BARAN ELEKTONIC SYSTEMS

Free Cooling Viewer

Software User Manual

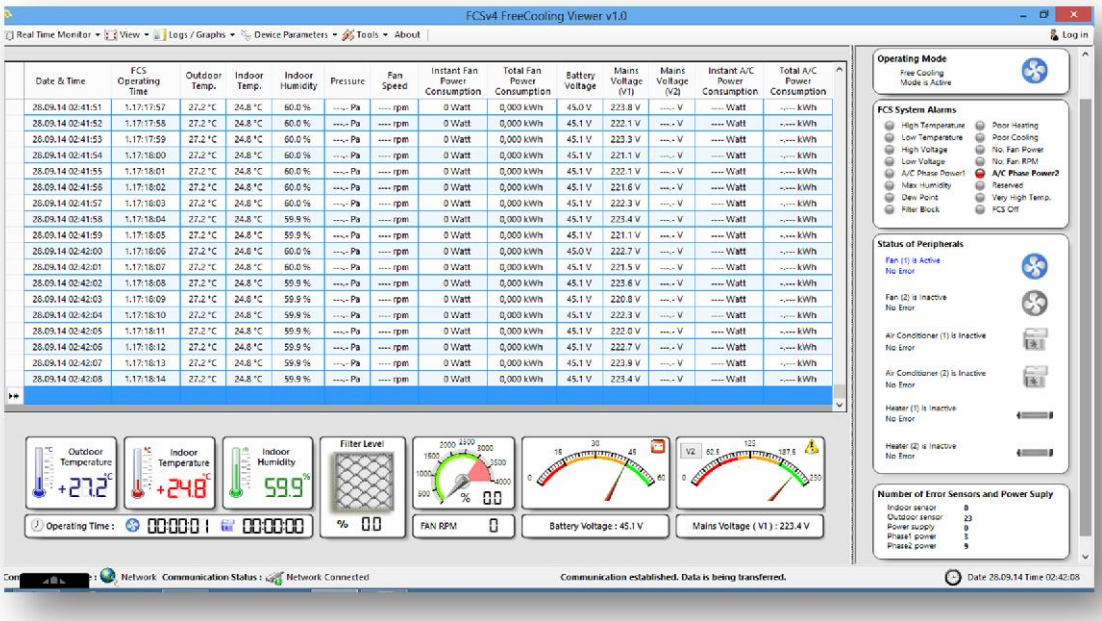
Contents

Introduction

"FCSv4 Free Cooling Viewer v1.0" is a 3.party Windows application that user can easily achieve to manage the FCS system from PC with an interface by using one of the USB, RS232 or Ethernet Connection.

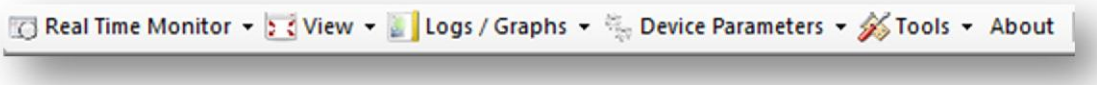
Free Cooling Viewer has ability to;

- remote reel time chasing and graphically monitoring
- show, change and reset the operating parameters
- enable/disable keypad
- restart FCS and air-conditioning units
- switch FCS to bypass mode
- erase data from memory
- download data as Excel file.
  (fan & air-conditioning operating times, temperature curves..)



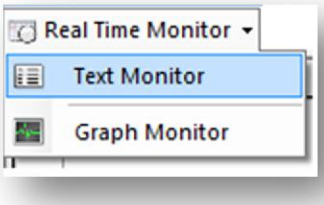
Software Usage

1. Menu



Device control settings can be managed by using this layer. These settings are given below:

a) Real Time Monitor

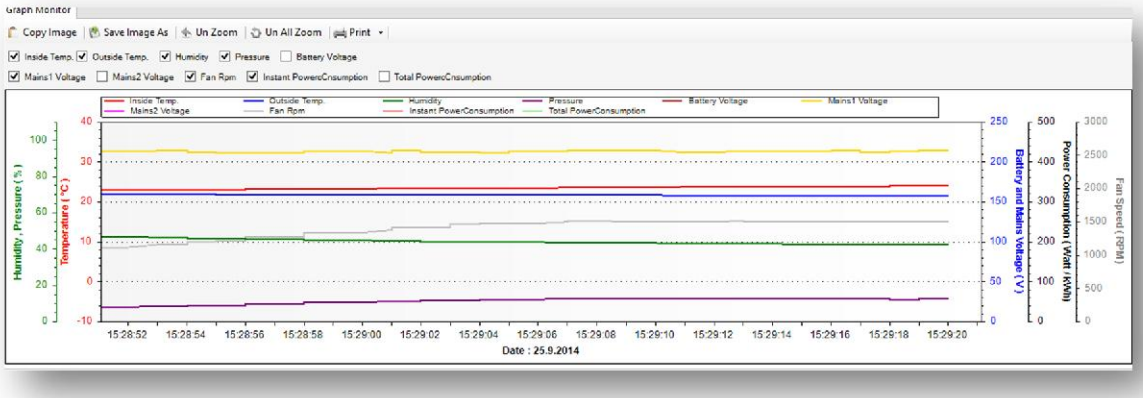


Real Time Monitor menu ;

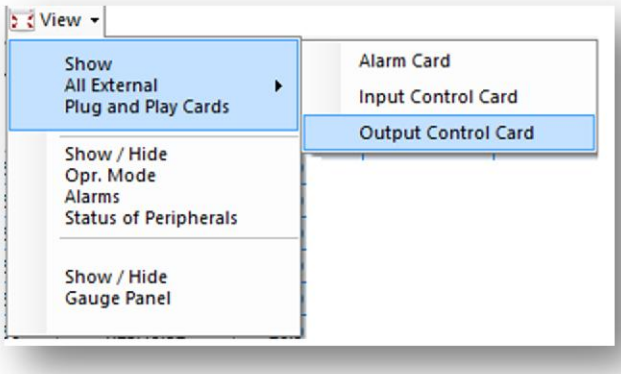
Text Monitor; User can monitor the list of data about the station by using this option.

