

INSTRUCT LIFT CONTROL SYSTEMS

INSTRUCT ESP Gateway Card

Installation, Operation & Maintenance Manual

MODEL: 103381133

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Terms Used in This Manual

Caution	Caution, risk of electric shock Attention, risque d'électrocution		
Attention			
WARNING	A warning identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.		
AVERTISSEMENT	Un avertissement identifie des informations sur des pratiques ou des circonstances pouvant entraîner des blessures corporelles ou la mort, des dommages matériels ou des pertes économiques.		
Caution	Caution statements Indicate actions or procedures which, if not performed correctly, may lead to personal injury or incorrect function of the instrument or connected equipment.		
Attention	Indiquez les actions ou les procédures qui, si elles ne sont pas effectuées correctement, peuvent entraîner des blessures ou un mauvais fonctionnement de l'instrument ou de l'équipement connecté.		
Note	Indicates additional information about specific conditions or circumstances that may affect instrument operation.		
Remarque	Indique des informations supplémentaires sur des conditions ou des circonstances spécifiques pouvant affecter le fonctionnement de l'instrument.		

Revision History

Revision	Description of Change	Sensia Issuer	Date
1	Initial release	Lift Control Systems	30-June-2021
2	Add InTouch reference number Change internal document number to LCS-ENG-M0021 SIM Card APN change to sensia02.com.attz Gateway COM3 setting change to 4-wire mode	Lift Control Systems	20-Feb-2023
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5	Add modem config for Zedi. (config_MTR-MNG2_5_3_6s- s1_FOR_ZEDI_MAY2024tar.gz) Add firmware versions for Zedi, Avalon, LiftIQ. Changed baud rate for Modbus.	Lift Control Systems	May 22, 2024

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Section 1: Product Description

1.1 OVERVIEW

The INSTRUCT^{*} ESP Gateway Card is a standalone INSTRUCT SCB3 CPU card, which can be used inside INSTRUCT ESP Intelligent Controller to enable advanced real-time services. The Gateway Card, with external cellular modem, can be used to connect wellsite equipment to the real-time infrastructure servers and allows for remote monitoring, control, and surveillance of the reservoir, pump, motor, and surface equipment.

Figure 1-1: INSTRUCT ESP Gateway Card

1.2 END-TO-END DIAGRAM

Figure 1-2: End-to-End Diagram

Section 2: Specifications

2.1 HARDWARE SPECIFICATIONS

Part Numbers	103381133	
Description	INSTRUCT ESP Gateway card	
Board Size	PCB Size: 100mm x 160mm	
	Eurocard 3U compliant (IEC 60297-3)	
Power Supply	DC (Input) 24VDC +/-10%, 300mA	
Maximum Altitude	3,000 meters above sea level	
Temperature	Operating -40 degC to +70 degC	
		(-40 degF to +158 degF)
	Storage-40 degC to +75 degC(-40 degF to +167 degF)	
Approvals,	CE, UL, cUL, FCC	
Certifications, and Declarations		
RoHS Compliance	Compliant	

2.2 HARDWARE OVERVIEW

Figure 2-1: Front Connections

Port	Functional Description
Eth0	Used to connect the gateway card to the field network for local
	acquisition via Modbus TCP/IP protocol, or connect to Cellular Modem
COM1 RS-232 Console	Used by field users to configure, commission, and troubleshoot the
	gateway card. Settings are 38400, 8, N, 1.
COM2 RS-485 Port	Secondary Modbus acquisition port
USB Receptacle	Enables retrieval of encrypted data logs or Firmware Upgrade
USB Console	Not used
CPU Status LED	Blinks once per second when system is healthy
CPU I/O Interface	Not used. Do not use this port.

Port	Functional Description
COM 3 RS-485 Port	Default Modbus Acquisition port for communication with INSTRUCT ESP
(gateway card Backplane	Intelligent Controller
Connector)	

Section 3: Installation and Operation

Potential Severity: Light

Potential Loss: Assets, Personnel

hazard Category: Electrical

Installation can only be performed by authorized factory or service personnel. Operators only have access to the front panel of the controller. No installation or retrofit can be carried out by the operator.

Using the appropriate procedures, ensure the Drive/Switchboard is stopped and that input power supplies are OFF before proceeding with the procedure.

Using the appropriate procedures, open the cabinet door and use a voltmeter to verify all power is OFF on the Drive/Switchboard prior to proceeding with the remaining procedure.

3.1 MULTITECH CELLULAR MODEM PREPARATION AND CONFIGURATION

3.1.1 MULTITECH CELLULAR MODEM INSTALLATION PREPARATION

The following parts are required for the preparation and installation of the modem. They are included in the INSTRUCT ESP Gateway Cellular Modem Global Kit (PN: 50370539).

i Note: PN 50376574: Gateway Card Cellular Kit (NA Alternate) is an alternative kit equivalent to PN: 50370539 but can only work in North America.

