



# IG601 Intelligent Gateway Quick Guide

[www.inhandnetworks.com](http://www.inhandnetworks.com)

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# 1. Product Information

This document instructs users on how to rapidly deploy the IG601 in the field.

Before beginning, check that you have:

- The package accessories, such as the external antenna
- SIM card with a data plan and text messaging
- Small flat-head screwdriver
- Normal Philips-head screwdriver

Carefully check the contents of the package and look for any missing or damaged parts. If there are any problems, please contact InHand sales staff. InHand also offers optional accessories to customers depending on the site characteristics and customer requirements please see the list of optional accessories below:

## 1.1 Standard Accessories

Accessories	Quantity	Description
IG601	1	IG601 Intelligent Gateway
DIN-Rail	1	Install router
Power terminal	1	3-pin power terminal
Serial terminal	1	5-pin serial terminal
Cable	1	1.5m cable
Antenna	1	Cellular antenna

## 1.2 Optional Accessories

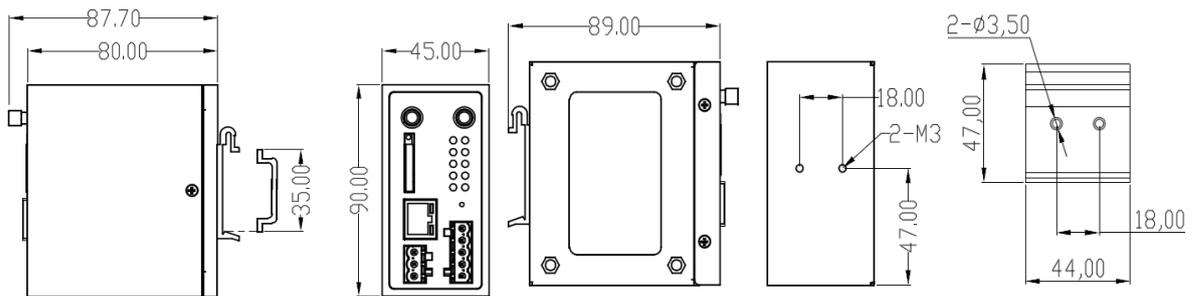
Accessories	Quantity	Description
AC power cord	1	AC power cord
DC power adapter	1	Power adapter
Wall-mounting kit	1	Attach the InGateway to a wall.

