

BACnet, LonWorks

Supplemental Installation and Operation Manual

For use with RS, DL, and
ME humidifiers with
Software version 5.x.x.x

Thank you for choosing Nortec

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

Manufacturer

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1 Introduction

1.1 Notes on this addendum manual

The Nortec integrated controller (touch screen) can readily connect to BACnet Master Slave Token Passing (BACnet MS/TP - Slave only) and Internet Protocol (BACnet IP) building management systems (BMS) out of the box, with no required options.

To connect the Nortec Integrated Controller to LonWorks, BACnet IP or BACnet MS/TP (includes all Master functionality) the optional LonWorks or BACnet gateway boards (ProtoCessor gateway) must be used. This manual describes how to install and configure the optional LonWorks or BACnet gateway boards to connect the Nortec 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 installing and configuring the BACnet or LonWorks based network.

If you have questions after reading this documentation, please contact your Nortec 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 Nortec representative for replacement.

Language versions

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

2 For your safety

General

Every person working with the Nortec Integrated Controller must have read and understood this addendum manual, and the installation manual and operation manual of the Nortec 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 Nortec Integrated Controller are familiar and comply with the appropriate local regulations on work safety and the prevention of accidents.

Intended use

The optional LonWorks or BACnet gateway boards are intended exclusively for connecting the Nortec Integrated Controller to a LonWorks or 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 Nortec 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 Nortec Integrated Controller are observed.**

Danger that may arise from the Nortec Integrated Controller



DANGER!

Risk of electric shock!

The electrical compartment where the Integrated Controller is located may have live mains voltage connected for other uses of the humidifier. 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 on the control unit disconnect the mains supply voltage to the humidifier 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 Nortec 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 optional LonWorks or BACnet gateway boards and on the Nortec 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 Nortec representative.

3 Notes for the planning engineer

3.1 Overview

The optional LonWorks or BACnet gateway boards allow the integration of the Nortec Integrated Controller into a **BACnet IP**, **BACnet MS/TP** or a **LonWorks** network. The optional LonWorks or BACnet gateway boards feature a serial-interface Gateway which converts the information from the host RTU Modbus protocol to a specified secondary protocol.

Important: Please note that the gateway board is configured for the latest software version of the Integrated Controller. To guarantee correct data communication it is therefore mandatory to update the software of the Integrated Controller to the latest version before installing the gateway board. Please contact your Condair distributor regarding a software update of the Integrated Controller.

The following protocol options are available and must be specified when ordering (ordering form see Nortec HELP):

Part Number	Protocols	Part Description
2583810	BACnet IP	BMS Set Master BACnet IP ME
2583813	BACnet MS/TP	BMS Set Master BACnet MS/TP ME
2583808	LonWorks	BMS Set Master LonWorks ME
2583809	BACnet IP	BMS Set Master BACnet IP RS
2583812	BACnet MS/TP	BMS Set Master BACnet MS/TP RS
2583807	LonWorks	BMS Set Master LonWorks RS
2582291	BACnet IP	BMS Set Master BACnet IP DL
2583811	BACnet MS/TP	BMS Set Master BACnet MS/TP DL
2582290	LonWorks	BMS Set Master LonWorks DL

The following read out and settings functions are available.

(Please take a look in the BACnet object or Lonworks SNVT list for all functions, see [chapter 6](#))

Functions
Read out of unit status (operating mode, etc.)
Read out of Maintenance and malfunctions status
Read out of analog (%) and sensor (%rh) demand
Read out actual system request
Read out system hours
Demand signal (%) / sensor signal (%rh)
Setting the humidity setpoint (%rh / internal controller)
Setting the proportional range
Setting the integral time
Setting the capacity limitation

3.2 Principle Network diagrams

3.2.1 Principle BACnet network

The principle diagram below shows the connection of the Nortec Integrated Controller to an Ethernet network.

Principle BACnet IP network

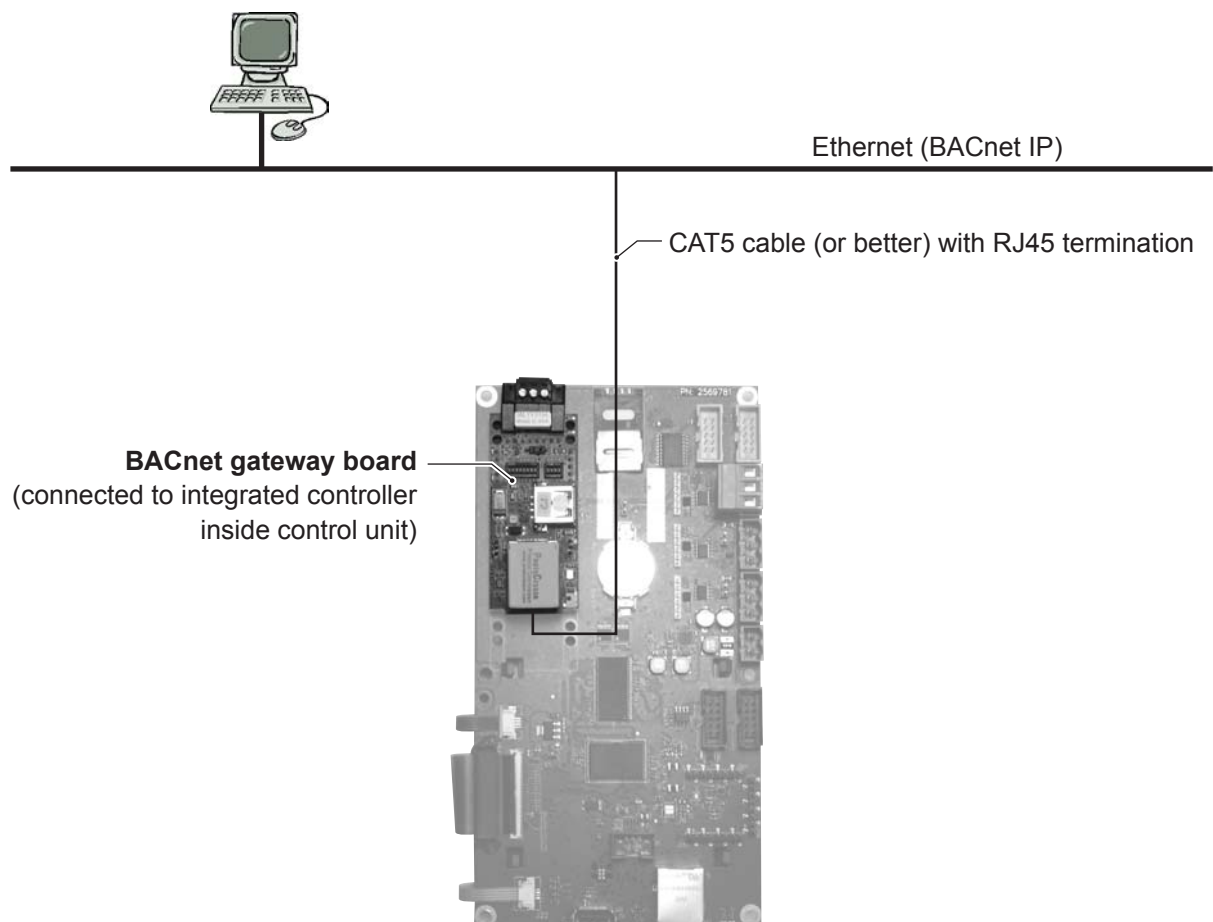


Abb. 1: Principle BACnet IP network

Principle BACnet MS/TP network

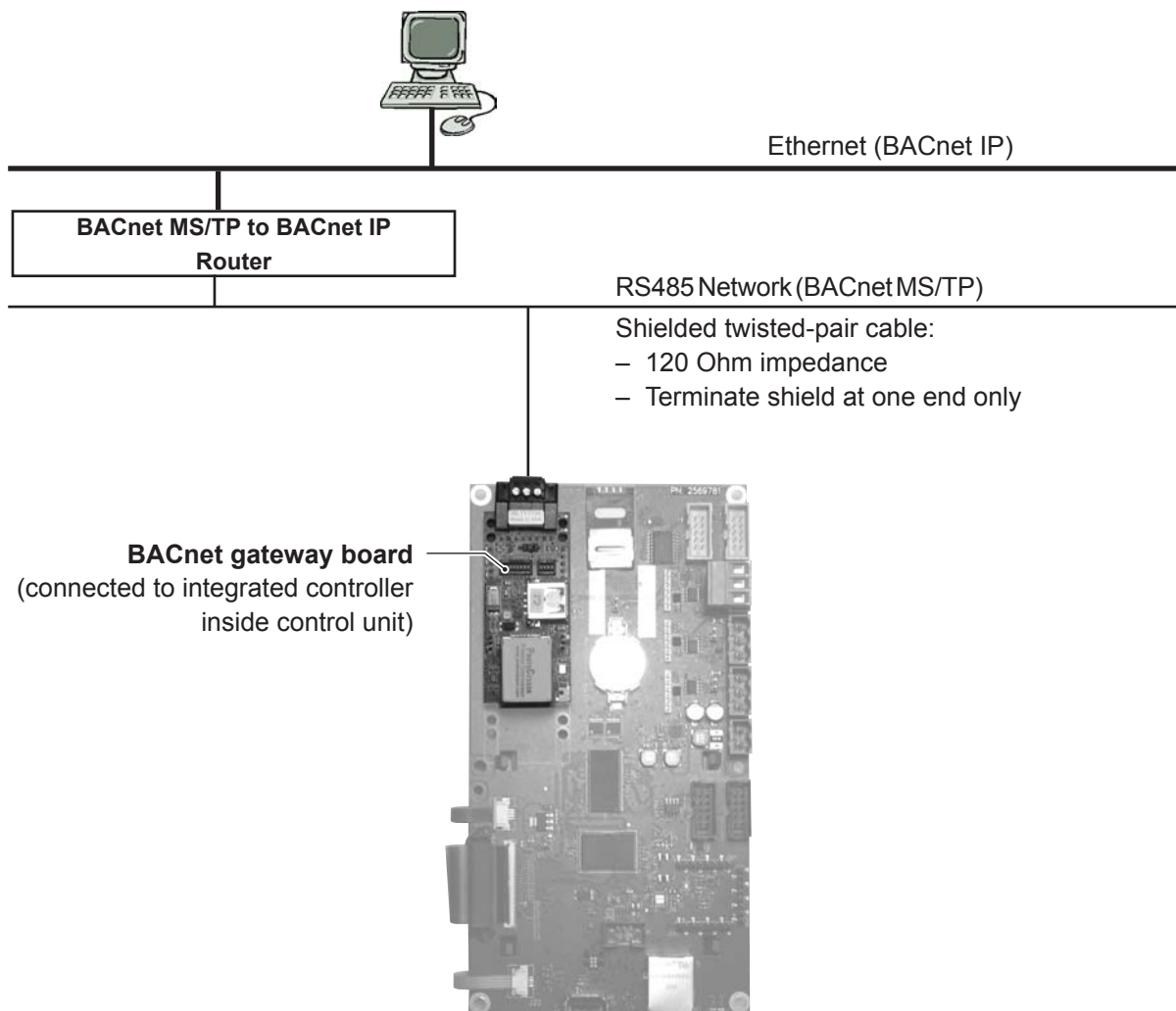


Abb. 2: Principle BACnet MS/TP network

3.2.2 Principle LonWorks network

This principle diagram below shows the connection of the Nortec Integrated Controller to a LonWorks network via a shielded twisted-pair cable.