Date & Time	FCS Operating Time	Outdoor Temp.	Indoor Temp.	Indoor Humidity	Pressure	Fan Speed	Instant Fan Power Consumption	Total Fan Power Consumption	Battery Voltage	Mains Voltage (V1)	Mains Voltage (V2)	Instant A/C Power Consumption	Total A/C Power Consumption
25.09.14 15:25:57	7.00:02:23	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.9 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:25:58	7.00:02:24	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.6 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:25:59	7.00:02:25	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.6 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:00	7.00:02:26	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	216.1 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:01	7.00:02:27	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.4 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:02	7.00:02:28	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	213.9 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:03	7.00:02:29	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.6 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:04	7.00:02:30	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.9 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:05	7.00:02:31	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	213.2 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:06	7.00:02:32	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.8 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:07	7.00:02:33	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	213.1 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:08	7.00:02:34	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.1 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:09	7.00:02:35	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.8 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:10	7.00:02:36	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.1 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:11	7.00:02:37	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	213.4 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:12	7.00:02:38	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	215.8 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:13	7.00:02:39	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	216.7 V	----.- V	---- Watt	-.--- kWh
25.09.14 15:26:14	7.00:02:40	22.4 °C	21.4 °C	47.1 %	----.- Pa	---- rpm	0 Watt	1,778 kWh	53.6 V	216.1 V	----.- V	---- Watt	-.--- kWh

Graph Monitor: User can observe real time data all together on a graphic by using this option.



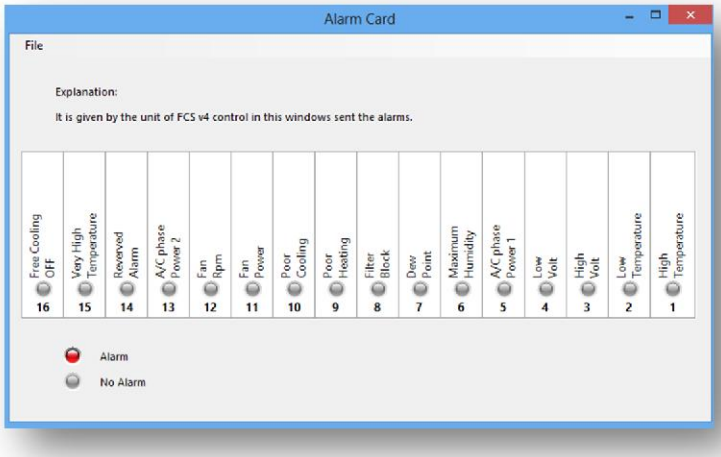
b) View



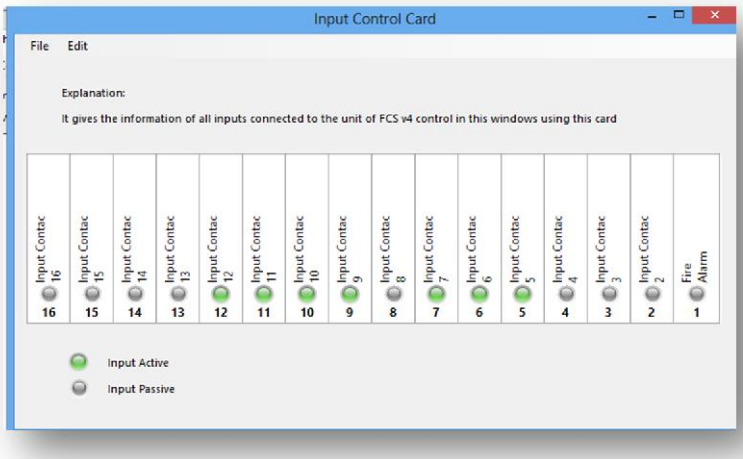
View menu;

Show All External Plug and Play Cards

-> Alarm Card: User can monitor the current situation about the alarm card by using this option.



-> **Input Control Card (Optional) :** User can monitor the current situation about the Input Control Card.

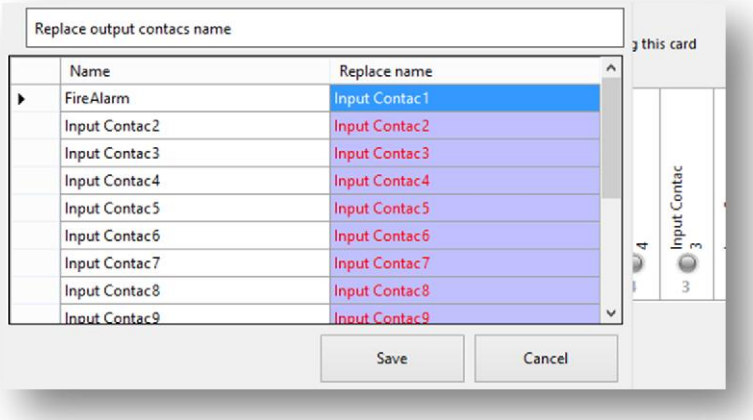


Number one is defined for the **fire** alarm. Other numbers can be switched by user.

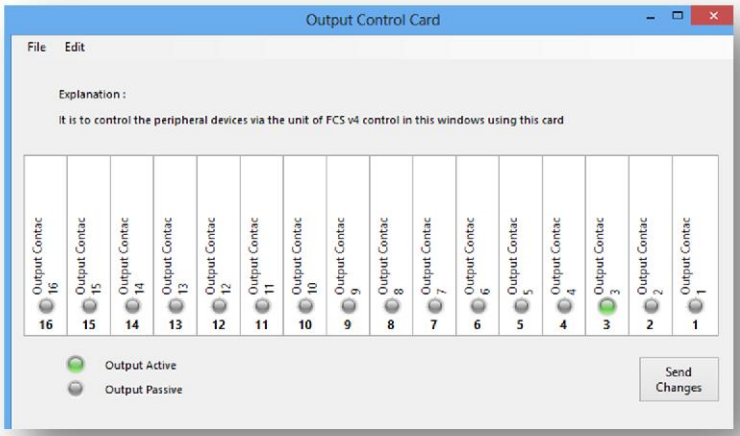
File -> Import contacts name table; all user-defined input names can be loaded from a saved file.

File -> Export contacts name table; all user-defined input names can be transferred to external storage devices, PC etc.

Edit -> Replace name; all inputs can be renamed by user.



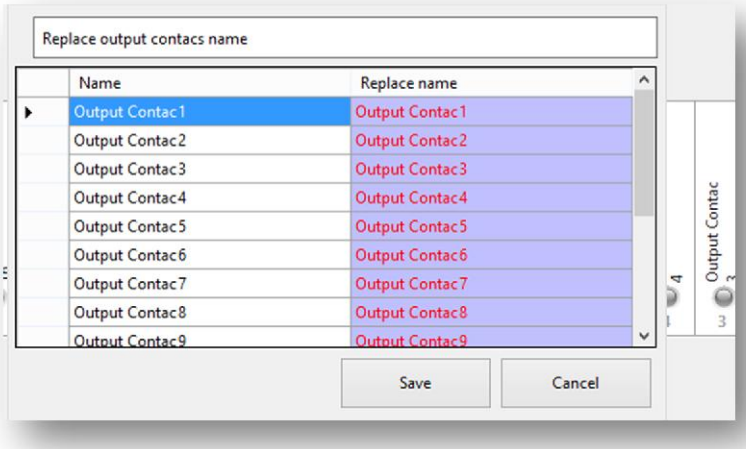
-> **Output Control Card (Optional):** User can monitor the current situation about the output control card and also can change these outputs.



