Page 1 of 39



# HSPA Cellular Router BC-3GM User Manual

3G Wireless Internet Access Device via HSPA with secure HTTPS environment



BEACON GLOBAL TECHNOLOGY VERSION: v1.1.49

> Technical Support: <u>tech.support@beacongt.com</u> For more information: <u>www.beaconglobaltech.com</u>

# **Table of Contents**

Co	pyright.		3
Pu	rpose		3
Re	vision H	listory	3
Tra	ademark	<s< th=""><th> 3</th></s<>	3
He	adquart	ter	3
1.	INTROD	DUCTION	4
	1.1.	OVERVIEW	4
	1.2.	MAIN FEATURE	5
2.	BR		6
	2.1.	APPEARANCE	6
	2.2.	COMPONENT	6
	2.3.	PACKAGES	8
	2.4.	SOFTWARE COMPOSITION	9
	2.4	1. Web-based configuration page	9
	2.4	.2. Firmware	9
3.	BE	FORE USAGE	9
	3.1.	Installation	10
	3.2.	Checking Device	10
	3.3.	Understanding Modem Router Mode	11
4.	SE	TTING UP YOUR PC ENVIRONMENT	12
	4.1.	Setting up host PC	12
5.	AC	CESSING WSU (WEB-BASED SETTING UTILITY)	14
	5.1.	How to access WSU	14
	5.2.	How to configure WSU	15
6.	со	NFIGURATION OF INTERNET CONNECTION	15
	6.1.	Setting up your cellular environment	15
	6.1	.1. Accessing WSU	15
7.	СО		29
	7.1.	Rockwell/Allen-Bradley PLC Configuration	29
	7.1.	.1. Configuration Guide	29
	7.2.	MODBUS TCP SMS	37
8.	IN	FORMATION OF SMS FUNCTION IN HSPA ROUTER	39
	8.1.	DSR.REBOOT	39
	8.2. D	DSR. NETINFO	
	8.3.	DSR.PPP = (ON or OFF)	39

# Copyright

This user manual describes features, especially usage of BC-3GM including hardware and software. BEACON GLOBAL TECHNOLOGY has made best effort to ensure that the information contained in this document is accurate and reliable. This document is the property of BEACON GLOBAL TECHNOLOGY and implies no license under patents, copyrights, trade secrets. No part of this publication should be copied, reproduced, stored in a retrieval system, or transmitted, in any form or by any means (electronic, mechanical, photographic, or otherwise) without the prior permission of BEACON GLOBAL TECHNOLOGY.

# Purpose

This manual includes how to use and configure the BC-3GM (Model name).

# **Revision History**

This user manual is based on firmware version v1.1.49

# Trademarks

All other products or technologies are the trademarks or registered trademarks of their respective companies.

# Headquarter

Beacon Global Technology Inc. 1812 Delacorte Dr., Bakersfield, CA 93311

# **1. INTRODUCTION**

## **1.1. OVERVIEW**

- BC-3GM is a 3G wireless internet access device with Ethernet interface, it performs wireless internet service between PC and wireless WAN via HSPA Cellular station.
- BC-3GM integrates a HSPA modem, a 32-bit MCU, system memories, a 10/100 Ethernet, Embedded OS, various network protocols for wireless internet.
- BC-3GM has some additional functionalities which include Always On-line; HTTP Log-On for security environment; IP Filtering and MAC filtering for high security application.
- BC-3GM also supports configuration change whenever/wherever necessary through Internet.
- BC-3GM supports Keep-Alive function to ensure 7\*24 hours online service.
- BC-3GM is the best choice for industrial application.

# **1.2. MAIN FEATURE**

- 3G Wireless internet access device
- Integrated 3G wireless HSPA modem
- A 10/100Mbps Ethernet interface
- Embedded Operating System
- User friendly Web-based Management Tool
- 6-Status LED indicates real-time status of the device
- An external power switch
- Support various Network Protocols
- Support sending both English and Chinese SMS messages through EtherNet/IP services from Rockwell Automation devices
- Support sending both English and Chinese SMS messages through Modbus TCP command
- DHCP Server
- NAT(Network Address Translation)
- Configuration change whenever/wherever necessary through Internet
- HTTPS security access to avoid hackers attack
- IP filtering, MAC filtering to ensure access for high security
- Keep-Alive function to make sure system are 7\*24 hours on-line.
- Allow up to 3 registered cellular phones to send SMS messages to reboot router and change settings.

# 2. BRIEF INFORMATION

# **2.1. APPEARANCE**

Below picture shows the appearance and structure of BC-3GM.



[Picture 2.1: BC-3GM Appearance ]

# 2.2. COMPONENT

## 2.2.1. MiniDCJack

Must connect the given power adapter DC 12V/1.5A on this jack.It can accept wide range 6V-30VDC for industrial purpose.

# 2.2.2. Power S/W

Turn the power on or off.

**2.2.3. Reset S/W** Reset the BC-3GM.

# 2.2.4. LAN

LED	State	Description
Green	ON	Indicates that 10Mbps LAN is connected.

Page 7 of 39

	BLINK	Indicates that data exists via 10Mbps LAN.
	OFF	Indicates that 10M LAN is disconnected.
	ON	Indicates that 100Mbps LAN is connected.
Orange	BLINK	Indicates that data exists via 100Mbps LAN.
	OFF	Indicates that 100M LAN is disconnected.

[Table 2.1 : LED indicator description on LAN port]

User can connect BC-3GM with Host PC, HUB, Router etc, via 10/100 LAN port. The RJ-45 connector (LAN port) has two Link-LED. Table below lists out description for each LED indicator.

# 2.2.5. Console

This port is for manufacturer use only. The console is designed mainly for diagnostic data reading. Normally this port is for debugging.

# 2.2.6. Antenna Connector

This connector should be connected to an antenna.

# 2.2.7. HSPA Module

This Router supports 3G 800/850/900/1700/1900/2100MHz with upload 384Kbps, downlink 21.1Mbps and uplink 7.2Mbps. 2G 850/900/1800/1900MHz

## 2.2.8. 6-Status LED

BC-3GM has 6-Status LED to indicate real-time status.

