

Start-up Guide for the gateway MODBUS RTU / BACnet



© Copyright 2024 Caleffi

Code 755052

INSTRUCTION SHEET



CONTENTS

Certification and technical specifications	2
Introduction	
Gateway setup	3
Dimensions	4
Device connection to Gateway	5
Power connection	6
Configuration of the Gateway	7
Web server setup	9
LED Functions	13
Appendix	14

1. CERTIFICATIONS AND TECHNICAL SPECIFICATIONS

The BTL Mark on gateway is a symbol that indicates that a product has passed a series of rigorous tests conducted by an independent laboratory which verifies that the product correctly implements the BACnet features claimed in the listing. The mark is a symbol of a high-quality BACnet product. Go to www.BACnetInternational.net for more information about the BACnet Testing Laboratory.

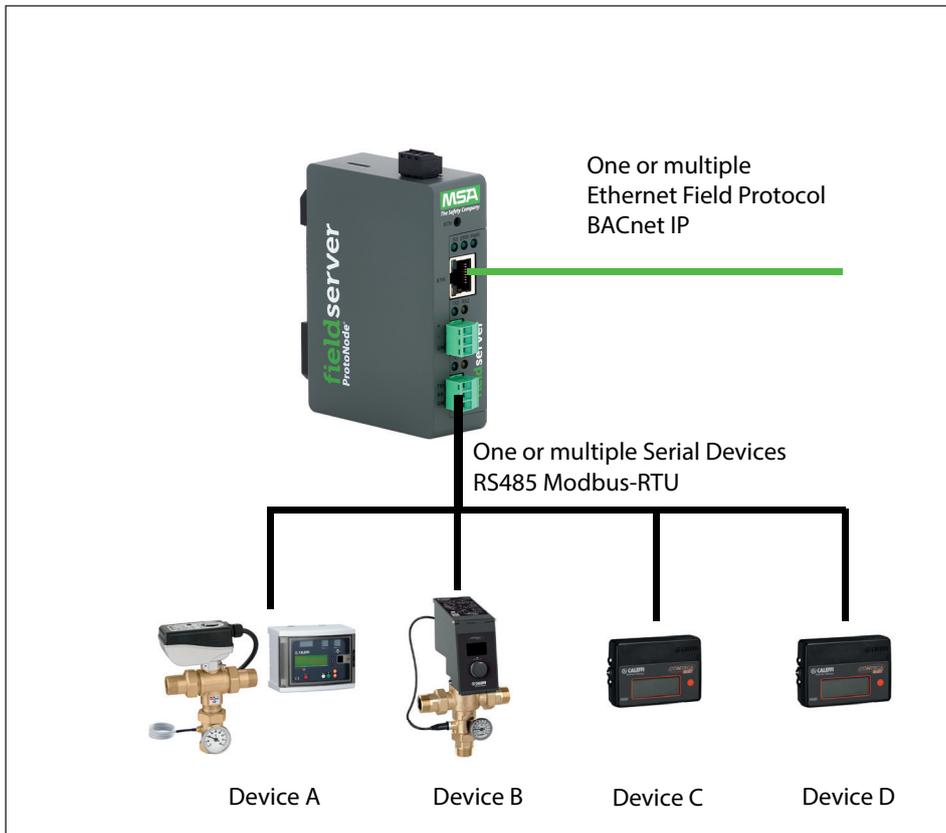


FPC-N54	
Electrical Connections	One 3-pin Phoenix connector with: RS-485/RS-232 (Tx+ / RX- / gnd) One 3-pin Phoenix connector with: RS-485 (+ / - / gnd) One 3-pin Phoenix connector with: Power port (+ / - / Frame-gnd) One Ethernet 10/100 BaseT port
Power Requirements	Input Voltage: 12-24 V \equiv (DC) or 24 V \sim (AC) Current draw: 24 V \sim (AC) 0.125A Max Powe: 3 Watts 12-24 V \equiv (DC) 0.25A @12 V \equiv (DC)
Approvals	FCC Part 15 B, UL 60950-1 and CAN/CSA C22.2, EN IEC 62368-1, WEEE compliant, RoHS compliant, DNP 3.0 and Modbus conformance tested, BTL marked, REACH compliant, UKCA and CE compliant, ODVA conformant, CAN ICES-003(B) / NMB-003(B)
Physical Dimensions	4 x 1.1 x 2.7 in (10.16 x 2.8 x 6.8 cm)
Weight	0.4 lbs (0.2 Kg)
Operating Temperature	-20 °C to 70 °C (-4 °F to 158 °F)
Humidity	10-95 % RH non-condensing

NOTE: Specifications subject to change without notice.

2. INTRODUCTION

The gateway is an external, high performance Building Automation multi-protocol gateway that is preconfigured to auto-discover any of Caleffi's products (hereafter called "device") connected to the the gateway and automatically configures them for BACnet MS/TP, BACnet/IP. It is not necessary to download any configuration files to support the required applications. The gateway is pre-loaded with tested Profiles/Configurations for the supported devices.



3. GATEWAY SETUP

Record identification data

Each gateway has a unique part number located on the side or the back of the unit. This number should be recorded, as it may be required for technical support. The numbers are as follows:

Model	Caleffi code
FPC-N54-1861	755052

The gateway have the following **2** ports: RS-485 + Ethernet

Point count capacity and registers per device

The total number of registers presented by all of the devices attached to the gateway cannot exceed:

Model	Caleffi code	Total Registers
FPC-N54-1861	755052	1,500

Devices	Registers Per Device
Legiomix_6000_Series	43
Legiomix_2_0_6000_Series	54
Conteca_Easy_750_Series	40

Configuring device communications

- Set Modbus Node-ID for each of the devices attached to gateway. The Node-ID's need to be uniquely assigned between 1 and 255.
- The Node-ID that is assigned for each device needs to be documented.
- The Node-ID's assigned are used for deriving the device instance for BACnet/IP and BACnet MS/TP.

