



Connecting Device, Enabling Service

Quick Guide

For IR700 M2M Industrial Cellular Router

Third Edition, January, 2011



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Announcements

Thank you for choosing our product. INHAND NETWORKS IR700 series is Machine-to-machine (M2M) industrial cellular router with Din-rail mounting, which works on 2G/3G cellular networks, provides reliable and robust wireless connections.

IR700 series is specified for industrial M2M usage. Designed to endure extreme conditions, such as temperatures ranging from -25°C to +70°C and low power consumption.

IR700 series also supports the PPTP, L2TP, GPE, IPSec VPN tunnel providing high-grade network security.

Please read this manual carefully before using the product.

Important Safety Information

This product is not intended for use in the following circumstances

- Area(s) where radio transmission equipment (such as cell phone) are not permitted.
- Hospitals, health care facilities and area(s) where cell phones are restricted by law.
- Gas stations, fuel storage and places where chemical are stored.
- Chemical plants or places with potential explosion hazard.
- Any metal surface that may weaken the radio signal level.

Copyright Announcement

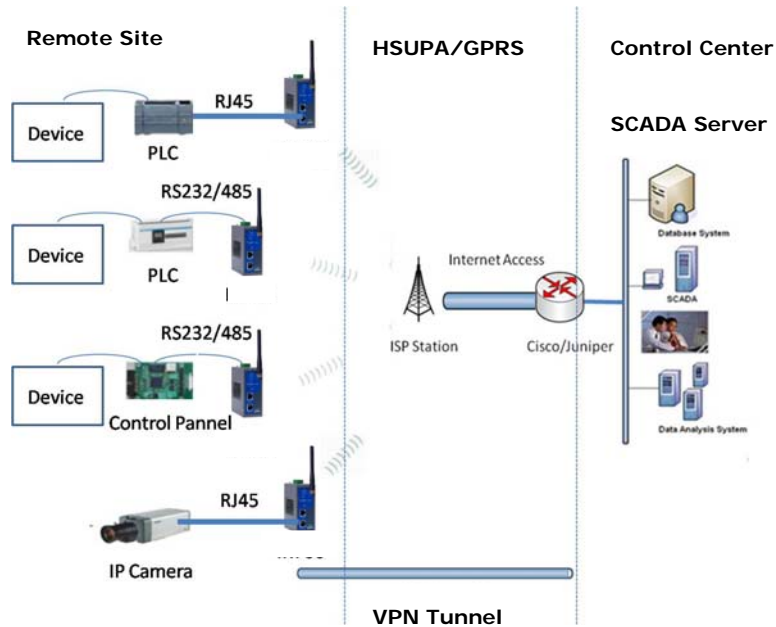
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Information Edition: GQ – A – IR700 - 1.0

1. Scenario: Use as Ordinary Router

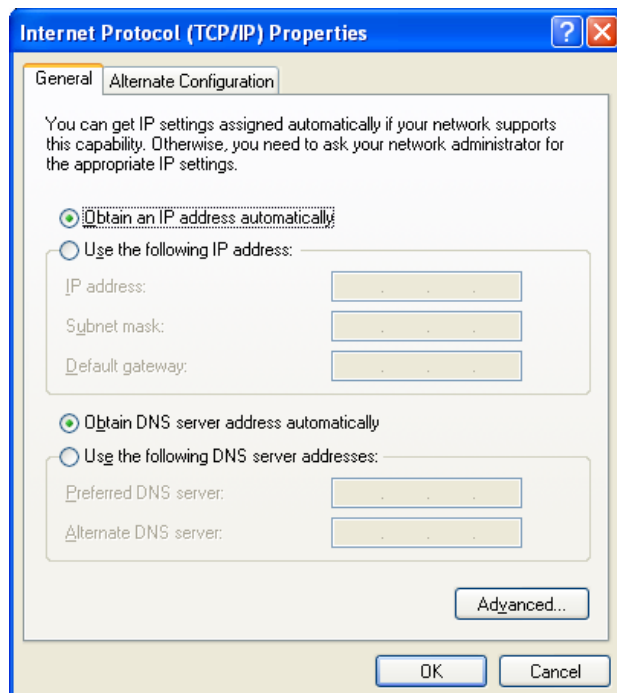


Scenario introduction:

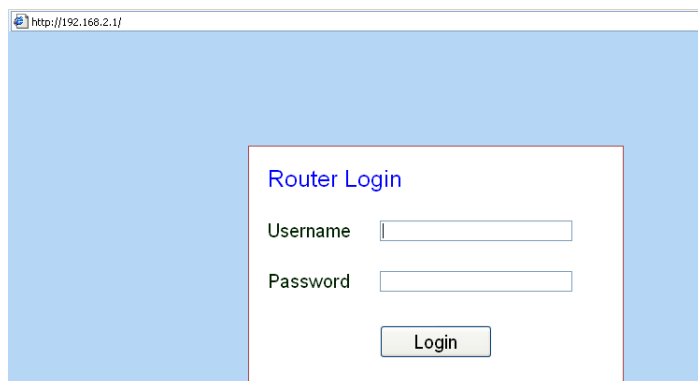
IR700 series router can be used as ordinary router, through which users can easily access into the Internet.

Configuration:

IR700 has been set as DHCP server as default. Please configure your Ethernet connection as follow, then Router will auto assign IP address 192.168.2.x to your PC:



Open Internet Explorer (or other web browsers), enter the IP address of router in the URL link field, e.g. <http://192.168.2.1> (- default IP of IR700).



Login

User name: adm

Password: 123456

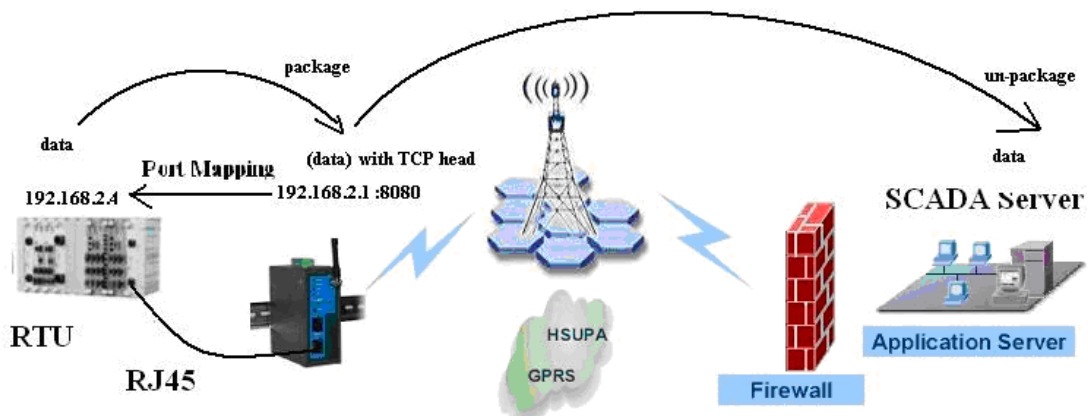
Get network parameters from local ISP, then input in “Network->Dialup”.

System	Network	Services	Firewall	QoS	VPN	Tools
Dialup						
Enable	<input checked="" type="checkbox"/>					
Time schedule	ALL <input type="button" value="Schedule Management"/>					
Shared Connection	<input checked="" type="checkbox"/>					
Network Provider (ISP)	Custom <input type="button" value="Manage"/>					
APN	uninet					
Access Number	*99***1#					
Username	gprs					
Password	••••					
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="button" value="Seconds"/>					

After configuration successful, user could access internet via IR700.



2. Scenario: Connecting to RTU via Ethernet port



Scenario introduction:

RTU connects to IR700 via Ethernet port; RTU sends transparent data to SCADA server via TCP protocol.

The server accesses RTU via 8080 Port of IR700.