File -> Import contacts name table; all user-defined input names can be loaded from a saved file.

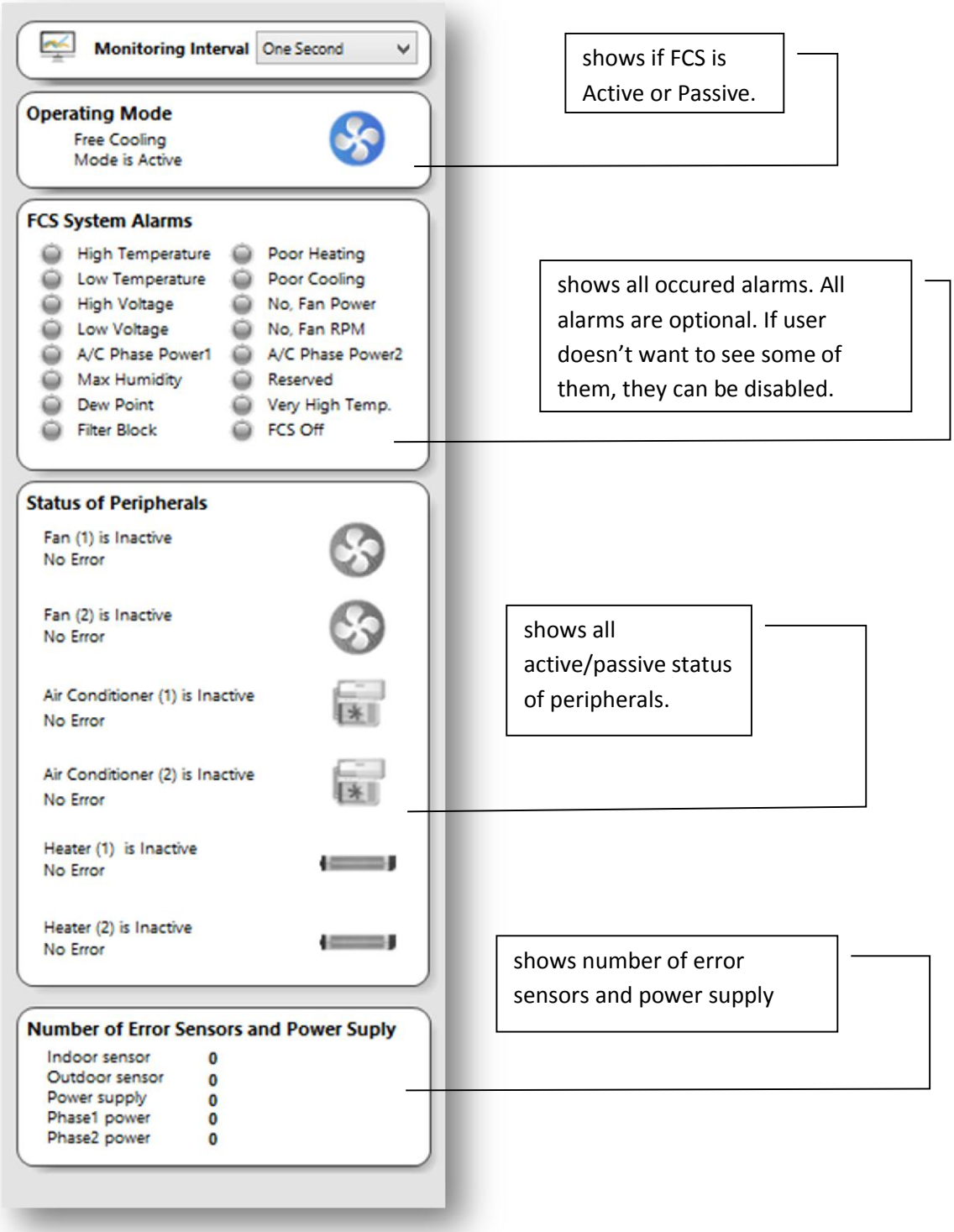
File -> Export contacts name table; all user-defined input names can be transferred to external storage devices, PC etc.

Edit -> Replace name; all inputs can be renamed by user.



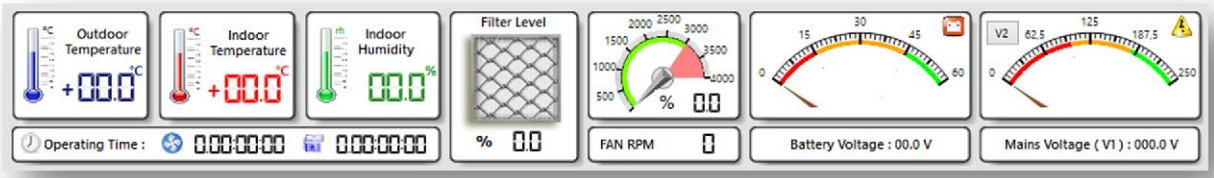
Show / Hide Opr.Mode Alarms Status of Peripherals; show / hide situations can be switched which are located at the right side.

User can see operating mod of connected FCSv4, all occured alarms and active/passive status of peripherals at the right side.

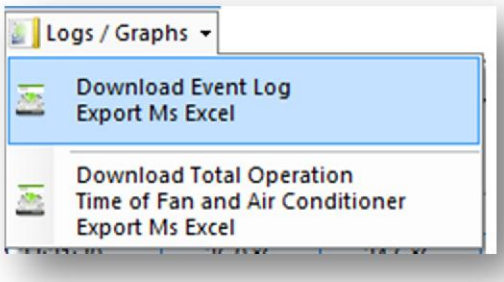


Show / Hide Gauge Panel; gauge panel show / hide options can be changed.

All measured data for FCSv4 can be observed bu using Gauge Panel.



c) Logs / Graphs



Logs/Graphs menu;

Download Event Log Export MS Excel; saved status and alarm data from FCSv4 storage are reported as Excel file.

Download Total Operation Time of Fan and A/C Export MS Excel; daily saved operation time of fan & A/C and power consumptions are reported as Excel file.

