Supervision solutions for Rooftop units

Montilla Site January 2022



Index

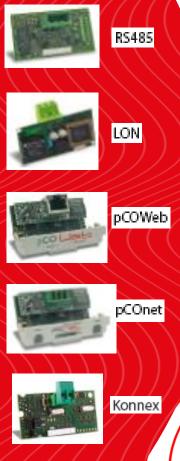
DIFFERENT MONITORING PROTOCOLS

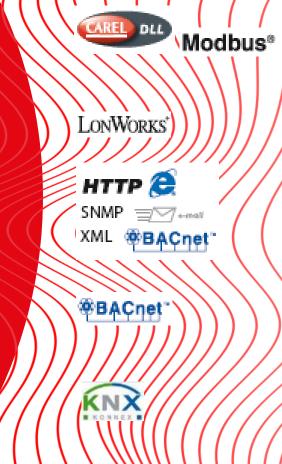
DIFFERENT MONITORING SOLUTIONS

- PCOWEB CIAT (1 unit) –HTML page
 BOSS MINI CIAT (until 10 units)
 - BOSS CIAT (until 300 units)

REMOTE CONNECTION TO INSTALLATION – ROUTER – BLUEDGE DIGITAL









The electronic control is designed to allow the establishment of a communication with a centralized management system using a BMS card specified for each of the following protocols:

MODBUS

For monitoring network with MODBUS protocol, you must connect each electronic control with RS485 serial card.

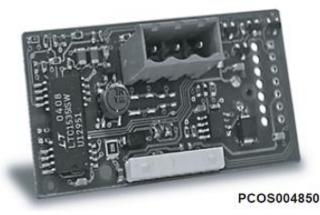
Protocol:

CIAT



Speed: 1200, 2400, 4800, 19200 bps

Address: 1...207



LONWORKS

To communicate with a network with the LonWorks protocol, each electronic control requires a serial card FTT-10A 78kbs (TP / FT-10). The monitoring program is stored in flash memory

and can be programmed directly from the LonWorks network using tools such as LonMaker.

Protocol: LONWORKS*

Speed: 4800 bps

Address: 1

CIAT



Factory settings → YES

Programming tool → LONset

BACNET

To establish communication with a network with the BACNet[™] MSTP protocol is needed a BACnet[™] RS485 serial card. This open standard, developed by ASHRAE, enables air conditioning and heating systems for homes and buildings to be connected for the sole purpose of performing intelligent energy management.



Protocol: CAREL

Speed: 19200 bps

Address: 1

CIAT



Factory settings of BACNET → NO

Programming tool \rightarrow BACset

ETHERNET

To communicate with a network with **TCP/IP MODBUS**, **ETHERNET BACNET**, **TCP/IP**, **SNMP V1 V2 V3**, **FTP y HTTP** protocols, each electronic control requires an ethernet card.





Protocol: CAREL

Speed: 19200 bps

Address: 1

Factory settings of HTML → YES

Factory settings of BACNET \rightarrow **NO** Programming tool \rightarrow BACset



KONNEX (KNX)

To communicate with a network with the KONNEX protocol (before EIB, European Installation Bus), each electronic card need a KONNEX serial card. This open standard allow the interconnection and integration of home automation devices in both commercial and residential level applications.



Protocol: MODBUS

Speed: 9600 bps

Address: 1

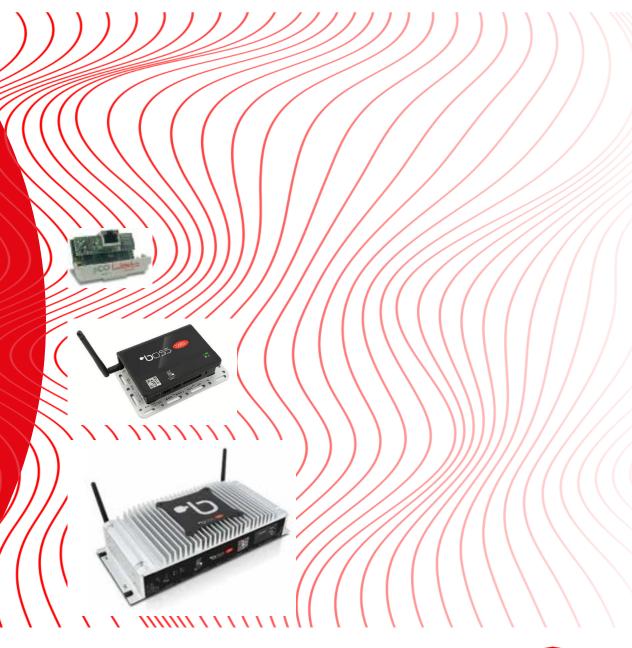


Factory settings \rightarrow **NO**

Programming tool → K-set



- PCOWEB CIAT (1 unit HTML page)
- BOSS MINI (10 units)
- BOSS CIAT (300 units)





PCOWEB CIAT (1 UNIT – HTML PAGE)





PCOWEB CIAT (1 unit)

The PCOWEB is a solution developed for monitoring a unit single via the Ethernet network of the installation.

The PCOWEB is always installed on the BMS communication port of the electronic control



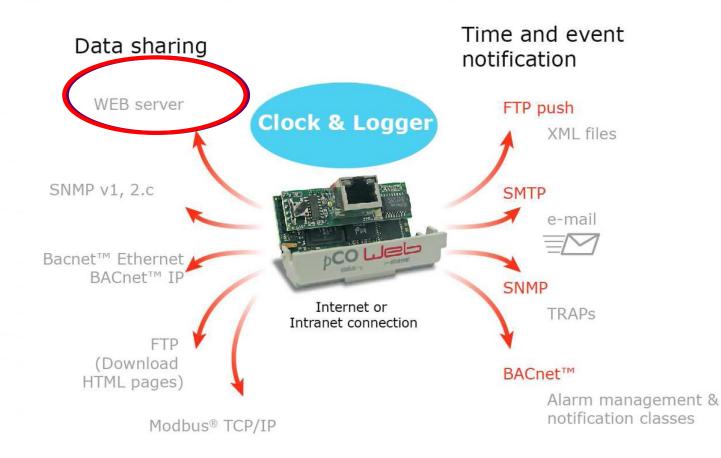
The PCOWEB connected to the Ethernet network has the following functions: WEB server (design of HTML pages), data logging, graphics creation, sending e-mail, MODBUS communication protocol over TCP/IP, Ethernet BACnet ISO8802-2 over 8802-3 and BACnet/IP, FTP server (uploap y download of files), DHCP (automatic IP address), updating your firmware and update the software installed on the electronic control.