Data is packaged in IR700 as TCP message and then it transmits through internet. It will be unpackaged while reaching SCADA server, which supports transparent TCP protocol.

Configuration in IR700:

Firewall->Port Mapping:

Firewall	QoS
Basic	
Filtering	
Port Mapping	
Virtual IP Mapping	
DMZ	
MAC-IP Bundling	

Port Mapping

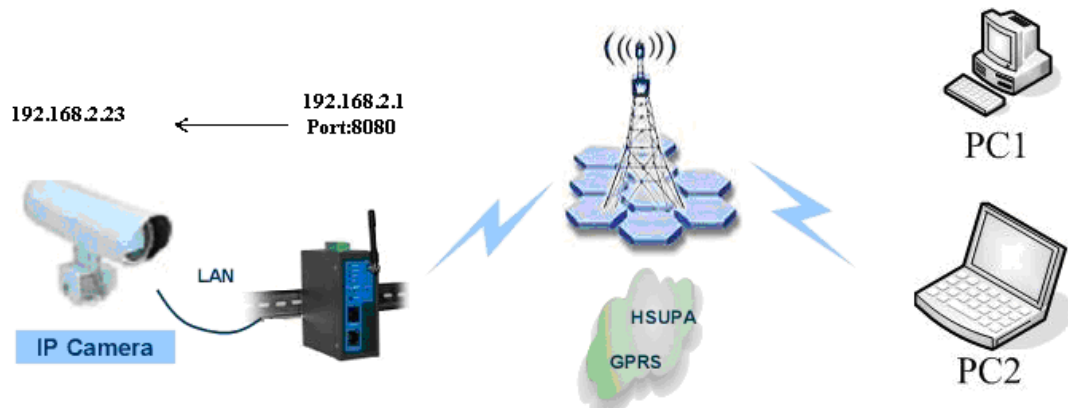
Enable	Proto	Source	Service Port	Internal Address	Internal Port	Log	Description
<input checked="" type="checkbox"/>	TCP	112.112.112.234/24	8080	192.168.2.3/24	8080	<input type="checkbox"/>	

select TCP (points to Proto)
SCADA Server IP/Netmask, for example: e.g.:112.112.112.234/24 (points to Source)
SCADA Port (points to Service Port)
RTU address (points to Internal Address)
RTU port (points to Internal Port)

Note:

1. The RTU and IR700 must be in the same Network Segment. Else, you need to set the function of multiple IP in the IR700 configuration web.
2. The Port must not be used for other applications, such as 80 (http), 23 (telnet) and etc. else the Router will ignore the demand of Mapping.
3. If end users want to access RTU via any remote IP, please input "0.0.0.0/0" at "Firewall->Port Mapping->Source".

3. Scenario: Connecting to IP Camera via Ethernet port



Scenario introduction:

IP Camera connects to IR700 via Ethernet port; End user can view IP Camera anytime and anywhere.

End user can access IP Camera via 8080 port of IR700.

Configuration in IR700:

User can configure port mapping or DMZ for this scenario.

Via Port mapping:

Firewall->Port Mapping

Firewall	QoS
Basic	
Filtering	
Port Mapping	
Virtual IP Mapping	
DMZ	
MAC-IP Bundling	

Port Mapping

Enable	Proto	Source	Service Port	Internal Address	Internal Port	Log	Description
<input checked="" type="checkbox"/>	TCP	203.86.43.186/24	8080	192.168.2.3/24	8080	<input type="checkbox"/>	

select TCP End user PC address End user PC port IP Camera address IP Camera port

Note:

1. The IP Camera and IR700 must be in the same Network Segment. Else, you need to set the function of multiple IP in the IR700 configuration web.
2. The Port must not be used for other applications, such as 80 (http), 23 (telnet) and etc. else the Router will ignore the demand of Mapping.
3. If end users want to access IP Camera via any remote IP, please input "0.0.0.0/0" at "Firewall->Port Mapping->Source".
4. If end users want to access IP Camera anywhere anytime via public IP networks, then SIM Card in IR700 should get public IP from ISP also. Please contact with local ISP for how to get public IP in SIM Card.

