have added many features that allow for calculations of all types. From time to time we are asked to create a function that will calculate web bulb temperature. This is not necessary because using the laws of psychrometrics and a few function objects we can create the calculation quite easily.

The configuration diagram shows an example of calculating the outdoor wet bulb temperature. You will need to know the outdoor dry bulb temperature and the outdoor relative humidity.

Outdoor temperature and the outdoor relative humidity are brought into the function object to calculate the outdoor enthalpy. Psychrometrics tells us that the wet bulb temperature is the temperature that the air would be with the same enthalpy at 100% relative humidity.

Figure 1 shows an example of wet bulb derivation using the psychrometric chart.

Outdoor Dry Bulb: 73 Deg F

Outdoor Relative Humidity: 20%

Enthalpy (as derived from the chart): 21.3 Btu/lbm

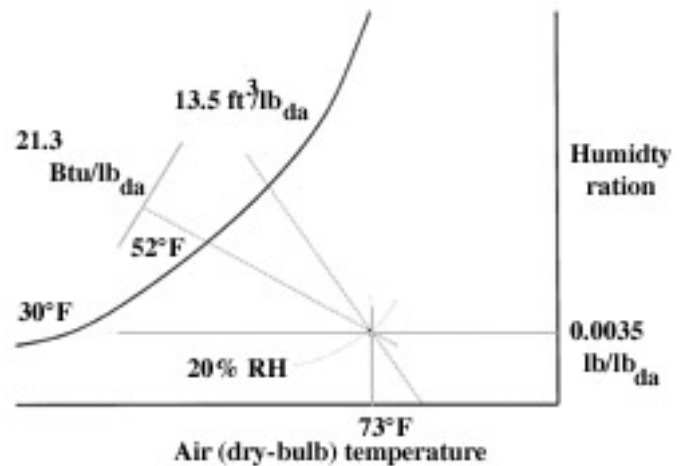


Fig 1. Wet Bulb Illustration

This navigation of the psychrometric chart is duplicated in the controller by using a look-up table matching enthalpies with temperatures at 100% RH.

NOTE: The example is for a Barometric Pressure of 29.92 inches of Mercury. Both the enthalpy function and look-up table will need to be modified for any other Barometric Pressure.

Modifying the Look-up Table

Device Address: 32109 Firmware: 840c v1.5 Fri 5/26/00 10:23:11
 Description: Wet Bulb Calculation

Enthalpy Calculation Look Up Conversions UTL- Index 2

Instance Name: 100% Enthalpy Lookup

Number of Pairs:	Enthalpy Input	Temperature Output
16	11.65	32.00
	13.83	37.00
	16.12	42.00
	18.63	47.00
	21.36	52.00
	24.43	57.00
	27.83	62.00
	31.56	67.00
	35.85	72.00
	40.38	77.00
	46.01	82.00
	51.88	87.00
	58.88	92.00
	66.55	97.00
	75.36	102.00
	85.64	107.00

Outdoor Temp (INP-00)
 84.97 F
 Input OR Status: No

Outdoor RH (INP-01)
 75.0 %
 Input OR Status: No

Enthalpy (FUN-00)
 42.05 BTU/lbm

Barometric Press. (FUN-00)
 29.92 in. Hg

ASIC/2-8040 Configuration View (ASI Controls, 1998)

Fig 2. Wet Bulb Calculation PVS

Figure 2 shows the 3rd view of the Wet Bulb Calculation PVS. From here one can modify the look-up table for different barometric pressures.

