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ICX35-HWC

Industrial Cellular Gateway 3G/4G LTE

April 21, 2016

USER MANUAL

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ProSoft Technology

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ICX35-HWC User Manual Rev. 1.1.0

April 21, 2016

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THIS EQUIPMENT IS AN OPEN-TYPE DEVICE AND IS MEANT TO BE INSTALLED IN AN ENCLOSURE SUITABLE FOR THE ENVIRONMENT SUCH THAT THE EQUIPMENT IS ONLY ACCESSIBLE WITH THE USE OF A TOOL.

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

INSTRUCTIONS D'INSTALLATION

CET APPAREIL EST OUVERT UN DISPOSITIF DE TYPE ET EST DESTINE A ETRE INSTALLE DANS UNE ENCEINTE ADAPTÉ POUR L'ENVIRONNEMENT TELS QUE L'ÉQUIPEMENT EST ACCESSIBLE SEULEMENT AVEC L'UTILISATION D'UN OUTIL.

ADAPTÉ POUR UNE UTILISATION EN CLASSE emplacements non dangereux SEULEMENT I, Division 2, Groupes A, B, C ET D LIEUX DANGEREUX OU.

AVERTISSEMENT - RISQUE D'EXPLOSION - NE PAS COUPER EQUIPEMENT LORSQUE LE CIRCUIT EST EN DIRECT ou si la zone est connue pour être dépourvue de concentrations inflammables.

AVERTISSEMENT - RISQUE D'EXPLOSION - SUBSTITUTION DE TOUT COMPOSANT PEUT NUIRE CONFORMITÉ À CLASS I, DIVISION 2.

Agency Approvals and Certifications

Agency	
ATEX	
CE	
CB Safety	
ETSI	
FCC/IC	
PTCRB	
UL/cUL	

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"THIS DEVICE CONTAINS A TRANSMITTER MODULE:

FCC ID: N7NMC7355

PLEASE SEE FCC ID LABEL ON BACK OF DEVICE."

"THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION."

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Industry Canada Requirements:

THE INSTALLER OF THIS RADIO EQUIPMENT MUST INSURE THAT THE ANTENNA IS LOCATED OR POINTED SUCH THAT IT DOES NOT EMIT RF FIELD IN EXCESS OF HEALTH CANADA LIMITS FOR THE GENERAL POPULATION; CONSULT SAFETY CODE 6, OBTAINABLE FROM HEALTH CANADA.

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1.1 About the ICX35-HWC Industrial Cellular Gateway

The ICX35-HWC Industrial Cellular Gateway provides secure wireless Ethernet and serial connectivity to remote devices over 4G LTE cellular services with fallback to 3G. These devices include PAC/PLCs, RTUs, DCS systems, instruments, electronic billboards and communication towers.

The ICX35-HWC is ideal for programming and maintenance of remote equipment, remote data collection, SCADA, and machine-to-machine (M2M) applications. It operates on LTE/GSM networks with a single device.



The ICX35-HWC supports:

- 4G LTE with GSM
- Cellular networks worldwide
- Secure VPN connections over internet and cellular links for remote site access to corporate networks (VPN Client Mode)
- Simultaneous Ethernet and serial data port (Modbus & DF1 encapsulation) communications providing SCADA migration path to cellular for serial and Ethernet devices.
- Built-in web server for local/remote configuration, monitoring, and wireless network diagnostics.

1.1.1 Specifications

Cellular Modem

Cellular Technology	LTE, GSM, UMTS/HSPA+, GPRS, EDGE
Frequency/Bands	ICX35-HWC-A: Freq: 700/850/900/1700/1800/1900/2100 MHz HSPA and HSPA+ Bands: 1,2,4,5,8 LTE Bands: 2,4,5,13,17,25 Quad-band EDGE/GPRS/GSM
	ICX35-HWC-E: Freq: 700/800/850/900/1700/1900/2100/2600 MHz HSPA and HSPA+ Bands: 1,2,5,6,8 LTE Bands: 1,3,7,8,20 Quad-band EDGE/GPRS/GSM
Max Downlink Speeds	Up to 100 Mbps maximum (network dependent)
Max Uplink Speeds	Up to 50 Mbps maximum (network dependent)
Activation	SIM Slot
Security	OpenVPN client, IPSec client, IP Address Filtering
Physical	
Enclosure	Extruded aluminum with DIN clip
Dimensions (H x W x D)	5.52 x 2.06 x 4.37 in 14.01 x 5.24 x 11.09 cm
Shock	IEC 60068-2-27; 20G @ 11ms (Operational) IEC 60068-2-27; 30G @ 11ms (Non-Operational)
Vibration	IEC 60068-2-6; 10G, 10 to 150 Hz
Ethernet Port	(1) 10/100 Base-T, RJ45 connector
Serial Port	(1) DB9 female (serial tunneling & encapsulation)
Antenna Ports	(2) Female RP-SMA connector Antennas sold separately
Weight	14.5 oz (411 g)
Enclosure	Extruded aluminum with DIN clip
Environmental	
Operating Temperature	IEC 60068 -22°F to +158°F (-30°C to +70°C)
Humidity	IEC 60068-30 5% to 95%, with no condensation
External Power	10 to 30 VDC
Peak Power Consumption	< 6W

1.2 Package Contents

The following components are included with the ICX35-HWC and are required for installation and configuration.

Important: Before beginning the installation, please verify all of the following items are present.

VC

If any of these components are missing, please contact ProSoft Technology Support for replacement parts.

1.3 Jumpers

There are three jumpers located on the rear of the unit.



1.4 Power Requirements

The ICX35-HWC accepts voltages between 10 and 30 VDC, with an average power draw of 3 watts or less.



2 Connecting to the ICX35-HWC

In This Chapter

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The configuration webpage is used to configure and manage the ICX35-HWC. First-time setup must be performed over a wired network, where provider-specific cellular configuration details are configured. Once initially set up, you can access the webserver over the LAN and cellular networks (unless LAN access is disabled).

Key benefits of the web-based configurator include:

- Login and device parameter configuration
- Network setting adjustments
- Security setting maintenance
- Event reporting update
- Firmware updates

2.1 Configuration Webpage Setup

- 1 Insert the SIM card on the front of the module.
- 2 Ensure that the module is connected to the network.
- **3** Apply power to the module.
- 4 Log into the radio's configuration webpage. The default IP address of the ICX35-HWC is 192.168.0.250. If your PC is on a different subnet, temporarily set the IP address of your PC to 192.168.0.xxx with a subnet of 255.255.255.0

IP address:	192.168.0.
Subnet mask:	255.255.255.0

- 5 Open a web browser and enter the ICX35-HWC default address of http://192.168.0.250:8080 You can also use ProSoft Discovery Service to set a temporary IP address. You can download and install ProSoft Discovery Services from the ProSoft website at www.prosoft-technology.com.
- 6 Once the ICX35-HWC homepage opens, enter the USERNAME and PASSWORD to log in. You will be able to customize these later. The default USERNAME is '*admin*' and the default PASSWORD is '*password*'.

Note: Be sure to change your password once you log in. You can do this by navigating to **Administrator > Access Control > Web Login**. Be sure to click **Apply** after entering your new credentials.

ICX35 Logon	
User:	
Password:	
	Login

7 After successful login, the homepage displays data from the Status tab.

- 4	90				User: admin	Log off
ProSoft						
Status	Configuration Administra	ator				
System Status	System					
	System	Un Time	0h 2m 43c			
Resources		System Time	1970-01-01 00:02:43 UTC			
Fechnical Support		Board F/W Version	1.1-2016-03-30			
ProSoft Discovery		Serial Number	00:0D:8D:11:F5:A8			
Service	WAN	Disconnected, will retry				
ProSoft Technology		Connection Type	GSM			
and the second se		Signal Level	OdBm			
		Network Registration	COPS:			
		Link Time	0			
n 🥐		IP	0			
-U *		Sent Bytes				
		Received Bytes				
		Whitelist	Disabled			
	Cellular Data Usage	Disabled	Reset Period Usag	2		
PioSoff		Current Period	0			
	LAN					
		Connection Status	Link Up - 100/ful			
		IP Address	192.168.0.250			
		Netmask	255.255.255.0			
		Ethernet Address (MAC)	21619			
		Sent Bytes	129946			
	VPN	Disabled				
	Serial	Disabled				
		Copyright © 19	98 - 2015 ProSoft Technology Inc All Rights Rese	rved		

2.2 Assigning a LAN IP Address to the ICX35-HWC

ProSoft	100701 100701			User: admin	Log off
Status	Configuration Adminis	strator			
Basic	Module Settings				
Advanced	Module Name	ICX35			
	APN Name	ATT			
Resources	LAN Settings				
Jechnical Support	LAN IP Address / Subnet Mask	192.168.0.250	/ 24		
Service	Enable DHCP	Disable 🔻			_
ProSoft Technology	End Device IP Address	192.168.0.100			
	<u>Appy</u>				

1 Select the *Configuration* tab and then select **Basic**.

- 2 Enter a name for the module in the **Module Name** field.
- **3** Enter the APN (Access Point Name). This information is provided by your cellular provider.
- 4 Enter the LAN IP Address/Subnet Mask of the ICX35-HWC.

- 5 Enter the **End Device IP Address** of the end device if you only have one device. The end device is the device connected to the LAN port of the device that the ICX35-HWC will access.
- 6 Choose whether or not to use DHCP (Dynamic Host Configuration Protocol) for end devices.
 - a) If YES, **Enable** the DHCP option and select a **DHCP Range** of IP addresses applicable to multiple End Devices.

			User: admir	Log o
rosoft				
CHNOLOGY				
Status	Configuration Admin	istrator		
ic	Module Settings			
anced	Module Name	IC/35		
vall	APN Name	ATT		
van	LAN Settings			
urcas	LAN IP Address / Subnet Mask	192.168.0.250	/ 24	
nical Support	Enable DHCP	Enable 🔻		
oft Discovery	DHCP Range	192.168.0.201	- 192.168.0.210	
ce	Lease Time	60	m 🔻	
oft Technology	Annha			
-	Арріу			
)°				
100 A				
ProSoft				

- **DHCP Range** This allows you to enter a range of IP addresses that can be addressed. For example, if you have a number of devices connected to a remote ICX35-HWC, you can enter the DHCP range to use on devices connected to the remote ICX35-HWC.
- Lease Time Enter the desired lease time using seconds, minutes, or hours. This setting depends on your cellular plan.

b) For each End Device, set the TCP/IPv4 properties (Found at **Control Panel\Network and Internet\Network Connections**) as follows:

General Alternate Configuration You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.						
Obtain an IP address autor	matically					
 Use the following IP addres 	55:					
IP address:						
Sybnet mask:						
Default gateway:						
Obtain DNS server address	; automat	ically				
Ose the following DNS serv	er addres	sses:				
Preferred DNS server:						
<u>A</u> lternate DNS server:						
Validate settings upon exi	t			Adya	inced	

c) If NO, **Disable** the DHCP option and enter an applicable **End Device IP Address**.

