Monitoring equipment

BACnet Cloud Smart Controller

WC-RB1x

【Application Description】

WC-RB1 x is a BTL BACnet B-BC certified building controller with 32-bit core processor with Router function, Stand alone capability and Web Embedded operating system. Suitable for use in situations where long-term recording and analysis of various energy-consuming electromechanical equipment in buildings are required.



【Product Features】

- Manufactured in accordance with the BACnet communication protocol established by the American Society for Heating, Refrigeration, and Air Conditioning (ASHRAE) and certified to BTL B-BC level.
- Peer to Peer data transfer and sharing, programmable, standalone, alarm and event management, calendar, Schedule, trend log, device and network management. Online program editing, debugging, online program download and online firmware update.
- With the built-in Linux Web Embeded operating system and BEMS, users can obtain real-time and historical energy consumption information through the web browser of 3C devices.
- E-mail and Line alarm function; different alarms can be set up to notify different E-mail and Line users.
- Energy analysis charts include pie charts, bar charts, trend charts, dot matrix charts, step line charts, etc. Annual, monthly and weekly reports are available.different types of reports. Users can set the data source and format for various combinations of analysis charts and reports through the webpage to meet various application requirements.
- The Dash Board function allows users to edit their customized dashboard style on the web page without using other graphic control software tools.
- WC-RB not only can save data in the SD card of the device, but also can be set to save data in PC (either as Excel file or in Maria DB with BACsoft) and Google cloud hard disk at the same time.
- Proportional, integral, differential, float, logic, arithmetic, and other functions and support for subroutine execution.
- Calendar, Schedule, Notification Class, Trend-log, Alarm & Event enrollment, and other standard BACnet objects. Schedule, Trend-log and Alarm & Event enrollment support external object access.
- The 1,000 digital software points (BV) and 1,000 analog software points (AV) can be used to calculate values, set points, timers or alarms, etc. The BV points support 16-bit priority control.
- Gold capacitor non-stop backup design, can provide normal operation of the clock after power failure.
- Depending on the size of the building and the functions required, there are various models with different software/hardware capacity/functions, so that users can find the most suitable cost-effective products according to their actual needs.
- It can be equipped with a variety of peripherals, and can be freely expanded to include physical I/O points and the number of various communication ports/protocols, providing maximum design flexibility.

【Hardware differences between series models】

Type	Ethernet	MS/TP	EIMnet	MSnet	USB Config	DSTcom	SD Card
WC-RB10-U	3	X	X	X	V	V	64GB
WC-RB11-U	3	X	1* 24EIM	1	V	V	64GB
WC-RB12-U	3	1* 32dev	1* 24EIM	1	V	V	64GB
WC-RB12-S	3	1* 8 dev	1* 4 EIM	1	V	V	64GB
WC-RB10-T	3	X	X	X	V	V	64GB

【Software differences between series models】

Type	Trend Record	Schedule	Alerts	Circulars	Calendar	Av	Bv	DDC program
WC-RB10-U	200	200	200	20	20	2000	2000	64KB
WC-RB11-U	400	400	400	40	40	2000	2000	64KB
WC-RB12-U	800	800	800	80	80	2000	2000	64KB
WC-RB12-S	10	10	10	2	2	1000	1000	64KB
WC-RB10-T	200	200	X	X	X	1000	1000	X

【Expandable I/O products with EIMnet】

Type	BI	AI	BO	AO
EIM24000M	24	X	X	X
EIM8000M	8	X	X	X
EIM0800M	X	8	X	X
EIM0080M	X	X	8	X
EIM0040M	X	X	4	X
EIM0004M	X	X	X	4
EIM4020M	4	X	2	X
EIM0402M	X	4	X	2

【Expandable communication integration products with Eth LAN】

Type	Application Notes
GC-RT..	Expansion of BACnet MSTP connection loop
PC-ME10	Expansion of Modbus TCP Client connection loop
PC-ME11	Expansion of Modbus RTU Master connection loop
PF-BM..	Expansion of AIRTEK FCU connection loop
PV-BM..	Expansion of Panasonic VRF connection loop

