T3000 controller is a multi-user, including T3-BB, T3-LB and T3-TB.It can stand DDC panel alone or in a multiple network system with full communication capabilities. The multiple communication ports allow the controller to operate on a network or host sub networks and to communicate with local and remote operators simultaneously.

Setup and programming are done on a PC not necessary to connect to live hardware as it is the case with many systems. When the program is ready for on-site testing, connect it to a live panel and download the T3000 software. Programming can be done remotely over the network and modem connections as well. The network system is very flexible and economical for the installation.



T3-BB



### Specifications

#### Software

- Interactive dynamic color graphics
- Industry standard Bacnet & Modbus protocols
- User programming, built in networking features
- 16 Control Basic programs
- 16 User screen displays
- 8 Weekly routines, 4 annual routines
- 128 User variables
- 16 PID controllers
- 8 passwords or users

#### Hardware

Highly Configurable: any combination of input/ output cards totalling up to 64 points

Digital output: 5V/125VAC, 30DVC

Analog output: 0-10V

Universal input: Thermistor, 0-10V, 0-5V, 0-20mA

Mechanical relays 2A, 24VAC/DC

Diagnostic LEDs & Hand-Off-Auto Switches

512K Flash / 512k Ram

SD Disk slot for trend logs, alarms, graphics

Ethernet Port: Bacnet & Modbus supported

simultaneously

2 x RS485 ports

USB Port only for T3-BB, T3-LB

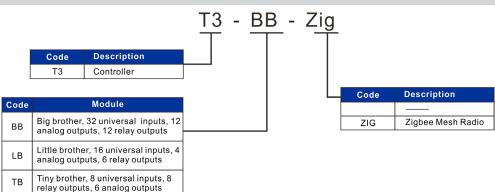
RS232 only for T3-BBt

Zigbee port is optional, only for T3-BB, T3-LB

Clock with battery backup

https:// www.bravocontrols.com/ftp/ software/09T3000Software.zip

### Part Number Scheme



Surge-protected Universal Inputs with 12-bit resolution

• UL listed ABS enclosure with rubberized texture creates a high end feel.

• Software configure the I/O ranges with the free T3000 software or by writing to the registers with your own software.

• Each output has a hand-off-auto switch for easy troubleshooting and overrides.

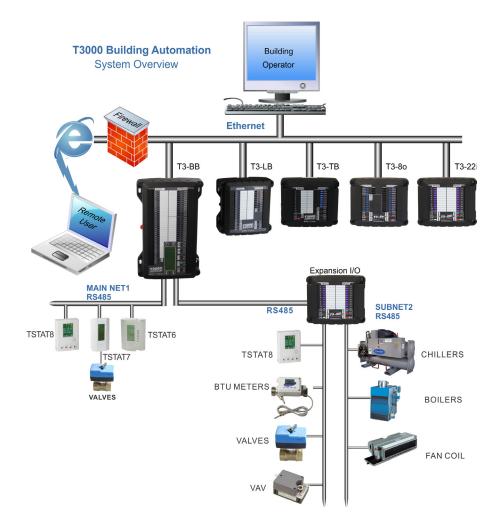
• Each I/O as well as the RS485 connections have a separate screw terminal, there's no need to gang two wires under one terminal for any of the terminations.

- High/Low speed input pulse counters
- RS485 sub baudrates: 9600, 19200
- RS485 main baudrates: 1200~921600
- Communication methods are RS485, Ethernet, USB, Zigbee but it can, at the same time, support Modbus and Bacnet.
- Starter space source code is avaliable.
- T3000 front end is free and open source: http://tinyurl.com/n7kkqp6

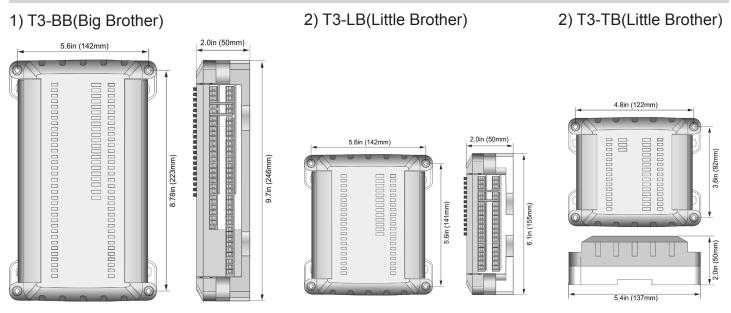
• Compiled version of the front end is here: https://tinyurl.com/y7uyu9n3

- Power Supply Voltage: 24V AC/DC
- Relay: 5A/125VAC, 30VDC
- Operating Temperature: -30~70°C
- (-22~158°F)
- Maximum Power Consumption
  - T3-BB: 10W
  - T3-LB: 10W
  - T3-TB: 6W
- Case Color: Black

