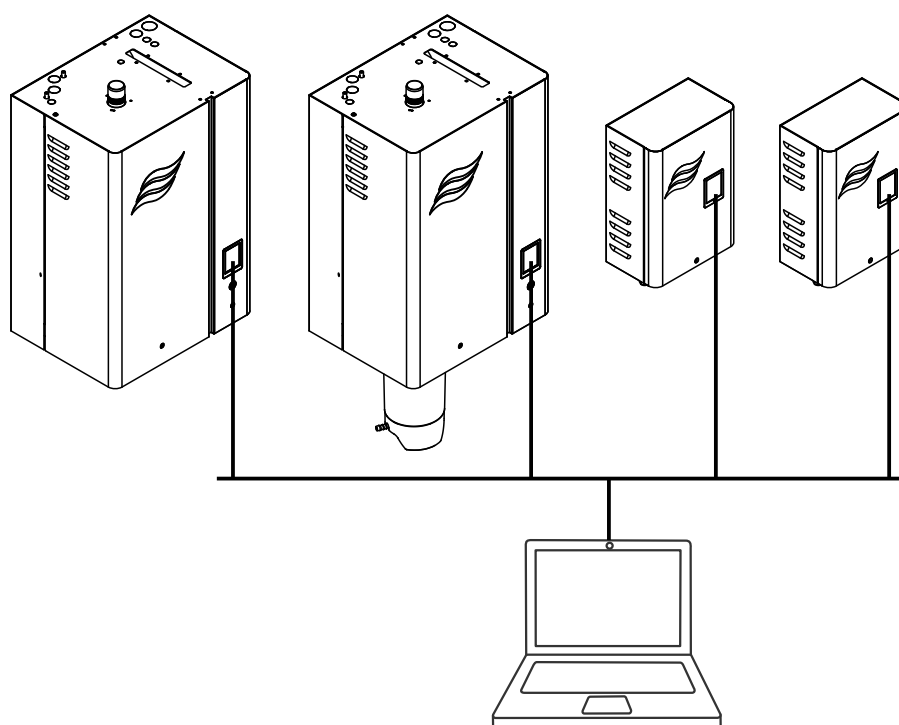




BACnet on-board

Supplemental Installation and Operation Manual

For use with RS, EL, GS II, DL, ME and RO-A units
with software version 5.9.x.x, 5.10.x.x and 5.11.x.x

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

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1 Introduction

1.1 Notes on this addendum manual

Condair devices equipped with an Integrated Controller can be connected via the corresponding interface on the Integrated Controller (BACnet on-board) to a BACnet IP network or a BACnet MS/TP network.

This manual describes how to install and configure BACnet on-board (see [chapter 3](#)) to connect Condair devices with Integrated Controller to a building management system.

This addendum manual is intended for use by engineers and properly trained technical personnel. Please read this manual thoroughly before working on the Integrated Controller.

If you have questions after reading this documentation, please contact your Condair representative. They will be glad to assist you.

Symbols used in this manual



CAUTION!

The catchword "CAUTION" used in conjunction with the caution symbol in the circle designates notes in this manual that, if neglected, may cause **damage and/or malfunction of the unit or other material assets**.



WARNING!

The catchword "WARNING" used in conjunction with the general caution symbol designates safety and danger notes in this manual that, if neglected, may cause **injury to persons**.



DANGER!

The catchword "DANGER" used in conjunction with the general caution symbol designates safety and danger notes in this manual that, if neglected, may lead to **severe injury or even death of persons**.

Safekeeping

Please safeguard this addendum manual in a safe place, where it can be immediately accessed. If the equipment changes hands, the documentation must be passed on to the new operator.

If the documentation gets mislaid, please contact your Condair representative for replacement.

Language versions

This addendum manual is available in various languages. Please contact your Condair representative for information.

1.2 Functions overview

The following table gives you an overview of the supported protocols and functions.

	BACnet on-board Integrated controller
BACnet IP	yes
BACnet MS/TP Master Mode	yes
BACnet MS/TP Slave Mode	yes
BACnet IP and BACnet MS/TP BTL certified	no
Remote "RS draining"	no
BACnet Service COV (Change of Value)	no

Please refer to the BACnet Protocol Implementation Conformance Statement (PICS, see [chapter 4.2](#)) and the objects tables (see [chapter 3.4](#)) for detailed information.

2 For your safety

General

Every person working with the Condair Integrated Controller must have read and understood this addendum manual, and the installation manual and operation manual of the Condair Integrated Controller, before carrying out any work.

Knowing and understanding the contents of the manuals is a basic requirement for protecting the personnel against any kind of danger, to prevent faulty operation, and to operate the unit safely and correctly.

All icons, signs and markings applied to the unit must be observed and kept in readable state.

Qualification of personnel

All work described in this addendum manual **may only be carried out by specialists who are well trained and adequately qualified and are authorised by the customer.**

For safety and warranty reasons any action beyond the scope of this manual must be carried out only by qualified personnel authorised by the manufacturer.

It is assumed that all persons working with the Condair Integrated Controller are familiar and comply with the appropriate local regulations on work safety and the prevention of accidents.

Intended use

The BACnet on-board interfaces Condair Integrated Controller are intended exclusively for connecting the Condair Integrated Controller to a BACnet based network. Any other type of application, without the written consent of the manufacturer, is considered as not conforming with the intended purpose and may lead to the Condair Integrated Controller becoming dangerous.

Operation of the equipment in the intended manner requires **that all the information contained in this addendum manual as well as in the installation manual and operation manual of the Condair Integrated Controller are observed.**

Danger that may arise from the Condair Integrated Controller



DANGER!
Risk of electric shock!

The control unit where the Integrated Controller is located is mains powered. Live parts may be exposed when the control unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: Before commencing any work disconnect the corresponding Condair device from the mains supply via the electrical isolator in the mains supply line, and secure electrical isolator in "Off" position against inadvertent switching on.

Safety reporting

All persons working with the Condair Integrated Controller are obliged to report any alterations to the system that may affect safety to the owner without delay and to **secure such systems against accidental power-up**.

Prohibited modifications to the unit

No modifications must be undertaken on the Condair Integrated Controller without the express written consent of the manufacturer.

For the replacement of defective components use exclusively **original accessories and spare parts** available from your Condair representative.

3 Network integration via BACnet on-board

3.1 Notes for the planning engineer

3.1.1 Overview

The BACnet on-board functionality of the Integrated Controllers allows to connect Condair devices via the RJ45 Ethernet interface to a BACnet IP network or via the RS485 interface to a BACnet MS/TP network without further options.

The following protocol options are available as standard:

Interface on the Integrated Controller	Protocol	Description
RJ45 Ethernet port	BACnet IP	BACnet IP
RS485 interface	BACnet MS/TP	BACnet MS/TP Master or Slave Mode

Please refer to the BACnet object tables in [chapter 3.4](#) for detailed information regarding the available read out and settings functions.

Principle BACnet MS/TP network

The diagram below shows the connection of a Condair Integrated Controller to a BACnet MS/TP network. The diagram also shows an application encountered in practice: BACnet MS/TP communicates with the higher-level BACnet IP via a router.