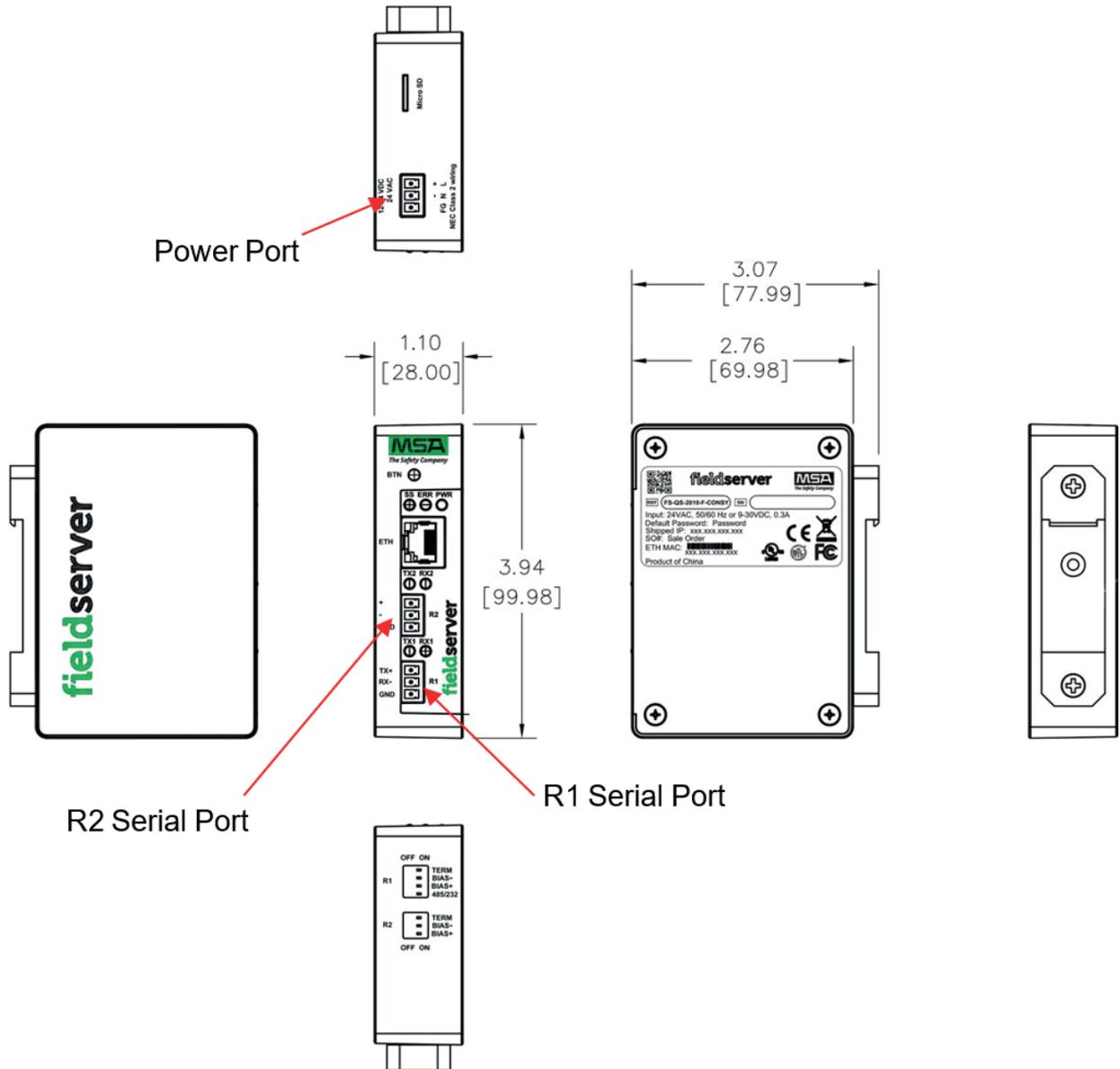
Port Setting	Legiomix_6000_Series	Legiomix_2_0_6000_Series	Conteca_Easy_750_Series
Protocol	Modbus RTU	Modbus RTU	Modbus RTU
Baud Rate	9600	9600	9600
Parity	None	Even* / None	Even* / None
Data Bits	8	8	8
Stop Bits	1	1	1

*Factory default setting = Even

Set Modbus Node-ID for each device attached to the gateway

- Set Modbus Node-ID for each of the devices attached to gateway. The Node-ID's need to be uniquely assigned between 1 and 255.
- The Node-ID that is assigned for each device needs to be documented.
- The Node-ID's assigned are used for deriving the device instance for BACnet/IP and BACnet MS/TP.

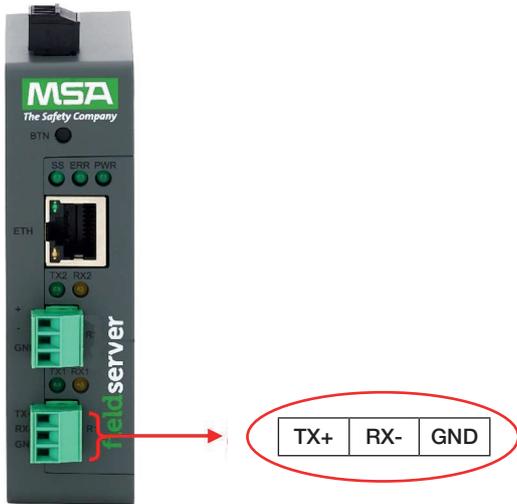
4. DIMENSIONS



5. DEVICE CONNECTIONS TO GATEWAY

ATTENTION! in this step do not connect power

Modbus Connection

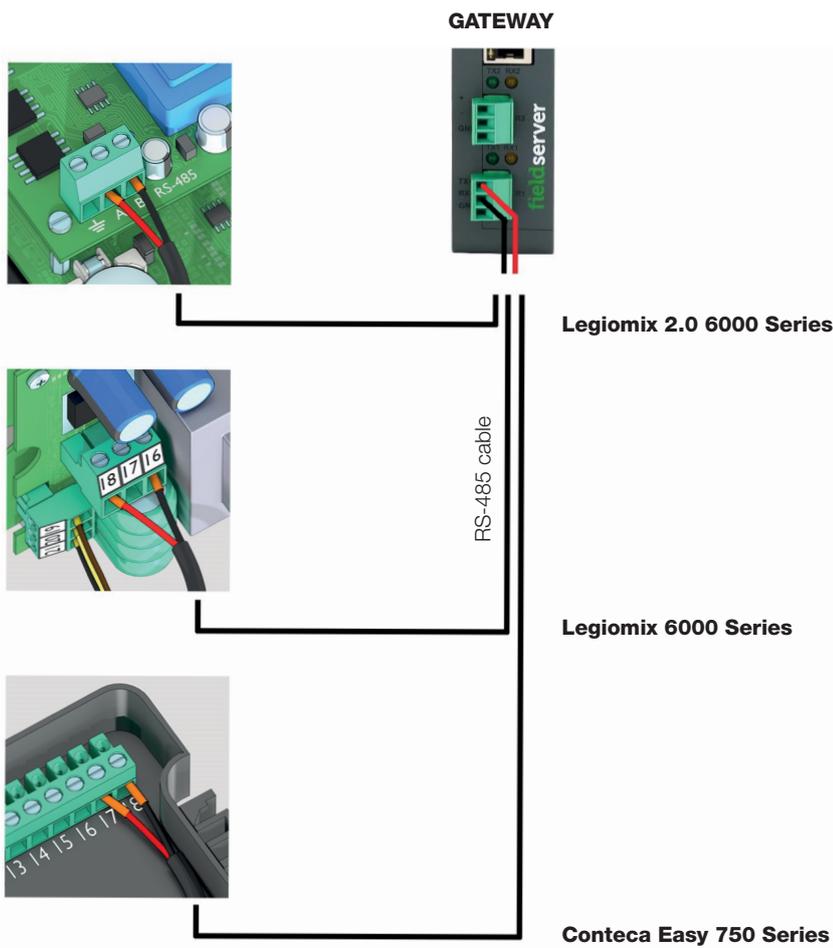


Wiring correspondence

See the diagrams below for the connection for the different devices (from MODBUS to BACnet network).

Power Requirement for gateway External		
	Gateway R1	
Devices	TX+	RX-
Legiomix_2_0_6000_Series	A	B
Legiomix_6000_Series	(18)	(16)
Conteca_Easy_750_Series	(17)	(18)

Wiring diagram



6. POWER CONNECTION

Check power requirements in the table below:

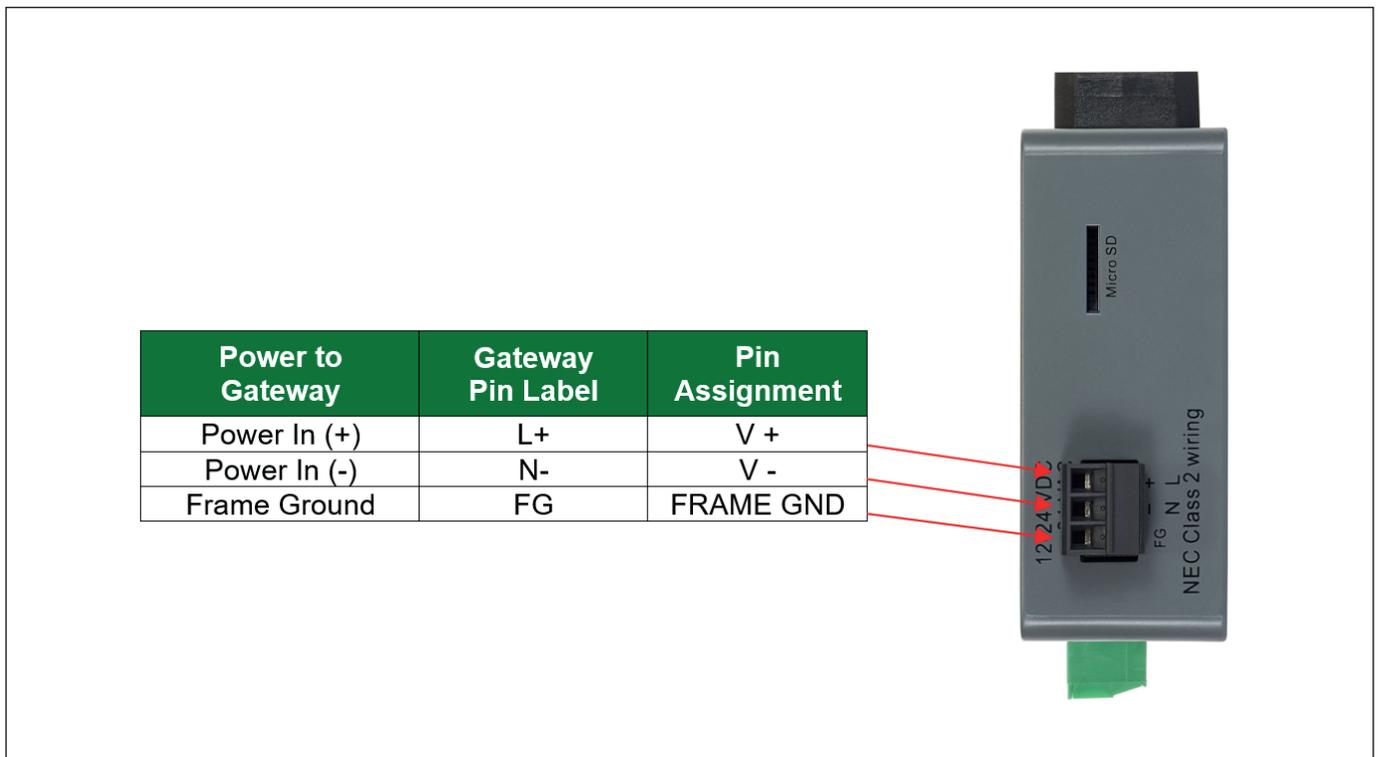
Power Requirement for ProtoNode External Gateway		
ProtoNode Family	Current Draw Type	
	12 V \equiv (DC)	24 V \sim / \equiv (AC/DC)
FPC-N54 (Typical)	250mA	125mA

NOTE: These values are 'nominal' and a safety margin should be added to the power supply of the host system. A safety margin of 25 % is recommended.

Apply power to the ProtoNode as shown below. Ensure that the power supply used complies with the specifications provided in **Section 10.4 Specifications**.

- The gateway accepts 12-24 V \equiv (DC) or 24 V \sim (AC) on pins L+ and N-.
 - Supports both Full-Wave and Half-Wave AC
- Frame GND should be connected to ensure personnel safety and to limit material damages due to electrical faults. Ground planes are susceptible to transient events that cause sudden surges in current. The frame ground connection provides a safe and effective path to divert the excess current from the equipment to earth ground.

NOTE: Floating AC Power Supplies are supported.



7. CONFIGURATION OF THE GATEWAY

Connect the PC to gateway via the Ethernet Port



Connect a CAT5 Ethernet cable (Straight through or Cross-Over) between the local PC and gateway.

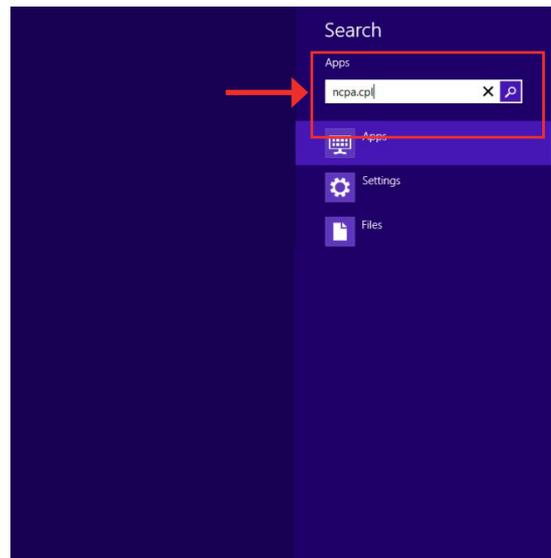
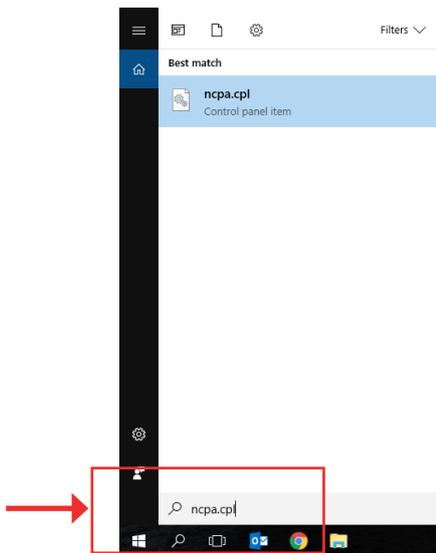
NOTE: The Default IP Address of gateway is 192.168.1.24, subnet mask is 255.255.255.0. If the PC and gateway are on different IP Networks, assign a static IP Address to the PC on the 192.168.1.1 network.

To set up the gateway by different Windows version follow the instruction below:

1 - Go to the start button and digit the following code: **ncpa.cpl**

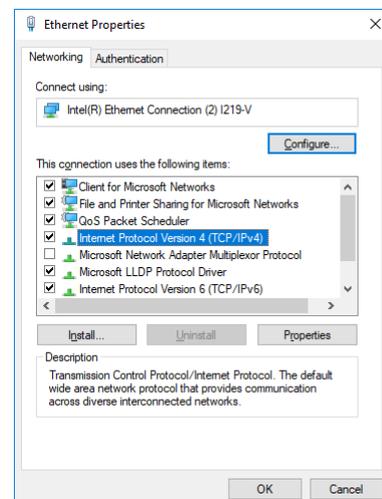
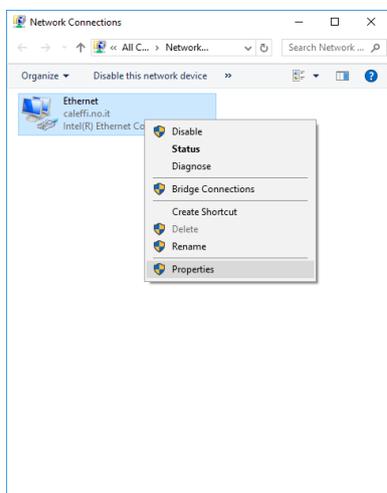
- For Windows 10

- For Windows 8

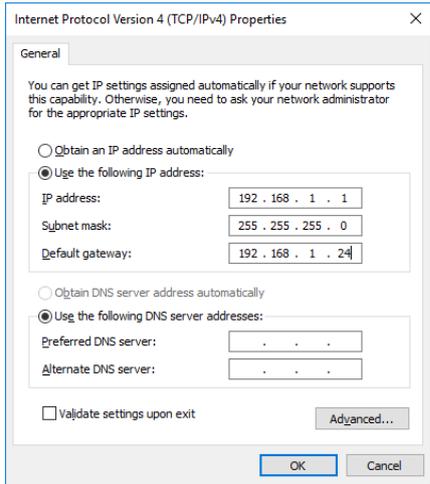


2 - Select "Properties" by the right button of the mouse.