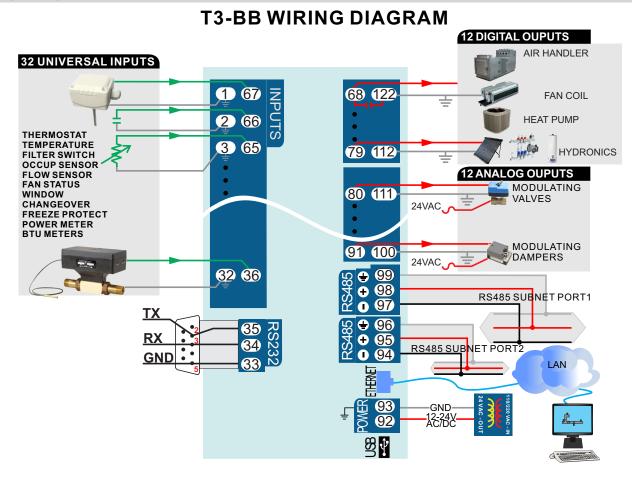
### **Network Diagram**



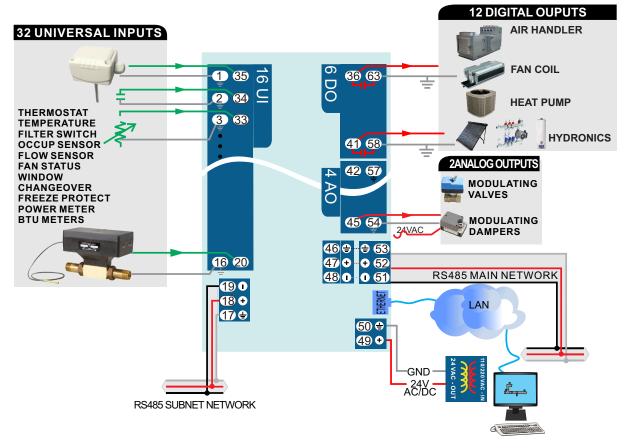
#### Dimensions

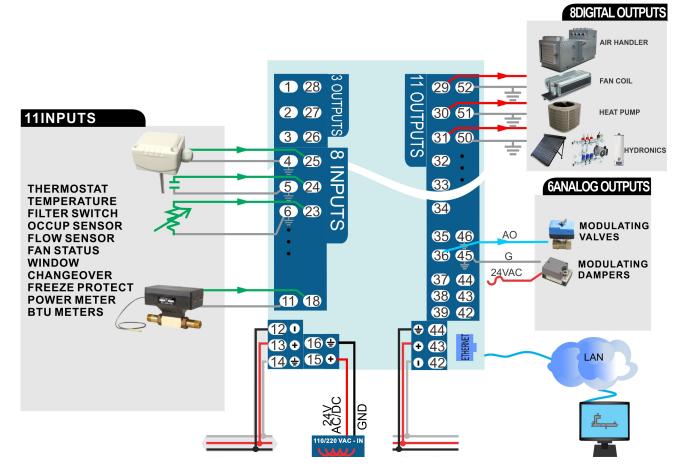


#### Wiring Diagram



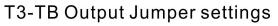
**T3-LB WIRING DIAGRAM** 

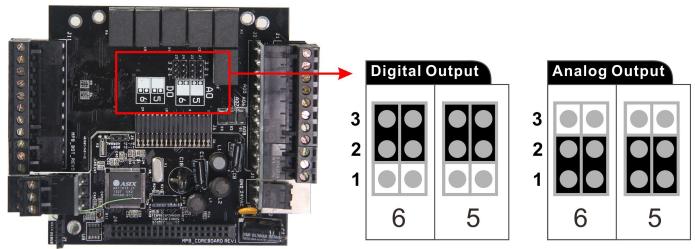




# **T3-TB WIRING DIAGRAM**

T3-TB Output Jumper Settings



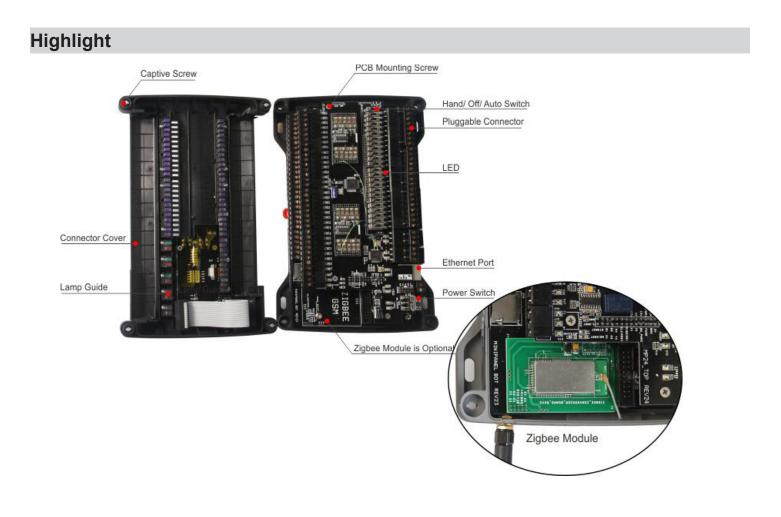


		Controller	
	T3-BB Big Brother	T3-LB Little Brother	T3-TB Tiny Brother
Total Channels:	56	26	22
Universal Input	32	16	8
Analog Output	12	4	6
Relay Output	12	6	8
Comm ports:			
RS485	2	2	2
RS232	1	0	0
Ethernet	1	1	1
USB	1	1	0
Option port**	1	1	0

\* The 2 universal output can be selected by jump as either 1-10V analog or relay outputs.

\*\* zigbee module.

Transportation methods of these units are RS485, Ethernet, USB, Zigbee ,at the same time, they support Modbus and Bacnet. The T3-BB unit features 32 channels input and 24 channels output including 12 channels analog output and 12 channels digital output. As for the T3-LB, there are 16 channels input and 10 channels output including 4 channels analog output and 6 channels digital output. For T3-TB, it includes 8 inputs and 14 outputs which contain 6 analog outputs, 8 digital outputs. All of these channels can be controlled directly by minipanel through input and output cards.



#### **T3000 Operation Instructions**

3.Click to select minipanel

1. Visit https://tinyurl.com/y7uyu9n3, download 09T3000 software.zip and install it;

2. Take an example of T3-BB here, connect T3-BB to PC by RS485 network at pin 94, 95, and 96 or Ethernet.

3. Open T3000 software, and click icon building, an popup window will appear, set protocol to Auto, then close it. Click scan icon which is next to the icon building to find the connected unit.