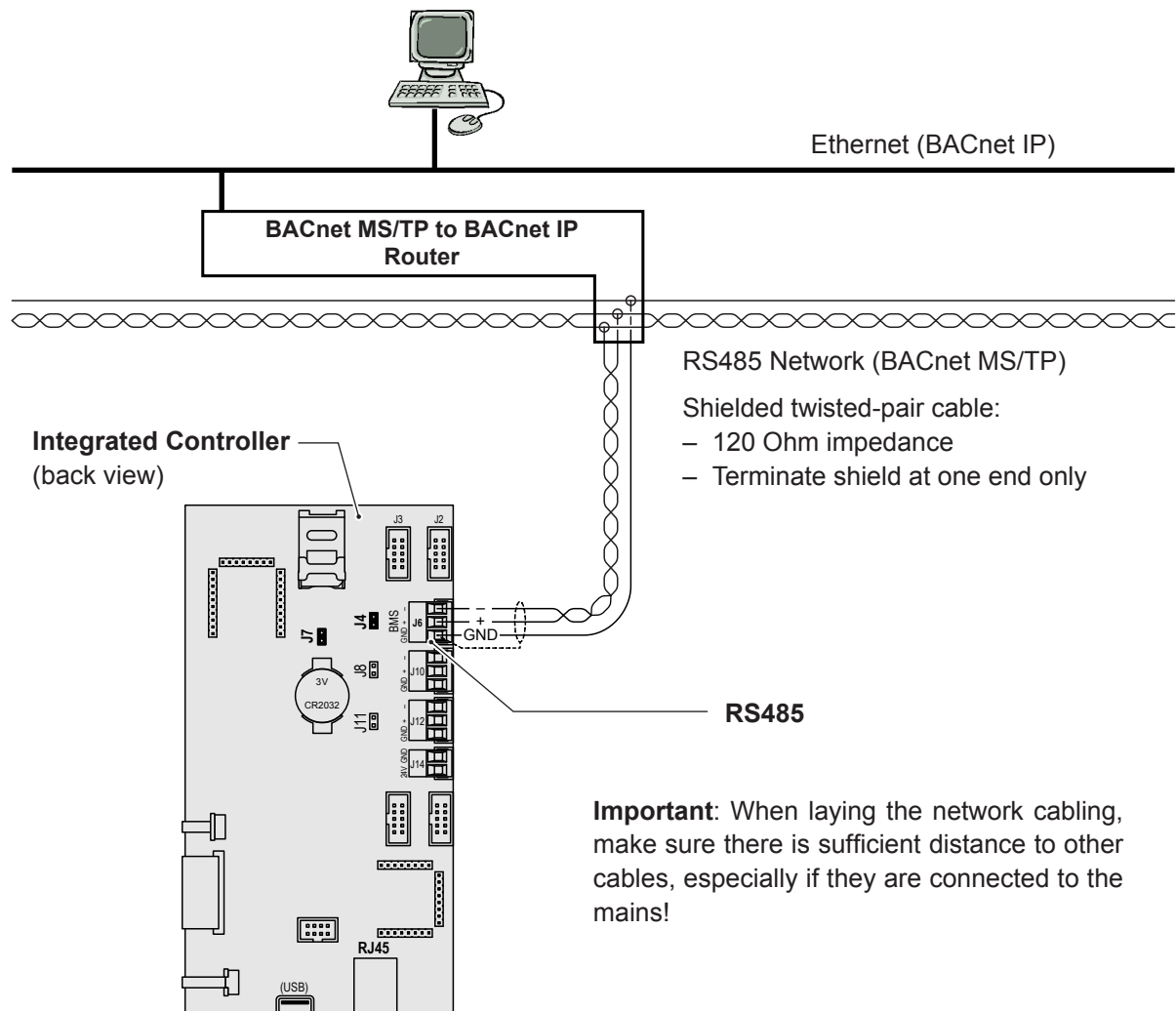
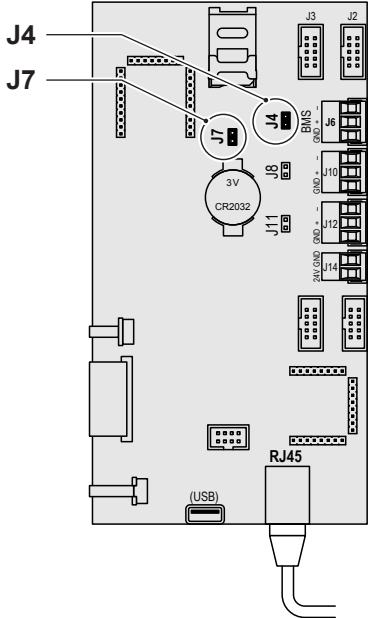
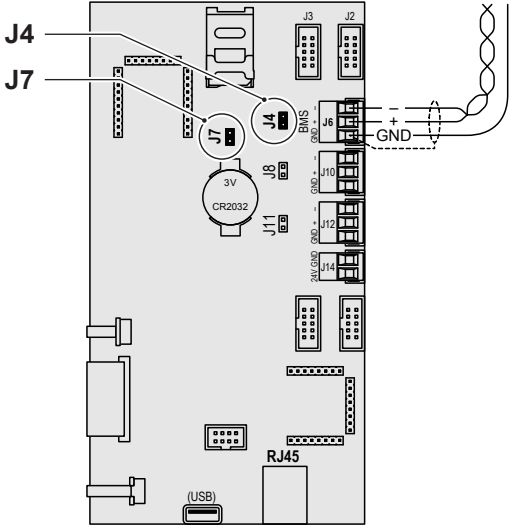


Fig. 2: Principle BACnet MS/TP network

3.2 Wiring

1. Lead the network cable through a cable gland or the rectangular cable lead-through into the control unit.
2. Connect network cable according to the following wiring diagrams to the corresponding interface connector on the Integrated Controller.

BACnet IP	BACnet MS/TP
 Jumper settings: Jumper J7 and J4 do not have any effect for BACnet IP communication.	 Important: all devices must be connected to each other via GND Jumper settings: – Jumper J7 must be set on all Integrated Controllers. – Jumper J4 must be set on the first and the last Integrated Controller in the network (serves as terminating resistor at the start and end of the network). Jumper J4 set = terminating resistor active.

3.3 Configuration

After network wiring connections have been completed, the Condair Integrated Controller needs to be setup to operate and communicate through BACnet IP or BACnet MS/TP with the building management system. This setup includes the settings in the "**Communication**" and the "**Control Settings**" submenu of the Condair Integrated Controller.

3.3.1 Configuring the Condair Integrated Controller

3.3.1.1 Setup the communication parameters

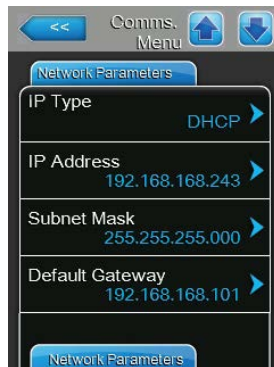
Select "Communication" submenu as shown below.



