

PRIVATE MOBILE CONNECTIVITY FOR INDUSTRY

This application note describes how to establish a secure connection between a Mobile “Smart Device” and a Programmable Logic Controller using R2xx/IR7xx Gateway Routers from SATEL USA.

Increasingly, PLC manufacturers are including features to allow the creation, storage and viewing of user created web pages for monitoring and control.

These web pages are used to graphically display the conditions, collected data, and controls of a single pump station, control system, or substation, etc...; and also to display centralized information from several pump stations, control systems, or substations, etc...

With the addition of the R2xx/IR7xx Gateway Router to the PLC Local Area Network, PLC web pages are available to specified Smartphones and Tablet PCs providing direct access to critical systems when needed.



This application note covers most Mobile Devices including specifically:

- ✓ Apple iOS Devices: iPad, iPod, iPhone, etc...
- ✓ Windows Device OS: Smartphones & Tablet PCs
- ✓ Android OS: Phones and Tablets
- ✓ BlackBerry Smartphones
- ✓ Similar Phone, Handheld and Tablet Devices

Connecting to PLCs with WEB SERVER capabilities and/or Web Server modules from:

- | | |
|---------------------------------------|-----------------|
| ✓ Siemens | ✓ Eaton-Moeller |
| ✓ Bristol Babcock | ✓ Foxboro |
| ✓ IDEC | ✓ GE Fanuc |
| ✓ Modicon / Schneider Electric | ✓ Advantech |
| ✓ Rockwell Automation / Allen Bradley | ✓ Others |
| ✓ Mitsubishi | |

This solution example employs the R2xx/IR7xx Gateway Router as a Virtual Private Network (VPN) Server using Point-to-Point Tunneling Protocol (PPTP) features and VPN client utilities of the mobile device to access user web pages from the HTTP web server of the connected PLC.

In this scenario, the remote mobile device becomes part of the PLC, LAN network using DHCP, or automatic IP address assignment.¹

Items Required:

- A. R211, R214 or IR711, IR714 Gateway Router**
- B. PLC, or device with and Ethernet RJ-45 connection running a Web Server for user web pages**
- C. Mobile Device such as Tablet PC, Smartphone, IPad, iPhone, Blackberry, Android or similar device with internet connection**

¹ Other configurations are available with Internet Protocol Security (IPSec) Tunnel encryption, Layer 2 Tunneling Protocol (L2TP), Generic Route Encapsulation (GRE), Hypertext Transfer Protocol Secure (HTTPS), OpenVPN, and other methods of secure connection with a variety of encryption types, certificate capabilities, and static route utilities which are compatible with all PC operating systems, Smart Devices, and IT Infrastructure from CISCO, Juniper, and most others. Please consult an IT professional, SATEL USA, or the User's Guide for additional details.

Part 1: PLC Configuration

Specific configuration varies from PLC to PLC. The basic steps of operation are to program the PLC and then design web pages for the desired purpose.

The user web pages must be created and configured to the PLC manufacturer's instructions for LAN access.

The PLC must be configured with the R2xx/IR7xx as the LAN Gateway.

- a. Configure PLC for LAN connection and HTTP access according to PLC instructions

Example IPv4 network settings:

IP Address: 192.168.2.2

Subnet Mask: 255.255.255.0

Gateway: 192.168.2.1

Primary DNS: 192.168.2.1

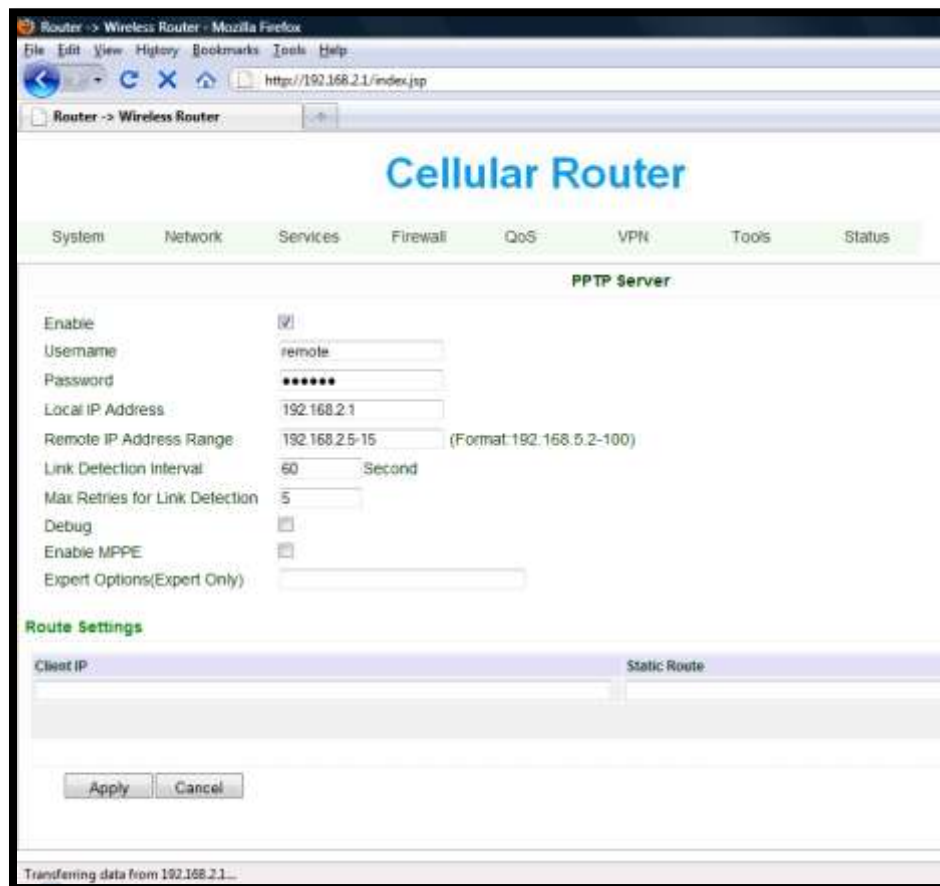
- b. Create, save, and test custom web pages on PLC via PLC web interface as directed by the PLC manufacturer. The created pages typically are viewed using the LAN IP address of the PLC. Password protection options should be utilized for maximum security.

