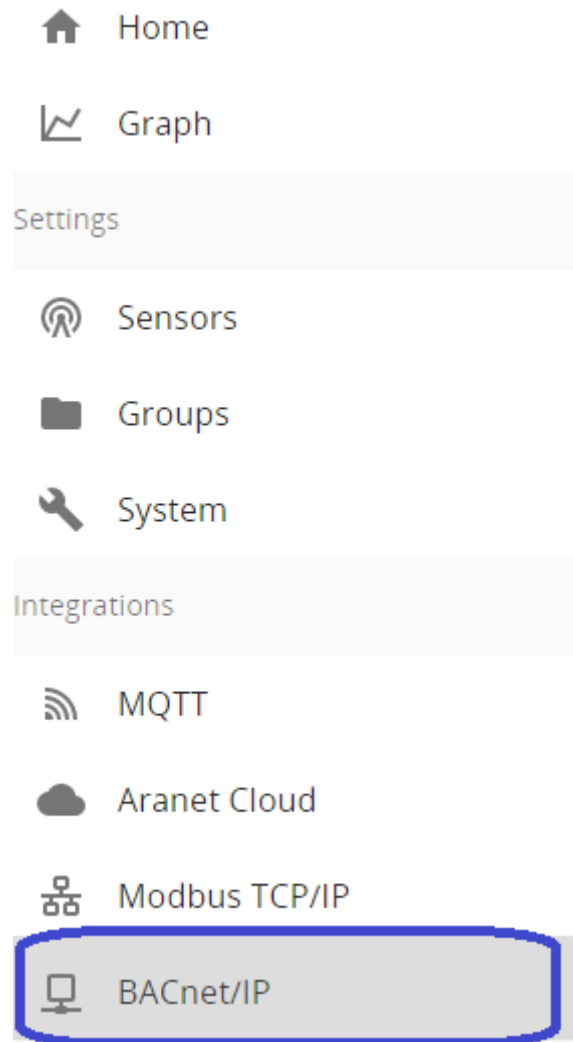


Aranet PRO BACnet/IP server

In the web GUI main page BACnet/IP server configuration is available under “BACnet/IP”




IMPORTANT:

- The BACnet/IP service can only be accessed through an Ethernet (wired) network interface.
- The full functionality of the BACnet/IP service requires an additional license to be uploaded.

Configuration controles

1. Status of BACnet/IP server process;
2. Enable/Disable server process;
3. Information about BACnet service availability on Ethernet interface (wired) only;
4. Specify UDP port number (default 47808);
5. BACnet device object instance ID (default 1234);
6. Network number (default 1);
7. Set device object property Location;
8. Select BACnet object type to be used for sensor measurement objects;
9. Create/Download Engineering Data Exchange (EDE) file;
10. Reset values of writeable BACnet object (Device, AI, AV) properties to defaults;
11. Save BACnet/IP settings.

 BACNET_RUNNING **1.**
Status (2023-08-16 07:54)

Enable **2.**

BACnet IP service is served on the ethernet interface **3.**

Port* **4.**
47808

Device ID* **5.**
1234


Network ID* **6.**
2


Location **7.**
WorkShop

Compatibility options

BACnet sensor measurement object type **8.**
Analog input

CREATE EDE FILE **9.**

 RESET BACNET OBJECT PROPERTIES **10.**

11. 

Aranet PRO used BACnet object types and properties

Object types used in Aranet PRO BACnet server implementation – **Device** object type, **Analog Input** object type or **Analog Value** object type (depends on object type selection in “Compatibility options”).

Device object properties

Property	Access rights
Active Change-of-Value (CoV) Subscriptions	Read-only
Apdu Timeout	Read-only
Application Software Version	Read-only
Daylight Saving Status*	Read-write
Database Revision	Read-only
Description	Read-only
Device Address Binding	Read-only
Firmware Revision	Read-only
Local Date	Read-only
Local Time	Read-only
Location	Read-only
Max Apdu Length Accepted	Read-only
Model Name	Read-only
Number Od Apdu Retries	Read-only
Object Identifier	Read-only
Object List	Read-only
Object Name	Read-write
Object Type	Read-only
Protocol Object Types Supported	Read-only
Protocol Revision	Read-only
Protocol Services Supported	Read-only
Protocol Version	Read-only
Segmentation Supported	Read-only
System Status	Read-only
Utc Offset**	Read-write
Vendor Identifier	Read-only
Vendor Name	Read-only

* - **Daylight Saving Status** must be updated from the BACnet Client system as it is not being auto-updated and cannot be set using Aranet PRO base web GUI (it uses UTC time throughout the back-end processes).