3.1.1.1 Hardware

Item Description	Quantity	Details
Router, Cellular, LTE CAT M1+NB-IOT Sensia PN: 50369243 (For NA kit 50376574, the router PN is 50376572)	1	HUILICONNECT COIL
Modem Power Cable Sensia PN: 50369242	1	
MultiTech Modem Mounting Bracket Sensia PN: 50369241 (Not included in NA kit 50376574)	1	

Item Description	Quantity	Details
AT&T SIM Card	1	
Power Supply Module Sensia PN: 50369248 (For NA kit 50376574, the Power Supply PN is 50376572)	1	
Cat5E Ethernet Cable, 3 ft Sensia PN: 50369237	1	
Mag-Mount Antenna Sensia PN: 77025191 (For NA kit 50376574, the Antenna PN is: 77027787)	1	

Item Description	Quantity	Details
GLAND, CABLE, NYLON, 3/4 in NPT Sensia PN: 77024442	1	
PSU and Modem Mounting Plate Kit Sensia PN: 50371409 (For NA kit 50376574, Adhesive tape PN: 77027803 is used instead of mounting plate)	1	
CABLE DB9 MALE/FEMALE SERIAL 3 ft RoHS Sensia PN: AC14505 Note : This serial cable is not included inside the standard kit. It can be ordered separately.	1	

3.1.1.2 Software

	• • • •	
Item Description	Quantity	Details
Downloaded Multitech Modem Firmware version 5.3.6 from <u>Sensia Technical Document</u> <u>Library</u> (Gateway Card configuration_FW_Manual Package) or InTouch 7745571	1	mtr-lte_v5.3.6s-s1_upgrade-signed.zip
Downloaded configuration file config_MTR-LEU7_5_3_6s- s1_02_05_20.tar if using global version modem MTR-MNG2 Or NA version modem MTR- LNA7 or EU version modem MTR-LEU7 from <u>Sensia Technical</u> <u>Document Library</u> (Gateway Card configuration _FW_Manual Package) or InTouch <u>7745571</u>	1	Config_MTR-LEU7_5_3_6s-s1_02_05_20.tar 1

3.1.2 MULTITECH MODEM CONFIGURATION

Instructions	Illustrations
1. MultiTech Modem Wiring	

Instructions	Illustrations
 1.1. Obtain Power Supply Module (50369248), MultiTech Modem (50369243), MultiTech Power Supply Cable (50369242), Antenna (77025191), and Ethernet Cable (50369237). 1.2. Attach Ethernet cable from MultiTech Modem to PC. 1.3. Attach an AC power plug (not included in the kit because of regional differences) to the Power Supply module input. Use the power cable to connect the Power Supply output to the MultiTech Modem power input. 1.4. Insert AT&T MicroSIM card into MultiTech Modem. 1.5. Power up the modem. Wait for 15 min and ensure Power LED, Status LED, Carrier Detect LED - CD, Link Status LED - LS, Signal Strength bars, and Ethernet port LEDs are blicking or lit 	<image/> <text></text>
Note: For first-time startup of the MultiTech Modem, it might take up to 45 min for the CD light to turn on.	
2. Configuring MultiTech Modem	
2.1. Attach Ethernet cable from laptop to MultiTech Modem.	
2.2. Open Internet Explorer and type the following IP address in the address bar: 192.168.2.1. Press Enter .	MULTITECH mPower ^{ar} Edge Intelligence rCell Commissioning Mode
2.3. For first-time initialization of the new MultiTech Modem, you need to set the username and password. Please take note of the username and password entered for first-time login.	Username: OK The following steps must be followed to register your first administrator user. You must specify a username and a password to continue configuring the device. You must specify a valid username and specify a password that meets the complexity requirements.
example: Username: admin Password: Admin2023	The username may contain only alpha-numeric (A-Z, a-z, 0-9), dot, hyphen and underscore characters and must not start with a hyphen character. The user password must meet the complexity requirements and be at least 8 characters and contain three or more different types of characters (a through Z) - ilowcrase alphabetical characters (a through Z) - ilowcrase (babetical characters (a through Z) - numerals (0 through 9) - special characters
Step through the wizard and keep all the default settings. Once the configuration file is applied, all these settings will be updated.	The password must not contain any common dictionary word. Copyright © 1995 - 2023 by Multi-Tech Systems, Inc All rights reserved.

Instructions	Illustrations	
	• Commissioning Mode x +	× : »
	Image: Contract of the contract	
	requirements. The username may contain only alpha-numeric (A-Z, a-2, 0-3), dot, hyphen and underscore characters and must not start with a hyphen character. The user password must meet the complexity requirements and be at least 8 characters and contain three or more different types of characters: • uppercase alphabetical characters (A through Z) • lowercase alphabetical characters (a through Z) • numerals (0 through 9) • special characters The password must not contain any common dictionary word. Copyright © 1995- 2023 by Multi-Tech Systems, Inc All rights reserved.	
	mPower ^{ara} Edge Intelligence rCell	
	First-Time Setup Wizard First-Time Setup Wizard Firs	