PCOWEB CIAT (1 unit)

CIAT

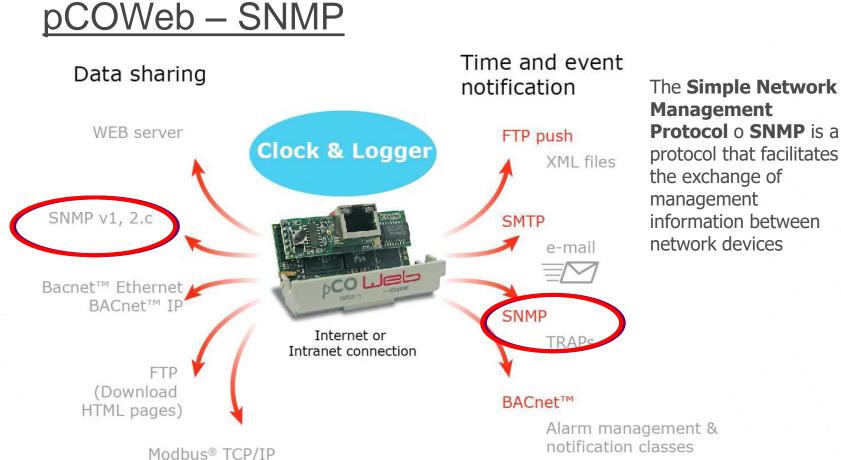


pCOWeb – Web Server



CIAT

y | 13

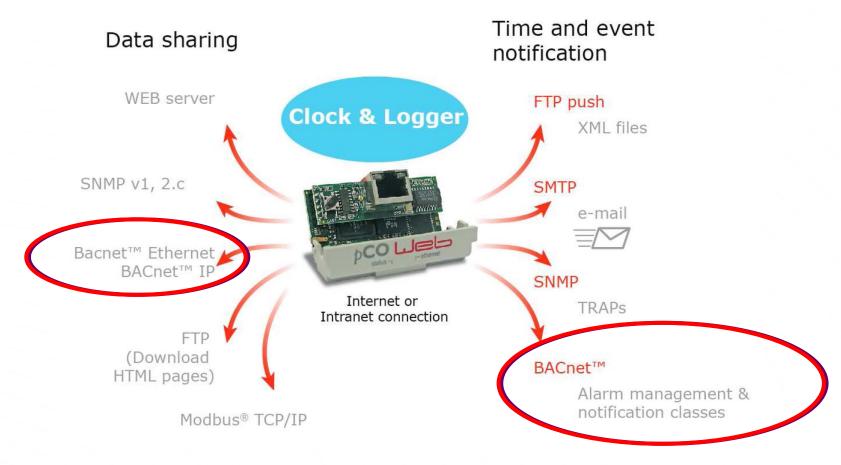


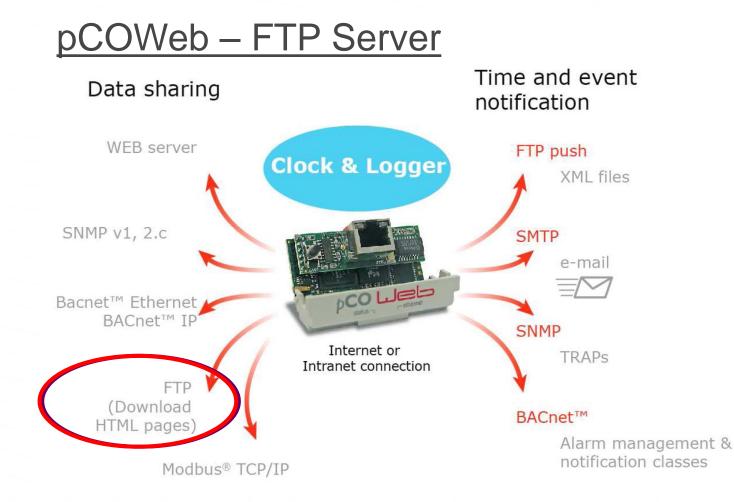
protocol that facilitates the exchange of management information between network devices

A CIAT Company 14

CIAT

pCOWeb – BACNET: IP and Ethernet

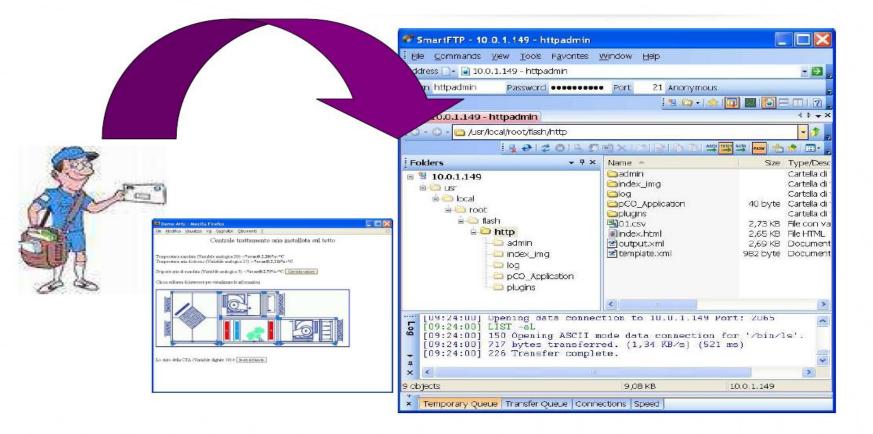






pCOWeb – FTP Server

CIAT



pCOWeb – FTP Server (html VECTIC)



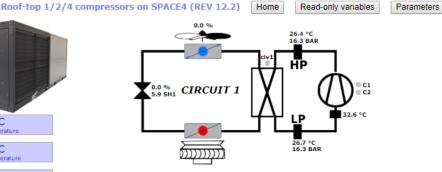


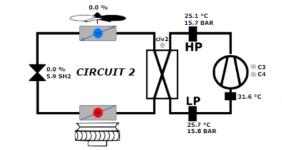
20.5 °C Return air Temperature

25.8 °C External air Temperature

24.4 °C	
Supply air Temperature	
0.3 kW	

ON	COOLING	HEATING	VENT.
0	•	0	0
Internal	Rec.	Elect. Res.	Elect. R
Fan	Comp.	1	2
0	0	0	0