## 2. Physical Layout

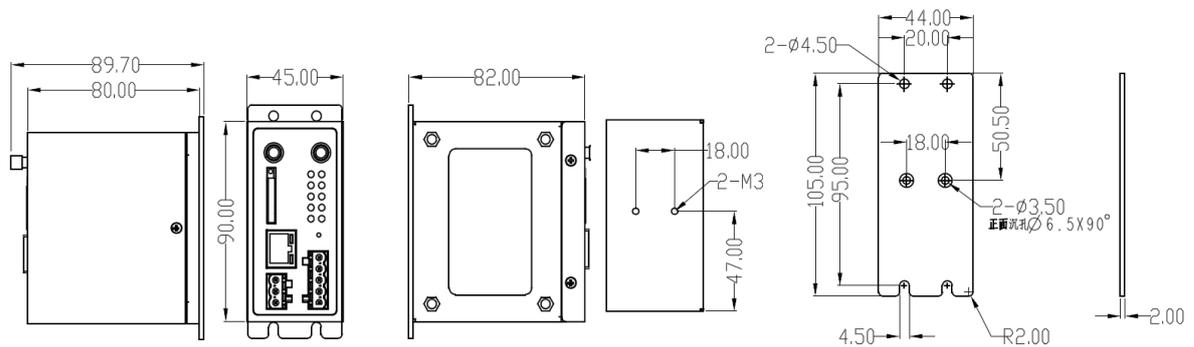
### 2.1 Layout Diagram



### 2.2 DIN-Rail Plan



### 2.3 Wall-mount Plan

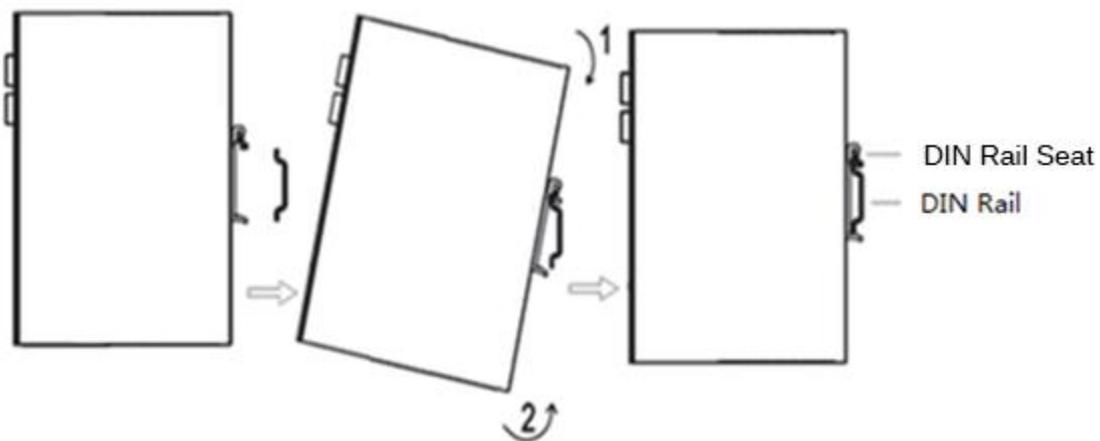


## 3. Install the Cellular Router

### 3.1 DIN rail mounting

#### 3.1.1 Mount the IG601 onto a DIN-rail

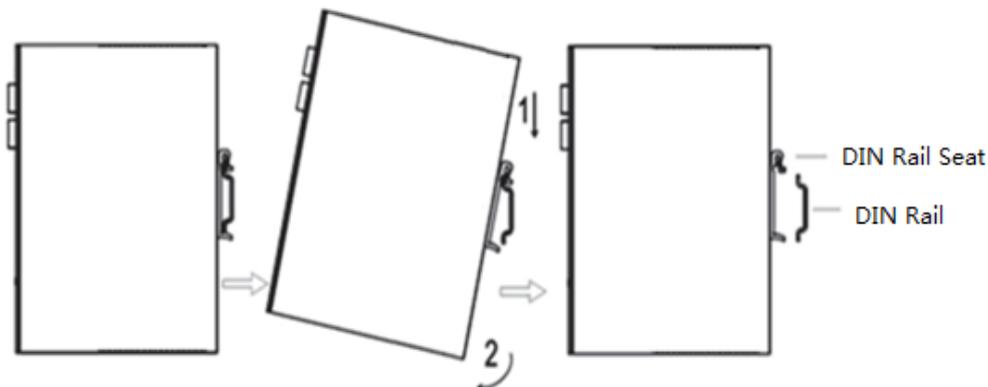
- Fixed to the back of the IG601 is a DIN rail mounting bracket. To mount the router follow these steps:
- Hook the top seat of the mounting bracket onto the DIN rail.
- Push the bottom of the IG601 towards the DIN rail, causing the bottom lip to snap onto the bottom of the rail. This may require some force.



#### 3.1.2 Uninstall the IG601 from a DIN Rail

Removing the IG601 is opposite of mounting it.

1. Pull the bottom part of the router out until the bottom lip of the bracket unclips from the rail. This may take some force.
2. Lift the IG601 so that the rail seat clears the top part of the DIN rail. Now, you are finished.



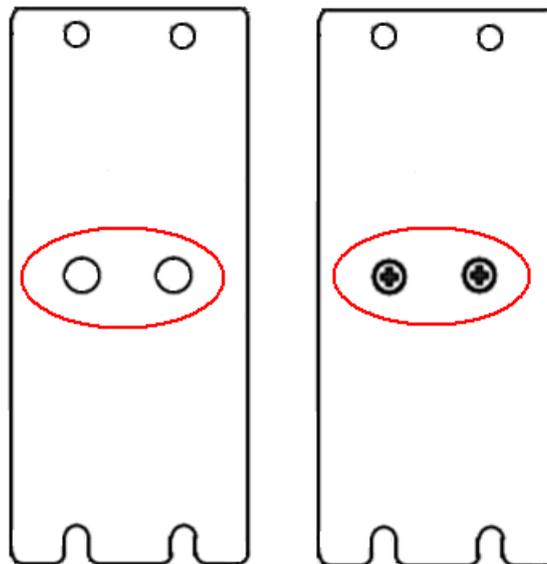
## 3.2 Wall mounting

### 3.2.1 Mount the IG601 onto a wall

Specific steps are as follows:

1. Select the installation location of the device, making sure there is enough space.
2. Use a screwdriver to attach the wall mounting plate to the back of the device as shown in Figure 3-3.

Figure 3-3 Schematic wall mounting plate



3. Screw the wall mounting plate to the wall. Make sure it is steady and well anchored.

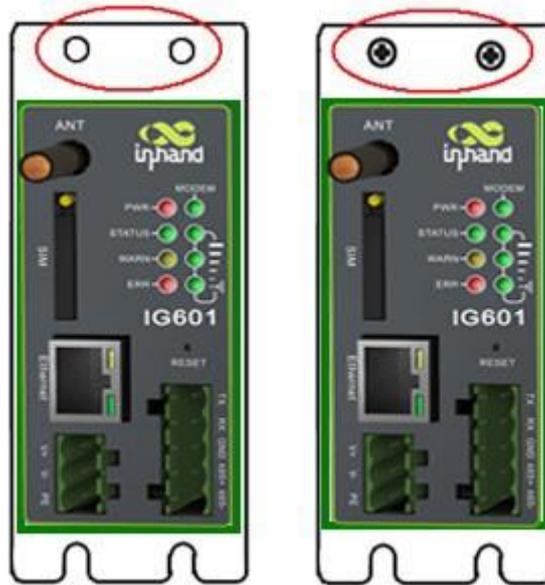


Figure 3-2, Wall mounting

### 3.2.2 Uninstall from the wall

To uninstall the device, hold it with one hand, while unscrewing it from the wall.

