

MCS-MSTP-ROUTER

Revision History

Date	Author	Description
11-27-19	DEW	Setup

Startup Guide

MCS-MSTP-ROUTER

BAS Router (BACnet Multi-Network Router)



Any questions regarding this release, contact: support@mcscontrols.com

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1.1. EQUIPMENT SETUP

1.1.1 Mounting

The MCS-MSTP-ROUTER can be mounted using the DIN rail mounting bracket on the back of the unit.











1.1.3 Connecting the R1 and R2 Ports

The R1 and R2 Ports are RS-485.

NOTE: For the R1 Port, ensure RS-485 is selected by checking that the number 4 DIP Switch is set to the left side.

Connect to the 3-pin connector(s) as shown below.



The following baud rates are supported: 9600, 19200, 38400, 76800

1.2. Wiring

RS-485	
BMS RS-485 Wiring	Gateway Pin Assignment
RS-485 +	TX +
RS-485 -	RX -
GND	GND

NOTE: Use standard grounding principles for GND.

1.3. 10/100 Ethernet Connection Port

The Ethernet Port is used both for BACnet/IP communications and for configuring the MCS-MSTP-ROUTER via the Web App. To connect the MCS-MSTP-ROUTER, either connect the PC to the Router's Ethernet port or connect the Router and PC to an Ethernet switch. Use Cat-5 cables for the connection.

NOTE: The Default IP Address of the MCS-MSTP-ROUTER is 192.168.2.101, Subnet Mask is 255.255.255.0.

1.4. POWER UP THE DEVICE

Apply power to the MCS-MSTP-ROUTER as shown below in Figure 6. Ensure that the power supply used complies with the specifications provided in Appendix B.1.

- The gateway accepts 9-30VDC or 24VAC on pins L+ and N-.
- Frame GND should be connected, except when using 24VAC.



1.5. CONNECTING TO THE MCS-MSTP-ROUTER

The FieldServer Toolbox Application can be used to discover and connect to the MCS-MSTP-ROUTER on a local area network. To connect to the MCS-MSTP-ROUTER over the Internet using Toolbox, add the Internet exposed IP Address of the Router by clicking on the + button, or alternatively enter the Internet exposed IP Address in a web browser directly.

1.5.1 Using the FieldServer Toolbox

- Install the FS Toolbox application from the USB drive or download it from the Sierra Monitor website.
- Use the FS Toolbox application to find the MCS-MSTP-ROUTER, change the IP Address details (if required) and launch the Web App (by clicking the Connect button).

FieldServer Toolbox						
FieldServer Setup He	r Toolbo	x			S	M
DEVICES	۲	IP ADORESS	MAC ADDRESS	FAVORITE	CONNECTIVITY	
DCC285 QS.CSV v4.10	36	192.168.2.135	00-50-4E-01-02-03	*	•	

٦

1.6. Using a Web Browser Directly

- Open a Web Browser and connect to the MCS-MSTP-ROUTER's Default IP Address. The Default IP Address of the MCS-MSTP-ROUTER is 192.168.2.101, Subnet Mask is 255.255.255.0.
- If the PC and the MCS-MSTP-ROUTER are on different IP Networks, assign a Static IP Address to the PC on the 192.168.2.X network.

at Bacret Router	BACost Device	RACnet Ethernet	Controls
A Bacert Explorer	- DACHELDEVICE	bachet colernet	Condois
	Device Name BACeut Rooker	Enable 🛛	Related Defeats
 Network Settings 	Device Instance 1000	Network Number 3	Save Restart
S Router Diagnostics	Device Location -	DAGE AN MICTO COMINGE	
SMC Cloud™	Device Connection B4Cnet IP Wind 1 *	BAChet MSTP Settings	
0 About	BAC not ID Wired 1	Max Info Frames 50	Status
	bachecie when i	Max Master 127	Router is online
	Enable R		
	Network Number 1	BACnet MSTP R1	Log
	IP Port 47308	Enable	
	DAGent ID Miseed 2	Network Number 4	
	BACHELIP WITED 2	MAC Address 0	
	Enable 🛛	Baud Rate 38400 •	
	Network Number 2	Token Usega Timeout (ma) 50 v	
	IP Port 47309		
	DI COMPANYE	BACnet Explorer	
	BACRET IP WIFI	Network Number 7	
	Enable D		
	Network Number 6		
	IP Port. 47810		
	BACnet IP BBMD		
	Copyright © Sierro	a Monitor Corporation - Diagnostics	
	Figure 7: BACe	not Router Settings Dage	

