boss

The complete range for mobile-ready local supervision

Supervisors for small, medium and large sites

with built-in Wi-Fi, accessible from all mobile devices

boss range

- Completely browsable from mobile devices, from commissioning to daily access for system maintenance;
- Built-in Wi-Fi to create a network and allow the supervisor to be accessed from the user's devices without requiring other network infrastructure.
- Built-in 4G modem on boss-micro for sending emails / instant messages / SMS without needing to use the building's IT infrastructure to connect to the Internet

Energy saving & system optimisation

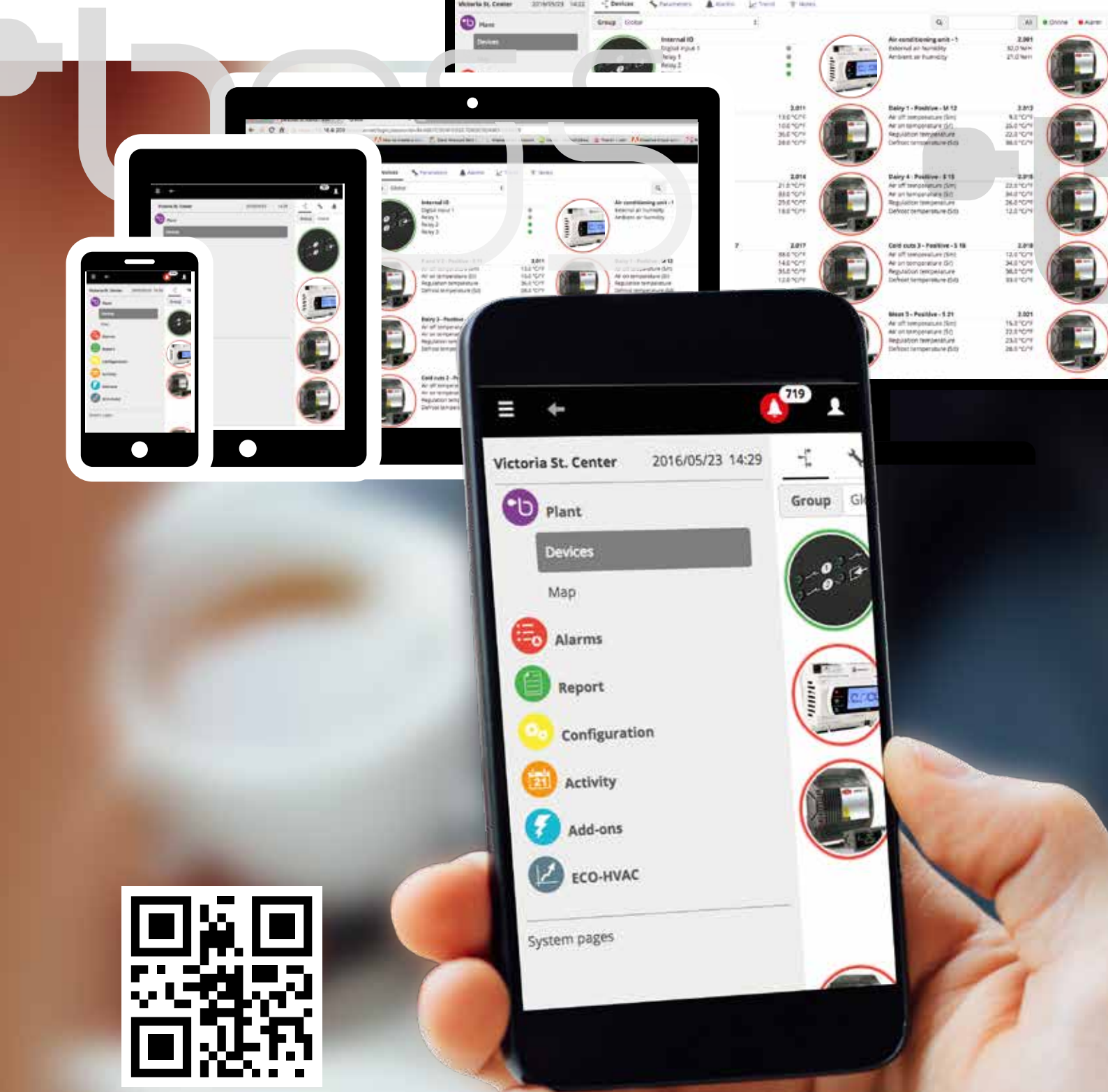
Algorithms for analysis and comparison, developed exploiting CAREL's experience, to facilitate and guide users in optimising energy consumption.

Secure data & browsing

HTTPS protocol for secure data transfer over the web from boss to an external device.
Customised operating system to guarantee system reliability.