## 3.3 Install a SIM Card

**Before changing SIM cards, power off the device!**

1. To open the SIM card slot press the small yellow button beside the SIM slot.
2. A small plastic SIM holder will pop out.
3. Put a SIM card or into the holder. You may need an adapter for micro or nano SIM cards.
4. Insert the SIM holder.



Figure 3-3. SIM Holder.

- To connect to a GSM/HSPA+ network like AT&T or T-mobile, you will need a SIM card.
- To connect to a CDMA network like Verizon, you will need the Verizon edition of the IG601, which has no SIM card slot.
- Look for the SIM card slots on the top of the case. If the device has SIM card slots, it is a GSM device. But, if the router has no SIM slot it is CDMA.

### 3.4 Attach the SMA Antenna

1. To attach the antenna, first screw the antenna into its base.
2. Attach the antenna by screwing it onto the SMA connector.
3. Check the letters on the base of the antenna:
  - a. 2G GSM networks require a '**G**' type antenna.
  - b. 3G EVDO or 2G CDMA networks require a '**C-E**' type antenna.
  - c. 3G WCDMA/HSPA+ networks requires a '**W**' type antenna.

The 'W' antenna in Figure 3-6 matches a HSPA+ SIM card:



Figure 3-4. The Removable Antenna.

### 3.5 Power up the IG601

1. Before proceeding, insert the power terminal into the DC power plug.
2. Loosen the lockdown screws.
3. Note which side of the terminal is positive and which side is negative.
4. Find the leads from the DC power source and insert the lead wires.
5. Finally, tighten the lock-down screws by turning them clockwise.

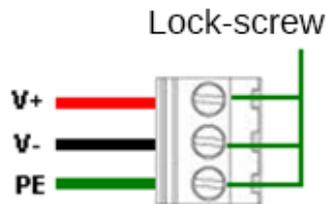


Figure 3-5, The DC power terminal

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**⚠** If users insert the leads into the wrong hole, the router will not start and the user must switch the wires.

---

### 3.6 Install Ground Protection

To ground the device, follow these steps:

1. Loosen the grounding screw.
2. Connect a grounding wire to the grounding screw.
3. Tighten the ground screw.



Figure 3-6. The grounding screw.

---

**⚠** In order to improve radiation protection and ESD resistance, equipment must be grounded. The grounding method will vary from site to site.

---

### 3.7 Ethernet Cable

- Plug one end of an Ethernet CAT5e cable into the LAN port.
- Plug the other end into a PC.



Figure 3-7, The LAN Interface.

### 3.8 Connect the Serial Port

1. To begin connecting the serial port, first obtain:
  - a. A green elbow terminator
  - b. A small flat-head screwdriver
  - c. Light duty copper wire
2. For RS232, connect these wires:
  - a. Rx
  - b. Tx
  - c. GND
3. For RS485, attach:
  - a. A (Non-inverting)
  - b. B (Inverting)
  - c. GND (optional)
4. Tighten the lockdown screws once you are done.

Locking Screw



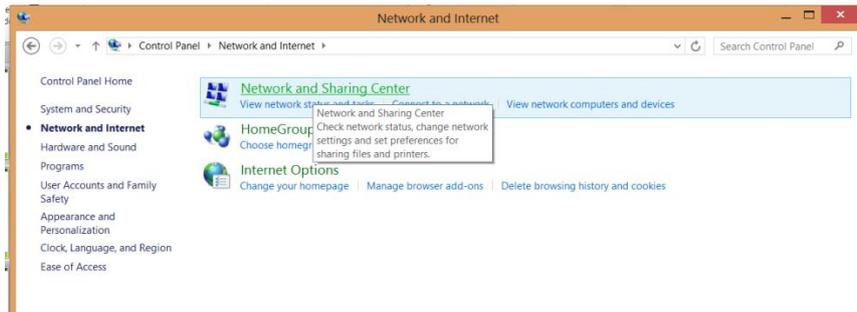
- Tx - 232 Transmit
- Rx - 232 Recieve
- GND - Ground
- A 485+
- B 485-