** - **UTC Offset** must be updated from the BACnet Client system as it is not being auto-updated and cannot be set using Aranet PRO base web GUI. BACnet UTC Offset is inverse of common practice. If your UTC offset is -5hours of GMT, then BACnet UTC offset is +5hours. BACnet UTC offset is expressed in minutes, therefore convert UTC offset from minutes to hours.

Analog Input/Analog Value (measurement) object properties

Property	Access rights
Cov Increment	Read-write
Description*	Read-only
Event State	Read-only
Object Identifier	Read-only
Object Name	Read-write
Object Type	Read-only
Out Of Service	Read-write
Present Value**	Read-only
Reliability	Read-only
Status Flags	Read-only
Units	Read-only
9997 (proprietary) – Time of Last Present Value update	Read-only
9998 (proprietary) – Date of Last Present Value update	Read-only

* - **Description** is a combination of sensor HEX UID, group name, sensor name, measurement type and unit, e.g., “[500ACE] roomEnv Contact pulse meter pulses (pulses)” where:

- [500ACE] – HEX UID
- roomEnv – group name
- Contact pulse meter – sensor name
- pulses – measurement type
- (pulses) – unit

** - **Present Value** can be changed in case if **Out Of Service** value is set to “True”. It applies for both supported object types (**AI** and **AV**).

Object Name default assignment

By default for the **Device object name** has the same value as the System name has. It is not being updated on System name change. Device object name can be changed from BACnet Client side only.

Measurement object’s default name is a combination of object type abbreviation and object instance ID, e.g., “AV – 2”, where AV stands for “Analog value”. Object name can be changed from the BACnet client side. In case if user has changed setting “BACnet sensor measurement object type” in the GUI from *Analog value* to *Analog input*, object names will be updated for those objects which have default names, e.g., “AV – 2” will be updated to “AI - 2”.

Indications of alarm presence for measurement objects

Depending on alarm type the property **Reliability** is being updated for the measurement object to which it refers, or for all measurement objects of the corresponding sensor.

Alarm type	Alarm applies to	Reliability (integer value)
Threshold alarm	Measurement object	UNRELIABLE_OTHER (7)

Battery alarm	Battery object	UNRELIABLE_OTHER (7)
RSSI alarm	RSSI object	COMMUNICATION_FAILURE (12)
Wrong channel alarm	All sensor objects	CONFIGURATION_ERROR (10)
Error flag alarm	All sensor objects	UNRELIABLE_OTHER (7)

Reliability property value is set to “NO_FAULT_DETECTED” (integer value: 0) if there is no alarm detected.

Units for Measurement object present value

Units property conversion table. All units which are not in this table does not have appropriate BACnet unit integer. **Units** property will be set to 95 (No Units)

Unit string value	BACnet enum integer value	Bacnet-stack variable name
C, °C	62	DEGREES_CELSIUS
F, °F	64	DEGREES_FAHRENHEIT
K, °K	63	DEGREES_KELVIN
% (RH)	29	PERCENT_RELATIVE_HUMIDITY
ppm	96	PARTS_PER_MILLION
A	3	AMPERES
V	5	VOLTS
s	73	SECONDS
Ω	4	OHMS
lx	37	LUXES
kg/m ³ , kg/m ^{^3}	186	KILOGRAMS_PER_CUBIC_METER
dBm	200	DECIBELS_MILLIVOLT
hPa	133	HECTOPASCALS
mmHg	59	MILLIMETERS_OF_MERCURY
bar	55	BARS
inHg	61	INCHES_OF_MERCURY
Pa	53	PASCALS
mmh ₂ o	206	MILLIMETERS_OF_WATER
mbar	134	MILLIBARS
m	31	METERS
cm	118	CENTIMETERS
mm	30	MILLIMETERS
μm	194	MICROMETERS
ft	33	FEET
in	32	INCHES
kg	39	KILOGRAMS
lb	40	POUNDS_MASS
N	153	NEWTON
m/s	74	METERS_PER_SECOND