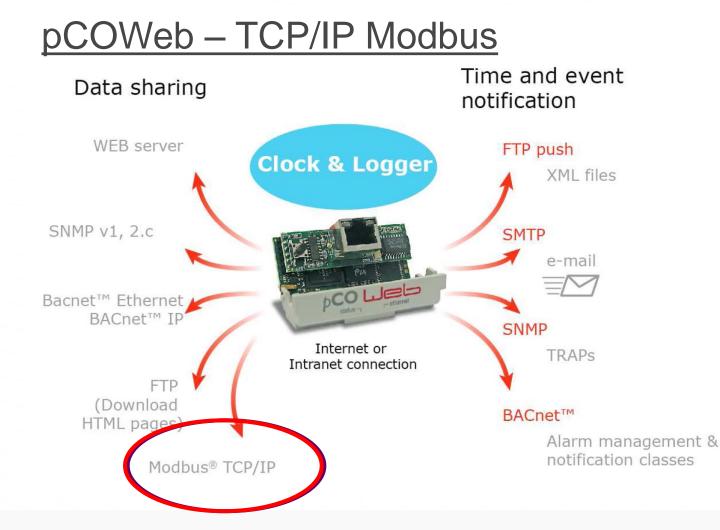


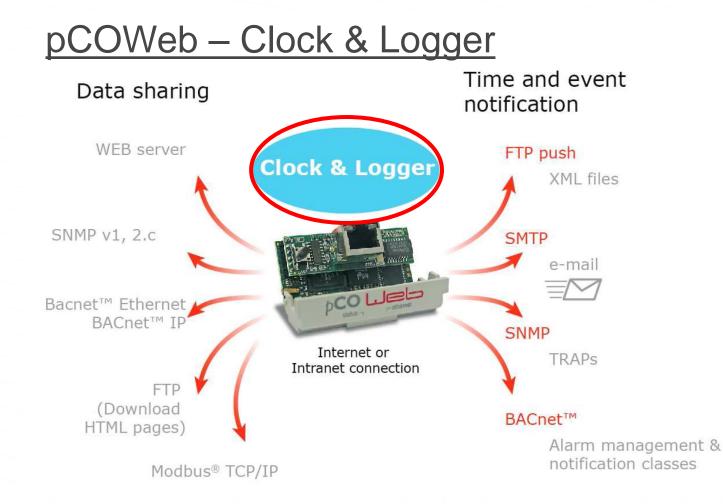


Value	Unit	Code	Description
12.4		VER_SOFT	Board SW version
0		NUM_AL	Active alarms number
0		NUM_WO_SPV	Unit Work Order number (WO)
24.2	°C	TEMP_AMB	Ambient air temperature
19.8	°C	TEMP_MEZCLA	Mixing air temperature
415	ppm	C02	Air quality CO2 rate
0.0	%rH	HUM_REG	Return air relative humidity
0.0	%rH	HUM_EXT	External air relative humidity
0	%	RENOVACION_CAL	Calculated percentage of air renovating depending on mixing temp.
0.0	%	AOUT_COMPUERTA	External air damper aperture
0.0	%	AOUT BAC O RES PROP O COMP INV	Heating valve of Water support coil aperture
AIR-AIR heating pump		INFO_EQUIPO_1	Unit info: air-air, water-air, only cooling, reversible
4 Comp/2 Circ + Rec.C.		INFO EQUIPO 2	Unit info: compressors-circuits (0, 1c, 2c-1c, 2c-2c, 2c+p, 2c on 3st ,4c tandem, 4c-4c) + recovery
Electric Resistance		INFO EQUIPO 3	Unit info: electric resistance - burner - Hot water coil

New Value	Value	Unit	Code	Description
T	0=OFF		SYS_ON	OFF/ON Unit
T	1=Summer		CALOR_FRIO_PANEL	Heating/Cooling selection by pannel
T	0=No		RESET_ALARMS	Reset alarms
	22.0	°C	SET_POINT_TEMP_FRIO	Return air setpoint on Cooling mode (Summer)
	20.0	°C	SET_POINT_TEMP_CALOR	Return air setpoint on Heating mode (Winter)
	0		DESCONEXION_NUM_COMPRESORES	Number of compressor stages to disable
	0		DESCONEXION_NUM_RESISTENCIAS	Number of electric resistance stages to disable









pCOWeb - Events Time and event Data sharing notification WEB server FTP push Clock & Logger XML files SNMP v1, 2.c SMTP e-mail Bacnet[™] Ethernet BACnet[™] IP SNMP Internet or TRAP Intranet connection FTP (Download BACnet™ HTML pages) Alarm management & notification classes Modbus® TCP/IP



pCOWeb – Software upgrade from remote

Configuration \rightarrow Firmware \rightarrow pCo Application Upgrade

C-P	CO LJEL
Information	General Network pCO Com SNMP BACnet Plugins Users Firmware
Configuration	!!BE CAREFUL!!
Clock & Logger	Any power supply interruption during upgrade may corrupt pCOWeb or pCO; in this case, the devices must be sent back to Carel for reprogramming.
Events	Before upgrade, pCOWeb will shut down all services in order to free memory.
Tests	pCOWeb Firmware Upgrade
Customer Site	To fully upgrade pCOWeb firmware you need two files:
Info & Contact	 flash_apps_Axxx.bin to upgrade applications; flash_sys_Byyy.bin to upgrade the base operating system.
Reboot	pCOWeb firmware file Examinar
System is using: User parameters	pCO Application Upgrade
Firmware Release: A1.5.0 - B1.2.4	To upgrade pCO application you need:
Mac Address: 00:0a:5c:10:74:86	1. pCO with BIOS $>= 4.10$ (4.20 recommended) to automatically switch to pCOLoad mode; 2. zip file containing the new application.
pCOWeb's date: 2015-02-08 10:48	Refer to pCOWeb User Manual for more information.
W3C 4.01	Password (if pCO is protected) pCO application zip file Examinar
.SkCast.	Upload

CIAT

PCOWEB CIAT (1 unit)

EXAMPLE OF REMOTE ACCESS TO PCOWEB

http://10.122.19.237/





UTILITIES - UTILIDADES

- Go to Administrator Area Ir al Area de Administrador
- Go to UNIT with CIATRTC CONTROL (ENGLISH)
- Ir a UNIDAD con CONTROL CIATRTC (ESPAÑOL)

Information

Main IP Address: **172.26.0.177** Mac Address: **00:0a:5c:10:74:86** Firmware Release: **A1.5.0** - **B1.2.4**

BOSS MINI CIAT (10 UNITS)





BOSS MINI CIAT (until 10 units)

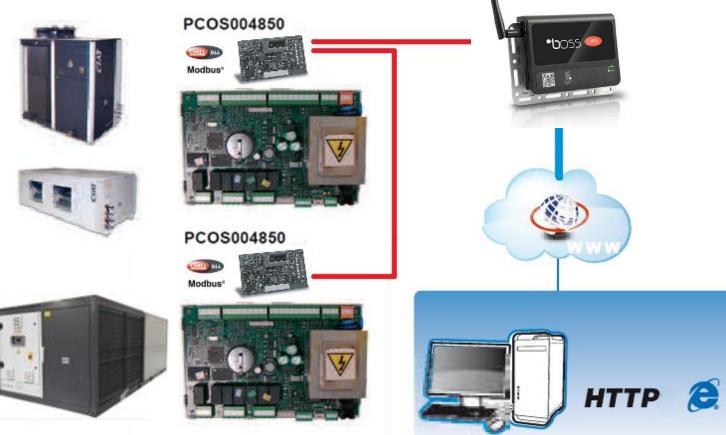
The local supervisor for small and medium with built-in Wi-Fi, accessible from all mobile devices.