Figure 3-8, Serial Pinout

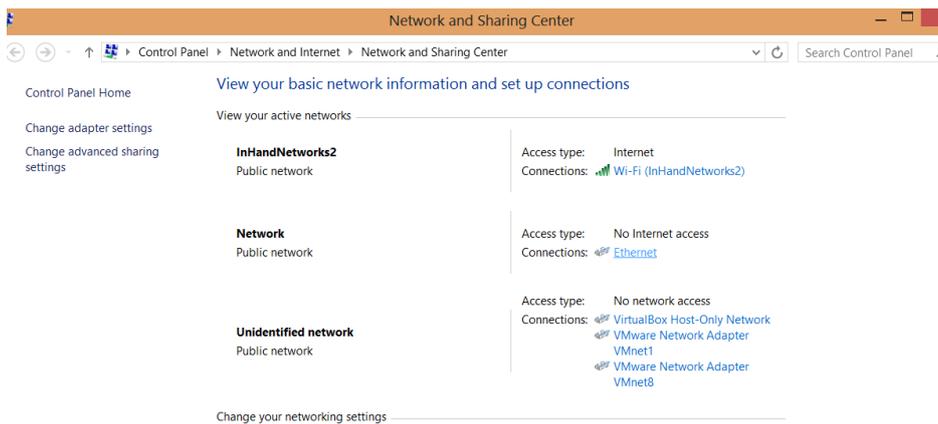
# 4. Access the Web Interface

## 4.1 Set the PC's IP address

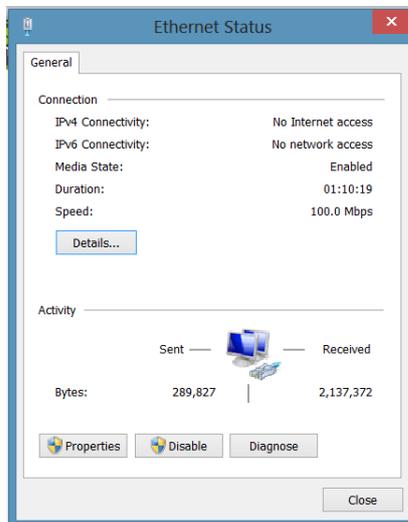
1. Before starting, disconnect from any VPNs or proxies and temporarily disable the computers wireless interface.
2. Open the **Control Panel** and click **View network status**.



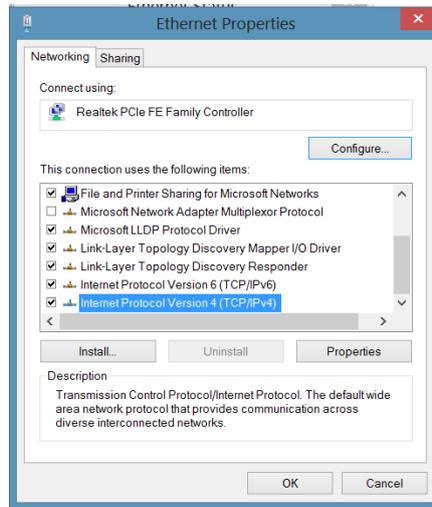
3. Click the **Ethernet** or **Local area network** button.



4. Click the **Properties** button to enter the window "Local Connection Properties."



5. Select the text box “Internet Protocol Version 4 (TCP/IPv4),” and click **Properties**.

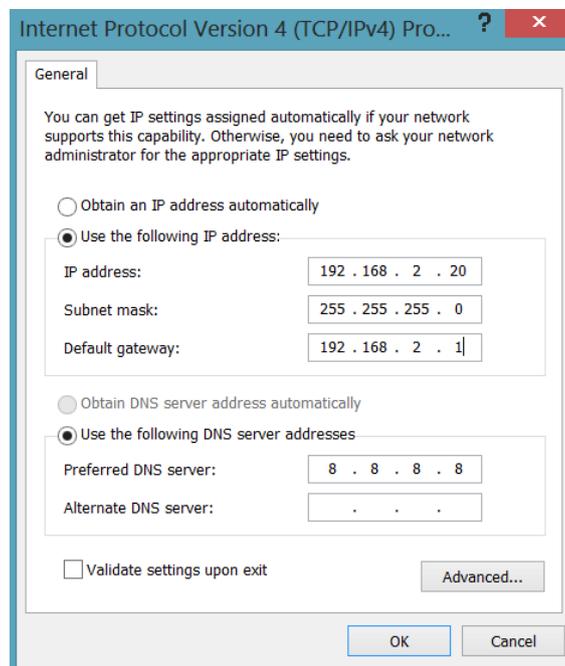


6. Set the IP address to 192.168.2.21 (or any IP from the range of – 192.168.2.254)

7. Set the subnet mask to 255.255.255.0

8. Set the gateway to 192.168.2.1

9. Press **OK** and exit all windows to save.



10. Ping 192.168.2.1 to make sure the PC is connected.
  - a. If you are not connected, be sure to:
  - b. Disconnect from any proxy servers or VPNs.
  - c. Check the Ethernet link lights and cables.
  - d. Check for power on all the devices
  - e. Check the IPv4 settings on your PC