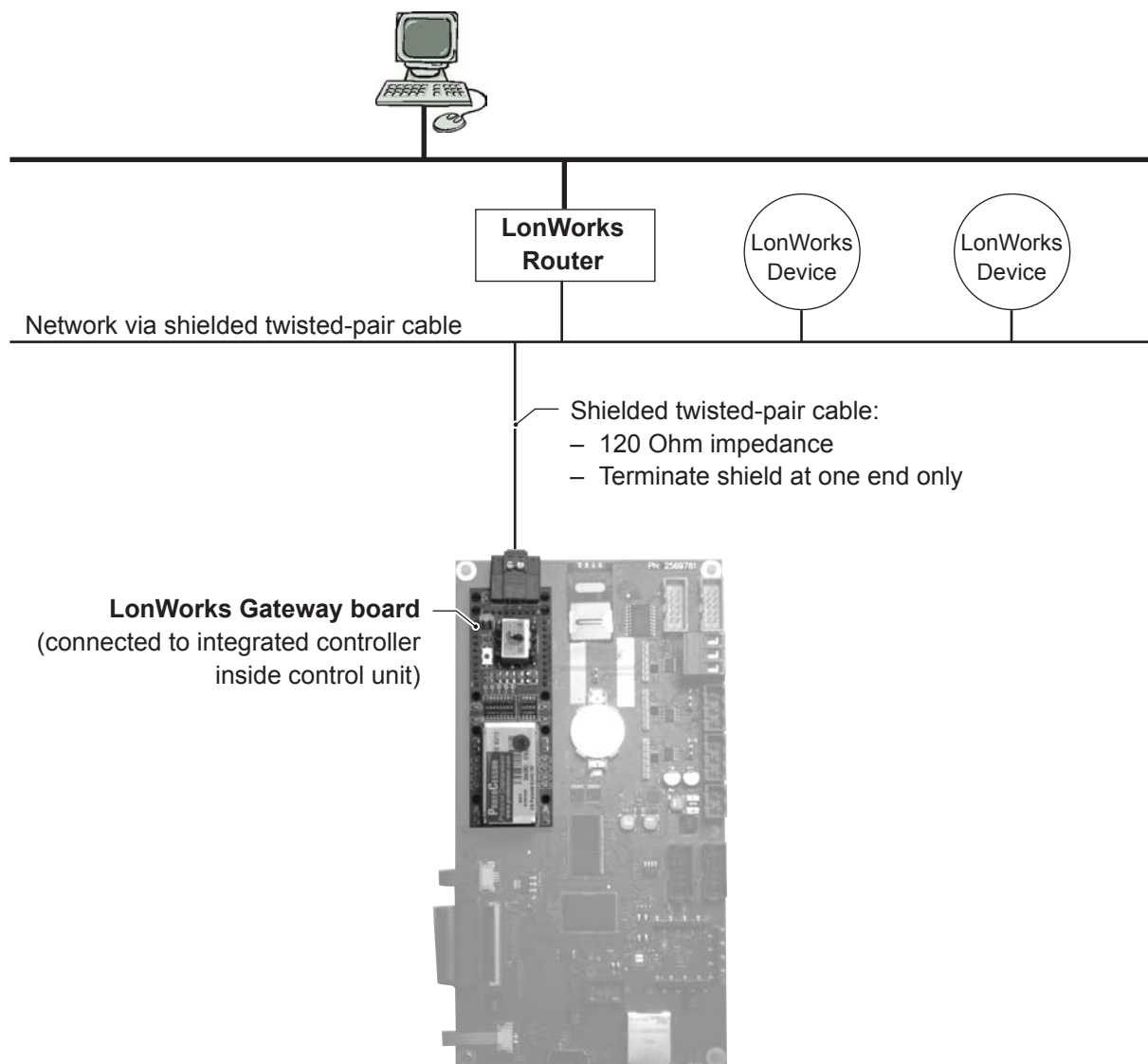


Abb. 3: Principle LonWorks network

4 Installation work

4.1 Installing the BACnet/LonWorks gateway board on the Integrated Controller

1. Isolate power supply to the controller unit.
2. Remove the front cover of the control unit.



CAUTION!

Electronic components are very sensitive to electrostatic discharge. Before proceeding with the next step, appropriate measures (ESD-protection) must be taken to prevent damage to electronic components. A wrist strap should be worn to connect the maintenance specialist with a common ground point. For more information, refer to ANSI/ESD-S20.20.

3. Open the control unit inner door.
4. Fix BACnet or LonWorks gateway board to the TTL interface on the Nortec Integrated Controller.
Important: Ensure pin alignment when fixing.
5. Remove Jumper "J7".

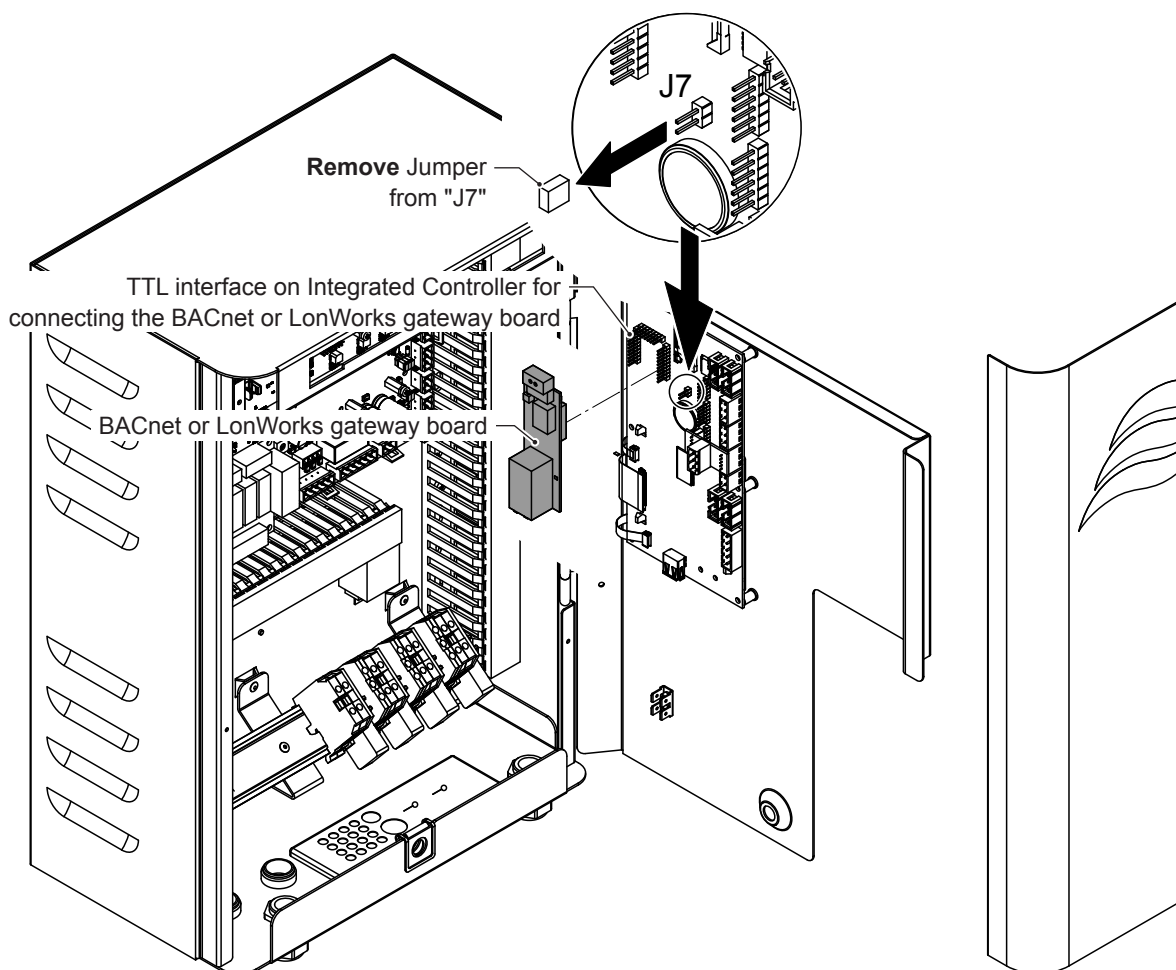


Abb. 4: Installing the BACnet/LonWorks gateway board on the integrated controller (ME control module shown).

4.2 Wiring

1. Lead the network cable through the rectangular cable lead-through into the control unit. Inside the control unit run the cable to the BACnet or LonWorks gateway board, respectively.
2. Connect network cable according to the following wiring diagrams.