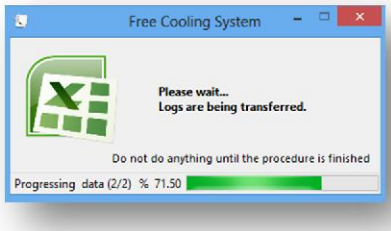
Downloading and Reporting data;

1.step; download data from storage

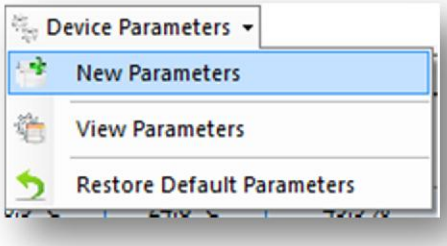
(**Transfering data (1/2)**)

2.step; report downloaded data as Excel file

(**Progressing data (2/2)**)

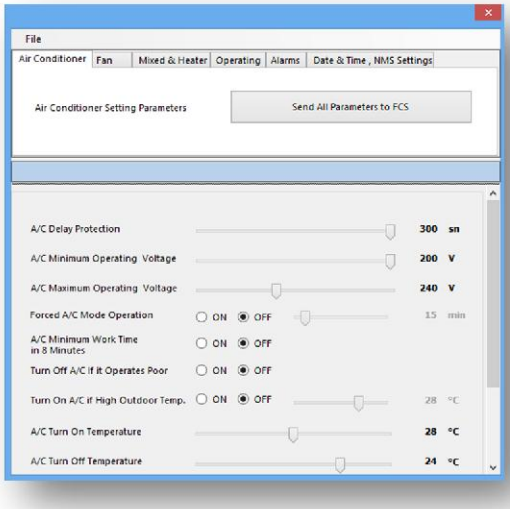


d) Device Parameters

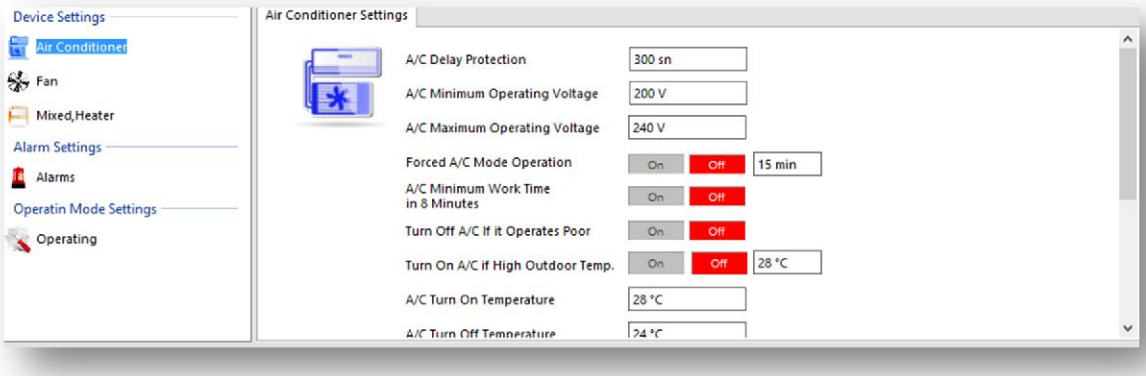


Device Parameters menu;

New Parameters; user can change the FCSv4 current settings with the new settings. Also, user can apply these settings by using **Send All Parameters to FCS** button.



View Parameters; FCSv4 operating settings are displayed. User can display several operating parameters which are located at the left side.



Restore Default Parameters; operating settings can be restored.

Desired values can be set for FCSv4 which will determine operating conditions.

	Parameter	Status	Unit	Default	Min	Max
1	**A/C delay protection**		Sn	300	0	300
2	**A/C minimum operating voltage**		V	120	100	200
3	**A/C maximum operating voltage**		V	245	220	270
4	**Forced A/C mode operation**	ON / OFF	-	OFF		
	Forced A/C mode operation		Min.	15	0	180
5	**A/C minimum work time in 8 minutes**	ON / OFF	-	OFF	-	-
6	**Turn off if A/C if it oprates poor**	ON / OFF	-	OFF	-	-
7	**Turn on if high outdoor temp.**	ON / OFF		ON		
	Turn on if high outdoor temp.		°C	25	18	32
8	**A/C turn on temperature**		°C	28	24	32
9	**A/C turn off temperature**		°C	24	18	26
10	***A/C1 - A/C2 Delta temerature**		°C	5	1	10
11	***Switch the A/C using timing**	ON / OFF		OFF		
	***Switch the A/C using timing**		min	120	120	240
12	**Fan turn on temperature**		°C	22	15	25
13	**Fan turn off temperature**		°C	28	24	32
14	**Selection of Fan type**	DC / AC	-	DC	-	-
15	**Fan power type**	55w,120w,190w,380w	Watt	55w	-	-
	Fan speed (Night)		%	50	15	100
	Fan speed (Daytime)		%	100	15	100
16	**Indoor-outdoor delta temperature**		°C	2	2	5
17	**Critical indoor temp max fan speed,no AC**	ON / OFF		ON		
	Critical indoor temp max fan speed,no AC			30	28	35
18	**A/C phase fail fan speed**	HALF-MAX		HALF		
19	**Fan with work the A/C mode**	ON / OFF		OFF		
20	**Show Fan Speed Value Type On LCD**	%RPM / Decimal RPM		% RPM		
21	**Mixed Mode Start Temperature**		°C	35	34	41
22	**Mixed mode fan turn off temp**	Set - Diff		Set		
	Mixed mode fan turn off temp		°C	32	28	35
23	**Mixed mode A/C turn off temp**		°C	25	21	28
24	**Heating method**	A/C - Heater	-	A/C		
25	**Heater turn on temperature**		°C	10	2	10
26	**Heater turn off temperature**		°C	16	14	18
27	***Heater 1 and 2 Delta temerature**		°C	5	1	10
28	**Fan off,outdoor temp. high**	ON / OFF	-	OFF		
	Fan off,outdoor temp. high		°C	45	40	60
29	**Fan off,outdoor temp. low**	ON / OFF	-	OFF		
	Fan off,outdoor temp. low		°C	10	-20	10
30	**Fan off,Maximum indoor humidity**	ON / OFF	-	ON		
	Fan off,Maximum indoor humidity		°C	85	80	90
31	**Fan Paramater enable in mixmode**	ON / OFF	-	OFF		

32	**Start of the night**		-	20:00		
	Stop of the night		-	08:00		
33	**Low batt alarm threshold**		V	-44 (+22)	-42 (*21)	-46(*23)
34	**High batt alarm threshold**		V	-54 (+27)	-54 (*27)	-60(*30)
35	**Low temp alarm threshold**		°C	8	4	12
36	**High temp alarm threshold**		°C	35	25	35
37	**Very High temp alarm threshold**		°C	40	35	45
38	**Low voltage alarm**	ON / OFF	-	OFF		
39	**High voltage alarm**	ON / OFF	-	OFF		
40	**Low temp alarm**	ON / OFF	-	ON		
41	**High temp alarm**	ON / OFF	-	ON		
42	**Very High temp alarm**	ON / OFF	-	ON		
43	**Filter pressure alarm**	ON / OFF	-	OFF		
	Threshold		Pa	500	200	500
44	**A/C phase power alarm**	ON / OFF	-	OFF		
45	**Poor heating alarm**	ON / OFF	-	OFF		
46	**Poor cooling alarm**	ON / OFF	-	OFF		
47	**Fan power alarm**	ON / OFF	-	OFF		
48	**Fan spped (RPM) alarm**	ON / OFF	-	OFF		
49	**Max humidity alarm**	ON / OFF	-	ON		
50	**Dew-point alarm**	ON / OFF	-	OFF		
51	**Show FCS alarms on LCD**	ON / OFF	-	ON		
52	**NMS time (dk)**		-	5	5	240
53	**Send event data to the NMS**	ON / OFF	-	ON		

* These are set parameters for two phase systems when +24VDC power supply was used.