8		T3000 B	uilding Automatic	on System 2016.03.18	3				
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MiniPanel:90028-1-192.168.0.54									
MiniDanel-01017-254-102 168 0 3									
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	Decella	BB/LB/T	B:92294-1-192.168.0 fa	ult_Buildi floor1 room1	fault_Buildi 92	2294 192.16	8.0.97 503	2 TCP/IP	
	Panel Name :		B:90023-1-192.168.0 fa 150-249-192.168.0.9: fa			0023 192.16 7150 192.16			
	Port :				_				

Then click the device log what have been connected, T3000 software will show the info in righ hand place. You can click Input, Output and other icon.

o building Automation System 2010.10.21												
Tools View Database Control Miscellaneous Help												
<b>-</b> ]			<b>O</b> O						_			
View • # × Default_Building	Input	Panel	Full Label	Auto/Manual	Value	Units	Range	Calibration	Sign	Filter	Status	Jumper
	IN1	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN2	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
BTUMet	IN3	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
	IN4	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
CHAMBER	IN5	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
	ING	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
	IN7	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
	IN8	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
HUMSENSOR	IN9	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
COOPZIG_TEST	IN10	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
minipanel	IN11	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
( miniparter	IN12	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
POWER_METER	IN13	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
TSTAT8	IN14	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN15	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Drv
TSTAT8	IN16	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
TSTAT8	IN17	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
TOD	IN18	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
Х 🚺 ТЗВВ	IN19	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
- 🛃 Serial Port	IN20	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN21	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	+	0	Open	Themistor Dry
	IN22	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Themistor Dry
T3-PT12:25254	IN23	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN24	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN25	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	-	0	Open	Thermistor Dry
	IN26	1		Auto	-40.00	Deg.C	10K -40 to 120	0.0	1	0	Open	Thermistor Dry

4. Click input icon, it will show all inputs in T3000 software.

	T3-BB	T3-LB	T3-TB	Speed
Low Speed Input channels	1-32	1-16	1-8	1 Hz
High Speed Input channels	27-32	11-16	3-8	1M Hz

For T3-BB, T3-LB, T3-TB, all the inputs channels have pulse counters. High speed counters capable of 1M Hz. Low speed inputs channels reach to 1 hz per channel.

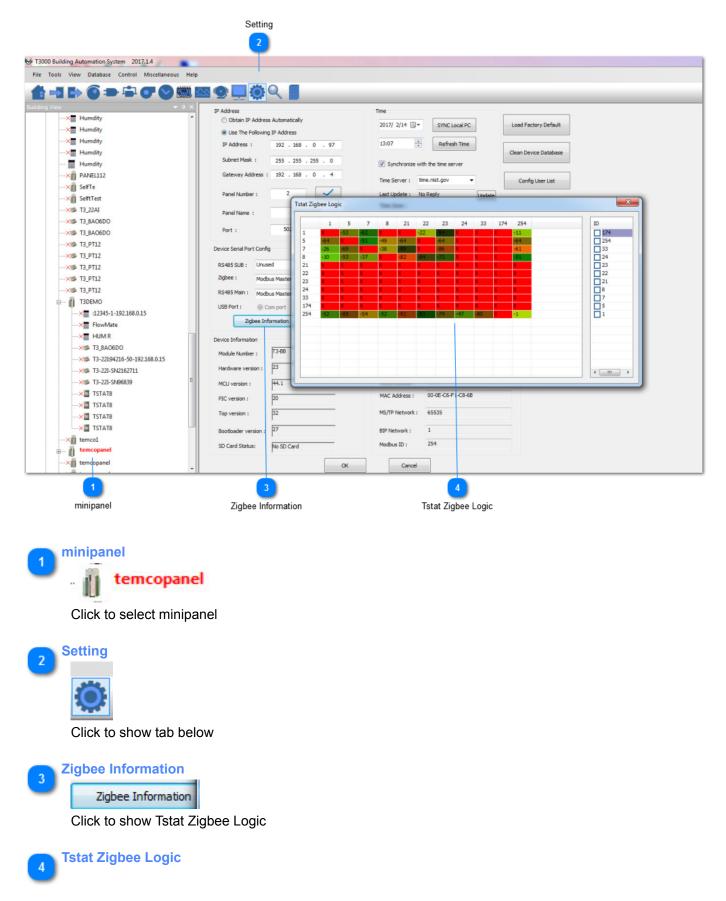
Here we take an example of T3-BB, showing how to configure the high speed and low speed counters in T3000 software.