Intuitive & customisable interface

All the information is available to the user in just a few simple clicks, including system configuration and device management.



boss always in your pocket

Responsive web pages offer the possibility to access all boss pages for both programming and everyday operations using mobile devices. The graphics automatically to the device they are displayed on (computers with different screen resolutions, tablets, smartphones), minimising the need for the user to resize the pages and scroll the contents.

centralised management

boss permits automatic data and alarm synchronisation with RemotePRO, so as to keep the situation on all connected systems under control from just one interface. Centralised system management also increases reliability, through alarm analysis and scheduling of service. It also allows increased energy efficiency by comparing energy consumption and performance between the different sites and identifying possible cost reduction actions.

remote service

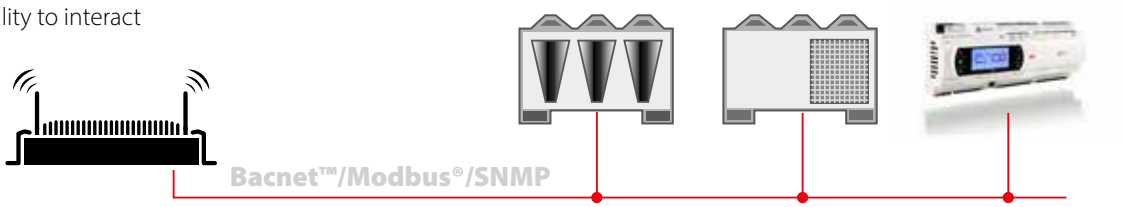
Access to typical operating system functions, such as printer driver installation, copying files, etc. is also available via a web interface, another first for a supervisory system. This means that remote service operations can be performed by authorised personnel without needing to travel on site, as is required with other supervisory systems.

Protocols and connectivity

Management of Modbus®, BACnet™ and SNMP protocols for third-party device integration.

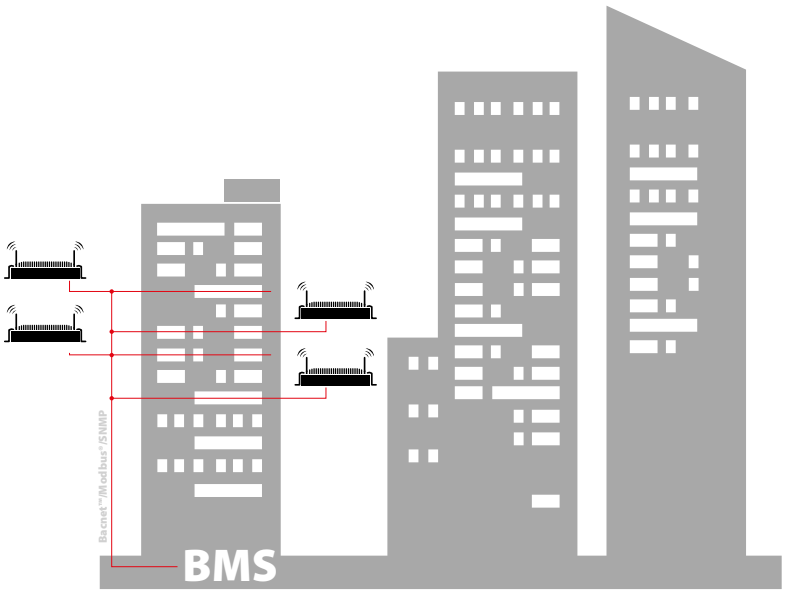
Third-party device integration

Management of these three protocols offers high potential for integration with third-party devices. The SNMP manager and BACnet™ Client protocols, available both in MS/TP and IP modes, as well as the Modbus® protocol in RS485 and TCP modes, offer the possibility to interact with the widest range of devices on the HVAC/R market



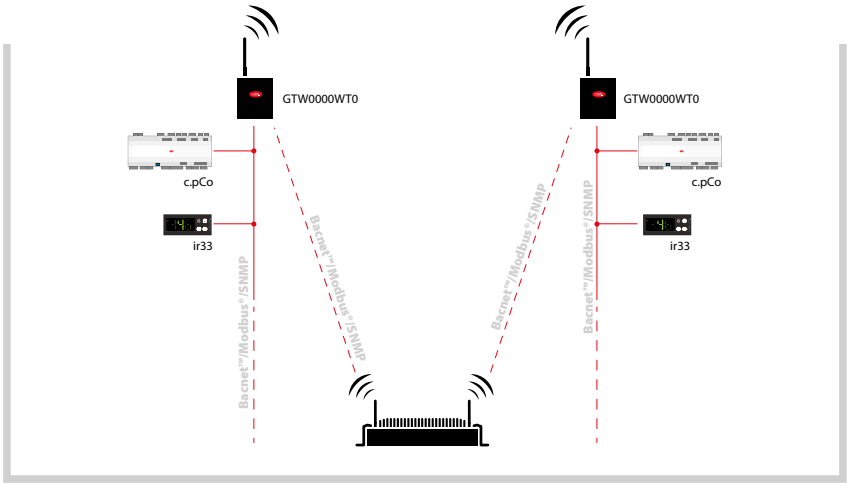
Integration into BMS systems

In addition to Client mode, the SNMP, BACnet™ and Modbus® protocols are also available on boss in Server mode, the BACnet™ protocol is also available on boss in TCP/IP Slave mode, allowing boss to be integrated into a higher-level BMS, sharing the values of interest for overall building management (e.g. unit status, alarm status, ON/OFF controls,...)



Wireless field connectivity

If Modbus RTU devices cannot be connected directly to the boss/boss-mini RS485 network due to installation constraints, these can be integrated into the boss system via its Wi-Fi network, using the WiFi-Modbus gateways (GTW0000WT0). Nonetheless, when a wired connection is available, this is the preferred option due to its reliability.