A/C: Air-Conditioning

“A/C Delay Protection”

In case of frequent power cut, compressor is disabled during the set time and sytem protects A/C.

“A/C Minimum Operating Voltage”

Minimum operating voltage is adjusted according to A/C features. With this way, when mains voltage is low, system protects A/C.

“A/C Maximum Operating Voltage”

Minimum operating voltage is adjusted according to A/C features. With this way, when mains voltage is high, system protects A/C.

“Forced A/C Mode Operation”

After A/C runs, continuous operating time is determined.

“A/C Minimum Work Time in 8 Minutes”

When this mode is ON, A/C operates at least for 8 minutes.

“Turn Off A/C if it Opr. Poor”

When this mode is ON and if cooling performance of A/C is unsatisfactory, system stops the A/C to save the energy.

“Out Temp High F/C Operation”

With this mode is ON, when the outside temperature exceeds the setpoint, Free Cooling mode is disabled and let A/C to operate.

“A/C Turn On Temperature”

The Indoor temperature is adjusted to let A/C to operate when Free Cooling mode is unsatisfactory for cooling. But minimum operating voltage should be provided by mains to let A/C to work. Otherwise, A/C does not operate.

“A/C Turn Off Temperature”

Indoor temperature is adjusted to stop A/C.

* “A/C1 - A/C2 delta temperature” (Two phase systems)

Operating temperature is adjusted for A/C2 when A/C1 is inefficient in two phase systems.

* “Switch the A/C using timing” (Two phase systems)

When the both A/C exceed the setpoints of operation times, system switches A/C units from active to passive. With this way, both A/C can run equally and stable.

“Fan Turn On Temperature”

Indoor temperature is adjusted for operation of fan to run. If;

- fan fuse(F1) is not plugged in
- humidity value is higher than the setpoint
- DC power supply is not proper for fan
- There is dewpoint alarm

Fan does not run.

“Fan Turn Off Temperature”

Indoor temperature is adjusted for operation of fan to stop.

“Selection of Fan Type”

DC fan is chosen on installation. But DC or AC fan can be chosen.

“Fan Power Type & Day-Night Speed”

Fan Power and Fan Day-Night Speed parameter settings can be adjusted.

“Fan Work With The A/C Systems”

With this mode, after A/C started to run, according to indoor/outdoor temperature (Δt), fan can run if it’s desired.

“Indoor - Outdoor Delta Temperature (Δt)”

Δt is determined for fan’s maximum speed. Δt is effective on cooling capacity. If measured Δt is equal to or bigger than set Δt, fan will work at maximum speed.

“Critical Indoor Temp Max Fan Speed,No AC”

When inside temperature is on critical value and fan can be operated on maximum speed by using this mode. Also inside temperature is adjusted to run fan on maximum speed when there is no energy.

“A/C Phase Fail Fan Speed”

Fan speed can be adjusted from here.

“Mixed Mode Start Temperature”

Inside temperature value is adjusted to start mixed mode.

“Mixed Mode Fan Turn Off Temp”

“Mixed Mode Fan turn off temperature” can be set from this mode by choosing “Set”. When it’s on mixed mode and when set value is under 3°C, fan will stop.

“Mixed Mode A/C Turn Off Temp”

If inside temperature exceeds “Mixed Mode Start Temperature”, A/C & fan run together to decrease inside temperature.

“Heater Turn Off Temperature”

“Heater Turn Off Temperature” is determined with this mode.

* “Heater 1 - 2 delta temperature” (Two phase systems)

When 1.heater(A/C) is inefficient for heating, the temperature level is adjusted to run 2.heater(A/C).

“Fan Off,Outdoor Temperature High”

When the outdoor temperature increases to set value, operation of the fan and air flow stops.

“Fan Off,Outdoor Temperature Low”

When the outdoor temperature decreases to set value, operation of the fan and air flow stops.

“Fan Off,Maximum Indoor Humidity”

When indoor humidity increases to set value, operation of the fan and air flow stops. With this mode, indoor humidity value is held between desired range which devices can work decently.

“Fan Parameter Enable in Mixmode”

On mixmode when the outdoor temperature is low/high or value of indoor humidity is high, operation of the fan and air flow stops.

“Start of Night” - “Stop of the Night”

Night mode can be used when user want to reduce the noise of fan.

“Low Batt Alarm Threshold”

Default “Low Battery Alarm Threshold” is adjusted “-44 VDC” when supply voltage is “-48 VDC”, “22 VDC” when supply voltage is “24 VDC”. When supply voltage is under these values, user receive Low Battery Alarm and system doesn’t run the DC Fan.

“High Batt Alarm Threshold”

Default High Battery Alarm Threshold is adjusteed “-54 VDC” when supply voltage is “-48 VDC”, “27 VDC” when supply voltage is “24 VDC”. When supply voltage is under these values, user receive High Battery Alarm and system doesn’t run the DC Fan.

“Low Temp Alarm Threshold”

The minimum indoor temperature is determined that user can get Low Temperature Alarm.

“High Temp Alarm Threshold”

The maximum indoor temperature is determined that user can get High Temperature Alarm.

“Very High Temp Alarm Threshold”

The maximum indoor temperature is determined that user can get Very High Temperature Alarm.

“Low Voltage Alarm”

If the voltage of the device is lower than normal supply voltage, system sends Low Voltage Alarm.

“High Voltage Alarm”

If the voltage of the device is higher than normal supply voltage, system sends High Voltage Alarm.

“Low Temp Alarm”

If indoor temperature is lower than adjusted minimum value, system sends Low Temperature Alarm.

“High Temp Alarm”

If indoor temperature is higher than adjusted minimum value, system sends High Temperature Alarm.

“Very High Temp Alarm”

If indoor temperature is much higher than adjusted minimum value, system sends Very High Temperature Alarm.

“Filter Pressure Alarm”

If air filter does not let air flow because it’s too dirty & blocked, system sends Filter Pressure Alarm. User can set the desired pressure value and if the filter pressure value reachs to this level, user receives the alarm.

“A/C Phase Power Alarm 1”

When the mains voltage is off, system sends A/C Phase Power Alarm 1.

“Poor Heating Alarm”

If indoor temperature does not reach to the desired value (heater OFF temperature) in one hour while heating, system sends Poor Heating Alarm.

“Poor Cooling Alarm”

If indoor temperature does not reach to the desired value in one hour while cooling, system sends Poor Cooling Alarm.

“Fan Power Alarm”

If somehow fan doesn’t run, system sends Fan Power Alarm.