Via DMZ:

Firewall->DMZ

DMZ

Enable DMZ

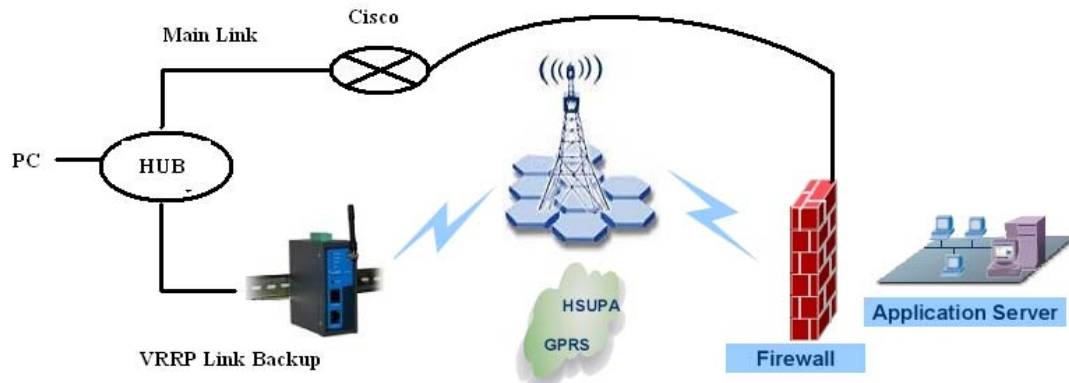
DMZ Host: 192.168.2.23 Fill in the blank with the IP of IPC

Source Address Range: (Optional Example: "1.1.1.1", "1.1.1.0/24", "1.1.1.1 - 2.2.2.2")

Note:

After enable DMZ, user could remote login IP Camera, but could not remote login IR700.

4. Scenario: VRRP backup



Scenario introduction:

It is a VRRP scenario (Virtual Router Redundancy Protocol) with IR700 and Cisco routers. VRRP ensures that important gateways are available on a reliable basis. The protocol provides a type of backup/redundancy function. Both devices are configured with a functioning Internet connection.

Requirements:

Two devices that support the VRRP protocol.

Configuration in IR700:

Services->VRRP:

VRRP	
Enable	<input checked="" type="checkbox"/>
Group ID	1
Priority	10
Advertisement Interval	60 Seconds
Virtual IP	
Authentication Type	none

Apply Cancel

Fill in the blank with follow parameters:

1. **Enable**: select enable.
2. **Group ID**: the same configured in Cisco.
3. **Priority**: Normally set lower than Cisco, to set Cisco as the first choose for link;
4. **Advertisement Interval**: If no Advertisement package received from Cisco after the interval, IR700 VRRP will be enabled.

Then click "Apply".