Instructions	Illustrations	
	First-Time Setup Wizard	×
	Time Configuration	
	Current Time	01/27/2023 12:53:18 (UTC)
	Date	01/27/2023
	Time (24 hr)	HH:MM
	Time Zone	UTC ~
	First-Time Setup Wizard	Back Next
	Network Interface Configu	uration - eth0
	Bridge	br0 v
	Network Interface Configu	uration - br0
	IPv4 Address	192.168.2.1
	Mask	255.255.255.0
		Back Next
2.4. Update Modem FW to 5.3.6s-s1	← → C ① ▲ Not secure +	https://192.168.2.1/administration/firmware-upgrade dge Intelligence rCell - Intelligent Cellular Router
is at least 5.1.3.	Home FIRMWARE U	WWW 513
- If lower than 5.1.3, isolate the modem and contact LCS	Save And Restart Setup Firmware Upgra	rade
Custom Service at:	Cellular Choose Firm	www.bgn/df FKe No file selected
bal.com	SMS Tunnele	
- If the modem already has	Administration	
proceed.	Self-Diagnostics (beta) Access Configuration	
Go to Administration -> Firmware	X.509 Certificate	
Select rcell-mtrv1-upgrade_5.3.6s-	Remote Management Notifications	
s'i-signed.bin, then start upgrade.	Firmware Upgrade	

Instructions	Illustrations
2.5. After re-flashing, you will see the wizard on the right. Close the wizard by clicking on the X at the top right.	First-Time Setup Wizard Full time to the setup wizer to the setup with the setup time to the setup time
	Next
2.6. Restore the configuration file.Go to the Administration option and select Save/Restore.	Configure 1921/1921/1921/1921/1921/1921/1921/1921
	MultiConnect® rCell - Intelligent Wireless Router
	Home Device Televenting
	Save and Restart Rester LAN
	Setup Model Number HTR-H5 NAC Address 00:0
	Cellular Serial Number 18286889 IP Address 192. IMEE 351570055402851 Netwood 255
	Firewall Fir
	SMS Current Time 04/21/2017 10:36:03 DNS 192. Tunnels Up Time 0:02:50 DHCP State Enal
	Administration Wan Cellular Lease Range 192.
	Access Configuration
	Remote Management State PPP Link is up
	Web UI Customization Signal
	Save/Restore Connected 0:01:57 Initial Setup 10 address 10 200 240 38
	Debug Options Reaming Yes
	https://122.168.21/vara_ventore.item!
2.7. Click Browse and then select the configuration file available at	Binger 18210922 (recymbolic to P + Q CostCottern. d) MultiConnectS (Cd x The Ent View Forothm Tests Help Ditted Sec Galley +
In louch <u>7745571</u> or the file downloaded from <u>Sensia Technical</u>	MULTITECHO MultiConnect® rCell - Intelligent Wireless Router Laged In Jahre Laged In Jahre Laged In Jahre Laged
Document Library (config_MTR-	Home Upload Configuration 2
2.8 For Zedi Firmware use (config MTR-	Settig Restore Configuration Trailing
MNG2 5 3 6s-	Collidar Save Colligation to the American Firewall Reset To User-Defined Configuration Reset
s1 FOR ZEDI MAY2024tar.gz)	Cocce File to Upload
	Contra - New folder E - C O
7	Marie Ditembilities State
Note:	Vites Comp. Num. Port. J. (19), 27 (20) And Apr. Current Dial Num. Port. Apr. J. (20), 27
After you upload this configuration file,	Compare
the login credentials will be automatically	Augustation and a second
updated to the settings in the	If gold kon 202010 911 AM Konker Excludes. Image: State of the s
configuration file:	
Username: admin	

Instructions	Illustrations
Password: admin	
2.9.	
2.10. Select Restore .	Composition 1920921 (Secondenter of P * Contributer of B ManConnect® (Cel x File Edit Veror Foreiter Tesh Help Des Sicc Galey * MultiConnect® (Cell - Intelligent Wireless Router Lagard In: saless
	Home Upload Configuration 2 Home Upload Configuration 2 Save and Bestant Entres Difference Setup Colludar Entres Difference Colludar Entres Difference Entres Freewall Entres Difference Entres Abarnistration Entres Entres Entres Value User-Defined Default Corr Corr User-defined default configurations are used to set deployment specific default settings, overriding the factory default configurations are used to set deployment specific default settings, overriding the factory default configurations and restore the unit to factory default, press and hold the RESET hutton on the device fact and the factory default configurations and restore the unit to factory default, press and hold the RESET hutton on the device fact and seconds.
	😤 👔 😸 MultiConnects (Cells) 🖂 📱 🔍 Sripping Tool 🛛 😸 📢 Document - Wood 🕼 Dirotes - Pant 💦 🔀 💥 S 🗃 🗰
2.11. The modem will reboot. It will take approximately 10 min for the modem to reboot.	MULTITECHO MultiConnect® rCell - Intelligent Wireless Rout MTR-H5 Firmware 3.1.4
<i>i</i> Note: Normally restoring the configuration file should take 10 minutes at most. If the modem hangs, or get stuck, then power cycle the modem. And re-login	Home Save and Restart Setup
If power cycle does not recover the modem, then a reset function is required by pressing and holding down the reset button for 20 seconds. This will reset the modem to default settings. The configuration file needs to be reapplied.	