3 - Select "Internet Protocol Version 4" and confirm.



4 - Fill the correct setting for the IP BACnet gateway address.

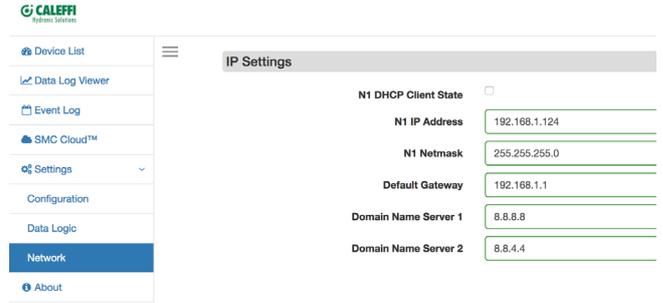


Connecting to gateway Web Configurator

Change the IP address of the Gateway Modbus RTU / BACNET: If for network configuration reasons, the IP address 192.168.1.24 is already assigned in the network, the IP address of the Gateway Modbus RTU / BACNET can be changed.

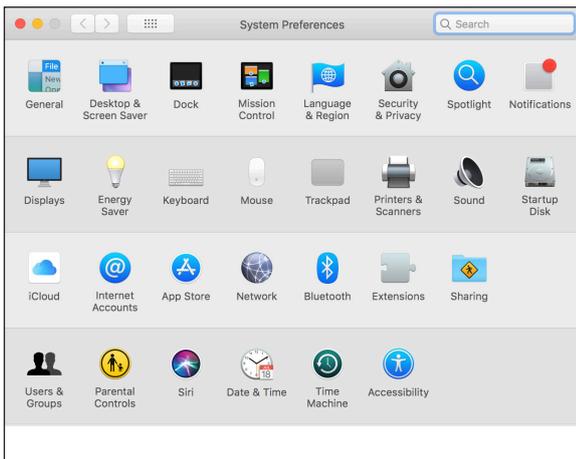
1. Open a web browser on the PC and enter the IP Address of the gateway; the default address is 192.168.1.24;
2. At the bottom-left of the page, click the "Network" button;
3. Set a new IP address for Gateway Modbus RTU / BACNET at the voice "N1 IP Address";
4. Click "Save".

Now, open a web browser on the PC and enter the IP Address of the gateway; insert the new address.

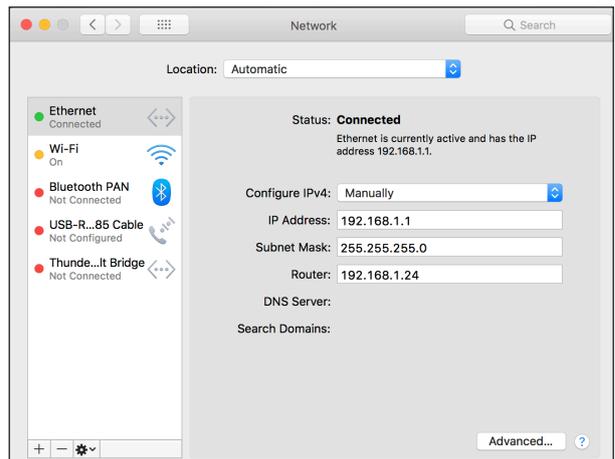


To set up the gateway for MAC systems follow the instruction below:

1 - Open "System Preferences"



2 - Go to "Network" and choose the Ethernet system connected, fill the correct setting for the IP BACnet gateway address



8. WEB SERVER SETUP

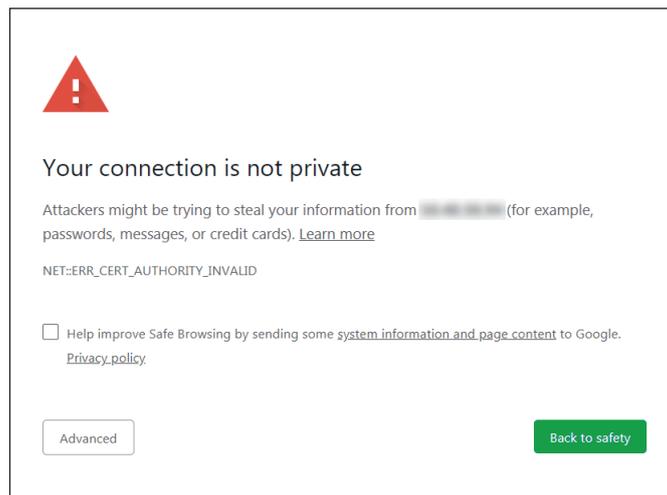
Login to the FieldServer

The first time the FieldServer GUI is opened in a browser, the IP Address for the gateway will appear as untrusted. This will cause the following pop-up windows to appear.

- When the Web Server Security Unconfigured window appears, read the text and choose whether to move forward with HTTPS or HTTP.



- When the warning that "Your connection is not private" appears, click the advanced button on the bottom left corner of the screen

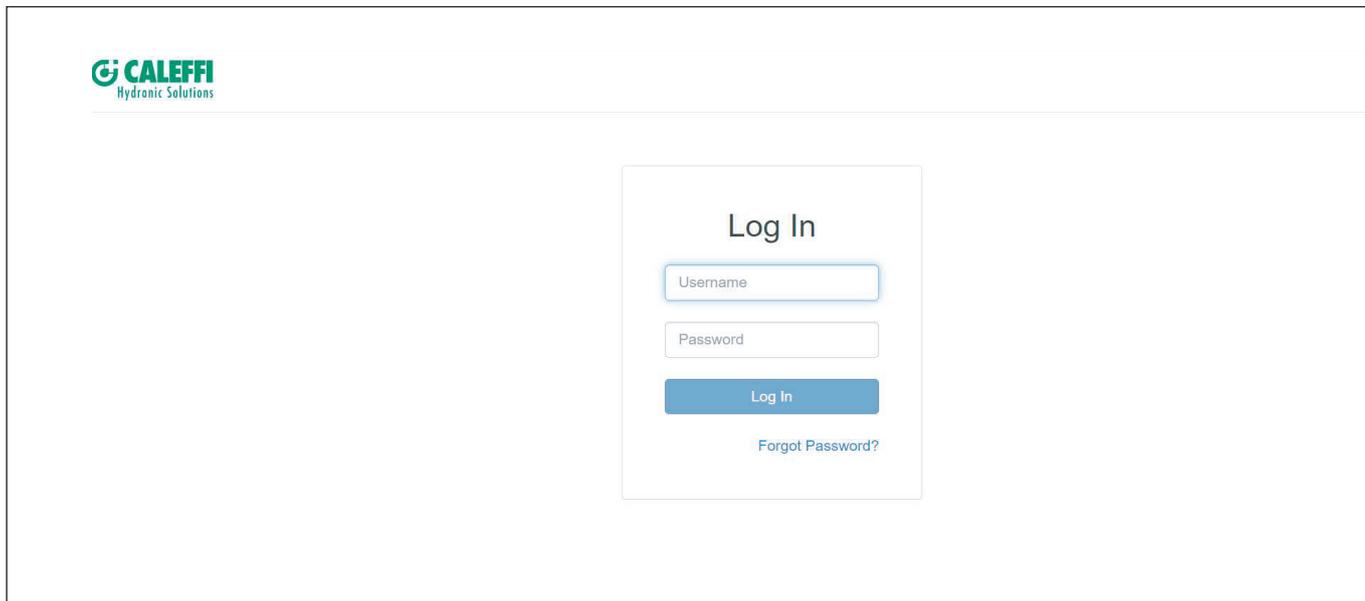


After setting a local PC on the same subnet as the gateway (previous chapter), open a web browser on the PC and enter the IP Address of the gateway; the default address is 192.168.1.24.

