PWM Input to Voltage Output Transducer

Model : PWM-1

Descriptions

The PWM-1 is a signal converter which takes a pulsed binary input signal and outputs a voltage signal proportional to the duration of the pulse. The device allows controllers with only relay outputs to connect to field devices such as modulating dampers, valves and variable speed drives. The output signal can be modulated with precision of one-tenth of a volt. The device has an RS485 port for integrating over Modbus RTU and Bacnet MSTP, all settings and the current state of the inputs and outputs are visible as Modbus registers or Bacnet objects. Each output has a manual hand-off-auto switch which allows the installer and building operator to override the software settings for field testing and overrides. The voltage which is output in manual mode can be adjusted when in manual mode so you can effectively command the output to any state from fully open to fully closed using the hand-off-auto switch and potentiometer.

The device can be firmware updated in the field over the RS485 port and source code is available on github if you care to add your own firmware features.

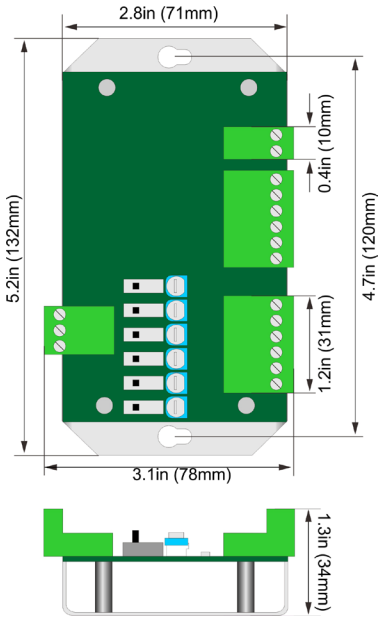
The inputs are in fact universal inputs which can be software configured to operate over a number of ranges, including on-off and other binary modes as well as 10k thermistor mode, type 2 and 3 for monitoring temperatures.

The outputs similarly can be configured to a number of custom ranges besides the usual 0-10V modulating output they can be set to operate as binary on-off outputs. The current drive of the analog outputs is 100ma @10 volts which is enough to drive many typical 12VDC relays. Effectively this unit can be used as generic Modbus and bacnet i/o for integration with systems such from Siemens, Honeywell, Tridium, Kreuter and Delta to name a few.

Features

Highlights:

- 6 Universal Inputs
- 6 Analog outputs
- Converts relay outputs to analog outputs.
- Use with PLC’s to manage modulating dampers, valves and VFD’s.
- RS-485 port supports both Modbus RTU and Bacnet MSTP protocols
- Use as generic Modbus/bacnet i/o for integration with popular DDC systems.



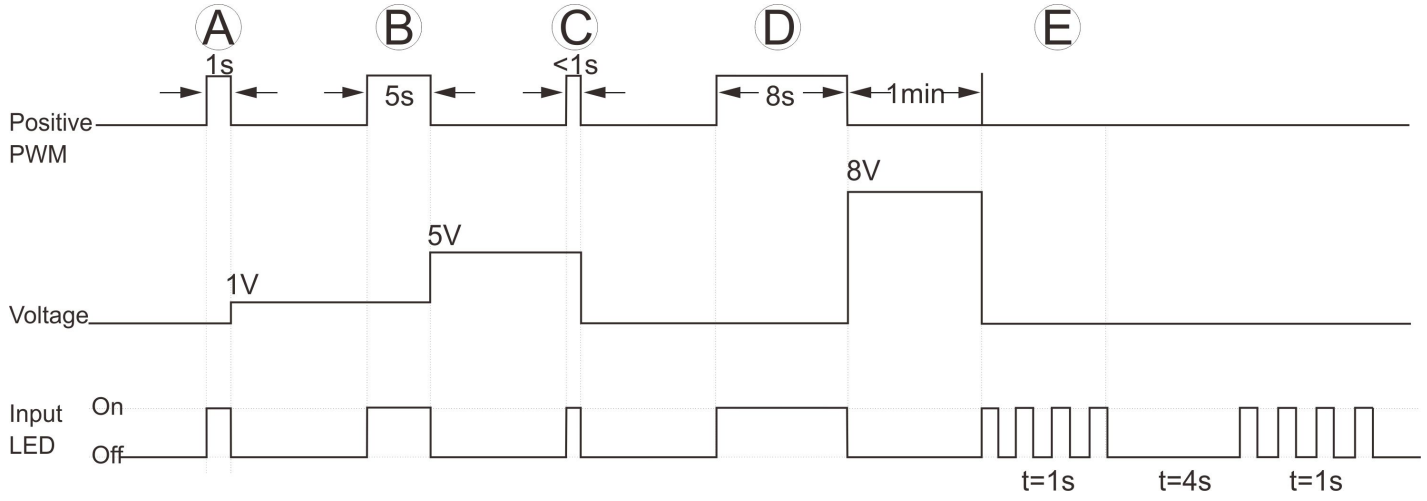
Applications:

- Pulse to Analog Transducer
- Interface to Electric Actuator
- Drive Variable Speed Pump Control
- Drive Variable Frequency Fan Control
- Dial potentiometer for manual override of output

Specifications

Power (Voltage) / Max Power	15-24V AC/DC / 2W
Operating Temperature	32 to 120°F (0 to 49°C)
Storage Temperature	-20 to 150°F (-29 to 65°C)
Operating Humidity	0% to 95% non-condensing
Accuracy	±0.1V
Status Indicators	Red LED - variable intensity to indicate output voltage, dim light indicates 1V and bright light indicates10V. Input LED provides direct status of PWM signal.
Input Specifications	Maximum input voltage is 24V AC/DC. Unit accepts positive or negative AC or DC signal, with a 50-60Hz frequency range. PWM integrator slow rate is at 1V/sec i.e. 10 seconds for 10V. Refresh must be once per 60 seconds otherwise output will failsafe to 0V and input LED for the channel will flash 4 times per second as a fault indicator. If PWM signal is less than 1 second, output is set to 0V.

Note:
Input Specifications



A) A 1 second input pulse produces a 1 volt output voltage at the end of the input pulse. The input LED is on for the duration of the input pulse (1 second).

B) A 5 second input pulse results in a 5 volt output voltage with the input LED on during the 5 second input pulse.

C) An input pulse less than 1 second produces an output voltage of 0 volts. The input LED correlates to the input signal.

D) Output voltage changes to 8 volts at the end of an 8 second input pulse. The input LED remains on for the 8 second pulse.

E) After a period of 60 seconds with no input pulse the output voltage faults to 0 volts and the input LED begins a fault cycle of 4 pulses per second followed by 4 second off period. This 5 second fault cycle will repeat until an input signal occurs.