		5.Click input to show table below	
000 Building Automation System 2016.10.21	-	P. B. B.	
Tools View Database Control Miscellaneous	Help		
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ing View 🗸 🖓	×		
🛃 Default_Building	Input Panel Full Label	Auto/Manual Value Units Range Calibration Sign Filter Status Jumper	Label
🖶 📲 Local Network	IN1 1 IN2 1	Auto         -40.00         Deg.C         10K-40 to 120         0.0         -         0         Open         Themis           Auto         -40.00         Deg.C         10K-40 to 120         0.0         -         0         Open         Themis	tor Dry tor Dry
📋 BTUMet	IN3 1	Auto -40.00 Deg.C 10K -40 to 120 0.0 - 0 Open Themis	
	IN4 1 IN5 1	Auto Auto Select Range Number	_
	IN6 1	Auto	
	IN7 1 IN8 1	Auto Enter Units Number: 45 OK Cancel Speed Count	
	IN9 1	Auto Digital Units	
·····×II COOPZIG_TEST	IN10 1 IN11 1	Auto O. Unused 0 10. Unoccupy/Occupy 0 21	Occupy/Unoccupy
10 m	IN12 1	Auto 1. Off/On 12. On/Off 11. Low/High 22	. High/Low
DOWER_METER	IN13 1 IN14 1	Auto © 2. Close/Open © 13. Open/Close © 23. /	Edit
	IN15 1	Auto	Lun
TSTAT8	IN16 1 IN17 1	Auto © 4. Disable/Enable © 15. Enable/Disable © 25. /	
ТЗВВ	IN18 1	Auto	
	IN19 1 IN20 1	Arto	
	IN21 1	Auto	
T3-PT12:25254	IN22 1 IN23 1	Auto 7. Normal/Low 18. Low/Normal 28. /	
	IN24 1	Auto 8. No/Yes 19. Yes/No 29. /	
	IN25 1 IN26 1	Auto O 9. Cool/Heat O 20. Heat/Cool O 30. /	
	IN27 1	Auto Input Analog Units	
	IN28 1 IN29 1	Auto 0 31. Y3K-40 to 150 Deg.C 0 40. A10K-60 to 200 Deg.F 50. Table 1	
	IN30 1 IN31 1	Auto Auto © 32. Y3K -40 to 300 Deg.F © 41. 0.0 to 5.0 Volts © 51. Table 2	
	IN32 1	Auto O 33. 10K-40 to 120 Deg.C(Type2) 0 42. 0.0 to 100 Amps 0 52. Table 3	
		◎ 34. 10K-40 to 250 Deg.F(Type2) ◎ 43. 0.0 to 20 ma ◎ 53. Table 4	
		© 35. G3K -40 to 120 Deg.C ◎ 44. 0.0 to 20 psi ◎ 54. Table 5	
		© 36. G3K -40 to 250 Deg.F	ed Coun
		© 37. 10K-40 to 120 Deg.C(Type3) ◎ 46. 0.0 to 3000 FPM ◎ 56. HZ	
		© 38. 10K-40 to 250 Deg.F(Type3) ◎ 47. 0 to 100 %(0-5V)	
		© 39. A10K -50 to 110 Deg.C ◎ 48. 0 to 100 %(4-20ma)	
		© 49. 0.0 to 10.0 Volts	