BACnet

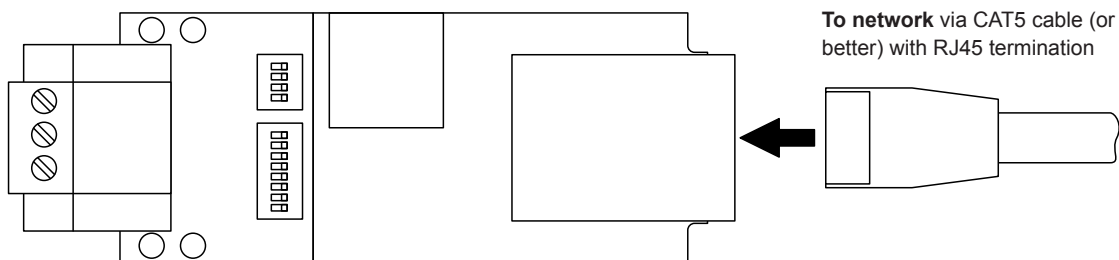


Abb. 5: BACnet IP network connection

To network via shielded twisted-pair cable:

- 120 Ohm impedance
- Terminate shield at one end only

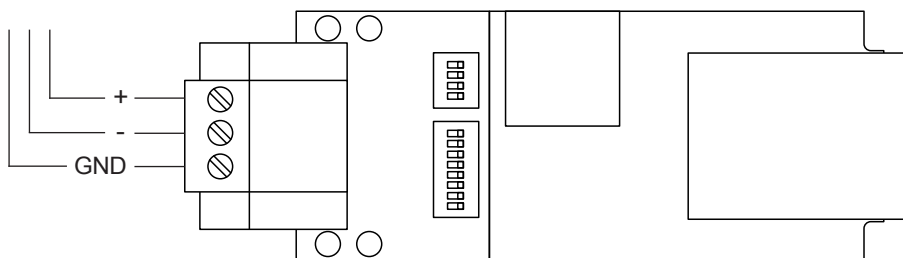


Abb. 6: BACnet MS/TP network connection

LonWorks

To network via shielded twisted-pair cable:

- 120 Ohm impedance
- Terminate shield at one end only

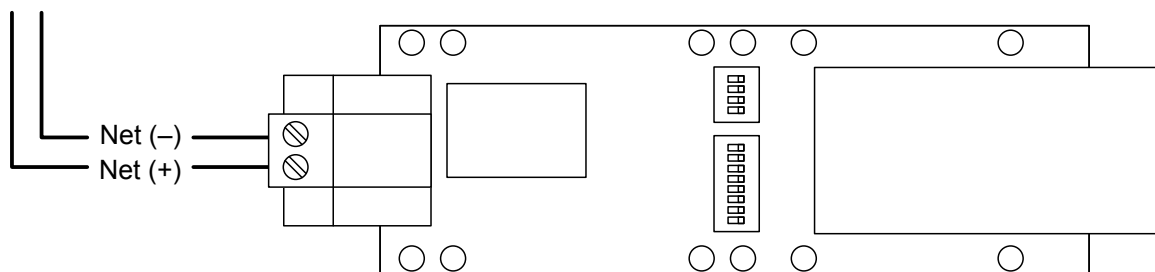


Abb. 7: LonWorks network connection

5 Configuration

After wiring connections have been completed, the Nortec Integrated Controller needs to be setup to operate and communicate through its optional BACnet or LonWorks gateway board. This setup includes the settings in the "**Control Settings**" and the "**Communication**" submenu of the Nortec Integrated Controller unit and the **Gateway configuration**.

5.1 Configuring the Nortec Integrated controller (software version 5.x.x.x)

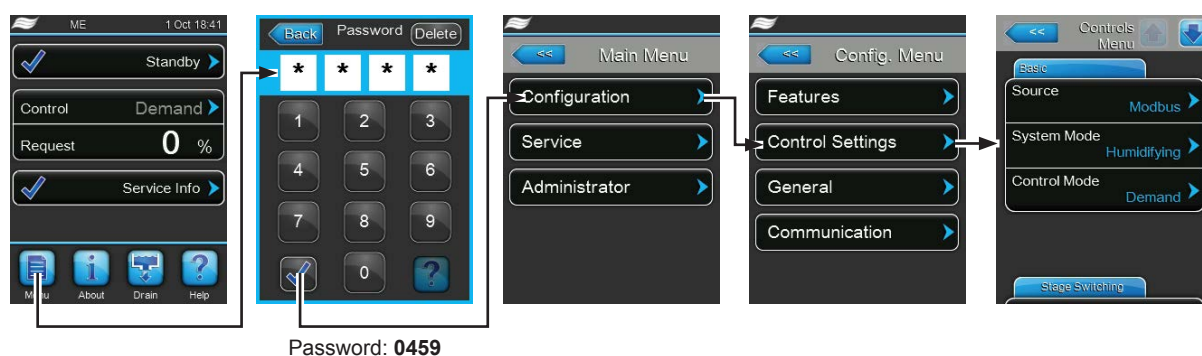
5.1.1 Setup control settings

By default the Nortec Integrated Controller is configured to operate on a hardwired analog control signal from a 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 Nortec 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 Nortec Integrated Controller Operation Manual for details).

If you want to control the Nortec Integrated Controller entirely via the BMS through the optional BACnet or LonWorks interface 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):

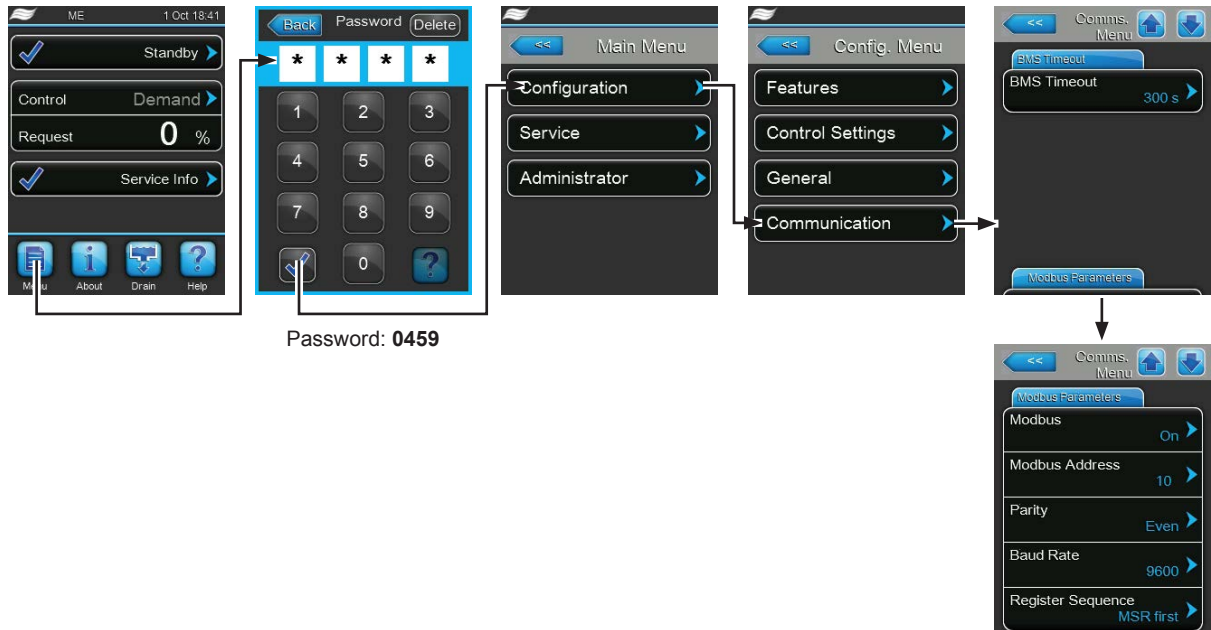
Signal Source:	Modbus
System Mode:	Humidifying or Cooling (only by ME)
Control Mode:	Demand (if you use a demand control signal)
	RH P (if you use a sensor value and proportional)
	RH PI (use a sensor value and proportional-integral control band)

Note: see Humidifier Operation Manual for details on control settings

5.1.2 BMS Timeout and Modbus settings

To allow the Nortec Integrated Controller to be controlled via the BMS through the optional BACnet or LonWorks gateway board the Nortec Integrated Controller must be configured as follows:

1. Switch on control unit (if not already switched on).
2. Select "Communication" submenu as shown below.



3. Select "**BMS Timeout**" tab and set **BMS Timeout settings** as follows:
BMS Timeout: **300 s**
4. Select "**Modbus Parameter**" tab and set **Modbus settings** as follows (see rightmost screen):
Modbus: **On**
Modbus Address: **10**
Parity: **Even**
Baud Rate: **9600**
Register Sequence: **MSR first**

5.2 Gateway configuration

The **protocol configuration is made at the factory**, prior to final testing. The baud rates are adjusted to the following values:

Protocol	Baud rate
BACnet IP	10 / 100 BaseT
BACnet MS/TP	9600 Baud *
LonWorks	78125 bps

* Baud rates ex factory adjustable: 19200, 38400 or 76800

5.2.1 Requirements for gateway configuration

Hardware Requirements

A PC with web browser that connects over Ethernet on port 80 and a Ethernet cable to establish the connection between Computer/Laptop and BACnet or LonWorks gateway board.

PC Software Requirements

One of the following web browsers must be used:

- Mozilla Firefox 13.0 and up
- Microsoft Internet Explorer 8 & 9
- Google Chrome 19.0 and up
- Opera 11 and up

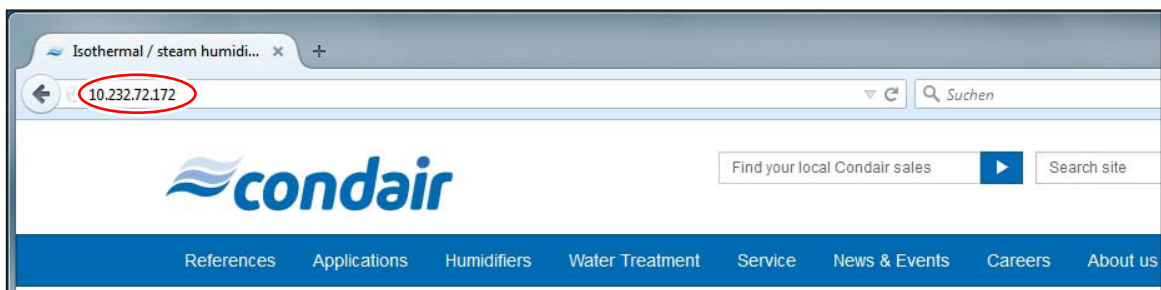
Please note that the computer and network firewalls must be opened for Port 80 to allow FS-GUI to function.