\* The LED position are from left to right on top view

LED	Display	Description		
Deview	ON	Indicates that main power is on		
Power	OFF	Indicates that main power is off		
5	Recognizes the HSPA modem			
Modem	OFF	Does not recognize the HSPA modem.		
Net	BLINK	Indicates that data exists on 3G wireless network		
Net	OFF	Indicates that data does not exist on 3G wireless network		
IP	ON	Indicates that cellular IP is received from ISP		
IP	OFF	Indicates that cellular IP is not achieved from ISP.		

Page 8 of 39

SIM	ON Indicates that U-SIM card is ready		
514	OFF	Indicates that U-SIM card is not ready	
	ON	Indicates that RF signal sensitivity is perfect (Over 30)	
		RF signal sensitivity has low, fair, good, excellent	
		Excellent: RSSI >= -79dbm On Off with 0.25s	
	BLINK	Good:-90dBM <= RSSI <= -80dBm Off 1.5s On 0.25s	
		Fair:-103dBM <= RSSI <= -91dBm Off 1s On 0.25s	
		Low and None:RSSI< -103dBm Off 0.5s On 0.25s	
RSSI		This is based on CSQ level	
		None (99)	
		Low(from 0 to 4)	
		Fair(from 5 to 7)	
		Good(from 8 to 11)	
		Excellent(from 12 to 31)	
	OFF	Indicates that RF signal sensitivity is poor.	

[Table 2.2: 6-Status LED indication]

# 2.2.9. U-SIM Socket

For metal housing, it shows location of SIM card on the CASE.



[Picture 2.2: 6-Status LED indication]

# 2.3. PACKAGES

BC-3GM full package includes:

1. BC-3GM

Page 9 of 39

BC-3GM User Manual



2. UTP Cable (Direct)



3. DC 12V/1.5A Adapter



# 2.4. SOFTWARE COMPOSITION

BC-3GM software includes:

### 2.4.1. Web-based configuration page

BC-3GM has a web-based configuration page that user can access and make changes on configurations.

# 2.4.2. Firmware

Firmware is the program operating the BC-3GM. Firmware: Version BC-3GM- v1.1.49\*

\* This version name will be changed whenever this is updated.

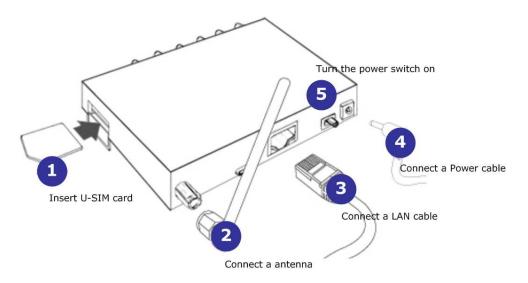
# 3. PREPARE DEVICE

## 3.1. Installation

BC-3GM is a 3G wireless internet access device with PC or other LAN devices via HSPA mobile station.

To install this device, please follow 5 steps below (corresponding position is marked in picture 3) to complete installation.

- 1. Insert U-SIM card into the slot named "SIM"
- 2. Connect the proper antenna.
- 3. Connect the LAN cable between PC and LAN port of this device.
- 4. Connect the power adapter.
- 5. Turn on the power switch.



[Picture 3.1: Installation of BC-3GM]

Page 11 of 39

BC-3GM initial status is set as PPP (NAT Router) and Always On-line mode. When you get this device for the first time, it is suggested to perform device check following below steps.

Install BC-3GM referring to "3.1 Installation."
 \* Be sure the LAN cable must be connected between PC and BC-3GM.

2. When you turn on the power switch, the LED named "POWER" is on.

3. The LED named "MODEM" is on.

\* You would see this LED on in 20 seconds. Should you met any problems please contact us

#### 4. The LED named "SIM" is on.

\* If this "SIM" LED is not on in 60 seconds, please check the whether the U-SIM card is correctly inserted.

#### 5. The LED named "NET" is asynchronously blinking.

\* Whenever data are transferred or received from/to 3G wireless network, this "NET" LED will be blinking asynchronously.

#### 6. The LED named "RSSI" is on or blinking.

\* When this "RSSI" LED is off, please check whether the antenna is correctly connected

#### 7. The LED named "IP" is on.

\* When you use wireless internet, this "IP" LED must be on. It might take a little while to get cellular IP because it depends on the current mobile network status. If this LED is not on, please check the configuration of **[WAN]** menu.

(Refer to "6.1.1 Accessing WSU, 3) Select **[Network]** page then Click **[WAN]** menu." for more details)

#### 3.3. Understanding Modem Router Mode

On Modem router mode, BC-3GM gets an IP from ISP (Internet Service Provider) then BC-3GM keeps the IP and shares the IP with connected Host PC via NAT.

The main feature is that BC-3GM gets the mobile IP from ISP and your PC connected with BC-3GM has a private IP from DHCP of BC-3GM.

On Modem Router mode, there are two kinds of options, one is always On-line and the other one is Demand On-line under Manual mode. For these options, please refer to [**WAN**] settings.

# 4. SETTING UP YOUR PC ENVIRONMENT

# 4.1. Setting up host PC

BC-3GM initial status is set as Modem router mode/Always On-line for the first time. Therefore the first step is to connect a LAN cable (Direct) between your PC and LAN port of BC-3GM. Set the network environment of your PC as automatically.

1. Take Windows XP as an example, to connect between PC and BC-3GM, point cursor over "My Network Places" and click right button on your mouse, then select [properties] in the menu.



[Picture 4.1: Step 1 of setting up your PC's network environment]

2. Check the "Local Area Connection" then click the right button on your mouse then select [Properties] in the menu.

Page 13 of 39

BC-3GM User Manual

e Edit View Favorites Too	ols Advanced Help		
) Back - 🕥 - 🏂 🔎	Search 🝺 Folders 🛄 🗸		
dress 🔕 Network Connections		Go Norton AntiViru	s 🔓
Network Tasks	LAN or High-Speed Internet		
And a second	Bluetopth Network	Local Area Connection 2	
Create a new	📈 🂢 Network cable unplugged	Enabled	
Set up a home or small	Bluetooth LAN Access Server		
<ul> <li>office network</li> </ul>	Local Area Connection		
Disable this network device	Enabled Compag 10 Disable		
Repair this connection	Disable Status		
Rename this connection	Repair		
View status of this	Bridge Connect		
Connection Change settings of this			
connection	Create Shorto. Delete	ut	
	Rename		
Other Places	Propertier		
D	Properties		
Control Panel			
My Documents			
V Computer			
G to section			
Details (*)			
Details 🛞			
Local Area Connection			

[Picture 4.2: Step 2 of setting up your PC's network environment]

3. Go to "General" Tab, scroll down the right hand side bar until you see "Internet Protocol [TCP/IP]", then double click it.