System optimisation functions

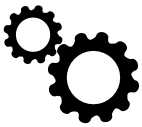
KPI
Performance index

Allows users to analyse the thermodynamic behaviour of the individual units connected to boss, defining for each, or for groups of units, the minimum and maximum operating thresholds for different variables, creating dashboards to identify which units are operating outside of the optimum conditions.

ENERGY
Consumption control and management

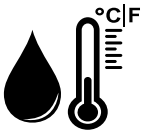
Allows users to monitor system energy consumption using graphs and reports, and then implement actions aimed at reducing waste or fixing any faults highlighted.

FLOATING SUCTION
Optimised suction pressure



This is used to optimise - in real time - the compressor rack working set point, thus reducing power consumption, by analysing the duty cycle of the connected cabinets. Based on cabinet cooling demand, the plug-in increases or decreases the compressor rack set point.

DEW POINT BROADCAST
Share the dew point



This is used to optimise activation of the anti-sweat heaters on the refrigeration units connected to boss, and consequently reduce power consumption. Connected to a room temperature and humidity probe, boss calculates the dew point in the area and sends the value to the entire network of connected units.

SAFE RESTORE
Safe compressor rack restart

This is used to manage safe and optimum compressor rack restart following a fault, in the event of specific compressor rack conditions putting all the connected refrigeration units in safety mode.

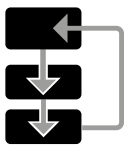
PARAMETER CONTROL
Parameter control

This is used to monitor all fundamental parameter setting actions on the units connected to the supervisor, for example the set point, performed either using boss or directly on the unit, and then activate restore logic, sending alerts when such occur.

LOGICAL DEVICE/COMPUTED VARIABLES
Logical devices / computed variables

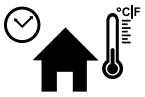
This function is used to create new variables and logical devices, with the possibility of creating relationships based on values from different physical devices, using simple and intuitive language to form logical expressions directly on the supervisor.

ALGORITHM PRO
Customised logic



This is used to create additional customised logic using the Java programming language, so as to increase interaction between boss and the connected devices.

HVAC SMART START
Optimised air-conditioning ON/OFF



This is used to optimise activation, shutdown and set point change on HVAC units based on the ambient information acquired by boss, such as inside and outside temperature, system inertia, occupancy and air quality.

GEO - LIGHTING
Optimised management of lights based on outside light

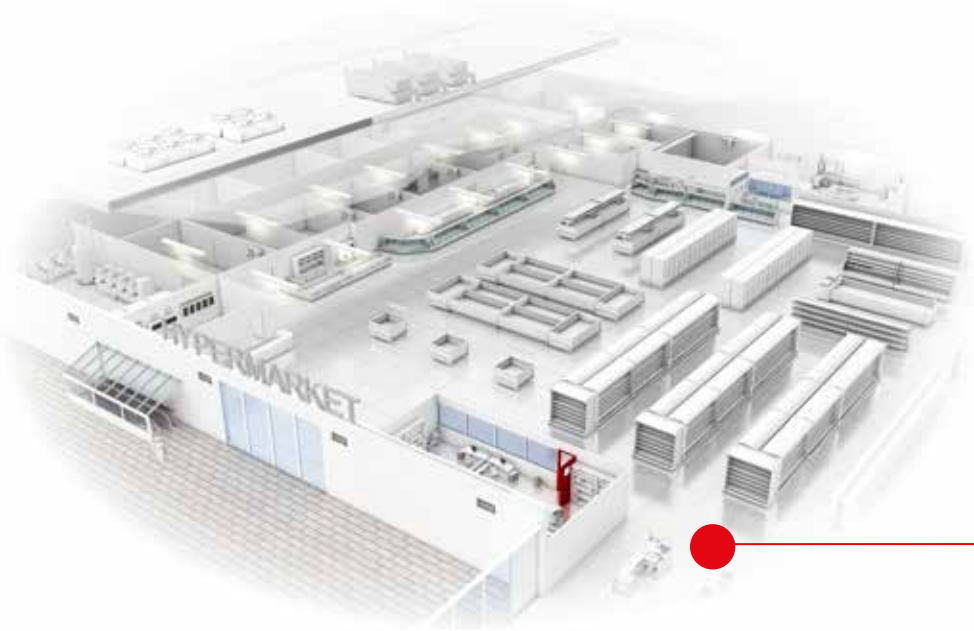
This is used to optimise switch-on and switch-off of outdoor lights based on site latitude and longitude, thus knowing the time when the sun rises and sets.