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\dlz>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\dlz>_
  
```

## 4.2 Log into the Web interface.

1. To begin configuring the IG601, open your preferred browser.
2. Type **192.168.2.1** into the address bar and press enter.
  - a. Username: **adm**
  - b. Password: **123456**
3. The web interface controls all the IG601s features.

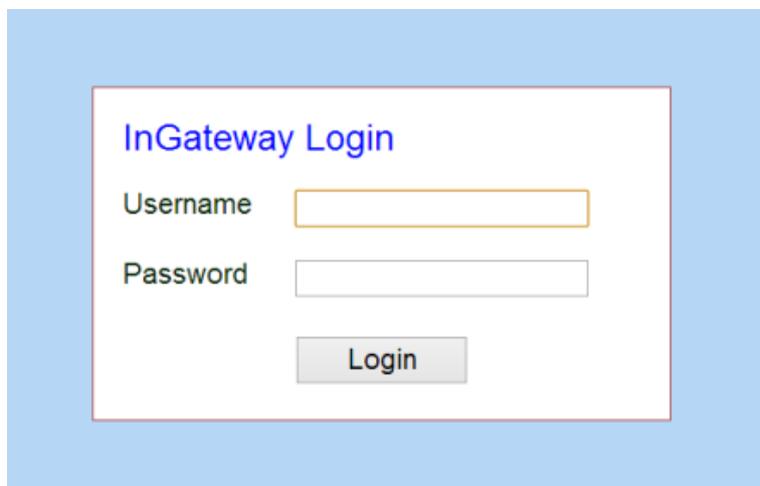


Figure 4-2, Web login.

## 4.3 Set the Language to English

Some customers may purchase an IG601 with a default languages other than English. To change the interface language follow these steps:

1. Click on the far top-left button: **System**.
2. Click on the first drop-down menu item. **Basic Setup**.



3. Click on the drop-down menu and select English, Ingles, or 英语.
4. Click the bottom-left button, **Apply**.



## 5. Basic Configuration

### 5.1 Cellular Settings

#### 5.1.1 Find the Cellular Settings

- Search for the SIM card’s settings in your favorite search engine.
- Save these settings so you can enter them into your IG601.
- Many GSM cards will require an APN like ‘epc.t-mobile,’ with a blank username and password.

t-mobile SIM settings

- Android 1.6: **Wireless Controls**.
- Garminfone: **Wireless Manager**.
- Behold II: **Phone Information**.
- Android 4.1 (Samsung): **Connections** tab then tap **More networks**.

3. Touch **Mobile Networks**.
4. Touch **Access Point Names** or **APNs**.
5. If there is a **T-Mobile APN**, touch it. If not, press the **Menu** key, and touch **New APN**.
6. Enter the following settings for the Data APN:
  - **Name:** T-Mobile
  - **APN:** epc.tmobile.com or fast.t-mobile.com (for LTE devices)
  - **Proxy:** <Not set>
  - **Port:** <Not set>
  - **Username:** <Not set>
  - **Password:** <Not set>
  - **Server:** <Not set>
  - **MMSC:** http://mms.msg.eng.t-mobile.com/mms/wapenc
  - **MMS proxy:** <Not set>
  - **MMS port:** <Not set>
  - **MMS protocol:** WAP 2.0
  - **MCC:** 310
  - **MNC:** 260
  - **Authentication type:** <Not set>
  - **APN type:** <Not Set> OR Internet+MMS (depending on software version)
7. Press the **Menu** key.
8. Touch **Save**.
9. In the list of APNs, delete all others that may appear. If there is a **FOTA APN**, you may leave that one. To do this:
  1. Touch the APN you want to delete.
  2. Press the **Menu** key.

### 5.1.2 Configure the Cellular Settings

- Open the web interface by typing 192.168.1.2 into the browser's address bar, as shown in chapter 4.
- Navigate to **Network >> Dialup** on the top menubar.
- Enter the SIM card settings.
- Press **Apply**

- Navigate to **Status >> Modem**.
- Check that the 'Status' reads 'modem is ready.'
- Make sure the device has adequate signal and is registered.

### 5.1.3 Test the Connection

- Navigate to **Tools >> Ping**
- Ping **8.8.8.8** to test the connection.
- If the cellular interface is disconnected:
- Attach the correct antenna.
- Check your SIM card.
- Check the APN name.
- Make sure your cellular data plan is not over the data limit and in good standing.

The screenshot shows the 'Tools' menu with 'PING' selected. The configuration fields are as follows:

- Host: 8.8.8.8
- Ping Count: 4
- Packet Size: 32 Bytes
- Expert Options: (empty)

The output of the ping command is shown in a terminal window:

```

PING 8.8.8.8 (8.8.8.8): 32 data bytes
40 bytes from 8.8.8.8: icmp_seq=0 ttl=38 time=222.0 ms
40 bytes from 8.8.8.8: icmp_seq=1 ttl=38 time=223.3 ms
40 bytes from 8.8.8.8: icmp_seq=2 ttl=38 time=256.0 ms
40 bytes from 8.8.8.8: icmp_seq=3 ttl=38 time=217.3 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 217.3/229.6/256.0 ms
    