🕂 Local Area Connection Properties 🛛 💽 🔀				
General Authentication Advanced				
Connect using:				
B Compaq 10_100 MiniPCI Ethernet NIC				
Configure				
This connection uses the following items:				
Inf NWLink NetBIOS				
✓ T NWLink IPX/SPX/NetBIOS Compatible Transport Prot				
✓ Tinternet Protocol (TCP/P)				
Install Uninstall Properties				
Description				
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.				
Show icon in notification area when connected				
OK Cancel				

[Picture4.3: Step 3 of setting up your PC's network environment]

4. Check "Obtain an IP address automatically" then click the [OK] button.

BC-3GM User Manual		Page 14 of 39
	Internet Protocol (TCP/IP) Properties         General       Alternate Configuration         You can get IP settings assigned automatically if your network supports this appropriate IP settings.       Image: Configuration         O Dotain an IP address automatically       Image: Configuration         IP address       Image: Configuration         Subnet mask:       Image: Configuration         Image: Configuration       Image: Configuration         O Dotain an IP address automatically       Image: Configuration         Image: Configuration       Image: Configuration         O Dotain an IP address       Image: Configuration         Image: Configuration       Image: Configuration         Image: Configuration	

[Picture 4.4: Step 4 of setting up your PC's network environment]

 After setting up Host PC, please connect a LAN cable between PC and BC-3GM, then connect power cable between BC-3GM to power supply. Turn the power switch on then you will be able to see LED "IP" is on soon.

# 5. ACCESSING WSU (WEB-BASED SETTING UTILITY)

# 5.1. How to access WSU

WSU (Web-based Setting Utility) will provide a web-based interface for users to access and make configuration. This web-based configuration page just needs a couple simple steps to setup.

- 1) Set up your PC's network environment as automatically referring to "4. SETTING UP YOUR PC ENVIRONMENT"
- 2) Connect the LAN and power cable on BC-3GM.
- 3) Launch the web browser on your PC then write IP address, https://192.168.0.1: 443/home.asp (Set by default). This router is designed for Security HTTP env ironments. Port 443 accepts IE, Opera, Firebox.etc to access data under sec ure environment.
- 4) The pop-up window of login page appears.

BC-3GM User Manual		Page 15 c
	Windows Security	Ĩ
	The server 192.168.0.1 is asking for your user name and password. The server reports that it is from BC-3GM.	
	admin   Remember my credentials	
	OK Cancel	

[Picture5.1: Log-in window]

\* Default setting is

User name: admin

Password: admin

You can change this option on [System config] .1page ->[SYSTEM]menu.

5) When you enter the correct information, you will access WSU.

# 5.2. How to configure WSU

When you finish configuration please click [**Apply Changes**] button, then please reboot BC-3GM to make new setting effective.

Rebooting BC-3GM is a must. Click [**REBOOT**] menu, which will make new settings effective.

# 6. CONFIGURATION OF INTERNET CONNECTION

### 6.1. Setting up your cellular environment

# 6.1.1. Accessing WSU

- 1) Access WSU referring to 5.1.1 How to access WSU
- 2) [Home] page will be shown as below picture.

Status	Network	Advanced	Administrator
Up Time :	0day : 0h : 54m : 48s		
System Time :	1970-01-01 08:54:47		
IMEI :	356911050015922		
Firmware Version :	1.1.49-S [201504120725	]	
HSPA Module Version :	LISA-U270-62S-00		
Area Information :	LAI(45005), LAC(2241),	CELLID(4872204)	
Network Registration :	SKTelecom Local network	registered	
PIN Status :	PIN request deactivated		
Signal Level :	-89 dBm		
WAN (Modem Router) :	Connected IP:10.242.16.4 (Up:1	20 Bytes, Down : 68 Bytes)	
LAN:	IP:192.168.0.1 (Up:5	15 KBytes, Down : 958 KBytes	5)

[Picture 6.1: Home page of WSU]

**Up Time:** The time period that router has been ON.

**IMEI**: ID Number of router.

Firmware version: It shows which firmware version that router is running.

Area Information: It shows to which cell station that router is connecting.

**PIN Status**: It shows PIN status.

**Signal level:** This shows the signal strength. The higher value shows stronger signal. For example -65dbM is better than -80dbm.

**WAN**: It indicates whether router is connected to network. If connected, it will show IP address that has been assigned to this router. It also associates with volume of data that has been uploaded or downloaded.

LAN: It shows IP address of this router within local network.

3) Select [Network] page then click the [WAN] menu.

Status	Network	Adva	nced	Administrator			
Authentication related information and scheduler configuration.							
Mode :	Modem Router 🗸 🗸	·					
Connection mode :	Always connect 🗸 🗸	•					
APN Name :	web.sktelecom.com						
User Name :							
Password :							
Confirm Password :							
Authentication :	PAP & CHAP 🗸						
Auto PIN :	Disable 🗸 PI	N code					
Dialup :	*99#						



**Mode: Modem router** and **Disabled** are available to select. Default value is **Modem router** 

**APN Name**: It is provided by service provider to link to internet. For example, in Australia, Telstra has a few different APN names. Please use correct one for your service. Default value will be set as "**internet**"

**Username**: Username for your account if any.

**Password**: Password for your account if any.

**Authentication**: To choose **PAP** or **CHAP** or **PAP & CHAP**. Default is PAP & CHAP.

BC-3GM User Manual		Page 18 of 39
		rage 10 01 59
Auto PIN :	Disable V PIN code	
Dialup :	*99#	
Static DNS:	Disable      C Enable	
	DNS1:	
	DNS2 :	
MTU :	1492	
Check LAN Cable :	Enable 🗸	
Band :	Checking	
Periodic Reset :	Disable V Hours	
Keep Alive :	Disable 🗸	



**Auto PIN**: To choose from **Disable** or **enable**. If you choose **enable**, Router will enter PIN code automatically each time router is powered on.

# Please keep your PIN code in safe place. If wrong code is entered for 3 times, SIM card will be locked by user. By this case, you will need to ask service provider to provide PUK code to unlock your SIM.