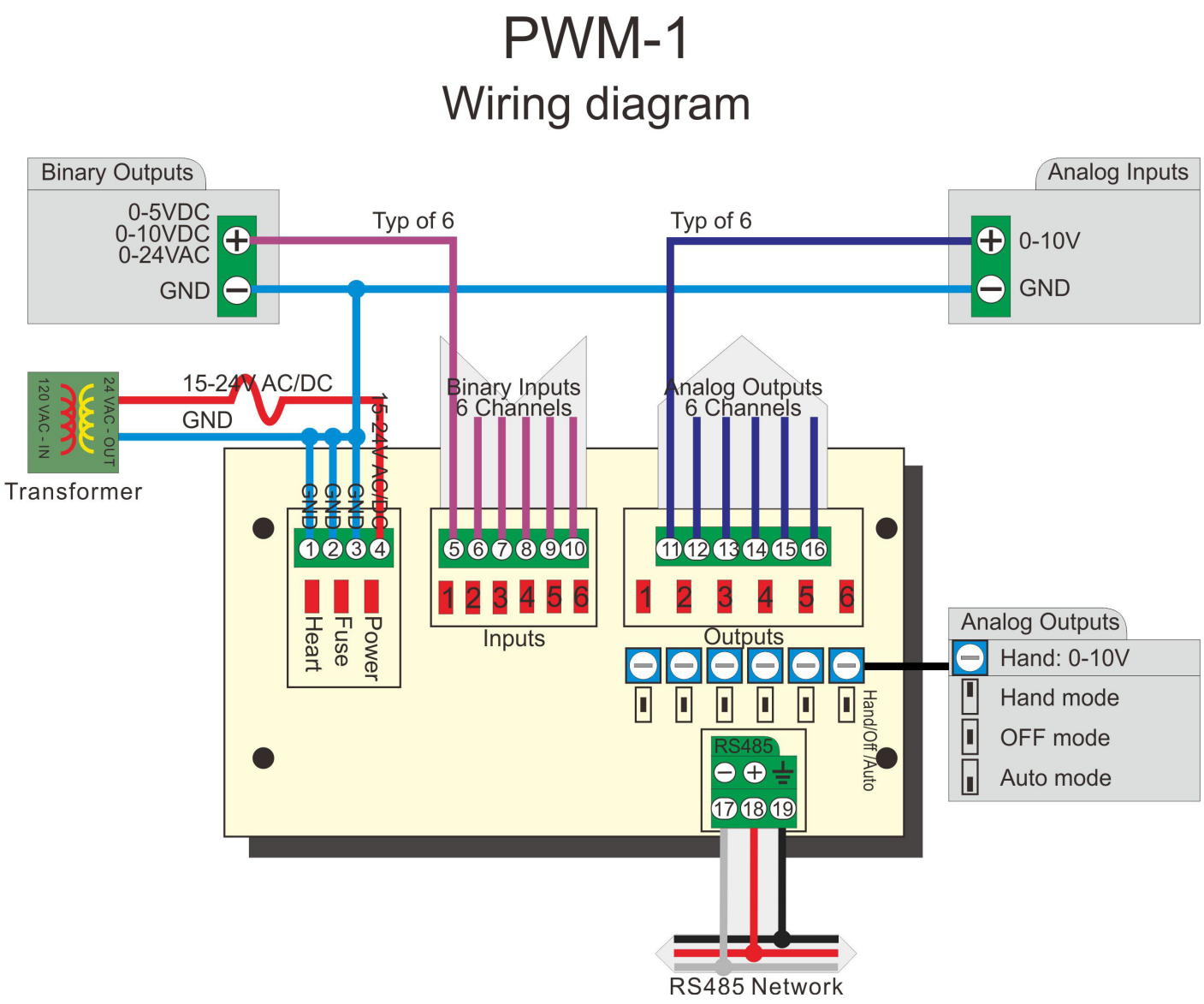
Wiring Diagram

Follow the PWM-1 wiring diagram below.

There are six output channels which can be selected by the switch : hand/ off/ auto. When the switch is at hand, the corresponding output can be adjusted by potentiometer, and the output range is 0-10V. When the switch is at off, the corresponding output is 0V. When the switch is at auto, the output is decided by the corresponding input from the PWM duty cycle.

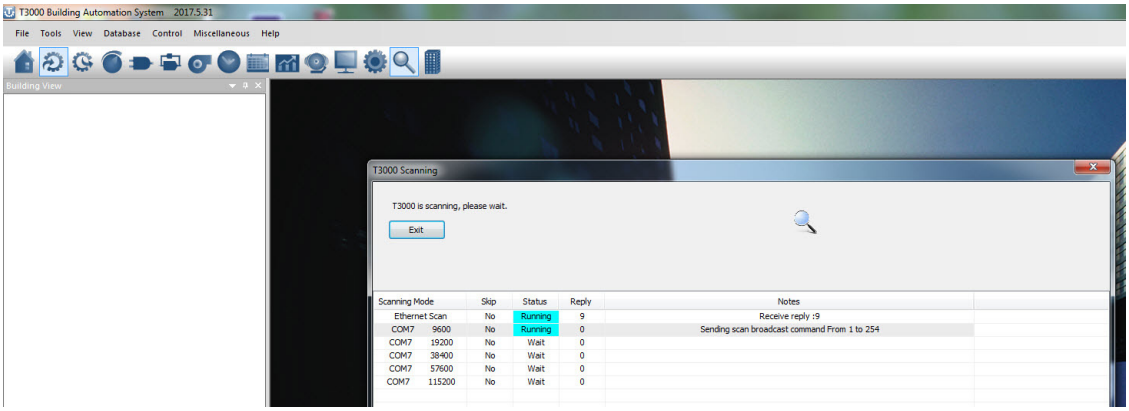
There are six binary input channels, and the input voltage types are 5VDC, 10VDC, and 24VAC. No jumper is required, the unit will auto detect the signal type.