SMART HIGH PURGE
Optimised free cooling on HVAC units

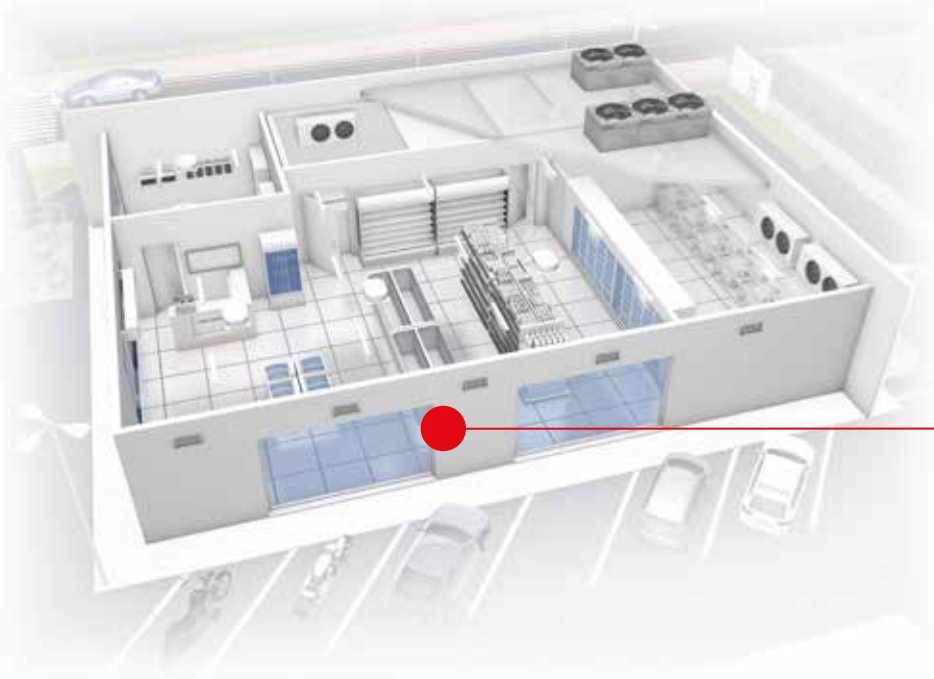
The air-conditioning system can be started before sunrise using calculations based on system enthalpy (inside and outside), so as to fully exploit free cooling.

USAGE BALANCER
Optimised unit capacity management

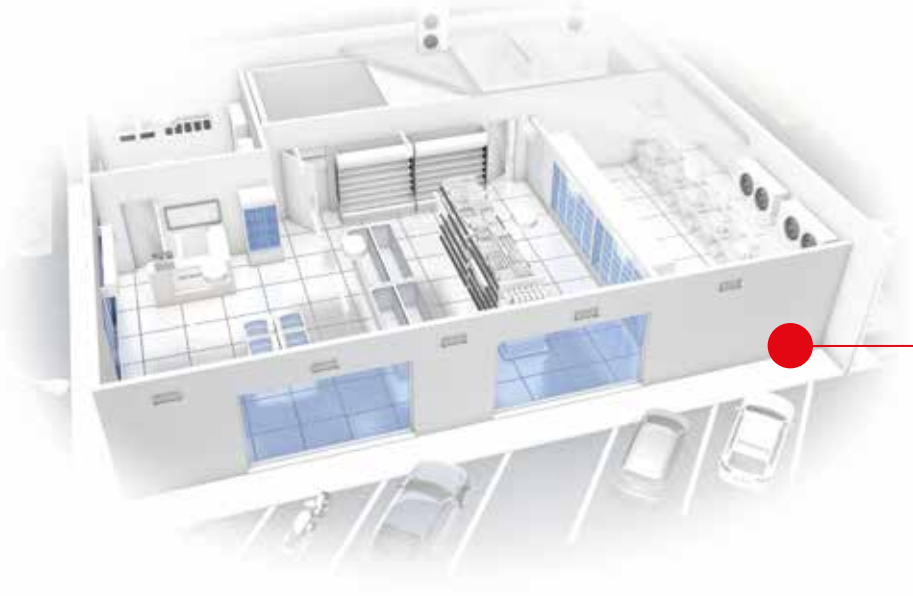
By reading the room temperature and humidity probes, the average values can be calculated so as to determine the actual capacity required and optimise and balance the operating cycles of the various units installed (**)