**Periodic Reset**: Router will be reset according to preset timer. Value is from 1-24 hours. Default is Disable.

**Keep Alive**: This is to make sure that router is on-line all the time. If **enable** is chosen, router will ping to private server with **interval** time and IP set by user on **1**<sup>st</sup> or **2**<sup>nd</sup> or both server. When it fails, it will be counted as 1 time. If **count** reaches preset times, router will be reset and re-connect again.

BC-3GM User Manual		Page 19 of 39
Keep Alive :	EnableInterval :30Seconds (Min 10s, Max 300s)Fail count :2times1st Server :0.0.0.02nd Server :0.0.0.0	
	Apply Changes	

[Picture 6.4: Keep alive menu]

#### 4) Select [LAN]

Gateway IP: Choose from Static or DHCP Client. If Static is chose, Router will use static IP address shown on "IP address". If choose DHCP Client, Router IP address will be assigned by connecting host. Default to static.
IP Address: To assign IP address for Router. Default to 192.168.0.1

Subnet Mask: Default to 255.255.255.0

DHCP Client Range: This is the range that Router will assign IP address to device which connects to this router. Default is **192.168.0.200**-**192.168.0.250** 

1<sup>st</sup> DNS: To set up DNS address. Default is 168.126.63.1

2<sup>nd</sup>DNS: To set up DNS address. Default is 168.126.63.2

**Assign IP by MAC**: This is to prevent that devices link to router which may be assigned by different IP address every time router power on or reboot. It can be added up to 10 MAC address. The same MAC address cannot be assign to different IP address.You can enter MAC address format as both 00-00-00-00-00-00 and 00:00:00:00:00:00. And if router has entered MAC address format as 00:00:00:00:00:00, it will change format to 00-00-00-00-00-00. So you can see format as 00-00-00-00-00 only in list.

When you finish this setting, you must click [Apply change] button

Page	20	of	39

Status	Network	Advanced	Administrator
Gateway IP :	Static 🗸		
IP Address :	192.168.0.1		
Subnet Mask :	255, 255, 255, 0		
Default Gateway :	192.168.0.1		
DHCP :	Enable 🗸		
DHCP Client Range :	192.168.0.200 - 192.168.	0.250 Show Client	
1st DNS :	168.126.63.1		
2nd DNS :	168.126.63.2		
	Assign IP by MAC Mac Address :	IP Address :	
	Add	eset	
	Assigned IP List :		
	Mac Address	Assignedl IP Addr	ess Select
	Delete Selected	Delete All	Reset
	Apply Changes	Reset	

[Picture 6.5: Setting up LAN menu]

# 5) Click [Advanced] then [DMZ]

This is to enable or disable DMZ function. If **DMZ** is **Enabled**, please enter **DMZ Host IP address**. Default is disabled.

Status	Network	Advanced	Administrator
Enable DMZ :			
	DMZ Host IP Address :		
	Apply Changes Re:	set	
	[Picture 6.6: Setting up DI	1Z menu]	

#### 6) Click [Advanced] then [Port Forwarding]

If **Port Forwarding** is **enabled**, user can connect to device through Router. For example, there are 2 pieces of network devices, Device A with IP address 1 92.168.0.200 with port 2010 and device B with IP address 192.168.0.211. It can be set as picture below.

IP address: Type in device IP address.
Protocol: To choose from TCP, UDP or both.
Port Range: To enter port number or range.
Apply Changes: After Apply Changes is clicked, the setting will be added to Cu rrent Port Forwarding Table.

After setup is done, since user is offering Dynamic IP most of the time, if you have DDNS service, for example <u>http://bc3gm.dyndns.org:1110</u> to see device A and <u>http://bc3gm.dyndns.com:1111</u> to see device B, you also can check the **Select** checkbox then click **Delete Selected** or **Delete All**.

Status	Network	A	dvanced	Admin	istrator
	_				
Enable Port Forward :	$\checkmark$				
	IP Address	Р	rotocol	WAN Port	LAN Port
		TCP	& UDP 🗸	-	-
	Apply Changes		Reset		
Current Table :	Local IP Address	Protocol	WAN Port	LAN Port	Select
	192.168.0.200	TCP+UDP	1100-1200	100-200	
	Delete Selected	Delete All	Reset		

[Picture 6.7: Setting port Forwarding menu]

#### 7) Click [Advanced] then [IP Filter].

IP filtering is to block un-wanted user either from local or remote side. **Out-bound IP Filtering**: Enable this function will block all registered IP address on Local network. **In-Bound IP Filtering**: Enable this function will block all unregistered IP address to send in packet. Only registered IP address can send in packet under rule's restriction.

Rule: If Rule is click, the IP address can send it packet.

**Protocol**: It can define to allow TCP, UDP or both to communicate.

**Port Range**: It specifies port number or range to accept.

Status	Network	Advanced	Administrator
Enable Out-Bound Filter :			
	Local IP Address :	Protocol : TCP & UE	
	Apply Changes	Reset	
Current Table :	Local IP Add	iress Protocol	Select
	Delete Selected	Delete All	Reset
	In-Bound IP Filtering	l.	
	Enable	IP Address Protoc	ol Port Range
	Rule 1	TCP + U	
		ТСР	0 - 0
		UDP	0 - 0
	Rule 2	TCP + U	
		TCP	0 - 0
		UDP	0 - 0
	Rule 3 🗌	TCP + L	
		TCP	0 - 0
		UDP	
	Rule 4	TCP + L	
		TCP	0 - 0
		UDP	
	Rule 5	TCP + L	
		тср	0 - 0
	Rule 6	TCP + L	
		TCP	0 - 0
		UDP	
	Rule 7 🗌	TCP + L	
		TCP	0 - 0
		UDP	
	Rule 8 🗌	TCP + L	
		ТСР	0 - 0
		UDP	
	Rule 9 🗌	TCP + L	
		ТСР	0 - 0
		UDP	
	Rule 10 🗌	TCP + L	
		TCP	0 - 0
		UDP	0 - 0
	Apply Changes	Reset	

[Picture 6.8: Setting up IP filtering menu]

8) Click [Advanced] then [MAC Filter].

**MAC Filtering**: This is to block all un-wanted user if their equipment's MAC address is not registered.

If MAC Filtering is enabled, please enter MAC address and apply changes. Only registered MAC address can access to this router.

