

Engineering Note: EN0119 Remote Connection to Hydronix Control Systems via a Cellular Router

Summary:	A procedure detailing how Control (HC07), Hydro-Vie internet connection availa	v to use a Ce ew (HV05) c ble.	ellular Router to connect remotely to a Hydro- or Hydro-Hub (HH01) that does not have a local
Products affected:	Hydro-Control (HC07), Hy	/dro-Hub (H	H01), Hydro-View (HV05)
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1 Introduction

There are occasions when a Hydro-Control, Hydro-View or Hydro-Hub may be required to be installed in a remote location that does not have access to a local network connection. Alternatively, security policies may prevent these units from being connected to an organisation's network. While the Hydro-Control, Hydro-View or Hydro-Hub can function offline without issue, it is often desirable to be able to remotely manage the device from another location. One option to accomplish this is to use a Cellular Router in conjunction with a Virtual Private Network (VPN) to enable a direct connection between a remote PC and the Unit.

This Engineering Note provides an example of how to set up such a solution, using the InHand Networks IR302 Industrial LTE Router in conjunction with an OpenVPN based VPN server. While the exact steps detailed below will be different if using a device from another manufacturer, the principle of the set up should be similar.

2 Equipment

This example uses the InHand Networks IR302 Industrial LTE Router which has the following features:

WiFi: IEEE 802.1 1b/g/n, 150Mbps

4G LTE Cellular Modem

2x 100Mbps Ethernet Ports (1 LAN port and 1 port that can be configured as either WAN or LAN)

Dual SIM slots (supports automatic failover)

Power Supply: 9 – 36VDC (Nominally 24V)

DIN Rail mount

2x SMA Antennas (WIFI & 4G)

2x GPIOs (can be configured as RS232)

Built in VPN (OpenVPN & WireGuard)



https://inhandgo.com/products/inrouter300-lte-cellular-routers



Other equipment required:

- Hydro-Control (HC07), Hydro-View (HV05) or Hydro-Hub (HH01)
- SIM card with appropriate, activated data plan
- Cat 5 or 6 ethernet cable (x2)
- Virtual Private Network (VPN) service
- Windows PC

3 Hardware Setup



Detail of the InHand IR302 Router ports.

Attach the antenna marked "WIFI" to the WiFi SMA port and the antenna marked "4G" to the Cellular 1 SMA port.

Connect an ethernet cable from the PC to the LAN2 port on the Router.

Connect an ethernet cable from the Hydro-Control or Hydro-View to the WAN/LAN1 port.

Connect the 24V supply to the 9-36V DC power input.





Fit the activated SIM card into Slot 1 of the SIM card holder and insert into the Router.





4 Initial Router Setup

On the PC, open a browser window and navigate to IP address 192.168.2.1

At the login screen, enter the default username/password: adm/123456

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					Username		
					Password		
						Login	
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It is recommended that these credentials are changed. This can be done by selecting **System > Admin Access** from the top menu bar and entering a new Username and Password in the appropriate fields, followed by clicking the "Apply" button.

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	iŋла	nd Int	land	Net	worl	ks					
F	Syster	m Netw	ork S	Services	Firewal	QoS	VPN	Tools	Application	Status	
								Your pass	word have security	y risk, please	click here to change!
	Usernar	ne / Password							Adm	nin Access	
	Lisema	me		Hydronix							
	Old Pas	ssword				=					
	New Pa	assword				6					
	Confirm	New Passwor	d								
	Manage	ment									
	Enable	Service Type	Service Por	t Local access	Remote	Allowed addresse (Optional)	es from WAN	Description			
		HTTP	80			[
		HTTPS	443					_			
		SSHD	22								
	Non-priv	vileged users									
	Usernai	me Passv	word								
				_	_						
	Other Pa	arameters									
	Login ti	imeout		500	Seconds						
				0.12							
	E	Арриу Са	ancel								
	Other Processing Control of Contr	arameters imeout	word	500	Seconds						

Log back in to the router with the new Username and Password.

The correct time zone and time should also be set by selecting **System > Time** from the top menu, then selecting the time zone from the drop-down list, checking the "Auto Daylight Saving Time" option and clicking on the "Apply" button. After this click on the "Sync Time" button to sync the PC's time to the Router.