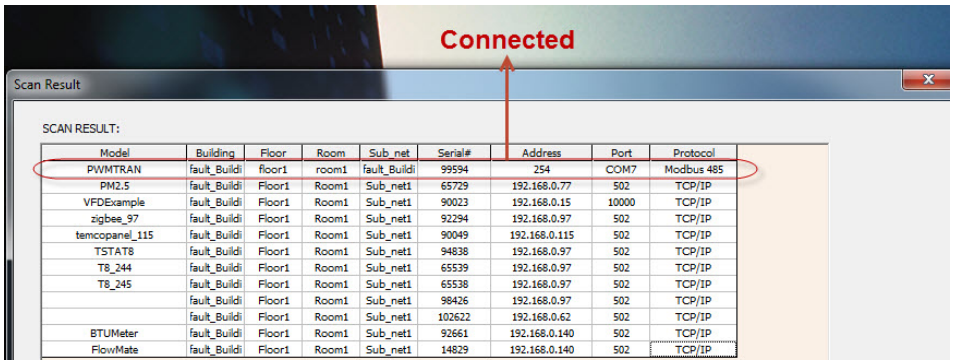
Analog Output/ Switch	Hand	Adjusted by potentiometer, and the output range is 0-10V
	Off	The corresponding output is 0V
	Auto	The output is decided by the corresponding input from the PWM duty cycle
Binary Input	Voltage supports 0-5VDC, 0-10VDC, and 0-24VAC	