Up to 300 devices



Up to 50 devices

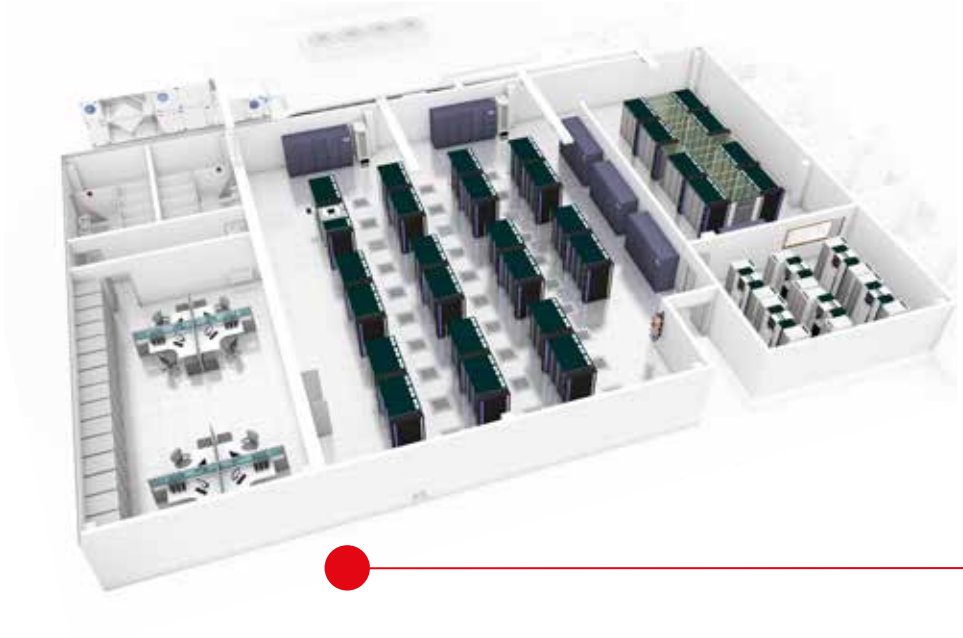


Up to 30 devices

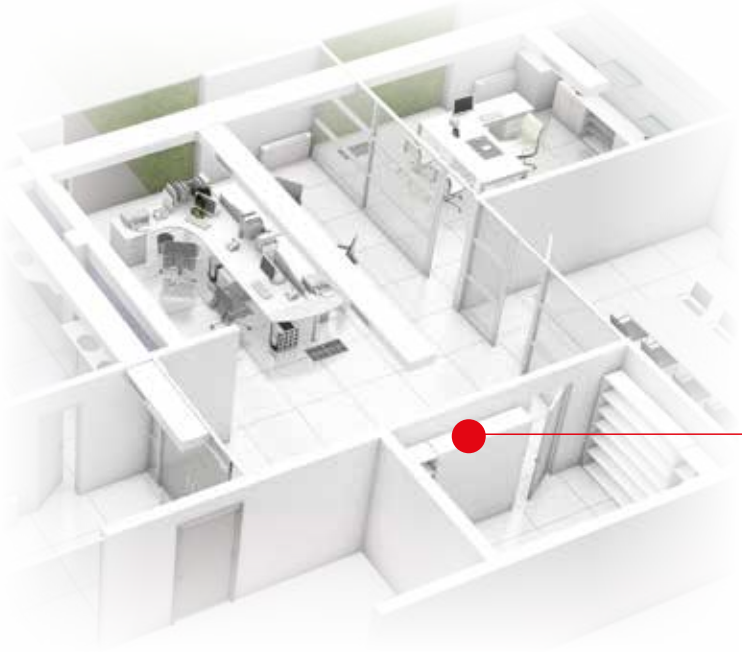
Refrigeration applications

Optimisation of retail systems

In addition to all the functions of a standard supervisor, boss all includes functions for managing refrigeration units and interaction between units, meaning not only is the system controlled, but also optimised in terms of thermodynamic performance and energy consumption.
CAREL's extensive and in-depth knowledge of these applications has also led to the development of user interfaces that are configured based on the type of user (i.e. installer, maintenance personnel, system manager) and the type of use, so as ensure simpler and faster commissioning.



Up to 300 devices



Up to 50 devices

Up to 30 devices

Air-conditioning applications

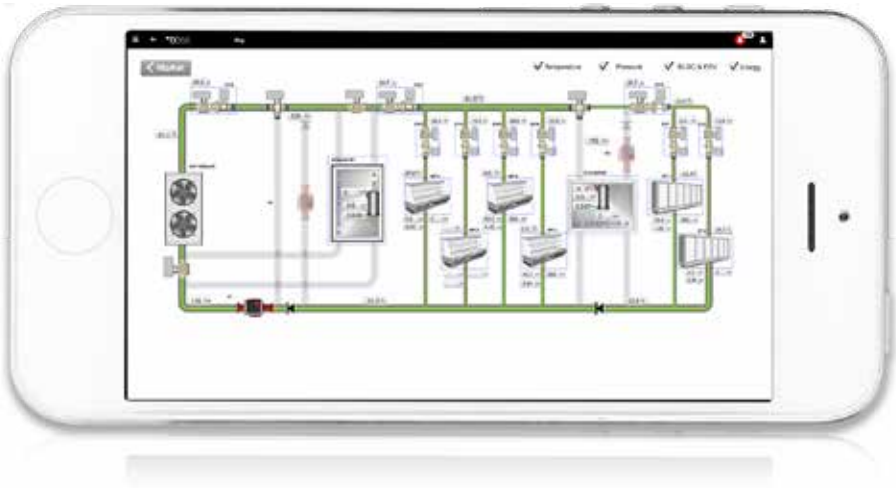
Optimisation of HVAC systems

The high level of configurability, the possibility to customise maps and the availability of BACnet, SNMP and Modbus standard protocols for communication over the Ethernet network, make boss suitable for numerous HVAC applications.
The supervisor can also interface with other BMS systems, for example in large buildings where the main BMS manages those systems that are not included among the functions handled by boss (security, fire safety,…).
In this case, boss manages the HVAC systems, providing specific data that create added value for the end customer, and then sharing with the main BMS only the information needed to understand system status.

Customised graphics

User interfaces that can be customised according to the way in which information is managed by different users

With the c.web tool, system status and the main variables relating to each controller can be represented using customised graphics. Indeed c.web offers several powerful features, such as the creation of vectorial images that can adapt to all screen sizes on both desktop and mobile devices without losing resolution, the possibility to develop customised animated widgets in just a few clicks, and the reusability of graphic libraries developed for one project inside another.