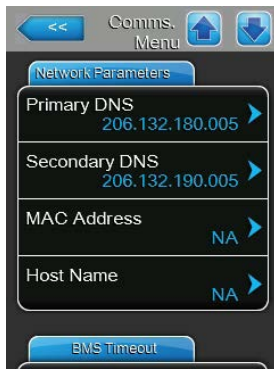
Then setup the communication parameters in the corresponding tabs listed below.

Network Parameters Tab

The following network settings are used only for the communication via the integrated BACnet IP interface.

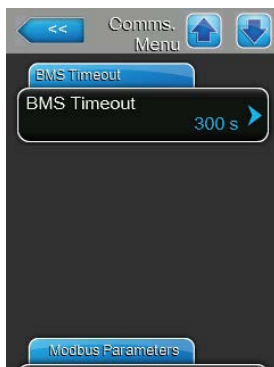


- **IP Type:** with this setting you determine whether you want to assign the IP Address, the Subnet Mask, the Standard Gateway as well as the Primary and Secondary DNS address as fixed values or whether these should be dynamically assigned via a DHCP server.
Note: after 5 unsuccessful attempts at obtaining an address with DHCP the system will revert to fixed assignment
Factory setting: **DHCP**
Options: **DHCP** (dynamic assignment)
Fixed (fixed assignment)
- **IP Address:** This field shows the actual IP address of the device assigned manually or assigned by a DHCP server.
If the parameter "IP Type" is set to "Fix", the IP address of the device can be set via this field. If the parameter "IP type" is set to "DHCP", the IP address of the device is assigned by a DHCP server.
- **Subnet Mask:** This field shows the actual subnet mask of the IP network assigned manually or assigned by a DHCP server.
If the parameter "IP Type" is set to "Fix", the subnet mask can be set via this field. If the parameter "IP type" is set to "DHCP", the subnet mask is assigned by a DHCP server.



- **Default Gateway:** This field shows the actual IP address of the default gateway assigned manually or assigned by a DHCP server. If the parameter "IP Type" is set to "Fix", the IP address of the default gateway can be set via this field. If the parameter "IP type" is set to "DHCP", the IP address of the default gateway is assigned by a DHCP server.
- **Primary DNS:** This field shows the actual IP address of the primary domain name server (DNS) assigned manually or assigned by a DHCP server. If the parameter "IP Type" is set to "Fix", the IP address of the primary domain name server can be set via this field. If the parameter "IP type" is set to "DHCP", the IP address of the primary domain name server is assigned by a DHCP server.
- **Secondary DNS:** This field shows the actual IP address of the secondary domain name server (DNS) assigned manually or assigned by a DHCP server. If the parameter "IP Type" is set to "Fix", the IP address of the secondary domain name server can be set via this field. If the parameter "IP type" is set to "DHCP", the IP address of the secondary domain name server is assigned by a DHCP server.
- **MAC Address:** Factory set MAC Address (Media Access Control) of the device. Not modifiable.
- **Host Name:** Host Name of the device automatically generated by the control. Format: "IC_"+"Serial number of the device". Not modifiable.

BMS Timeout Tab



- **BMS Timeout:** with this setting you determine the maximum time the humidifier will wait with no communication from the BMS network before warning W35 "BMS Timeout" is triggered. The device is stopped until a valid signal is transmitted again.
Note: The BMS timeout is only evaluated if the signal source (Path: Menu> Configuration> Control Settings > Source) is not set to "Analog".
Factory setting: **300 s**
Setting range: **1 ... 300 s**

BACnet Parameters Tab



- **BACnet:** with this setting you can activate ("MSTP" or "BACnet/IP") or deactivate ("Off") the communication via the integrated BACnet interface. Note: For some settings, the device will reboot to apply the changes.
Important! If the control signal is also to be sent via BACnet, always make sure that the signal source in the submenu "Configuration> Control settings > Source" is set to the BACnet protocol, see [chapter 3.3.1.2](#).
Factory setting: **Off**
Options: **Off** (BACnet interface deactivated)
MSTP (BACnet MS/TP via RS 485 interface)
BACnet/IP (BACnet IP via RJ45 interface)

BACnet IP Settings

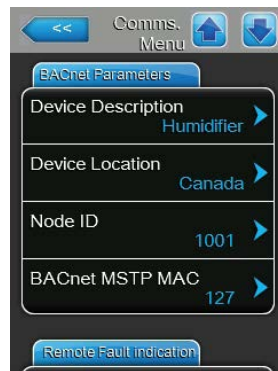
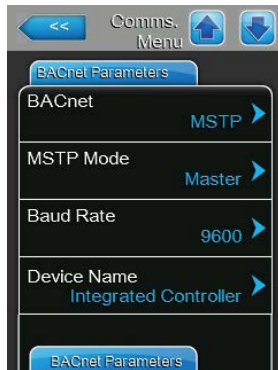
The following settings appear only, if the parameter "BACnet" is set to "BACnet/IP".



- **Device Name:** with this setting you determine the name of the device for the communication via the integrated BACnet interface.
Note: The name assigned here is also assigned to the object name of the device object.
- **Device Description:** with this setting you determine a short description of the device.
Note: The device description assigned here is also assigned to the property "Description" in the device object.
- **Device Location:** with this setting you determine the designation of the device location.
Note: The location assigned is also assigned to the property "Location" in the device object.
- **Node ID:** with this setting you assign a node ID to the device for the communication over the BACnet IP protocol.
Factory setting: **1001**
Setting range: **1 - 4194303**
- **BACnet IP Port:** with this setting you assign a IP port number for the device.
Factory setting: **47808**
Setting range: **1 - 65535**
- **Foreign Device:** With this setting, you determine whether the device logs in to an external BACnet IP Broadcast Management Device (BBMD) ("On") so that it can receive broadcast messages (messages to all participants) on the IP network or not ("Off").
Note: In an IP network, routers generally block broadcast messages (messages to all participants) to reduce traffic. This prevents a BACnet IP device from being detected via the "Who-is" service, or to answer via the "I-Am" service. In order for the BACnet IP broadcast messages to be forwarded to other network segments anyway, a BBMD (BACnet IP Broadcast Management Device) is required. These devices integrated into the IP network forward BACnet IP broadcast messages to other network segments. Only one BBMD may be integrated per network segment.
Factory setting: **Off**
Options: **Off or On**
- **BBMD IP Address:** With this setting, you specify the IP address of the external BBMD to which the device should log on.

BACnet MS/TP Settings

The following settings appear only, if the parameter "BACnet" is set to "MSTP".