Status	Network	Advanced	Administrator
Enable MAC Filter :			
	MAC Address :		
	Apply Changes	Reset	
Current Table :		MAC Address	Select
	Delete Selected	Delete All Reset	

[Picture 6.9: Setting up MAC Filtering menu]

9) Click [Advanced] then [Ping].

**Ping**: Enter IP address and click [Run], Router will ping this IP address and show result.

Status	Network	Advanced	Administrator
IP Address/Host Name :			
	Run R	eset	
[	[Picture6.10: Setting up	Ping menu]	
10) Click [ <b>Advanced</b>	] then [ <b>NTP</b> ].		

This is to synchronize router timer with public time server.

Enter current time in the text box.

**Enable** NTP client update will synchronize to public time server. When router is power on, it will link to NTP server and update the timer.

**Time zone**: To selection which time zone to use.

Daylight saving: Click if Daylight saving is in use.

Status	Network	Advanced	Administrator
Current Time :	1970 - 1 - 1 9	: 8 : 27	
Enable NTP client update :			
NTP Server :	time.nist.gov		
Time Zone :	(GMT+08:00)Taipei Daylight saving 🗌		~
	Apply Changes	Reset Refresh	

#### [Picture6.11: Setting up NTP menu]

## 11) Click [Advanced] then [DDNS].

In most of case, user will assign Dynamic IP address to Router after it is connected. This IP address changes all the time. To avoid tracing IP, Router can link to DDNS service. For example, if you have applied a service from <u>www.dyndns.com</u> and registered address is bc3gm.dyndns.com. Then each time when Router powers on, it will register to <u>www.dyndns.com</u>. All you need is to type-in bc3gm.dyndns.com to login this router.

When DDNS is enabled:

**Domain name**: Enter the name has been applied.

**Username/E-mail**: Enter user name or e-mail. This depends on your DDNS service requirement. If it needs e-mail to login, then type-in e-mail address only.

Password/key: Enter password or key

			Page 25 of 39
Status	Network	Advanced	Administrato
Enable DDNS :			
Service Provider :			
Domain Name :			
User Name/Email :			
Password/Key :			
	Apply Changes Rese	ət	

[Picture6.12: Setting up DDNS menu]

# 12) Click [Administrator] then [Password].

This section is for you to change name and password. When you login to Router, you need to enter exactly the same information as you have entered.

Status	Network		Advanced	Administrator
Current Name:				
Current Password:				
New Name:				
>New Password:				
Confirm Password:				
	Apply Changes	Reset		

[Picture 6.13: Setting up Password menu]

# 13) Click [Administrator] then [Password].

Save: Click Save, it will save current setting as file. Load settings from File: Point to file location, click upload will load the settings which has been saved

Status	Network	Advanced	Administrator
Save Settings to File :	Backup		
Load Settings from File:		Browse Upload	
	[Picture 6.14: Setting up	Backup menu]	
14) Click [ <b>Administ</b>	rator] then [System	m Logs].	
	<u></u>		
-	og file will shows on	-	
Enable Remo	te Logs: Log file wil	log screen. I send to remote addr	ess which shows on
-	te Logs: Log file wil	-	ess which shows on
Enable Remo	te Logs: Log file wil	-	ress which shows on Administrator
Enable Remo Log Server II Status	te Logs: Log file wil Address.	l send to remote addr	
Enable Remo Log Server II Status Enable Logs	te Logs: Log file wil Address. Network	l send to remote addr	
Enable Remo Log Server II	te Logs: Log file wil Address. Network	I send to remote addr	

Refresh Clear

[Picture6.15: System Logs menu]

The logs will be kept in flash but the maximum size is 1MB. If log file exceeds maximum size, router will write a new log after deleting the old one.

Page 27 of 39

You can see the old log in the system log page. If you enable remote log You can see logs on the PC for remote troubleshooting or administration.

## 15) Click [Administrator] then [System].

This section is to setup Router system.

**Web Access**: Enable web access on port 443. When user needs to login, Web address should be <u>https://192.168.0.1/home.asp</u>

**Telnet Access**: If Telnet Access is enabled, please specify which port is used for Telnet. Default is port 23.

**NAT**: It is default as NAT router.

**SMS Phone Number**: If router received SMS "REBOOT" from registered phone Numbers, Router will make reboot. It allows to register 3 different cellular phone numbers.

Status	Network	Advanced	Administrator
Web Access :	Enable V Port : 443		
Telnet Access :	Enable 🗸 Port : 23		
NAT :	⊖ Off		
	Phone 1 : Enter Pho	one Number	
SMS Phone Number :	Phone 2 : Enter Pho	one Number	
	Phone 3 : Enter Pho	one Number	
	Apply Changes Re	set	

[Picture 6.16: Setting up System menu]

#### 16) Click [Administrator] then [Upgrade].

Router can be updated either from local network or remote PC.

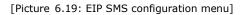
Select file: Point to new firmware location, then click [Upgrade].

Router will upgrade to new firmware. During upgrade procedure, please remain power on all the time until upgrade is complete finished.

BC-3GM User Manual			Page 28 of 39
Status	Network	Advanced	Administrator
Select File :		Browse	
	Upgrade	leset	
	[Picture 6.17: Setting up	Update menu]	
17) Click [ <b>Reboot</b> ]	].		
Reboot: When Re	boot is clicked, it will		
Reboot: When Re			
Reboot: When Re	boot is clicked, it will		
Reboot: When Re setting and rebo Status	boot is clicked, it will <b>ot.</b> Click OK, router w Network	ill save settings and	reboot.
Reboot: When Re setting and rebo	boot is clicked, it will <b>ot.</b> Click OK, router w	ill save settings and	reboot.

18) Click [Administrator] then select [EtherNet/IP SMS].You can define up to 30 SMS messages in Chinese on this web page. These predefined SMS messages can be sent to the specified phone number through EtherNet/IP service or Modbus TCP command. This chapter will describe how to configure EtherNet/IP parameters and RSLogix5000 tags for SMS text messaging.

Status	Network	Advanced	Administrator
List SMS			
This page allows set up S	MS text list for BC-3GM Single	Router with EIP.	
SMS 1 :	北京		
SM5 2 :	大连		
SMS 3 :	香港		
SMS 4 :	1		
SMS 5 :			
SMS 6 :			
SMS 7 :			
SMS 8 :			
SMS 9 :			
SMS 10 :			
	Apply Changes	Reset	



\*Please be noted that each Chinese SMS messages contains up to 80 Chinese characters, each English SMS messages contains up to 160 ASCII characters.