km/h	75	KILOMETERS_PER_HOUR
mi/h	78	MILES_PER_HOUR
ft/s	76	FEET_PER_SECOND
%	98	PERCENT
ppm	96	PARTS_PER_MILLION
Nm	160	NEWTON_METERS
m/s ²	166	METERS_PER_SECOND_PER_SECOND
J	16	JOULES
kJ	17	KILOJOULES
MJ	126	MEGAJOULES
BTU	20	BTUS
kWh, kWh/h	19	KILOWATT_HOURS
S/m	174	SIEMENS_PER_METER
W	47	WATTS
kW	48	KILOWATTS
MW	49	MEGAWATTS
hp	51	HORSEPOWER
m ³ /h	135	CUBIC_METERS_PER_HOUR
l/h	136	LITERS_PER_HOUR
m ³ /min	165	CUBIC_METERS_PER_MINUTE
l/min	88	LITERS_PER_MINUTE
m ³ /s	85	CUBIC_METERS_PER_SECOND
l/s	87	LITERS_PER_SECOND
ft ³ /s	142	CUBIC_FEET_PER_SECOND
m ³	80	CUBIC_METERS
l	82	LITERS
ft ³	79	CUBIC_FEET
gal	83	US_GALLONS
Bq	222	BECQUERELS

For those measurements which have a string representation of it's **unit** is included in the **Description** property.

Aranet PRO supported BACnet services

- Subscribe Cov (execute)
- Read Property (execute)
- Write Property (execute)
- Who Has (execute)
- Who Is (execute)

When a device wants to locate a device that provides a particular service or object, it sends a **Who-Has** message on the network. The message contains information about the service or object that the device is looking for, such as the object type, instance number, and property. The Who-Has message is broadcast to all devices on the network, and the devices that can provide the requested service or object respond with an I-Have message. The I-Have message includes the network address of the device that provides the requested service or object.

The Who-Has message is an important part of the BACnet protocol, as it allows devices to locate each other on the network and to communicate with each other to exchange data and control signals. By using the Who-Has message, devices can quickly discover the network address of other devices that provide the services or objects they need, without the need for manual configuration or intervention.

The purpose of a **Who-Is** broadcast is to get the network addresses of devices on the network. These network addresses are critical to allow devices to communicate with one another without broadcasting the entire system. So, a device that needs another's address will send a message "specifying a Device Object Instance Number or a range of Instance Numbers". For example, it will send a "Who-is device 3001" or "Who-is device 3000 to 3099."

The responding devices send an I-Am to a local or remote network, or to the full network. "This allows other devices that may need to know about the responders to acquire the address information without creating more network traffic", and it allows the responding device to figure out its route.

Engineering Data Exchange file

EDE file is used to integrate Aranet PRO BACnet service into 3rd party systems using offline import. File defines the structure of BACnet project data of a device.

As EDE file contains information about available objects, in Aranet PRO base each time when changes in the object list are made, irrelevant EDE file (with old object list) is removed and user can request base to generate a new EDE file.

Aranet PRO EDE file structure description

File is in CSV format. First 6 rows contain descriptive information about the BACnet project which generated the EDE file.

Column name	Required information	Description
keyname	mandatory	BACnet specific object type combined with object instance identifier
device-object-instance	mandatory	Device object instance ID which owns this object
object-name	mandatory	Name of the object
object-type	mandatory	BACnet specific identifier used to identify object type
object-instance	mandatory	Object instance identifier
description	optional	Object description auto-generated by BACnet project on object creation.
state-text-reference	optional	- Not used
present-value-default	optional	- Not used
supports COV	optional	Does object supports Change-Of-Value
commandable	optional	Is commandable (using priority array)
min-present-value	optional	- Not used
max-present-value	optional	- Not used
hi-limit	optional	- Not used
low-limit	optional	- Not used
unit-code	optional	BACnet specific identifier used to identify measurement unit
vendor-specific-address	optional	- Not used
element	optional	Additional field which contains object's description value