NOTE: The SMC Cloud[™] tab (see Figure 7) allows users to connect to the SMC Cloud, Sierra Monitor's device cloud solution for IIoT. The SMC Cloud enables secure remote connection to field devices through a FieldServer and its local applications for configuration, management, maintenance.

1.7. CONFIGURING THE MCS-MSTP-ROUTER

1.7.1 Settings

1.7.1.1. 6.1.1 Button Functions

Controls		• Save – write the currently displayed settings to the device. A restart will be required to apply the updated settings.
Reload	Defaults	 Reload – discard the currently displayed settings and reload the settings stored on the device. This will undo any unsaved edits.
Save	Restart	• Defaults – discard the currently displayed settings and load default settings. This must still be saved and the device must be restarted for the default settings to be applied.
		Restart – restarts the device.

1.7.2 Multiple Connections

- Network Number set up the BACnet network number for the connection. Legal values are
- 1-65534. Each network number must be unique across the entire BACnet internetwork.
- Enable enable or disable the connection; note that BACnet/IP Primary is always enabled.

BACnet Dev	ice
Device Name	BACnet Router
Device Instance	1000
Device Location	-
Device Connection	BACnet IP Wired 1 •

1.8. BACnet/IP

BACnet IP	Wired 1
Enable	۲
Network Number	1
IP Port	47808

BACnet IP Wired 2

Enable	0	
Network Number	2	
IP Port	47809	

BACnet IP WiFi

Enable	0
Network Number	6
IP Port	47810

BACnet IP BBMD

Enable		
BBMD Connection	BACnet IP Wired 2	•
Public IP Address	-	
Public IP Port	-	
	Edit BDT	

- Device Instance and Device Name a BACnet
- Router must provide a Device Object. Configure its name and Instance Number here. Take care to select a Device Instance Number that is unique across the entire BACnet internetwork.
- Device Location enter a location for the Device. The loca tion may not contain any commas.
- Device Connection select which connection to bond the BACnet device settings.
- IP Port the BACnet/IP default is 47808 (0xBAC0), but a different port number may be specified here.
- IP Port this MUST be different to the IP Port used on the BACnet/IP Primary connection. Default is 47809 (0xBAC1).
- BBMD Connection select which connection to bond the BACnet/IP BBMD settings.
- Public IP Address and Port if the BBMD is being accessed across a NAT Router, then these values must be configured with the public IP Address and Port by which the BBMD can be reached from across the NAT Router. The Public IP Address and Port would also be used in the BDT of remote BBMD's that need to reach this BBMD across the NAT Router. If no NAT Router is being used, these fields can be left blank. For example, type into a Google browser "my IP Address" to see the local PC's Public IP Address.

1.9. BACnet MS/TP, BACnet Ethernet and BACnet Explorer

Enable	0	
Network Number	3	
BACnet MS	STP Settings	
Max Info Frames	50	
Max Master	127	
BACnet MS	STP R1	
BACnet MS Enable Network Number	STP R1	
BACnet MS Enable Network Number MAC Address	STP R1	
BACnet MS Enable Network Number MAC Address Baud Rate	STP R1 4 0 38400	
BACnet MS Enable Network Number MAC Address Baud Rate Token Usage Time (ms)	STP R1 4 0 38400 out 50	

- Max Info Frames the number of transactions the
- Router may initiate while it has the MS/TP token. Default is 50.
- Max Master the highest MAC address to scan for other MS/TP master devices. The default of 127 is guaranteed to discover all other MS/TP master devices on the network.
- MAC Address legal values are 0 to 127, must be unique on the physical network.
- Baud Rate the serial baud rate used on the network.
- Token Usage Timeout (ms) the number of milliseconds the router will wait before deciding that another master has dropped the MS/TP token. This value must be between 20ms and 100ms. Choose a larger value to improve reliability when working with slow MS/TP devices that may not be able to meet strict timing specifications.

