

Version 1.1

Index

oBacnetMaster	3
oBacnetMaster Control	4
oBacnetMaster Monitor.....	8
oBacnetMaster Settings.....	10
BACnet information.....	11
BACnet Object Types supported by oBacnetMaster	12
APPENDIX A.....	13
BACnet Properties	13
APPENDIX B.....	17
BACnet Property Engineering Units	17

oBacnetMaster

oBacnetMaster is an easy to use program for communication with BACnet-IP devices.

- Control** - Read and write data from and to a BACnet device
- Monitor** - Read and write data using a list of different BACnet items
- Settings** - Configure oBacnetMaster

oBacnetMaster Control

Control can be used to check BACnet-IP devices for available items and their data types.

oBacnetMaster

IP-adres: 192.168.2.22: 47808 - Local

Protocol: BACnet-IP

Connect:

Control Monitor Settings

Invoke id: 1

Object: 08 - Analoge Value (AV)

Instance number: 1

Property: 55 - Present Value (PV) Hex: 55

Data type: Auto REAL32 - Floating point IEEE 754 single precision 32 bits

Response: 12.500000

New data: 12.500000

Read after write

Protocol viewer

Read

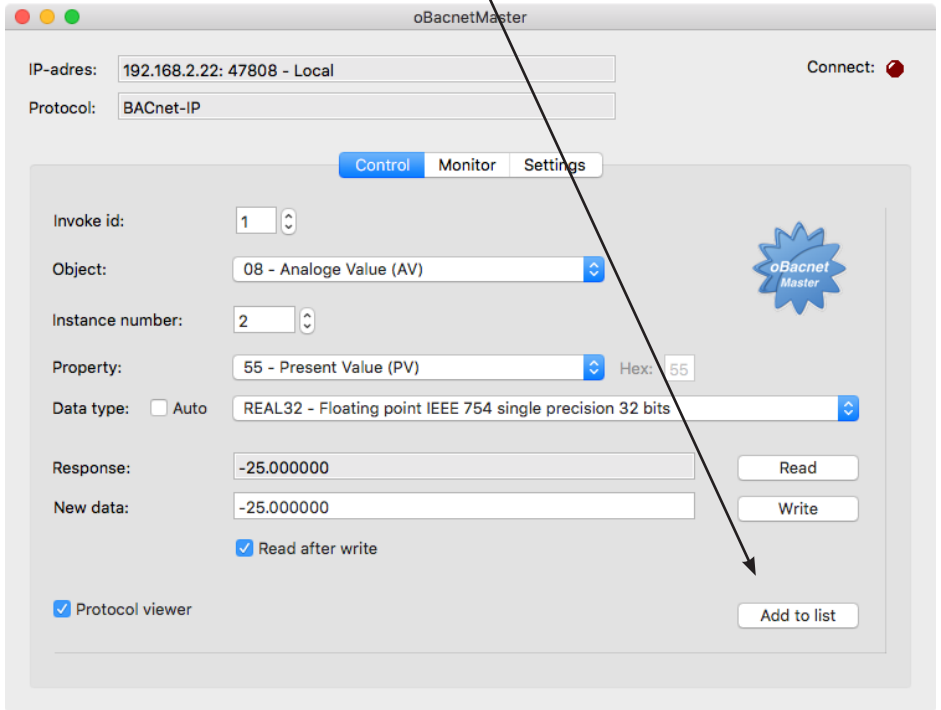
Write

Add to list

For some data types the **Read after write** can be set to check whether the item was correctly written.

When **Auto** is select, oBacnetMaster sets the correct Data type for the selected Property.

An item can directly added to the monitor list.



oBacnetMaster can read (and write some) items for the following **Objects**:

- 00 - Analoge Input (AI)
- 04 - Analoge Output (AO)
- 0B - Analaoqe Vaulue (AV)
- 0C - Binary Input (BI)
- 10 - Binary Output (BO)
- 14 - Binary Value (BV)
- 20 - Device (DV)

Check the Protocol Implementation Conformance Statement (PICS) of the BACnet device for more information.