5. Click output icon, it will show the output view.

Ite         Tools         Yes         Database         Control         Miscilaneous         Help           Image: Second Party Control         Image: Second Party Contro         Image: Second Party Contro										and the second			Building Automation System 2016.10.21
Interview         v 0 × 2           Default_Building         Output         Panel Full_abel         Auto/Manual         HOASWICh         Value         Units         Range         PWMeriod         Status         L           Implement         BTUMet         Implement         Auto         MANCON         On         OffOn         0         OK         DX           Implement         CHAMMER         Implement         Auto         MANCON         On         OffOn         0         OK         DX           Implement         CHAMER         Immitig         Auto         MANCON         On         OffOn         0         OK         DX           Implement         CHAMER         Immitig         Auto         MANCON         On         OffOn         0         OK         DX           Immitig         Immitig         Auto         MANCON         On         OffOn         0         OK         DX													
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HUMSENSOR         OUT8         1         Auto         MAN-ON         On         Off/On         OK           Iminipanel         OUT9         1         Auto         MAN-ON         On         Off/On         OK         OK           Iminipanel         OUT10         1         Auto         MAN-ON         On         Off/On         OK         OK           Iminipanel         OUT11         1         Auto         MAN-ON         On         Off/On         OK         OK           Iminipanel         OUT12         1         Auto         MAN-ON         On         Off/On         OK         OK           Iminipanel         OUT13         Auto         MAN-ON         ON         Off/On         OK         OK           Iminipanel         OUT14         1         Auto         MAN-ON         10.00         Voits         0.0 > 10         OK           Iminipanel         OUT15         1         Auto         MAN-ON         10.00         Voits         0.0 > 10         OK           Iminipanel         OUT16         Auto         MAN-ON         10.00         Voits         0.0 > 10         OK           Iminipanel         OUT17         1         Manual			OK				On	MAN-ON	Auto		1	OUT6	
HUMSENSUR         OUT9         1         Auto         MAN-ON         On         Off/On         OK           COOPZIG_TEST         OUT10         1         Auto         MAN-ON         On         Off/On         OK           POWER_METER         OUT12         Auto         MAN-ON         On         Off/On         OK           POWER_METER         OUT13         1         Auto         MAN-ON         0.0         Off/On         OK           UT13         1         Auto         MAN-ON         0.0         Off/On         OK           UT14         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           UT15         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           UT14         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           UT15         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           UT18         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           UT19         1         Manual         MAN-ON <td></td> <td></td> <td>OK</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1 A A A A A A A A A A A A A A A A A A A</td> <td></td>			OK									1 A A A A A A A A A A A A A A A A A A A	
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minipanel         OUT11         1         Auto         MAN-ON         On         Off/On         OK           POWER_METER         OUT12         1         Auto         MAN-ON         On         Off/On         OK           TSTAT8         OUT14         Auto         MAN-ON         0.00         Volts         0.0 -> 10         OK           TSTAT8         OUT14         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           TSTAT8         OUT14         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT15         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT16         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT19         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT19         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT21         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT21 <td></td>													
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Striat         OUT14         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         Instruct         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         OUT14         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         OUT15         1         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         OUT15         1         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         OUT16         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           Instruct         OUT19         Auto         MAN-ON         D.0.0         Volts         D.0.>10         OK           OUT20         Manual         MAN-ON         D.0.0         Volts         D.0.>10         OK           OUT21         Manual         MAN-ON         D.0.0         Volts         D.0.>10         OK           OUT22         I         Manual         MAN-ON         D.0.0         Volts         D.0.>10         OK											1.5	and the second second	DOWER METER
Note         OUT15         1         Auto         MAN-ON         10.00         Volts         0.0->10         0         OK           International State         OUT16         1         Auto         MAN-ON         10.00         Volts         0.0->10         0         OK           International State         OUT16         1         Auto         MAN-ON         10.00         Volts         0.0->10         0         OK           International State         OUT17         1         Manual         MAN-ON         10.00         Volts         0.0->10         0         OK           Serial Port         OUT20         1         Manual         MAN-ON         10.00         Volts         0.0->10         0         OK           OUT21         1         Manual         MAN-ON         10.00         Volts         0.0->10         0         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0->10         OK         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0->10         OK         OK           OUT24         1         Manual         MAN-ON         10.00													
With ISTA18         OUT16         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           TSTAT8         OUT17         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           TSTAT8         OUT19         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           Serial Port         OUT20         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT20         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT20         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT21         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT25         1         Auto         AUTO         0.00												and the second	TSTAT8
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Serial Port         OUT 18         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         O         OC           Serial Port         OUT 19         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           Com6         OUT 22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT 22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT 22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT 22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT 22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT 24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT 25         1         Auto         AUTO         0.00         Unused         -         -           OUT 25         1											2.5	and the second second second	TCTATO
Serial Port         OUT19         1         Auto         MAN-ON         10.00         Volts         0.0 -> 10         OK           Serial Port         OUT20         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           Com6         OUT21         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT25         1         Auto         AUTO         0.00         Unused         0         -           OUT25         1         Auto         AUTO         0.00         Unused         0         -           OUT25         1         Auto         AUTO         0.00         Unused         -         -           OUT25         1         Auto         AUTO <td></td> <td>and the second se</td>													and the second se
Serial Port         OUT20         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         OK           Com6         OUT21         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         0         OK           Vits         0.0721         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         0         OK           Vits         0.0723         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         0         OK           0UT24         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         0         OK           0UT24         1         Manual         MAN-ON         10.00         Voits         0.0 -> 10         OK           0UT26         1         Auto         AUTO         0.00         Unused         0         -           0UT26         1         Auto         AUTO         0.00         Unused         0         -           0UT27         1         Auto         AUTO         0.00         Unused         -         -           0UT28         1         Auto         AUTO <td></td> <td>×10 13BB</td>													×10 13BB
Com6         OUT21         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         0         OK           OUT25         1         Auto         AUTO         0.00         Unused         -         -           OUT26         1         Auto         AUTO         0.00         Unused         -         -           OUT27         1         Auto         AUTO         0.00         Unused         -         -           OUT28         1         Auto         AUTO         0.00         Unused													Serial Port
OUT22         1         Manual         MAN-ON         10.00         Volts         0.0 > 10         OK           OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 > 10         0         OK           OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 > 10         0         OK           OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 > 10         0         OK           OUT25         1         Auto         AUTO         0.00         Unused         0         -           OUT26         1         Auto         AUTO         0.00         Unused         -         -           OUT27         1         Auto         AUTO         0.00         Unused         -         -           OUT28         1         Auto         AUTO         0.00         Unused         -         -           OUT29         1         Auto         AUTO         0.00         Unused         -         -           OUT30         1         Auto         AUTO         0.00         Unused         -         -           OUT30         1 <td>_</td> <td></td> <td>of the local sector of the later</td> <td></td>	_											of the local sector of the later	
OUT23         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         O         OCC           OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         O         OCC           OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         O         OCC           OUT25         1         Auto         AUTO         0.00         Unused         -													
OUT24         1         Manual         MAN-ON         10.00         Volts         0.0 -> 10         O         OK           OUT25         1         Auto         AUTO         0.00         Unused         0         -           OUT26         1         Auto         AUTO         0.00         Unused         -         -           OUT27         1         Auto         AUTO         0.00         Unused         -         -           OUT27         1         Auto         AUTO         0.00         Unused         -         -           OUT28         1         Auto         AUTO         0.00         Unused         -         -           OUT29         1         Auto         AUTO         0.00         Unused         -         -           OUT29         1         Auto         AUTO         0.00         Unused         -         -           OUT30         1         Auto         AUTO         0.00         Unused         -         -           OUT31         1         Auto         AUTO         0.00         Unused         -         -											1		
OUT25         1         Auto         AUTO         0.00         Unused         -           OUT26         1         Auto         AUTO         0.00         Unused         -           OUT27         1         Auto         AUTO         0.00         Unused         -           OUT27         1         Auto         AUTO         0.00         Unused         -           OUT28         1         Auto         AUTO         0.00         Unused         -           OUT29         1         Auto         AUTO         0.00         Unused         -           OUT30         1         Auto         AUTO         0.00         Unused         -									Manual				
OUT27         1         Auto         AUTO         0.00         Unused         -           OUT28         1         Auto         AUTO         0.00         Unused         -           OUT29         1         Auto         AUTO         0.00         Unused         -           OUT29         1         Auto         AUTO         0.00         Unused         -           OUT30         1         Auto         AUTO         0.00         Unused         -           OUT31         1         Auto         AUTO         0.00         Unused         -					Unused		0.00	AUTO	Auto		1	OUT25	I
OUT28         1         Auto         AUTO         0.00         Unused         -           OUT29         1         Auto         AUTO         0.00         Unused         -           OUT30         1         Auto         AUTO         0.00         Unused         -           OUT31         1         Auto         AUTO         0.00         Unused         -			-		Unused		0.00	AUTO	Auto		1	OUT26	I
OUT29         1         Auto         AUTO         0.00         Unused         0         -           OUT30         1         Auto         AUTO         0.00         Unused         0         -           OUT31         1         Auto         AUTO         0.00         Unused         0         -			4		Unused		0.00	AUTO	Auto		1	OUT27	
OUT30         1         Auto         AUTO         0.00         Unused         -           OUT31         1         Auto         AUTO         0.00         Unused         -			-		Unused		0.00	AUTO	Auto		1	OUT28	
OUT31 1 Auto AUTO 0.00 Unused 0 -			-	0	Unused		0.00	AUTO	Auto		1	OUT29	
			-		Unused		0.00	AUTO	Auto		1	OUT30	
0.000			-		Unused		0.00	AUTO	Auto		1	OUT31	I
OUT32 1 Auto AUTO 0.00 Unused -			-		Unused		0.00	AUTO	Auto		1	OUT32	

\*6.Steps to get zigbee information by T3000.