- **MSTP Mode:** with this setting you determine whether the device should act as Master or Slave.
Factory setting: **Master**
Options: **Master or Slave**
- **Baudrate:** with this setting you set the Baudrate for the data transfer.
Factory setting: **9600**
Options: **9600, 19200, 38400, 57600, 76800**
- **Device Name:** with this setting you determine the name of the device for the communication via the integrated BACnet interface.
Note: The name assigned here is also assigned to the object name of the device object.
- **Device Description:** with this setting you determine a short description of the device.
Note: The device description assigned here is also assigned to the property "Description" in the device object.
- **Device Location:** with this setting you determine the designation of the device location.
Note: The location assigned is also assigned to the property "Location" in the device object.
- **Node ID:** with this setting you assign a node ID to the device for the communication over the BACnet MS/TP protocol.
Factory setting: **1001**
Setting range: **1 - 4194303**
- **BACnet MSTP MAC:** with this setting you assign a MSTP MAC address for the device.
Factory setting: **127**
Setting range: **0 - 127 (for Master)**
0 - 254 (for Slave)

3.3.1.2 Setup control settings

By default the Condair Integrated Controller is configured to operate on a hardwired analog control signal from an external humidity controller or a humidity sensor (if internal P or PI controller is used) connected to the driver board inside the control unit.

Note: If you want the Condair Integrated Controller to be controlled via a hardwired analog control signal set "Signal Source" to "Analog" and set the other control settings as required (see "Operation Manual" of the corresponding device for details).

If you want to control the Condair Integrated Controller via one of the integrated BACnet on-board interfaces the "Control Settings" must be adjusted as follows:

1. Close control unit and switch it on.
2. Select "Control Settings" submenu as shown below.



3. Set **control settings** as follows (see rightmost screen):

Signal Source:	BACnet
System Mode:	Humidifying or Cooling (only by ME)
Control Mode:	Demand (if you use an external demand control signal) RH P (if a sensor signal and proportional controller is used) RH PI (if a sensor signal and proportional-integral controller is used)

Note: see "Operation Manual" of the corresponding for details on control settings.

3.3.1.3 Monitoring of bus communication:

The monitoring of the bus communication described below only takes place if the "Source" parameter in the "Control Settings" menu is not set to "Analog".

As soon as the control signal (demand or humidity signal) is transmitted via the BACnet IP or BACnet MSTP bus system, communication via the bus system is also monitored.

The control signal must be periodically updated within the time set in "BMS Timeout".

If the control signal is not updated within the set time, warning W35 "BMS Timeout" will be triggered and the humidification will be stopped until a writable object (AV or AO) receives an updated value.

This monitoring is intended to prevent the humidifier from humidifying with the last transmitted value in the event of a bus failure.

3.4 Communication tables

3.4.1 DL - BACnet on-board (Integrated Controller Software version 5.9.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Humidifier	—	DEV	1001	—
Hum. Status	Operating status	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Flushing 5 = Standby 6 = Flushed 7 = Humidifying 8 = Ready 9 = Refreshing 10 = Air Pressure Cleaning 11 = Filling 12 = Conductivity Flush 13 = Switched Off 14 = Remote Off 15 = Regenerating 16 = Temperature Flush 17 = Ceramic Wash Over	MI	500	R
Service Status	Maintenance and malfunctions status	1 = Service Info 2 = Warning 3 = Activation Code 4 = Out of Commissioning 5 = Refill Disinfection 6 = Service 7 = Fault 8 = Replace Ag Cartridge 9 = Disinfection	MI	549	R
Device Type	Device type	1 = Hum 2 = Hum + FC 3 = Hum + RO-C 4 = Hum + FC-off	MI	597	R
Fault Code	Error code ²⁾	0 = no Error	AI	10759	R
Operating Hours	Operating hours	0 - 1'200'000 h	AI	10699	R
Next Service	Next service	0 - 10000 h	AI	10700	R
Humidity Control	Actual humidity or demand	0 - 100 %	AI	10729	R
Max. Capacity	Max. capacity ¹⁾	2 - 1000 kg/h 4 - 2573 lb/hr	AI	10596	R
Capacity	Actual capacity ¹⁾	0 - 1000 kg/h 0 - 2573 lb/hr	AI	10702	R
Remain.Capacity	Remaining Ag-Ion Capacity	0 - 58.4 Ah	AI	10701	R
Target Ag-Ion Curr.	Target Ag-Ion Current	0 - 29.2 mA	AI	10703	R
PS4	Inlet pressure PS4 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	AI	10732	R
PS5	Nozzle pressure PS5 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	AI	10733	R
Water Temperature	Water temperature ¹⁾	°C or °F	AI	10734	R
Conductivity	Conductivity	µS/cm	AI	10735	R
Pump Current	Pump current	0 - 5.0 A	AI	10727	R
Ag-Ion Current	Ag-Ion current	mA	AI	10632	R

¹⁾ According to the settings <Imperial> or <Metric> in the DL controller software.

²⁾ See Error code description in the malfunction list in the DL operation manual.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Setpoint	Humidity setpoint	0 - 95 %	AV	10602	R/W
Band Channel 1	Proportional band	6 - 65 %	AV	10604	R/W
ITime Channel 1	Integral time	1 - 60 min	AV	10606	R/W
Manual Capacity	Manual capacity	20 - 100 %	AV	10610	R/W
Manual Mode	Manual drain	Read: 0 = Off 2 = Flushing active Write: 0 = Stop flushing 1 = Start flushing	AV	10789	R/W
Manual Ceramic Flush	Ceramic wash over	Read: 0 = Off 2 = Ceramic wash over active Write: 0 = Stop ceramic wash over 1 = Start ceramic wash over	AV	10790	R/W
RhorDemand	Actual humidity or demand via BACnet	0 - 100 % Relinquish Default = 0	AO	10611	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Safety Loop	Safety loop	0 = Open 1 = Closed (ok)	BI	578	R
Y1	Y1 inlet valve	0 = Closed 1 = Open	BI	603	R
Y2	Y2 valve	0 1	BI	604	R
Y3	Y3 valve air cleaning	0 = Closed 1 = Open	BI	605	R
Y4	Y4 valve external pipe flush	0 = Closed 1 = Open	BI	606	R
Y5	Y5 valve spray circuit	0 = Closed 1 = Open	BI	607	R
Y6	Y6 valve spray circuit	0 = Closed 1 = Open	BI	608	R
Y7	Y7 valve spray circuit	0 = Closed 1 = Open	BI	609	R
Y8	Y8 valve spray circuit	0 = Closed 1 = Open	BI	610	R
Y9	Y9 valve spray circuit	0 = Closed 1 = Open	BI	611	R
Y10	Y10 valve drain (NO)	0 = Open 1 = Closed	BI	612	R
Y11	Y11 auxiliary outlet valve	0 = Open 1 = Closed	BI	613	R
FC Enable	FC enable	0 = Off 1 = On	BI	636	R

