

ControlMaestro *and* BACnet integrated solution



The Automation Software Platform designed to deliver first class solutions to the Building Automation market using its intimate knowledge of Building protocols.

Open
your
Supervision

ControlMaestro,
the next-generation SCADA software
platform for site-wide automation

[Strength]	Native BACnet Solution
[Flexibility]	Open, non proprietary standard
[Reliability]	Easy connectivity and deployment
[Effectivity]	Object-oriented device management and scheduling
[Scalability]	Multi-protocol, single or multi-building systems
[Configurability]	Interface and management of sub-networks





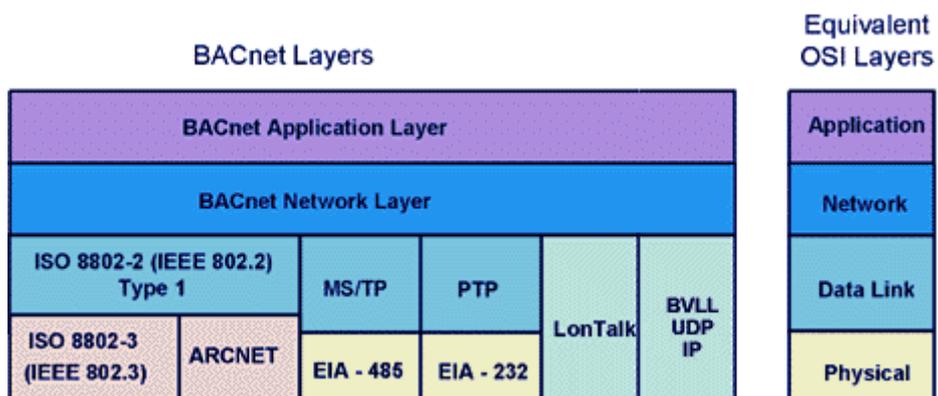
BACnet® is an International Standard (ISO 16484-5) Communication Protocol for **Building Management Systems (BMS)**. It is neither Hardware, Software, nor Firmware: **BACnet** means **Building Automation and Control networks**. It is best described as a set of rules for open, manufacturer-independent data sharing in networked Building Automation environments.

Historically, the most widely deployed **BACnet** applications are in HVAC (Heating, Ventilation and Air Conditioning). But today **BACnet** extends to:

- Fire/Life safety,
- Access control,
- Intrusion alarms,
- Lighting control,
- All other building automation systems.

ELUTIONS supports **BACnet** through its product offering **ControlMaestro**. Elutions are an experienced SCADA software provider able to deliver first class solutions to the Building Automation market using its knowledge & experience in Building Management protocols.

BACnet layers for Building Automation with ControlMaestro



Note: additional hardware routers are required for others than BACnet/IP

Why BACnet for BMS applications?

BACnet offers many benefits for both technical and economical aspects:

- Respond to user demand
- Flexibility of networking and architecture
- Open, non-proprietary technology
- High performance
- Broad participation to its development
- Number of actors sharing a global interest

What benefits does BACnet bring to customers?

BACnet offers many benefits in both technical and economical aspects:

- Benefits of a standard and open protocol
- Single operation workstation for all systems:
 - affords facility owners and managers maximum flexibility and cost-effectiveness
- Competitive system expansion:
 - Can be easily enhanced and improved
- Eliminates risk of being “locked in” to single supplier:
 - Can be implemented in devices of any size
- Interoperability:
 - Data sharing
 - Alarm & event management
 - Trending
 - Scheduling
 - Remote device and network management

Why ControlMaestro SCADA solution?

- Complement an open network with an open software solution!
- Preserve your investment:
 - ELUTIONS Europe is the only software editor, independent from hardware activity and/or larger group, to offer full BACnet integration
- Save engineering time:
 - One tool to develop and configure the whole network, independently from proprietary tools
 - Automatic Tags generation
 - Automatic recognition of devices on the network
 - Optimisation of equipment performance



1. About BACnet

Building Automation has a set of rules governing the exchange of data over the computer network and specific prerequisites to control equipment.

BACnet can accommodate these special rules and respond to the specific needs of building automation systems by providing standardized tools to help enable the creation of systems that can interoperate.

All information within an **interoperable BACnet** device is modelled in terms of one or more **information objects**. Each object represents an important component of the device, or some collection of information that may be of interest to other **BACnet** devices. **BACnet** can, for example ask for the value of a temperature, define a fan operating schedule, send a pump status alarm, etc.