5.2.2 Setting the IP address and subnet mask

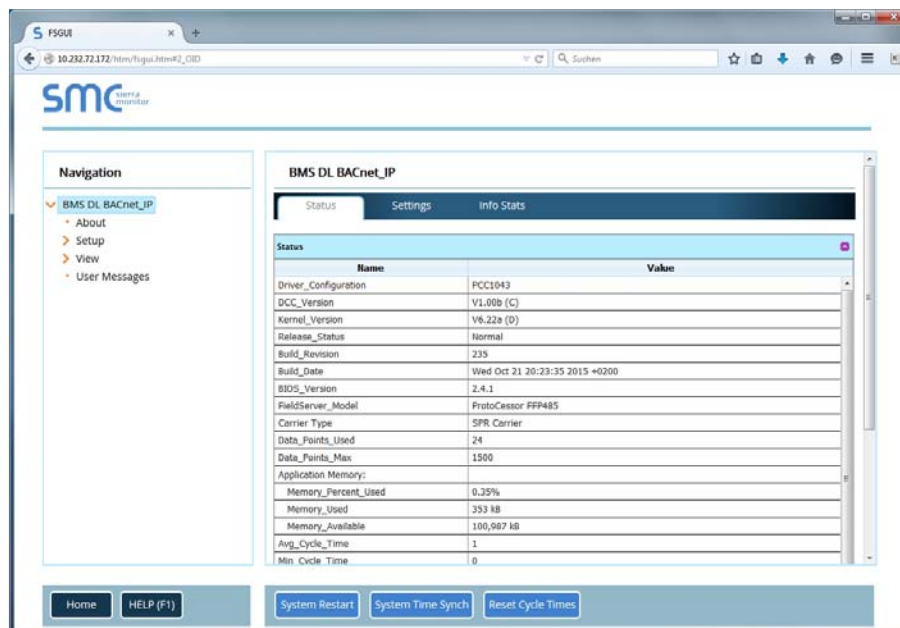
For BACnet and LonWorks application, an IP address and the subnet mask must be assigned to the gateway of the BACnet/LonWorks gateway board in order to access it. The IP address and subnet mask may be assigned at the factory or can be modified at any time via the integrated FS-GUI (Graphic User Interface) of the gateway board.

To configure the IP address and the subnet mask via the integrated FS-GUI of the gateway proceed as follows:

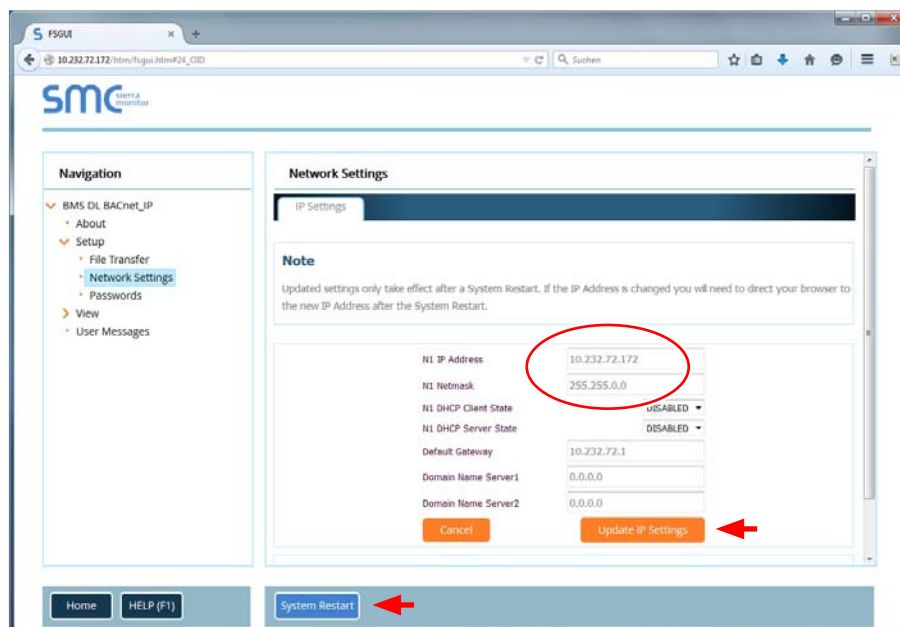
1. Connect the gateway board **to a PC using an Ethernet cross-over cable** or **directly to the network using a straight cable**.
2. The default IP address of the gateway board is set to 10.232.72.172, Subnet Mask is 255.255.0.0. Make sure your PC is in the same IP network as the gateway board; otherwise assign a static IP address to your PC on the 10.232.72.0 network.
3. Switch on Nortec Integrated Controller unit in order to power up the Gateway board.
4. Open your internet browser and enter the IP address of the gateway (by default ex factory 10.232.72.172), then confirm the entry with the Enter key.



5. The FS-GUI (from Sierra Monitor or FieldServer Technologies) will be started.



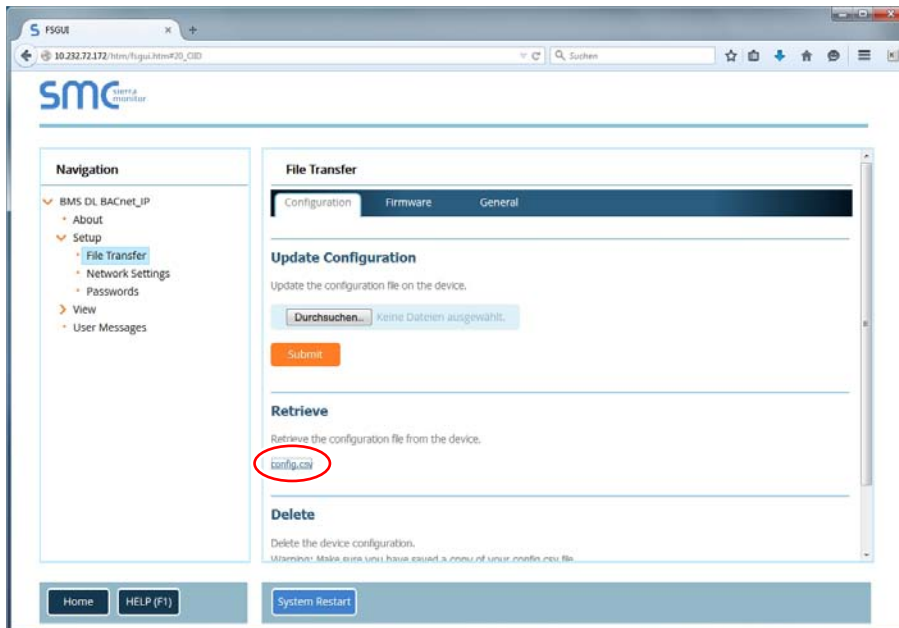
6. Select the menu point "**Setup > Network Settings**" in the "**Navigation Tree**". Enter the appropriate **IP-Address** and **subnet mask**. To activate the new settings, click first on the button **<Update IP settings>** and then on the button **<System Restart>**. After restart the gateway is configured to the new IP address and subnet mask.



7. In order to access the gateway board, the IP address of your laptop must be set to the same network as the gateway board.

5.2.3 Modifying the BACnet Node ID and BACnet MAC Address

1. Enter the (new) IP address of the gateway in your internet browser and confirm the entry with the Enter key. The FS-GUI will be started.
2. Select the menu point "**Setup > File Transfer**" in the "**Navigation Tree**". Then, click in the "**Retrieve**" section on the link "**config.csv**" and save the configuration file to the desired location on your laptop.



Modbus settings:

3. Modbus connections in the "config.csv" file are set ex factory. Node_ID in "**Client Side Nodes**" has to be the same as in the Nortec Integrated Controller settings (see [chapter 5.1.2](#)). Default Node_ID = 10.

```
=====
Client Side Nodes
Nodes
Node_Name ,Node_ID ,Protocol ,Port ,Recovery_Interval ,Node_Offline_Action
ME_01 ,10 ,Modbus_RTU ,S1 ,20s ,Clear_Data_Array
```

BACnet IP settings:

4. Open the configuration file "config.csv" with Excel or a text editor, change in the section "**Server Side Nodes**" of the window the Node ID to the appropriate value and save the configuration file.

Range: 0...4194303

```
=====
Server Side Nodes
Nodes
Node_Name ,Node_ID ,Protocol ,Node_Offline_Response
Virtual_BCU_ME ,410 ,Bacnet_IP ,Force_Normal_Response
```

BACnet MS/TP settings:

- Open the configuration file "config.csv" with Excel or a text editor, change in the section "**Bridge**" of the window the System_Station_Address (= MAC address) to the appropriate value and save the configuration file. Default MAC address 127, Range: 1...127.

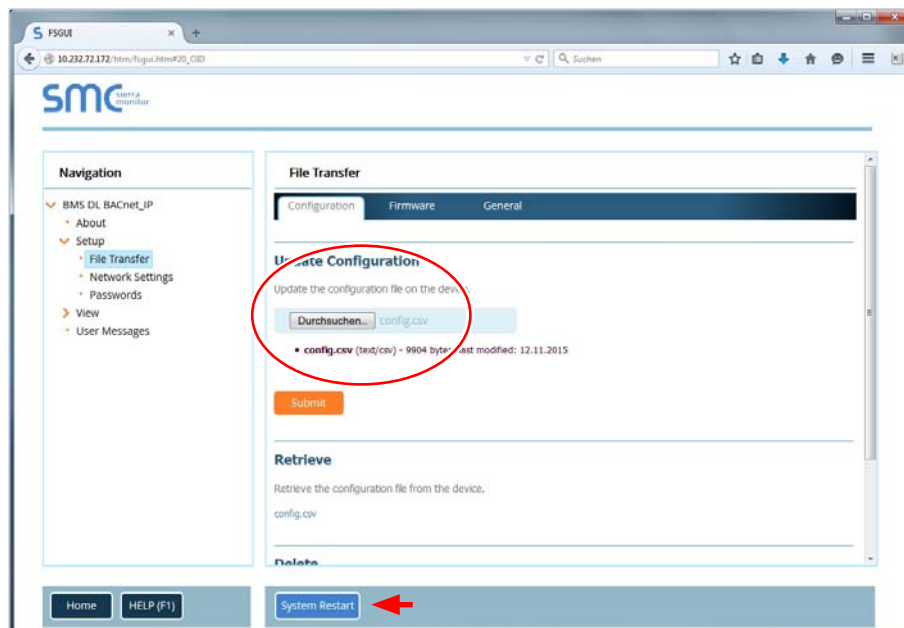
```
//=====
Bridge
Title,System_Station_Address
BMS DL BACnet_MSTP,127
//=====
```

- Open the configuration file "config.csv" with Excel or a text editor, change in the section "**Server Side Nodes**" of the window the Node_ID to the appropriate value and save the configuration file. Default Node_ID 1001, Range: 1...16777215

```
//=====
// server side Nodes
Nodes
Node_Name,Node_ID,Protocol,
Virtual_BCU_DL,1001,Bacnet_MSTP
//=====
```

Download config.csv file:

- Select the menu point "**Setup > File Transfer**" in the "**Navigation Tree**". Click in the "**Update**" section on the button **<Browse...>** and select the configuration file you have modified. Then, click on the button **<Submit>** in order to upload the configuration file into the gateway board.



As soon as the upload is finished a corresponding message appears in the upper part of the window. Click on the button **<System Restart>** to restart the system with the new settings. After restart the Node ID or MAC address is changed to the new value.