```

### 5.2 Change the LAN Interface’s IP Address

- To change your Ethernet interface address, navigate to **Network >> LAN**.
- Under “IP Address” enter the desired IP for the LAN port.
- Under “Netmask” enter the subnet mask.
- Be sure to click **Apply**.

The screenshot shows the LAN configuration interface with the following settings:

- MAC Address: 00:18:05:03:8C:67 (Default)
- IP Address: 192.168.4.1
- Netmask: 255.255.255.0
- MTU: Default (1500)
- LAN Mode: Auto Negotiation

Below the main settings is a 'Multi-IP Settings' table:

IP Address	Netmask	Description
192.168.1.1	255.255.255.0	1.1 backup
	255.255.255.0	

Buttons for 'Apply' and 'Cancel' are visible at the bottom.

- The Ethernet port IP defaults to 192.168.2.1/24 with secondary

address of 192.168.1.1/24.



**Use caution when changing the LAN port's IP address.**

---

- In order to apply the configuration, the web interface will reload in approximately twenty seconds.
- You must change the IP of your PC's Ethernet interface so that it is on the same subnet.
- Finally, type the new IP of the IG601's LAV port into the browser's address bar.



- In **Tools >> Ping**, ping 8.8.8.8 to test WAN connectivity.

Host

Ping Count

Packet Size  Bytes

Expert Options

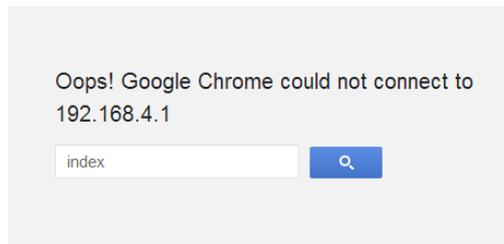
---

```

PING 8.8.8.8 (8.8.8.8): 32 data bytes
40 bytes from 8.8.8.8: seq=0 ttl=45 time=22.992 ms
40 bytes from 8.8.8.8: seq=1 ttl=45 time=22.039 ms
40 bytes from 8.8.8.8: seq=2 ttl=45 time=21.854 ms
40 bytes from 8.8.8.8: seq=3 ttl=45 time=26.707 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max = 21.854/23.398/26.707 ms
        
```

- Sometimes you may forget the IP or there may be a problem with the interface configuration.
- If you enter the new IP and change your PC's IP, and still cannot connect to the web interface, you must either hard reset the device or configure it via console cable.
- The end of this document instructs users on how to reset the device with the physical **RESET** button.



## 6. Diagnose the IG601

### 6.1 View the Log files

- To view system logs, go to **Status >> Log**.
- The logs are vital to diagnosing and fixing problems.

Log			
View recent		20	Lines
Level	Time	Module	Content
Too many logs, old logs are not displayed. Please download log fi			
info	Dec 31 07:56:24	redial[118]	setup AT command set for usb modem!
info	Dec 31 07:56:24	redial[118]	nvrnm set wan1_iface=/dev/ttyUSB0
info	Dec 31 07:56:24	redial[118]	can not open /dev/ttyUSB2
info	Dec 31 07:56:24	redial[118]	send to modem (4): AT*M
info	Dec 31 07:56:24	redial[118]	modem response :<3>, AT*M
info	Dec 31 07:56:24	redial[118]	modem response :<6>, *M OK*M
info	Dec 31 07:56:24	redial[118]	send to modem (6): ATE0*M
info	Dec 31 07:56:24	redial[118]	modem response :<5>, ATE0*M
info	Dec 31 07:56:24	redial[118]	modem response :<6>, *M OK*M
info	Dec 31 07:56:24	redial[118]	send to modem (10): AT+CPIN?*M
info	Dec 31 07:56:24	redial[118]	modem response :<9>, *M ERROR*M
info	Dec 31 07:56:27	redial[118]	SIM/UIM Card Failure
info	Dec 31 07:56:37	redial[118]	send to modem (10): AT+CPIN?*M
info	Dec 31 07:56:37	redial[118]	modem response :<9>, *M ERROR*M
info	Dec 31	redial[118]	SIM/UIM Card Failure

### 6.2 Download the log files.

- To download the log files, navigate to **Status >> Log**.
- Scroll to the bottom of the page.
- Click **Download Log File**.

info	Dec 31 08:00:46	redial[118]	SIM/UIM Card Failure
info	Dec 31 08:00:56	redial[118]	send to modem (10): AT+CPIN?*M
info	Dec 31 08:00:56	redial[118]	modem response :<9>, *M ERROR*M
info	Dec 31 08:00:59	redial[118]	SIM/UIM Card Failure
			<input type="button" value="Clear Log"/> <input type="button" value="Download Log File"/> <input type="button" value="Download System Diagnosing Dat"/>

## 6.4 Open the log files

- Your browser will download the log files to **/<user>/Downloads**
- Open the log files with **Notepad++** or a comparable document editor.
- Windows Notepad will not open the log files properly.