“Fan Speed (RPM) Alarm”

If there is a problem about fan speed, system sends Fan Speed Alarm.

“Max Humidity Alarm”

If indoor humidity is higher than adjusted humidity value, system sends Max Humidiy Alarm.

“Dew-Point Alarm”

In any Dew-Point situation, system sends Dew-Point Alarm.

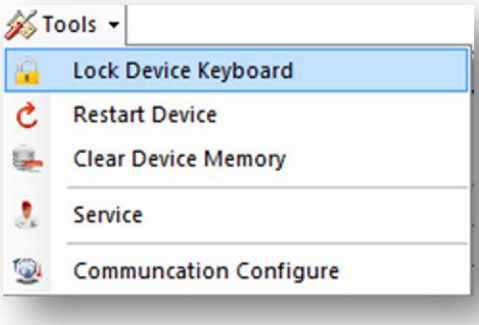
“Show FCS Alarms On LCD”

When this mode is ON, user can see all alarms on the screen.

“Send event data to the NMS”

When this mode is ON, all occured events and alarms deliver to network management system.

e) Tools



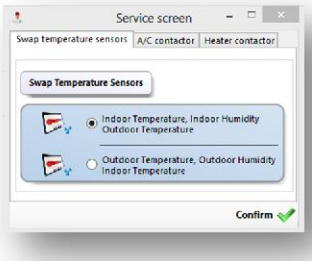
Tools;

Lock Device Keyboard; FCSv4 keyboard can enable/disable. Thus, System parameters are prevented to change by unauthorized persons on the field. (This option only can be used through the USB Connection.)

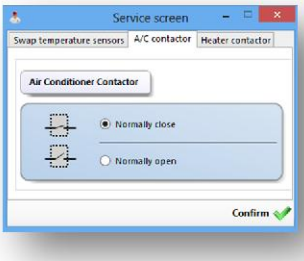
Restart Device; FCSv4 can be reset with this option.

Clear Device Memory; All data in FCSv4 memory can be deleted.

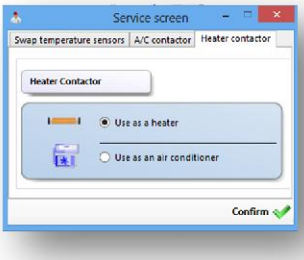
Service; Service settings of FCSv4 is accessible with this option. Service settings are given on the right side;



1. FCSv4 operation system can be optimized according to sensor placements.



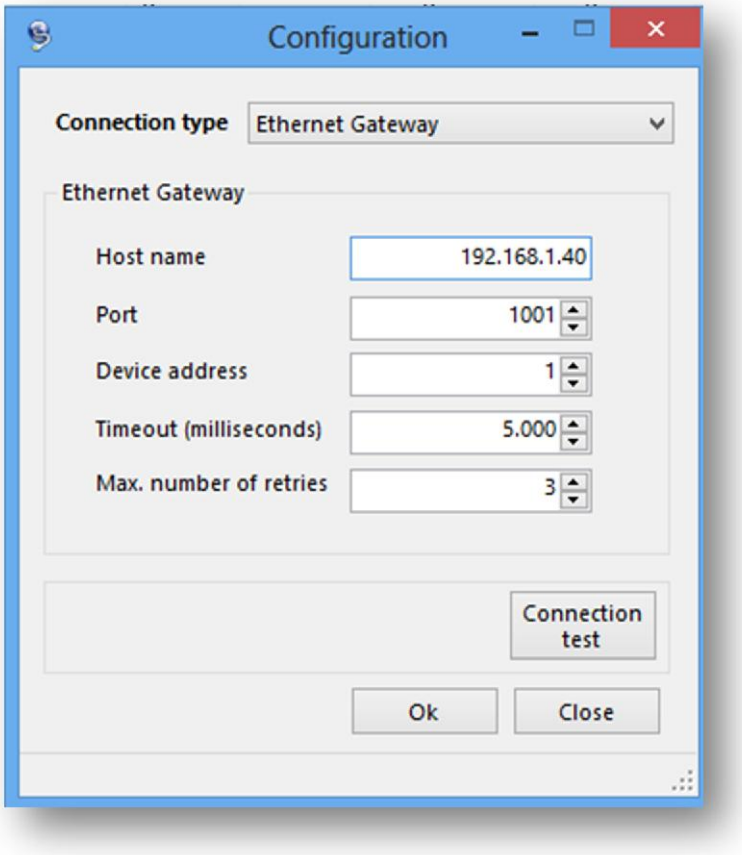
2. FCSv4 contacts (NC/NO), which controls the air-conditioning units, can be optimized according to system operation.



3. FCSv4 contacts, which controls heaters, can be optimized as air-conditioning unit or heater.

Communication Configure; “access point settings” are configured which will provide to connect to the FCSv4 control unit. This connecition can be made through two different point.

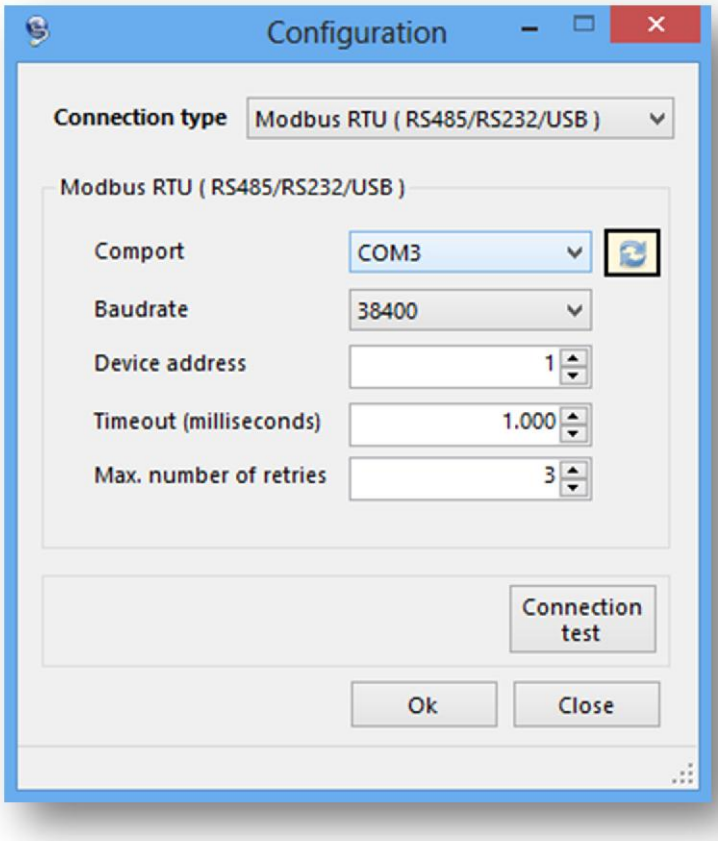
1-Ethernet Connection



After Free Cooling Viewer is executed;

1- Tools -> Communication Configuration -> Connection type -> Ethernet Gateway
2- After Ethernet Gateway settings are done as shown above, user can apply the settings with “Connection Test” button.
3- Then “Ok”.