6 Communication tables

6.1 Conversion tables gateway variables

The following table shows the gateway variables and their BACnet / LonWorks equivalents.

6.1.1 DL - BACnet (Integrated Controller software version 5.x.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
MI_HumStatus	Operating status	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Flushing 5 = Standby 6 = Flushed 7 = Humidifying 8 = Ready 9 = Refreshing 10 = Air cleaning 11 = Filling 12 = Flushing Conductivity 13 = Switched Off 14 = Remote Off 15 = Regenerating	MI	01	R
MI_ServStatus	Maintenance and malfunctions status	1 = Service info 2 = Warning 3 = Activation 4 = Out of commissioning 5 = Dosing 6 = System Service 7 = Fault	MI	02	R
MI_HumType	Device Type	1 = Hum 2 = Hum + FC 3 = Hum + RO-C 4 = RO	MI	03	R
AI_ErrorCode	Error code ²⁾	0 = no Error	AI	01	R
AI_OperatHours	Hours of Operating	0 - 1'200'000 h	AI	02	R
AI_HoursToServ	Next Service	0 - 10000 h	AI	03	R
AI_RHorDemand	Actual humidity or demand	0 - 100 %	AI	04	R
AI_MaxHumOut	Max. capacity ¹⁾	2 - 1000 kg/h 4 - 2573 lb/hr	AI	05	R
AI_ActCapHum	Actual capacity ¹⁾	2 - 1000 kg/h 4 - 2573 lb/hr	AI	06	R
AI_RemCapSilv	Remaining Ag-Ion Capacity	0 - 58.4 Ah	AI	07	R
AI-TaAgCurrent	Target Ag-Ion Current	0 - 29.2 mA	AI	08	R
AI_PressInlet	Inlet pressure PS4 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	AI	09	R

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
AI_PressNozzle	Nozzle pressure PS5 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	AI	10	R
AI_ActPermTemp	Water Temperature ¹⁾	°C or °F	AI	11	R
AI_ActPermCond	Conductivity	µS/cm	AI	12	R
AI_PumpCurrent	Pump Current	0 - 5.0 A	AI	13	R
AI_AgCurrent	Ag-Ion Current	mA	AI	14	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)
AV_SetPointHum	Humidity setpoint	0 - 95 %	AV	01	R/W
AV_PropBand	Proportional band	6 - 65 %	AV	02	R/W
AV_IntTime	Integral time	1 - 60 min	AV	03	R/W
AV_CapLimit	Manual Capacity	20 - 100 %	AV	04	R/W
AO_RemRHorDem	Actual humidity or de- mand via BACnet	0 - 100 % Relinquish Default = 0	AO	01	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
BI_ExtSchSta	Safety loop	0 = open 1 = closed (ok)	BI	01	R
BI_ValveY1	Y1 inlet valve	0 = closed 1 = open	BI	02	R
BI_ValveY2	Y2 valve		BI	03	R
BI_ValveY3	Y3 valve air cleaning	0 = closed 1 = open	BI	04	R
BI_ValveY4	Y4 valve external pipe flush	0 = closed 1 = open	BI	05	R
BI_StageValveY5	Y5 valve spray circuit	0 = closed 1 = open	BI	06	R
BI_StageValveY6	Y6 valve spray circuit	0 = closed 1 = open	BI	07	R
BI_StageValveY7	Y7 valve spray circuit	0 = closed 1 = open	BI	08	R
BI_StageValveY8	Y8 valve spray circuit	0 = closed 1 = open	BI	09	R
BI_StageValveY9	Y9 valve spray circuit	0 = closed 1 = open	BI	10	R
BI_DrainValY10	Y10 valve drain (NO)	0 = open 1 = closed	BI	11	R
BI_ValveY11	Y11 valve		BI	12	R
BI_Pump	FC enable	0 = disable 1 = enable	BI	13	R

6.1.2 DL - LonWorks (Integrated Controller software version 5.x.x.x)

Variable Name	Description	Range	SNVT	#SNVT	Index
nviRequest	Requesting the status		SNVT_obj_request	92	0
nvoStatus	Current status		SNVT_obj_status	93	1
nvoHumStatus	Operating status	0 = Initializing 1 = Diagnostic 2 = Stopped 3 = Flushing 4 = Standby 5 = Flushed 6 = Humidifying 7 = Ready 8 = Refreshing 9 = Air cleaning 10 = Filling 11 = Flushing Conductivity 12 = Switched Off 13 = Remote Off 14 = Regenerating	SNVT_count	8	2
nvoServStatus	Maintenance and malfunctions status	0 = Service info 1 = Warning 2 = Activation 3 = Out of Commissioning 4 = Dosing 5 = System Service 6 = Fault	SNVT_count	8	3
nvoHumType	Device Type	0 = Hum 1 = Hum + FC 2 = Hum + RO-C 3 = RO	SNVT_count	8	4
nvoErrorCode	Error code ²⁾	0 = no Error	SNVT_count	8	5
nvoOperatHours	Hours of Operating	0 - 65535 h	SNVT_time_hour	124	6
nvoHoursToServ	Next Service	0 - 10000 h	SNVT_time_hour	124	7
nvoRHorDemand	Actual humidity or demand	0 - 100 %	SNVT_lev_percent	81	8
nvoMaxHumOut	Max. capacity ¹⁾	2 - 1000 kg/h 4 - 2573 lb/hr	SNVT_count_f	51	9
nvoActCapHum	Actual capacity ¹⁾	2 - 1000 kg/h 4 - 2573 lb/hr	SNVT_count_f	51	10
nvoRemCapSilv	Remaining Ag-Ion Capacity	0 - 58.4 Ah	SNVT_count_f	51	11
nvoTaAgCurrent	Target Ag-Ion Current	0 - 29.2 mA	SNVT_amp_mil	2	12
nvoPressInlet	Inlet pressure PS4 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	SNVT_count_f	51	13
nvoPressNozzle	Nozzle pressure PS5 ¹⁾	0 - 12.0 bar 0 - 174.0 psi	SNVT_count_f	51	14
nvoActPermTemp	Water Temperature ¹⁾	°C or °F	SNVT_count_f	51	15
nvoActPermCond	Conductivity	µS/cm	SNVT_count_f	51	16
nvoPumpCurrent	Pump Current	0 - 5.0 A	SNVT_amp	1	17
nvoAgCurrent	Ag-Ion Current	mA	SNVT_amp_mil	2	18

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoSetPointHum nviSetPointHum	Humidity setpoint	0 - 95 %	SNVT_lev_percent	81	19 20
nvoPropBand nviPropBand	Proportional band	6 - 65 %	SNVT_lev_percent	81	21 22
nvoIntTime nviIntTime	Integral time	1 - 60 min	SNVT_time_min	123	23 24
nvoCapLimit nviCapLimit	Manual capacity	20 - 100 %	SNVT_lev_percent	81	25 26
nvoRemRHorDem nviRemRHorDem	Actual humidity or demand via LonWorks	0 - 100 %	SNVT_lev_percent	81	27 28

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.

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoExtSChSta	Safety loop	0 = open 1 = closed (ok)	SNVT_switch	95	29
nvoValveY1	Y1 inlet valve	0 = closed 1 = open	SNVT_switch	95	30
nvoValveY2	Y2 valve	0 1	SNVT_switch	95	31
nvoValveY3	Y3 valve air cleaning	0 = closed 1 = open	SNVT_switch	95	32
nvoValveY4	Y4 valve external pipe flush	0 = closed 1 = open	SNVT_switch	95	33
nvoStageY5	Y5 valve spray circuit	0 = closed 1 = open	SNVT_switch	95	34
nvoStageY6	Y6 valve spray circuit	0 = closed 1 = open	SNVT_switch	95	35
nvoStageY7	Y7 valve spray circuit	0 = closed 1 = open	SNVT_switch	95	36
nvoStageY8	Y8 valve spray circuit	0 = closed 1 = open	SNVT_switch	95	37
nvoStageY9	Y9 valve spray circuit	0 = closed 1 = open	SNVT_switch	95	38
nvoDrainValY10	Y10 valve drain (NO)	0 = open 1 = closed	SNVT_switch	95	39
nvoValveY11	Y11 valve	0 1	SNVT_switch	95	40
nvoPump	FC enable	0 = disable 1 = enable	SNVT_switch	95	41

6.1.3 ME - BACnet (Integrated Controller software version 5.x.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
MI_HumStatus	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	01	R
MI_ServStatus	Maintenance and malfunctions status	1 = Service info 2 = Warning 3 = ME Service 4 = Refill Liquid 5 = Replace Pure-Flow Ag+ 6 = Replace UV Bulb 7 = Matrix Wash Over 8 = Out of Commissioning 9 = Activation Code 10 = Fault	MI	02	R
AI_ErrorCode	Error code ²⁾	0 = no Error	AI	01	R
AI_OperatHours	Hours of operating	0 - 1'200'000 h	AI	02	R
AI_NextSySvc	Next service	0 - 10000 h	AI	03	R
AI_NextUVSvc	Next UV service	0 - 8760 h	AI	04	R
AI_NextAgSvc	Next Ag+ service	0 - 5000 h	AI	05	R
AI_RHorDemand	Actual humidity or demand	0 - 100 %	AI	06	R
AI_Temp	Actual air temperature ¹⁾	°C or °F	AI	07	R
AI_UVCurrA	UV Current	0 - 4.0 A	AI	08	R
AI_Stage1Cap	Water capacity stage 1 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	09	R
AI_Stage2Cap	Water capacity stage 2 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	10	R
AI_Stage3Cap	Water capacity stage 3 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	11	R
AI_Stage4Cap	Water capacity stage 4 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	12	R
AI_Stage5Cap	Water capacity stage 5 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	13	R
AI_Stage6Cap	Water capacity stage 6 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	14	R
AI_Stage7Cap	Water capacity stage 7 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	AI	15	R