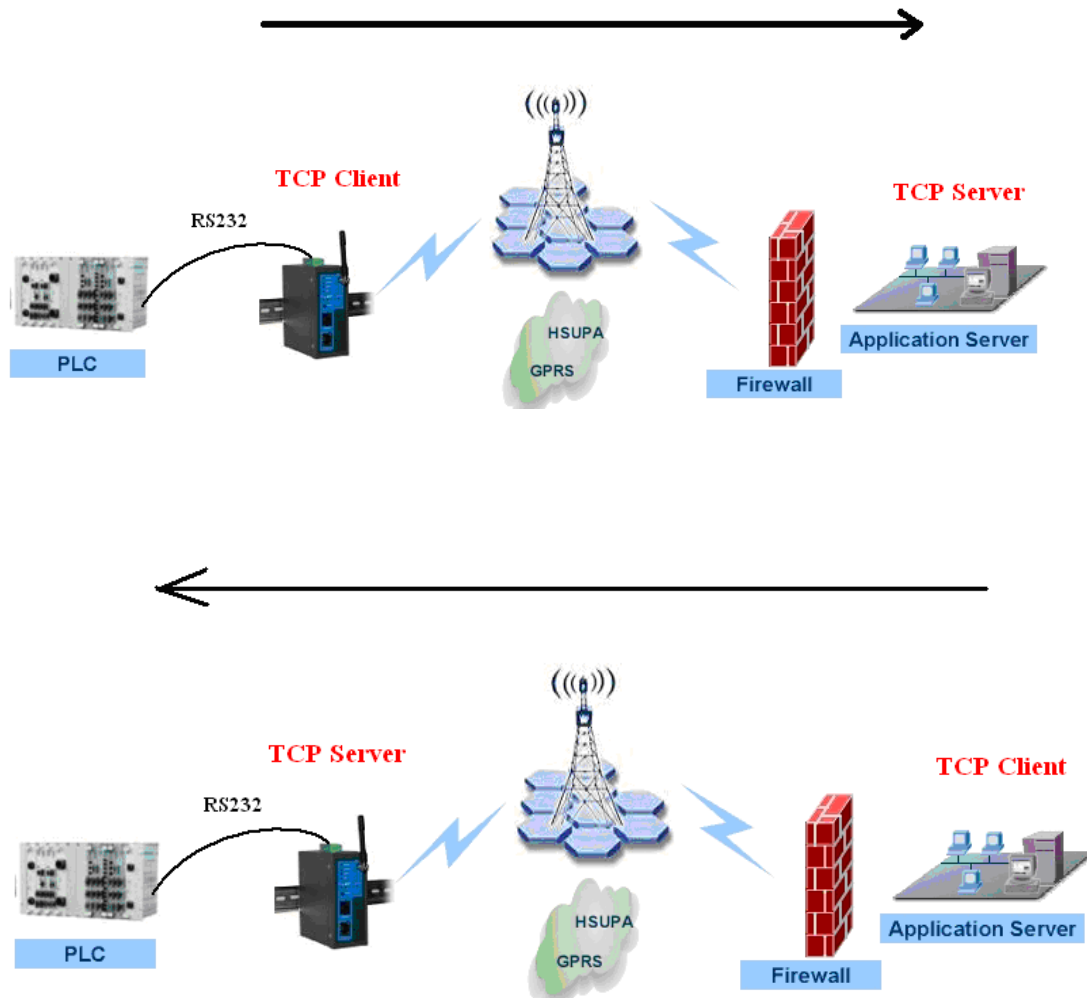


5. **Authentication Type:** None or choose the same as Cisco

Configuration in Cisco:

```
Router> en
Router#conf t
Router(config)# int fa0/1          // the interface of router
Router(config)# vrrp 1 priority 200 //set a bigger number than in IR700,
//The "1" stands for Group 1, the same as IR700
Router(config)# vrrp 1 ip 10.5.1.100 //Virtual IP
Router(config)# vrrp 1 timer advertise 60 //advertisement interval, seconds
Router(config)# vrrp 1 preempt     //set the main router according to //priority
Router(config)# .....
..... Finished.
```

5. Scenario: Connecting to RTU via Serial RS232 port



Scenario introduction:

RTU connects to IR700 via serial RS232 port, RTU communicates with SCADA server via TCP protocol.

IR700 supports both TCP client or server mode.

IR700 configure as TCP client and SCADA server configure as TCP server:

Configuration in IR700:

System->Serial Port:



System	Net
Basic Setup	
Time	
Serial Port	

Serial Port

Baudrate	19200 ▾
Data Bits	8 ▾
Parity	None ▾
Stop Bit	1 ▾
Hardware Flow Control	<input type="checkbox"/>
Software Flow Control	<input type="checkbox"/>

Note:

These parameters must match devices (e.g.: RTU) connected with IR700.