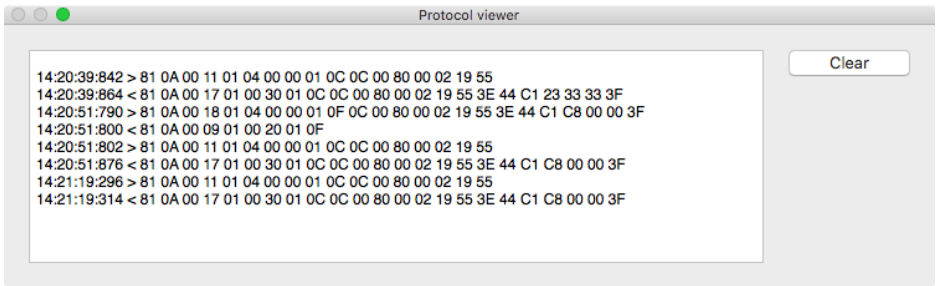
You can use the **Properties**:

- 00 - User Defined (UD) - Use Hex code 00 - FF (see Appendix A)
 - 1C - Description (DS)
 - 1F - Device Type (DT)
 - 4D - Object Name (ON)
 - 4F - Object Type (OT)
 - 55 - Present Value (PV)
 - 75 - Units (UN) - Engineering Units (see Appendix B)
-

The following **Data types** are available:

- BOOL1 - Boolean 1 bit
- CHAR - Character
- ENUM8 - Enumerated 8 bits
- HEX - Hexadecimal
- INT16 - Signed integer 16 bits
- REAL32 - Floating point IEEE 754 single precision 32 bits
- UINT8 - Unsigned integer 8 bits
- UINT16 - Unsigned integer 16 bits

You can enable the **Protocol viewer** to get more information about the datastream.



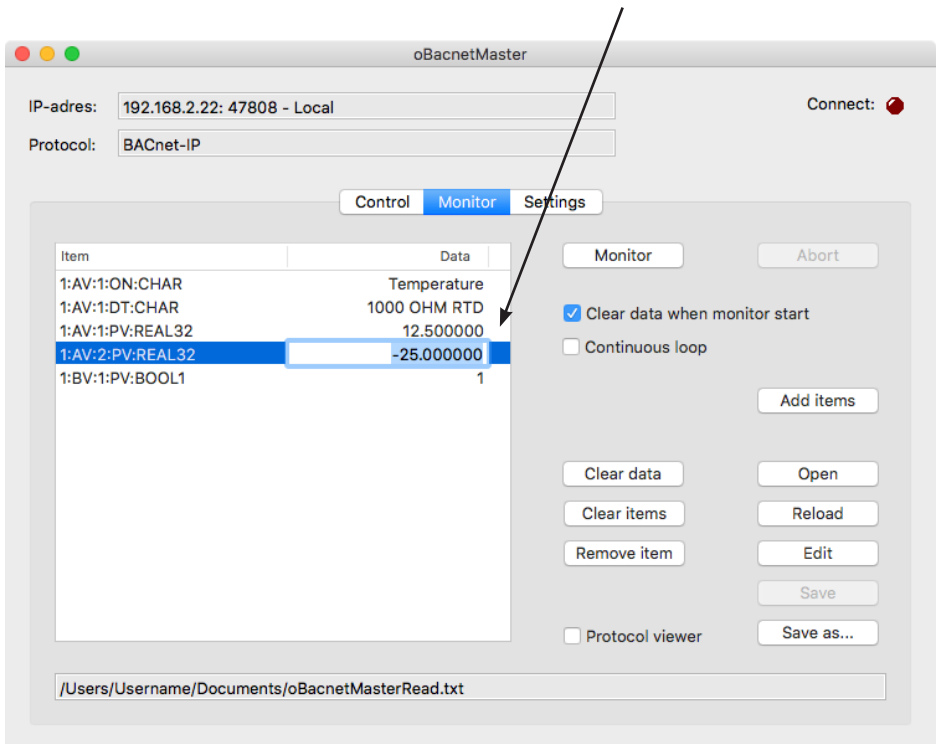
oBacnetMaster Monitor

Monitor can be used to read (and write) a list of items used by the selected BACnet device.

oBacnetMaster can Save, Save as... and Open a customized item list.