- 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.
- Boss introduces the Bacnet protocol (MS/TP and TCP/IP) together with the Modbus protocols (MS/TP and TCP/IP)
- BMS integration with IP Slave mode (sharing the values of interest for overall building management)



BOSS MINI (until 10 units)

CIAT

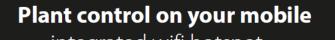


DIFFERENT MONITORING SOLUTIONS boss-mini - the solution The new compact dimension of boss

All the advanced features of the high-end boss solution available now for medium size plants



CIAT



- integrated wifi hotspot
- fully mobile compatible from first boot to ordinary maintenance

boss-mini – the product

HW FEATURES:

- •24Vdc power supply
- •2 RS485 ports
- •2 Ethernet ports (2 different IP)
- •3 digital output (+24Vdc command)
- •1 USB port
- •1 SD slot
- •1 'recovery mode" button
- •2 system led (on/off alarm)
- •1 micro HDMI output
- •1 wifi hotspot

10 devices with 50 variables logged for each device (500 variables)



User interaction		
RemotePRO	x	
Local network	x	
WIFI hotspot	x	
Embedded HDMI	x	
Devices / Variables logged	50/500	



USB port:

- it's for connecting USB pendrive, mouse, touch monitor, keyboard, printer, UMTS modem. SD memory card:

- it's for saving back-up (manual and automatic ones), report and other files allowed by the export functions of boss-mini;

RS485 ports:

- 1 opto-isolated RS485 (for devices in the system)

- 1 not opto-isolated RS485 (for devices in the panel or close to boss-mini)

- not possible to add more using external USB-RS485 converter



External relay module:

External relay module directed supplied by boss-mini



Power supply:

Power supply DIN and plug models:





boss-mini – the evolution

Top class connectivity

•WIFI for local user access Integrated wifi hotspot for direct access without any extra infrastructure

•Mobile/smarthphone compatibility Completely browsable from mobile devices, from commissioning to daily access

•Enhanced channel for remote support Fully and secure supervisor control from remote (also OS level) trough a simple browser





CIAT

BOSS mini CIAT (until 10 units)

- With new Bacnet master protocol (IP and MS/TP), and Modbus master (TCP/IP and RTU) customers can integrate also third party HVAC devices and enlarge the proposal of CAREL
- Carel master, Modbus master (RTU and TCP/IP) are <u>always</u> <u>activated on boss</u>
- With new BACnet slave (IP), and Modbus slave (TCP/IP and RTU) protocols, boss can be integrated also in third party BMS HVAC system, for sharing some data of the boss to other systems
- Modbus slave (RTU and TCP/IP), BACnet master (MS/TP and IP) and BACNet slave, are not activated as default, <u>they have to been</u> <u>enabled as extra features</u> (plug-in)

BOSS mini CIAT (until 10 units)

• 24 HOURS A DAY – 7 DAYS A WEEK

• 14 DIFFERENT LANGUAGES

English, Italian, French, German, Spanish, Portuguese, Czech, Greek, Russian, Chinese, Turkish, Swedish, Polish and Magyar. Template for each unit, only in Spanish, French and English (posibility of including more languages)

• 4 USER ACCESS LEVELS



BOSS mini CIAT (until 10 units)

• FACTORY PRECONFIGURATION AND CUSTOMIZATION

- ACCORDING TO CUSTOMER SPECIFICATIONS AND NEEDS
- BASIC CUSTOMIZATION:
 - LANGUAGE CONFIGURATION: ENGLISH + USER LANGUAGE
 - SITE DRAWING WITH DIRECT ACCESS TO EACH UNIT
 - ACTIVITY TIME PROGRAMMING EXAMPLE
 - CONTROL TEMPLATES IN ENGLISH, FRENCH OR SPANISH



BOSS mini CIAT (until 10 units)

MAIN OPTIONS

■ ENERGY PACK PLUG-IN → SOFTWARE EXPANSION THAT ALLOWS A COMPLETE ENERGY CONSUMPTION MANAGEMENT

■ LOGICAL VARIABLES PACK PLUG-IN → SOFTWARE EXPANSION THAT ALLOWS A COMPLETE LOGICAL VARIABLES CONFIGURATION

■ APP "TELEGRAM"→ TO SEND MESSAGE IN CASE OF ALARM

■ ENERGY METER → FACTORY MOUNTED IN ELECTRICAL PANEL



Telegram

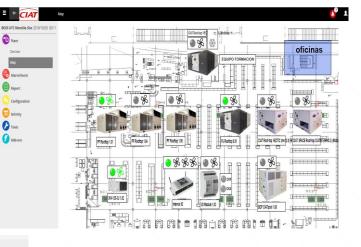


BOSS mini CIAT (until 10 units)

UNIT MANAGEMENT



- All the information is available using some summary pages
- Site overview thanks to the customized drawings, including the units



ALARM MANAGEMENT



- All the detected alarms are notified to the maintenance manager (telegram, e-mail, relay, ...)
- Automatic updates of operating parameters can be configured in response to alarms

Priority	Date Time		Description
	2019/10/02 17:33:08	OFFLINE	
	2019/09/27 11:40:10	OFFLINE	
	2019/09/27 11:40:10	OFFLINE	
	2019/09/27 11:39:40	OFFLINE	



BOSS mini CIAT (until 10 units)

PLANNER SCHEDULER



Some actions or events can be programming

according to the date, time, working mode, alarm,



-- Seturde





-- Frides

Energy

ENERGY MANAGEMENT (plug-in)

- Realtime data acquisition
- Statistical and economic analysis are presented on graphs or reports and the user can check the consumption trend over time



BOSS mini CIAT (until 10 units)

REMOTE CONTROL

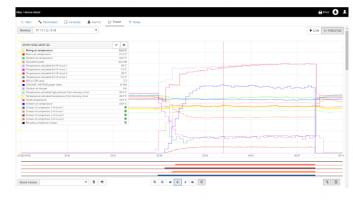
A physical IP address allows to establish

the connection via Internet

Web interface is the same as local interface

REPORT AND GRAPHS

- Represent the values and trends of all logged variables in the system
- Data are easily accesible to each user for analysis



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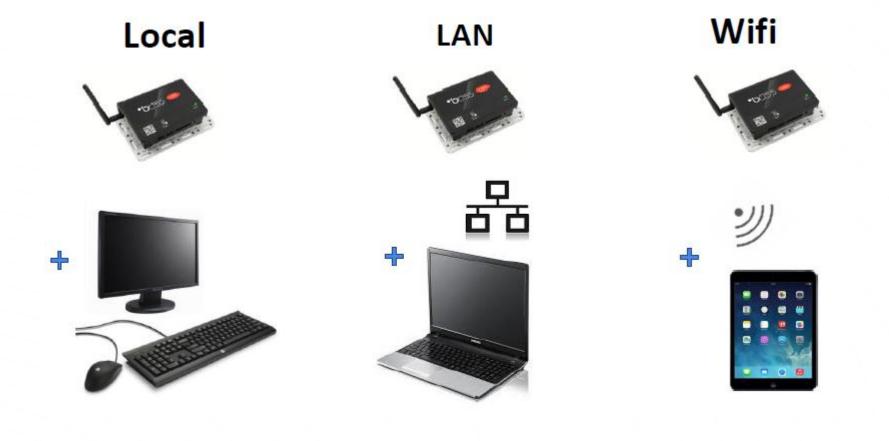
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connectivitv





BOSS mini CIAT (until 10 units)



DIFFERENT MONITORING SOLUTIONS - boss - the family

Continuity of user experience with

BOSS: one range for all formats

•Scalable supervisory range in terms of features and price to fit all the scenarios