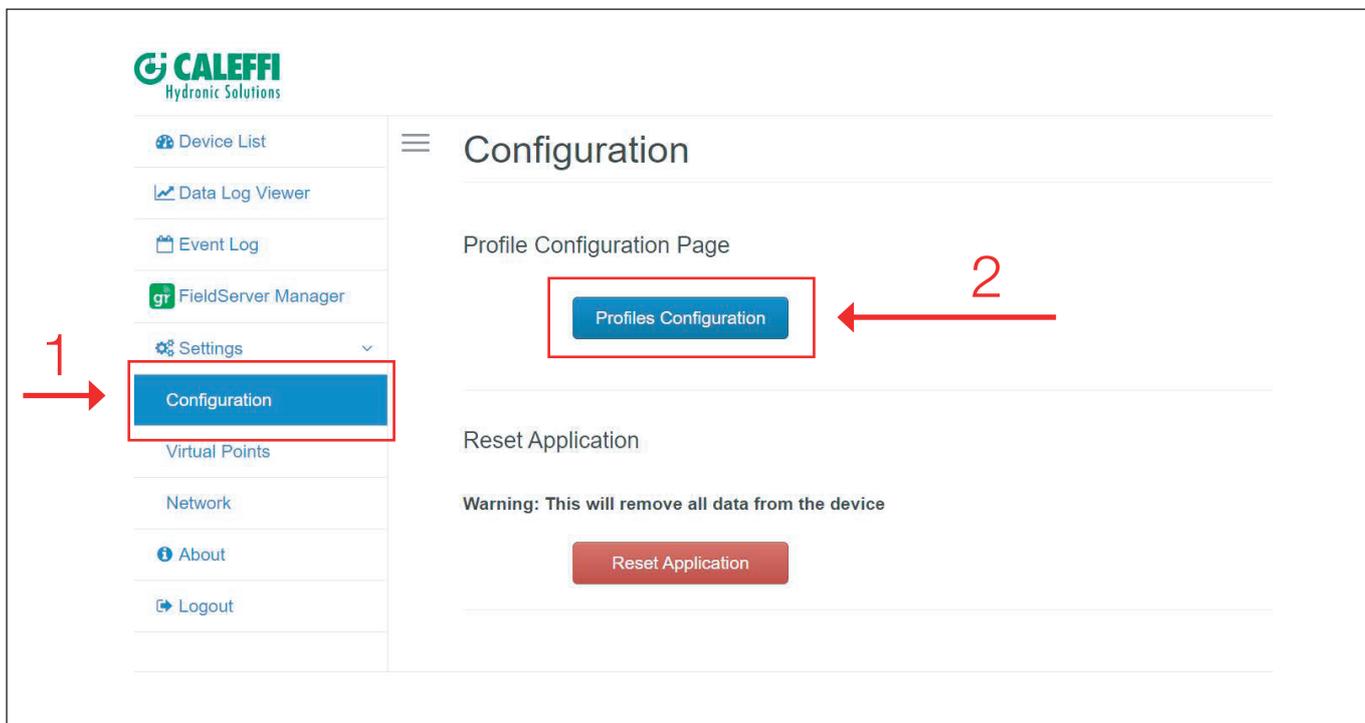
After setting the local IP address of the gateway, to show the parameters of the connected device, following the screens below.

Username: *admin*

Password: see label on side of the Gateway (ref. Default Password)



Select the command "Configure" (1) and the command "Profiles Configuration" (2) to enter on the "Configuration Parameters" menu.



Parameter Name	Parameter Description	Value
protocol_select	Protocol Selector Set to 1 for BACnet IP Set to 2 for BACnet MSTP Set to 3 for Modbus TCP Set to 4 for BACnet MSTP (single node)	1 <input type="button" value="Submit"/>
mod_baud_rate	Modbus RTU Baud Rate This sets the Modbus RTU baud rate. (9600/19200/38400/57600)	9600 <input type="button" value="Submit"/>
mod_parity	Modbus RTU Parity This sets the Modbus RTU parity. (None/Even/Odd)	None <input type="button" value="Submit"/>
mod_data_bits	Modbus RTU Data Bits This sets the Modbus RTU data bits. (7 or 8)	8 <input type="button" value="Submit"/>
mod_stop_bits	Modbus RTU Stop Bits This sets the Modbus RTU stop bits. (1 or 2)	1 <input type="button" value="Submit"/>
network_nr	BACnet Network Number This sets the BACnet network number of the Gateway. (1 - 65535)	50 <input type="button" value="Submit"/>
node_offset	BACnet Node Offset This is used to set the BACnet device instance. The device instance will be sum of the Modbus device address and the node offset. (0 - 4194303)	50000 <input type="button" value="Submit"/>
bac_ip_port	BACnet IP Port This sets the BACnet IP port of the Gateway. The default is 47808. (1 - 65535)	47808 <input type="button" value="Submit"/>
bac_cov_option	BACnet COV This enables or disables COVs for the BACnet connection. Use COV_Enable to enable. Use COV_Disable to disable. (COV_Enable/COV_Disable)	COV_Disable <input type="button" value="Submit"/>
bac_bbmd_option	BACnet BBMD This enables BBMD on the BACnet IP connection. Use BBMD to enable. Use - to disable. The bdt.ini files also needs to be downloaded. (BBMD/-)	- <input type="button" value="Submit"/>
3  bac_virt_nodes	BACnet Virtual Server Nodes Set to NO if the unit is only converting 1 device to BACnet. Set to YES if the unit is converting multiple devices. (No/Yes)	No <input type="button" value="Submit"/>

NOTE: Below the “Active profiles” heading, the profiles for connected devices are listed. If no profiles are present, then wiring, baud rate and DIP switch settings must be checked, because there is a problem with device communications. All the active profiles must show the correct Node-ID’s before proceeding.

NOTE: If multiple devices are connected to the gateway, set the Virtual Server Nodes field to “YES”; otherwise leave the field on the default “No” setting (3).

Active profiles

Nr	Node ID	Current profile	Parameters
<input type="button" value="Add"/>			

The Active profiles section lists the currently active device profiles, including previous Web Configurator additions. This list is empty for new installations, or after clearing all configurations. To add an active profile to support a device, click the Add button under the Active Profiles heading. This will present a drop-down box underneath. The Current profile column that lists all the available profiles.

Active profiles			
Nr	Node ID	Current profile	Parameters
		<input type="text" value="BAC_IP_CONTECA_EASY_750_Series"/>	<input type="button" value="Submit"/> <input type="button" value="Cancel"/>

For every device that is added, assign a unique Modbus Node-ID. This specification must match the device’s network settings.

Active profiles			
Nr	Node ID	Current profile	Parameters
		<input type="text" value="BAC_IP_CONTECA_EASY_750_Series"/> <input type="text" value="BAC_IP_LEGIOMIX_2_0_6000_Series"/> <input type="text" value="BAC_IP_LEGIOMIX_6000_Series"/>	<input type="button" value="Submit"/> <input type="button" value="Cancel"/>

Once the Profile for the device has been selected from the drop-down list, enter the value of the device’s Modbus Node-ID which was assigned in set modbus node - ID. Then press the “Submit” button to add the Profile to the list of devices to be configured. Repeat this process until all the devices have been added. Completed additions are listed under “Active Profiles” as shown in the following figure.

Active profiles			
Nr	Node ID	Current profile	Parameters
1	1	BAC_IP_CONTECA_EASY_750_Series	<input type="button" value="Remove"/>
2	2	BAC_IP_LEGIOMIX_6000_Series	<input type="button" value="Remove"/>
3	3	BAC_IP_LEGIOMIX_2_0_6000_Series	<input type="button" value="Remove"/>
<input type="button" value="Add"/>			

9. BACNET MS/TP AND BACNET/IP: SETTING NODE_OFFSET TO ASSIGN SPECIFIC DEVICE INSTANCES

After setting a local PC to the same subnet as the gateway, open a web browser on the PC and enter the IP Address of the gateway; the default address is 192.168.1.24. If the IP Address of the gateway has been changed by previous configuration, the assigned IP Address must be gathered from the network administrator (The Web Configurator is shown in the chapter 5). Node_offset field shows the current value (default = 50,000).