BACnet devices exchange information by sending and receiving electronic messages in a stream of numeric codes that represent the desired functions or services to be performed.

Besides allowing the use of different LANs, the **BACnet** standard also specifies how to build routers, or in other words, how to connect together multiple networks of similar or completely different types.

Interoperability and connectivity

BACnet doesn't require multivendor installations. The appropriate network technology can be chosen to connect devices together to optimize the implementation, performance and costs. This delivers important flexibility:

- **Ethernet** - 10 Mbps with 100 Mbps (can use a variety of physical media coaxial cable, twisted pairs, even fibre optic cable).
- **ARCNET** - 2.5 Mbps (can use a variety of physical media coaxial cable, twisted pairs, even fibre optic cable).
- **MS/TP** (master-slave/token-passing) network designed to run at speeds of 1 Mbps or less over twisted pair wiring.
- **LonTalk** network (from Echelon's) can also be used on various media.
- **PTP** - "point-to-point" protocol for use over phone lines or hardwired EIA-232 connections.

BACnet data can be transmitted by any network technology, if and when it becomes cost-effective to do so.

2. ControlMaestro speaks BACnet. Do You?



BACnet native

ControlMaestro's leading-edge BACnet integration features:

- a communication driver,
- an automated tag generator,
- a user-friendly management interface,
- full integration with Web Scheduler.

The module enables:

1. Upload, editing and download of time-switched programs for BACnet devices (**over 180 BACnet-compatible manufacturers**),
2. Complete object-oriented remote configuration & maintenance of a **BACnet** network and its deployed devices,
3. Tag generation both online and offline from external *.EDE or *.CSV files.

→ **Independent from any device manufacturer, ControlMaestro is highly interoperable supporting over 270 equipment suppliers worldwide.**

ControlMaestro™ and the BACnet driver

The **BACnet driver VPIWNBCN** for **ControlMaestro** turns **ControlMaestro** into a BACnet operator workstation:

- BACnet operator workstation (B-OWS), suitable for configuring BACnet servers and accessing any property of any object,
- Standard SCADA operation, providing a graphical, intuitive user interface in order to allow the end user to easily access and operate the plant. Data sharing, scheduling, alarming and trending services are fully integrated with the services of the SCADA system.

The **ControlMaestro BACnet driver**, VPIWNBCN.DLL, fully conforms BACnet standards, supporting all types of **BACnet** objects.

→ **The BACnet Operator Workstation (B-OWS) is the Server aspect of any BACnet system, i.e. the BMS brain.**

→ In 2013, **ControlMaestro** has been awarded **BACnet Advanced Workstation (B-AWS)**, **the highest certification level by the BACnet Test Framework (BTF)**. This further confirms **ControlMaestro's** market position as the premier **BACnet** Building Management software provider.

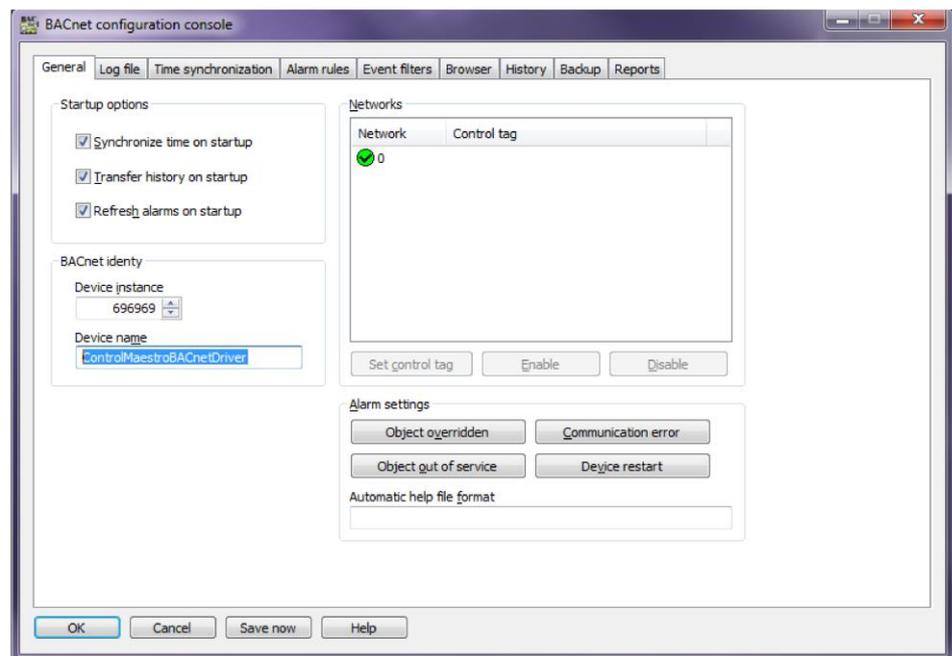




Complex BACnet integration made easy with ControlMaestro

ELUTIONS offer extensive **BACnet** integration, which enables even complex **Object Types** to be managed directly within the **ControlMaestro** product.