Services->DTU

Services	Fire
DHCP Service	
DNS Relay	
VRRP	
Device Manager	
DTU	

System	Network	Services	Firewall	QoS
DTU				
Enable		<input checked="" type="checkbox"/>		
DTU Protocol		Transparent		
Protocol		TCP		
Work Mode		Client		
Frame Interval		100	mseconds	
DTU ID				

Fill in the blank with follow parameters:

1. **Enable**: select enable.
2. **DTU Protocol**: Transparent.
3. **Work Mode**: Client.
4. **Frame Interval**: the time interval to divide frames.
5. **DTU ID**: provided by user, for management.

IR700 configure as TCP server and SCADA server configure as TCP client:

Configuration in IR700:

System->Serial Port:

System	Net
Basic Setup	
Time	
Serial Port	

Serial Port

Baudrate	19200 ▾
Data Bits	8 ▾
Parity	None ▾
Stop Bit	1 ▾
Hardware Flow Control	<input type="checkbox"/>
Software Flow Control	<input type="checkbox"/>

Note:

These parameters must match devices (e.g.: RTU) connected with IR700.

Services->DTU

Services	Fire
DHCP Service	
DNS Relay	
VRRP	
Device Manager	
DTU	

DTU

Enable	<input checked="" type="checkbox"/>	1. Select "Enable"
DTU Protocol	Virtual-Serial ▾	2. Select Virtual-Serial"
Protocol	TCP ▾	3. Select the protocol supported by center SCADA;
Work Mode	Server ▾	4. Select "Server";
Listening Port	502	5. Set the same as SCADA;
Frame Interval	<input type="text"/> mseconds	6. Interval for cutting frames

Fill in the blank with follow parameters:

1. **Enable**: select enable.
2. **DTU Protocol**: Virtual-Serial.
3. **Work Mode**: Server.
4. **Listening Port**: The same as SCADA server
5. **Frame Interval**: the time interval to divide frames.
6. **DTU ID**: provided by user, for management.

6. Scenario: Connect on Demand->Triggered by Call

Scenario introduction:

Call the SIM card number if user needs to wake up IR700.

Configuration in IR700:

Network->Dialup



Set "Connecting Mode" to "Connect on Demand"

Connection Mode

Set the parameters as follow:

Connection Mode

Triggered by Data

Triggered by Call

Triggered by SMS

Max Idle Time Seconds

Then user could call IR700 to take it up.

Scenario introduction:

Control IR700 online/offline via SMS.

Configuration in IR700:

Network->Dialup



Network	Set
Dialup	
LAN	
DNS	
DDNS	
Static Route	

Set "Connecting Mode" to "Connect on Demand"

Connection Mode

Set the parameters as follow:

Connection Mode	<input type="text" value="Connect On Demand"/>
Triggered by Data	<input type="checkbox"/>
Triggered by Call	<input type="checkbox"/>
Triggered by SMS	<input checked="" type="checkbox"/>
SMS Connect Command	<input type="text" value="connect"/> (English Only)
SMS Disconnect Command	<input type="text" value="disconnect"/> (English Only)
Max Idle Time	<input type="text" value="0"/> Seconds
Redial Interval	<input type="text" value="30"/> Seconds

Click "Apply", then you can send the SMS "connect"/"disconnect" by your mobile phone to connect/disconnect IR700.

Scenario introduction:

If there's data, IR700 will be wake up, else, after the idle interval, it sleeps.

This scenario could be used in connecting to POS machine, when there is a transaction, IR700 will be wake up and after the idle interval, it sleeps.

Configuration in IR700:

Network->Dialup



Connecting Device, Enabling Service

Network	Set
Dialup	
LAN	
DNS	
DDNS	
Static Route	

Set "Connecting Mode" to "Connect on Demand"

Connection Mode

Set the parameters as follow:

Connection Mode

Triggered by Data

Triggered by Call

Triggered by SMS

Max Idle Time Seconds

Then click "Apply".



7. Support

In case you have problems with the installation and use, please address them to us by e-mail: support@inhandnetworks.com.



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