			User: admin	Log off
ProSoft				
TECHNOLOGY				
Status	Configuration Admini	istrator		
Basic	Module Settings			
Advanced	Module Name	IC/35		
Advanced	APN Name	ATT		
Firewall	LAN Settings			
	LAN IP Address / Subnet Mask	192.168.0.250	/ 24	
Resources	Enable DHCP	Disable 👻		
	End Device IP Address	192.168.0.201		
Service	Apply			
ProSoft Technology	Арріу			
- O o o o o o o o o o o o o o o o o o o				

d) On the laptop, set the TCP/IPv4 properties as follows. Non-PC devices, such PLC's, do not require the *Prefered DNS Server* entry.

ternet Protocol Version 4 (TCP/IPv	/4) Properties
General	
You can get IP settings assigned au this capability. Otherwise, you need for the appropriate IP settings.	itomatically if your network supports d to ask your network administrator
) Obtain an IP address automat	ically
• Use the following IP address:	
IP address:	192 . 168 . 0 . 201
S <u>u</u> bnet mask:	255 . 255 . 255 . 0
Default gateway:	192.168.0.250
Obtain DNS server address au	Itomatically
• Use the following DNS server a	addresses:
Preferred DNS server:	192 . 168 . 0 . 250
<u>A</u> lternate DNS server:	
🔲 Vaļidate settings upon exit	Advanced
	OK Cancel

7 In the ICX35-HWC configuration webpage, click **Apply**. The module reboots and should connect to the cellular provider.

Apply

- 8 Once the reboot is complete, reset your PC back to its original IP address. This IP address should now be on the same subnet as the ICX35-HWC.
- 9 Close your browser and open a new session. Enter the new IP address of the ICX35-HWC to access the configuration web page. Add :8080 to specify the correct port (192.168.0.250:8080).

2.3 Connecting to your Cellular Provider

The ICX35-HWC supports 3G GSM/GPRS and 4G LTE (where applicable) networks. It uses your cellular provider as an ISP (Internet Service Provider) to connect to the Internet. Cellular devices using GSM technology, such as AT&T, require a SIM (Subscriber Identity Module) card to be installed in the radio.

2.3.1 Connection using GSM/GPRS

The Subscriber Identity Module (SIM) in the ICX35-HWC is a smartcard that securely stores the key identifying a cellular subscriber. Generally, you will only need to install a SIM once in the life of the cellular gateway - and it may be preinstalled by your ProSoft Technology Representative.

The SIM card slot is located on the front of the cellular gateway.



- 1 Remove the SIM Card Slot cover by removing the two screws holding it into place.
- 2 Insert the SIM card into the ICX35-HWC and cycle power. The SIM card is read by the ICX35-HWC upon boot up.
- **3** Re-attach the SIM Card Slot cover.
- 4 After the ICX35-HWC reboots, it establishes a link to your cellular provider network, also called registering on the network, and then receives an IP address.
- **5** When the ICX35-HWC receives its IP address from the cellular provider, a connection to the Internet or the cellular network is also available for computers or other devices to connect directly to the ICX35-HWC.
- 6 The GSM network information is now displayed on the *Status* web page.

A.	6 8			User: admin	Log off
ProSoft					
TECHNOLOGY					
Status	Configuration Admini	strator			
System Status]
	System				
		Up Time	0h, 6m, 6s		
Resources		System Time	2015-11-18 18:26:50 UTC		
Technical Support		Board F/W Version	1.1-2016-03-30		
Pro Soft Discovery		Serial Number	00:0D:8D:A6:00:10		
Service	WAN	Connected			
ProSoft Technology		Connection Type	4G-LTF		
(incode recenterog)		Signal Level	(3-0		
		Network Registration	-030Bm		
		Network Registration	Aloci Ob Em 20r		
		Disconnect Count	0, 50, 505		
n a		TD	166 130 150 86		
		Sent Rutes	2856		
· ·		Pereived Bytes	2475		
8		Whitelist	Disabled		
	Cellular Data Usage	Disabled	Reset Period Usage		
ProSoft		Current Period	29974777		
	LAN				
		Connection Status	Link Un - 100/full		
		IP Address	172.20.1.248		
		Netmask	255 255 255 0		
		Ethernet Address (MAC)	00:0D:8D:A6:00:10		
		Received Bytes	197630		
		Sent Bytes	333582		
	VPN	Disabled			
	Serial	Modbus RTU connected to a Slave			
		Received Ruter	0		
		Sent Buter	193		
		Dronoed Buter	0		
		Dropped Serial Messages	0		
		Received Encanculated Messages	7		
		Sent Encapsulated Messages	0		
		Sent Encapsulated Bytes	0		
		Dropped Encapsulated Messages	0		
		erepped encoperated meadyes	-		

3 ICX35-HWC Webpage

There are three main tabs of the ICX35-HWC web pages:

- Status
- Configuration
- Administrator

3.1 Status

The *Status* tab displays the current settings of the cellular gateway including up time, IP address, and cellular data usage.

A.	6 6			User: admin	Log off
DroCoff					
Proson					
TECHNOLOGY					
Status	Configuration Admini	strator			
System Status	System				
	System	In The s	Oh for fo		
.		Up Time Sustan Time	0h, 6m, 6s		
Resources		Board F/W Version	1 1 2016 03 30		
lechnical Support		Serial Number	0000:80:46:00:10		
ProSoft Discovery			0010010001000120		
Service	WAN	Connected			
ProSoft Technology		Connection Type	4G-LTE		
		Signal Level	-63dBm		
		Network Registration	AT&T		
Iteme		Link Time	0h. 5m. 30s		
		Disconnect Count	0		
-0 -		IP	166.130.159.86		
ų -		Sent Bytes	2856		
		Received Bytes	2475		
		Whitelist	Disabled		
	Cellular Data Usage	Disabled	Reset Period Usage		
Proson		Current Period	29974777		
	LAN				
		Connection Status	Link Up - 100/ful		
		IP Address	172.20.1.248		
		Netmask	255.255.255.0		
		Ethernet Address (MAL)	197630		
		Sent Bytes	333582		
	VPN	Disabled			
	Serial	Modbus RTU connected to a Slave			
		Received Bytes	0		
		Sent Bytes	193		
		Dropped Bytes	0		
		Dropped Serial Messages	0		
		Received Encapsulated Messages	7		
		Sent Encapsulated Messages	0		
		Sent Encapsulated Bytes	0		
		Dropped Encapsulated Messages	0		

System	Description
Up Time	Amount of time the cellular gateway has been active since the last power cycle or a reset
System Time	Current date and time of the ICX35-HWC
Board F/W Version	Firmware version of the cellular hardware
Serial Number	Serial number of the ICX35-HWC
WAN	
Connection Type	The type of connection. For example, GSM
Signal Level	Signal Level of cellular network (dBm)
Network Registration	Registered local cellular network
Link Time	The number of days, hours, minutes, seconds connected to the WAN
Disconnect Count	Indicates the time that the unit has lost communication to a cell tower and has/is attempting to reconnect back to the cellular service. It counts each time that the service has disconnected from the cellular service while the unit is running.
IP	IP address of the ICX35-HWC on the WAN
Sent Bytes	Number of sent bytes on the WAN port for this connection
Received Bytes	Number of received bytes on the WAN port for this connection
Whitelist	Indicates if whitelisting is enabled or disabled
Cellular Data Usage	
Current Period	Shows the total number of bytes (sent and received) on an ongoing basis. This number is reset on the <i>Plan Start Day</i> unless changed by clicking on the Reset Period Usage button.
LAN	
Connection Status	Displays the Link status
IP Address	IP address of the ICX35-HWC on the LAN
Netmask	Subnet Mask
Ethernet Address (MAC)	MAC address of the ICX35-HWC
Received Bytes	Total number of bytes received on the Ethernet port
Sent Bytes	Total number of bytes send on the Ethernet port
DDNS	Dynamic DNS. This value is set during Advanced Configuration.
VPN	Set in Advanced Configuration Settings
Serial	Based on Advanced Configuration settings. For example, this displays a serial status based on selections in Advanced Configuration.

3.2 Configuration

3.2.1 Basic

The **Configuration > Basic** tab allows you to configure the Module and LAN settings.

	3 9 0				User: admin	Log of
roSoft						
Status	Configuration	Administrator				
	Module Settings	10005				
ced	ABN Name	10.35				
dl .						
	LAN IR Address (Subpat Mac					
ces	Enable DHCD			/ 24		
cal Support	Enable DHCP	Disabl	•			
t Discovery	End Device IP Address	192.168	.0.100			
t Technology	Apply					
recimology						
-0 @						
ProSoft						
Contraction of the second						

Module Settings

Parameter	Description
Module Name	Name of ICX35-HWC on network
APN Name	Access Point Name of the network path for cellular connectivity

LAN Settings

Parameter	Description
LAN IP Address / Subnet Mask	IP address of the ICX35-HWC ethernet port
Enable DHCP	Enables/Disables DHCP functionality
End Device IP Address	Used when DHCP is disabled. IP address of end device.
DHCP Range	Used when DHCP is enabled. DHCP range of end devices
Lease Time	Used when DHCP is enabled. Enter the desired lease time using seconds, minutes, or hours. This setting depends on your cellular plan.

3.2.2 Advanced

The **Configuration > Advanced** tab allows you to configure the following:

- WAN
- Cellular Usage Tracking
- DDNS
- VPN
- Serial/Encapsulation

<u>WAN</u>

			User: admin Log of
ProSoft			
ECHNOLOGY			
Status	Configuration	Administrator	
sic	-WAN		
vanced	User Name	admin	
	Password	•••••	
ewall	Wait Between Reconnect	30 Seconds	
	Authentication	CHAP -	
sources	Roaming	Disable 👻	
Soft Discovery	Keep Alive	Disable 💌	
vice	+Cellular Usage Tracking		
Soft Technology	+DDNS		
ison recimology	+VPN		
		Apply	

Parameter	Description
User Name	(optional) User Name for the connection
Password	(optional) Password for connection
Wait Between Reconnect	The number of seconds to wait before trying to establish a reconnect. If this is set to '0', the auto connection is disabled.
Authentication	PAP - Password Authentication Protocol
	CHAP - Challenge Handshake Authentication Protocol
	PAP & CHAP - A mix of both methods
Roaming	This setting prevents the device from connecting to a non-native network, helping to prevent additional charges.
Keep Alive	If enabled (0 denoting Disabled), this parameter sets the keep alive ping period time in seconds. When Enabled, the two fields listed below appear.
Keep Alive Ping Address	Time to keep a connected address connection alive
Keep Alive Ping Period	Number of seconds to ping to ping address in order to keep a connection between a cell tower and a module alive

Cellular Usage Tracking

Note: The Cellular Usage Tracking feature is not an official value of the usage a carrier would report. Due to possible differences in these values, cellular usage tracking should be used as an aid for gauging how much data the system is using over a period rather than as a reliable method to determine billing costs.