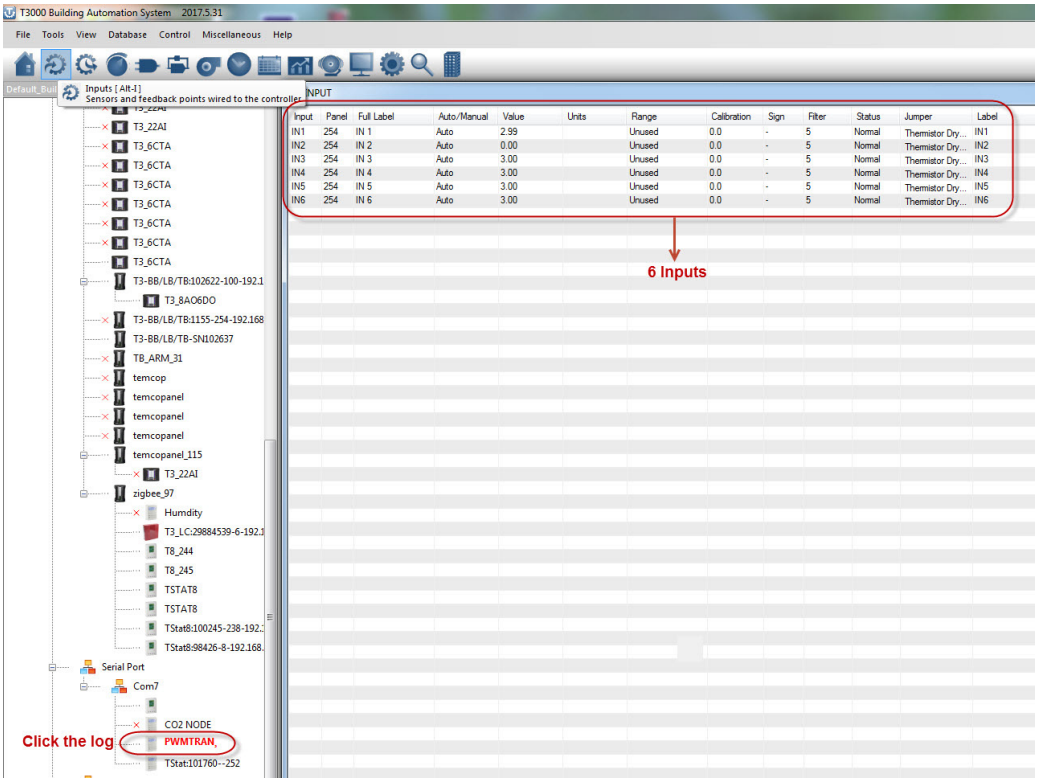
T3000 Operation

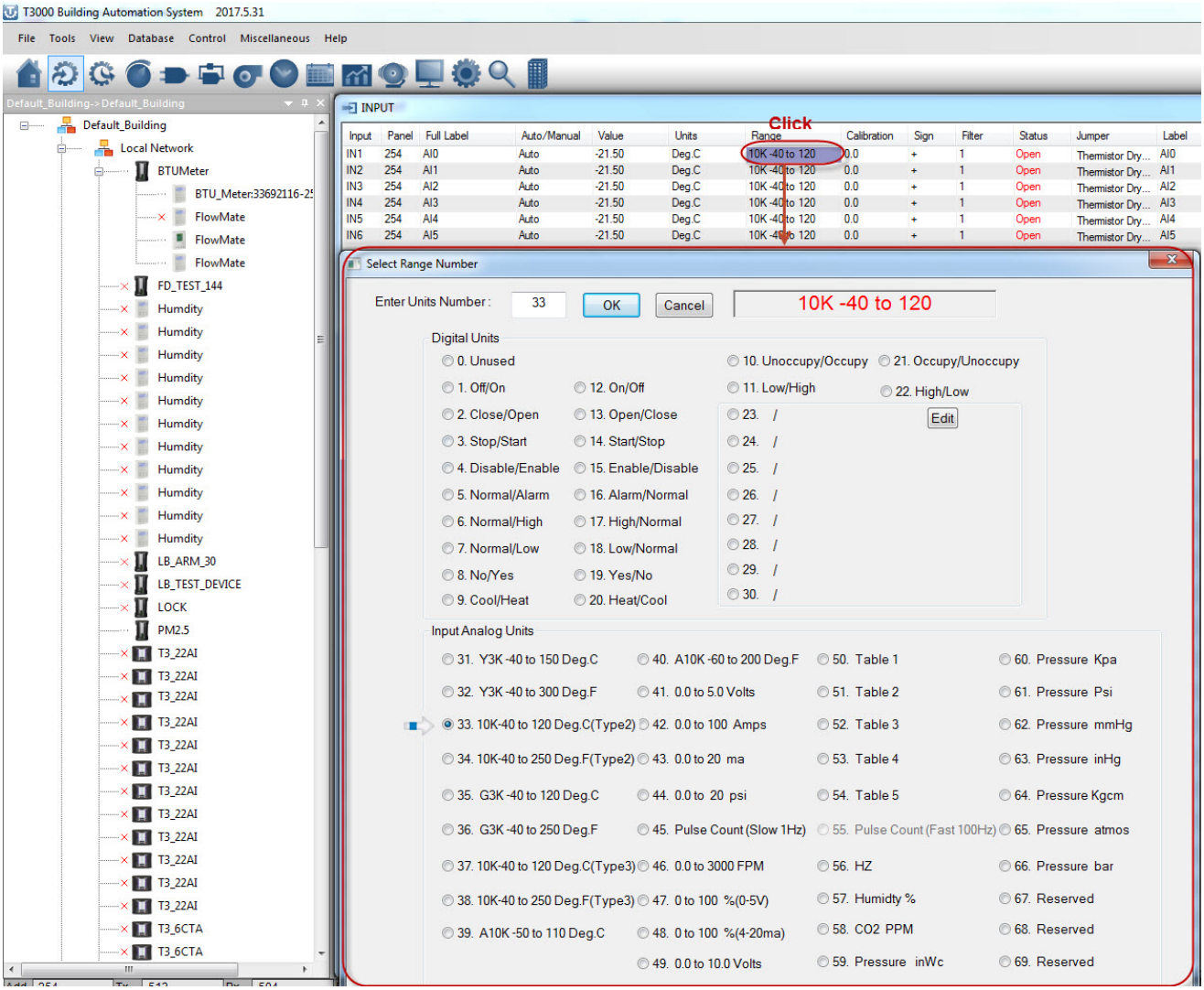
Step1.Plug the PWM Transducer in power,Connect it to PC via RS485.
Step2.Visit https://temcocontrols.com/ftp/software/T3000.zip,download T3000 software.
Step2.Start T3000 program, Click  to scan,then you can find the device connected.