Instructions	Illustrations	
Instructions	inustrations	
2.12. After the MultiTech Modem has		
completed rebooting, log into the	File Edit View Favorites Tools Help	
MultiTech website at 192,168,2,1	🖕 🕘 Web Slice Gallery 🕶	
again. On the login page, enter the	MultiOperative and a coll a Tabelli and Mindlers Double	
following crodentiale	MULTITECHO MULTIConnect® rceir - Intelligent Wireless Route MTR-H5 Firmware 3.1.4	31
following credentials.		
Username: admin	Home Device Information	
Password: admin	Save and Restart Router LA	AN
	Setup Model Number MIR-H5 MA	AC Address
It may take a couple of minutes for the	Cellular IMEL 351579055497851 Ne	etmask
It may take a couple of minutes for the	Firewall Firmware 3.1.4 Ga	ateway
modem to finish the booting process.	SMS Current Time 04/21/2017 10:41:54 DM	NS
	Tunnels Up Time 0:01:15 DF	HCP State
Please wait up to 10 min for the	Administration WAN Cellular Le	ase Range
MultiTech main screen to be updated	Status & Logs Cellular	
Vorify that the modern has a good signal	Commands State PPP Link is up	
the DDD and in induction has a good signal,	Help Signal	
the PPP session is up, and a cellular IP	edil	
address has been assigned	Copyright © 1995-2017 Connected 0:00:26 Multi-Tech Systems, Inc.	
(10.242.xxx.xxx) or (10.243.xxx.xxx)	All rights reserved.	
(Tower 4B17B73	
	🚱 🔯 🧭 MultiConnect® rCell 🔤 📑 🧟 Snipping Tool 📃 🖬 Document1 - Word 👩 Untitled - Pair	nt
	Note:	
	The picture is only for illustration refer to left Instructions	
	column for the IP address format, it should be 10.212 xxx	vvv
	OF 10.243.XXX.XXX	
2.13. This completes the MultiTech		
Modem configuration.		
Ŭ		
Power off the modem dismantle all		
accessories (ethernet cables, AC/DC		
adapter), and place aside.		

3.2 COMPONENTS INSTALLATION INSIDE VSD

Potential Severity: Major Potential Loss: Assets, Personnel Hazard Category: Electrical

Ensure VSD is powered off during the following procedure.

	Instructions	Illustrations
1.	INSTRUCT ESP Gateway card Installation. Install INSTRUCT ESP Gateway card (PN: 103381133) into the expansion slot of the INSTRUCT ESP Intelligent Controller inside the VSD drive.	CONTROL CARD 105840110 R5 - 232 Wa vog
2.	Modem and Power Supply Module Installation (For NA kit 50376574, use adhesive tape included inside the kit to mount the Power Supply Module and Modem on the side of Instruct Controller or inside the VSD Door.	
2.1.	Obtain PSU and Modem Mounting Plate (PN: 50371138) inside the Mounting Kit 50371409. Install the mounting plate to the right side of the INSTRUCT ESP Intelligent Controller by using the provided standoffs and screws.	
2.2.	Mount the modem and the Power Supply to the plate by using the Modem Mounting bracket (PN: 50369241) and DIN rail provided in the kit.	

	Instructions	Illustrations
3.	Make the cable connection between the Power Supply output to the modem power input by using the modem power cable (PN: 50369242).	
4.	Connect 120VAC inside the VSD to the Power Supply Module AC input. (For INSTRUCT ES7 Intelligent VSDs, it should be connected to CPT2 terminals. For INSTRUCT E20P Intelligent VSDs, connect to the 120VAC terminal block.)	
5.	Drill a ³ / ₄ in hole on the VSD door close to the INSTRUCT ESP Intelligent Controller. The hole is for mounting the cable gland (77024442). Do not mount the cable gland yet.	
6.	Place the Mag-Mount Antenna onto the VSD body and pass the coax cable through the drilled hole. Connect the other end of the coax cable to the modem Cell1 port.	
7.	Connect the Ethernet cable between the gateway card Ethernet port to the MultiTech Modem Ethernet port.	

3.3 INSTRUCT ESP GATEWAY CARD CONFIGURATION AND COMMISSIONING

The INSTRUCT ESP Gateway Card (103381133) is factory loaded with FW 2120901 or later. It is ready to be used directly inside the INSTRUCT ESP Intelligent Controller with the modem. Note that the FW must be started with 212xxxx: that is, the specific FW for the gateway card to be used inside the controller. In case the gateway card firmware is not correct, please follow section 4.4 to upgrade the firmware.

The gateway card configuration and commissioning can be done locally by using the TUI through the RS232 COM1 port or remotely by the Proser Team. To do it locally, you need to bring the USB cable out of the VSD through the drilled hole temporarily during the commissioning procedure.