3.4.2 ME - BACnet on-board (Integrated Controller software version 5.10.x.x and 5.11.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Humidifier	—	DEV	1001	—
Operation Status	Operating status	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Humidifying 5 = Cooling 6 = Holding 7 = Draining 8 = Refreshing 9 = Filling 10 = Standby 11 = Diluting 12 = Drain Assisting 13 = Bleeding 14 = Ramping Up 15 = Switched Off 16 = Remote Off 17 = Purging 18 = Drain Check	MI	500	R
Service Status	Maintenance and malfunctions status	1 = Service Info 2 = Warning 3 = Service 4 = Refill Liquid 5 = Replace PureFlow Ag+ 6 = Replace UV Bulb 7 = Matrix Wash Over 8 = Out of Commissioning 9 = Activation Code 10 = Fault	MI	549	R
Fault Code	Error code ²⁾	0 = no Error	AI	10650	R
Operating Hours	Operating hours	0 - 1'200'000 h	AI	10626	R
Next Service	Next service	0 - 10000 h	AI	10627	R
Next UV Bulb ex- change	Next UV bulb exchange	0 - 450 d	AI	10628	R
Next PureFlo Ag+ exchange	Next PureFlo Ag+ exchange	0 - 350 d	AI	10629	R
Humidity Control	Actual humidity or demand	0 - 100 %	AI	10526	R
Temperature Control	Actual air temperature ¹⁾	°C or °F	AI	10527	R
UV Current	UV current	0 - 4.0 A	AI	10532	R
Capacity 1	Water capacity stage 1 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10588	R
Capacity 2	Water capacity stage 2 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10589	R
Capacity 3	Water capacity stage 3 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10590	R
Capacity 4	Water capacity stage 4 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10591	R
Capacity 5	Water capacity stage 5 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10592	R
Capacity 6	Water capacity stage 6 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10622	R
Capacity 7	Water capacity stage 7 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/hr	AI	10623	R
Speed Pump 1	Demand pump 1	0 - 100 %	AI	10631	R
Speed Pump 2	Demand pump 2	0 - 100 %	AI	10632	R
Speed Pump 3	Demand pump 3	0 - 100 %	AI	10633	R

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Speed Pump 4	Demand pump 4	0 - 100 %	AI	10634	R
Speed Pump 5	Demand pump 5	0 - 100 %	AI	10635	R
Speed Pump 6	Demand pump 6	0 - 100 %	AI	10636	R
Speed Pump 7	Demand pump 7	0 - 100 %	AI	10637	R
Conductivity	Conductivity	µS	AI	10530	R
Water Temperature	Actual water temperature ¹⁾	°C or °F	AI	10529	R
Incoming Air Temperature	Actual air temperature ¹⁾	°C or °F	AI	10528	R
Actual Stage	Number of running stages	0 - 7 stages	AI	10624	R
Level	Water level in tub	0 - 8	AI	10595	R

¹⁾ According to the settings <Imperial> or <Metric> in the ME controller software.

²⁾ See Error code description in the malfunction list in the ME operation manual.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Setpoint Channel 1	Humidity setpoint	0 - 95 %	AV	10602	R/W
Band Channel 1	Proportional band humidity control	6 - 65 %	AV	10604	R/W
ITime Channel 1	Integral time humidity control	1 - 60 min	AV	10606	R/W
Setpoint Channel 2	Temperature setpoint ¹⁾	5 - 40 °C 41 - 104 °F	AV	10603	R/W
Band Channel 2	Proportional band temperature control ¹⁾	1 - 50 °C 34 - 122 °F	AV	10605	R/W
ITime Channel 2	Integral time temperatur control	1 - 60 min	AV	10607	R/W
Manual Mode	Matrix wash over / Tank draining	Read: 0 = Off 1 = Initialisation 2 = Process active 3 = Process completed Write: 0 = Stop active process 1 = Start matrix wash over 2 = Start tank draining	AV	10675	R/W
RHorDemand	Actual humidity or demand via BACnet	0 - 100% Relinquish Default = 0	AO	10611	R/W
Temperature	Actual temperature via BACnet ¹⁾	-25 - 100 °C -13 - 212 °F Relinquish Default = 0	AO	10612	R/W

¹⁾ According to the settings <Imperial> or <Metric> in the ME controller software.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Safety Loop	Safety loop	0 = Open 1 = Closed (ok)	BI	532	R
Dosing Pump Level Float	Dosing pump level	0 = Empty 1 = Ok	BI	534	R
Standing Water	Leakage sensor	0 = Fault 1 = Ok	BI	535	R
Drain Valve	Drain valve	0 = Open 1 = Closed	BI	537	R
Inlet Valve	Inlet valve	0 = Closed 1 = Open	BI	536	R
Drain Pump	Drain pump	0 = Off 1 = On	BI	551	R
Pump 1 Error	Fault pump 1	0 = Fault 1 = Ok	BI	572	R
Pump 2 Error	Fault pump 2	0 = Fault 1 = Ok	BI	573	R
Pump 3 Error	Fault pump 3	0 = Fault 1 = Ok	BI	574	R
Pump 4 Error	Fault pump 4	0 = Fault 1 = Ok	BI	575	R
Pump 5 Error	Fault pump 5	0 = Fault 1 = Ok	BI	576	R
Pump 6 Error	Fault pump 6	0 = Fault 1 = Ok	BI	577	R
Pump 7 Error	Fault pump 7	0 = Fault 1 = Ok	BI	578	R
Water Inlet	Fault water inlet	0 = Fault 1 = Ok	BI	579	R
Water Temp	Fault water temperature	0 = Fault 1 = Ok	BI	580	R
Water Outlet	Fault water outlet	0 = Fault 1 = Ok	BI	581	R
Level Sensor	Fault level sensor	0 = Fault 1 = Ok	BI	582	R
Water Condu	Fault water conductivity	0 = Fault 1 = Ok	BI	583	R
System Reset	Remote reset	0 = Off 1 = On	BV	586	R/W

3.4.3 RS - BACnet on-board (Integrated Controller software version 5.9.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Humidifier	—	DEV	1001	—
Status A	Operating status unit A	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Break 5 = Level Test 6 = Standby 7 = Humidifying 8 = Filling 9 = Idle 10 = Draining 11 = Remote off 12 = Keep Warm	MI	500	R
Status B	Operating status unit B	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Break 5 = Level Test 6 = Standby 7 = Humidifying 8 = Filling 9 = Idle 10 = Draining 11 = Remote off 12 = Keep Warm	MI	654	R
Service Status A	Maintenance and malfunctions status unit A	1 = Service Info 2 = Warning 3 = RO Service 4 = Extended Maint. 5 = Small Maint. 6 = Activation Code 7 = Fault	MI	549	R
Service Status B	Maintenance and malfunctions status unit B	1 = Service Info 2 = Warning 3 = RO Service 4 = Extended Maint. 5 = Small Maint. 6 = Activation Code 7 = Fault	MI	655	R
Mode	Device type	1 = RS 2 = RS+ RO 3 = RO	MI	717	R
Nominal Voltage	Nominal voltage	1 = 200 V 2 = 208 V 3 = 230 V 4 = 240 V 5 = 400 V 6 = 415 V 7 = 440 V 8 = 460 V 9 = 480 V 10 = 500 V 11 = 550 V 12 = 600 V 13 = 380 V	MI	699	R
Level A	Water level unit A	0 = no level 1 = low 2 = low-mid 3 = mid 4 = mid-high 5 = high	AI	10820	R

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Level B	Water level unit B	0 = no level 1 = low 2 = low-mid 3 = mid 4 = mid-high 5 = high	AI	10821	R
Fault Code	Error code ²⁾	0 = No Error	AI	10823	R
Operating Hours	Operating hours	0 - 1'200'000 h	AI	10699	R
Next Service A	Next service unit A	0 - 6000 h	AI	10758	R
Next Service B	Next service unit B		AI	10759	R
System Demand	System demand	0 - 100 %	AI	10057	R
Channel 1	Input signal channel 1 unit A	0 - 100 %	AI	10001	R
Channel 2	Limiter signal channel 2 unit A	0 - 100 %	AI	10002	R
Max Capacity	Max. capacity ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	AI	10596	R
Capacity A	Max. capacity unit A ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	10754	R
Capacity B	Max. capacity unit B ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	10755	R
Capacity	Actual capacity ¹⁾	0 - 160 kg/h 0 - 360 lb/hr	AI	10702	R
Cylinder A	Actual capacity unit A ¹⁾	0 - 40 kg/h 0 - 90 lb/hr	AI	10734	R
Cylinder B	Actual capacity unit B ¹⁾	0 - 40 kg/h 0 - 90 lb/hr	AI	10735	R

¹⁾ According to the settings <Imperial> or <Metric> in the RS controller software.