	1	5	7	8	21	22	23	24	33	174	254	ID
	Х	-53	-62	X	Х	-22	-94	Х	Х	X	-11	174
5	-64	X	-51	-49	-64	Х	-64	Х	Х	Х	-64	254
, ,	-26	-69	X	-38	-89	Х	-86	Х	Х	Х		33
3	-10	-53	-37	X	-82	-84	-73	х	x	X		24
21	x	X	X	X	Х	х	х	Х	х	Х	X	23
22	x	X	X	X	X	X	X	X	Х	X	X	22
23	X	X	X	X	X	X	X	Х	х	X	X	21
24	х	X	X	X	Х	х	х	Х	х	Х	X	8
33	х	X	X	X	X	X	X	X	X	X	X	7
174	х	X	X	X	Х	х	X	Х	х	Х		5
254	-52	-85	-54	-52	-91	-83	-74	-47	-80	Х	-1	1

It shows the information details

To read the zigbee signal for the T3 controller, read registers 5030 thru 5099. 5031~5099 are ID and signal strength, high byte is ID, low byte is signal strength. Register 5030 holds the number of neighbors the controller can see, let's say there are three thermostats near the T3 controller so N=3.

Resgister 5031 holds the Modbus ID and signal strength of the first neighor, high byte is ID, low byte is signal strength.

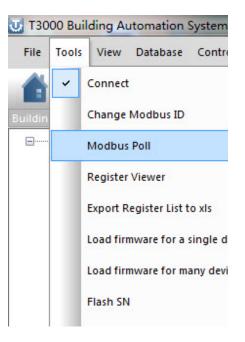
Resgister 5032 holds the Modbus ID and signal strength of the second neighor, high byte is ID, low byte is signal strength.

Resgister 5033 holds the Modbus ID and signal strength of the third neighor, high byte is ID, low byte is signal strength.

. . . . . .

To read the signal strength for any of the thermostats.the same applies but the table starts at register 51, this holds the number of neighbors for the thermostat. Let's use N=3 again.Register 52 thru 54 holds the Modbus ID of the three neighbors. Register 55 thru 57 holds the signal strength of the three neighbors.

\*You can also get the detail information using Temco Modbus Poll tool.



Temco Modb	and the generation			0			
1 🗖 🛙	<b>. X</b>		} ₽ >	<(Ö	JIX (	05 06	15
File Edit Co	nnection	Setup Fund	tions Display	View	Window	Help	
ModbusPol	1						
Model Nam	e:	Read/Write	e Definition		with 1	D-25	X
Connected		Slave ID:	255			0	ĸ
Description	n Address	Function:	03 Read Holding	) Registers	(4x)	▼ Car	
0	0	Address:	299	Ĩ.			
1	1			1			
2	2	Quantity:	10			Ap	ply
3	3	Scan Rate:	1000	2		Read/Write	Once
4	4	View					
5	5	Rows	20 0 50	100	) Fit to	Quantity	
6	6	Display					
7	7	Unsign		-		Alias Columns ss in Cell	
8	8					ddresses(Ba	ce 1)
•	1						
2010							

ID 255 means reading zigbee BB itself. Address 299 indicates how many units are connecting For this test, there are 3 units connecting:

reg300: ID + 256 of unit 1, the highest bit set to 1 means that device is online, if it is off line, reg300 = ID = 18

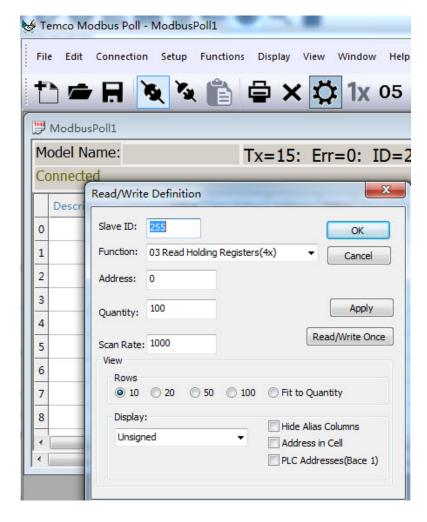
It's the same for reg301 and 302 and so on.

Description	Address	Value
TOTAL NO	299	3
SUBADOR F	300	274
SUBADOR L	301	265
SUBADOR L	302	262
SUBADOR L	303	0
SUBADOR L	304	0
SUBADOR L	305	0
SUBADOR L	306	0
SUBADOR L	307	0
SUBADOR L	308	0

For debugging:

1. First make sure the zigbee unit is connected to the zigbee network, when it is connected you can see the red led keeps on, otherwise it will be flashing.

- 2. In these two situations you can try to re-power the zigbee BB
- A. If you wait for a long time the zigbee BB cannot find the units
- B. If you find the units by T3000,but when you click the unit icon you can not access them.
- 3. Using modbus poll to access each of the unit



#### \*Port Forwarding

Following are steps for port forwarding:

Step1. Set port forward for router:TCP 502(modbus TCP);UDP 47808(Bacnet port); UDP 1234(Temco private scan).