1.10. Network Settings

Т

The IP Settings for the MCS-MSTP-ROUTER are used by BACnet/IP. The IP Settings can be edited in the Network Settings section as shown.

≓ Bacnet Router	IP Settings	
A Bacnet Explorer	N1 DUCP Client State	0
F Network Settings	N1 IP Address	192.168.3.87
양 Router Diagnostics	N1 Netmask	255.255.255.0
SMC Cloud™	Default Gateway	192.168.3.1
About	Domain Name Server 1	8.8.8.8
	Domain Name Server 2	8.8.4.4
		Save Refresh
	Copyright © Sierra Monitor Corpor	ration - Diagnostics
	Figure 8: Network S	ettings

1.11. Router Diagnostics

By clicking on the Router Diagnostics tab all the connection communication details can be viewed to ensure the BACnet Router is working correctly.

Bacnet Explorer				
	Network Number	1		
Network Settings	Info Statistics	Messages Sent		264
안 Router Diagnostics		Messages Received		975314
SMC Cloud [™]	Error Statistics	Total Errors		(
About				
	Routing Table			
	DNET MA	AC Address	Status	
	5 19	2.168.3.121:47808	Available	
	6 19	2.168.3.12:47808	Available	
	50 19	2.168.3.101:47808	Available	
	1100 19	2.168.3.222:47808	Available	
	1101 19	2.168.3.50:47808	Available	
	1200 19	2.168.3.222:47808	Available	
	1203 19	2.168.3.50:47808	Available	
	50003 19	2.168.3.107:47808	Available	
	60003 19	2.168.3.64:47808	Available	
	N1 - BACnet E	xplorer 47800		
	Network Number	7		
	Info Statistics	Messages Sent		97505
		Messages Received		(
	Error Statistics	Total Errors		(
	Routing Table is empty			

1.12. BACNET EXPLORER

The Bacnet Explorer tab allows installers to validate that their equipment is working on Bacnet without having to ask the BMS integrator to test the unit.

• To access the embedded BACnet Explorer click the BACnet Explorer tab.

acnet Router	BACnet Dev	ice	BACnet Ethernel	t	Controls
Bacret Explorer	Desire Name	Daff and Brocker	Englis (1		
Network Settings	Device Instance	1000	Network Number 3		Towned Linear
Router Disondation	Device Location				Serve Rentart
RAAD (Devel IV)	Device Connection	DACret P Wred 1 +	BACnet MSTP Se	ettings	
			Max Info Energias (0)		Status
About	BACnet IP V	Vired 1	Max Master 127		
Enable			(and the second second		Houser is online
Network Nur	Network Number		BACnet MSTP R1	1	Log
	IP Port	47805	-		rog
			Enable historie	8	
	BACnet IP V	Vired 2	MAC Address		
	Enable		Eaud Rate	36400	
	Network Number	2	Token Usage Timeout (ms)	50	
	IP Port	47505			
		Copyright © Sierra M	onitor Corporation - Diagnostica		

• Then login to the BACnet Explorer page using the supplied username and password. NOTE: The default user name is "admin" and default password is "admin".



NOTE: For BACnet/IP, click on the Settings button on the left side of the landing page to ensure the BACnet Router is on the BACnet/IP network subnet or to configure BBMD.

1.13. Discover Device List

• From the BACnet Explorer landing page, click on the BACnet Explorer button on the left side of the screen to go to the BACnet Explorer page.

										A Profile
4 BACnet Explorer		≡	A Discover	B Remove All						
	>		Search		Network	Device	Object	Property	Value	Monitor
Cloud Integrations	>		BACnet							•
0 About										
					Tatal Issue	0				
					nstali neritis.					
				Copyright © Sierra Mo	nitor Corpo	ration - C	lagnostici	,		
				Figure 12: BA	Cnet Ex	plorer	Page			

- To discover the devices connected to the same subnet as the BACnet Explorer, click the Discover button (binocular icon).
- This will open the Discover window, click the checkboxes next to the desired search settings and click Discover to start the search.