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
AI_ConductLp	Conductivity	µS	AI	16	R
AI_WtrTmp	Actual water temperature ¹⁾	°C or °F	AI	17	R
AI_AirTmp	Actual air temperature ¹⁾	°C or °F	AI	18	R
AI_NumStgAct	Number of running stages	0 - 7 stages	AI	19	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)
AV_SetPointHum	Humidity setpoint	0 - 95 %	AV	01	R/W
AV_PropBandH	Proportional band humidity control	6 - 65 %	AV	02	R/W
AV_IntTimeH	Integral time humidity control	1 - 60 min	AV	03	R/W
AV_SetPointTmp	Temperature setpoint ¹⁾	5 - 40 °C 41 - 104 °F	AV	04	R/W
AV_PropBandT	Proportional band temperature control ¹⁾	1 - 50 °C 34 - 122 °F	AV	05	R/W
AV_IntTimeT	Integral time temperatur control	1 - 60 min	AV	06	R/W
AV_WashAct	Remote WashOver activation	Read: 0 = Off 1 = Initialization 2 = Wash over in progress 3 = Wash over finished Write: 0 = Stop wash over 1 = Start wash over	AV	07	R/W
AO_RemRHorDem	Actual humidity or demand via BACnet	0 - 100% Relinquish Default = 0	AO	01	R/W
AO_RemTemp	Actual temperature via BACnet ¹⁾	-25 - 100 °C -13 - 212 °F Relinquish Default = 0	AO	02	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)
BI_ExtSchLSta	Safety loop	0 = open 1 = closed (ok)	BI	01	R
BI_DosLvl	Dosing pump level	0 = empty 1 = ok	BI	02	R
BI_Leak	Leakage sensor	0 = Leakage 1 = ok	BI	03	R
BI_DrainValLp	Drain valve	0 = open 1 = closed	BI	04	R
BI_FillValLp	Inlet valve	0 = closed 1 = open	BI	05	R
BI_DrainPump	Drain pump	0 = off 1 = on	BI	06	R

6.1.4 ME- LonWorks (Integrated Controller software version 5.x.x.x)

Variable Name	Description	Range	SNVT	#SNVT	Index
nviRequest	Requesting the status		SNVT_obj_request	92	0
nvoStatus	Current status		SNVT_obj_status	93	1
nvoHumStatus	Operating status	0 = Initializing 1 = Diagnostic 2 = Stopped 3 = Humidifying 4 = Cooling 5 = Holding 6 = Draining 7 = Refreshing 8 = Filling 9 = Standby 10 = Diluting 11 = Drain Assisting 12 = Bleeding 13 = Ramping Up 14 = Switched Off 15 = Remote Off 16 = Purging 17 = Drain Check	SNVT_count	8	2
nvoServStatus	Maintenance and malfunctions status	0 = Service info 1 = Warning 2 = ME Service 3 = Refill Liquid 4 = Replace PureFlow Ag+ 5 = Replace UV Bulb 6 = Matrix Wash Over 7 = Out of Commissioning 8 = Activation Code 9 = Fault	SNVT_count	8	3
nvoErrorCode	Error code ²⁾	0 = no Error	SNVT_count	8	4
nvoOperatHours	Hours of operating	0 - 65535 h	SNVT_time_hour	124	5
nvoNextSySvc	Next service	0 - 10000 h	SNVT_time_hour	124	6
nvoNextUVSvc	Next UV service	0 - 8760 h	SNVT_time_hour	124	7
nvoNextAgSvc	Next Ag+ service	0 - 5000 h	SNVT_time_hour	124	8
nvoRHorDemand	Actual humidity or demand	0 - 100 %	SNVT_lev_percent	81	9
nvoTemp	Actual air temperature ¹⁾	0 - x °C or °F	SNVT_count_f	51	10
nvoUVCurrA	UV Current	0 - 4.0 A	SNVT_amp	1	11
nvoStage1Cap	Water capacity stage 1 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	12
nvoStage2Cap	Water capacity stage 2 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	13
nvoStage3Cap	Water capacity stage 3 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	14
nvoStage4Cap	Water capacity stage 4 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	15
nvoStage5Cap	Water capacity stage 5 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	16
nvoStage6Cap	Water capacity stage 6 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	17

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoStage7Cap	Water capacity stage 7 ¹⁾	5.0 - 200.0 kg/h 11.0 - 440.9 lb/h	SNVT_count_f	51	18
nvoConductLp	Conductivity	µS	SNVT_count_f	51	19
nvoWtrTmp	Actual water temperature ¹⁾	0 - x °C or °F	SNVT_count_f	51	20
nvoAirTmp	Actual air temperature ¹⁾	0 - x °C or °F	SNVT_count_f	51	21
nvoNumStgAct	Number of running stages	0 - 7 stages	SNVT_count	8	22

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.

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoSetPointHum nviSetPointHum	Humidity setpoint	0 - 95 %	SNVT_lev_percent	81	23 24
nvoPropBandH nviPropBandH	Proportional band humidity control	6 - 65 %	SNVT_lev_percent	81	25 26
nvoIntTimeH nviIntTimeH	Integral time humidity control	1 - 60 min	SNVT_time_min	123	27 28
nvoSetPointTmp nviSetPointTmp	Temperature setpoint ¹⁾	5 - 40 °C 41 - 104 °F	SNVT_count_f	51	29 30
nvoPropBandT nviPropBandT	Proportional band temperature control ¹⁾	1 - 50 °C 34 - 122 °F	SNVT_count_f	51	31 32
nvoIntTimeT nviIntTimeT	Integral time temperatur control	1 - 60 min	SNVT_time_min	123	33 34
nvoWashAct nviWashAct	Remote WashOver activation	Read: 0 = Off 1 = Initialization 2 = Wash over in progress 3 = Wash over finished Write: 0 = Stop wash over 1 = Start wash over	SNVT_count	8	35 36
nvoRemRHorDem nviRemRHorDem	Actual humidity or demand via Lonworks	0 - 100 %	SNVT_lev_percent	81	37 38
nvoRemTemp nviRemTemp	Actual temperature via Lonworks ¹⁾	0 - 100 °C 0 - 212 °F	SNVT_count_f	51	39 40

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

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoExtSchLSta	Safety loop	0 = open 1 = closed (ok)	SNVT_switch	95	41
nvoDosLvl	Dosing pump level	0 = empty 1 = ok	SNVT_switch	95	42
nvoLeak	Leakage sensor	0 = Leakage 1 = ok	SNVT_switch	95	43
nvoDrainValLp	Drain valve	0 = open 1 = closed	SNVT_switch	95	44
nvoFillValLp	Inlet valve	0 = closed 1 = open	SNVT_switch	95	45
nvoDrainPump	Drain pump	0 = off 1 = on	SNVT_switch	95	46

6.1.5 RS - BACnet (Integrated Controller software version 5.x.x.x)

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
MI_UnitStatusA	Operating status unit A	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Break 5 = Level test 6 = Standby 7 = Humidifying 8 = Fill 9 = Idle 10= Drain 11= Remote off 12= Keep Warm	MI	01	R
MI_UnitStatusB	Operating status unit B	1 = Initializing 2 = Diagnostic 3 = Stopped 4 = Break 5 = Level test 6 = Standby 7 = Humidifying 8 = Fill 9 = Idle 10= Drain 11= Remote off 12= Keep Warm	MI	02	R
MI_ServStatusA	Maintenance and malfunctions status unit A	1 = Service info 2 = Warning 3 = RO Service 4 = Extended Maintenance 5 = Small Maintenance 6 = Activation 7 = Fault	MI	03	R
MI_ServStatusB	Maintenance and malfunctions status unit B	1 = Service info 2 = Warning 3 = RO Service 4 = Extended Maintenance 5 = Small Maintenance 6 = Activation 7 = Fault	MI	04	R
MI_HumType	Device Type	1 = RS 2 = RS+ RO 3 = RO	MI	05	R
MI_NomVoltage	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	MI	06	R

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
MI_LevelA	Water level unit A	1 = no level 2 = low 3 = low-mid 4 = mid 5 = mid-high 6 = high	MI	07	R
MI_LevelB	Water level unit B	1 = no level 2 = low 3 = low-mid 4 = mid 5 = mid-high 6 = high	MI	08	R
AI_ErrorCode	Error code ²⁾	0 = No Error	AI	01	R
AI_OperatHours	Operating hours	0 - 1'200'000 h	AI	02	R
AI_HoursToServA	Next service unit A	0 - 6000 h	AI	03	R
AI_HoursToServB	Next service unit B		AI	04	R
AI_SystemDemand	Demand unit A	0 - 100 %	AI	05	R
AI_InputA1	Demand channel 1 unit A	0 - 100 %	AI	06	R
AI_InputA2	Limiter channel 2 unit A	0 - 100 %	AI	07	R
AI_MaxHumOut	Max. capacity ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	AI	08	R
AI_CylMaxCapA	Max. capacity unit A ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	09	R
AI_CylMaxCapB	Max. capacity unit B ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	10	R
AI_ActCapHum	Actual capacity ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	AI	11	R
AI_CylActCapA	Actual capacity unit A ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	12	R
AI_CylActCapB	Actual capacity unit B ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	AI	13	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)
AV_SetPointA1	Setpoint channel 1 unit A	0 - 95 %	AV	01	R/W
AV_SetPointA2	Setpoint channel 2 unit A limiter	10 - 95 %	AV	02	R/W
AV_PropBandA1	P-Band unit A (Proportionalband)	6 - 65 %	AV	03	R/W
AV_PropBandA2	P-Band unit A (Proportionalband) limiter	6 - 65 %	AV	04	R/W
AV_IntTimeA1	Integral time channel 1 unit A	1 - 60 min	AV	05	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
AV_DampTimeA2	DampTime channel 2 unit A	0 - 60 s	AV	06	R/W
AV_CapLimitA	Manual Capacity unit A	20 - 100 %	AV	07	R/W
AV_RemoteDrain	Remote Drain	Read: 0= Off 1=Init 2=busy 3=done Write 0=Off(Operation) 1= RS drain cylinder A 2= RS drain cylinder B 3= RS drain cyl. A+B 4 = RO flush 5 = RO fresh water automation	AV	08	R/W
AO_RemRHorDemA1	Actual humidity or demand via BACnet unit A	0 - 100 % Relinquish Default = 0	AO	01	R/W
AO_RemRHorDemA2	Actual humidity or limiter via BACnet unit A	0 - 100 % Relinquish Default = 0	AO	02	R/W

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
BI_BlowerPackA	Blower ready unit A	0 = off 1 = on	BI	01	R
BI_BlowerPackB	Blower ready unit B	0 = off 1 = on	BI	02	R
BI_ExtSChStaA	External safety chain unit A	0 = open 1 = closed (ok)	BI	03	R
BI_ExtSChStaB	External safety chain unit B	0 = open 1 = closed (ok)	BI	04	R
BI_IntSChStaA	Internal safety chain unit A	0 = open 1 = closed (ok)	BI	05	R
BI_IntSChStaB	Internal safety chain unit B	0 = open 1 = closed (ok)	BI	06	R
BI_HeatVoltageA	Heating voltage unit A	0 = off 1 = on	BI	07	R
BI_HeatVoltageB	Heating voltage unit B	0 = off 1 = on	BI	08	R
BI_LevelSafetyA	Internal safety chain unit A (security level)	0 = off 1 = on (ok)	BI	09	R
BI_LevelSafetyB	Internal safety chain unit B (security level)	0 = off 1 = on (ok)	BI	10	R
BI_LeakA	Leakage sensor unit A	0 = off (Leak) 1 = on	BI	11	R
BI_LeakB	Leakage sensor unit B	0 = off (Leak) 1 = on	BI	12	R