【Hardware specifications】

◆ Supply power :

* 24VAC, 50/60Hz, 6VA(Half-wave rectification)

◆ Processor :

* Cortex®-A7 32-bit CPU Up to 800MHz 512MB DDR3/LvDDR3 SDRAM · 16GB eMMC
* Cortex®-M4 32-bit RISC core Up to 72MHz (Only WC-RB12 has M4 processor)

◆ Ethernet interface :

* 10/100Mbps Ethernet communication interface*3 with Hub function
* Communication methods such as BACnet (Ethernet or /IP), JSON API, and Modbus Tcp (Server) can be performed simultaneously.
* The Ethernet network also has an upper and lower tandem connection cable, Enables multiple WC/GC equipment Simultaneous use.
  It is recommended to install a physical firewall when connecting to an external network.

◆ MS/TP interface :

* RS-485 BACnet MSTP communication interface, connect up to 32 BACnet devices.
* Built-in rated isolation voltage of 2,500Vrms, interference immunity with a maximum operating insulation voltage of 560Vpeak.
* Communication rate of 9,600/19,200/38,400 /76,800 BPS can be selected.Transmission distance of 1,200 meters.

◆ MSnet interface :

* RS-485 Modbus RTU Master/Slave communication interface, Modbus Master RW command can be customized through BACsoft DDC editing.
* Connection rate of 9,600/19,200/38,400 BPS is selectable.Transmission distance is 1,200 meters.

◆ Product Certification :

* BTL(B-BC), CE certification and RoHS compliance.

◆ EIMnet interface :

* RS-485 I/O expansion module communication interface.
* Direct hot plug to connect AIRTEK EIM series expansion I/O modules or set as Modbus Slave for integration with other devices.
* EIMnet communication rate of 38,400 BPS and transmission distance of 1,200 meters.
* The EIMnet also has an upper and lower serial connection cable, which allows the WC to be used simultaneously with EIM I/O modules. (Up to 4 sets of EIMs can be connected to the cable).

◆ SD Card slot :

* Micro SD Card Slot, factory built-in 64GB SD card. It is used to store log data.
* Record data volume up to 10 years (800 records, 1 minute / 1 data).

◆ DSTcom interface :

* 7.0"/ 3.5"/ 2.8" DST series touch panel can be connected. The panel supports internal network parameter setting of the controller.
* The panel can be edited by BACsoft screen to make the controller with live operation function.

◆ Config interface :

* USB Type-C interface, you can use the software with terminal function to set the internal network parameters of the controller after connecting to PC.

◆ Real time clock :

* Real-time Clock with battery backup design Provides normal operation of the clock after power failure.

◆ Usage environment :

* 0 ~ 50℃, 5 ~ 95%RH without condensation.

【Software Specification】

◆ Trend Record :
* Data is stored in the SD card, and at least 1 data per minute can be recorded.
* With WC-RB recorder software, you can regularly backup and save SD card data as CSV files.
* BACsoft-AWS/OWS with data transfer function.

◆ Schedule / Calendar :
* Exceptional schedule includes date/date range /week-n-day and other schedule control functions.
* The priority level can be set for each exception time.
* Calendar scheduling control with reference calendar objects
* The schedule can be set on the WC website.
* Schedule objects with BACsoft-AWS/OWS can be configured to use as Group Control function.

◆ Alerts / Notices :
* Alarm with Notify function can set different alarm notifications different devices/users.
* WC web page can save up to 100 alarms/confirmations for review.
* The alarm can be set to notify users by E-mail or Line instantly.
* With AIRTEK DACSMSB controller, it can be set to send alarm notification by SMS; up to 10 groups of calls can be set.

◆ Software digital analog point BV/AV :
* All software points support simultaneous access by BACnet & Modbus & JSON communication.
* All BV points support the BACnet Priority attribute.