Status Configuration Administrator Basic Attransmit Attransmit Briskel Attransmit Briskel Configuration Image: Configur	Log off	User: admin	Us				00	
Status Configuration Administrator scic - - - wanced - - - ewall - - - sources To Ba Status 1 - sholcal Support Soft Technology 1 - Soft Technology 1 - GB First and the status - - - Soft Technology - - -								ProSoft
Status Configuration Administrator sic								CHNOLOGY
sic wanced ewall sources chincial Support Soft Technology Image: Soft Technology<						Administrator	Configuration	Status
sic vanced evall sources thrifical Support Soft Technology First Soft Technology Soft Technology								
- Cellular Usage Tracking bata Pian Limit Disable purces Pian Start Day hnical Support Soft Discovery Soft Discovery CB vice VPN • Serial / Encapsulation							+ WAN	ic
ances wall Data Plan Limit Disable Plan Start Day I Plan Size I GB V Soft Discovery ice Soft Technology							- Cellular Usage Tracking	
wall Plan Start Day 1 burger Image: I						Disable -	Data Plan Limit	anced
Ources Inical Support Soft Discovery Soft Technology Image: Im						1	Plan Start Day	wall
Stop Data After Plan Limit Reached > DDNS • VPN • Sefital / Encapsulation Apply				-	GB	1	Plan Size	
Initial Support Readed Disable GB Soft Discovery vice • DDNS Unlimited • VPN • Serial / Encapsulation					MB		Stop Data After Plan Limit	ources
 + DDNS Unlimited + VPN + Serial / Encapsulation 					GB	Disable 👻	Reached	nical Support
• VPN • Serial / Encapsulation Apply					Unlimited		+ DDNS	Soft Discovery
Soft Technology							+ VPN	vice
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Postor								- Canal ===================================
								ProSoft

Parameter	Description
Data Plan Limit	Specifies whether or not the cellular data storage usage tracking feature is enabled.
Plan Start Day	Specifies the day of the month (1 to 28) that the data plan begins. For example, AT&T service in the USA is billed from the 19th of the month through the 18th of the following month. This is the day that the Usage Value Counter resets on.
Plan Size	Maximum number of megabytes (MB) or gigabytes (GB) of WAN data usage before 3G communications are shut down until the next plan start day. You can also choose <i>Unlimited</i> . It provides a visual status of how much data is being used.
Stop Data After Plan Limit Reached	Specifies whether or not the ICX35-HWC will voluntarily deactivate cellular data if it reaches its data plan limit. You can select <i>Disabled</i> or <i>Enabled</i> . If you select <i>Disabled</i> , the ICX35-HWC will attempt to transfer data even if the Plan Size is exceeded, but the cellular data service provider may halt data, reduce the data rate, or charge additional fees. A 10% buffer is automatically used to help prevent data overages because the gateway usage number isn't instantaneously updated and it may be possible that some amount of byte count loss occurs due to a device reset. <i>Enabled</i> tells the ICX35-HWC to stop transferring data after the Plan (size) limit is reached.

<u>DDNS</u>

Dynamic DNS (DDNS) is a method of mapping WAN IP addresses that are assigned to a domain name.

	0 0 0		User: admin Log o
ProSoft			
Status	Configuration	Administrator	
eie	- WAN		
SIC	+ Cellular Usage Tracking		
anced	- DDNS		
wall	Active	Disable 👻	
	DDNS Server	dvndns@dvndns.org	
urces	ICX35 Domain Name		
nical Support	liser		
oft Discovery	Baseword		
ce	Password		
C Polotiti			
rameter		Description	
tive	-	This parameter specifies if dynamic DN	S is disabled or to which

T di di li otori			
Active	This parameter specifies if dynamic DNS is disabled or to which provider it will update information. (Disabled, DynDNS.org, No-IP.com)		
	Important: For providers like DynDNS.org, the Time to Live (TTL) value may affect how long it takes an ICX35-HWC to see a change in IP address (for example, the IP address changes because of a reboot). It may take the ICX35-HWC upwards of 30 minutes to see the new address.		
DDNS Server	System name for DDNS service.		
ICX35 Domain Name	Specifies the domain that is updated with this gateway's current IP address.		
User	If the dynamic DNS provider requires a username, this parameter specifies what name is sent to authorize the dynamic DNS transaction.		
Password	If the dynamic DNS provider requires a password, this parameter specifies the password that is sent to authorize the dynamic DNS transaction.		

<u>VPN</u>

	0 0			User: admin	Log off
ProSoft					
TECHNOLOGY					
Status	Configuration	Administrator			
Basic	+ WAN				
Advanced	+ Cellular Usage Trackin	g			_
Firowall	+ DDNS - VPN				_
irewaii	Client	Disable 🔻			
Resources	+ Serial / Encapsulation				
echnical Support					
roSoft Discovery Service			Apply		
roSoft Technology					

The Client drop-down list includes the following options:

- Disable
- OpenVPN
- IPSec

Select **Disable** to disable VPN functionality.

OpenVPN

The Virtual Private Network (VPN) Tunnel allows you to access a private local network through the ICX35-HWC.

If you select **OpenVPN** from the *Client* drop-down list, the following additional parameters appear:

					User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrator				
Basic	+ WAN					
Advanced	+ Cellular Usage Tracking					
Advanced	+ DDNS					
Firewall	- VPN					
	Client	OpenVPN 👻				
Resources	OpenVPN					
Technical Support	TLS Renegotiation Time	3600	Seconds			
ProSoft Discovery	Server IP					
Service	Server Port	1194				
ProSoft Technology	Credential Files					
	Certificate Authority	Current File:		Browse No file selected.		
all at	Client Certificate	Current File:		Browse No file selected.		
	Client Key	Current File:		Browse No file selected.		
-Ŭ @	Custom Config File	Current File:		Browse No file selected.	Delete	
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				Арруу		
ProSoff						
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OpenVPN is an open source software application that implements virtual private network (VPN) techniques for creating secure point-to-point or site-to-site connections in routed or bridged configurations and remote access facilities. It uses a custom security protocol that utilizes SSL/TLS for key exchange.

This document assumes you have access to a running OpenVPN server to generate the required certificates and to authenticate through. Chapter 4 provides details on using OpenVPN.

Parameter	Description
TLS Renegotiation Time	Transport layer Security renegotiation time in seconds. This controls how often the underlying SSL/TLS session renegotiates. This provides additional security by frequently rekeying the session keys. This is set to 3600 by default.
Server IP	IP address of the VPN server. This is the IP Address that you are creating the tunnel to. In the previous example, this is the public IP Address of the ICX35-HWC in pass-through mode that is being used as the default connection to the Linux server.
Server Port	Service port number on the VPN server. The default port is 1194. This is the port number for the OpenVPN. Port 1194 is the generally accepted default port designated for OpenVPN. This is the port number that is used for the previous example.

Parameter	Description
Credential Files	 Certificate Authority - VPN authentication that issues certificates for VPN, Secure Internal Communication (SIC), and users.
	• Client Certificate - Issued by a certificate authority as proof of identity.
	 Client Key - Password to the corresponding client certificate.
	Once you have all of the files, click the browse button to locate them on the file system. Once all of the files are uploaded, the actual files appear in the appropriate Current File area.
Custom Config File	Allows you to choose and upload a custom OpenVPN configuration file, which overrides any credential files previously loaded. The Delete button allows you to delete the Custom Configuration file.

Verification

Once the client and server are configured, the client creates a VPN tunnel through the server to the LAN where the server resides. The Status web page will indicate that an OpenVPN connection is established.

You can now pass secured data between the two LAN devices. Verify this with a simple ping from one LAN device to the other.

es Command Prompt	_IOIX
C:\iperf>ping 192.168.0.30	<u>^</u>
Finging 192.168.0.30 with 32 bytes of data:	
Reply from 192.168.0.30: bytes=32 time=2734ms TTL=126 Reply from 192.168.0.30: bytes=32 time=256ms TTL=126 Reply from 192.168.0.30: bytes=32 time=301ms TTL=126 Request timed out.	
Ping statistics for 192.168.0.30: Packets: Sent = 4, Received = 3, Lost = 1 (25% loss), Approximate round trip times in milli-seconds: Minimum = 256ms, Maximum = 2734ms, Average = 1097ms	
C:\iperf>_	
	-
	1.11

IPSec

The VPN Tunnel Internet Protocol Security (IPsec) feature consists of protocols used for authentication and encryption.

The **IPSec** option from the *Client* drop-down list displays the following parameters:

					User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrator				
Basic	+ WAN					
	+ Cellular Usage Trackir	ng				
Advanced	+ DDNS					_
Firewall	- VPN Client	104				
	- Cheric	Ib260				
Pesources	IPSec					
echnical Sunnort	Local Identifier	ICX35_172_201				
	Remote IP	107 131 242 109		Remote Subnet	192.168.1.0	
ProSoft Discovery	itemote a	107.151.242.105		Remote Subfree	/ 24	
	Remote Identifier	routerc0de40		Pre-shared Key		
roSoft lechnology						
			Apply			
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The second se						
ProSoff						

Parameter	Description
Local Identifier	Specifies the identifier to be used for the local side of the IPsec connection. This is used during authentication of the tunnel. It is a free-form string, although typically it is a Fully Qualified Domain Name, or an IP address. Max length is 28.
	Note: Use the "@" prefix when the IPSec tunnel is established between two ICX35- HWC's. Example: @ICX35_local (This may be the local Module Name. If you are establishing an IPSec tunnel with a network router that supports IPSec, no "@" prefix is needed)
Remote IP	This parameter specifies the IPsec remote IP.
Remote Identifier	This parameter specifies the identifier to be used for the remote site of the IPsec connection. This is used during authentication of the tunnel. It is a free-form string, although typically, it is a FQDN name, or an IP address. Max length is 28. Note: Use the "@" prefix when the IPSec tunnel is established between two ICX35-HWC's. Example: @ICX35_remote (This may be the remote Module Name. If you are establishing an IPSec tunnel with a network router that supports IPSec, no "@" prefix is needed)
Remote Subnet	This parameter specifies the subnet address block on the LAN side of the remote peer. This parameter must be specified in the CIDR notation (i.e., a number from 1 to 32)
Pre-shared Key	Specifies the pre-shared key that needs to match between both ends of the VPN tunnel.

IPSec authenticates and encrypts each IP packet of a communication session. IPSec also includes protocols for establishing mutual authentication between agents at the beginning of the session and negotiation of cryptographic keys to be used during the session. This is an end-to-end security scheme operating in the internet layer of the Internet Protocol Suite.

Example

This example connects two devices on different subnets. The devices can be any LAN-based devices that allow you to set the IP Address and Gateway IP address.

	\sim			
ICX35 #1 'West' WAN IP Address = 166.131.66 LAN IP Address = 192.168.1.13	ICX3 .25 WAN 50 LAN	35 #2 'East' IP Address = 166.130.204 IP Address = 192.168.0.23	4.9	
LAN Device (PC #1) IP Address = 192.168.1.155 Gateway IP = 192.168.1.150	L AN IP Ad Gatew	I Device (PC #2)' Idress = 192.168.0.25 way IP = 192.168.0.230		
		IPSec		
@West		Local Identitier	@East	
166.130.204.9		Remote IP / Domain	166.131.66.25	
@East		Remote Identifier	@West	
192.168.0.0 /	24	Remote Subnet	192.168.1.0	/ 24
******		Pre-shared Key		
	ICX35 #1 'West' WAN IP Address = 166.131.66 LAN IP Address = 192.168.1.1 LAN Device (PC #1) IP Address = 192.168.1.155 Gateway IP = 192.168.1.150 @West 166.130.204.9 @East 192.168.0.0 //	ICX35 #1 'West' ICX3 WAN IP Address = 166.131.66.25 LAN IP Address = 192.168.1.150 LAN Device (PC #1) LAN IP Address = 192.168.1.155 Gateway IP = 192.168.1.150 Gateway IP = 192.168.1.150 Gateway IP = 192.168.1.150 Gateway IP = 192.168.1.150 [@West] 166.130.204.9 [@East] 192.168.0.0 / 24	ICX35 #1 'West' WAN IP Address = 166.131.66.25 LAN IP Address = 192.168.1.150 IAN IP Address = 192.168.1.150 LAN Device (PC #1) IP Address = 192.168.1.155 Gateway IP = 192.168.1.150 Gateway IP = 192.168.0.230 West 166.130.204.9 @West 192.168.0.0 / 24 Remote IP / Domain Remote Identifier Pre-shared Key	ICX35 #1 'West' WAN IP Address = 166.131.66.25 LAN IP Address = 192.168.1.150 ICX35 #2 'East' WAN IP Address = 166.130.204.9 LAN IP Address = 192.168.0.230 LAN Device (PC #1) IP Address = 192.168.1.155 Gateway IP = 192.168.1.150 LAN Device (PC #2)' IP Address = 192.168.0.230 @West ICX35 #2 'East' WAN IP Address = 192.168.0.230 @West ICX35 #2 'East' WAN IP Address = 192.168.0.230 @West IcX35 #2 'East' WAN IP Address = 192.168.0.230 @West IcX35 #2 'East' In P Address = 192.168.0.230 @West IcX35 #2 'East' Remote IP / Domain 166.130.204.9 Remote IP / Domain If 66.130.204.9 Icx31 Identifier @East Remote IP / Domain 192.168.0.0 / 24

Two ICX35-HWC radios and two PCs are used. Once the IPSec tunnel is created, communications can occur between the two PCs. IPSec uses the concept of Local ID and RemoteID to identify each device.