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÷	→ C ▲ Not secure	192.168.2.1/indexjsp
	inhand InHand	I Networks
+	System Network	Services Firewall QoS VPN Tools Application Status
		Your password have security risk, please click here to change!
		Time
	Router Time	2025-06-03 18:12:44
	PC Time	2025-06-03 11:12:45 Sync Time
	Timezone Auto Daylight Savings Time	(UTC+00.00 England V
	Auto Update Time	On startup 🗸
	NTP Time Servers	1 pool ntp org
	Apply Cancel	

EN0119 Issue 1.0.0

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4.1 Cellular Network Settings

Setting up the Cellular connection, requires the following information about the SIM card: Access Point Name (APN), Access Number (typically the country dialling code, entered in the form "*xx#" where xx is the country code), Authentication Type (typically Auto), Username and Password. This information can be obtained from the SIM card provider.

For the purposes of this example, we are using a Vodafone Pay-As-You-Go SIM in the UK:

APN:	pp.vodafone.co.uk
Access Number:	*44#
Authentication Type:	Auto
Username:	wap
Password:	wap

Select **Network > Cellular** from the top menu. Check the "Enable" box, and in the drop-down next to "SIM1 Network Provider", select "Profiles 1".

Set "Network Select Type" to "Auto" and "Connection Mode" to "Always Online" from their respective drop-downs.

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+	System Network	Services Firewall QoS	VPN Tools Applicate	on Status			
				Cellular			(
	Enable Time schedule Force Rebot Shared Connection(NAT) Default Route Stildt Network Provider Network Select Type Connection Mode Redail Interval Show Advanced Options Profiles	ALL Schedule Management.	•] Manage				
	Index	APN	Access Number	Authentication Type	Username	Password	
		Cirk to edit	30%	Auto			
	Apply Cancel						Add

Next, click on the line "Index 1", below the "Profiles" heading to edit it and fill in the information listed above. Click on the "OK" and then "Apply" buttons to safe the information.

Index A	APN	Access Number	Authentication Type	Username	Password	
1	pp.vodafone.co.uk	*44#	Auto 👻	wap	wap	Ì.
					Delete OK	Cancel
		*99#	Auto 🗸			
						Add
Apply Cancel						



After a few minutes, the Router should now be connected to the Cellular network. The status of the Cellular connection can be seen by selecting **Status > Modem** from the top menu, it should look similar to the image below. "Register Status" should show as "registered" if the SIM card has been correctly authenticated.

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	System	Network	Services	Firewall	QoS	VPN	Tools	Application	Status
									System
	Cellular								Modem
	Status		modern is	ready					Traffic Statistics
	Current SIM		SIM1						Alarm
	Network Type		4G						WLAN
	Signal Level		(34 asu)					Network
	RSSI		-77 dBm						Connections
	RSRO		-100 dbm						Device Manager
	SINR		7 dB						Route Table
	Register Status		registered	-					Device List
	IMEI(ESN) Coo	ie .	86582806	1422604					Device List
	IMSI Code		23415958	3207948					Log
	ICCID Code		894410003	304806764714					Third Party
	MCC		234						Sonware Notices
	MNC		15						
	PLMN		23415						
	Band		20						
	LAC		UX6027						
	Cell ID		0x0111C0/	A					
	PCI		177						

The status of the Network connection can be seen by selecting **Status > Network Connections**. Under the "Cellular" heading "Status" should show as "Connected".

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inprand InHar	nd Networks	
+ System Network	Services Firewall QoS VPN Tools Application	Status
	Networ	System
WAN		Modem
MAC Address	00:18:05:2E:C6:B8	Traffic Statistics
Connection Type	Disabled	Alarm
IP Address	0.0.0	WLAN
Netmask	0.0.0	Network
DNS	0000	Connections
MTU		Device Manager
Status	Disconnected	Route Table
Connection time		Device List
N 8 1		Log
Cellular	Cellular 1	Third Party Software Notices
Connection Type	Dialup	
IP Address	10.194.115.33	
Netmask	255.255.255.255	
Gateway	10.194.110.34	
MTU	152.100.200.01,102.100.200.01	
Status	Connected	
Connection time	0 day, 00:00:50	
Connect Disconnect		

4.2 VPN Settings

Setting up the VPN connection will require an OpenVPN configuration file (e.g. config.ovpn). This file should be provided by the VPN administrator.

Select **VPN > OpenVPN Tunnels** from the top menu. On the "OpenVPN Tunnels" page, click on "Add" to create a new tunnel.

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+	-							Open	PN Tunnels			
	Enable Marte	Add	Tunnel Description Show Det	n all Status							Tunnel Status	Conneted Time



Click on the "Mode" drop-down and change this from "Client" to "Ovpn Config".