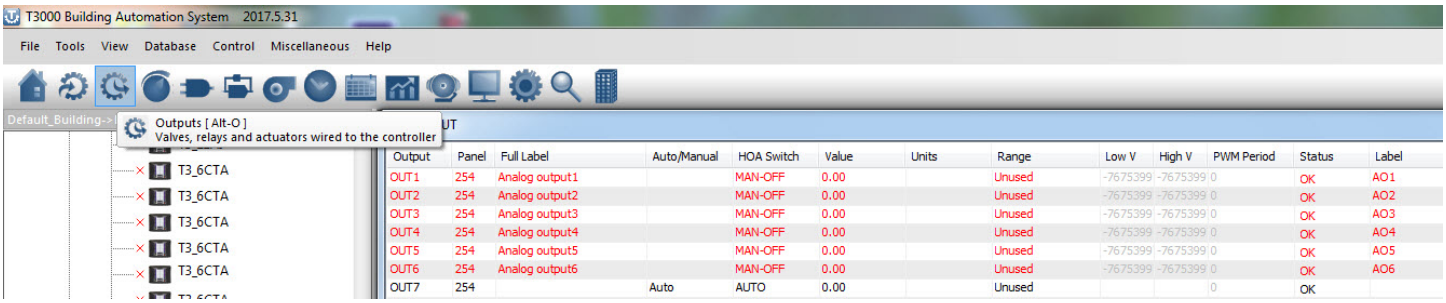


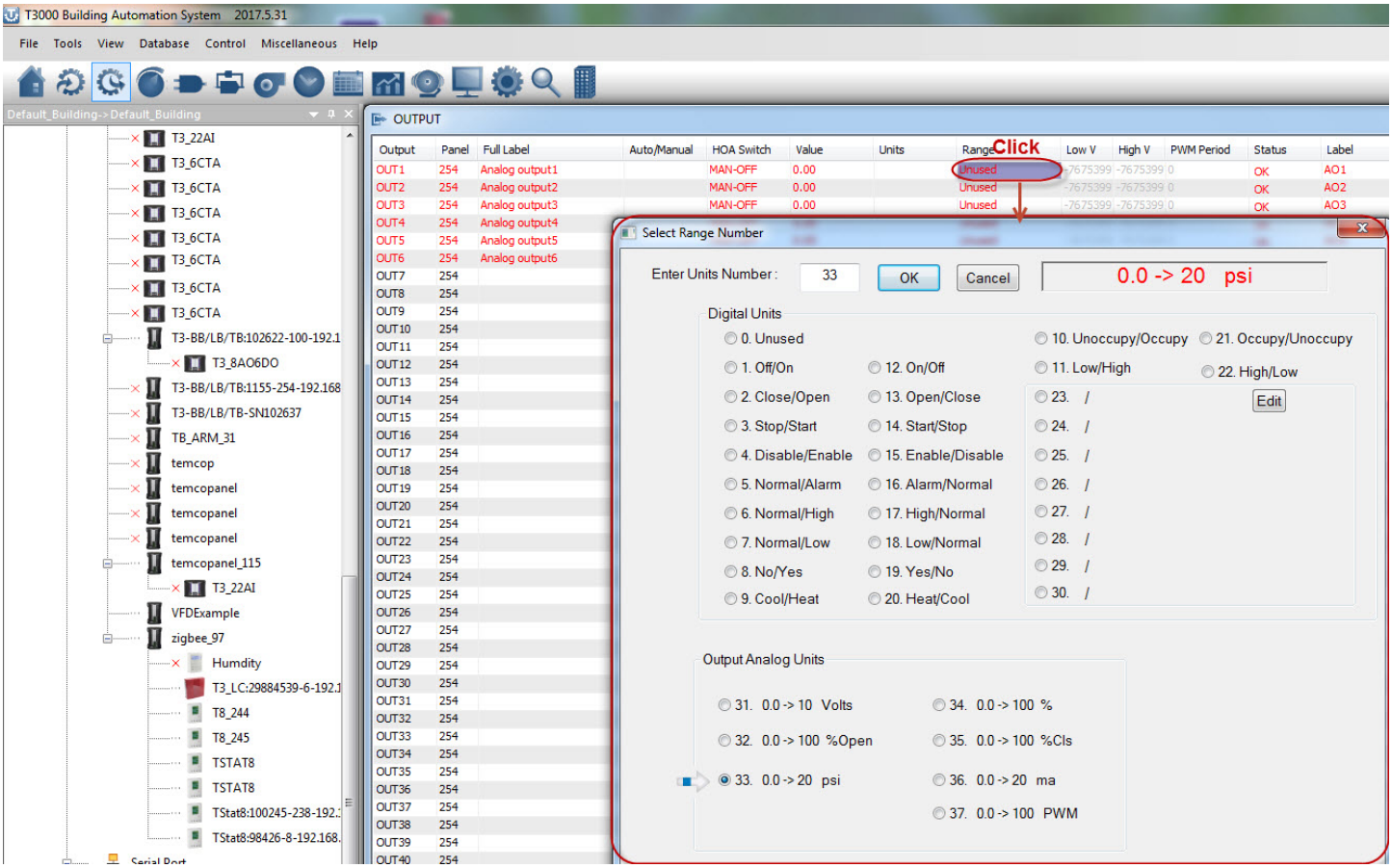
Step4.Click PWM Transducer log,click  to see 6 inputs.Click Range value to Select Range Number.