•Dedicated boss mini HW models for different user interaction needs

•Same user interface and same functionalities for all your sites



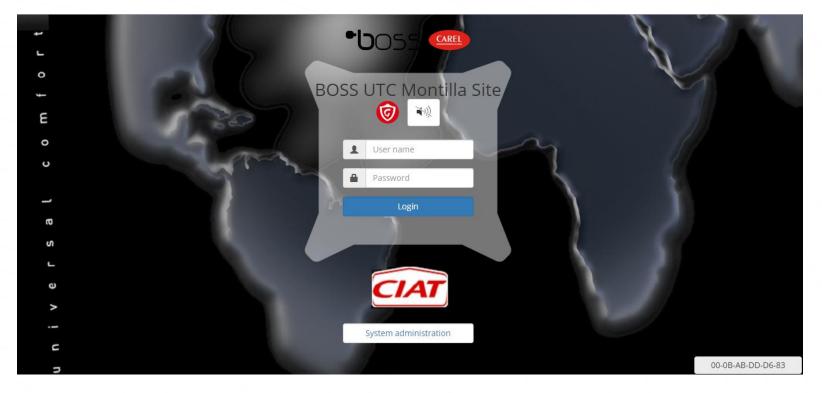
boss-mini VS boss

Function	boss-mini	boss	
Maximum number of devices connected	50	300	
Maximum number of logged variables	500	3500	
Minimum variable sampling time	30 sec	5 sec	
Maximum number of plug-ins that can be activated	3	20	
Maximum number of reports that can be recorded in the	60	200	
internal memory			



BOSS MINI CIAT (until 10 units) EXAMPLE OF REMOTE ACCESS TO

https://10.122.18.29/boss/



BOSS CIAT (300 UNITS)





BOSS CIAT (until 300 units)

The local supervisor for medium and large with built-in Wi-Fi, accessible from all mobile devices.

- 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.
- Boss introduces the Bacnet protocol (MS/TP and TCP/IP) together with the Modbus protocols (MS/TP and TCP/IP)
- BMS integration with IP Slave mode (sharing the values of interest for overall building management)



BOSS CIAT (until 300 units)



BOSS CIAT (until 300 units)



CIAT

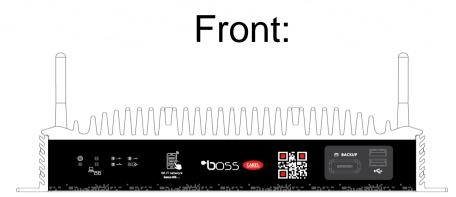
Plant control on your mobile

- integrated wifi hotspot
- fully mobile compatible from first boot to ordinary maintenance

Tough for all environment

- rugged HW fanless mounted in a strong case
- secure SW in compliance with advanced standards (https, embedded os, backup on sd card)

BOSS CIAT (until 300 units)



8 status led, uSD slot, 2 USB ports 2 Wi-Fi antennas, 2 Ethernet ports,
4 USB ports, display and VGA ports,
1 dig. Input, 2 RS485 port, 3 relays, power connector/button

Rear:



BOSS CIAT (until 300 units)

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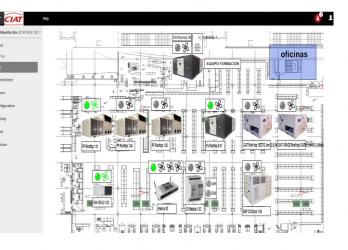


BOSS CIAT (until 300 units)

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BOSS CIAT (until 300 units)

PLANNER SCHEDULER



Energy

 Some actions or events can be programming

according to the date, time, working mode, alarm,



ENERGY MANAGEMENT (plug-in)

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BOSS CIAT (until 300 units)

REMOTE CONTROL

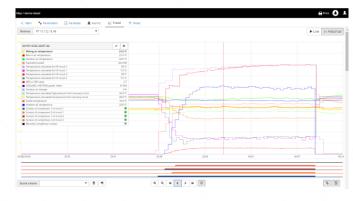
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connectivity

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BOSS CIAT (until 300 units) LAN Wifi

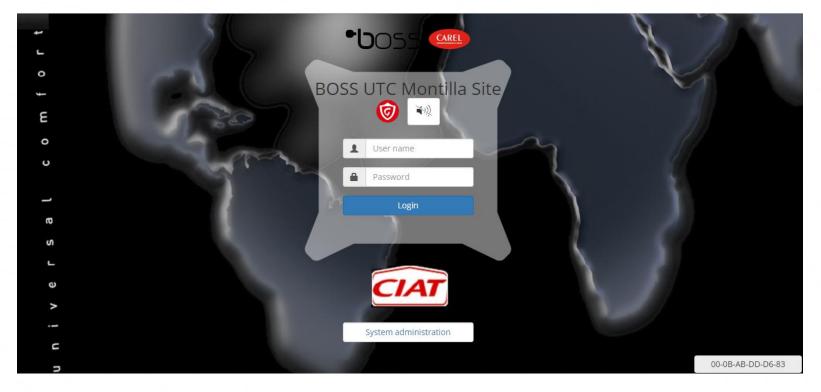
CIAT



Local

BOSS CIAT (until 300 units) EXAMPLE OF REMOTE ACCESS TO

https://10.122.17.191/boss/



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LAN ROUTER

3G/4G ROUTER

 BLUEDGE DIGITAL (1 or 3 units)





ROUTER-MODEM

LAN ROUTER

RO 3

PCOWEB

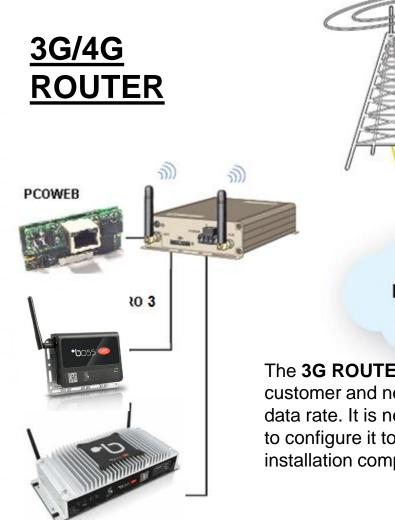
The **ROUTER-MODEM** is installed by the supplier of internet company. It is necessary to configure the client for access to the components of the installation.