ICX35 #1 "West"	
Name	ICX35 #1 West
WAN IP	WAN IP Address of ICX35 #1
LAN IP	192.168.1.150
Local Identifier	@West
Remote IP	WAN IP Address of ICX35 #2
Remote Identifier	@East
Remote Subnet	192.168.0.0/24
Preshared Key	presharedkey (this can be any string)
End Device	192.168.1.155 (IP address of LAN Device #1)

LAN Device #1 (Connected to ICX35 #1)

IP Address	192.168.1.155 (ICX35 #1 end device IP address
Gateway	192.168.1.150 (ICX35 #1 LAN IP address
Preferred DNS (if applicable)	192.168.1.150 (ICX35 #1 LAN IP Address

ICX35 #2 "East"

Name	ICX35 #2 East
WAN IP	WAN IP address of ICX35 #2
LAN IP	192.160.0.230
Local Identifier	@East
Remote IP	WAN IP address of ICX35 #1
Remote Identifier	@West
Remote Subnet	192.168.1.0/24
Preshared Key	presharedkey (this can be any string)
End Device	192.168.0.30 (IP address of LAN Device #2)
LAN Device #2 (Connected to ICX35 #2)	
IP Address	192.168.0.30 (ICX35s end device IP address)
Gateway	192.168.0.230 (ICX35s LAN IP address)

Verification

Once all four devices are configured, the status web page in both of the ICX35s will indicated that an IPSec VPN connection is made.

VPN	IPSec Tunnel Connected	
	IP Address	166.131.66.25
	Received Bytes	0
	Sent Bytes	0

You can ping from one LAN device to the other to further verify that the connection is made.

Serial / Encapsulation

			User: admin	Log off
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Status	Canfinumkian	Administrator		
Status	Configuration	Auministrator		
D :				
Dasic	+ WAN + Cellular Usage Tracki	10 10		
Advanced	+ DDNS	עי		
Firewall	+ VPN			
	- Serial / Encapsulation			
Deceutres	Port Mode	R5232 👻		
Technical Support	Baud Rate	9600 👻		
	Data Bits	8 Bits 🔻		
Service	Parity	None -		
ProSoft Technology	Stop Bits	1 Bits 🔻		
5)	Protocol	Disabled 🔹		
		Apply		
)° 18 –				
ProSoft				

Parameter	Description
Port Mode	This parameter sets the scheme for the serial port (RS-232, RS-485, or RS-422)
Baud Rate	Baud rate used on the ICX35-HWC serial port
Data Bits	Number of data bits per character for the serial port
Parity	Parity type used on the serial port. None, Odd, Even, Mark, Space.
Stop Bits	Number of stop bits per character for the serial port.
Protocol	 This parameter sets the serial encapsulation mode for the gateway: Disabled Generic Modbus RTU Modbus ASCII Modbus RTU to TCP Modbus ASCII to TCP
	 Moduls ASCI to TCP DF1 Full-Duplex (Not available for RS485 port mode)
	• DF1 Radio Modem (Not available for RS485 port mode)

<u>Generic</u>

The **Generic** option sends all serial data to a single destination.

	200		User: admin	Log off
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Status	Configuration	Administrator		
Status	configuration	Fullinguesi		
Desia	. WAN			
Dasic	+ WAN + Cellular Usage Tracki	a		
Advanced	+ DDNS	7		
Firewall	+ VPN			
	- Serial / Encapsulation			
Parourrar	Port Mode	RS232 🔻		
Technical Support	Baud Rate	9600 🔻		
Pro Soft Discovory	Data Bits	8 Bits 💌		
Service	Parity	None 🔻		
ProSoft Technology	Stop Bits	1 Bits 🔻		
	Protocol	Generic 👻		
	Generic			
	Role	Slave 👻		
-[] @	Timeout Bits	40		
^	Port Type	TCP 🔻		
		Apply		
ter El Istorie				
ProSoff				

Parameter	Description
Role	Network role for the encapsulation process (Master, Slave, Master/Slave)
Timeout Bits	Length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data. (0 to 65535)
Port Type	Type of IP connection (TCP or UDP) for the encapsulated data.

The Master role contains an additional parameter:

4	366		User: admin	Log off
ProSoft				
TECHNOLOGY				
Status	Configuration	Administrator		
Basic	+ WAN			
	+ Cellular Usage Track	ng		
Advanced	+ DDNS			
Firewall	+ VPN			
	- Serial / Encapsulation			
Resources	Port Mode	RS232 👻		
Technical Support	Baud Rate	9600 🗸		
Pro Soft Discovery	Data Bits	8 Bits 🔻		
Service	Parity	None 💌		
ProSoft Technology	Stop Bits	1 Bits 👻		
	Protocol	Generic 👻		
	Generic			
	Role	Master 👻		
	Timeout Bits	40		
e contraction de la contractio	Port Type	TCP		
F	Pemote IP			
	Keniote ir			
		Apply		
ProSoft		MARKA		
	-			

Parameter	Description
Remote IP	IP address of the Remote connection to which the encapsulated data will be sent.

Modbus RTU

The Modbus RTU option displays the following additional parameters:

oSoft [®]			
INOLOGY			
Status	Configuration	Administrator	
	+ WAN		
	+ Cellular Usage Tracki	a	
ed	+ DDNS	9	
1	+ VPN		-
	- Serial / Encapsulation		
	Port Mode	RS232 🔻	
es	Baud Rate	9600 👻	
cal Support	Data Bits	8 Bits 💌	
Discovery	Parity	None -	
Technology	Stop Bits	1 Bits 💌	
	Protocol	Modbus RTU 👻	
	Modbus RTU		
	Role	Slave 💌	
- 🗋 🍥 -	Timeout Bits	40	
0	Port Type	TCP V	
		Apply	
ProSoft			
in a state of the second			

Parameter	Description
Role	Network role for the encapsulation process (Master, Slave, Master/Slave).
Timeout Bits	Sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	Type of IP connection (TCP or UDP) for the encapsulated data.

The Master role contains additional parameters:

	200		User: admin	Log of
roSoft				
CHNOLOGY				
Status	Configuration	Administrator		
C	+ WAN			
nced	+ DDNS	R		
vall	+ VPN			
	- Serial / Encapsulation			
urcac	Port Mode	RS232 -		
nical Support	Baud Rate	9600 🗸		
	Data Bits	8 Bits 🔻		
ce	Parity	None 👻		
oft Technology	Stop Bits	1 Bits 💌		
-	Protocol	Modbus RTU 👻		
-aa-	Modbus RTU			
	Role	Master 👻		
- 🗍 🐲	Timeout Bits	40		
an ^o	Port Type	TCP -		
	Encapsulation Table			
a 👔 🐲	Add Entry to Client Tab	a List Remove Selected Entres		
** [*] SECTOR				
ProSoft		Apply		
		1000		

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the *Encapsulation* table is not visible. You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button.

LOGY		• • • • • • • • • • • • • • • • • • • •	""	""	
itatus	Configuration	Administrator			
	+ WAN				
	+ Cellular Usage Tracki	ng			
	+ DDNS				
	- Serial / Encapsulation				
_	Port Mode	R5232 -			
Support	Baud Rate	9600 👻			
support	Data Bits	8 Bits 🔻			
covery	Parity	None 👻			
hnoloay	Stop Bits	1 Bits 🔻			
57	Protocol	Modbus RTU 👻			
ž.	Modbus RTU				
2	Role	Master 👻			
@	Timeout Bits	40			
8	Port Type	TCP 💌			
	Encapsulation Table				
_ <u>@</u>	Serial Addre	255 0	IP Address	0.0.0.0	
HERON HAVE	Add Entry to Client Tab	le List Remove Selected Entres			
ProSoft			Apply		

The Remove Selected Entries button selects and removes entries from this list.

Modbus ASCII

The **Modbus ASCII** option displays the following additional parameters:

tatus	Configuration	Administrator		
	+ WAN			
	+ Cellular Usage Tracki	ng		
	+ DDNS	-		
	+ VPN			
	- Serial / Encapsulation			
	Port Mode	R5232 👻		
Support	Baud Rate	9600 🗸		
COVERV	Data Bits	8 Bits 🔻		
covery	Parity	None 🔻		
hnology	Stop Bits	1 Bits 🔻		
_	Protocol	Modbus ASCII 👻		
Eat	Modbus ASCII			
	Role	Slave 🔻		
@	Timeout Bits	40		
	Port Type	TCP -		
۲			Apply	
ICON-HWO				
ProSoft				

Parameter	Description
Role	Network role for the encapsulation process (Master, Slave, Master/Slave).
Timeout Bits	Sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	Type of IP connection (TCP or UDP) for the encapsulated data.
The Master role contains additional parameters:

			User: admin	Log of
roSoft				
CHNOLOGY				
Status	Configuration	Administrator		
	+ WAN			
nced	+ Cellular Usage Tracki	ng		
-	+ DDNS			
all	- Serial / Encansulation			
	Port Mode	R5232 -		
urces	Baud Rate	0500 -		
nical Support	Data Rite	3000 •		
oft Discovery	Data bits	8 Bits 🗸		
ce	Parity	None -		
oft Technology	Stop Bits	1 Bits 👻		
	Protocol	Modbus ASCII 👻		
Tana at	Modbus ASCII			
2	Role	Master 👻		
-[] @	Timeout Bits	40		
	Port Type	TCP 💌		
	Encapsulation Table			
	Add Entry to Client Tab	la List Remove Selected Entres		
11 1 100 1000	Add Entry to chent ha			
ProSoft		Apply		
		CARA		

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the *Encapsulation* table is not visible. You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button.

Status	Configuration	Administrator	
	+ WAN		
	+ Cellular Usage Trackin	9	
2	+ DDNS		
	+ VPN		
	Port Mode	B5323 -	
5	Pour Moue	R5252 •	
I Support	Data Rite	9600 -	
Discovery	Data bits	8 Bits 👻	
	Parity	None -	
Technology	Stop Bits	1 Bits 💌	
	Protocol	Modbus ASCII 👻	
in all	Modbus ASCII		
8	Role	Master 👻	
- 📋 🍥	Timeout Bits	40	
°	Port Type	TCP 💌	
	Encapsulation Table		
i	Serial Addre	IP Address 0	000
E icon towe	Add Entry to Client Tab	list Remove Selected Entres	
ProSoft	nud citily to citerit rub		
		Apply	

The Remove Selected Entries button selects and removes entries from this list.