			A Discove	r		
Devices	Devices					
From device 0		to device	4194303			
Networks						
Discover All	Networks					
Discover Spec	ific Network	0				
					Discover	Cancel
		Figu	re 13: Discover V	Vindow		

NOTE: The "Discover All Devices" or "Discover All Networks" checkboxes must be unchecked to search for a specific device range or network.

NOTE: Allow the devices to populate before interacting with the device list for optimal performance. Any discovery or explore process will cause a green message to appear in the upper right corner of the browser to confirm that the action is complete.

Search	1	Device	Object	Property	Value	Monitor	
T (Dev_0)						-	
+ 12 (Dev_02)		1000 /PACant Bauteri	device (000 /PACent Review)	may and a langth accorded	1450	0.0	~
+ 13 (Dev_03)		TOOD (BACHEL ROUME)	dence toou (BACHE Router)	max-apud-lenger-accepted	1400	011	~
network 6		1000 (BACnet Houter)	device:1000 (BACnet Router)	object-name	BACnet Router	Off	~
+ 2	1	1000 (BACnet Router)	device:1000 (BACnet Router)	vendor-identifier	37	Off	C
+ 101 (New BACnet Node)	1	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	max-apdu-length-accepted	1458	Off	0
network 50	12	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	object-name	WeatherLink_1	off	0
+ 50001 (DIN410 1)	1	1991 (WeatherLink_1)	device:1991 (WeatherLink_1)	vendor-identifier	37	Off	0
+ 50001 (RM/10_1)	2	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	max-apdu-length-accepted	1458	orr	0
+ 50002 (f0M10_2)	2	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	object-name	Fike_Panel_01	Off	0
+ 00022	1	2982 (Fike_Panel_01)	device:2982 (Fike_Panel_01)	vendor-identifier	153	or	0
T 50055	14	4499 (BACnet Router)	device:4499 (BACnet Router)	max-apdu-length-accepted	1458	Off	0
- HERROR (DADA)	1	4499 (BACnet Router)	device:4499 (BACnet Router)	object-name	BACnet Router	or	0
 1000 (BAChet Rober) 1991 (Weatherlink, 1) 	\times	4499 (BACnet Router)	device:4499 (BACnet Router)	vendor-identifier	37	Off	0
+ 2982 (Fike_Panel_01) + 4499 (BACost Bauer)	Total	Items: 36 (Showing Items	12)				

1.14. View Device Details and Explore Points/Parameters

- To view the device details, click the blue plus sign () next to the desired device in the list.
 - o This will show only some of the device properties for the selected aspect of a device.

	_		Trace	1.1	1	151 55		
Search		v.	Object	Property	Value	Monitor		
+ 12 (Dev_02)	-							
13 (Dev_03)		2	device:1991 (WeatherLink, 1)	max-apdu-length-accepted	1458	Off	C	
network 6		2	device:1991 (WeatherLink_1)	object-name	WeatherLink_1	Off	0	
	1	4	device:1991 (WeatherLink_1)	vendor-identifier	37	Off	0	
network:50								
+ 50001 (RIM10_1)								
+ 50002 (RIM10 2)								
+ 50022								
+ 50022 + 50033								
+ 50022 + 50033 • network 60001	I							
+ 50022 + 50033 • network:60001 + 1000 (BACnet Router)								
+ 50022 + 50033 • network:60001 + 1000 (BACnet Router) - 1991 (WeatherLink_1)								
+ 50022 + 50033 • network:60001 + 1000 (BACnet Router) = 1991 (WeatherLink_1) device:1991 (WeatherLink_1)								
+ 50022 + 50033 network:60001 + 1000 (BACnet Router) - 1991 (WeatherLink_1) device:1991 (WeatherLink_1) + 2982 (Fike_Panel_01)								