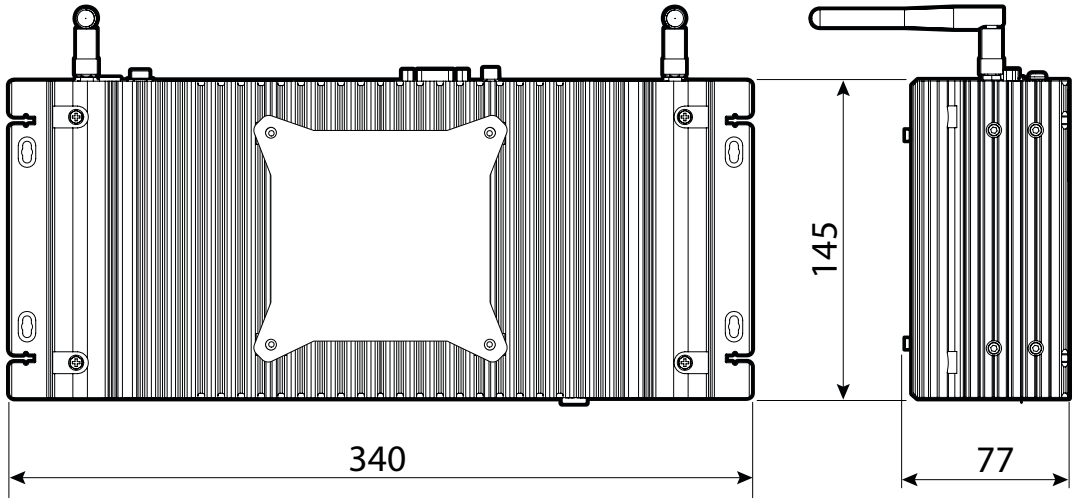
The same hardware is suitable for all applications

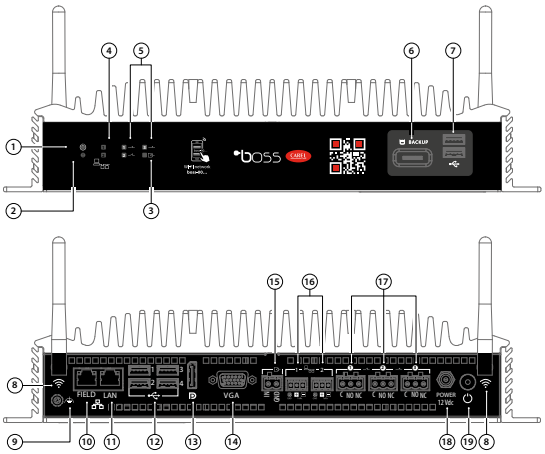
No moving mechanical devices for heat dissipation, thus allowing installation in various different equipment rooms and other spaces, allowing installation even in unfavourable technical environments.

boss	boss mini	boss micro	
			Desktop
			Wall-mounted
			DIN rail

Dimensions and key

boss

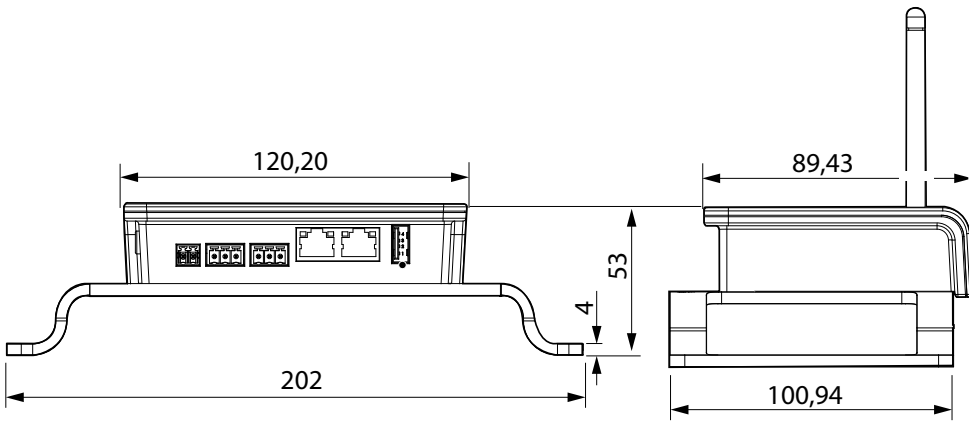


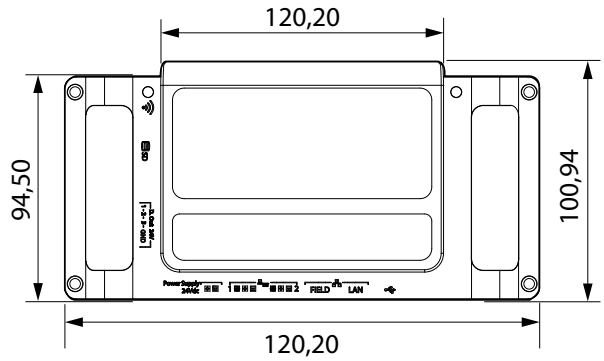


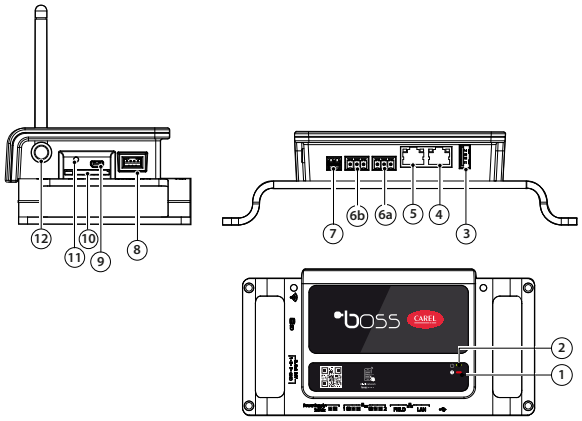
Key
1. ON/OFF status LED
2. Alarm status LED
3. Digital input status LED
4. RS485 status LED (1, 2)
5. relay status LED (1, 2, 3)
6. µSD port
7. USB ports (1, 2)
8. Two antennas
9. Earth
10. FIELD Ethernet