The **ControlMaestro** Platform automatically recognises all BACnet devices connected and can easily generate the structure of the application. By supporting multiple communication protocols like OPC, MODBUS, XML, ODBC and many others found in BMS, the **ControlMaestro** Platform facilitates the integration of all the equipment of a building, even from multiple suppliers.



General BACnet Configuration into ControlMaestro

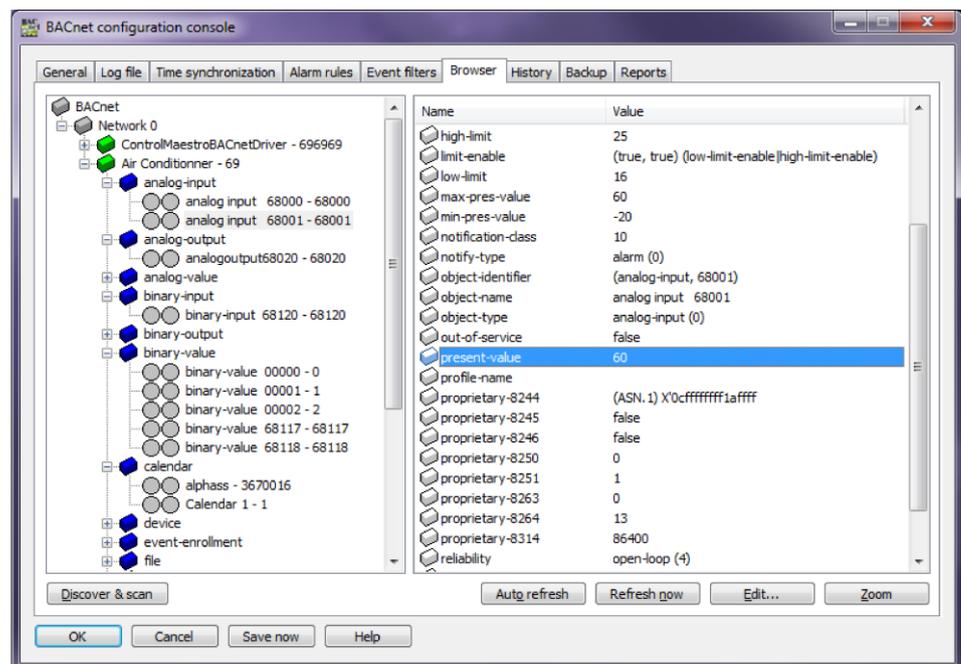
Fast and easy BACnet-related tag creation with “Object Generator”

→ Time saving when creating the application.

Browse all BACnet devices easily over the entire network:

- Overview of all BACnet devices connected,
- Overview of all BACnet devices in use,
- Read a variable’s current value, e.g. Analogue Input - Temperature = 17.16°C,
- Write properties of objects, (e.g. changing “high-limit” of an “analogue-input”).

→ Straight forward communication with all Building Automation Systems – whoever the vendor.



BACnet Configuration Browser into ControlMaestro

ControlMaestro BACnet Alarm Management

Full integration of BACnet alarm events with confirmation & acknowledgement:

- Route any standard BACnet event to ControlMaestro, additionally objects states like « out of service », or « device restart » notifications,
 - Powerful filtering capacity based on objects (name, type), and event properties (priority, type, state, ...),
 - Automatic and free alarm text formatting using device name, object description, event text, etc...,
 - Full acknowledgement is supported: start and end, sent to the device from image or event summary.
- ➔ **BACnet alarms are directly handed over to the ControlMaestro alarm module ControlMaestro AAM, they do not need to be re-defined.**



ControlMaestro Scheduling - Time programs

- The scheduler in a BACnet device can be configured into ControlMaestro's Web Scheduler,
 - Each device can be configured from a standard Web browser,
 - Manufacturer-specific configuration software is no longer required,
 - Support of two BACnet Objects: Scheduling (SH), Calendar (CL),
 - User-friendly programming of scheduler, e.g. heating or lighting control.
- Easy connection to devices from any supplier.