3.3.1 REQUIRED EQUIPMENT & SOFTWARE

Prepare the following equipment and software before the start of software configuration.

SN	Item Description	Illustrations
1	Windows (32/64) laptop / PC	

SN	Item Description	Illustrations
2	USB to RS232 serial converter (not provided in the kit)	
3	RS232 (DB9 female) to gateway card RS232 COM1 Connector (not provided in the kit)	DB-9 Cable - Connector - 101078022 Pin 3 Pin 1 Pin 2 Pin 3 Pin 5 Pin 3 DE OCCORD Pin 8 SOMETIC VEW Pin 8 Control VEW Deg PIN 5 Control VEW Deg PIN 5 DB PIN 2 Deg PIN 5
4	Download Terminal User Interface (TUI) – PuTTY Download the 32-bit version of putty.exe and save it on the Windows laptop or PC.	Download URL: https://the.earth.li/~sgtatham/putty/latest/w32/putty.exe

3.3.2 INSTRUCT ESP GATEWAY CARD CONFIGURATION CHECK AND COMMISSIONING

This section outlines the software configuration required for the gateway card to communicate with the MultiTech Cellular Modem.

Ins	tructions	Illustrations
1.	Connect the USB to RS232 serial converter to the gateway card RS232 Serial Port COM1. Bring the USB end out of the VSD through the hole drilled on the VSD. This connection is only for the commissioning procedure.	
2.	Close the VSD door, turn on the power to the VSD, and wait for the controller to boot up.	
3.	Connect the above USB plug described in step 1 (outside of the VSD) to a computer.	

Instructions	Illustrations
 4. Open PuTTy. Execute putty.exe and configure as below: Serial Line: COMxx (PC Com port connected to gateway card) Speed: 38400 Connection Type: Serial Press Open. 	WITTY Configuration 2 Category: Session - Logging - Teminal - Keyboard Specify the destination you want to connect to - Bell Specify the destination you want to connect to - Window - Appearance - Behaviour - Raw - Translation - Selection - Colours - Connection - Data - AMS-ASA - Proxy - Telnet - Rilogin - SSH - Serial - Colours - Colours - Colours - Colours - Colours - Berlay - Colours - Colours - Colours - Boata - MMS-NSA - Proxy - Telnet - Biogin - SSH - Serial - Cose window on exit: - About - Help - Open Cancel
 5. Press Enter till the Login prompt appears and enter the following credentials: Login: admin Password: admin 	(none) login: admin Password:
 6. Check that the FW revision is the latest version. Avalon: 0948-AVL-G LiftlQ: 0947-LIQ-G Zedi: 43007 If not, refer to section 4.2.5 for the firmware upload process. The latest firmware available in <u>Sensia Technical Document Library</u> or InTouch <u>6117586</u> covers support for the gateway Cellular Modem. 	<pre>@ COMS-PuTTY C X qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>

Instructions	Illustrations
 7. If it is a new gateway card from the factory, wait 10 to15 minutes. The modem status should become Online, and the IP address should be 10.242.xxx.xx or 10.243.xxx.xx. Once the above is verified, skip to the commissioning task in step 11. If it is a used gateway card, proceed to step 8 below. 	COM5-PuTTY
8. Perform a factory reset.	COM5 - PuTTY - C X
 Note: The factory reset will break the old commissioning. It is necessary to contact the Proser team to redo the commissioning after the factory reset. In the main menu, select 5. Advance Settings. 	Device SN: 9D6A109C Firmware rev. : 0600859 Modem: ONLINE IP ETH0: 10.209.247.15 Network Status: UNDEFINED Comms Loss: 0 KB IP ETH1: Signal Strength: 26 HFDC Buffer: 0 KB IP WAN0: 10.209.247.15 Voltage: 23.9V RAM: 97% of 487M free Working I/Os: 0/0 Uptime: 2m 5s Int. Temp: 40C qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
8.1. Under Advanced Options Settings Menu, select 4. Actions, Diagnostics and Logs.	<pre>qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>
8.2. Under Actions, Diagnostics, and Logs menu select 5. Factory Reset (including Network Settings).	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
Enter the reason for the reset, e.g., "INSTRUCT ESP Gateway Cellular LiftIQ" and press Enter .	<pre>qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>
8.3. Select 1. to Run .	