Modbus RTU to TCP

The Modbus RTU to TCP option displays the following additional parameters.

	300		User: admin Log off
ProSoft			
TECHNOLOGY			
Status	Configuration	Administrator	
Pasia	. WAN		
Dasic	+ Cellular Usage Trackin	q	
Advanced	+ DDNS	-	
Firewall	+ VPN		
	- Serial / Encapsulation		
Resources	Port Mode	RS232 🔻	
echnical Support	Baud Rate	9600 🔻	
Pro Soft Discovery	Data Bits	8 Bits 🔻	
Service	Parity	None 👻	
ProSoft Technology	Stop Bits	1 Bits 💌	
-	Protocol	Modbus RTU to TCP 👻	
	Modbus RTU to TCP		
	Role	Slave 💌	
	Timeout Bits	40	
00	Port Type	TCD	
1	- one type		
		Anniv	
the second		. 46.6.3	
ProSoff			

Parameter	Description
Role	Specifies the network role for the encapsulation process (Master, Slave).
Timeout Bits	This parameter sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	This parameter specifies the type of IP connection (TCP or UDP) for the encapsulated data.

The Master role contains additional parameters:

4	200		Us	er: admin Log off
ProSoft				
TECHNOLOGY				
Status	Configuration	Administrator		
Basic	+ WAN			
Advanced	+ Cellular Usage Tracki	g		
Advanced	+ DDNS			
Firewall	+ VPN			
	- Serial / Encapsulation			
Resources	Port Mode	RS232 -		
Fechnical Support	Baud Rate	9600 👻		
Pro Soft Discovery	Data Bits	8 Bits 🔻		
Service	Parity	None 👻		
ProSoft Technology	Stop Bits	1 Bits 👻		
-	Protocol	Modbus RTU to TCP 👻		
	Modbus RTU to TCP			
	Role	Master 💌		
-0 0-	Timeout Bits	40		
0.0	Port Type	TO		
	Foreight and Table			
and the second second	Encapsulation Table			
	Serial Addre	ss 0 IP Addr	ess 0.0.0.0	
ProSoft	Add Entry to Client Tab	e List Remove Selected Entres		
		Apply		

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the Encapsulation table is not visible.

You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button.

The Remove Selected Entries button selects and removes entries from this list.

Modbus ASCII to TCP

The Modbus ASCII to TCP option displays the following additional parameters.

4	300		User: admin	Log off
ProSoft				
TECHNOLOGY				
Status	Configuration	Administrator		
Basic	+ WAN			
	+ Cellular Usage Tracki	g		
Advanced	+ DDNS			
Firewall	+ VPN			
	- Serial / Encapsulation			
Resources	Port Mode	R5232 -		
Technical Support	Baud Rate	9600 -		
ProSoft Discovery	Data Bits	8 Bits 🔻		
Service	Parity	None 🔻		
ProSoft Technology	Stop Bits	1 Bits 💌		
and the second se	Protocol	Modbus ASCII to TCP 👻		
	Modbus ASCII to TCP			
	Role	Slave 👻		
- 🗋 🍥 -	Timeout Bits	40		
e e	Port Type	TCP -		
		Apply		
ProSoff				

Parameter	Description
Role	Specifies the network role for the encapsulation process (Master, Slave).
Timeout Bits	This parameter sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	This parameter specifies the type of IP connection (TCP or UDP) for the encapsulated data.

The Master role contains additional parameters:

	3 6 6		Us	er: admin Log off
ProSoft				
TECHNOLOGY				
Status	Configuration	Administrator		
Pasia				
Dasic	+ Cellular Usage Tracking			
Advanced	+ DDNS			
Firewall	+ VPN			
	- Serial / Encapsulation			
Resources	Port Mode	RS232 🔻		
Technical Support	Baud Rate	9600 👻		
Dro Soft Discovoru	Data Bits	8 Bits 💌		
Service	Parity	None 👻		
ProSoft Technology	Stop Bits	1 Bits 💌		
and the second se	Protocol	Modbus ASCII to TCP 💌		
	Modbus ASCII to TCP			
	Role	Master 👻		
- 🗋 🍥 -	Timeout Bits	40		
e e e e e e e e e e e e e e e e e e e	Port Type	TCP 👻		
	Encapsulation Table			
eser (Ser)	Serial Addres	i 0 IP Addres	ss 0.0.0.0	
and Secondaria	Add Entry to Client Table	List Remove Selected Entres		
ProSoft				
		Apply		

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the Encapsulation table is not visible.

You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button.

The Remove Selected Entries button selects and removes entries from this list.

DF1 Full Duplex

The **DF1 Full-Duplex** option displays the following additional parameters.

4	366		User: admin	Log off
ProSoft				
TECHNOLOGY				
Status	Configuration	Administrator		
Desia				
Dasic	+ WAN + Cellular Usage Trackir			_
Advanced	+ DDNS			
Firewall	+ VPN			
	- Serial / Encapsulation			
Perources	Port Mode	R5232 -		
Technical Support	Baud Rate	9600 🔻		
Pro Soft Discovory	Data Bits	8 Bits 🔻		
Service	Parity	None 👻		
ProSoft Technology	Stop Bits	1 Bits 💌		
-	Protocol	DF1 Full-Duplex 👻		
	DF1 Full-Duplex			
	Role	Slave 👻		
	Timeout Bits	40		
e e e	Port Type	TCD		
	DE1 Error Checking			
	Di i Enor checking	BCC V		
		Apply		
ProSoft		Арру		

Parameter	Description
Role	Specifies the network role for the encapsulation process (Master, Slave).
Timeout Bits	Sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	Specifies the type of IP connection (TCP or UDP) for the encapsulated data.
DF1 Error Checking	Specifies which type of error checking is used for DF1 data messages (BCC or CRC).

The Master role contains the following additional fields:

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the *Encapsulation* table is not visible.

You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button.

						User: admin	Logo
rosoft							
CHNOLOGY							
Status	Configuration	Administrator					
с	+ WAN						
nced	+ Cellular Usage Tracking						
nood	+ DDNS						
/all	+ VPN						
	- Serial / Encapsulation						
urces	Port Mode	RS232 -					
nical Support	Baud Rate	9600 👻					
oft Discovoru	Data Bits	8 Bits 👻					
ce	Parity	None 👻					
oft Technology	Stop Bits	1 Bits 🔻					
-	Protocol	DF1 Full-Duplex 👻					
	DF1 Full-Duplex						
	Role	Master 👻					
-	Timeout Bits	40					
e e e e e e e e e e e e e e e e e e e	Port Type	TCP -					
	DF1 Error Checking	RCC -					
	Francisco Table	BCC V					
	Encapsulation Table						
ProSoft	Serial Address	0		IP Address	0.0.0		
	Add Entry to Client Table L	ist Remove Selected Entres					
			Apply				

The Remove Selected Entries button selects and removes entries from this list.

DF1 Radio Modem

The **DF1 Radio Modem** option displays the following additional parameters:

				User: admin	Log off
ProSoft					
TECHNOLOGY					
Status	Configuration	Administrator			
Basic	+ WAN				
	+ Cellular Usage Trackin	g			
Advanced	+ DDNS				
Firewall	+ VPN				
	- Serial / Encapsulation				
Resources	Port Mode	RS232 -			
Technical Support	Baud Rate	9600 👻			
Pro Soft Discovery	Data Bits	8 Bits 👻			
Service	Parity	None 👻			
ProSoft Technology	Stop Bits	1 Bits 🔻			
And and a second second	Protocol	DF1 Radio Modem 👻			
	DF1 Radio Modem				
	Role	Slave 👻			
	Timeout Bits	40			
°.	Port Tune	40			
H	Port type	TCP 👻			
	DF1 Error Checking	BCC 👻			
- Contraction					
ProSoft			Apply		

Parameter	Description
Role	Specifies the network role for the encapsulation process (Master, Slave).
Timeout Bits	This parameter sets the length of time the gateway will wait when no further serial data is received before encapsulating and transmitting data (0 to 65535).
Port Type	This parameter specifies the type of IP connection (TCP or UDP) for the encapsulated data.
DF1 Error Checking	This parameter specifies which type of error checking is used for DF1 data messages (BCC or CRC).

The **Master** role contains the following additional fields:

- Add Entry to Client Table List
- Remove Selected Entries

If **Slave** is selected, the *Encapsulation* table is not visible.

You can add an entry to the *Client Table* list. Click on the **Add Entry to Client Table List** button

	366				User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrator				
lasic	+ WAN					
	+ Cellular Usage Tracking					
Advanced	+ DDNS					
irewall	+ VPN					
	- Serial / Encapsulation					
Resources	Port Mode	RS232 🔻				
echnical Support	Baud Rate	9600 👻				
ro Soft Discovory	Data Bits	8 Bits 🔻				
ervice	Parity	None 🔻				
roSoft Technology	Stop Bits	1 Bits 🔻				
-	Protocol	DF1 Radio Modem 👻				
	DF1 Radio Modem					
	Role	Master 👻				
- 🗋 🍥	Timeout Bits	40				
· · ·	Port Type	TCP -				
	DE1 Error Checking					
and and a second	Enconculation Table	bee •				
ProSoft	Serial Address	0	IP Address	0.0.0.0		
	Add Entry to Client Table Lis	t Remove Selected Entres				
			Apply			

The Remove Selected Entries button selects and removes entries from this list.

3.2.3 Firewall

The **Configuration > Firewall** tab displays the following fields for Port Forwarding. Up to 10 mappings can be created.

*	0.0			User: admin	Log
roSoft					
Status	Configuration Administrator				
	Common Ports:	Example:			
ed]	CIP (ControlLogix/CompactLogix) : 44818 SLC/PLC5 : 2222 Moddus TCP/IP : 502 DNP over Ethernet : 20000 PROFINET : 8892	CompactLogix to SLC505 through ICX3 Application Protocol LittoSLC TCP	LAN IP Address From Port Range 10.10.10.208 44818 - 44818	To Port Range 2222 - 2222	
ces cal Support t Discovery	-Port Forwarding Enable: 🗍				
; t Technology	Application Protocol Name Select	LAN IP Address From Po	ort Range To Port Ran	ge - 1 Add	Clear
	Application Protocol	IP Address	From Port Range	To Port Range	
	Delete Apply				

Enable this feature by selecting **Enable** in the dropdown menu.



Port Forwarding

Parameter	Description
	Description
Application	Name of particular mapping
Protocol	Packet delivery method (TCP, UDP, both)
LAN IP Address	IP address of the destination LAN device
From Port Range	WAN port range through which data will be forwarded to each device
To Port Range	LAN device port range listening for forwarded traffic

When the fields above are complete, click the **Add** button to load the parameters into the table. To remove an existing mapping in the table, highlight it and click **Delete**.

When complete, click **Apply**.

3.3 Administrator

The *Administrator* tab allows you to configure the password, record logs, update firmware, etc.