Internet



- Internet Explorer





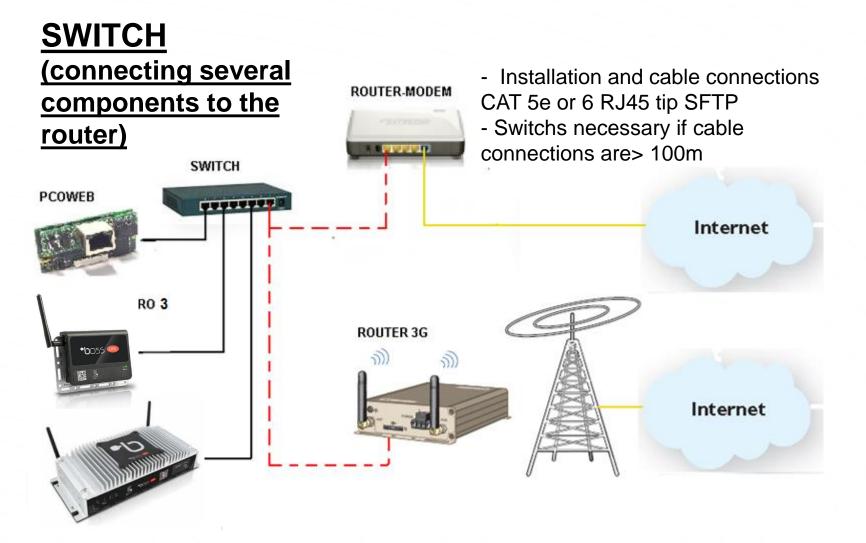
Internet

The **3G ROUTER** is installed by the customer and needs a SIM card with data rate. It is necessary for the client to configure it to allow access to the installation components



- Internet Explorer



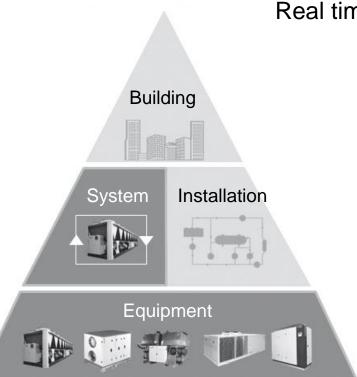




DIGITAL

Monitoring solution

To track, monitor hvac system performance & take preventive and corrective actions remotely