To view the full details of a device, go back to highlighting the device directly (in Figure 16 "1991 WeatherLink_1") and click the Explore button (
 that appears to the right of the highlited device as a magnifying glass icon or double-click the highlighted device.

earch	1	Object	Property	Value	Monitor	
T 30022			1222			
+ 50033	5	device 1991 (Weathed ink. 1)	may and length accepted	1460	04	0
network 60001		device.1991 (WeatherLink_1)	shiast arms	Weathed late 4	0	~
+ 1000 (BACnet Router)		device 1991 (WeatherLink_1)	object-name	meamerLink_1	UII	~
= 1991 (WeatherLink_1) Q i		device:1991 (WeatherLink_1)	vendor-identifier	37	Off	~
device: 1991 (WeatherLink_1)	12	analog-input 1 (INSIDE_TEM	object-name	INSIDE_TEMPERATURE	Off	0
analog-input 1 (INSIDE_TEMPERATURE)	4	analog-input 2 (OUTSIDE_T	object-name	OUTSIDE_TEMPERATURE	or	0
analog-input 2 (OUTSIDE_TEMPERATURE)	1	analog-input:3 (INSIDE_HU	object-name	INSIDE_HUMIDITY	or	0
analog.cout 3 (INSIDE_HUMIDITY)	4	analog-input 4 (OUTSIDE_H	object-name	OUTSIDE_HUMIDITY	orr	0
analog input 4 (OUTSIDE 14 MIDITY)	2	analog-input 5 (WIND_SPEED)	object-name	WIND_SPEED	orr	0
analog input 4 (001002_nombin 1)	1	analog-input 6 (WIND_SPEE	object-name	WIND_SPEED_AVG	or	0
analog-eputo (WIND_SPEED)	1	analog-input 7 (STORM_RAIN)	object-name	STORM_RAIN	orr	0
analog-input 6 (VIND_SPEED_AVG) analog-input 7 (STORM_RAIN) analog-input 8 (WIND_DIRECTION)	4	analog-input 8 (WIND_DIRE	object-name	WIND_DIRECTION	or	0
+ 2582 (Fike_Panel_01)						
+ 4499 (BACnet Router)	Tota	Items: 44 (Showing Items: 11)				

- o Now additional device details are viewable; however, the device can be explored even further
- Click on one of the device details.

n Discover	Remove Al	1				
Search		1.4	Property	Value	Monitor	
network:60001		•				
+ 1000 (BACnet Router)		15	object-name	WIND DIRECTION	Off	0
= 1991 (WeatherLink_1)			1-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		10750	10000
device:1991 (WeatherLink_1)					
analog-input:1 (INSIDE_TEM	IPERATURE)					
analog-input2 (OUTSIDE_T	EMPERATURE)					
analog-input:3 (INSIDE_HUN	(IDITY)					
analog-input:4 (OUTSIDE_H	UMIDITY)					
analog-input:5 (WIND_SPEE	D)					
analog-input 6 (WIND SPEE	D AVG)					
analog-input:7 (STORM_RAI	N)					
analog-input/8 (WIND_DIRE)	CTION) Q					
+ 2982 (Fike_Panel_01)			4			
		Tot	al items: 44 (Showing Iten	ns: 1)		

• Then click on the Explore button or double-click the device object.

Search		2	Property	Value	Monitor	
network:60001					•	
 1000 (BACnet Router) 1991 (WeatherLink_1) device: 1991 (WeatherLink_1) 		~	cov-increment	D	on	
		w.	description	WIND_DIRECTION	Off	0 /
		2	event-state	normal	or	0
analog-input 1 (INSIDE_TEMPERATURE)		w.	object-identifier	analog-input 8	Off	0
analog-input 2 (OUTSIDE_TEMPERATURE)		ý.	object-name	WIND_DIRECTION	off	
analog-input.3 (INSIDE_HUMIDITY)		ġř.	object-type	analog-input	Off	0
analog-input 4 (OUTSIDE_HUMIDITY)		Ŷ.	out-of-service	false	off	
analog-input5 (WIND_SPEED)		ν.	present-value	23	Off	0 .
analog-input 6 (WIND_SPEED_AVG)		2	reliability	no-fault-detected	off	C
analog-input7 (STORM_RAIN)		÷.,	status-flags	[in-alarm: false; fault: false; overri	Off	0
analog-input8 (WIND_DIRECTION) Q + 2982 (Fike_Panel_01) + 4499 (BACnet Router)		2	units	no-units	Off	C
		otal	Items: 54 (Showing	Items: 11)		