3.3.1 System

4.				User: admin	Log off
ProSoft					
TECHNOLOGY					
	_				
Status	Configuration	Administrator			
System	Reboot Unit			 	
Access Control	Reboot				
Logs					
Eugo	Configuration Backup				
Ping	Backup				
Technical Support	Configuration Restore	No file selected	Pertore		
Pro Soft Discovery	Please select file	wse No me selected.	Restore		_
Service	Peret Unit to Default Config	auration			
ProSoft Technology	Reset	Juration			
	hesee				
The state	Firmware Upgrade				
Å –	Please select file	owse No file selected.	Upgrade		
<u>−</u> Ŭ @		Home selected.	opgidde		
	Prosoft Connect			 	
	Prosoft Connect	Activating			
PioSoff	Note: Log into www.prose	oft.io , click "Activate Gateway" ar	id enter the code		

The ICX35-HWC configuration can be saved to a file for backup. The file can also be loaded back into the ICX35-HWC. Restoring to factory defaults is accomplished here as well.

Parameter	Description
Reboot Unit	Reboots the ICX35-HWC
Configuration Backup	Saves the configuration to a file
Configuration Restore	Loads the configuration to the module. The Choose File button allows you to locate and select the configuration file that you want to restore. The Restore button restores the file.
Reset Unit to Default Configuration	Restores the ICX35-HWC to factory defaults – the previous configuration is lost.
Firmware Upgrade	Performs a firmware upgrade to the module. The Choose File button allows you to locate the firmware upgrade file. The Upgrade button allows you to upgrade the firmware using the selected file.
ProSoft Connect	Secure webpage interface to activate, setup VPN clients, invite team members, and manage multiple ProSoft cellular radios on the network.

3.3.2 Access Control

	8				User: admin	Log off
DroCoff						
PIOSOII						
Status	Configuration	Administrator				
System	Web Access					
Cystem	Web Port	8080				
Access Control	Web Protocol	HTTP 👻				
Logs	Web Access On WAN	Enable 👻				
Ping	Web Login					
	User	admin				
Resources	New Password	•••••				
Technical Support	Confirm Password					
ProSoft Discovery	White List					
Service	Active	Dirable				
ProSoft Technology	Active					
			Apply			
en av and an						

Parameter	Description
Web Access	
Web Port	Web access port number
Web Protocol	HTTPS or HTTP
Web Access on WAN	Allows or blocks web page access from the WAN
User	
User Name	New login user name
New Password	New login password
Confirm Password	Confirm new password
White List	
Active	Choose Enable or Disable . If you choose Enable , the unit displays the Add Entry to WAN Whitelist button.

Adding Entries to the Whitelist

Click on the **Add Entry to WAN Whitelist** button. This unit displays a line entry in which you can enter an IP address.

•			User: admin
Y	Configuration	Administrator	
	Web Access		
	Web Port	8080	
	Web Protocol	HTTP V	
	Web Access On WAN	Enable T	
	Web Login		
	User	admin	
rt	New Password		
у	Confirm Password		
	White List		
gy	Active	Enable 🔻	
	WAN Whitelist		
	IP Address	0.0.0.0	
÷	IP Address	0.0.0.0	
	IP Address	0.0.0.0	
		ict Remove Selected Entres	

Whitelist entries can either be single IP addresses (e.g., 50.40.20.15) or IP addresses followed by a CIDR netmask (e.g., 50.40.20.0/8) allowing subnets to be whitelisted via a single whitelist entry. Whitelists only apply to the cellular (WAN) interface. No whitelist filtering is possible on the LAN interface.

Since all VPN traffic is presumably between trusted hosts, whitelist entries are ignored (but not deleted) when an OpenVPN or IPsec tunnel is configured.

Add your entry. Use the **Add Entry to WAN Whitelist** button to add additional IPs.

To remove whitelist entries, click the checkbox of the entry and click on the **Remove Selected Entries** button.

Click **Apply** when done.

3.3.3 Logs

٨	User: admi	n Log off
ProSoft		
TECHNOLOGY		
Status	Configuration Administrator	
System	System Logs	
- cycloni	System Log Level (1-8) 6 Apply	
Access Control	Refresh Show all log entries Download Clear Logs	
Logs		
Logo	Jan 6 14:32:09 icx35 user.notice pppwd: pppd exited with code 0x0800	
Ping	Jan 6 14:32:40 icx35 user.err pppwd: Connection lost to GSM network. Trying to reconnect Jan 6 14:32:40 icx35 deemon notice prod(145551 . nprd 2 4 5 started by root wid 0	
	Jan 6 14:32:40 icx35 daemon.err ppp[14555]: Connect script failed	
D	Jan 6 14:32:40 icx35 user.notice pppwd: pppd exited with code 0x0800	
Resources	Jan 6 14:33:10 jav26 doerne ret pppwd: Connection lost to GSM network. Trying to reconnect	
Technical Support	Jan 6 14:33:11 icx35 deemon.motice pppulitor; pppulitor; the state by 100, 110 5	
ProSoft Discovery	Jan 6 14:33:11 icx35 user.notice pppwd: pppd exited with code 0x0800	
Service	Jan 6 14:33:41 icx35 user.err pppvd: Connection lost to GSM network. Trying to reconnect	
ProSoft Technology	Jan 6 14:33:41 10x35 daemon.motice pppd14672]: pppd2.4.5 started by root, uid 0 Jan 6 14:33:42 10x35 daemon.err popd146721: Connect script failed	
Troson recimology	Jan 6 14:33:42 icx35 user.notice pppwd: pppd exited with code 0x0800	
	Jan 6 14:34:12 icx35 user.err pppwd: Connection lost to GSM network. Trying to reconnect	
The second	Jan 6 14:34:12 icx35 daemon.notice pppd[145/9]: pppd 2:4.5 started by root, uid 0 Jan 6 14:34:12 icx35 daemon err pprd[14559]: Compact satirt failed	
	Jan 6 14:34:12 icx35 user.notice ppped: ppd etited with code 0x0800	
-0 -	Jan 6 14:34:42 icx35 user.err pppwd: Connection lost to GSM network. Trying to reconnect	
Ų ···	Jan 6 14:34:42 icx35 daemon.notice pppd[14588]: pppd 2.4.5 started by root, uid 0	
	Jan 6 14:34:43 icx35 daemon.err pppal14588): Connect Script Tailed	
	Jan 6 14:34:58 icx35 user.err /psft/bin/usaged: mktime for period reset failure: No such file or directory	
	Jan 6 14:35:13 icx35 user.err pppwd: Connection lost to GSM network. Trying to reconnect	
	Jan 6 14:35:13 icx35 daemon.notice pppd[14597]: pppd 2.4.5 started by root, uid 0	
Barrier Construction	Jan 6 14:35:13 10:25 daemon.err pppal1657/]: Connect Script Tailed	
ProSoff	Jan 6 14:35:43 icx35 user.er ppprd: Connection lost to GSM network. Trying to reconnect	
	Jan 6 14:35:43 icx35 daemon.notice pppd[14604]: pppd 2.4.5 started by root, uid 0	
	Jan 6 14:35:44 icx35 daemon.err pppd[14604]: Connect script failed	
	Jan 6 14:35:44 14:55 War ar ponyd: Consection last to GSM patwork Truing to reconnect	

Parameter	Description
System Log Level	Specifies how much information is saved to the log file. Lower numbers limit the log entries to more critical information, while higher numbers include information useful for troubleshooting. Higher numbers include all entries associated with lower-level numbers. This value can typically be left alone until instructed by a Technical Support representative.
Refresh	Performs a refresh of the log results
Show all Log Entries	Refreshes and displays all log entries
Download	Allows you to download and save the log to a file

3.3.4 Ping

		User: admin	Log off
ProSoft			
Status	Configuration Administrator		
System	System Ping		
Access Control	Ping		
Logs			
Ping			
Resources			
ProSoft Discovery			
Service			
ProSoft Technology			

You can ping a remote device to determine whether you can connect to it. Enter the WAN IP address or hostname to be pinged and click **Ping**.

4 ProSoft Connect

ProSoft Connect is a secure webpage interface to activate, setup VPN clients, invite team members, and manage multiple ProSoft cellular radios on the network.

4.1 Activation

ProSoft Connect requires you to activate the ICX35-HWC upon initial use.

- 1 On the Configuration webpage, click on Administrator > System.
- 2 Under the *ProSoft Cloud Connect* section, click on the **Activate** button.

4		User: admin Log off
ProSoft		
TECHNOLOGY		
Status	Configuration Administrator	
	Reboot Unit	
System	Reboot	
Access Control		
Logs	Configuration Backup	
Ping	Danap	
Resources	Configuration Restore	
Technical Support	Please select file Browse No file selected. Restore	
ProSoft Discovery Service	Reset Unit to Default Configuration	
ProSoft Technology	Reset	
	Firmware Upgrade	
-0 -	No ne secced.	
-1	Brocoff Connact	
	Prosoft Connect Activate	
ProSoft		
	(

3 A six-character alphanumeric Activation Key is generated. Record this key for later use.

Prosoft Connect		
Proceft Connact	Activating	un Entre
Prosont Connect	Activating	VWSIIIU
Note: Log into <u>www.pr</u>	osoft.io , click "Activate Gate	way" and enter the code

- 4 Click on the <u>www.prosoft.io</u> link. Or open a new tab in your web browser, enter <u>www.prosoft.io</u>, then press **Enter**.
- 5 Enter or create an account in the ProSoft Connect log-in screen.

PROSOFT CON	NECT
Have an account? Login here:	New Customers
Email address	
Please enter a value for this field.	
Password	
Please enter a value for this field.	Sign up now »
Remember me	

6 Once logged in, you can take a tour of the features of the ProSoft Connect utility.



7 When ready, activate the ICX35-HWC within the tour, or you can click on the **Activate a Gateway** button at the top of the screen. It will prompt you for the Activation Key.



8 Once the ICX35-HWC is activated, you can navigate to each tab on the lefthand side of the page. Each tab contains a 'lifesaver' icon for a tutorial of the feature.

\$	Gateway 😫 🖉 🖉 Gateway
GATEWAYS	Filter: Show All
TEAM	CELLULAR GATEWAYS (0)
ALERTS	
? SUPPORT	

5 Hardware Installation

The ICX35-HWC should be mounted in a position that allows easy access for the cables so they are not bent, constricted, in close proximity to high amperage, or exposed to extreme temperatures. The LEDs on the front panel should be visible for ease of operational verification. Ensure that there is adequate airflow around the device but kept free from direct exposure to the elements, such as sun, rain, dust, etc.

Caution: The ICX35-HWC is in a hardened case, and designed for use in industrial and extreme environments. However, unless you are using cables expressly designed for such environments, they can fail if exposed to the same conditions the ICX35-HWC can withstand.

5.1 Antenna Installation

Antennas selected should not exceed a maximum gain of 5 dBi under standard installation configuration. In more complex installations (such as those requiring long lengths of cable, and/or multiple connections), it is imperative that the installer follow maximum dBi gain guidelines in accordance with the radio communications regulations of the Federal Communications Commission (FCC), Industry Canada, or your country's regulatory body (if used outside the US).

The ICX35-HWC will work with most quad-band GSM/CDMA cellular antennas with a SMA connector. Connect the primary antenna or primary RF cable directly to the 'ANT A' antenna connector on the front of the ICX35-HWC.

A secondary antenna port labeled 'ANT B' is provided to attach an additional antenna. Use of a secondary antenna is not required, but will often increase cellular reliability and throughput performance.