Step5.Click  to see 6 outputs.Click Range value to Select Range Number.




T3000 Building Automation System 2017.5.31
File Tools View Database Control Miscellaneous Help
Default_Building->Default_Building
T3_22AI
T3_6CTA
T3_6CTA
T3_6CTA
T3_6CTA
T3_6CTA
T3_6CTA
T3_6CTA
T3_6CTA
T3-BB/LB/TB:102622-100-192.1
T3_8AO6DO
T3-BB/LB/TB:1155-254-192.168
T3-BB/LB/TB-SN102637
TB_ARM_31
temcop
temcopanel
temcopanel
temcopanel
temcopanel_115
T3_22AI
VFDExample
zigbee_97
Humdity
T3_LC:29884539-6-192.1
T8_244
T8_245
TSTAT8
TSTAT8
TStat8:100245-238-192.
TStat8:98426-8-192.168.
Serial Port
OUTPUT
Output Panel Full Label Auto/Manual HOA Switch Value Units Range Low V High V PWM Period Status Label
OUT1 254 Analog output1 MAN-OFF 0.00 Unused OK AO1
OUT2 254 Analog output2 MAN-OFF 0.00 Unused OK AO2
OUT3 254 Analog output3 MAN-OFF 0.00 Unused OK AO3
OUT4 254 Analog output4
OUT5 254 Analog output5
OUT6 254 Analog output6
Click
Select Range Number
Enter Units Number : 33
OK
Cancel
0.0 -> 20 psi
Digital Units
0. Unused
1. Off/On
2. Close/Open
3. Stop/Start
4. Disable/Enable
5. Normal/Alarm
6. Normal/High
7. Normal/Low
8. No/Yes
9. Cool/Heat
10. Unoccupy/Occupy
11. Low/High
12. On/Off
13. Open/Close
14. Start/Stop
15. Enable/Disable
16. Alarm/Normal
17. High/Normal
18. Low/Normal
19. Yes/No
20. Heat/Cool
21. Occupy/Unoccupy
22. High/Low
23. /
24. /
25. /
26. /
27. /
28. /
29. /
30. /
Edit
Output Analog Units
31. 0.0 -> 10 Volts
32. 0.0 -> 100 %Open
33. 0.0 -> 20 psi
34. 0.0 -> 100 %
35. 0.0 -> 100 %Cls
36. 0.0 -> 20 ma
37. 0.0 -> 100 PWM