NOTE: The values allowed for a BACnet Device Instance can range from 1 to 4,194,303

To assign a specific device instance (or range); change the Node_offset value as needed using the calculation below:
 Device instance (desired) = Node_offset + Modbus Node_ID

For example, if the desired Device Instance for the device 1 is 50,001 and the following is true:

- Device 1 has a Modbus Node-ID of 1
- Device 2 has a Modbus Node-ID of 2
- Device 3 has a Modbus Node-ID of 3

Then plug the device 1's information into the formula to find the desired Node_offset:

- 50,001 = Node_offset + 1
- 50,000 = Node_offset

Once the Node_offset value is input, it will be applied to all devices as shown below:

- Device 1 Instance = 50,000 + Modbus Node_ID = 50,000 + 1 = 50,001
- Device 2 Instance = 50,000 + Modbus Node_ID = 50,000 + 2 = 50,002
- Device 3 Instance = 50,000 + Modbus Node_ID = 50,000 + 3 = 50,003

Click "Submit" once the desired value is entered.

node_offset

BACnet Node Offset
 This is used to set the BACnet device instance.
 The device instance will be sum of the Modbus device address and the node offset.
(0 - 4194303)

BACnet: Setting Network_Number for more than one gateway on Subnet

For both BACnet MS/TP and BACnet/IP, if more than on gateway is connected to the same subnet, they must be assigned unique Network_Number values. On the main Web Configurator screen, update the BACnet Network Number field and click submit. The default value is 50.

network_nr

BACnet Network Number
 This sets the BACnet network number of the Gateway.
(1 - 65535)

HOW TO CLEAR PROFILES

After setting a local PC to the same subnet as the gateway, open a web browser on the PC and enter the IP Address of the gateway; the default address is 192.168.1.24.

If the IP Address of the gateway has been changed by previous configuration, the assigned IP Address must be gathered from the network administrator (the Web Configurator is shown in the chapter 5).

At the bottom-left of the page, click the "Clear Profiles and Restart" button. Once restart is complete, old profiles discovered and/or added via Web configurator are deleted. Now the unit can be reinstalled.

EXAMPLE: CONTECA EASY 750 SERIES DATA AND PARAMETERS

To show the parameters of the connected devices, following the screens below.

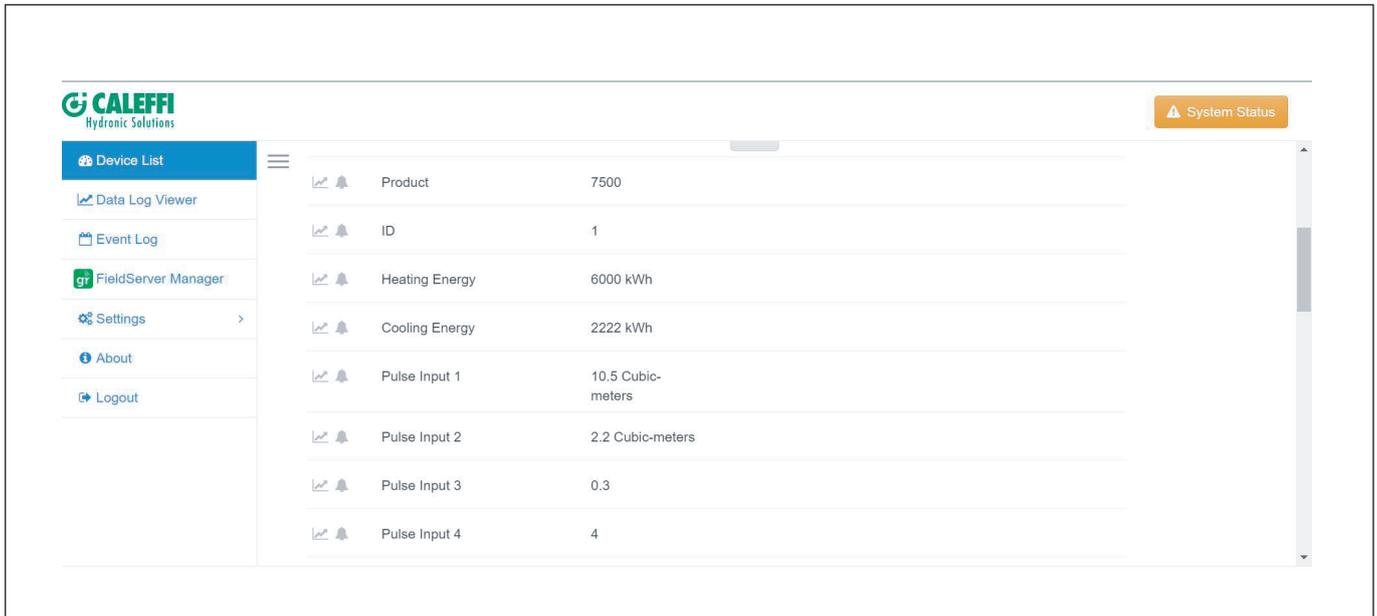
Select "Device List" to show the devices profiles (1)

Select the profile of the connected device (2).

The screenshot shows the Caleffi web interface. On the left, a sidebar menu has 'Device List' highlighted with a red arrow and the number '1'. Below it, 'FieldServer Manager' is also highlighted with a red arrow and the number '2'. The main content area is titled 'System View' and displays a table for 'CONTECA EASY 750 Series'.

Name	Address	Location	Description	Product	ID	Heating Energy	Cooling Energy	Power
BAC_IP_CONTECA_EASY_750_Series_1_	1			7500	1	6000	2222	0
BAC_IP_CONTECA_EASY_750_Series_2_	2			7500	2	156	2	0

The parameters of the select device are shown in the screen below.



10. LED Functions



Tag	Description
SS	The SS LED will flash once a second to indicate that the bridge is in operation.
ERR	The SYS ERR LED will go on solid indicating there is a system error. If this occurs, immediately report the related "system error" shown in the error screen of the FS-GUI interface to support for evaluation.
PWR	This is the power light and should always be steady green when the unit is powered.
RX	The RX LED will flash when a message is received on the serial port on the 3-pin connector. If the serial port is not used, this LED is non-operational.
TX	The TX LED will flash when a message is sent on the serial port on the 3-pin connector. If the serial port is not used, this LED is non-operational.

Appendix 1. COMPLIANCE WITH UL REGULATIONS

For UL compliance, the following instructions must be met when operating gateway.

The units shall be powered by listed LPS or Class 2 power supply suited to the expected operating temperature range. The interconnecting power connector and power cable shall:

- Comply with local electrical code.
- Be suited to the expected operating temperature range.
- Meet the current and voltage rating for gateway.

Furthermore, the interconnecting power cable shall:

- Be of length not exceeding 3.05m (118.3")
- Be constructed of materials rated VW-1, FT-1 or better.
- If the unit is to be installed in an operating environment with a temperature above 65°C (149°F), it should be installed in a Restricted Access Area requiring a key or a special tool to gain access.
- This device must not be connected to a LAN segment with outdoor wiring.

Appendix 2. VIEWING DIAGNOSTIC INFORMATION

- Type the IP Address of the gateway into the web browser to connect to the gateway.
- Click on Diagnostics and Debugging Button, then click on view, and then on connections.
- If there are any errors showing on the Connection page, refer to Appendix A.4 for the relevant wiring and settings.