Object Name	Description	Range	Object-Type	Object-ID	Read(R) Write(W)
BI_MainContactA	Contactor unit A	0 = off 1 = on	BI	13	R
BI_MainContactB	Contactor unit B	0 = off 1 = on	BI	14	R
BI_PumpA	Pump unit A	0 = off 1 = on	BI	15	R
BI_PumpB	Pump unit B	0 = off 1 = on	BI	16	R
BI_InletA1	Inlet valve 1 unit A	0 = closed 1 = open	BI	17	R
BI_InletB1	Inlet valve 1 unit B	0 = closed 1 = open	BI	18	R
BI_InletA2	Inlet valve 2 unit A	0 = closed 1 = open	BI	19	R
BI_InletB2	Inlet valve 2 unit B	0 = closed 1 = open	BI	20	R
BI_DrainA1	Drain cool valve unit A	0 = closed 1 = open	BI	21	R
BI_DrainB1	Drain cool valve unit B	0 = closed 1 = open	BI	22	R
BI_DrainA2	Complete drain valve unit A	0 = closed 1 = open	BI	23	R
BI_DrainB2	Complete drain valve unit B	0 = closed 1 = open	BI	24	R
BI_FanA	Ext. fan unit A	0 = off 1 = on	BI	25	R
BI_FanB	Ext. fan unit B	0 = off 1 = on	BI	26	R
BI_FlushValveA	Hygiene flush unit A	0 = closed 1 = open	BI	27	R
BI_FlushValveB	Hygiene flush unit B	0 = closed 1 = open	BI	28	R

6.1.6 RS - LonWorks (Integrated Controller software version 5.x.x.x)

Variable Name	Description	Range	SNVT	#SNVT	Index
nviRequest	Requesting the status		SNVT_obj_request	92	0
nvoStatus	Current status		SNVT_obj_status	93	1
nvoUnitStatusA	Operating status unit A	0 = Initializing 1 = Diagnostic 2 = Stopped 3 = Break 4 = Level test 5 = Standby 6 = Humidifying 7 = Fill 8 = Idle 9 = Drain 10 = Remote off 11 = Keep Warm	SNVT_count	8	2
nvoUnitStatusB	Operating status unit B	0 = Initializing 1 = Diagnostic 2 = Stopped 3 = Break 4 = Level test 5 = Standby 6 = Humidifying 7 = Fill 8 = Idle 9 = Drain 10 = Remote off 11 = Keep Warm	SNVT_count	8	3
nvoServStatusA	Maintenance and malfunctions status unit A	0 = Service info 1 = Warning 2 = RO Service 3 = Extended Maintenance 4 = Small Maintenance 5 = Activation 6 = Fault	SNVT_count	8	4
nvoServStatusB	Maintenance and malfunctions status unit B	0 = Service info 1 = Warning 2 = RO Service 3 = Extended Maintenance 4 = Small Maintenance 5 = Activation 6 = Fault	SNVT_count	8	5
nvoHumType	Device Type	0 = RS 1 = RS+ RO 2 = RO	SNVT_count	8	6
nvoNomVoltage	Nominal voltage	0 = 200 V 1 = 208 V 2 = 230 V 3 = 240 V 4 = 400 V 5 = 415 V 6 = 440 V 7 = 460 V 8 = 480 V 9 = 500 V 10 = 550 V 11 = 600 V	SNVT_volt	44	7

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoLevelA	Water level unit A	0 = no level 1 = low 2 = low-mid 3 = mid 4 = mid-high 5 = high	SNVT_count	8	8
nvoLevelB	Water level unit B	0 = no level 1 = low 2 = low-mid 3 = mid 4 = mid-high 5 = high	SNVT_count	8	9
nvoErrorCode	Error code ²⁾	0 = No Error	SNVT_count	8	10
nvoOperatHours	Operating hours	0 - 65535 h	SNVT_time_hour	124	11
nvoHoursToServA	Next service unit A	0 - 6000 h	SNVT_time_hour	124	12
nvoHoursToServB	Next service unit B		SNVT_time_hour	124	13
nvoSystemDemand	Demand unit A	0 - 100 %	SNVT_lev_percent	81	14
nvoInputA1	Demand channel 1 unit A	0 - 100 %	SNVT_lev_percent	81	15
nvoInputA2	Limiter channel 2 unit A	0 - 100 %	SNVT_lev_percent	81	16
nvoMaxHumOut	Max. capacity ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	SNVT_count_f	51	17
nvoCylMaxCapA	Max. capacity unit A ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	SNVT_count_f	51	18
nvoCylMaxCapB	Max. capacity unit B ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	SNVT_count_f	51	19
nvoActCapHum	Actual capacity ¹⁾	5 - 160 kg/h 10 - 360 lb/hr	SNVT_count_f	51	20
nvoCylActCapA	Actual capacity unit A ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	SNVT_count_f	51	21
nvoCylActCapB	Actual capacity unit B ¹⁾	5 - 40 kg/h 10 - 90 lb/hr	SNVT_count_f	51	22

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.

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoSetPointA1 nviSetPointA1	Setpoint channel 1 unit A	0 - 95 %	SNVT_lev_percent	81	23 24
nvoSetPointA2 nviSetPointA2	Setpoint channel 2 limiter unit A	10 - 95 %	SNVT_lev_percent	81	25 26
nvoPropBandA1 nviPropBandA1	P-Band unit A (Proportional band)	6 - 65 %	SNVT_lev_percent	81	27 28
nvoPropBandA2 nviPropBandA2	P-Band unit A (Proportional band) limiter	6 - 65 %	SNVT_lev_percent	81	29 30
nvoIntTimeA1 nviIntTimeA1	Integral time channel 1 unit A	1 - 60 min	SNVT_time_min	123	31 32
nvoDampTimeA2 nviDampTimeA2	Damp time channel 2 unit A	0 - 60 s	SNVT_time_sec	107	33 34
nvoCapLimitA nviCapLimitA	Manual Capacity unit A	20 - 100 %	SNVT_lev_percent	81	35 36
nvoRemoteDrain nviRemoteDrain	Remote Drain	Read: 0 = Off 1 = Init 2 = busy 3 = done Write 0 = off(Operation) 1 = RS drain cylinder A 2 = RS drain cylinder B 3 = RS drain cyl. A+B 4 = RO flush 5 = RO fresh water automation	SNVT_count	8	37 38
nvoRemRHorDemA1 nviRemRHorDemA1	Actual humidity or demand via Lon- works unit A	0 - 100 %	SNVT_lev_percent	81	39 40
nvoRemRHorDemA2 nviRemRHorDemA2	Actual humidity or limiter via Lonworks unit A	0 - 100 %	SNVT_lev_percent	81	41 42

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoBlowerPackA	Blower ready unit A	0 = off 1 = on	SNVT_switch	95	43
nvoBlowerPackB	Blower ready unit B	0 = off 1 = on	SNVT_switch	95	44
nvoExtSchStaA	External safety chain unit A	0 = open 1 = closed (ok)	SNVT_switch	95	45
nvoExtSchStaB	External safety chain unit B	0 = open 1 = closed (ok)	SNVT_switch	95	46
nvoIntSchStaA	Internal safety chain unit A	0 = open 1 = closed (ok)	SNVT_switch	95	47
nvoIntSchStaB	Internal safety chain unit B	0 = open 1 = closed (ok)	SNVT_switch	95	48
nvoHeatVoltageA	Heating voltage unit A	0 = off 1 = on	SNVT_switch	95	49

Variable Name	Description	Range	SNVT	#SNVT	Index
nvoHeatVoltageB	Heating voltage unit B	0 = off 1 = on	SNVT_switch	95	50
nvoLevelSafetyA	Internal safety chain unit A (security level)	0 = off 1 = on (ok)	SNVT_switch	95	51
nvoLevelSafetyB	Internal safety chain Unit B (security level)	0 = off 1 = on (ok)	SNVT_switch	95	52
nvoLeakA	Leakage sensor unit A	0 = off (Leak) 1 = on	SNVT_switch	95	53
nvoLeakB	Leakage sensor unit B	0 = off (Leak) 1 = on	SNVT_switch	95	54
nvoMainContactA	Contactor unit A	0 = off 1 = on	SNVT_switch	95	55
nvoMainContactB	Contactor unit B	0 = off 1 = on	SNVT_switch	95	56
nvoPumpA	Pump unit A	0 = off 1 = on	SNVT_switch	95	57
nvoPumpB	Pump unit B	0 = off 1 = on	SNVT_switch	95	58
nvoInletA1	Inlet valve 1 unit A	0 = closed 1 = open	SNVT_switch	95	59
nvoInletB1	Inlet valve 1 unit B	0 = closed 1 = open	SNVT_switch	95	60
nvoInletA2	Inlet valve 2 unit A	0 = closed 1 = open	SNVT_switch	95	61
nvoInletB2	Inlet valve 2 unit B	0 = closed 1 = open	SNVT_switch	95	62
nvoDrainA1	Drain cool valve unit A	0 = closed 1 = open	SNVT_switch	95	63
nvoDrainB1	Drain cool valve unit B	0 = closed 1 = open	SNVT_switch	95	64
nvoDrainA2	Complete drain valve unit A	0 = closed 1 = open	SNVT_switch	95	65
nvoDrainB2	Complete drain valve unit B	0 = closed 1 = open	SNVT_switch	95	66
nvoFanA	Ext. fan unit A	0 = off 1 = on	SNVT_switch	95	67
nvoFanB	Ext. fan unit B	0 = off 1 = on	SNVT_switch	95	68
nvoFlushValveA	Hygiene flush unit A	0 = closed 1 = open	SNVT_switch	95	69
nvoFlushValveB	Hygiene flush unit B	0 = closed 1 = open	SNVT_switch	95	70

7 Troubleshooting

7.1 Operating trouble list

Problem	Resolutions
Cannot see/change set object/parameter from BMS	Check control type. – Demand type controls use internal algorithms to generate a signal telling the Nortec 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 Nortec Integrated Controller. As a result the set point and humidity/temperature levels cannot be monitored through the Nortec Integrated Controller when using demand controls. – Sensor ("transducer") type controls report a sensed humidity/temperature value to the Nortec Integrated Controller. The set point is configured at the control unit and the Nortec Integrated Controller uses internal algorithms to determine the output percentage. Since the Nortec Integrated Controller knows both the set point and humidity/temperature level, these values may be monitored through the Nortec Integrated Controller.
Cannot establish communication	– Check communication parameters (see chapter 5.1.2). – Check if the jumper J7 is removed. – Verify Hardware connections from BMS to BACnet or LonWorks gateway board (see chapter 4.2). – Ensure BACnet Workstation/BMS can handle BACnet slave devices. – Check MAC address by BACnet MS/TP.
Cannot read data	– Check correct using of data type on the BMS.
Only some objects/parameters report data	– Check the baud rate being used on the BMS network. Use of faster baud rates may assist. – Check the polling rate being used. High polling rates can cause data collision. A recommended polling rate is once per minute. – Check the software version of the intergrated controller. The configuration on the gateway board must match with the software version of intergrated controller.
Nortec Integrated Controller will not respond to set point/sensor values/demand values written over BACnet/LonWorks.	– Check that Nortec Integrated Controller is configured to be controlled via automation system (see chapter 5.1.1). Note: If "Signal Source" is set to "Analog" the humidifier will look for a control signal connected to the driver board only.