You can easily add, remove or modify items. By double clicking an item, you can change it.

When data is read, you can modify the data by double clicking the datafield. The new data is directly written to the BACnet device.



For a user defined item (property UD) you type for example:

1:AV:1:**UD:2D**:REAL32 (Invoke Id 1, AV1, property high-limit Hex **2D**)

See Appendix A for more information about all the different properties.

The following object **Descriptions** are used:

- AI - Analoge Input
 - AO - Analoge Output
 - AV - Analaoge Vaulue
 - BI - Binary Input
 - BO - Binary Output
 - BV - Binary Value
 - DV - Device
-

You can use the next **Property names**:

- DS - Description
 - DT - Device Type
 - ON - Object Name
 - OT - Object Type
 - PV - Present Value
 - UN - Units
-

Items can be added to the list via the Control screen (for a single item) or by using the **Add items** button.

The screenshot shows a window titled "Add items" with a standard macOS-style title bar (red, yellow, and grey buttons). The window contains the following fields and controls:

- Invoke id:** A text input field containing the number "1".
- Object:** A dropdown menu with "AI - Analoge Input" selected.
- Instance number:** A text input field containing the number "1".
- Property:** A dropdown menu with "PV - Present Value" selected.
- Data type:** A dropdown menu with "REAL32" selected.
- Number of items:** A text input field containing the number "1".
- Add:** A button located at the bottom right of the form.

oBacnetMaster Settings

Use Settings to configure oBacnetMaster.

The screenshot shows the 'oBacnetMaster' application window. At the top, there are two input fields: 'IP-adres:' with the value '192.168.2.22: 47808 - Local' and 'Protocol:' with the value 'BACnet-IP'. To the right of these fields is a 'Connect:' button with a red indicator. Below these fields are three tabs: 'Control', 'Monitor', and 'Settings' (which is selected). The 'Settings' tab contains several configuration options: 'Protocol:' (BACnet-IP), 'IP-address:' (192.168.2.22), 'Port:' (47808), 'Remote Lan (optional):' (0), 'Time-out (msec):' (500), 'Monitor file:' (/Users/Username/Documents/oBacnetMasterRead.txt), 'Initial settings:' (Clear data when monitor start checked, Continuous loop unchecked, Protocol viewer unchecked), and 'Delay (msec):' (50). Buttons for 'Defaults', 'Location', and 'Save' are also present.

oBacnetMaster can communicate with BACnet-IP devices using the UDP protocol.

Time-out (msec) is used for each BACnet protocol package.

The **Monitor file** is used to store the monitor item list.

The **Delay (msec)** is used as time between each item being read during monitoring.

BACnet information

BACnet is an open data communication protocol for building automation and control networks.

Information is available in the ASHRAE STANDARD 135-2001 and addenda.

BACnet Object Types supported by oBacnetMaster

analog-input (0)	Object 00 - AV
analog-output (1)	Object 04 - AO
analog-value (2)	Object 08 - AV
binary-input (3)	Object 0C - BI
binary-output (4)	Object 10 - BO
binary-value (5)	Object 14 - BV
device (8)	Object 20 - DV

APPENDIX A

BACnet Properties

Check the Protocol Implementation Conformance Statement (PICS) of your BACnet device to see if the property is available for the selected object.