◆ Communication Protocols :
* BACnet Ethernet or BACnet IP · BACnet MSTP。
* Modbus TCP Server · Modbus RTU Master/Slave。
* TACIS JSON API Server/Client, JSON API can read and write external points containing WC natively and all its connections through the BACnet system.

◆ DDC program :
* Support subroutine function, you can customize up to 32 subroutines, each subroutine can be customized with 32 sets of custom variables.
* The maximum program capacity is 32KB, and it supports 512 operation registers (Branch) and can read and write 256 external devices / 2048 external objects.

◆ Web Map Control :
* Web Server function for remote monitoring through any device's browser System monitoring can be done remotely through any device browser. Support SSL encryption certificate.
* The web control supports the alarm page jump function, which allows the control to automatically switch to the specified page when an alarm occurs. automatically switch to the specified page.

◆ Password permission :
* Multiple users can be set, each user can assign a different account/password and usage level.
* Each posting point can be set up individually to prevent misuse by personnel with insufficient authority.

◆ Google Data Logs :
* Uploads the BACnet system points connected to the WC to Google Drive and create a log sheet.
* The log sheets uploaded to Google can be used to create real-time analysis charts on the WC webpage.

◆ Statistical analysis chart (Chart) :
* The chart types include line graphs, bar graphs, pie charts, drop point analysis charts, and many other styles.

◆ Statistical analysis report (Report) :
* You can set the specified reports to be automatically sent by e-mail.

◆ Customize DashBoard:
* Customized dashboard can be edited on the browser to display a mix of statistical reports /charts/graphic screens/real-time alarm lists on the dashboard.
* Up to 5 charts/reports can be displayed simultaneously per dashboard; up to 50 dashboard pages can be edited.

◆ Energy Analysis Management (BEMS) :
* Equipped with

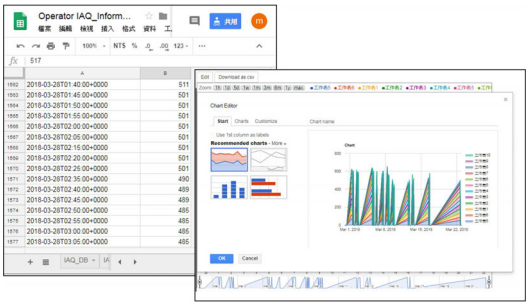
1 · Electricity demand analysis
2 · Time Tariff Management
3 · Demand loading and unloading
4 · Ice and water system data analysis
5 · Equipment power consumption, air conditioning power consumption and cost analysis report
6 · Statistical report of equipment operation hours

【Example of BEMS energy analysis application functions】

- The trend of total electricity consumption of air conditioning system, lighting system, power and other outlets is selected and the monthly EUI is calculated (X-axis is the month and Y-axis is the EUI).
- The regression analysis of the power consumption of the air conditioning system and the temperature of the chilled water discharge from the air conditioning machine (X-axis is the temperature, Y-axis is the power consumption).
- The regression analysis of external wet bulb temperature and cooling water tower discharge temperature (X-axis is external wet bulb temperature, Y-axis is discharge water temperature).
- Regression analysis of ice water host loading rate and ice water host power consumption (X-axis is ice water host loading rate, Y-axis is ice water host power consumption).
- The regression analysis of air conditioner power consumption and external temperature (X-axis is external temperature, Y-axis is air conditioner power consumption).
- Regression analysis of chilled water outlet temperature and power consumption of chilled water host kw/RT (X-axis is the chilled water outlet temperature of chilled water host, Y-axis is the power consumption of host).
- The proportion of each equipment pie chart (air conditioning system host, pump, air conditioning tank, cooling water tower ratio) energy consumption ratio chart (air conditioning, lighting, other proportion of the overall building electricity consumption).