11. LAN Ethernet
12. USB ports (1, 2, 3, 4)
13. Display port
14. VGA port
15. Digital inputs
16. RS485 line (1, 2)
17. Relay outputs (1, 2, 3)
18. Power supply
19. ON/OFF button

boss mini





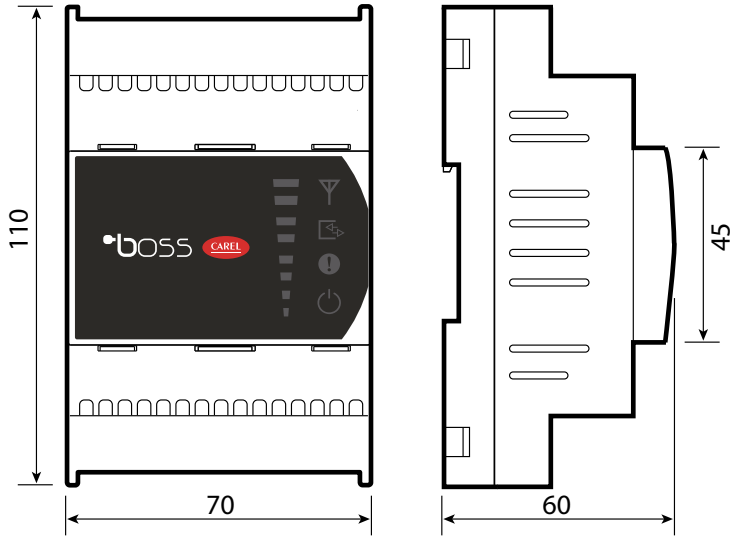


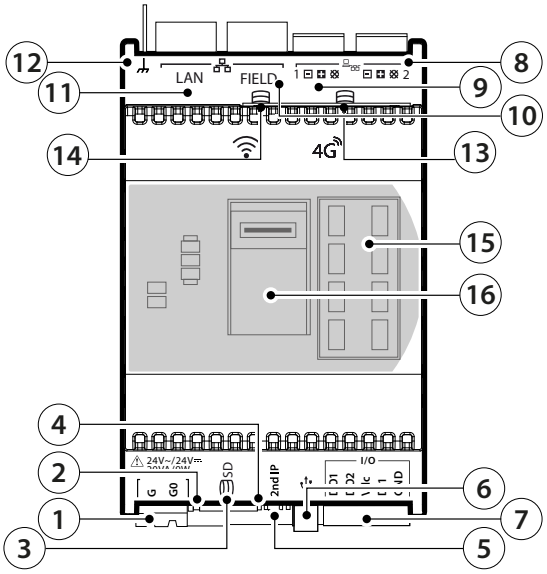
Key
1. Alarm status LED
2. ON/OFF status LED
3. USB host port
4. LAN Ethernet
5. FIELD Ethernet
6a: RS485 Serial non opto-isolated
6b: RS485 Serial opto-isolated

7. Power supply
8. Digital outputs +24Vdc (1, 2, 3)
9. µHDMI port
10. SD port
11. Temporary IP enable button
12. wi-fi antenna (*)

(*) only in the models prepared

boss micro





Key
1. Power supply connector [G(+), G0(-)] 24Vac/Vdc
2. LED power-on (green)
3. uSD-card reader for backup/recovery function
4. Ethernet signal Led
5. Reset button and Enable temporary IP
6. Standard HOST USB port, type A connector, for upgrading FW and downloading log files
7. External relay command and free contact digital input
8. RS485 serial opto-isolated
9. RS485 serial not opto-isolated
10. FIELD Ethernet
11. LAN Ethernet
12. Faston for shield ethernet port earth connection
13. 2G/3G/4G Antenna connector (*)
14. Wi-Fi Antenna connector (*)
15. LED synoptic
16. SIM connector (*)