- active-text (4)
- active-vt-sessions (5)
- active-cov-subscriptions (152)
- alarm-value (6)
- alarm-values (7)
- all (8)
- all-writes-successful (9)
- apdu-segment-timeout (10)
- apdu-timeout (11)
- application-software-version (12)
- archive (13)
- attempted-samples (124)
- average-value (125)
- backup-failure-timeout (153)
- bias (14)
- buffer-size (126)
- change-of-state-count (15)
- change-of-state-time (16)
- client-cov-increment (127)
- configuration-files (154)
- controlled-variable-reference (19)
- controlled-variable-units (20)
- controlled-variable-value (21)
- cov-increment (22)
- cov-resubscription-interval (128)
- current-notify-time (129)
- database-revision (155)
- datelist (23)
- daylight-savings-status (24)
- deadband (25)
- derivative-constant (26)
- derivative-constant-units (27)
- description (28)
- description-of-halt (29)
- device-address-binding (30)
- device-type (31)
- direct-reading (156)
- effective-period (32)
- elapsed-active-time (33)
- error-limit (34)
- event-enable (35)
- event-state (36)
- event-time-stamps (130)
- event-type (37)
- event-parameters (83)

exception-schedule (38)
fault-values (39)
feedback-value (40)
file-access-method (41)
file-size (42)
file-type (43)
firmware-revision (44)
high-limit (45)
inactive-text (46)
in-process (47)
instance-of (48)
integral-constant (49)
integral-constant-units (50)
issue-confirmed-notifications (51)
last-restore-time (157)
life-safety-alarm-values (166)
limit-enable (52)
list-of-group-members (53)
list-of-object-property-references (54)
list-of-session-keys (55)
local-date (56)
local-time (57)
location (58)
log-buffer (131)
log-device-object-property (132)
log-enable (133)
log-interval (134)
low-limit (59)
maintenance-required (158)
manipulated-variable-reference (60)
maximum-output (61)
maximum-value (135)
maximum-value-timestamp (149)
max-apdu-length-accepted (62)
max-info-frames (63)
max-master (64)
max-pres-value (65)
max-segments-accepted (167)
member-of (159)
minimum-off-time (66)
minimum-on-time (67)
minimum-output (68)
minimum-value (136)
minimum-value-timestamp (150)
min-pres-value (69)
mode (160)
model-name (70)
modification-date (71)
notification-class (17)
notification-threshold (137)
notify-type (72)
number-of-APDU-retries (73)
number-of-states (74)

object-identifier (75)
object-list (76)
object-name (77)
object-property-reference (78)
object-type (79)
operation-expected (161)
optional (80)
out-of-service (81)
output-units (82)
polarity (84)
present-value (85)
previous-notify-time (138)
priority (86)
priority-array (87)
priority-for-writing (88)
process-identifier (89)
profile-name (168)
program-change (90)
program-location (91)
program-state (92)
proportional-constant (93)
proportional-constant-units (94)
protocol-conformance-class (95)
protocol-object-types-supported (96)
protocol-revision (139)
protocol-services-supported (97)
protocol-version (98)
read-only (99)
reason-for-halt (100)
recipient (101)
recipient-list (102)
records-since-notification (140)
record-count (141)
reliability (103)
relinquish-default (104)
required (105)
resolution (106)
segmentation-supported (107)
setpoint (108)
setpoint-reference (109)
setting (162)
silenced (163)
start-time (142)
state-text (110)
status-flags (111)
stop-time (143)
stop-when-full (144)
system-status (112)
time-delay (113)
time-of-active-time-reset (114)
time-of-state-count-reset (115)
time-synchronization-recipients (116)
total-record-count (145)

tracking-value (164)
units (117)
update-interval (118)
utc-offset (119)
valid-samples (146)
variance-value (151)
vendor-identifier (120)
vendor-name (121)
vt-classes-supported (122)

APPENDIX B

BACnet Property Engineering Units

The property type BACnet Engineering Units indicates the measurement units of the selected object.