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•	inhand InHand Networks												
۲	System	Network	Services	Firewall	QoS	VPN	Tools	Application	Status				
+	Edit OPENVP	N Tunnel						Open	VPN Tunnels				
	Tunnel name		OpenVPN	_T_1									
	Enable												
	Mode		Client	× -									
	Protocol		UDP 🗸										
	Port		1194										
	OPENVPN S	erver											
	Authenticatio	n Type	None	~									
	Local IP Addr	ress											

On this screen enter the Username and Password for the VPN and check "Enable" and "Update DNS". Note that the Tunnel name is automatically created as "OpenVPN_T_1".

Open the aforementioned OpenVPN configuration file in a text editor, then Copy and Paste the contents from this file to the box labelled "Ovpn Config".

Edit OPENVPN Tunnel OpenVPN Tunnels Tunnel name OpenVPN_T_1	
Tunnel name OpenVPN_T_1	
Enable Open Canfig Username ddwy Vsername ddwy Pasword Update DNS drv tun clater ccp cce cce cce cce cce cce cce cce cce	

Click the "Save" button. After a few seconds, the "Tunnel Status" should show as "Connected". Note and record the IP address of the connection in the "Tunnel Description" as this will be required later to connect remotely.

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System	Network	Services	Firewall	QoS	VPN	Tools	Application	Status			
							OpenV	PN Tunnels			- (1)
Enable Name		Tunnel Description	n							Tunnel Status	Conneted Time
Mode: Organ Config Yes Open/VFN_T_1 0:2:168:11:35-255.255.255.0 Dist: 10:10:10:10:10:10:10:10:10:10:10:10:10:1								 Connected	0 day, 00:00:15		
	Add	Show Det	all Status								



5 Connecting a Hydro-Control, Hydro-View or Hydro-Hub

If not already done so, the Hydro-Control, Hydro-View or Hydro-Hub should now be connected to the Router using an ethernet cable. Connect this cable to the WAN/LAN1 port.

Select **Network > WAN/LAN Switch** from the top menu and select the LAN option from the Interface Mode drop-down, then click the "Apply" button.



5.1 Static DHCP Settings

To ensure that the Hydro-Control, Hydro-View or Hydro-Hub is always allocated the same IP address by the Router, it is necessary to set up a Static DHCP

On the Hydro-Control, navigate to the Settings screen and tap on the Network tab. Take note of the Network IP Address.

🌐 🗝 Settings			*	д	M	۵	٠	*	٥	>_	-
System	Defaults	Date / Time	Ν	leasures	_	Net	work	_	Brightne	ŝS	
Ethernet	WiFi										
● DHCP ○ Static I.P Address 192.168.2.30 ◆ Subnet Mask 255.255.255.0 Default Gateway 192.168.2.1 DNS 194.168.4.123			Updat	ie							
Save Close											



On the Hydro-View, log in as an Engineer and navigate to the "Settings" screen and tap on the "I.P Address" Settings tab. Take note of the IP address.

-	System Settings	Locale Settings I.P Address Settings	Sensor Communication Setup	Live Display Setup
		● DHCP ○ Static		
	I.P Address	192.168.2.48		
	Subnet Mask	255.255.255.0		
	Default Gateway	192.168.2.1		
	DNS	192.168.2.1		
₩.			Save	
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Back on the PC select **Status > Device List** from the top menu to display a list of the connected devices. There should be an entry with the IP address of the unit. Take note of the corresponding MAC address in the box to the left.

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	System	Network	Services	Firewall	QoS	VPN	Tools	Application	Status			
+								De	vice List			
	Interface		MAC Addres	\$5			IP Address		Host		Lease	
	lan0		DC:A6:32.E4	1:3E.9D	_		192.168.2.30	-			0 day, 00.59.57	
	lan0		00:BE:43:64	AC:4A			192 168 2.81		HL74		0 day, 00 58 20	
	lan0 50:84:92:50:58:27			192.168.2.99				0 day, 00:32:20				
										গাঁ¢ 3 Seconds	< Stop €	

If using a Hydro-Hub (HH01), navigate directly to the **Status > Device List** screen. It may not be obvious at first which is the correct IP address for the device as the PC will also be listed here. The hostname should say "hydrohub", but it may sometimes be blank. To check which is correct IP address, open a new browser window on the PC and navigate to the suspected IP address, port 5000 (e.g. http://192.168.2.48:5000). If the Hydro-Hub interface loads, that is the correct IP address. Take note of this address and the associated MAC address.