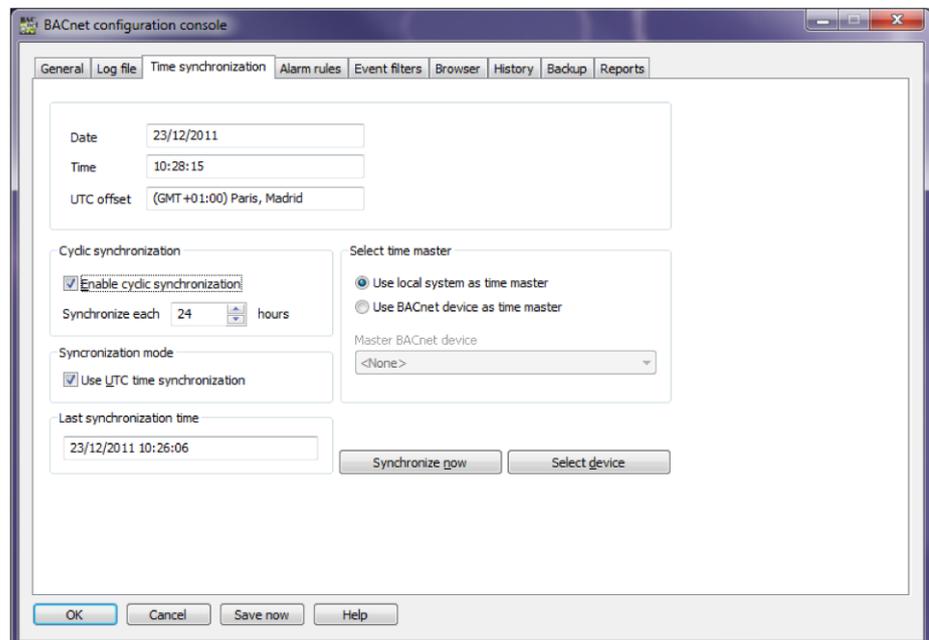
The screenshot shows the ControlMaestro Web Scheduler interface. The browser address bar displays the URL: <http://localhost/CMWebScheduler/Main/MainPage.asp?USERNA>. The page title is "ControlMaestro Web Scheduler" with a copyright notice for 2007-2008 by ELUTIONS Inc. The interface includes a navigation menu on the left with options like "New Scheduler Object", "New Calendar Object", and "Browse BACnet Objects". The main content area shows a tree view of "BACnet Devices" with "Air conditioner" selected, and "Alpha" under "Scheduler Objects". The "States" list includes "NULL", "12.0", and "18.5". The main table displays a schedule for "Air conditioner - alpha" with columns for days of the week and rows for time intervals. The table shows values for 12.0 and 18.5 at various times. Below the table, there are fields for "Description", "Effective Period" (From : 1/Jan/1900 To : 31/Dec/2154), "List of object property references", and "List of exceptions schedules".

Time/Day	Mon	Tue	Wed	Thu	Fri	Sat	Su
00:00:00							
01:00:00							
02:00:00							
03:00:00							
04:00:00	12.0	12.0	12.0	12.0	12.0	12.0	
05:00:00							
06:00:00							
07:00:00							
08:00:00							
09:00:00							
10:00:00							
11:00:00	18.5	18.5	18.5	18.5	18.5	18.5	
12:00:00							
13:00:00							

BACnet Web Scheduler into ControlMaestro

Time Synchronization

- The clock in the ControlMaestro PC can be synchronized with the clocks in BACnet devices,
 - Device-priority or PC-priority synchronization,
 - Establish a Time-Master among the target devices,
 - Adjust the synch cycle.
- Device data is recoverable even in case of communication failure.
- ControlMaestro always provides accurate historical data.