**** Area ****

square-meters (0)
square-centimeters (116)
square-feet (1)
square-inches (115)

**** Currency ****

currency1 (105)
currency2 (106)
currency3 (107)
currency4 (108)
currency5 (109)
currency6 (110)
currency7 (111)
currency8 (112)
currency9 (113)
currency10 (114)

**** Electrical ****

milliamperes (2)
amperes (3)
ohms (4)
kilohms (122)
megohms (123)
volts (5)
millivolts (124)
kilovolts (6)
megavolts (7)
volt-amperes (8)
kilovolt-amperes (9)
megavolt-amperes (10)
volt-amperes-reactive (11)
kilovolt-amperes-reactive (12)
megavolt-amperes-reactive (13)
degrees-phase (14)
power-factor (15)

**** Energy ****

joules (16)
kilojoules (17)
kilojoules-per-kilogram (125)
megajoules (126)
watt-hours (18)
kilowatt-hours (19)

btus (20)
therms (21)
ton-hours (22)

**** Enthalpy ****

joules-per-kilogram-dry-air (23)
btus-per-pound-dry-air (24)
btus-per-pound (117)

**** Entropy ****

joules-per-degree-Kelvin (127)
joules-per-kilogram-degree-Kelvin (128)

**** Frequency ****

cycles-per-hour (25)
cycles-per-minute (26)
hertz (27)
kilohertz (129)
megahertz (130)
per-hour (131)

**** Humidity ****

grams-of-water-per-kilogram-dry-air (28)
percent-relative-humidity (29)

**** Length ****

millimeters (30)
centimeters (118)
meters (31)
inches (32)
feet (33)

**** Light ****

watts-per-square-foot (34)
watts-per-square-meter (35)
lumens (36)
luxes (37)
foot-candles (38)

**** Mass ****

kilograms (39)
pounds-mass (40)
tons (41)

**** Mass Flow ****

kilograms-per-second (42)
kilograms-per-minute (43)
kilograms-per-hour (44)
pounds-mass-per-second (119)
pounds-mass-per-minute (45)
pounds-mass-per-hour (46)

**** Power ****

milliwatts (132)
watts (47)
kilowatts (48)
megawatts (49)
btus-per-hour (50)
horsepower (51)
tons-refrigeration (52)

**** Pressure ****

pascals (53)
hectopascals (133)
kilopascals (54)
millibars (134)
bars (55)
pounds-force-per-square-inch (56)
centimeters-of-water (57)
inches-of-water (58)
millimeters-of-mercury (59)
centimeters-of-mercury (60)
inches-of-mercury (61)

**** Temperature ****

degrees-Celsius (62)
degrees-Kelvin (63)
degrees-Fahrenheit (64)
degree-days-Celsius (65)
degree-days-Fahrenheit (66)
delta-degrees-Fahrenheit (120)
delta-degrees-Kelvin (121)

**** Time ****

years (67)
months (68)
weeks (69)
days (70)
hours (71)
minutes (72)
seconds (73)

**** Velocity ****

meters-per-second (74)
kilometers-per-hour (75)
feet-per-second (76)
feet-per-minute (77)
miles-per-hour (78)

**** Volume ****

cubic-feet (79)
cubic-meters (80)
imperial-gallons (81)
liters (82)
us-gallons (83)

**** Volumetric Flow ****

cubic-feet-per-second (142)
cubic-feet-per-minute (84)
cubic-meters-per-second (85)
cubic-meters-per-hour (135)
imperial-gallons-per-minute (86)
liters-per-second (87)
liters-per-minute (88)
liters-per-hour (136)
us-gallons-per-minute (89)

**** Other ****

degrees-angular (90)
degrees-Celsius-per-hour (91)
degrees-Celsius-per-minute (92)
degrees-Fahrenheit-per-hour (93)
degrees-Fahrenheit-per-minute (94)
kilowatt-hours-per-square-meter (137)
kilowatt-hours-per-square-foot (138)
megajoules-per-square-meter (139)
megajoules-per-square-foot (140)
no-units (95)
parts-per-million (96)
parts-per-billion (97)
percent (98)
percent-obscuration-per-foot (143)
percent-obscuration-per-meter (144)
percent-per-second (99)
per-minute (100)
per-second (101)
psi-per-degree-Fahrenheit (102)
radians (103)
revolutions-per-minute (104)
watts-per-square-meter-degree-kelvin (141)