Step2.Click to show the tab as below, select "Remote Device" protocol.

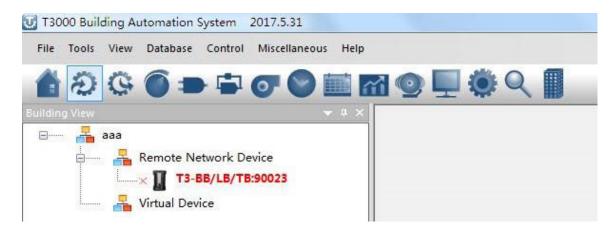
le Tools View Database Control Miscellaneous H	lain											
	1010 <b>1</b> 0											
D G 🕥 🖬 🖬 🐨 🕑 🛅		0	Q									
ding View 🗸 🗸 🗙	SCHE	a la su de la				_			_		-	
- Default_Building	SCHE	1 1 1 1				127.21		1.96.76		1 5222	_	
Local Network	NUM	Full Lab	el	Auto/Manual	Output I	Holiday 1		oliday2	State2	Label		
	<b>√</b> 1	WORK		Manual	ON		OFF		OFF			
BTUMeter	2	LUNCH		Manual	ON		OFF		OFF			
BTU_Meter:103288-253-		SLEEP		Manual Manual	ON ON		OFF		OFF			
BTUMeter	5	-		Manual	ON		OFF		OFF			
FlowMate	6		Building Configr	ation	-				-			
	7	ſ										
× 🗾 FlowMate	8			Building	Protocol	IP/D	Oomain/Tel#/SerialNum	. IP Port	COM	Port Bau	Rate	E
× 🗾 FlowMate		_	Selected	Default_Building	Remote Device	- 192.	168.0.3	10000	N/	A N	/A	Database\Buildings\Default_Building\Default_Building.db
TStat8:103291-253-192.:					Modbus 485							
TStat8-SN99885					Modbus TCP Bacnet MSTP							
					Remote Device							
					Auto							

Step3.It will show the tab as below, click to fill outer net IP or domain name.

Default_Building Auto	
	fault_Building.db
Selected aaa Remote Device 180.158.38.31 502 N/A N/A Database\Buildings\aaa.db	

Step4.Scan via T3000 software, the remote device can be connected.

F3000 Scanning	-	-			X
T3000 is scanning, p	olease wait.				
Scanning Mode	Skip	Status	Reply	Notes	
Ethernet Scan	No	Finished	0	Network scan finished.	
Remote IP Device	No	Running	1	Found remote device.	



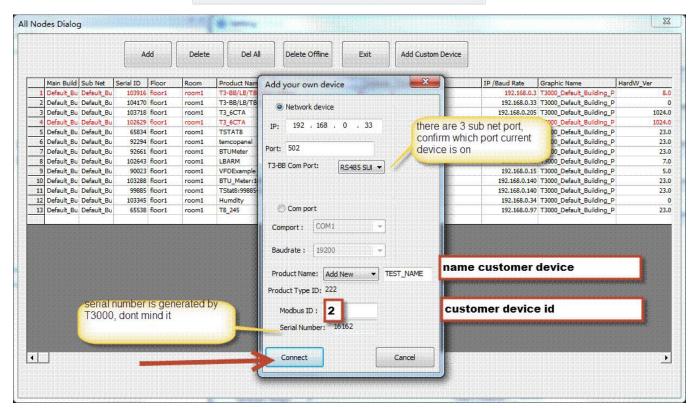
#### \* Adding Custom Devices

Only Temco's device can be discovered by T3-BB serial controller automatically, so we have to add custom device manually. Following are the steps to add custom devices:

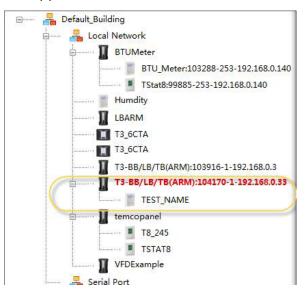
T3000 Building Auton	omation System 2017.5.31			
File Tools View Dat	tabase Control Miscellaneous Help			
🏠 🤣 🤤 🔳	Building Config Database 💦 👩 🗐 🌞 🔍 👖			
Building View	All Nodes a × and a second se			
🖃 🚣 Default	10NameConfig			
	User Account			

Sep2.If the customer would like to add a device in sub RS485 port, the protocol is Modbus/TCP to Modbus/RS485, we need to confirm which RS485 port to select; If custom device is on RS485 SUB PORT, you need to confirm which port from the three sub net ports current device is on. Then add a new name and ID for the custom device, and you can find the serial number is generated by T3000.

RS485 SUB :	Modbus Master 🔻	19200 🔻	
Zigbee :	Unused 👻	19200 👻	
RS485 Main:	Modbus Slave 👻	19200 🔻	
USB Port :	Ocm port	C GSM	



Step3.The custom device will appear in the tree node as below.



Step4. Choose Control->Program,then we can make a program to read and write custom device's register.