【Application Examples】

Google drive data upload analysis



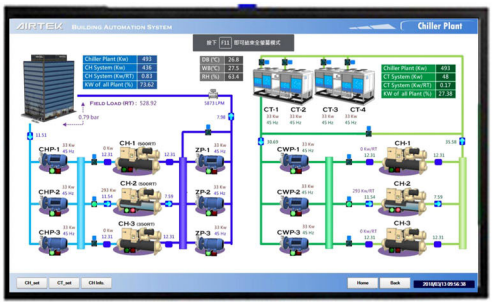
E-mail and Line alert settings



Mobile app operation screen



Browser monitoring operation/graphic control editing screen





Dash board design for various instrumentation applications





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【Example of electricity consumption analysis】





【Ice Machine System & Tariff Analysis Example】

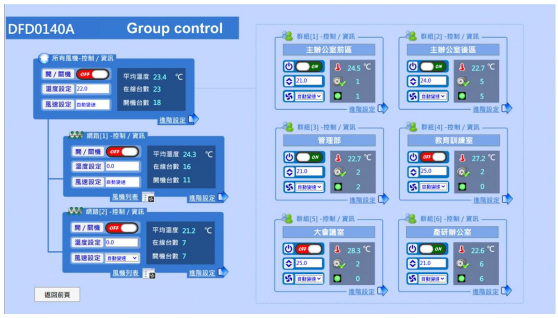




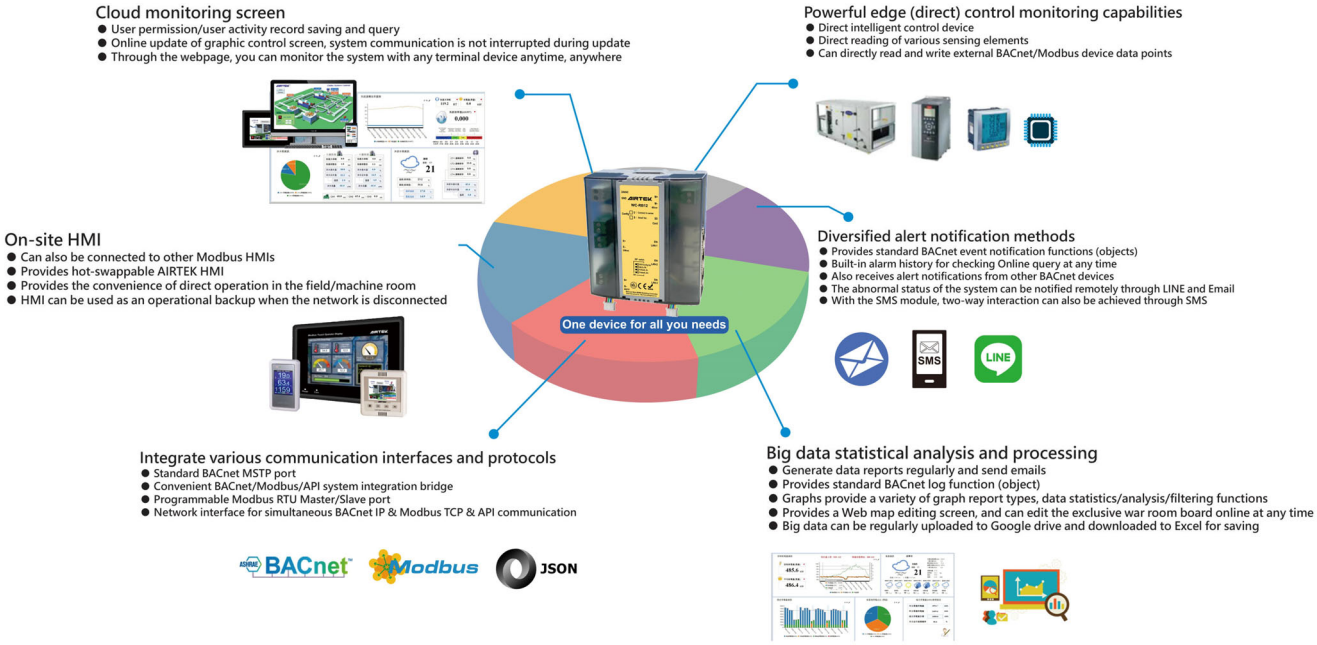
【Example of small air supply system & equipment operation analysis】