Part 2: R2xx/IR7xx Configuration

The R2xx/IR7xx Gateway router will be setup as a Virtual Private Network server providing remote and mobile devices with Local Area Network access to the connected PLC. Mobile devices will connect to the PLC just as it would via LAN connection once the VPN is established.

This configuration assumes elementary setup has been performed and a PC is able to connect to the gateway for setup, DHCP service is enabled in the R2xx/IR7xx and it is able to connect to the Wide Area Network. **This is a basic PPTP VPN connection.**

Configure VPN PPTP Server



- a. Select enable
- b. Create a username and password to be used
- c. Assign the local IP address, for simplicity the same router LAN IP address is used.
- d. Assign the range of IP addresses to assign to clients. This may be used to restrict the number of users and should exclude any addresses in use.
- e. Enable MPPE for Microsoft clients
- f. Apply Settings

Part 3: Mobile Device Configuration

The specific steps vary from operating system to operating system and device to device. These instructions are intended as an approximate guide.

WINDOWS MOBILE OS

A. Select Start.



B. Select Settings.



C. Click the Connections Tab and Icon.



D. Select the Add a new VPN server connection link.



E. The VPN settings are as follows:

- Name: Name of the connection can be anything
- Host Name/IP: External IP address of the R2xx/IR7xx Gateway
- Select PPTP
- Click “Next”

F. From the next window:

- Enter the Username & Password
- Do not enter a domain



Settings 12:06

nuvpn

User name: NetID

Password: *****

Domain:*

* If provided by ISP or network administrator.

Advanced...

Back Finish

APPLE IPHONE, IPAD, IOS

1. Configure VPN

Choose Settings - General - Network - VPN and then choose Add VPN Configuration.

- Description: Name of the connection can be anything
- Server: IP address of the R2xx/IR7xx Gateway
- Account: Enter the chosen Username
- RSA-SecureID: Off
- Password: Enter defined password
- Encryption Level: "auto"
- Send All Traffic: On



2. Turn VPN On

Once you've created a VPN configuration, the option to turn VPN on or off appears in the main Settings screen. When you are connected using VPN, the VPN icon appears in the status bar.

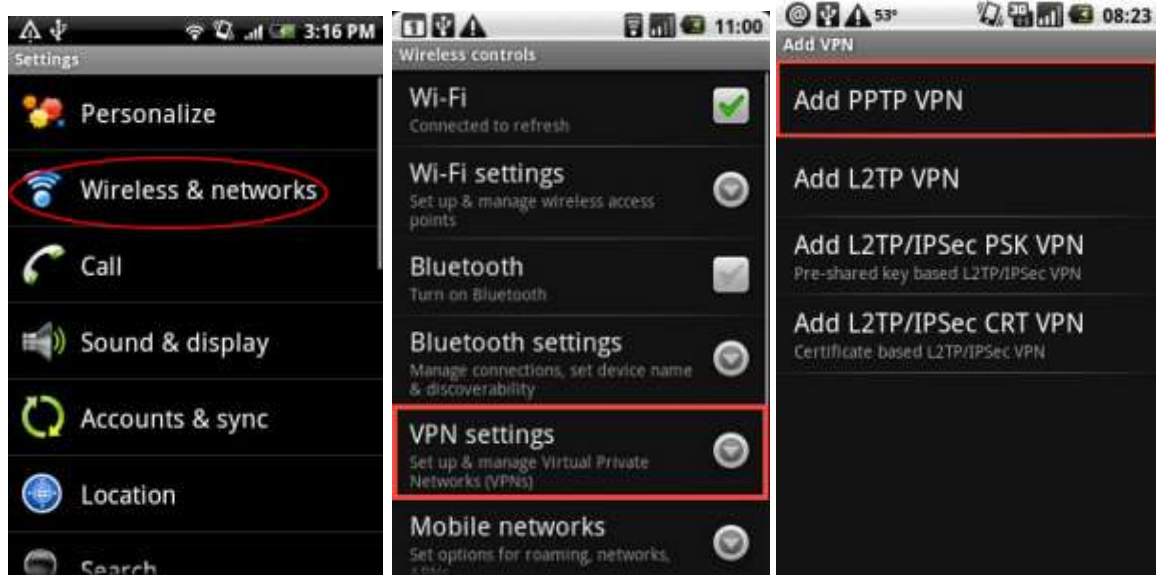


ANDROID PHONES & TABLETS

From the home screen of Android phones or tablets, press the Settings icon, then choose:

1. Configure VPN

Choose: Settings - Wireless & networks - VPN settings - Add VPN - Add PPTP VPN



2. The VPN settings are as follows:

- Description: Name of the connection can be anything
- Server: IP address of the R2xx/IR7xx Gateway
- Select Encryption

3. Enter Username & Password when connecting

BLACKBERRY SMARTPHONES

1. In the device options, click Security Options
2. Click VPN
3. Select the Enable VPN check box
4. Create a VPN profile using the IP address off the R2xx/IR7xx as the server
5. Enter additional settings as specified
6. Press the Menu key
7. Click Edit
8. In the User name field, change the user name
9. In the User password field, change the user password
10. Press the Menu key
11. Click Save