```

syslog (2).log
1 <46> Dec 31 07:56:15 syslogd started: BusyBox v1.4.2
2 <31> Dec 31 07:56:15 syswatcher[1]: starting eth2 => lan
3 <31> Dec 31 07:56:15 syswatcher[1]: set mip lan0 192.168
4 <31> Dec 31 07:56:15 syswatcher[1]: set lan mode...
5 <28> Dec 31 07:56:15 syswatcher[1]: router (vax:1.2.0.r28:
6 <30> Dec 31 07:56:15 syswatcher[1]: start service [Conso
7 <30> Dec 31 07:56:15 syswatcher[1]: start service [Telne
8 <30> Dec 31 07:56:15 syswatcher[1]: start service [Web S
9 <30> Dec 31 07:56:15 syswatcher[1]: start service [cron
10 <31> Dec 31 07:56:15 syswatcher[1]: applying MAC-IP rule:
11 <30> Dec 31 07:56:16 syswatcher[1]: nvram set wan1_iface=
12 <31> Dec 31 07:56:16 syswatcher[1]: starting ttyACM0 => v
13 <30> Dec 31 07:56:16 syswatcher[1]: start service [redia
14 <30> Dec 31 07:56:16 httpd[114]: listen at 0.0.0.0:80
15 <30> Dec 31 07:56:16 redial[118]: redial interval: 30 se
16 <30> Dec 31 07:56:16 syswatcher[1]: nvram set dhcpd_star
17 <30> Dec 31 07:56:16 syswatcher[1]: nvram set dhcpd_end=
18 <30> Dec 31 07:56:16 redial[118]: ppp redial (0/10)...
19 <30> Dec 31 07:56:16 redial[118]: start wan1...
  
```

## 6.5 Diagnose the log files

- To view system logs, go to **Status>> Log**.
- In this example, the cellular interface is trying to establish a connection over and over. The modem is constantly redialing.
- I must check the cell interface in **Status >> Modem**.

			Log
View recent			20 Lines
Level	Time	Module	Content
Too many logs, old logs are not displayed. Please download log fi			
info	Dec 31 07:56:24	redial[118]	setup AT command set for usb modem!
info	Dec 31 07:56:24	redial[118]	nvram set wan1_iface=/dev/ttyUSB0
info	Dec 31 07:56:24	redial[118]	can not open /dev/ttyUSB2
info	Dec 31 07:56:24	redial[118]	send to modem (4): AT^M
info	Dec 31 07:56:24	redial[118]	modem response :<3>, AT^M
info	Dec 31 07:56:24	redial[118]	modem response :<6>, ^M OK^M

- The **Status >> Dialup** shows the cellular interface is attempting to 'register,' or connect to the cellular provider.
- However, the interface is 'disconnected, and reads 'SIM/UIM' card failure.
- On further inspection, I notice the router has no SIM card in the slot.

Dialup		Modem
Modem Type	PHS8	
Status	SIM/UIM card failure	
Manufacturer	Siemens	
Product	PHS8	
Signal Level	- (0)	
Register Status	no registered	
IMEI(ESN) Code		
IMSI Code		
Network Type		
PLMN		
LAC		
Cell ID		

- If the router continues searching for a cell connection, eventually the auto-recovery feature will cause a reboot.
- To prevent the router from constantly rebooting, either insert a SIM card or disable the interface.

To disable the interface:

- Navigate to **Network >> Dialup**
- Untick the 'Enable' checkbox.

System	Network	Services	Firewall	QoS	Tools	Status
<b>Dialup</b>						
Enable	<input checked="" type="checkbox"/>					