# 7. CONFIGURATION GUIDE For PLC

# 7.1. Rockwell/Allen-Bradley PLC Configuration

# 7.1.1. Configuration Guide

1) Create a new RSLogix5000 project, select controller type from drop-down list.

BGM User	Manual		Pag	e 30 of 39
hange Con	troller	Alle Bellevilles Barrisette B	X	
anange con	troner	Second Res Report Res 1.		
		ype will change, delete, and/or invalidate the		
	troller properties and troller type.	other project data that is not valid for the new		
	nonor gpc.			
From				
Type:	1756-L61	ControlLogix5561 Controller		
Revision:	20.12			
_ To				
Туре:	1756-L61	ControlLogix5561 Controller	-	
Revision:	1756-L62S	ControlLogix5562S Safety Controller		
nevision.	1756-L63	ControlLogix5563 Controller		
	1756-L63S	ControlLogix5563S Safety Controller		
	1756-L64	ControlLogix5564 Controller	-	

٦

[Picture7.1: Change Controller]

2) Create an Ethernet module and edit device type and revision information.

General Connection Module Info Internet Protocol Port Type: 1756-ENBT 1756 10/100 Mbps Ethernet Br Vendor: Alfen-Bradley Parent: Local	dge, Twisted Pair Media Change Type	Module Definition Revision: 2.1 Electronic Keying: Compatible Module	Revision: Electronic Keying:	3 ◄ Compatible I
Name: ENBT	Change Type	Rack Connection: None Time Sync Connection: None	Rack Connection: Time Sync Connection:	None None
Module Definition Change Revision: 4.7 Electronic Keying: Compatible Module Rack Connection: None	From Type: 1756-ENBT 1756 10/100 Mbps Ethernet Bridge, Twisted Pair Media Revision: 4.7		ОК	Cancel
Time Sync Connection: None	To Type: 1275-EN2T-12755-10/100 Mippe Ethernet Bridge, Fiber Media Type: 1075-0757-13755-10/100 Mippe Ethernet Bridge, Fiber Media Revision 12750-EN2TR-12756-10/100 Mippe Ethernet Bridge, 2-90rt, Twieted-Pair Me 12750-EN2TR-12756-10/100 Mippe Ethernet Bridge, 2-90rt, Twieted-Pair Me 12756-ENET-12756 Ethernet Communication Interface	[Picture7.2:Change device type and		
atus: Offine	OK + Cancel Help	revision]		

3) Under Module Properties, General tab, change IP Address as shown below.

Page	31	of	39

aeneral* Connecti	on* Time Sync* Module Inf	o* Internet Protoci	ol* Port Configuratio	n* RSNetWorx*
Type: 17	56-EN2T 1756 10/100 Mbps	Ethernet Bridge, Twi	isted-Pair Media	Change Type +
Vendor: All	en-Bradley			
Parent: Lo	cal		Ethernet Address	
Name:	NBT		Private Netwo	ork: 192.168.1.
Description:		*	IP Address:	192 . 168 . 0 . 10
		Ŧ	Host Name:	
- Module Definition				
		Change	Slot	1 •
Revision:	3.6			
Electronic Keying	: Compatible Modul	e		
Rack Connection	: None			
Time Sync Conn	ection: None			

[Picture7.3: Change IP Address]

4) Create a module named BC-3GM,select module type as Ethernet-Module Gen eric Ethernet Module, modify IP address as 192.168.0.1.

Module Properties Report: ENBT (ETHERNET-MODULE 1.1)						
General Con	nection Module Info					
Туре:	ETHERNET-MODULE Generic Ethernet Module					
Vendor:	Allen-Bradley	Allen-Bradley				
Parent:	ENBT					
Name:	BC3GM	- Connection Para				
Description:			Assembly Instance:	Size:		
		Input:	1	125 🚔 (32-bit)		
	<b>T</b>	Output:	2	124 🚔 (32-bit)		
Comm Formal	t: Data - DINT 👻	Configuration:	4	0 🚔 (8-bit)		
Address / H	lost Name	coninguration.				
IP Addre	ess: 192 . 168 . 0 . 1	Status Input:				
🔘 Host Na	ime:	Status Output:				
Status: Offline	OK	Cancel	Apply	Help		

[Picture7.4: Create BC-3GM module]

- 5) Import an Add-on program for BC-3GM\_AddOn\_Rung\_v1\_1.L5X
- a) In the Controller Organization window, expand the Tasksfolder and subfolde r until you reach the MainProgram folder.
- b) In the MainProgram folder, double-click to open the MainRoutine folder.

BC-3	3GM User Manual	Page 32 of 39
	[Picture7.5: Open MainRoutine	folder]
c)	Select an empty rung in the routine, an nu. On the shortcut menu, choose Import Import Rungs	
	[Picture7.6: Import Rungs]	

Navigate to the location where you save the BC-3GM\_AddOn\_Rung\_v1\_1.L
 5X, select it and click Import.

File name:	BC3GM_Add0n_Rung_v1_11.5X	•	Import
Files of type:	(RSLogix 5000 XML Files (*.1.5X)	Ŧ	Cancel
Files containing:	H Rungs	Ŧ	Help
Into:	MainRoutine (MainProgram)	v	

[Picture7.7: Locate rungs]

e) Click OK to confirm the import.

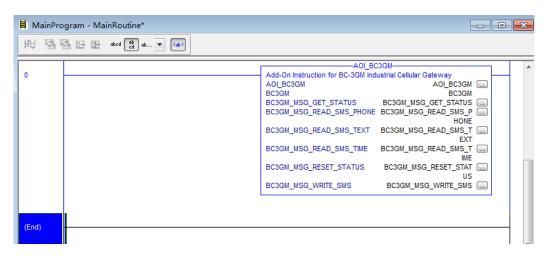
i 🛱 Find: Find Within: Final Na	- 🖧 🐴	Find/Replace	
port Content:			
🙀 MainTask	Configure Rung I	Properties	
MainProgram	(Rungs) Imported Rungs:	1	
References	Operation:	Create 💌	after last Rung
🔤 🛗 Data Tj	Instruction: ypes	References will be imported as configured in the References folders	
-🔯 Errors/Warnings	Routine Proper	ties	
	Name: Description:	MainRoutine	
	Description.	*	
		-	
	Type:	🗎 Ladder Diagram	
	In Program:	S MainProgram	
m	• •		

[Picture7.8: Complete the configuration]

6) Modify pointer for all MSG (except AOI\_BC 3GM) as illustrated below.