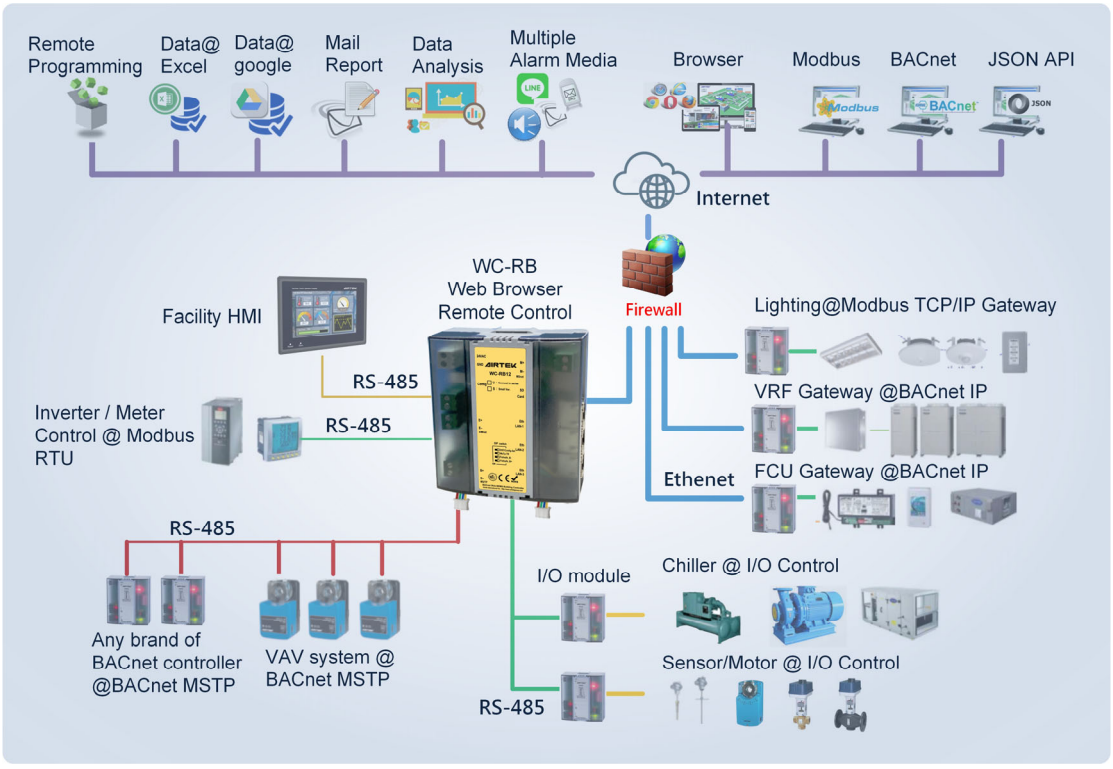




【WC Cloud Smart Controller addresses the following needs simultaneously】

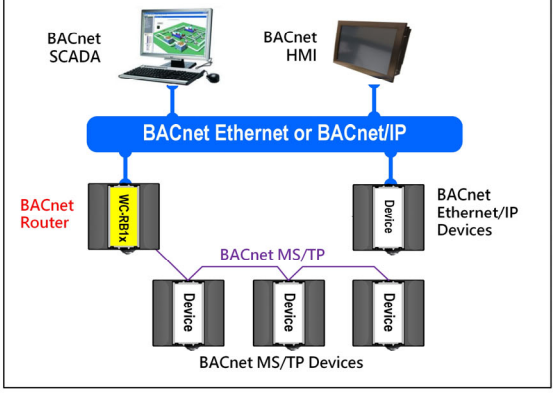


【Network Architecture】

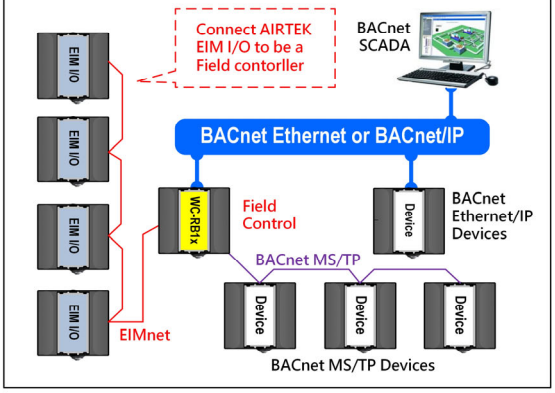


【Application Instructions】

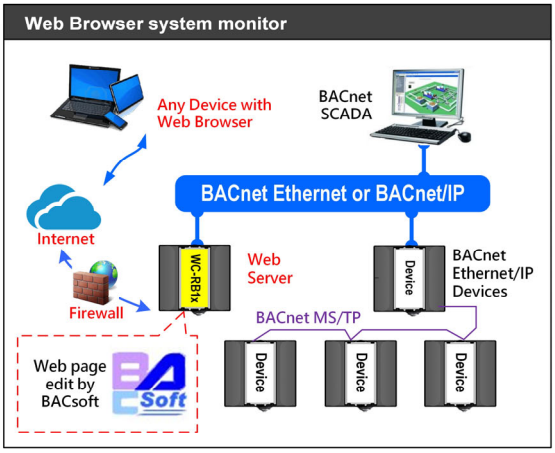