²⁾ See Error code description in the malfunction list in the RS operation manual.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Setpoint Channel 1	Setpoint channel 1 unit A	0 - 95 %	AV	10010	R/W
Setpoint Channel 2	Setpoint channel 2 limiter unit A	10 - 95 %	AV	10013	R/W
Band Channel 1	P-Band unit A (Proportional band)	6 - 65 %	AV	10011	R/W
Band Channel 2	P-Band limiter unit A (Proportional band)	6 - 65 %	AV	10014	R/W
ITime Channel 1	Integral time channel 1 unit A	1 - 60 min	AV	10012	R/W
Damp Channel 2	Damp time channel 2 unit A	0 - 60 s	AV	10015	R/W
Manual Capacity A	Manual capacity unit A	20 - 100 %	AV	10008	R/W
Digital RH/Demand A1	Actual humidity or demand via BACnet unit A	0 - 100 % Relinquish Default = 0	AO	10044	R/W
Digital RH/Demand A2	Actual humidity or limiter via BACnet unit A	0 - 100 % Relinquish Default = 0	AO	10045	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Blower Pack A	Blower ready unit A	0 = Off 1 = On	BI	653	R
Blower Pack B	Blower ready unit B	0 = Off 1 = On	BI	689	R
Safety Loop A	External safety loop unit A	0 = Open 1 = Closed (ok)	BI	578	R
Safety Loop B	External safety loop unit B	0 = Open 1 = Closed (ok)	BI	662	R
Overheat Switch A	Internal safety loop unit A	0 = Open 1 = Closed (ok)	BI	648	R
Overheat Switch B	Internal safety loop unit B	0 = Open 1 = Closed (ok)	BI	685	R
Heating Voltage A	Heating voltage unit A	0 = Off 1 = On	BI	650	R
Heating Voltage B	Heating voltage unit B	0 = Off 1 = On	BI	687	R
Temperature Switch A	Internal safety loop unit A (security level)	0 = Open 1 = Closed (ok)	BI	649	R
Temperature Switch B	Internal safety loop unit B (security level)	0 = Open 1 = Closed (ok)	BI	686	R
Leakage Sensor A	Leakage sensor unit A	0 = Off (Leak) 1 = On	BI	647	R
Leakage Sensor B	Leakage sensor unit B	0 = Off (Leak) 1 = On	BI	684	R
Main Contactor A	Contactor unit A	0 = Off 1 = On	BI	733	R
Main Contactor B	Contactor unit B	0 = Off 1 = On	BI	734	R
Relay Pump AC A	Pump unit A	0 = Off 1 = On	BI	735	R
Relay Pump AC B	Pump unit B	0 = Off 1 = On	BI	736	R

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Inlet 1 A	Inlet valve 1 unit A	0 = Closed 1 = Open	BI	760	R
Inlet 1 B	Inlet valve 1 unit B	0 = Closed 1 = Open	BI	761	R
Inlet 2 A	Inlet valve 2 unit A	0 = Closed 1 = Open	BI	762	R
Inlet 2 B	Inlet valve 2 unit B	0 = Closed 1 = Open	BI	763	R
Drain 1 A	Drain cool valve unit A	0 = Closed 1 = Open	BI	764	R
Drain 1 B	Drain cool valve unit B	0 = Closed 1 = Open	BI	765	R
Drain 2 A	Complete drain valve unit A	0 = Closed 1 = Open	BI	766	R
Drain 2 B	Complete drain valve unit B	0 = Closed 1 = Open	BI	767	R
Fan Activate A	External fan unit A	0 = Off 1 = On	BI	777	R
Fan Activate B	External fan unit B	0 = Off 1 = On	BI	778	R
Flush A	Hygiene flush unit A	0 = Closed 1 = Open	BI	781	R
Flush B	Hygiene flush unit B	0 = Closed 1 = Open	BI	782	R

3.4.4 RO-A - BACnet on-board (Integrated Controller software version 5.9.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Reverse osmosis	—	DEV	1001	—
Status RO	Operating status RO	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Standby 5 = Refreshing 6 = Flushing 7 = Producing 8 = Regeneration	MI	731	R
Capacity RO	Capacity RO	0 - 100%	AI	10779	R
Next Service RO	Next Maintenance RO	0 - 1'200'000 h	AI	10784	R
Operating Hours	Operating hours RO	0 - 1'200'000 h	AI	10785	R
Inlet pressure RO	Inlet pressure (fresh water) RO	0 - 12.0 bar 0 - 174.0 psi	AI	10824	R
Tank pressure RO	Pure water tank RO	0 - 12.0 bar 0 - 174.0 psi	AI	10825	R
Guard RO	Overcurrent pump RO	0 = Fault 1 = Ok	BI	724	R
Leakage RO	Leak sensor RO	0 = Fault 1 = Ok	BI	727	R
Inlet RO	Inlet valve RO	0 = Closed 1 = Open	BI	768	R
Drain RO	Drain valve RO	0 = Closed 1 = Open	BI	769	R
Service Status A	Maintenance and malfunctions status	1 = Service Info 2 = Warning 3 = RO Service 6 = Activation Code 7 = Fault	MI	549	R
Fault Code	Error code ²⁾	0 = No Error	AI	10823	R

RO = Reverse Osmosis

²⁾ See Error code description in the malfunction list in the RO-A installation and operation.