Page 33 of 39

BC-3GM User Manual



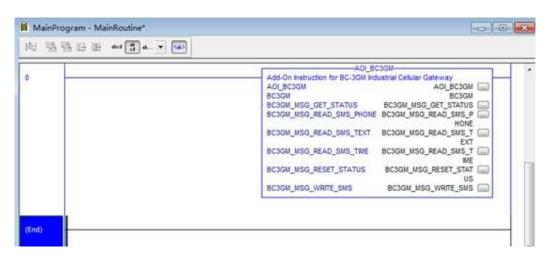
[Picture7.8: Modify Pointer]

\* Please be noted that ETHERNET-MODULE BC3GM is the BC-3GM module.

essage Configuration - BC3GM_MSG_ Configuration Communication Tag	GET_STATUS	
Ormanication Communication Tag     Path:     Broadcast:     Communication Method     © CIP DH+ Channel:     CIP With     Source ID     Source Link:     O     Connected	Browse Path: BC3GM 1.0 - ☐ 1/0 Configuration - ☐ 1756 Backplane, 1756-A4 - ☐ 101 1756-L63 BC3GM - ☐ 1756-EN2T ENBT - ☐ ☐ Ethernet	LEC3GM I Industrial Cellular Gateway AOL_BC3GM G_GET_STATUS G_READ_SMS_P HONE G_READ_SMS_T EXT G_READ_SMS_T ME G_RESET_STAT US SG_WRITE_SMS m
)Enable OEnable Waiting OS )Error Coć Extended Err ror ror	OK Cancel	M Help

[Picture7.9: Ethernet Module BC3GM]

 Setup the communication paths for the AOI\_BC3GM instruction after imp ort the sample rungs. The AOI\_BC3GM instruction implements 6 function s. Setup the communication path for each function by clicking the button '...' of the AOI\_BC3GM instruction.





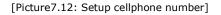
 Set up the number of phones to receive SMS messages by writing a value t o the tag BC3GM.SMS.WRITE.Phone\_Count. The default value is 1. The maxi mum value is 5.

Name	<b>18</b> A	Value	+	Force Mask 💦 🔦 🕈	Style
±-A0I_BC3GM		{}	{}		
BC3GM		{}	{}		
E-BC3GM.CONTROL		{}	{}		
+ BC3GM.STATUS			{}	{}	
E-BC3GM.SMS			{}	{}	
E-BC3GM.SMS.READ			{}	{}	
BC3GM.SMS.WRITE			{}	{}	
BC3GM.SMS.WRITE.Message_Byte_Cou	unt		-1		Decimal
■-BC3GM.SMS.WRITE.Message			{}	{}	ASCII
BC3GM.SMS.WRITE.Phone_Count		•	1		Decimal
E-BC3GM.SMS.WRITE.Phone_Number_1			{}	{}	ASCII
■-BC3GM.SMS.WRITE.Phone_Number_2			{}	{}	ASCII
⊕-BC3GM.SMS.WRITE.Phone_Number_3			{}	{}	ASCII
BC3GM.SMS.WRITE.Phone_Number_4			{}	{}	ASCII
⊞-BC3GM.SMS.WRITE.Phone_Number_5			{}	{}	ASCII
E-BC3GM.UTIL			{}	{}	
±-BC3GM:C			{}	{}	
I BC3GM:I			{}	{}	
+-BC3GM:0			{}	{}	
HETEL: HET			{}	{}	
BC3GM_MSG_READ_SMS_PHONE			{}	{}	
⊞ BC3GM_MSG_READ_SMS_TEXT			{}	{}	
BC3GM_MSG_READ_SMS_TIME			{}	{}	
BC3GM_MSG_RESET_STATUS			{}	{}	
HEC3GM_MSG_WRITE_SMS			{}	{}	

[Picture7.11: Setup cellphone count]

Name	<b>_</b> 8 A	Value 🔶	Force Mask 💦 🔦	Style
⊞-BC3GM.SMS.READ		{}	{}	
BC3GM.SMS.WRITE		{}	{}	
	lessage_Byte_Count	-1		Decimal
	lessage	{}	{}	ASCII
	'hone_Count	1		Decimal
BC3GM.SMS.WRITE.F	hone_Number_1	{}	{}	ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[0]	'1'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[1]	'5'		ASCII
	E.Phone_Number_1[2]	'9'		ASCII
	E.Phone_Number_1[3]	'1'		ASCII
	E.Phone_Number_1[4]	'1'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[5]	'8'		ASCII
E-BC3GM.SMS.WRITE	Phone_Number_1[6]	'9'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[7]	'5'		ASCII
	E.Phone_Number_1[8]	'5'		ASCII
	E.Phone_Number_1[9]	'8'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[10]	'8'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[11]	▼ [ '\$00'		ASCII
E-BC3GM.SMS.WRITE	E.Phone_Number_1[12]	'\$00'		ASCII
	E.Phone_Number_1[13]	'\$00'		ASCII
	E.Phone_Number_1[14]	'\$00'		ASCII
	E.Phone_Number_1[15]	'\$00'		ASCII
	E.Phone_Number_1[16]	'\$00'		ASCII
	Phone_Number_1[17]	'\$00'		ASCII
	Phone_Number_1[18]	'\$00'		ASCII

# 9) Set up the cellphone number in the tag BC3GM.SMS.WRITE.Phone\_Number\_x, ended by R\$00.P



- 10) Send SMS text in Chinese using EtherNet/IP
  - Below are the steps how to send the predefined SMS messages.
  - Set BC3GM.SMS.Write.Message\_Byte\_Count as -1.
  - Fill BC3GM.SMS.Write.Message with the sequence number of predefine SMS messages. The sequence number is stored as a null-terminated string format. a null-terminated string is a character string stored as an array containing the characters and terminated with a null character ('\$00').