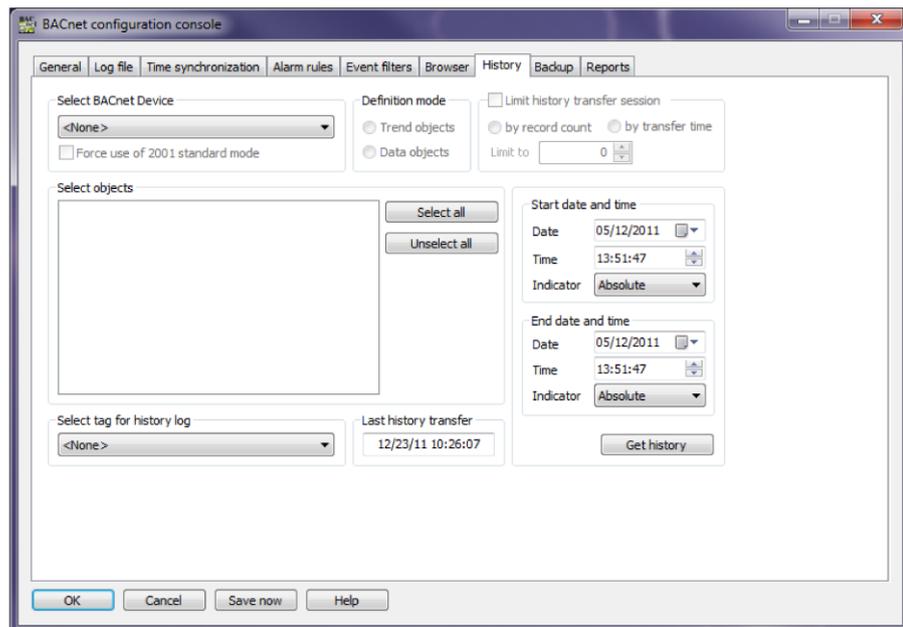


BACnet Time Synchronization into ControlMaestro



Acquire Historical Data

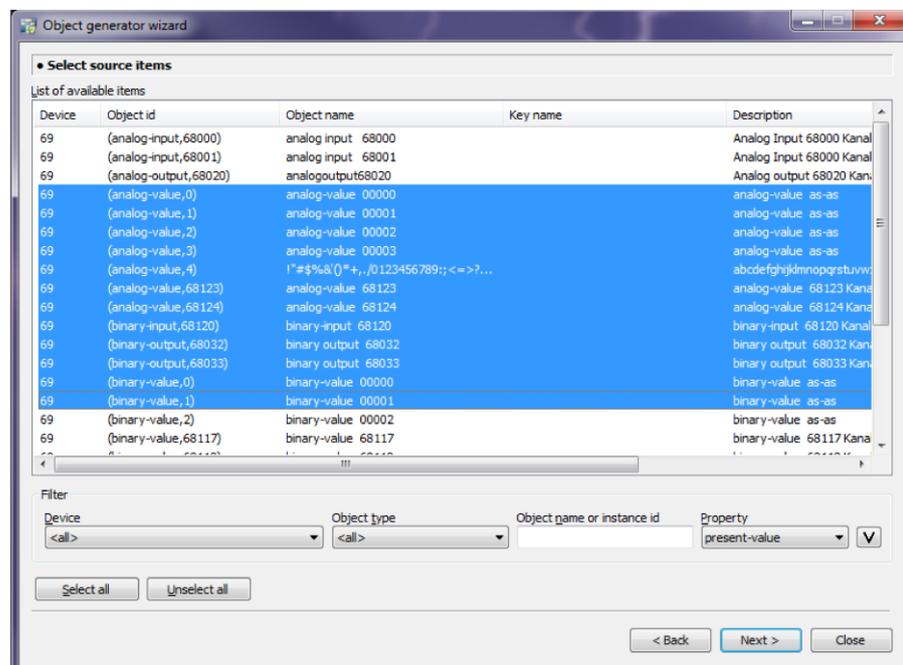
- History from BACnet devices can be transferred over into ControlMaestro History,
 - Historical data can be read from current devices and written into ControlMaestro History,
 - The History can be read depending on the variable, or when the device buffer is full, or upon ControlMaestro start-up.
- Analyses can be done to make comparisons between equipment.
- By default, the historical data (Trend Logs) are automatically imported into ControlMaestro upon receipt of the event BUFFER_READY.
- A preset recovery is possible by including a variable for triggering historical data.



BACnet Historical Data into ControlMaestro

Backup and restore of BACnet devices

- Backup selected devices and store all files on the computer (can be triggered by a specific control tag),
 - Restore any device at any time from a previous backup (can be triggered by a specific control tag).
- Avoid Human error.



BACnet Object Generator Wizard into ControlMaestro



You want only the best...

Don't settle for anything less.

Discover **ControlMaestro** today!

Download ControlMaestro now and test it for yourself, in your own environment.

Free evaluation version runs full-featured for 2 hours.

www.getControlMaestro.com



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