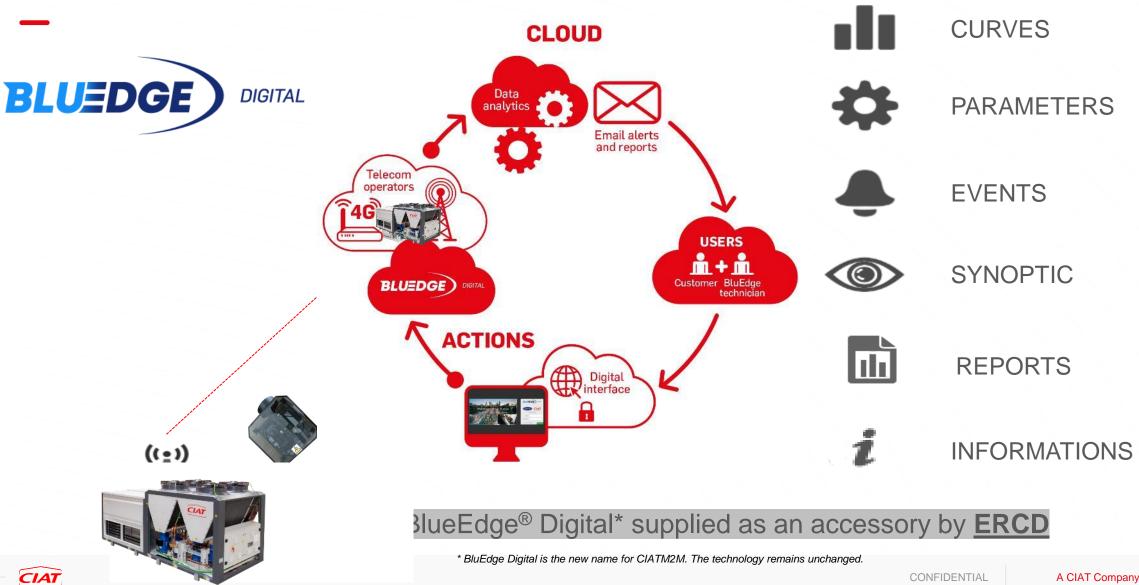


Real time monitoring 24/7

- Chiller and
- Heat pump
- Rooftop units
- Air handling unit
- Close control AC

Drycooler

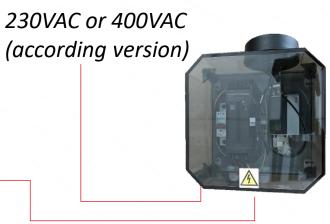
27 JANVIER 2022





DIGITAL

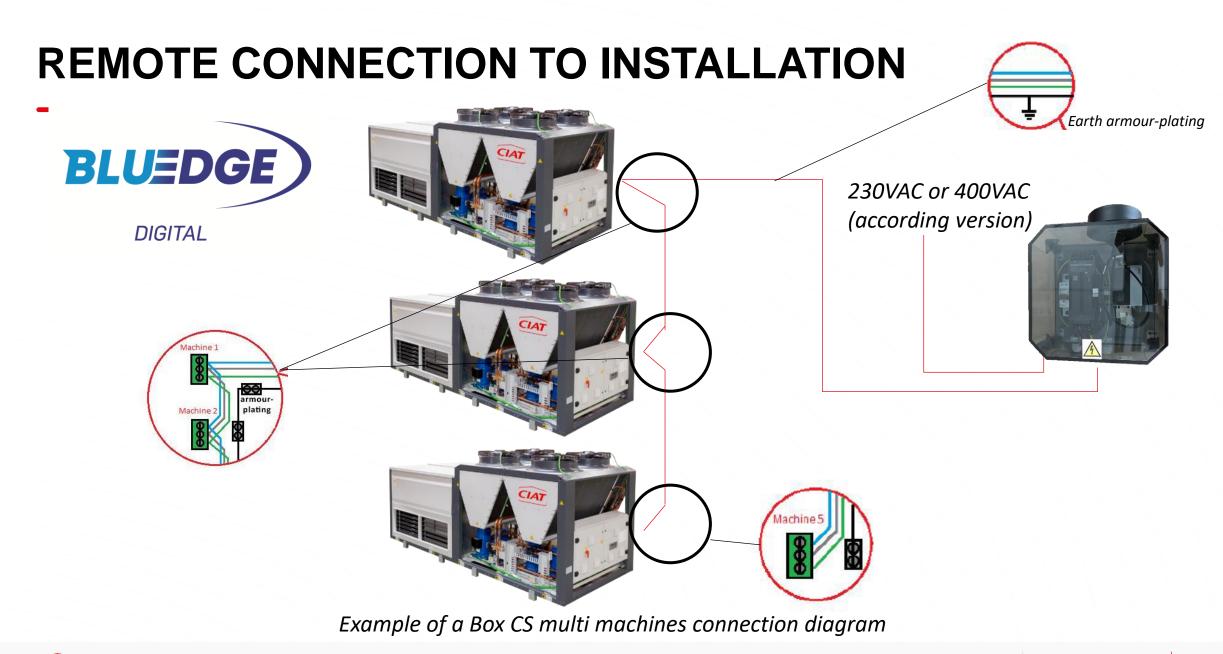


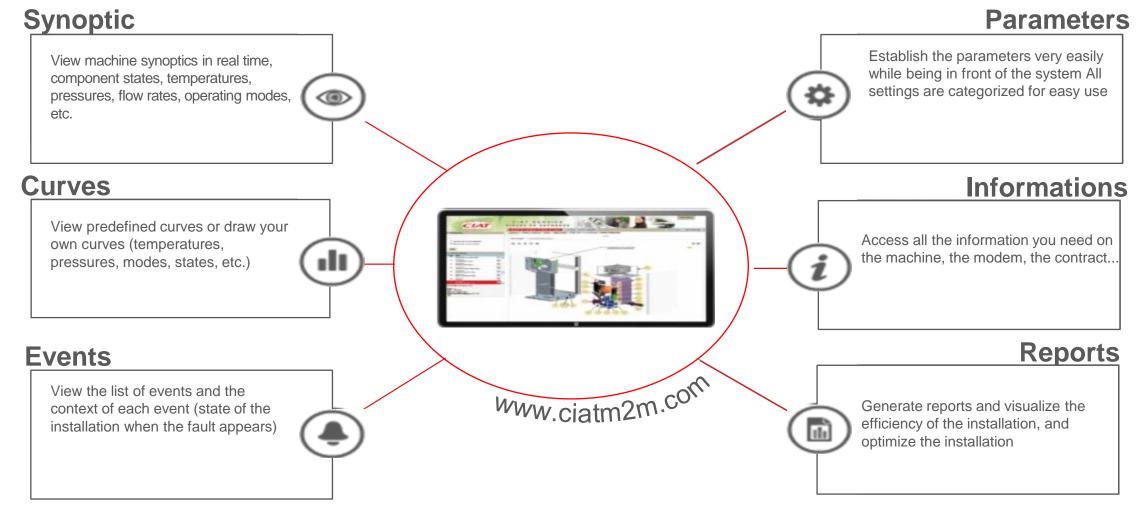


MODBUS RS485

Example of a Box CS connection diagram with 1 machine



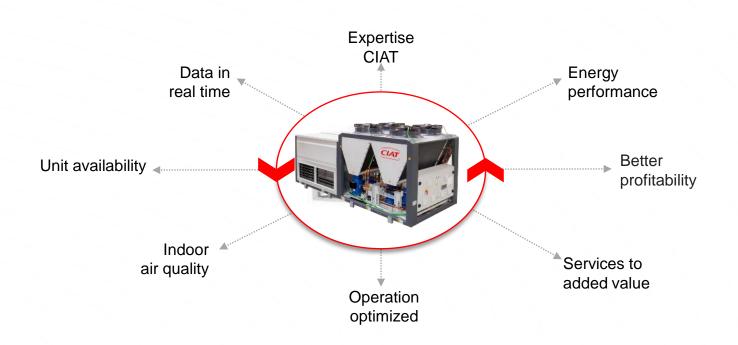




MAINTENANCE SERVICE FACILITIES



Expertise et Analyse





Composition of the box (available in 230v and 400v)

- 1 GPRS modem / 4G LTE-M
- 1 SIM SMART card
- 1 power supply
- 1 circuit breaker
- 1 GSM antenna
- Rail mounting
- Closed box to protect and transport the equipment
- Interconnection terminal (bus, power,...)

BLUEDGE DIGITAL

Box CS 230VAC 4G 30S GPS

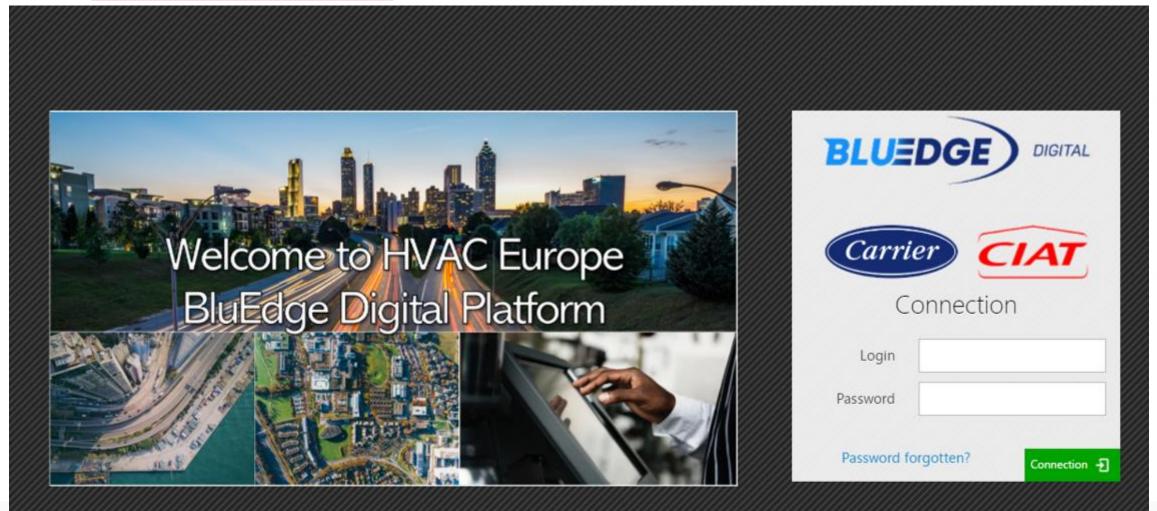
Box CS 400VAC 4G 30S GPS



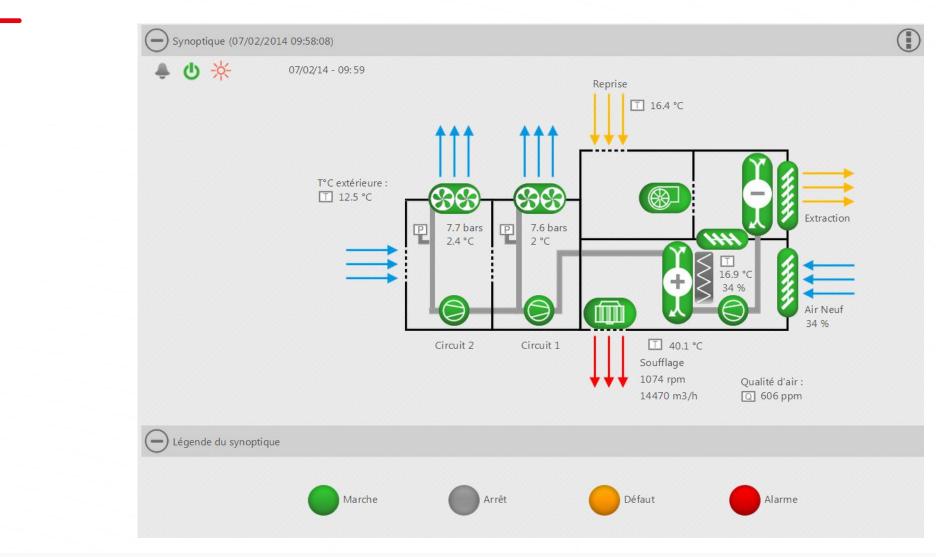
This box can be used both on the machines already put in service (existing fleet), on new machines

https://www.ciatm2m.com/

Link will change (we will inform when the change is done)