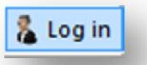
2-USB/RS485/RS232 Connection



After Free Cooling Viewer is executed;

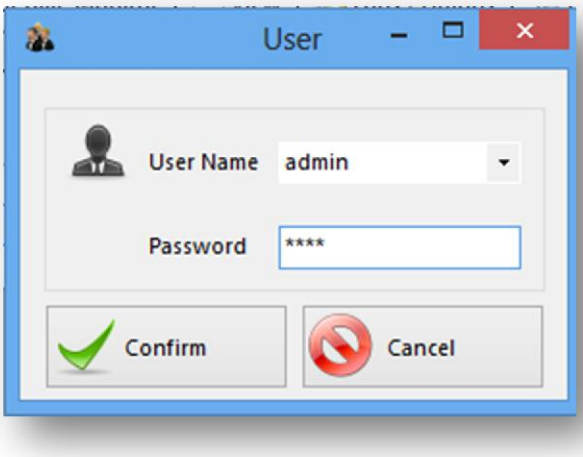
1- Tools -> Communication Configuration -> Connection type -> Modbus RTU (RS485/RS232/USB)
2- After Modbus RTU (RS485/RS232/USB) settings are done as shown above, user can apply the settings with “Connection Test” button.
3- Then “Ok”.
4- After these settings are done, user doesn’t need to do settings again.

f) Log in



Log in; User can access the system as admin. As an admin, user can;

- Reset the FCSv4
- Delete all data in FCSv4 memory
- Change parameters

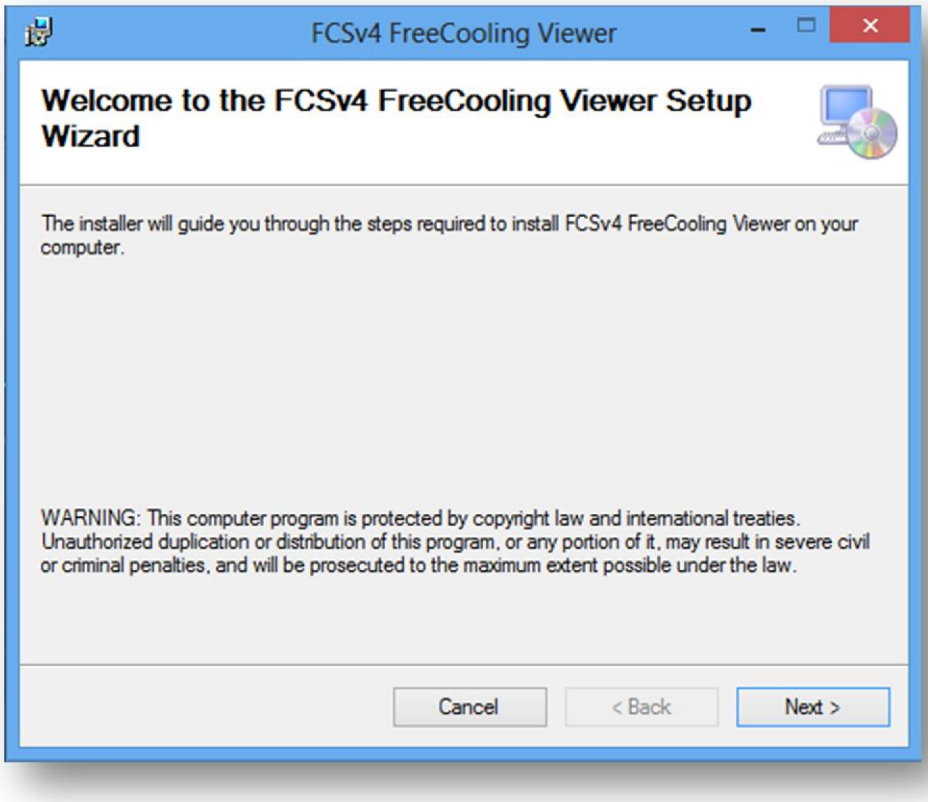


Installation

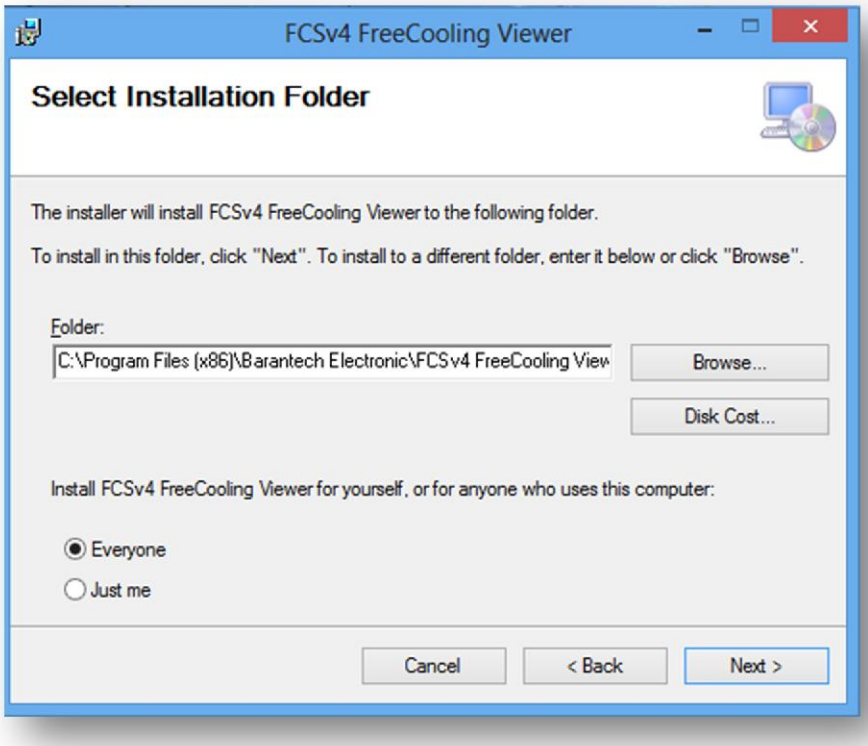
Installation CD is available in the control unit packet. User can install the software by this CD.