BACnet Ethernet to RS-485 Data Router



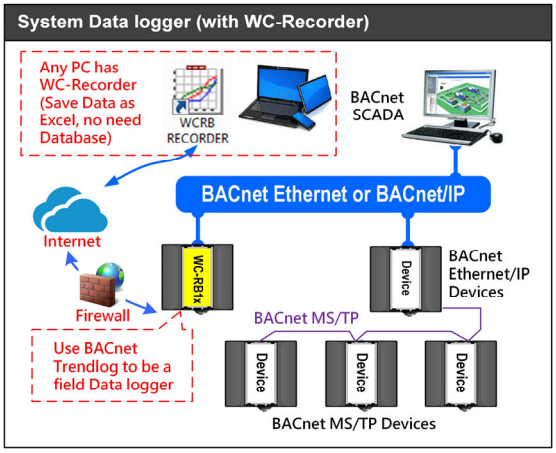
Field Control with EIM I/O



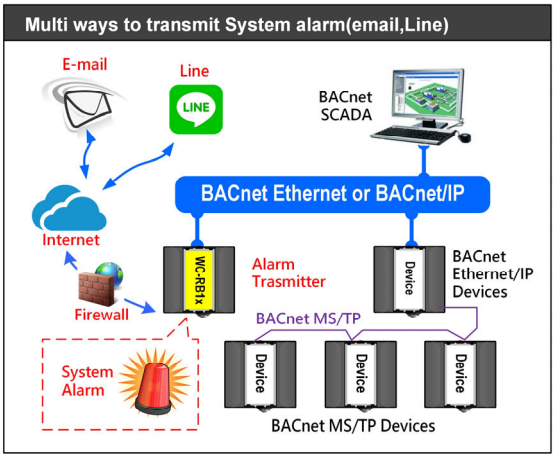
Web Browser system monitor



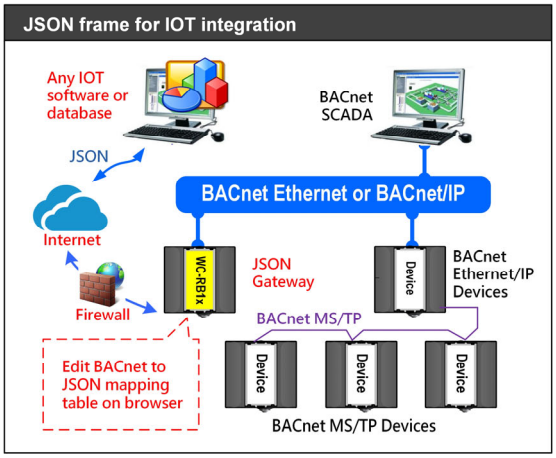
System Data logger (with WC-Recorder)