Index	Name	Tx Msg	Rx Msg	Tx Char	Rx Char	Errors
0	S1 - MODBUS_RTU	8,314	8,314	66,512	377,905	1
1	R1 - BACnet_MSTP	285	201	6,377	2,753	2

Appendix 3. CHECK WIRING AND SETTINGS

No COMS on Modbus RTU side. If the Tx/Rx LEDs are not flashing rapidly then there is a COM issue. To fix this, check the following:

- Visual observations of LEDs on gateway
- Check baud rate, parity, data bits, stop bits
- Check device address
- Verify wiring
- Verify device is connected to the same subnet as the gateway
- Verify the Modbus device was discovered in Web Configurator (Chapter 5)
- Field COM problems:
 - If Ethernet protocols are used, observe Ethernet leds on the gateway
 - Check dipswitch settings (using correct baud rate and device instance)
 - Verify IP Address setting
 - Verify wiring

Appendix 4. SECURING GATEWAY WITH PASSWORDS

Access to the gateway can be restricted by enabling a password on the FS-GUI Passwords page – click Setup and then Passwords in the navigation panel. There are 2 access levels defined by 2 account names:

- The Admin account has unrestricted access to the gateway.
- The User account can view any gateway information, but cannot make any changes or restart the gateway.

The password needs to be a minimum of eight characters and is case sensitive. If the password is lost, click cancel on the password authentication popup window, and email the password recovery token to support to receive a temporary password from the support team.

Access the gateway to set a new password.



Appendix 5. LEGIOMIX_6000_SERIES MODBUS RTU MAPPINGS TO BACNET

Point Name	BACnet Object Type	BACnet Object ID	Description
Product type	AV	1	6001
Address	AV	2	1...247
Tmix Deg_C (Mixing temp.)	AV	3	°C
Trec Deg_C (Recirculation temp.)	AV	4	°C
Tmix Deg_F (Mixing temp.)	AV	5	°F
Trec Deg_F (Recirculation temp.)	AV	6	°F
State	AV	7	1 - Regulation 2 - Disinfection 3 - Flushing 4 - Thermal shock 5 - Alarm
Program ID	AV	8	0 - 0 1 - 1a 2 - 1b 3 - 2
Current Day	AV	9	1...31
Current Month	AV	10	1...12
Current Year	AV	11	2017...
Current Hour	AV	12	0...23
Current Minute	AV	13	0...59
Language	AV	14	0 - IT 1 - EN 2 - FR 3 - DE 4 - ES 5 - PT 6 - NL 7 - SL 8 - HR 9 - SR 10 - RO
Time ON (h) (Start dis.)	AV	15	0...23 (h)
Time ON (m) (Start dis.)	AV	16	0...59 (min)
Time OFF (h) (Stop dis.)	AV	17	0...23 (h)
Time OFF (m) (Stop dis.)	AV	18	0...59 (min)
Time Wait (before reading rec.)	AV	19	1...255 (min)
Time min (to have correct dis.)	AV	20	0...254 (min)
Time Flux (Time of closing relay 4 after ending the dis.)	AV	21	0...2550 (sec)
Time Shock (Time of duration)	AV	22	1...4320 (min)
Set Reg Deg_C (Set Mix temp)	AV	23	20...85 (°C)
Set Dis Deg_C (Set Dis temp)	AV	24	40...85 (°C)
Set Ric Deg_C (Set Rec temp)	AV	25	40...85 (°C)
Set Shock Deg_C (Set Shock temp)	AV	26	30...85 (°C)
Set Tmax Deg_C (Set max temp)	AV	27	50...90 (°C)
Set Reg Deg_F (Set Mix temp)	AV	28	68...185 (°F)
Set Dis Deg_F (Set Dis temp)	AV	29	104...185 (°F)
Set Ric Deg_F (Set Rec temp)	AV	30	104...185 (°F)
Set Shock Deg_F (Set Shock temp)	AV	31	86...185 (°F)
Set Tmax Deg_F (Set max temp)	AV	32	122...194 (°F)
Daily Disinfection	AV	33	bit 5: Saturday bit 4: Friday bit 3: Thursday bit 2: Wednesday bit 1: Tuesday bit 0: Monday bit 6: Sunday

Presence of Recirculation Probe	BV	34	1 = Presence of Rec probe
Anticlog	BV	35	1 = Anticlog
Legal Hour	AV	36	bit 2:0 bit 3:1 = Disabled bit 2:1 bit 3:0 = EUR bit 2:0 bit 3:1 = USA bit 2:1 bit 3:1 = Custom
International System of Unit	BV	37	0 = °C , 1 = °F
LED Display Enable	BV	38	1 = LED display enable
Shock Activation	BV	39	1 = Shock Activation
Pin-code Reset	BV	40	1 = Pin-code Reset
Disinfection Reset	BV	41	2 = Disinfection Reset
Alarm Reset	BV	42	3 = Alarm Reset
Historical Data	BV	43	4 = Historical Data
Shock Deactivation	BV	44	1 = Shock Deactivation
Time Motor (Time to move actuator from close to open position)	AV	45	8...320 (sec)
Time Play (Delay of time in movement of actuator while changing direction)	AV	46	1...255 (sec)
Start Sunday Legal Hour *	AV	47	-3, -2, -1, 1, 2, 3
Start Month Legal Hour	AV	48	1...12
End Sunday Legal Hour *	AV	49	-3, -2, -1, 1, 2, 3
End Month Legal Hour	AV	50	1...12

* It's possible to choose the day of the hour change by setting the parameter #36 (Legal Hour) to "Custom":

- set: **-1** for the last Sunday of the month;
- set: **-2** for the second to last Sunday of the month;
- set: **-3** for the third last Sunday of the month;
- set: **1** for the first Sunday of the month;
- set: **2** for the second Sunday of the month;
- set: **3** for the third Sunday of the month.

Appendix 6. LEGIOMIX_2.0_6000_SERIES MODBUS RTU MAPPINGS TO BACNET

Point Name	BACnet Object Type	BACnet Object ID	Description
Model	AI	1	6002
ID Modbus	AI	2	1...250
T1	AI	3	°C (°F) *
T2	AI	4	°C (°F) *
ID Number	AI	5	1701...9952
Serial Number	AI	6	0001...9999
Status	AI	7	0 = Motor test 1 = Zero acquisition 2 = Full scale acquisition 3 = Water mixing status 4 = Thermal shock status 5 = Thermal disinfection status
Alarms AL01	BI	8	1 = AL01
Alarms AL03	BI	9	1 = AL03
Alarms AL04	BI	10	1 = AL04
Alarms AL05	BI	11	1 = AL05
Alarms AL06	BI	12	1 = AL06
Alarms AL07	BI	13	1 = AL07
Alarms AL08	BI	14	1 = AL08
Alarms AL09	BI	15	1 = AL09