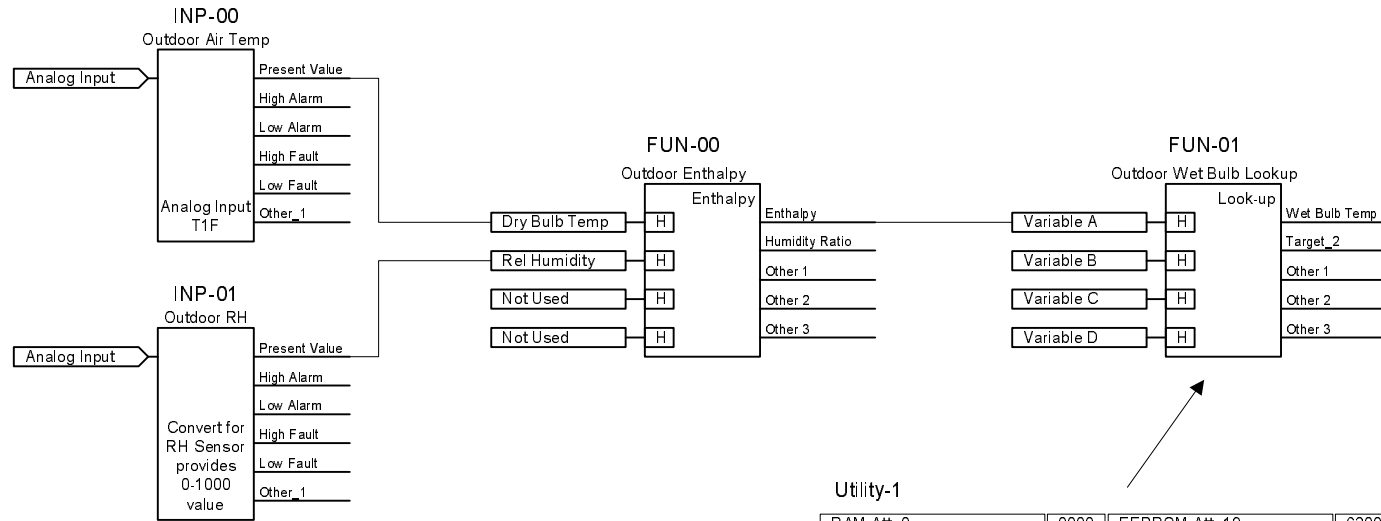
Step-by-step:

1. Change the Barometric Pressure to desired setting
2. Override both inputs
3. Set the Outdoor RH to 100%
4. Modify the Temperature value and enter the new Enthalpy

Example:

Change Barometric Pressure to 31.50. Override both inputs. Set the RH value to 100.0. Now set the Temperature to 32.00 (the first entry in the *Temperature Output* column). Enter the Enthalpy into the first entry in the *Enthalpy Input* column. In this example 11.65 would be replaced with 11.44. Continue on through 107.00.

Wet Bulb Calculation



Utility-1

RAM Att-0	0000	EEPROM Att-19	6200
RAM Att-1	0000	EEPROM Att-20	3156
RAM Att-2	0000	EEPROM Att-21	6700
RAM Att-3	0000	EEPROM Att-22	3585
RAM Att-4	0000	EEPROM Att-23	7200
EEPROM Att-5	16	EEPROM Att-24	4038
EEPROM Att-6	1165	EEPROM Att-25	7700
EEPROM Att-7	3200	EEPROM Att-26	4601
EEPROM Att-8	1383	EEPROM Att-27	8200
EEPROM Att-9	3700	EEPROM Att-28	5188
EEPROM Att-10	1612	EEPROM Att-29	8700
EEPROM Att-11	4200	EEPROM Att-30	5888
EEPROM Att-12	1863	EEPROM Att-31	9200
EEPROM Att-13	4700	EEPROM Att-32	6655
EEPROM Att-14	2136	EEPROM Att-33	9700
EEPROM Att-15	5200	EEPROM Att-34	7536
EEPROM Att-16	2443	EEPROM Att-35	10200
EEPROM Att-17	5700	EEPROM Att-36	7536
EEPROM Att-18	2783	EEPROM Att-37	10700
		EEPROM Att-38	0000



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Project Description

DRAWN BY	DAVET	DATE	5/25/00
		REVISED	5/25/00
FILENAME	19-WET BULB CALC.VSD	PAGE	1 OF 1