A full list of the device details will appear o explore, simply press the Refresh button (value.

e right side window. If changes are expected since the last) that appears to right of individual properties to refresh the

NOTE: The Explorer Search Bar will find devices based on their Device ID.

NOTE: The Explorer Discovery Tree has 3 levels that correspond to the following.

- Network number
 - o Device
 - Device object

1.14.1 Edit the Present Value Field

The only recommended field to edit via BACnet Explorer is the device's present value field.

NOTE: Other BACnet properties are editable (such as object name, object description, etc.); however, this is not recommended because the BACnet Explorer is a discovery tool not a Building Management System (BMS).

• To edit the present value, select it in the property listings.

			1.1				
Search		4	Property	Value	Monitor		
+ 50002 (RIM10_2)	•				•		
network: 60001		¥.	cov-increment	0	Off	C	
+ 1000 (BACnet Router)		Q.	description	WIND_DIRECTION	Off	0	
= 1991 (WeatherLink_1)		4	event-state	normal	Off	0	6
device: 1991 (WeatherLink_1)		×	object-identifier	analog-input 8	Off	0	
analog-input:1 (INSIDE_TEMPERATURE)		¥	object-name	WIND_DIRECTION	Off	0	
analog-input:2 (OUTSIDE_TEMPERATUR	RE)	4	object-type	analog-input	off	0	
analog-input:3 (INSIDE_HUMIDITY)		¥	out-of-service	false	or	0	
analog-input:4 (OUTSIDE_HUMIDITY)		4	present-value	254	Off	0	
analog-input:5 (WIND_SPEED)		×	reliability	no-fault-detected	off	0	1
analog-input/6 (WIND_SPEED_AVG)		×	status-flags	[in-alarm: false; fault: false; overri	Off	0	6
analog-input:7 (STORM_RAIN)		4	units	no-units.	Off	C	1
analog-input-8 (WIND_DIRECTION)	Q						
+ 4499 (BACnet Router)	*	lota	i items: 230 (Showing ite	ms: 11)			

• Then click the Write button (\nearrow) on the right of the property to bring up the Write Property window.

	Write Prope	erty	
present-value	2		
		Write	Cance

• Enter the appropriate change and click write.

The window will close. When the BACnet Explorer page appears, the present value will be changed as specified.

Search		8	Property	Value	Monitor		
+ 50002 (RIM10 2)	•				•		
network:60001		ų,	cov-increment	0	Off	0	
+ 1000 (BACnet Router) = 1991 (WeatherLink 1)		v.	description	WIND_DIRECTION	Off	0	
		×.	event-state	normal	Off	C	
device:1991 (WeatherLink_1)		y)	object-identifier	analog-input 8	Off	0	
analog-input:1 (INSIDE_TEMPERATURE)		ų.	object-name	WIND_DIRECTION	or	0	ġ
analog-input 2 (OUTSIDE_TEMPERATURE	=>	×	object-type	analog-input	or	0	
analog-input:3 (INSIDE_HUMIDITY)		Ý	out-of-service	false	off	0	
analog-input:4 (OUTSIDE_HUMIDITY)		Y	present-value	2	Off	0	1
analog-input-5 (WIND_SPEED)		¥.	reliability	no-fault-detected	Off	0	>
analog-input/6 (WIND_SPEED_AVG)		V.	status-flags	[in-alarm: false; fault: false; overri	Off	0	
analog-input:7 (STORM_RAIN)		2	units	no-units	Off	0	
analog-input.8 (WIND_DIRECTION) Q				1000 - 2010 1000 - 2010			
+ 4499 (BACnet Router)		lota	I Items: 230 (Showing Ite	ms: 11)			



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