This device is not intended for use within close proximity of the human body. Antenna installation should have at least 20 cm separation from the operator.

Tip: When using a cable to an antenna placed away from the modem, minimize the length of your cable. All gain from a more advantageous antenna placement can be lost with a long cable to the modem.

5.2 Connecting the Radio to a Network Device



The application ports are located on the front of the radio.

- The Ethernet port uses a standard RJ45 connector
- The serial port uses a standard DB9 connector for serial connectivity

5.2.1 Ethernet Cable Specifications

The recommended Ethernet cable is category 5 or better. A category 5 cable has four twisted pairs of wire that are color-coded and cannot be swapped. The module only uses two of the four pairs when running at 10 MBit or 100 MBit speeds.

The Ethernet port on the module is Auto-Sensing. Use either a standard Ethernet straight-through cable or a crossover cable when connecting the module to an Ethernet hub, a 10/100/1000 Base-T Ethernet switch, or directly to a PC. The module will detect the cable type and use the appropriate pins to send and receive Ethernet signals.

Ethernet cabling is like U.S. telephone cables but have eight conductors. Some hubs have one input that can accept either a straight-through or crossover cable, depending on switch position. In this case, ensure that the switch position and cable type agree.

Ethernet Cable Configuration

Note: The standard connector view shown is color-coded for a straight-through cable.

Crossover ca	able		Straight- thro	ough cable
RJ-45 PIN	RJ-45 PIN	Pin #1	RJ-45 PIN	RJ-45 PIN
1 Rx+	3 Tx+		1 Rx+	1 Tx+
2 Rx-	6 Tx-		2 Rx-	2 Tx-
3 Tx+	1 Rx+		3 Tx+	3 Rx+
6 Tx-	2 Rx-		6 Tx-	6 Rx-



5.2.2 Serial Port Basics

<u>RS-232</u>

The use of hardware handshaking (control and monitoring of signal lines) depends on the requirements of the networked device. If no hardware handshaking will be used, the cable to connect to the port is as shown below:



If hardware handshaking is required, the cable to connect to the port is as shown below:



<u>RS422</u>

The RS-422 interface requires a single four or five wire cable. The Common connection is optional, depending on the RS-422 network devices being used. The cable required for this interface is shown in the following diagram:



RS-485 Application Port(s)

The RS-485 interface requires a single two or three wire cable. The Common connection is optional, depending on the RS-485 network devices used. The cable required for this instance is shown in the following diagram:



RS-485 Application Port Cable

5.3 LED Indicators

LED	State	Description
PWR	Off	Power is not connected to the power terminals or source is insufficient to properly power the device.
	Solid Green	Power is connected to the power terminals
ERR	Off	Normal operation
	Solid Red	A critical error has occurred. Program executable has failed or has been user-terminated and is no longer running. Press the Reset button or cycle power to clear the error.
MS (Module Status)	Off	ICX35-HWC is powered off
	Solid Green	Initialization complete / OK
	Blinking Green	ICX35-HWC is in the process of configuring
	Solid Red	Unrecoverable error
	Blinking Red	Reading config/minor error/No SIM
NS (Network Status)	Off	ICX35-HWC is powered off
	Solid Green	Connected to cellular tower
	Blinking Green	Attempting to connect to cellular tower
	Solid Red	Duplicate IP (E/IP) /Non-recoverable network fault
	Blinking Red	Established connection timeout (E/IP) / Minor network fault

Serial Port LEDs

LED	State	Description
SER	Flashing	Indicates that data is moving from the serial port to the WAN port.
ТХ	Off	No activity on the port
	Flashing Amber	The port is actively transmitting data
RX	Off	No Activity on the port
	Flashing Green	The port is actively receiving data.

Ethernet Port LEDs

LED	State	Description
100 Mbit	Off	No activity on the port
	Flashing Amber	The Ethernet port is actively transmitting or receiving data.
LNK/ACT	Off	No physical connection is detected. No Ethernet communication is possible. Check wiring and cables.
	Solid Green	Physical network connection detected. This LED must be ON (solid) for Ethernet communication to be possible.

WWAN LED

LED	State	Description
Off	Off	ICX35-HWC is powered off
Solid Green	On	ICX35-HWC is powered and connected, but is not transmitting or receiving.
Slow Blink	LED flashes at a steady, slow rate:	ICX35-HWC is powered and searching for a connection.
	*0.2 Hz (5 sec) ON	
	*4 Hz (250 ms) OFF	
Faster blink	LED flashes at a steady, faster rate: *About 3 Hz (333 ms) blink rate	ICX35-HWC is transmitting or receiving data.

Note: The WWAN LED indicates a physical connection state between the ICX35-HWC and the cell tower. It is not an indicator of a logical connection state. There may be a situation when you may see a "Disconnect, will retry" indicator on the ICX35-HWC webpage, even when the WWAN LED light is on (solid green). This indicates that the module was able to make a physical connection to the tower, but the logical connection was not made between the ICX35-HWC and the cellular provider.

6 ICX35-HWC Tech Notes (Example Configurations)

This section describes example configurations of the ICX35-HWC using:

- Pass-thru (End Device to End Device) mode
- VPN OpenVPN in End Device to End Device mode
- VPN OpenVPN in DHCP mode

This chapter does not go into End Device configuration procedures since it is assumed the user knows how to configure End Devices. However, examples are provided to show how the End Device is configured along with the ICX35-HWC.

6.1 Pass-Thru Mode (End Device to End Device)

The following diagram illustrates a pass-thru mode configuration example:



In this scenario, the user on the laptop wants to communicate with a CLX.

To configure the ICX35-HWC, you must supply:

- WAN IP This number is supplied by the cellular provider.
- Module Name
- APN Name This is provided by the cellular provider
- LAN IP
- End Device IP Address

To configure the end device, you must supply:

- IP Address
- Mask
- Gateway IP Address

6.1.1 ICX35-HWC Configuration Parameters

- 1 Log in to the ICX35-HWC built-in web server.
- 2 Navigate to **Configuration > Basic**.

4	300				User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrato	r			
Status	configuration	Administrato	•			
Basic	Module Settings					
Advanced	Module Name		IC/35			
Auvanceu	APN Name		ATT			
Firewall	LAN Settings					
Perourcer	LAN IP Address / Subnet Ma	isk	105.102.0.100	/ 24		
Technical Support	Enable DHCP		Disable 🔻			
ProSoft Discoverv	End Device IP Address		105.102.0.10]	
Service	Apply					
ProSoft Technology	Арріу					
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Using the previous example, the LAN IP of the ICX35-HWC is **192.168.1.100**. This is configured in the **LAN IP Address/Subnet Mask** field as shown.

The *End Device IP Address* (also known as the pass-thru IP) is the IP Address of the device connected to the ICX35-HWC (193.168.1.10).

6.1.2 End Device Parameters

When configuring the end device, keep the following points in mind:

- The IP Address of the end device must match the end device IP Address configured on the ICX35-HWC.
- The Gateway Address on the end device must point to the LAN IP Address/Subnet Mask address of the ICX35-HWC.

6.1.3 Obtaining Data from the End Device

A user trying to reach the end device through the ICX35-HWC must address the WAN ID (in this case, 166.132.10.56 provided by the cellular provider).

6.2 Pass-Thru and OpenVPN Example

The following diagram illustrates using a pass-thru scenario with OpenVPN:



In this scenario, Virtual OpenVPN addresses are assigned by the VPN server. If the end device 172.020.000.220 wants to communicate with 192.168.000.211, it must address the device through the ICX35-HWC VPN address. The ICX35-HWC routes the request as it would a pass-thru device.

You must establish standard End Device-to-End Device communications before attempting to configure an OpenVPN tunnel.

6.2.1 ICX35-1 Configuration Parameters

In this scenario, configure the *ICX35-1* for pass-thru.

- 1 Log into the ICX35-1 internal web server.
- 2 Navigate to **Configuration > Basic**.

Status Configuration Administrator ced ill cel ill cel cal Support t Discovery e t Technology Int Device IP Address int Device IP Address int Device IP Address					No. A.
Status Configuration Administrator ed i Module Settings Module Name APN Name IATT LN PAddress / Subnet Mask 192.168.000.211 I Poly Apply					osoft
sadus Congutation Administrator and Administrator			Adaptata	Conformation	Status
red I I Module Name APN Name AT APN Name AT LAN Settings IAN IP Address / Subnet Mask 192.166.000.211 I biscovery Technology			Administrator	Configuration	status
Image: Section of the section of t				Module Settings	
APN Name ATT IN ADV Name ATT IN ADV Name ATT IN ADV Name ATT IN ADV NAME IN ADV NAME IN ADV NAME ATT IN ADV NA			IC/35	Module Name	he
LAN Settings LAN IP Address / Subnet Mask I Discovery b t Technology Apply			ATT	APN Name	
LAN IP Address / Subnet Mask 192.168.000.211 / 24 Inable DHCP Disable • Ind Device IP Address 192.168.000.220 Apply				LAN Settings	d
Cal Support Enable DHCP Disable 1 Discovery Image: Discovery It Technology]	/ 24	k 192.168	LAN IP Address / Subnet Ma	
End Device IP Address 192.168.000.220 Apply			Disable	Enable DHCP	cal Support
Apply	1		192.168	End Device IP Address	t Discovoru
Αρρίγ Τechnology	J			·	biscovery
				Apply	
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- 3 Enter the LAN IP of the *ICX35-1* in the LAN IP Address/Subnet Mask field.
- 4 Enter the LAN IP of End Device 1 in the **End Device IP Address** field. This address must match the IP address configured on the end device. In this case, 192.168.000.211 as shown in the diagram.
- 5 Perform the same procedure on the *ICX35-2* using the LAN IP of the *ICX35-2* and the End Device IP as shown.

Configuration Administrator Module Settings ICX35 Module Name ICX35 APN Name ATT LAN IP Address / Subnet Mask 172.020.000.211 In UP Address / Subnet Mask 172.020.000.220 Int Enable DHCP Disable ~ End DHCP Disable ~ End Device IP Address 172.020.000.220				User	admin :
Configuration Administrator Module Settings Module Name Module Name IC335 APN Name ATT LAN IP Address / Subnet Mask 172.020.000.211 IAN IP Address / Subnet Mask 172.020.000.220 In Device IP Address 172.020.000.220					
Configuration Administrator Module Settings Module Name Module Name IC335 APN Name ATT LAN IP Address / Subnet Mask 172.020.000.211 IAN IP Address / Subnet Mask 172.020.000.220 In Device IP Address 172.020.000.220	200000000				
Module Settings Module Name IC/35 APN Name ATT LAN Paddress / Subnet Mask 172.020.000.211 / 24 Enable DHCP Disable - End Device IP Address 172.020.000.220	Configuration	Administrator			
Module Settings Module Name ICX35 APN Name ATT IAN Settings LAN IP Address / Subnet Mask 172.020.000.211 / 24 LAN IP Address / Subnet Mask 172.020.000.220 Cogy					
Module Name ICGS APN Name ATT LAN Settings LAN IP Address / Subnet Mask 172.020.000.211 / 24 Enable DHCP Disable End Device IP Address 172.020.000.220 Ogy	Module Settings				
APN Name ATT IAN Settings LAN IP Address / Subnet Mask 172.020.000.211 / 24 Enable DHCP Disable Fry End Device IP Address 172.020.000.220 Apply Apply	Module Name	IC/35			
IAN Settings LAN Settings LAN IP Address / Subnet Mask 172.020.000.211 / 24 Enable DHCP Disable Fry End Device IP Address 172.020.000.220 LApply Apply	APN Name	ATT			
LAN IP Address / Subnet Mask 172.020.000.211 / 24 Finable DHCP Disable ry End Device IP Address 0gy Apply	LAN Settings				
ort Enable DHCP Disable ry End Device IP Address 172.020.000.220 Apply	LAN IP Address / Subnet	t Mask 172.020.000.211	/ 24		
ry End Device IP Address 172.020.000.220	Enable DHCP	Disable 🔻			
3y Apply	End Device IP Address	172.020.000.220		1	
	Apply				

6.2.2 Configuring End Device 1

- The IP address of the end device connected to *ICX35-1* must match the IP address configured on the *ICX35-1 End Device IP Address* field.
- The Gateway parameter must match the VPN address for the *ICX35-1*.