Alarms AL10	BI	16	1 = AL10
Alarms AL11	BI	17	1 = AL11
IN1 Status	BI	18	1 = disabled ; 0 = enabled
IN2 Status	BI	19	1 = disabled ; 0 = enabled
OUT1 Status	BI	20	1 = disabled ; 0 = enabled
OUT2 Status	BI	21	1 = disabled ; 0 = enabled
OUT3 Status	BI	22	1 = disabled ; 0 = enabled
Adjustment Status	AI	23	0 = Not in progress 1 = On max temperature limit 2 = T1 enabled control 3 = T2 enabled control with d2 type 4 = T2 enabled control with d1 type 5 = ΔT measurement in progress
Motor Status	AI	24	0 = Motor stopped 1 = Motor opening 2 = Motor closing
Device Adjustment Status	AI	25	0 = Without adjustment 1 = Adjustment on band 1 2 = Adjustment on band 2 3 = Adjustment on band 3 4 = Adjustment in position
DN	AI	26	0 = DN15 1 = DN20 2 = DN25 3 = DN32 4 = DN40 5 = DN50
Seconds	AI	27	0...59
Current Day	AI	28	1...7
Firmware	AI	29	Firmware
Software	AI	30	Software
Checksum	AI	31	Checksum
Encoder Position	AI	32	Encoder Position
Day	AV	33	1...31
Month	AV	34	1...12
Year	AV	35	0...99
Hour	AV	36	0...23
Minute	AV	37	0...59
Check Battery	BV	38	1 = confirmed ; 0 = not confirmed
Day-hour	BV	39	1 = confirmed ; 0 = not confirmed
Daylight Saving Time	BV	40	1 = enabled ; 0 = not disabled
Time Format	BV	41	1 = 12H ; 0 = 24H
Temperature Unit	BV	42	1 = °F ; 0 = °C
U.S. daylight Saving Time	BV	43	1 = enabled ; 0 = disabled
Disinfection Control	BV	44	1 = on T2 ; 0 = on T1
Encoder Steps Acquisition	BV	45	1 = encoder steps acquisition
Set Point Temperature	AV	46	35...65°C (°F) *
Disinfection Type	AV	47	bit 1-0: 00 = In1; 01 = In2; 10 = In3 bit 2: – bit 3: – bit 4: propagation time: 1 = fixed; 0 = calculated bit 5: ECO function: 1 = enabled; 0 = disabled bit 6: – bit 7: control on temp: 1 = d1; 0 = d2
Minimum Disinfection Temperature	AV	51	50...85°C (°F) *
Minimum Disinfection Time	AV	52	1...600
Maximum Disinfection Time	AV	53	3...900
Disinfection Start Day Monday	BV	54	1 = enabled ; 0 = disabled
Disinfection Start Day Tuesday	BV	55	1 = enabled ; 0 = disabled

Disinfection Start Day Wednesday	BV	56	1 = enabled ; 0 = disabled
Disinfection Start Day Thursday	BV	57	1 = enabled ; 0 = disabled
Disinfection Start Day Friday	BV	58	1 = enabled ; 0 = disabled
Disinfection Start Day Saturday	BV	59	1 = enabled ; 0 = disabled
Disinfection Start Day Sunday	BV	60	1 = enabled ; 0 = disabled
Monday Disinfection Starting Minute	AV	61	0...59
Monday Disinfection Starting Hour	AV	62	0...23
Tuesday Disinfection Starting Minute	AV	63	0...59
Tuesday Disinfection Starting Hour	AV	64	0...23
Wednesday Disinfection Starting Minute	AV	65	0...59
Wednesday Disinfection Starting Hour	AV	66	0...23
Thursday Disinfection Starting Minute	AV	67	0...59
Thursday Disinfection Starting Hour	AV	68	0...23
Friday Disinfection Starting Minute	AV	69	0...59
Friday Disinfection Starting Hour	AV	70	0...23
Saturday Disinfection Starting Minute	AV	71	0...59
Saturday Disinfection Starting Hour	AV	72	0...23
Sunday Disinfection Starting Minute	AV	73	0...59
Sunday Disinfection Starting Hour	AV	74	0...23
Time Bands 1 Ric Start	BV	75	1 = enabled ; 0 = disabled
Time Bands 2 Ric Start	BV	76	1 = enabled ; 0 = disabled
Time Bands 3 Ric Start	BV	77	1 = enabled ; 0 = disabled
Time Bands 4 Ric Start	BV	78	1 = enabled ; 0 = disabled
Time Bands 5 Ric Start	BV	79	1 = enabled ; 0 = disabled
Time Bands 6 Ric Start	BV	80	1 = enabled ; 0 = disabled
Minimum Thermal Shock Temperature	AV	81	65...85°C (°F) *
Minimum Thermal Shock Time	AV	82	0...4320
Maximum Thermal Shock Time	AV	83	0...4320
Maximum Temperature Limit	AV	84	65...85°C (°F) *
Thermal Schock	BV	85	1 = Start ; 0 = Stop
Disinfection	AV	86	1 = Start ; 0 = Stop
Reset active allarms	BV	87	0 = no allarm; 1 = allarm
Reset istorical allarms	BV	88	0 = no allarm; 1 = allarm

* WARNING:

if the "Temperature Unit" value is fixed in ° F (value = 1) the temperatures reported are already converted into ° F (not in ° C as per displayed)

Example of reading the Disinfection Type value:

1 - Value read in the Configurator Parameters: 130 decimals value

2 - Conversion the value in binarys value (composed to 8 bit):

binarys value	1	0	0	0	0	0	1	0
bit	7°	6°	5°	4°	3°	2°	1°	0°

3 - Interpretation of the reading Byte:

bit 0	0	==> ln3
bit 1	1	
bit 2	0	value not used
bit 3	0	value not used
bit 4	0	==> calculated
bit 5	0	==> disabled
bit 6	0	value not used
bit 7	1	==> d1

Appendix 7. CONTECA_EASY_750_SERIES MODBUS RTU MAPPINGS TO BACNET

Point Name	BACnet Object Type	BACnet Object ID	Description
Product	AI	1	7500
ID	AI	2	1...250
Heating Energy	AI	3	kWh
Cooling Energy	AI	4	kWh
Pulse Input 1	AI	5	m ³ (DHW)
Pulse Input 2	AI	6	m ³ (DCW)
Pulse Input 3	AI	7	m ³ / kWh
Pulse Input 4	AI	8	m ³ / kWh
Power	AI	9	kW
Flow Rate	AI	10	m ³ / h
Flow Temperature	AI	11	°C
Return Temperature	AI	12	°C
Delta Temperature	AI	13	Flow - Return Temperature
Alarm/Status	AI	14	bit 0 : T Flow error bit 1 : T Return error bit 2 : No flow rate bit 3 : Valve internal leakage bit 4 : - bit 5 : - bit 6 : Battery error bit 7 : No credit bit 8 : Measurement unit error C0 bit 9 : Measurement unit error C1 bit 10 : Measurement unit error C2 bit 11 : Measurement unit error C3 bit 12 : Measurement unit error C4 bit 13 : - bit 14 : - bit 15 : -
Product (Imperial Units)	AI	15	7500
ID (Imperial Units)	AI	16	1...250
Heating Energy (Imperial Units)	AI	17	kBTU
Cooling Energy (Imperial Units)	AI	18	kBTU
Pulse Input 1 (Imperial Units)	AI	19	kgal (DHW)
Pulse Input 2 (Imperial Units)	AI	20	kgal (DCW)
Pulse Input 3 (Imperial Units)	AI	21	kgal / kBTU
Pulse Input 4 (Imperial Units)	AI	22	kgal / kBTU
Power (Imperial Units)	AI	23	kBTU / h
Flow Rate (Imperial Units)	AI	24	GPM
Flow Temperature (Imperial Units)	AI	25	°F
Return Temperature (Imperial Units)	AI	26	°F
Delta Temperature (Imperial Units)	AI	27	Flow - Return Temperature
Alarm/Status (Imperial Units)	AI	28	bit 0 : T Flow error bit 1 : T Return error bit 2 : No flow rate bit 3 : Valve internal leakage bit 4 : - bit 5 : - bit 6 : Battery error bit 7 : No credit bit 8 : Measurement unit error C0 bit 9 : Measurement unit error C1 bit 10 : Measurement unit error C2 bit 11 : Measurement unit error C3 bit 12 : Measurement unit error C4 bit 13 : - bit 14 : - bit 15 : -

Manufactured By
MSA Innovation LCC
1100 Cranberry Woods Drive
Cranberry Township, PA 16066
USA

Authorized representative in the European Community
Safety IO,
Franz-Ehrlich-Straße 9,
12489 Berlin,
Germany