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	ідла	nd InHa	nd Net	tworks									
	System	n Network	Services	Firewall	QoS	VPN	Tools	Application	Status				
								D	vice List				
+	Interface	e	MAC Addre	55			IP Address			+ Host			Lease
1.00%	lan0		B8:27:EB:E	B:C9:81	_		192.168.2.48			hydrohub	-		0 day, 00:39:13
	lan0		00.BE:43.64	EAC:4A			192.168.2.81			HL74			0 day, 00:30:44



Next, select **Services > DHCP Service** from the top menu. On the line below the Static DHCP heading, fill in the MAC address and IP address noted above. Click on the "Add" button, followed by the "Apply" button.

Ô					🙀 Router -> Cellular Ro	uter	
	C 🔺 Not secure 192.16	8.2.1/index.jsp					
	inhand InHand	Networks					
	System Network S	Services Firewall	QoS	VPN Tools	Application Status		
					DHCP Service		
+	Enable DHCP IP Pool Starting Address IP Pool Ending Address Lease DNS Windows Name Server (WINS) Domain Option Static DHCP	192.168.2.2 192.168.2.100 60 Minutes 192.168.2.1 0.0.0.0 Imhand-router.com		Edit			
	MAC Address IP Address DC:A6:32:E4:3E:9D 192.168.2.30	Host					• • = ×
	00:00:00:00:00:00 192.168.2.3	1		Click to edit			Add
	Apply Cancel						



5.2 Firewall Settings

In order to access the Hydro-Control, Hydro-View or Hydro-Hub remotely, it is necessary to map the ports from the external connection to the internal IP address. This guide will map the ports required for HTTP* (1234), HTTPS (443), SSH (22), VNC (5900) and Hydro-View/Hydro-Hub (5000) connections. Depending on requirements, it may not be necessary to enable all of these.

Select **Firewall > Port Mapping** from the top menu. Enter the details for each one as shown below, clicking on the "Add" button after each line. Each entry should be set up as follows:

Enable:	Checked
Proto:	TCP & UDP
Source:	0.0.0/0
Service Port:	The external port as noted above
Internal Address:	The IP address as shown on the Hydro-Control or Hydro-View
Internal Port:	The internal port, usually the same as external (except port 80)
Log:	No
External Interface:	OpenVPN_T_1
Description:	As shown below

When all have been added, click on the "Apply" button.

	Vid Router >> Celular Router										
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0	0										
-	inhand InHand Networks										
	Syste	m N	letwork	Services Fire	wall QoS	,	VPN	Tools A	Application	Status	
+									Po	rt Manning	
									FU	it mapping	
	Enable	Proto	Source	Service Port	Internal Address	Internal Port	Log	External Interface(Optio	nal) Externa	Address(Optional)) Description
	Yes	TCP & UDP	0.0.0.0/0	1234 🤜	192.168.2.30 🔫	80 🔫	No	OpenVPN_T_1			нттр 🔫
	Yes	TCP & UDP	0.0.0.0/0	22	192.168.2.30	22	No	OpenVPN_T_1			SSH
	Yes	TCP & UDP	0.0.0.0/0	443	192.168.2.30	443	No	OpenVPN_T_1			HTTPS
	Yes	TCP & UDP	0.0.0.0/0	5900	192.168.2.30	5900	No	OpenVPN_T_1			VNC + X
	Yes	TCP & UDP	0.0.0.0/0	5000	192.168.2.30	5000	No	OpenVPN_T_1			HV05/HH01
		TCP	< 0.0.0.0/0	8080		8080			·		
											Add
		Apply	Cancel								

The Router setup is now complete. The PC can now be disconnected from the Router.

* Note for the HTTP connection, a different external port number must be used as port 80 will be sent to the Router's setup screen. This example uses port 1234 for the external port.



6 Connecting remotely via the VPN

With the Hydro-Control, Hydro-View or Hydro-Hub now connected to the VPN via the Router, it is now possible to connect to it from a remote PC.



Connect the remote PC to the same VPN as used to set up the Router. In browser window, navigate to the IP address noted in step 4.2 and port 1234 as set up in section 5.2. For this example, that would be:

http://192.168.113.5:1234 (For a Hydro-View or Hydro-Hub, the port will be :5000)

If warning is displayed regarding an insecure connection, click on "Advanced" followed by "Continue to 192.168.3.5 (unsafe)"

¢	Privacy error
← © ⊗ Not secure https://192.168.113.5	
•	
Pri	
+	
	Your connection isn't private
	Attackers might be trying to steal your information from 192.168.113.5 (for example, passwords, messages, or credit cards). Learn more about this warning
	Hide advanced Go back
	This server couldn't prove that it's 192.168.113.5; its security certificate is not trusted by
	your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.
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If everything has been set up correctly as per this document, the Hydro-Control, Hydro-View or Hydro-Hub interface will now be displayed in the browser window. Similarly, a VNC connection can now be established using port 5900.