6.2.3 Configuring End Device 2

- The IP address of the end device connected to *ICX35-2* must match the IP address configured on the *ICX35-2 End Device IP Address* field.
- The Gateway parameter must match the VPN IP address for the *ICX35-2* once connected.

6.2.4 Configuring OpenVPN Parameters

You must now configure OpenVPN parameters on both ICX35-HWC radios.

- 1 Navigate to Configuration > Advanced.
- 2 Click on the VPN link.

	60			User: admin	Log off
ProSoft					
TECHNOLOGY	6				
Status	Configuration	Administrator			
Basic	+ WAN				_
	+ Cellular Usage Track	ing			
Advanced	+ DDNS				
Firewall	- VPN	Disable			
	+ Serial / Encapsulatio	Disable •			
Resources					
			Apply		
Pro Soft Discovery Service					
ProSoft Technology					
Concession of the local division of the loca					
-0 @					
^					
ProSoft					
Contraction of the					

3 Select **OpenVPN** from the drop-down list box.

					User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrator				
Basic	+ WAN					
Advanced	+ Cellular Usage Tracking					
Auvanceu	+ DDNS					_
Firewall	- VPN	On an MDM				
	OpenVRN	Openvpi V				
Resources						
Fechnical Support	TLS Renegotiation Time	3600	Seconds			
ProSoft Discovery Service	Server IP	107.131.242.107				
	Server Port	1194				
ProSoft Technology	Credential Files					
	Certificate Authority	Current File:		Browse No file selected.		
	Client Certificate	Current File:		Browse No file selected.		
	Client Key	Current File:		Browse No file selected.		
	Custom Config File	Current File:		Browse No file selected.	Delete	
				Apply		
ProSoft						

- 4 Enter the in seconds in the TLS *Time* field.
- 5 Enter the OpenVPN server's IP Address in the **Server IP** field.
- 6 Enter the Server Port number in the **Server Port** field. This is the port assigned to the OpenVPN Server shown at the top of the diagram.

- 7 Choose the **Credential** files. Your Server Administrator will provide three certificate files. Browse to the location of these files and select for all three fields. Your Server Administrator will specify which files should be uploaded to the appropriate fields.
- 8 Click Apply.
- 9 Perform the same procedure for the *ICX35-2*.

6.3 OpenVPN with DHCP Enabled (Example)

The following diagram illustrates the use of OpenVPN with DHCP enabled.


6.3.1 ICX35-1 Configuration

The *ICX35-1* shown in the diagram is configured in the *ICX35-1* web page as follows.

- 1 Login to the *ICX35-1* web server.
- 2 Navigate to Configuration > Basic.

4			User: adm	in Log off
ProSoft				
TECHNOLOGY				
Status	Configuration Admin	istrator		
asic	Module Settings			
lvanced	Module Name	IC/35		
	APN Name	ATT		
ewall	LAN Settings			
0117505	LAN IP Address / Subnet Mask	192.168.0.250	/ 24	
nical Support	Enable DHCP	Enable 🔻		
Soft Discovery	DHCP Range	192.168.0.30 - 192.168.0.40		
ice	Lease Time	60 m 👻		
et lechnology	Apply			

- 3 Enter the name of the module in the **Module Name** field.
- 4 Enter the APN name in the **APN Name** field. Get this from your cellular provider.
- 5 Enter the LAN IP and subnet mask in the LAN IP Address/Subnet Mask field for the *ICX35-1*.
- 6 Select **Enable** from the *Enable DHCP* drop-down list box.
- 7 Enter the **DHCP Range** for the connected end devices.
- 8 Enter the appropriate lease time in the **Lease Time** field. See the *Lease Time* field description in the manual for detailed info.
- 9 Click Apply.
- 10 Navigate to Configuration > Advanced.
- 11 Click on the VPN link and select OpenVPN from the *Client* drop-down list.

	6 0				User: admin	Log off
ProSoft						
TECHNOLOGY						
Status	Configuration	Administrator				
Basic	+ WAN					
Advanced	+ Cellular Usage Tracking					
T	+ DDNS					
Firewall	Client	OpenVPN -				
D	OpenVPN	openni				
Technical Support	TLS Renegotiation Time	3600	Seconds			
ProSoft Discovery Service	Server IP	107.131.242.107				
	Server Port	1194	- · · ·			
ProSoft Technology	Credential Files	1134				
	Certificate Authority	Current File:		Browse No file selected.		
	Client Certificate	Current File:		Browse No file selected.		
	Client Key	Current File:		Browse No file selected		
	Custom Config File	Current File			Delete	
	Custom Coning File	Current File:		Browse No file selected.	Delete	
				Apply		
Recorder						
C CIONON						

- **12** Enter the *TLS Renegotiation Time* in the appropriate field (see TLS).
- 13 Enter the OpenVPN server's IP address in Server IP.
- 14 Enter the Server Port shown.
- **15** Choose and upload the **Credential Files**. Your Server Administrator will provide you with the certificate files and location.
- 16 Click Apply.

6.3.2 ICX35-2 Configuration

The *ICX35-2* is configured using the exact same procedure as the *ICX35-1* in this example. Use the diagram as a guide to fill in the appropriate fields as described.

6.3.3 End Device Configuration

End devices must be configured based on the DHCP assignments. The *Gateway* settings must match the LAN IP of the ICX35-HWC. This must be done on both ICX35-HWC radios.

When setting up *Ethernet Bridges*, set the IP address to the DHCP assigned addresses.

7 **GSM Communication (AT&T[®])**

Many GSM Networks have been upgraded to support HSUPA. GSM Networks use SIM cards which are smart cards containing the account holder's details. A SIM can generally be moved from one device to another allowing for account flexibility.

7.1 HSUPA

HSUPA (High-Speed Uplink Packet Access) is a cellular technology which most closely resembles a broadband synchronous connection. The upload and download speeds are maximized to provide a faster throughput, reaching speeds up to 2.0 Mbit/s for the uplink and 7.2 Mbit/s for the downlink. Please check with your network provider on the availability of HSUPA.

7.2 HSDPA

HSDPA (High-Speed Downlink Packet Access) is a cellular technology allowing for higher data transfer speeds. In HSDPA mode of operation, max speeds are up to 7.2 Mbit/s in the downlink and 384 kbit/s in the uplink. HSDPA uses Adaptive Modulation and Coding (AMC), fast packet scheduling at the Node B (Base Station) and fast retransmissions from Node B (known as HARQ-Hybrid Automatic Repeat Request) to deliver the improved downlink performance vs. UMTS and EDGE.

HSPDA (and HSUPA) falls back to UMTS, EDGE or GPRS (in order of precedence). This feature allows you to have seamless connectivity no matter where your ICX35-HWC is located.

7.3 UMTS

UMTS (Universal Mobile Telecommunications System) supports up to 1920 kbit/s data transfer rates, although most users can expect performance up to 384 kbit/s. A UMTS network uses a pair of 5 MHz channels, one in the 1900 MHz range for uplink and one in the 2100 MHz range for downlink.

7.4 LTE

Long Term Evolution (LTE) commonly referred to at 4G LTE, is based on the GSM/EDGE and UTMS/HSPA network technologies, increasing the capacity and speed using a different radio interface together with core network improvements. LTE offers the highest link rates currently available.

7.5 EDGE

EDGE (Enhanced Data rates for GSM Evolution) provides end-to-end packet data services with an enhanced connectivity building on GPRS technology and using the established GSM networks. EDGE provides higher transmission rates and better transmission quality for data than GPRS. EDGE can carry data at speeds typically up to 384 kbit/s in packet mode.

When EDGE is not available, your ICX35-HWC will fall back to GPRS for the connection to your cellular provider to provide continued connectivity.

7.6 GPRS

General Packet Radio Service (GPRS) is packet-switched with many users sharing the same transmission channel, but only transmitting when they have data to send. This means that the total available bandwidth can be immediately dedicated to those users who are actually sending at any given moment, providing higher utilization where users only send or receive data intermittently. GPRS provides speeds of 30-70 kbps with bursts up to 170 kbps.

8 Support, Service & Warranty

In This Chapter

- Contacting Technical Support77

8.1 Contacting Technical Support

ProSoft Technology, Inc. is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

- 1 Product Version Number
- 2 System architecture
- 3 Network details

If the issue is hardware related, we will also need information regarding:

- 1 Module configuration and associated ladder files, if any
- 2 Module operation and any unusual behavior
- 3 Configuration/Debug status information
- 4 LED patterns
- **5** Details about the serial, Ethernet or Fieldbus devices interfaced to the module, if any.

Note: For technical support calls within the United States, ProSoft's 24/7 after-hours phone support is available for urgent plant-down issues. Detailed contact information for all our worldwide locations is available on the following page.

Internet	Web Site: www.prosoft-technology.com/support
	E-mail address: support@prosoft-technology.com
Asia Pacific	Tel: +603.7724.2080
(location in Malaysia)	E-mail: asiapc@prosoft-technology.com
	Languages spoken include: Chinese, English
Asia Pacific	Tel: +86.21.5187.7337 x888
(location in China)	E-mail: asiapc@prosoft-technology.com
	Languages spoken include: Chinese, English
Europe	Tel: +33 (0) 5.34.36.87.20
(location in Toulouse,	E-mail: support.EMEA@prosoft-technology.com
France)	Languages spoken include: French, English
Europe	Tel: +971-4-214-6911
(location in Dubai, UAE)	E-mail: mea@prosoft-technology.com
	Languages spoken include: English, Hindi
North America	Tel: +1.661.716.5100
(location in California)	E-mail: support@prosoft-technology.com
	Languages spoken include: English, Spanish
Latin America	Tel: +1-281-2989109
(Oficina Regional)	E-Mail: latinam@prosoft-technology.com
	Languages spoken include: Spanish, English
Latin America	Tel: +52-222-3-99-6565
(location in Puebla, Mexico)	E-mail: soporte@prosoft-technology.com
	Languages spoken include: Spanish
Brasil	Tel: +55-11-5083-3776
(location in Sao Paulo)	E-mail: brasil@prosoft-technology.com
	Languages spoken include: Portuguese, English

8.2 Warranty Information

For complete details regarding ProSoft Technology's TERMS & CONDITIONS OF SALE, WARRANTY, SUPPORT, SERVICE AND RETURN MATERIAL AUTHORIZATION INSTRUCTIONS please see the documents on the ProSoft Solutions DVD or go to www.prosoft-technology.com/legal

Documentation is subject to change without notice.

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