Scope: 🛐 BC3GM 🛛 Show: All Tags	
Name 🔳 🛆	Value 🗲 Fi
E-BC3GM	{}
E-BC3GM.CONTROL	{}
E BC3GM.STATUS	{}
E-BC3GM.SMS	{}
E BC3GM.SMS.READ	{}
E-BC3GM.SMS.WRITE	{}
BC3GM.SMS.WRITE.Message_Byte_Count	-1
BC3GM.SMS.WRITE.Message	{}
E-BC3GM.SMS.WRITE.Message[0]	'3'
BC3GM.SMS.WRITE.Message[1]	'\$00'
BC3GM.SMS.WRITE.Message[2]	'\$00'
I DC2CM CMC \r/DITE Massace[2]	10001

11) If you would like to send the predefined SMS 10, the data of the BC3GM.S MS.Write.Message tag will be filled with a null-terminated string "10" (BC3G M.SMS.Write.Message[0] = '1', BC3GM.SMS.Write.Message[1] = '0', BC3GM.S MS.Write.Message[2] = '\$00')

Scope: 📴 BC3GM 🛛 Show: All Tags				▼ T. Enter Name	
Name	<b>_==</b> A	Value 🔶	Force Mask 💦 🗧 🗲	Style	
BC3GM.SMS		{}	{}		
E BC3GM.SMS.READ		{}	{}		
BC3GM.SMS.WRITE		{}	{}		
	Message_Byte_Count	-1		Decimal	
BC3GM.SMS.WRITE.	Message	{}	{}	ASCII	
E BC3GM.SMS.WRIT	E.Message[0]	'1'		ASCII	
E BC3GM.SMS.WRIT	[E.Message[1]	'0'		ASCII	
E BC3GM.SMS.WRIT	E.Message[2]	'\$00'		ASCII	
E-BC3GM.SMS.₩RI1	[E.Message[3]	'\$00'		ASCII	
E-BC3GM.SMS.WRIT	E.Message[4]	'\$00'		ASCII	
E-BC3GM.SMS.WRIT	E.Message[5]	'\$00'		ASCII	
		16001		ACCII	

[Picture7.14: Send predefine SMS messages]

12) Send English SMS text using EtherNet/IP

If you would like to send an English SMS message directly, please write the message content into the BC3GM.SMS.Write.Message tag and set the tagBC3GM.SMS.Write.Message\_Byte\_Count as the SMS message length.

13) Set CONTROL.WIRTE\_SMS as 1, message will be sent to targeted cellphone.

Scope: 🚺 BC3GM 🛛 🗸 Show: All Tags	
Name 🔳 🛆	Value 🗲 F
I AOI_BC3GM	{}
E-BC3GM	{}
E-BC3GM.CONTROL	{}
BC3GM.CONTROL.Get_Status	0
BC3GM.CONTROL.Reset_Status	0
BC3GM.CONTROL.Write_SMS	1
BC3GM.CONTROL.Read_SMS	0
E BC3GM.STATUS	{}
••••••中国移动 专 下午1:32 ④ 92% ■•	
く信息 详细信息	
通信/影像 今天下午1:29	
北京	
香港	

[Picture7.15: Send predefine SMS messages]

# 7.2. Using MODBUS TCP command Send SMS

发送

## 7.2.1. Overview

**回** 短信/彩信

This port is for manufacturer use only. The console is designed mainly for diagnostic data reading. Normally this port is for debugging.

- The BC-3GM supports 5 concurrent Modbus TCP/IP connections to read/write radio diagnostic and generic SMS data.
- BC-3GM supports sending both English and Chinese SMS messages through MODBUS TCP command to specified phone number
- BC-3GM supports Modbus function FC6 and FC16 used by Siemens and Schneider users to send 142 SMS transit messages, however totally 2

commands FC16 will be necessary to complete this since Modbus itself allows the data access to up to 125 registers for each command.

## 7.2.2. SMS message parameter

• The Modbus TCP server listens to 502 port and 2000 port. It can support the following Modbus functions.

FC6= Preset (Write) Single Register (4X)

• FC16= Preset(Write) Multiple Register(4X)

#### SMS Message Parameters

Name	Data Type	Access	Modbus Register	Description
Out_Str_Size	INT	Read/Write	40011	Number of bytes in the Output
Out_Sti_Size	1111	Read/ Write	40011	String
Num To Sond	INT	Read/Write	40012	Number of phone numbers that
Num_To Send				the SMS will be sent to
			40013-	Message to be transmitted (Max
Output_Str SINT[:	SINT[160]	] Read/Write	40092	160 Bytes)
Ph_Number_1 SIN		Read/Write	40093-	full number including prefixes
	SINT[24]		40104	country code etc
Ph_Number_2 SINT[24]		Read/Write	40105-	full number including prefixes
			40116	country code etc
		Dood /W/rito	40117-	full number including prefixes
Ph_Number_3	SINT[24]	Read/Write	40128	country code etc
Dh. Numhar 4			40129-	full number including prefixes
Ph_Number_4	SINT[24]	Read/Write	40140	country code etc
		Dood /Write	40141-	full number including prefixes
Ph_Number_5	SINT[24]	Read/Write	40152	country code etc

[Table7.1: Modbus TCP SMS message parameters]

Please be noted that it is very critical to predefine Chinese SMS messages ahead to enable sending Chinese SMS messages. In this brochure, Page28, it describes how to setup up to 30 Chinese SMS messages and each text message contains up to 80 characters. The predefined content will be the final received message in cellphone. Output\_Str parameter sent by Modbus command is actually the sequence number of predefined Chinese SMS messages.

# 8. INFORMATION OF SMS FUNCTION IN HSPA ROUTER

#### 8.1. DSR.REBOOT

If router receives this message **DSR.REBOOT**, router will reboot and display "Router will reboot now. Please wait...".

#### 8.2. DSR. NETINFO

If router receives this message **DSR.NETINFO**, router will display network information following format as:

<SIM No.><IP>,<APN>,<ID>,<Password>,<Authentication>,<Signal> Example:

Received Message: DSR.NETINFO Responded Message: SIM:1,192.168.0.1,internet,meter,meter, PAP and CHAP,55

#### 8.3. DSR.PPP = (ON or OFF)

If router receives this message **DSR.PPP = (ON or OFF)**, it will get router get online or offline. "SMS connection" option must be enabled in WAN page before using PPP connection

 Example 1
 Send Message: DSR.PPP=ON

 Receive Message: PPP Connection: Trying to make a PPP

 connection

 Example 2
 Send Message: DSR.PPP=OFF

Receive Message: PPP Connection: Disconnected