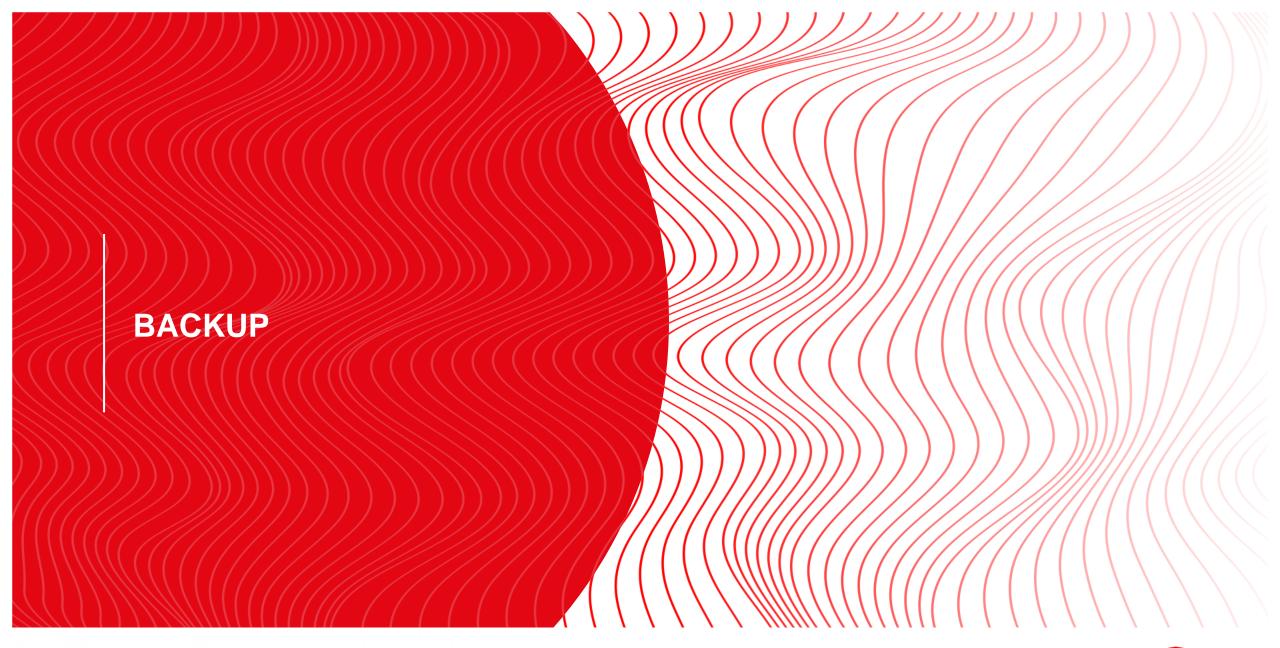
CIAT



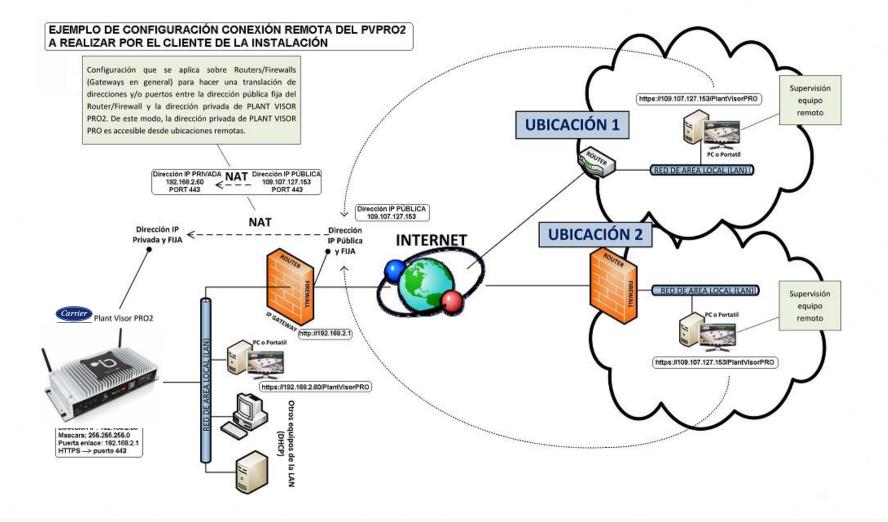
BLUEDGE Courbes de fonctionnement du 06/02/2014 01:04 au 07/02/2014 01:04 DIGITAL 38 _ Courbe de température 22.5 °C 20 °C 17.5 °C 15 °C 12.5 °C Jeudi, Févr. 6, 12:01:57 Température de l'air de soufflage: 10.4 °C 10 °C 7.5 °C 03:00 06:00 09:00 12:00 15:00 18:00 21:00 7. Févr. - Température de l'air extérieur - Température de l'air de reprise - Température de l'air de soufflage - Consigne sur l'air en mode froid Température de l'air de mélange



Mes installations	CIATESA > IPF240	💿 Syno. 🕕 Cour. 🌒 Evén	. 💿 Hist. 🏟 Para. 🚺 Info
Installations Agence CIAT Region Ouest Agence CIAT Rhône Alpes	Commande à distance ()7/02/2014 09:40:16)	1
··· 🖉 Alinea Aubagne ··· 🖉 Alstom Transport Reichsh.	Marche/arrêt de l'unité		Marche •
•• 🖉 Centre Antoine LACASSAGNE 🥖	Mode de fonctionnement		Chaud •
•• 🖉 CIAT ITALIA S.R.L. •• 🖉 CIAT Service bureaux	Consigne sur l'air en mod	e froid	10 °C
•• 🖉 CIATESA	Consigne sur l'air en mod	e chaud	25 °C
••• IPF240 •• 🖉 Cuisine centrale du mans	Consigne de régulation d'	humidité en mode froid	55 %rH
•• 🖉 France Plastique Recycla.	Nombre d'étages de comp	resseur à délester	0
•• 🍘 GEG •• խ Hotel Escargotière	Nombre d'étages de résis	tances électriques à délester	0







71

DDNS USING

Dynamic DNS is a system that allow real-time updating of information on domain names on a server name The most common use is given is to allow the assignment of an Internet domain name to a computer with a variable IP address (dynamic). This allows connecting to the computer in question without having to know the IP address.

Manage Hosts

EXAMPLE of DDNS with web page http://www.noip.com

Current Hosts: 2 of 3	Need More Hosts? Enha	ance Your Account! Enhance Your Account
Host	IP/URL	Action
😪 Hosts By Domain		
servehttp.com		
pvpro-grupociat.servehttp.com	2.142.186.224	Modify 🔀 Remove
pvpro-remote.servehttp.com	109.107.127.153	📝 Modify 🛛 💥 Remove

Domain Name Service EXAMPLE of the router configuration with DDNS

M	lanual DNS Configuration			
Primary DNS Server				
Secondary DNS Server				
DNS Domain				
Dynamic DNS Client Configuration				
Enabled		dyndns.com		
Service	no-ip.com 💌	no-ip.com		
Domain	pvpro-grupociat.servehttp.c			
Username	grupociat	easydns.com		
Password	Set New:			
Reset	Update			

72

Add A Host



EFFICIENCY IS IN THE AIR