Time schedule	ALL <input type="button" value="Schedule Management"/>					
SHARED	<input checked="" type="checkbox"/>					
Network Provider (ISP)	Custom <input type="button" value="Manage"/>					
APN	epc.tmobile					
Access Number	*99***1#					
Username	<input type="text"/>					
Password	<input type="text"/>					
Network Select Type	Auto <input type="button" value=""/>					
Static IP	<input type="checkbox"/>					
Connection Mode	Always Online <input type="button" value=""/>					
Redial Interval	30 <input type="text"/> Seconds					
Show Advanced Options	<input type="checkbox"/>					
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>						

## 6.6 The LED Array

When the router boots up and connects to a cellular network it will display codes on the LED array.

ON ● OFF ○ BLINK



Power On



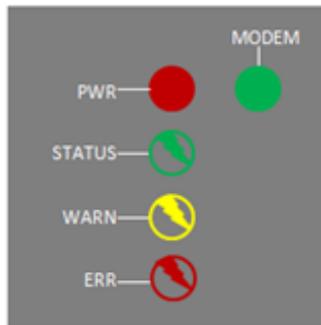
Successful Boot



Cell Dialing



Successful Dialup



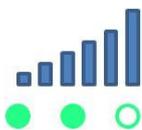
Upgrading



Successful Reboot



Indicates a weak cell signal. Make sure the antenna is correct and the SMA connector is not loose.



Normal operating cell signal.



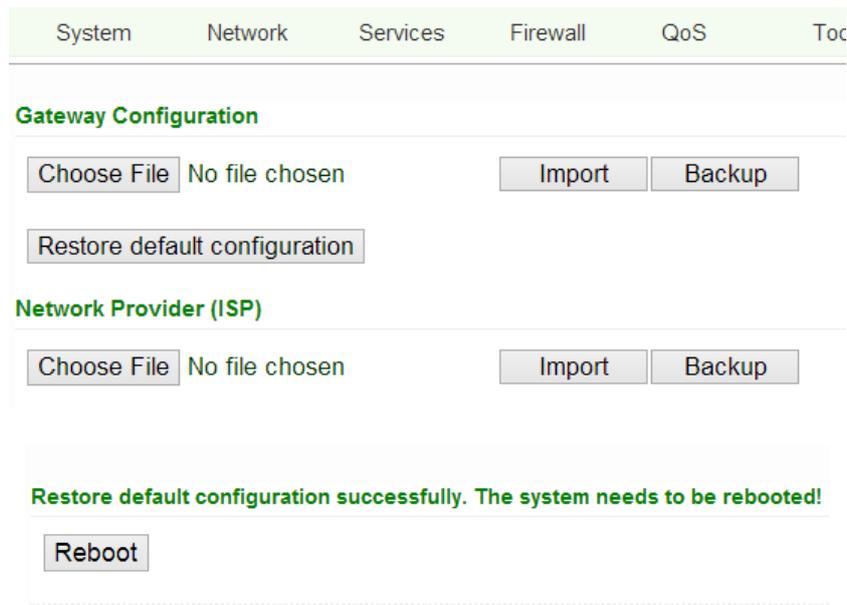
Excellent reception.

# 7. Restore the Factory Configuration

## 7.1 The web interface

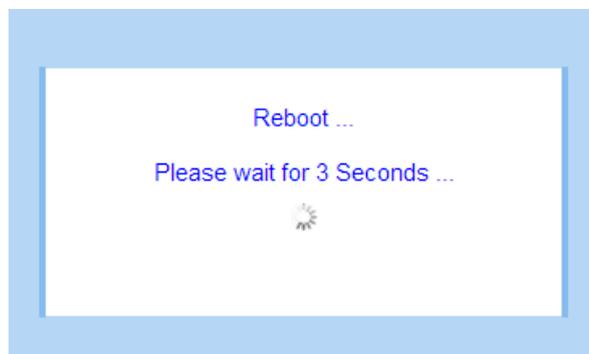
To restore the configuration to the factory default:

1. Navigate to **System >> Config Management** on the menu bar.
2. Click the **Restore default configuration** button.
3. Click **Reboot**.



4. Wait for up to 120 seconds.
5. Type 192.168.2.1 into the browser's address bar and press **Enter** to reload the webpage.

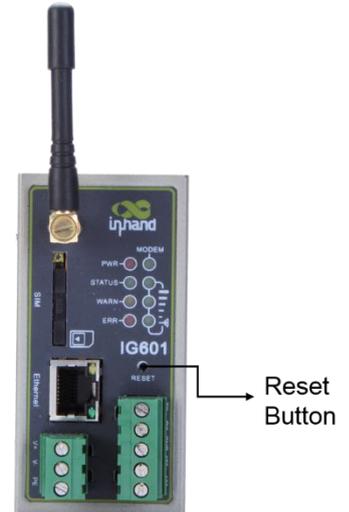
The IG601 should now be reset to the factory default configs.



## 7.2 The Pinhole RESET Button

Follow these steps to restore the InGateway601 to factory default settings by using the 'RESET' button.

- Step 1. Locate the RESET button on the device;
- Step 2. Turn on the device's power; within 10 seconds, press and hold RESET button;
- Step 3. When ERR LED is on, release the RESET button;
- Step 4. Within a few seconds, ERR LED should go off; then press and hold the RESET button again;
- Step 5. When the ERR LED blinks, release the RESET button; If the ERR LED goes off, that means InGateway601 is now restoring to factory default settings;
- Step 6. You can log in using the 192.168.2.1.



## 8. Support

For manuals and support documents, please visit:

[www.inhandnetworks.com](http://www.inhandnetworks.com)

For technical support contact:

[support@inhandnetworks.com](mailto:support@inhandnetworks.com)



### InHand Networks

3900 Jermantown Rd., Suite 150

Fairfax, VA 22030

USA

T: +1-703-348-2988

F: +1-703-348-2988

[info@inhandnetworks.com](mailto:info@inhandnetworks.com)

[www.inhandnetworks.com](http://www.inhandnetworks.com)