Instructions	Illustrations
	<pre>dqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>
8.4. The gateway card will reboot and restart with the factory reset defaults.	Console: colour dummy device 80x30 Calibrating delay loop (skipped) preset value 599.65 BogoMIPS (lpj=2998272) pid_max: default: 32768 minimum: 301 Mount-cache hash table entries: 512 CFU: Testing write buffer coherency: ok devtmpfs: initialized regulator: core version 0.5 NET: Registered protocol family 16 i.MX IRAM pool: 128 KB@0xdf840000 IRAM READY CFU is i.MX51 Revision 3.0 Using SDMA I.API MXC DMA API initialized MXC usb wakeup probe bio: create slab <bio-0> at 0 SCSI subsystem initialized CFU: registered new interface driver usbfs usbcore: registered new interface driver usb mol3892 Rev 2.0 FinVer 2 detected Initial</bio-0>
 9. After the gateway card reboots, enter the admin screen again following the instruction in Step 3. Ensure the firmware version is correct and the I/Os have been erased to 0/0. Wait 10-15 min for the Modem Status to be Online and the IP address to show 10.242.xxx. xx or 10.243.xxx.xx. 	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
 10. Check Time Sync under Network Settings: 3. Perform Time Sync. <i>i</i> Note: The time sync takes up to 50 seconds to show Success status. 	gqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq

Instructions	Illustrations		
11. <u>Commissioning:</u>			
Note: Before proceeding to the commissioning steps, you should have already obtained a token from the Proser Team. In case you don't have the token, you need to contact the Proser team (proser@sensiaglobal.com) and provide them the IP address in the form of 10.242.xxx.xxx or 10.243.xxx.xx. (The IP address is from your SIM card.) The Proser Team will provide a token number for commissioning.			
Commissioning is the process that will allow the gateway card to connect to the LiftIQ/Avalon/Zedi real- time server, and push the I/O, alarm, and reporting configuration from the real-time servers to the field hardware, enabling the users to verify that the I/Os are properly functioning.			
Commissioning can be done on location steps describe a commissioning done lo	by using TUI or remotely by the Proser Team. The following cally by using TUI.		
11.1. Go to the Main Menu, and select	B COM5 - PUTTY — — X		
5. Advanced Settings:	<pre>qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>		
11.2. Under the Advance Setting menu, select 3. Commissioning .	<pre>iqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>		
 11.3. For LiftIQ: Under the Commissioning menu, check that the 2. Bootstrap services options is default to 4. Configure LIFTIQ Production [default]. Then choose 0. 11.4. For Avalon: 2. Bootstrap services options is default to 2. Configure AVALON Production [default]. Then choose 0. 	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq		

Instructions	Illustrations		
11.5. For Zedi: Not applicable Back up one level to go back to the Commissioning menu.	COM3-PuTTY - C × qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq		
11.6. Under the Commissioning menu, choose 1. Status/Initiate commissioning.	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq		
11.7. Press c to initiate commissioning, and enter the token number obtained from the Proser Team.	Hqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq		

Instructions	Illustrations		
11.8. If commissioning is done successfully, the commissioning status should show: Commissioned with the Device	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq Device SN: 9D6F3480 IP ETH0: 10.209.240.34 IP ETH1: IP WAN0: 10.209.240.34 Working I/Os: 0/83	qqqq SITE NAME: SCB3 qqqqqq Firmware rev.: 1720039 Network Status: CONNECTED Signal Strength: 27 Voltage: 24.0V Uptime: 6h 11m 20s	Aggaaggaaggaaggaggag Kodem: ONLINE Comms Loss: 0 KB HFDC Buffer: 0 KB RAM: 97% of 487M free Int. Temp: 47C
ID.	qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq	q 2021-02-17 07:41:46 GMT qqq issioning and press 'q' to go	qqqqqqqqqqqqqqqqqqqqqqq back.
The Network Status will be changed to Connected and the modem status will show Online .	Commissioning status: "Con Last message: device id =	mmissioned" 3668	
Check Signal Strength is between 15- 31.			
Received Strength Signal Indicator (RSSI): 0-6 - Extremely Weak Signal 7-14 - Very Weak Signal 15-23 – Weak Signal 24-31 – Good Signal			
Straighten the Omni Directional Antenna to get a good signal.			
The gateway card is successfully commissioned.			

Instructions	Illustrations
12. Gateway Card COM3	R COM8 - PuTTY – – X
Configuration: Change the COM3 setting of the Gateway Card and make sure it is same to below: Baud Rate: 9600 Parity: None Type: RS485 (4-Wire) Pre Keying (ms): 2 Post Keying (ms): 2	<pre>gqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>
	·
	<pre>qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>
	COM13-PuTTY - C X qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
	<pre>IF ETH1: Signal Strength: 0 HFDC Buffer: 0 KB Int. Temp: 40C Voltage: 24.2V RAM: 98% of 487M free Working I/Os: 0/0 Uptime: 5m 14s Msg Queue: 0 qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq</pre>

3.4 INSTRUCT ESP INTELLIGENT CONTROLLER CONFIGURATION

Configure the INSTRUCT ESP Intelligent Controller Slot that contains the gateway card to the setting shown below. The following setting matches the gateway card Serial Port Com3 default setting. It ensures good communication between the controller and the card.