3.4.5 EL - BACnet on-board (Integrated Controller software version 5.10.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Humidifier	—	DEV	1001	—
Status A	Operating status unit A	1 = Humidifying 2 = Standby 3 = Idle Drain 4 = Keep Warm 5 = Filling 6 = Draining 7 = Disabled 8 = Safety Loop 11 = Blower Pack 12 = Stopped 13 = Partial Drain 14 = Self Test	MI	535	R
Status B	Operating status unit B	1 = Humidifying 2 = Standby 3 = Idle Drain 4 = Keep Warm 5 = Filling 6 = Draining 7 = Disabled 8 = Safety Loop 11 = Blower Pack 12 = Stopped 13 = Partial Drain 14 = Self Test	MI	536	R
Service Status A	Maintenance and mal- functions status unit A	1 = Service Info 2 = Warning 3 = Service 4 = Fault	MI	537	R
Service Status B	Maintenance and mal- functions status unit B	1 = Service Info 2 = Warning 3 = Service 4 = Fault	MI	538	R
Channel 1	Input signal channel 1 unit A	0 - 100%	AI	10001	R
Channel 2	Limiter signal channel 2 unit A	0 - 100%	AI	10002	R
System Demand	System demand	0 - 100%	AI	10057	R
Fault Code	Error code ²⁾	0 = No Error	AI	10661	R
Operating Hours A	Operating hours unit A	0 - 1'200'000 h	AI	10060	R
Operating Hours B	Operating hours unit B	0 - 1'200'000 h	AI	10079	R
Max Capacity	Max. capacity unit A+B ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	AI	10659	R
Capacity A/B	Max. capacity unit A/B ¹⁾	5 - 45 kg/h 10 - 100 lb/hr	AI	10100	R
Cylinder A	Actual capacity unit A ¹⁾	0 - 45 kg/h 0 - 100 lb/hr	AI	10103	R
Cylinder B	Actual capacity unit B ¹⁾	0 - 45 kg/h 0 - 100 lb/hr	AI	10104	R

¹⁾ According to the settings <Imperial> or <Metric> in the EL controller software.

²⁾ See Error code description in the malfunction list in the EL operation manual.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Manual Capacity A	Manual capacity unit A	20 - 100%	AV	10008	R/W
Setpoint Channel 1	Setpoint channel 1 unit A	0 - 95%	AV	10010	R/W
Band Channel 1	P-Band unit A (proportional band)	6 - 65%	AV	10011	R/W
ITime Channel 1	Integral time channel 1 unit A	1 - 60 min	AV	10012	R/W
Setpoint Channel 2	Setpoint channel 2 limiter unit A	10 - 95%	AV	10013	R/W
Band Channel 2	P-Band limiter unit A (Proportional band)	6 - 65%	AV	10014	R/W
Damp Channel 2	Damp time channel 2 unit A	1 - 60 s	AV	10015	R/W
Digital RH/Demand A1	Actual humidity or demand via BACnet unit A	0 - 100% Relinquish Default = 0	AO	10044	R/W
Digital RH/Demand A2	Actual humidity or limiter via BACnet unit A	0 - 100% Relinquish Default = 0	AO	10045	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Fan Activate A	External fan unit A	0 = Off 1 = On	BI	1	R
Fan Activate B	External fan unit B	0 = Off 1 = On	BI	2	R
Safety Loop A	External safety loop unit A	0 = Open 1 = Closed	BI	3	R
Safety Loop B	External safety loop unit B	0 = Open 1 = Closed	BI	5	R
Blower Pack A	Blower ready unit A	0 = Off 1 = On	BI	4	R
Blower Pack B	Blower ready unit B	0 = Off 1 = On	BI	6	R
Enable Input A	Enable contact unit A	0 = Open 1 = Closed	BI	80	R
Enable Input B	Enable contact unit B	0 = Open 1 = Closed	BI	81	R
Main Contactor A	Contactor unit A	0 = Off 1 = On	BI	519	R
Main Contactor B	Contactor unit B	0 = Off 1 = On	BI	520	R
Inlet A	Inlet valve unit A	0 = Closed 1 = Open	BI	521	R
Inlet B	Inlet valve unit B	0 = Closed 1 = Open	BI	522	R
Drain A	Drain pump unit A	0 = Off 1 = On	BI	523	R
Drain B	Drain pump unit B	0 = Off 1 = On	BI	524	R

3.4.6 GS II - BACnet on-board (Integrated Controller software version 5.10.1.14 or higher)

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Integrated Controller	Humidifier	—	DEV	1001	—
Status	Operating status	1 = Humidifying 2 = Idle 3 = Idle Drain 4 = Keep Warm 5 = Filling 6 = Draining 7 = Disabled 8 = Safety Loop 9 = Stopped 10 = Blower Pack 11 = Fill Check 12 = FTBD	MI	614	R
Service Status	Maintenance and mal- functions status	1 = Service Info 2 = Warning 3 = Service 4 = Fault	MI	549	R
Channel 1	Input signal channel 1	0-100%	AI	10001	R
Channel 2	Limiter signal channel 2	0-100%	AI	10002	R
System Demand	System demand	0-100%	AI	10057	R
Operating Hours	Operating hours	0-1'000'000 h	AI	10060	R
Next Service	Next service	0-3999 h	AI	10700	R
Max. Capacity	Max. capacity ¹⁾	23 ... 260 kg/h 50 ... 600 lb/hr	AI	10100	R
Output	Actual capacity ¹⁾	0 ... 260 kg/h 0 ... 600 lb/hr	AI	10103	R
Error Code	Error code ²⁾	0 = No Error	AI	10730	R
Exhaust Service	Time to exhaust service	0-7500 h	AI	10732	R

¹⁾ According to the settings <Imperial> or <Metric> in the GS II controller software.

²⁾ See Error code description in the malfunction list in the GS II operation manual.

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Manual Capacity	Manual capacity	0-100%	AV	10008	W/R
Setpoint Channel 1	Setpoint channel 1	0-95%	AV	10010	W/R
Band Channel 1	P-band (proportional band)	6-65%	AV	10011	W/R
ITime Channel 1	Integral time channel 1	1-60 min	AV	10012	W/R
Setpoint Channel 2	Setpoint channel 2 limiter	10-95%	AV	10013	W/R
Band Channel 2	P-band (proportional band) limiter	6-65%	AV	10014	W/R
Damp Channel 2	Damp time channel 2	0-60 s	AV	10015	W/R
Digital RH/Demand A1	Actual humidity or demand via BACnet	0-100%	AO	10044	W/R
Digital RH/Demand A2	Actual humidity or limiter via BACnet	0-100%	AO	10045	W/R

Object Name	Description	Range	Object-Type	Object-ID	Read (R) Write (W)
Safety Loop	Safety loop	0 = Open 1 = Closed	BI	3	R
Drain Pump	Drain pump	0 = Off 1 = On	BI	504	R
High Float Level	Water level high	0 = Off 1 = On	BI	542	R
Mid Float Level	Water level mid	0 = Off 1 = On	BI	544	R
Low Float Level	Water level low	0 = Off 1 = On	BI	546	R
Primary Inlet V1	Status of Primary inlet valve 1	0 = Closed 1 = Open	BI	599	R
Primary Inlet V2	Status of Primary inlet valve 2	0 = Closed 1 = Open	BI	601	R
Secondary Inlet V1	Status of Secondary inlet valve 1	0 = Closed 1 = Open	BI	603	R
Secondary Inlet V2	Status of Secondary inlet valve 2	0 = Closed 1 = Open	BI	605	R