(*) depending on the model

Part numbers

Part number	Description	Maximum number of devices managed/variables recorded
BMEST**RS0	boss-mini Monitoring System Standard Capacity - Headless	30/300
BMEST**RE0	boss-mini Monitoring System Standard Capacity - Headless	50/500
BMEST**LE0	boss-mini Monitoring System Extended Capacity - Wi-Fi / Video output	50/500
BMHST**XS0	boss Monitoring System Standard Capacity	100/1500
BMHST**XE0	boss Monitoring System Extended Capacity	300/3500
BMBST00RP0	Boss-Micro Monitoring System Wired	15/150
BMBST00FP0	Boss-Micro Monitoring System Wireless Wi-Fi	15/150
BMBST00GP0	Boss-Micro Monitoring System Wireless 4G EMEA	15/150
BMBST00CP0	Boss-Micro Monitoring System Wireless 4G China	15/150
BMBST00BP0	Boss-Micro Monitoring System Wireless 4G Australia & South America	15/150
BMBST00MP0	Boss-Micro Monitoring System Wireless Wi-Fi and 4G EMEA	15/150
BMBST00NP0	Boss-Micro Monitoring System Wireless Wi-Fi and 4G China	15/150
BMBST00DP0	Boss-Micro Monitoring System Wireless Wi-Fi and 4G Australia & South America	15/150
BMBSE00RP0	Boss-Micro Enhanced Monitoring System Wired	30/300
BMBSE00FP0	Boss-Micro Enhanced Monitoring System Wireless Wi-Fi	30/300
BMBSE00GP0	Boss-Micro Enhanced Monitoring System Wireless 4G EMEA	30/300
BMBSE00CP0	Boss-Micro Enhanced Monitoring System Wireless 4G China	30/300
BMBSE00BP0	Boss-Micro Enhanced Monitoring System Wireless 4G Australia & South America	30/300
BMBSE00MP0	Boss-Micro Enhanced Monitoring System Wireless Wi-Fi and 4G EMEA	30/300
BMBSE00NP0	Boss-Micro Enhanced Monitoring System Wireless Wi-Fi and 4G China	30/300
BMBSE00DP0	Boss-Micro Enhanced Monitoring System Wireless Wi-Fi and 4G Australia & South America	30/300

Accessory part numbers

Part number	Description
PGTA00TRX0	Power supply for boss-micro DIN rail - 110-230 Vac / 24 Vdc
BMBSTEWA00	3 m extension cable for remote Wi-Fi antenna
BMBSTEGA00	3 m extension cable for remote 4G antenna
BMEST01P00	Credit for 1 Boss-mini plug-in
BMEST03P00	Credit for 3 Boss-mini plug-ins
BMESTDNA0K	DIN rail mounting bracket kit for boss-mini
BMESTPWA00	Power supply for boss-mini / boss micro multi-country plug - 110-230 Vac / 24 Vdc
PGTA00TRF0	Power supply for boss-mini DIN rail - 110-230 Vac / 24 Vdc
BMESTRLA00	Boss-mini / boss-micro relay expansion module
BMHST01P00	Credit for 1 Boss plug-in
BMHST03P00	Credit for 3 Boss plug-ins
BMHST05P00	Credit for 5 Boss plug-ins
BMHSTDNA0K	DIN rail mounting bracket kit for boss
BMHSTMDA00	UMTS modem for sending SMS on boss / boss-mini

Functions

Functions	boss (BMHS*****0)	boss-mini (BMEST*****0)	boss-micro (BMBS*****0)
			
Hardware			
Built-in Wi-Fi connectivity to mobile devices	YES	YES (depending on the model)	
Video output	VGA/Display Port	micro HDMI (depending on the model)	NO
Two Ethernet ports (separate LAN/Internet connections)	YES		
Built-in backup memory expansion	YES (uSD)	YES already included on BMEST**LE0 models	YES (uSD)
Embedded RS485 ports	2 optically-isolated	1 opto-isolated 1 not opto-isolated	1 opto-isolated 1 not opto-isolated
Built-in digital input	YES	NO	YES
Temporary IP address / reset button	NO	YES	YES
Built-in digital outputs	3 relays with changeover contacts N.O./N.C.	3 outputs powered at 24 Vdc	2 outputs powered at at 24 Vdc
USB host ports	6 (2 front and 4 rear)	1	1
Status LED	8 front (status and I/O)	2 front (status)	8 front (status, I/0, wireless signal)
Possibility to connect external USB peripherals	YES		NO (not necessary)
Power supply voltage	100-240 V ~ 50-60 Hz (power supply module input)	24 Vdc	24 Vac/Vdc
Software			
Minimum variable sampling time	5 sec	30 sec	30 sec
Maximum number of devices and variables that can be logged	300/3500	50/500	30/300
Responsive pages	YES		
Graphic customisation via HTML5/SVG technology	YES (using c.web tool)		
Web connection with encrypted protocol (HTTPS)	YES		
Third-party device integration	YES (using device creator tool)		
Modbus TCP/IP protocol - RTU client	YES		
Send notifications	Email, SMS, Telegram		
Manual and/or automatic reports in CSV and PDF format	YES		
Scheduled activity management	YES		
Languages available	Italian, English, German, French, Spanish, Portuguese, Russian, Turkish, Chinese, Polish, Danish, Swedish, Japanese, Hungarian, Dutch, Korean		
Maximum number of extra functions that can be enabled (plug-ins)	20	4	3

Extra functions that can be enabled (plug-ins)
Data synchronisation with Carel RED optimise
Field and BMS protocols: BACnet client (MSTP and TCP/IP), BACnet server (TCP/IP), Modbus RTU server, Modbus RTU TCP/IP server, SNMP Manager, SMNP Agent
Cloud protocols: MQTT, Microsoft Azure agent, XML server, XML push
Custom logic development by customer
Logical devices / computed variables
Performance index
Consumption control and management
Suction pressure optimisation
Parametric controllers
Compressor rack safe restart
Dew point broadcast
HVAC unit free cooling optimisation
Air conditioning unit on/off optimisation
Optimised management of lights on-off based on outside light
Optimised unit power management

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