Device —		(Comm Setting	js —		Other Settings -		
¹ Name:	Slot4		Baud Rate:	9600	-	Slot Power	On	
Prunction:	Gateway	-	Data Bits:	8 bits	-	Watchdog:	Disable	
Aodbus Slav	ve Port Config-		Stop Bits:	1 bit	•	Timelimit (s):	60	
Site Addre	ess: 1		Parity:	None	-			
Acce	ess: View Only	-	Mode:	RS485	-			
Un	its: bpd, C, psi	-	Prekey:	2				
Custom M	ap: None	-	Postkey:	2				
Acce Un Custom M	ess: View Only its: bpd, C, psi ap: None	- -	Mode: Prekey: Postkey:	RS485 2 2				

Figure 3-1: Controller slot configuration for INSTRUCT ESP Gateway Card

3.5 READY FOR OPERATION

After all the above steps are done, the controller and gateway card are ready for operation. Turn off the VSD power and wait until the system is fully discharged.

Installation can only be performed by authorized factory or service personnel. Operators only have access to the front panel of the controller. No installation or retrofit can be carried out by the operator.

Using the appropriate procedures, ensure the Drive/Switchboard is stopped and that input power supplies are OFF before proceeding with the procedure.

Using the appropriate procedures, open the cabinet door and use a voltmeter to verify all power is OFF on the Drive/Switchboard before attempting the remaining procedure.

Remove the RS232-to-USB Cable and the antenna cable from the drilled hole. Install the cable gland to the drilled hole location on the VSD, put back the antenna cable, and pass the antenna cable through the cable gland. Now the system is ready to operate.

Section 4: Modbus and TUI Functions

4.1 SECONDARY MODBUS RS-485 CONNECTION (COM2)

The secondary Modbus RS-485 data acquisition port is COM2. This communication port shares the same connector as COM1, the Engineering port used to communicate with the CPU board inside the INSTRUCT ESP Gateway Card. This RS485 port can be used to connect to other RTU devices, in addition to the host controller.

Figure 4-1: COM2 RS485 port

- Pin 201: RS-485 (COM2)
- Pin 202: RS-485 (COM2)
- Pin 203: RS-485 (COM2) Earth Ground (Shield)
- Pin 204: RS-485 (COM2) Signal Ground

Figure 4-2: COM2 Connector

4.2 CONFIRMING RTU COMMUNICATIONS

4.2.1 SERIAL PORT CONFIGURATIONS

The Modbus Port Configuration menu permits the technician to configure and check the serial port connections with the local controllers. COM3 is used for the communication between the controller and the gateway card. COM2 can be used for an additional RS485 RTU device.

- 1. Open the terminal emulator (text user interface).
- 2. In the main menu, select option 2. Modbus Port Configuration.

3. Select the appropriate COM port to be configured (Option 1 or 2).

Putty 204.17.158.21 - Putty		
aqaqaqaqaqaqaqaqaqaqaqaqaqaqa Device SN: 906F5186 IP ETH0: 163.185.59.64 IP ETH1: 204.17.158.21 Int. Temp: 34C Working I/Os: 84/87 aqaqaqaqaqaqaqaqaqaqaqaqa aqaqaqaqaqaq	<pre>qq SITE NAME: SCB3 ION Firmware: 22020 Network Status: STAND Signal Strength: 66 Voltage: 14.8V Uptime: 6m 11s 2014-10-17 16:42:23 U Open for Port Config MODBUS PORT CONFIGUR</pre>	aqaqaqaqaqaqaqaqaqaqaqaqaqaqaqa Modem: ONLINE BY Comma Loss: 0 KB HFDC Buffer: 41 KB RAM: 97% of 487M free Msg Queue: 0 TC qaqaqaqaqaqaqaqaqaqaqa Uration (baud ecc). ATION ********
		*

Figure 4-3: Modbus Port Configuration

- 4. Select each of the configuration parameters one at a time and enter the required values to match the controller.
- 5. Press **0** to save changes and return to the previous menu.

4.2.2 CONFIGURING RTU SLAVES

The RTU configuration menu allows the technician to configure the gateway card to read from each of the individual RTUs including the controller.

To communicate properly, these parameters must match those of the controller.

- 1. Open the terminal emulator (text user interface).
- 2. In the main menu, select option **2. Modbus Port Configuration**.
- 3. Select option 3. RTU Configuration.

Figure 4-4: Modbus Port Configuration

4. Select an RTU to be configured from among the options provided or add a new RTU.

204.17.158.21 - PuTTY		
qqqqqqqqqqqqqqqqqqqqqqqqqqqq Device SN: 9D6F51B6 IP ETH0: 163.185.59.64 IP ETH1: 204.17.158.21 Int. Temp: 34C Working I/Os: 84/87	qqq SITE NAME: SCB3 qqqqqqq ION Firmware: 22020 Network Status: TIMEOUT Signal Strength: 64 Voltage: 14.8V Uptime: 15m 3s 2014-10-17, 16:51:15 UTC gaga	qqqqqqqqqqqqqqqqqqqqqq Modem: ONLINE Comms Loss: 2 KB HFDC Buffer: 41 KB RAM: 97% of 487M free Msg Queue: 1
Current DAQ RTUS configured Or, select 'Add New' for ne Press 'Delete' or 'd' to re "O. Back/Up One Level 1. Add New 2. Configure RTU Slave ID 3. Configure RTU Slave ID 4. Configure RTU Slave ID 5. Configure RTU Slave ID 6. Configure RTU Slave ID 8. Configure RTU Slave ID 9. Configure RTU Slave ID	. Open for settings. w RTU. move an RTU. * 2.3. RTU CONFIGURATION **** 1 2 3 4 5 6 7 8	E

Figure 4-5: RTU Configuration

5. Enter an RTU ID, name, and communication port (COM2 or COM3). Modify other configuration parameters and ensure they match the controller parameters.