3.5 Operating trouble list

Problem	Solutions
Cannot see/change set object/parameter from BMS	Check "Control Mode" setting in the "Control Settings" submenu. – Demand type controls use internal algorithms to generate a signal telling the Condair Integrated Controller to operate at a certain output percentage. These types of controls do not report the detected humidity or temperature level or set point to the Condair Integrated Controller. As a result the set point and humidity/temperature levels cannot be monitored through the Condair Integrated Controller when using demand controls. – Sensor ("transducer") type controls report a sensed humidity/temperature value to the Condair Integrated Controller. The set point is configured at the control unit and the Condair Integrated Controller uses internal algorithms to determine the output percentage. Since the Condair Integrated Controller knows both the set point and humidity/temperature level, these values may be monitored through the Condair Integrated Controller. Note: "Control Mode" must be set to "rH P" or "rH PI".
Condair Integrated Controller does not respond to humidity values or demand values written over BACnet.	– Check that Condair Integrated Controller is configured to be controlled via automation system (see chapter 3.3.1). Note: If "Source" in the controller settings is set to "Analog" the Condair Integrated Controller will look for a control signal connected to the driver board only.
The device will not respond to control signal connected to the driver board.	– Check that "Source" in the controller settings is configured for "Analog" control. Note: If the "Signal Source" is set to "Modbus", the Condair Integrated Controller will look for a control value sent by the BMS.
The BACnet node ID, BACnet IP port or BACnet MSTP MAC settings are not accepted. Original values remain active.	– Check if the input is within the valid value range. If this is not the case, the entered value is ignored.

Problem	Solutions
Intermittent Communications.	– Check whether the wire type and run length meet the requirements of the corresponding network. – Look for wire runs in close proximity to equipment generating significant electrical noise (such as VFD's, medical equipment, X-ray machinery, servers, etc.). – Check that wire shield is terminated at one end only. – Confirm correct polarity of conductors at each device. – Check BACnet/LonWorks addresses for conflicts with any device. Note: Each device on the network must have a unique address.
No communication can be established	– Check that latest software version of the device is installed. – With BACnet IP: Check the IP address, subnet mask and default gateway. These parameters must be in the same range as the client (client = BACnet device, for example a building controller or workstation requesting data from the humidifier) Check if other network participants or firewalls are blocking BACnet messages. – With BACnet MS/TP: Ensure that all devices in the MS/TP network use the same baud rate. Notice: Baud rate 76800 is not a standard baud rate and is not supported by many devices or notebooks. Check the times of the properties "APDU Segment Timeout" and "APDU Timeout" in the Device object. These should be the same for all subscribers in the same BACnet MS/TP network. – With BACnet MS/TP Master: Check the MAC address. This should be in the range 0-127. The value in the Device Object property "Max Master" must be equal to or higher than the MAC address. – With BACnet MS/TP Slave: MS/TP slave devices cannot be detected automatically via the "Who-is" BACnet service and therefore have to be manually added to the network.
Invalid data	– Check BACnet addresses for conflicts with any device. Note: Each device on the network must have a unique address.

Problem	Solutions
Error code "0" is shown though a fault is present on the Integrated Controller.	– Check software version of the Integrated Controller. Error code indication is not supported with software version 1.x.x.x.
Wrong values (e.g. temperature, pressure, mass flow) are shown via BMS.	– Check software version of the Integrated Controller. – Check the "Units" setting in the "General" menu.
More variables or additional information is required from the Condair Integrated Controller.	Contact Condair Technical Services for additional support.
The "Units" property is not defined for all BACnet objects, although the BACnet standard lists these units.	– BACnet objects that have units which differ depending on the setting "Metric" or "Imperial" are to and with software version 5.7.x.x not fixed implemented. These include units such as temperature (°C or °F), pressure (bar or psi), mass flow (kg/h or lb/hr).

4 Appendix

4.1 Object abbreviations

AI = Analog Input	Analog value, readable
AO = Analog Output	Analog control signal, readable and writable (with priority)
AV = Analog Value	Analog setting, readable and writable
BI = Binary Input	Binary state value, readable
BV = Binary Value	Binary value, readable and writable
MI = Multistate Input	Multistate status value, readable

4.2 Declaration of Conformity for the implementation of BACnet protocols (PICS)

INTEGRATED CONTROLLER BACnet Protocol Implementation Conformance Statement

Basic Information

Document Revision:	2.00
Issue Date:	March 2018
Vendor Name:	Condair Group AG (Vendor ID: 976)
Product Name:	Integrated Controller (IC)
Firmware Revision:	14.1.35.1 (BACnet Driver)
Application Software Version:	5.7.x.x, 5.8.x.x, 5.9.x.x and 5.10.x.x
BACnet Protocol Revision:	Version 1, Revision 14
Product Description:	The products are humidifiers, adiabatic coolers or water treatment units

BACnet Standardized Device Profile

- B-SS BACnet Smart Sensor
- B-SA BACnet Smart Actuator

BACnet Interoperability Building Blocks Supported (BIBBs)

- DS-RP-B Data Sharing, Read Property-B
- DS-WP-B Data Sharing, Write Property-B
- DS-RPM-B Data Sharing, Read Property Multiple-B
- DM-DOB-B Device Management, Dynamic Object Binding-B*
- DM-DDB-B Device Management, Dynamic Device Binding-B*

*not supported by MS/TP slave

Standard Object Types

- Analog Input
- Analog Output
- Analog Value
- Multi State Input
- Multi State Value
- Binary Input
- Binary Value
- Device

Optional Supported Properties

Description
Description, Max Pres Value, Min Pres Value
Description
Description, State Text
Description, State Text
Description, Active Text, Inactive Text
Description, Active Text, Inactive Text
Description, Location (both read- and writeable)
Max Segm Accepted
APDU Segm. Timeout, APDU Timeout (both read and writeable)
Max Info Frames (only BACnet MS/TP)
Max Master (read- and writeable BACnet MS/TP Master)

The following conditions apply to all object types Objects

- Objects may be neither dynamically created nor deleted
- Does not support any optional properties unless they are listed
- No proprietary properties are implemented
- No additional properties may be written, except they are listed above or required by the BACnet specification

Data Link Layer Options

- BACnet IP
- BACnet MS/TP Master Baud rates: 9'600, 19'200, 38'400, 57'600, 76'800
- BACnet MS/TP Slave Baud rates: 9'600, 19'200, 38'400, 57'600, 76'800

2009 / EN

Segmentation Capability

Segmented requests and responses are supported. Window size: 8

Device Address Binding

Static address binding is not supported

Network Options

No networking options are supported.

Character Sets Supported

ANSI UTF-8

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Attention: Date:
Company: Fax #:
From: Page: of
Subject:

☐ FOR YOUR INFORMATION ☐ RESPONSE REQUESTED

MESSAGE:

Distributor / Agent P.O. Number: Sales Order Number:

Desired interface option:

- ☐ BACnet IP
☐ BACnet MS/TP Master
☐ BACnet MS/TP Slave

Settings for BACnet IP only:

- IP Address:
- Subnet Mask:
- Default Gateway Address:
- BACnet Node ID (Device Instance):
- BACnet IP Port:

Settings for BACnet MS/TP only:

- MAC Address BACnet MS/TP:
- Baud rate:
- BACnet Node ID (Device Instance):

Notes

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