😈 T3000 Building Automa	ation Syste	m 2017.5.31				
File Tools View Da	tabase C	ontrol Miscellane	ous Help			
A 2 4	) = (	Graphics	(Alt - G)			
Building View	1	Programs	(Alt - P)			
J T3000 Building Automation System 2017.8.18						
File Tools View Database Control Miscellaneous Help						
		0				
🚹 🕀 🚱 🔵 🚍 🐨 🞯 🔛 🚮 🧐	<b></b>	Q 1				
Building View 🔋 🗙	PROGR	AM				
🖃 🔤 Default_Building	Program	Full Label	Status	Auto/Manual	Size	Run Statu
🛱 🔤 👫 Local Network		CUSTOMER DEVICE	ON	Auto	0	Normal
BTUMeter	2		ON	Auto	0	Normal
BTU_Meter:103288-253-192.168.0.140	3		ON	Auto	0	Normal
	4		needed ON defected electrone	Auto	tetete Ontetetetete	Normal Normal
TStat8:99885-253-192.168.0.140	Panel: 1	Program : 1 Nan	ne : PRG1	and a second		
Humdity	Send (F	2) Clear (F3) Load File	(F7) Save File (F6	) Refresh (F8)	Settings	
LBARM					_	
T3_6CTA	10 R	EM READ CUSTOE				
× 🛐 T3_6CTA		$AR1 = 1.2.MB_REG$				
T3-BB/LB/TB(ARM):103916-1-192.168.0.3	10 REM WRITE CUSTOEMR DEVICE					
T3-BB/LB/TB(ARM):104170-1-192.168.0.33		2.MB_REG6 = 100				
IS-DD/LD/ID(ARNI).1041/0-1-192.108.0.33		20m				
	VIEW CONTRACTOR CONTRACTOR					

Step5. Click "Network Point table" to check whether the remote points reading is ok.

T30 File	00 Build Tools	ling Aut View	Database	control	7.5.31 Miscellaneous Help		
4	Ð	Ģ	6=	-	or 🛇 🚞 🖬	199	
	g View	<b>.</b>	Building		- # ×		Network Points[Alt-N] Network points from other nodes used by the control

#### \* Network and remote points support

T3-serial controller (only new ARM) can support network points and remote points.

#### 1.Network points function

For example, there are panel 1 and 2 in network. We can use 2.2.VARx 2.2.OUTx 2.2.Inx to read or write the network ponts. Range of x is 1 to 255.

#### 2.Remote Bacnet points

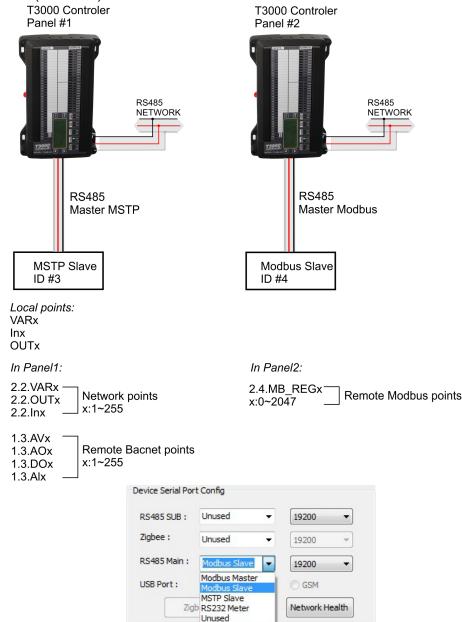
For example, panel 1 is T3000 controller, device 3 is MSTP slave device, which is integrated in only master RS485 port, and this port is set to master MSTP function. We can use 1.3. AVx 1.3. Aix 1.3. DOx 1.3. AOx to read and write remote bacnet points. Range of x is 1 to 255.

#### 3.Remote Modbus points

For example,panel 2 is controller, device 4 is Modbus slave device, which is integrated in master or slave RS485 port, and this port is set to master modbus function.We can use 2.4.MB\_REGx or 2.4.REGx to read and write remote modbus points. MB\_REG is base 0, and REG is base1.Range of x is 0 to 2047.

#### 4.Local points

INx (x: 1 - 64), OUTx (x: 1 - 64), VARx (x: 1 - 128), PRGx (x: 1 - 16), GRPx (x: 1 - 16), SCHx (x: 1 - 8), HOLx (x: 1 - 4), PIDx (x: 1 - 16).



# **Register List**

Address	R/W	Length	Description	
0~3	R	4	Reserved for serial numblert	
4~5	R	2	firmware Version Number	
6	R/W	1	Modbus device address	
7	R	1	Prodouct model	
8	R	1	Hardware Version Number	
9	R	1	PIC rev	
12	R	1	UART0 Baudrate. 5 - 9600 , 6 - 19200	
14	R	1	ISP Version	
18	R/W	1	UART1 Baudrate. 5 - 9600 , 6 - 19200	
19	R/W	1	UART2 Baudrate.(UART_1200 = 0, UART_2400 = 1, UART_3600 = 2, UART_4800 = 3, UART_7200 = 4, UART_9600 = 5, UART_19200 = 6, UART_38400 = 7, UART_57600 = 8, UART_115200 = 9, UART_921600 = 10	
33	N	1	test cmd, write 77 - reboot, 100 - set default paramer, 111 - erase prg, 150 - clear tstat db	
34	R	1	board type, big or small. 1 - big , 2 - samll,3-tiny,4-vav	
35	R	1	instance number	
36	R	1	station number	
39	R/W	1	EN clear tstat db	
42	R/W	1	USB MODE	
43	R/W	1	EN DYNDNS ,// 0 - no 1 - disable 2 - enable	
44	R/W	1	DYNDNS provider, // 0- www.3322.org 1-www.dyndns.com 2 - www.no- ip.com	
45	R/W	1	dyndns update timer	
46	R/W	1	NETWORK: MSB, MSB-1	
47	R/W	1	MSTP NETWORK: MSB, MSB-1	
51	R	1	TOP hardware	
52	R	1	c8051f023 firmware rev	
53	R	1	sm5964 firmware rev	

\*The register list is very long ,it can be downloaded as an excel spreadsheet (03ModbusBacnetRegisterList.xls) at the following link:<u>http://tinyurl.com/ybaj9d3u</u>