Problem	Resolutions
Humidifier will not respond to control signal connected to the driver board.	– Check that "Signal Source" in the controller settings is configured for "Analog" control. Note: If the "Signal Source" is set to "Modbus", the Nortec Integrated Controller will look for a control value sent by the BMS.
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.
Invalid data	– Check BACnet/LonWorks addresses for conflicts with any device. Note: Each device on the network must have a unique address.
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 data (e.g. temperature, pressure, mass flow) are shown via BMS.	– Check software version of the Integrated Controller. Some values are shown only with imperial units with software version 1.x.x.x.
Humidifier type is not shown on top of the navigation tree of the FS-GUI.	– Probably the configuration has not been uploaded into the gateway board. Contact Nortec Technical Services for additional support.
More variables or additional information is required from the Nortec Integrated Controller.	Contact Nortec Technical Services for additional support.

7.2 LED functions

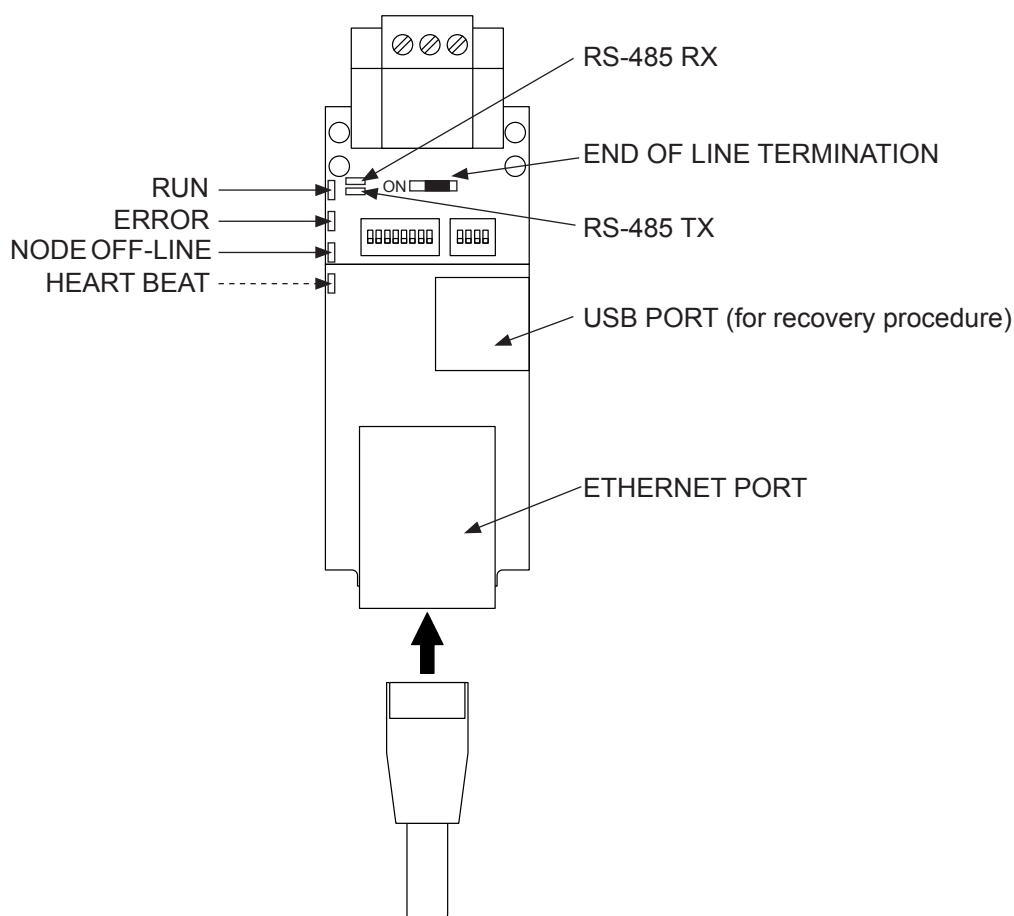


Abb. 8: BACnet IP / BACnet MS/TP LED's

LED	Description
HEART BEAT (amber)	The system indicator LED as indication that the operating system is running
ERROR (red)	The ERROR LED lights up on power up and goes off 15 seconds after power up. A steady red light will indicate there is a system error on the gateway board. The related "system error" is shown in the "User Messages / error screen" of the FS-GUI interface.
NODE OFF-LINE (amber)	The Node Offline LED lights up on power up and goes off 15 seconds after power up. If the Node Offline LED stays on solid, a Node Offline condition has occurred (no communication between Intergrated Controller and gateway).
RUN (green)	The RUN LED will start flashing 20 seconds after power indicating normal operation. The board will be able to access FS-GUI once this LED starts flashing.
TX	RS-485 indicator LED when a message is sent through the port.
RX	RS-485 indicator LED when a message is received by the port.

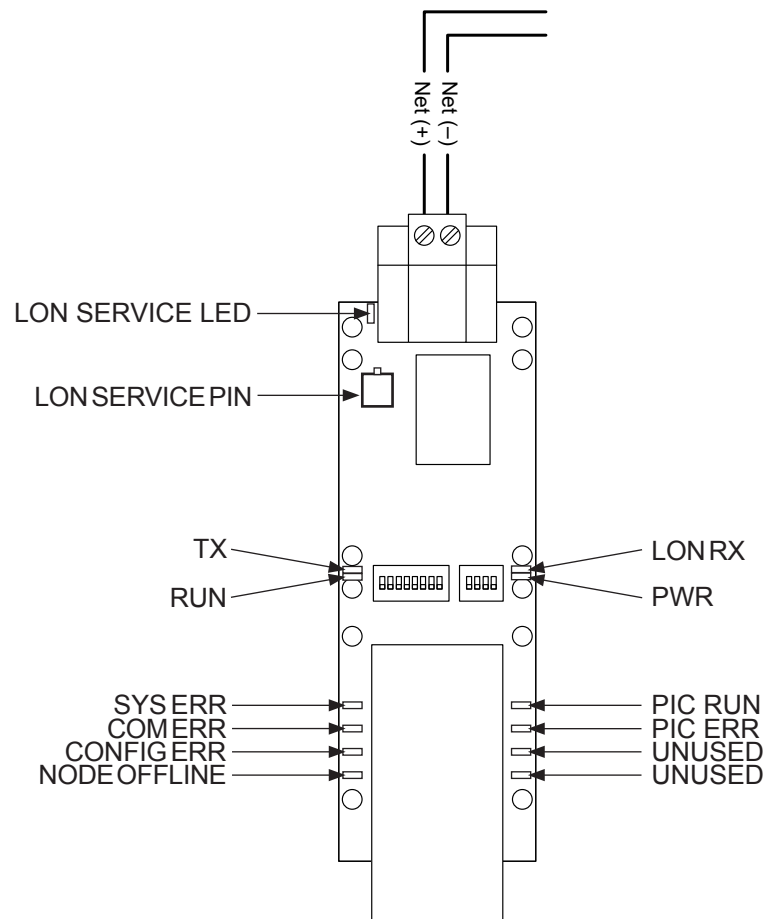


Abb. 9: LonWorks LED's

LED	Description
PWR (green)	This is the power light and should show steady green at all times when the board is powered.
SYS ERR (LED1, red)	The SYS ERR LED will flash once on power up and flash once 15 seconds after power up. A steady red light will indicate there is a system error on the board. The related "system error" is shown in the "User Messages / error screen" of the FS-GUI interface.
COMM ERR (LED2, red)	The COMM ERR LED will flash once on power up and flash once 15 seconds after power up. A steady red light will indicate a communication error has occurred. The related "system error" is shown in the "User Messages / error screen" of the FS-GUI interface.
Config ERR (LED3, amber)	The Config ERR LED will flash once on power up and flash once 15 seconds after power up. A steady amber light will indicate a configuration error exists in the active configuration. The related "system error" is shown in the "User Messages / error screen" of the FS-GUI interface.
Node Offline (LED4, amber)	The Node Offline LED will flash once on power up and flash once 15 seconds after power up. If the Node Offline LED stays on solid, a Node Offline condition has occurred.

LED	Description
RUN (PIO)	The RUN LED will start flashing 20 seconds after power indicating normal operation. The board will be able to access FS-GUI once this LED starts flashing.
PIC RUN (LED5)	The PIC RUN LED will flash indicating normal operation.
PIC ERR (LED6)	The PIC ERR LED will go on solid indicating there is a PIC error.
LON-TX LED	On normal operation of the board, the TX LED will flash when a message is sent on the Lon port of the board.
LON-RX LED	On normal operation of the board, the RX LED will flash when a message is received on the Lon port of the board.
LON-SRV LED (next to Lon port)	The LON-SRV LED will flash if the board is configured for implicit addressing and not commissioned. LED will be off if the board is configured for implicit addressing and commissioned or if it is configured for explicit addressing.
LED7	Not used
LED8	Not used



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
☐ LonWorks

Settings for BACnet only:

- Default Gateway Address/Name:
- BACnet Node ID (Device Instance):
- Network Number:
- Subnet Mask:
- Module IP Address:

Settings for BACnet MS/TP only:

- MAC Address BACnet MS/TP:
- Baud rate:

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Notes

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Warranty

Nortec Humidity Inc. and/or Nortec Humidity Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted (with the exception of the cylinder), are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or steam distribution systems.

THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.



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