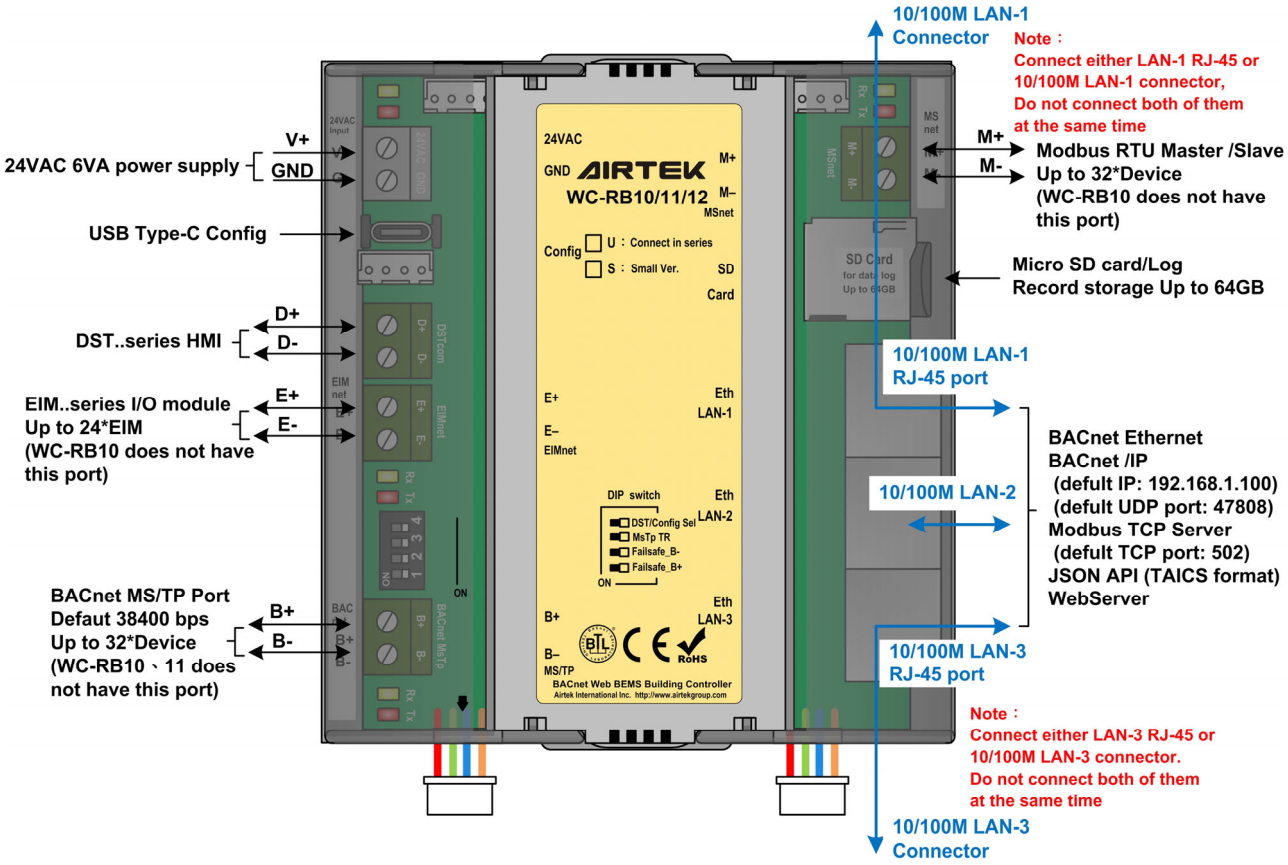
Multi ways to transmit System alarm(email,Line)



JSON frame for IOT integration



【Wiring instructions】



【Size】Unit:mm