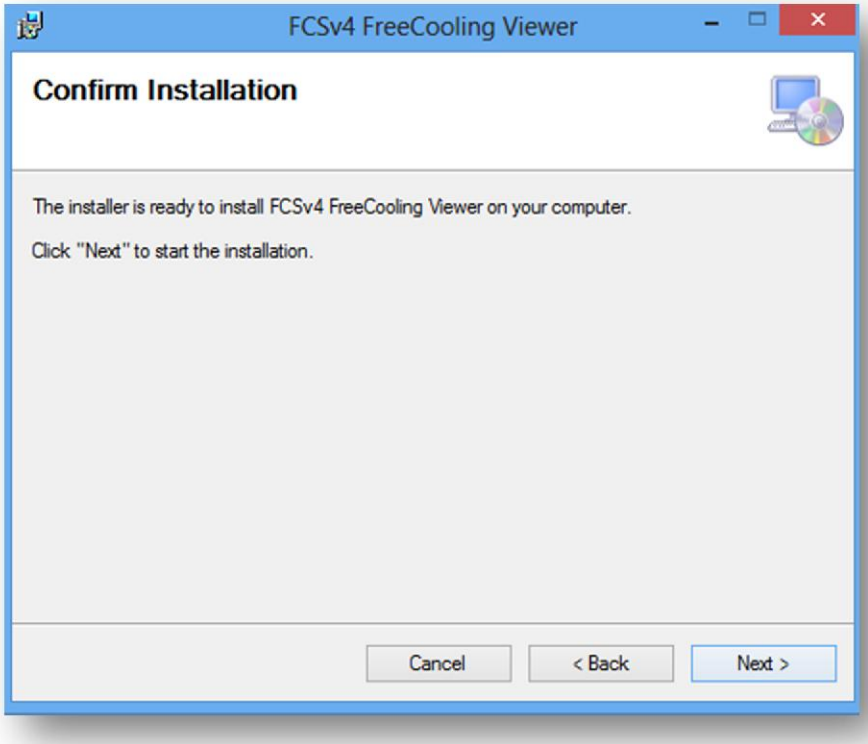
Installation stages;

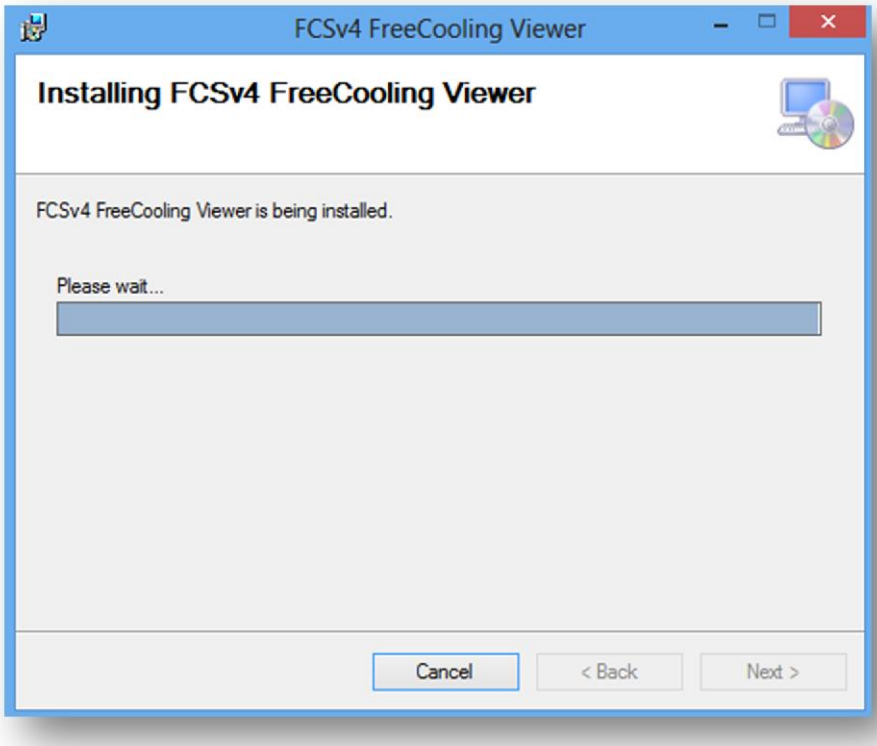
- **FCS v4 Free Cooling Viewer Setup\setup.exe**
- **Next**

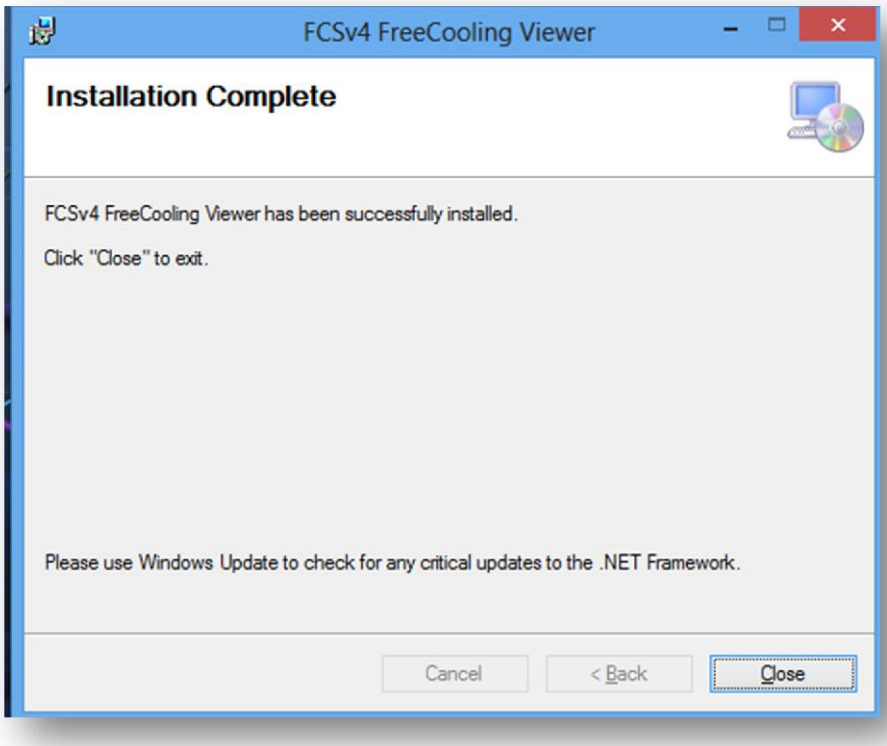


- User should choose the folder for installation and then clicks **Next;**

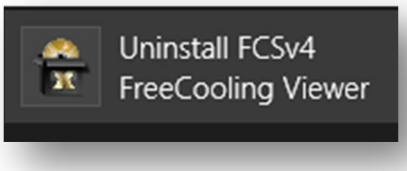





FCSv4 FreeCooling Viewer
Installing FCSv4 FreeCooling Viewer
FCSv4 FreeCooling Viewer is being installed.
Please wait...
Cancel
< Back
Next >


FCSv4 FreeCooling Viewer
Installation Complete
FCSv4 FreeCooling Viewer has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

Uninstallation



- User should run the Free Cooling Viewer to uninstall the program.
- All saved data still stays in the system after uninstalling.