P 204.17.158.21 - PuTTY		
dadadadadadadadadadadadadada	g SITE NAME: SCB3 qqqqqqq	वतवतववववववववववववववववव
Device SN: 9D6F51B6 IC	ON Firmware: 22020	Modem: ONLINE
IP ETH0: 163.185.59.64 Ne	etwork Status: CONNECTED	Comms Loss: 0 KB
IP ETH1: 204.17.158.21 Si	ignal Strength: 49	HFDC Buffer: 41 KB
Int. Temp: 34C Vo	oltage: 14.8V	RAM: 97% of 487M free
Working I/Os: 84/87 Up	ptime: 16m 26s	Msg Queue: 0
qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq	014-10-17 16:52:38 UTC qqqq	dadadadadadadadadadada
Max Retries is number of times	s to try operation before "	failing". Timeout is tim
e to wait until operation ret	ries. Backoff Count is how	many times in a row "fai
lure" occurs before backoff. H	Backoff Period is how long	to wait in backoff befor
e retrying. Max Reg Gap, Max H	Read Size: consult manual.	
***************************************	2. RTU CONFIGURATION: 1 **	********
-0. Back/Up One Level and A	Apply	
1. Cancel		
2. RTU ID: 1		=
3. Name: RTU1		
4. Port: COM3		
Max Retries: 1		
6. Timeout: 1000		
7. Backoff Count: 10		
 Backoff Period: 60 		
 Max Register Gap: 100 		
*. Max Read Size: 125		
		T

Figure 4-6: RTU Configuration Parameters

4.2.3 MONITORING COMMUNICATIONS

- 1. Open the terminal emulator (text user interface).
- 2. In the main menu, select option **4. Advanced Configuration**.
- 3. Navigate to the 1.I/O and Acquisition menu.

4. Select the **1. I/O Viewer**. The I/O viewer permits the technician to check the polling in real time on the serial port and see the status of all the RTUs simultaneously.

P	204.	17.158.21	- PuT	тү					5		
qq Der	qqq 7ic	qqqqqq ≥ SN: 9	qqqq 9D6F	1999999999 51B6	IOI IOI	SITE NAME V Firmware:	: SCB3 22020	ddddddd	iqqqqqqq Modem:	QQQQQQQQQ ONLINE	ववववववव
IP	ETI	HO: 163	3.185	5.59.64	Net	work Statu	s: STAN	IDBY	Comms L	oss: 0 K	в
IP	ETI	H1: 204	4.17	.158.21	Sig	gnal Streng	th: 49		HFDC Bu	ffer: 41	KB
Int		Temp: 3	34C		Vol	ltage: 14.9	V		RAM: 97	% of 487	M free
Wo	rkin	ng I/Os	3: 84	1/87	Upt	ime: 22m 1	63		Msg Que	ue: 0	
qqq	idd	dddddd	iddd	ddddddd	qqq 201	4-10-17 16	:58:28	UTC qqqqq	idddddd	dddddddd	adadadad
Use	e Uj	p/Down	or l	PgUp/PgDo	own to s	scroll list	. 'q' 1	eturns. '	p' poll	s all IO	points
im	ned	iately.									
lqo xPI	idmo IDx	qqqqqwo INDEX x H	qqqwa RTU x 1	qqqqqqqw 40DICONx	qqqqqqwq TYPEx	qqqqqqqqqqwq VALUEx	qqqqqwo NEXTxA	qqqqqqqqw AGE/STATx2	iqqqqwqq LARMxAC	qqqqqqqwq Q RATExR	qqqqqqqk PT RATEx
tq	qqn	qqqqn	addu	aaaaaaaa	qqqqqnq	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	qqqqqn	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	aaaanaa	aaaaaana	aaaaaaa
x23	54x	901x	2x	0x	DISCRx	1x	91sx	1s/OKx	OKx	180sx	86400sx
x23	54x	907x	1x	0x	FLOATx	14.8554x	91sx	1s/OKx	OKx	180sx	86400sx
x2	54x	909x	3x	0x	FLOATx	33.8274x	91sx	1s/OKx	OKx	180sx	86400sx_
x	2x	2004x	1x	7x	DISCRx	OFFx	x	22minx	OKx	x	x =
x	1x	2005x	1x	302143x	UINTx	0x	91sx	3min/OKx	OKx	300sx	600sx
x	2x	2008x	1x	400557x	UINTx	5000x	x	22minx	OKx	x	x
x	1x	2041x	1x	302049x	UINTx	0x	91sx	3min/OKx	OKx	300sx	600sx
x	1x	2042x	1x	302050x	UINTX	0x	91sx	3min/OKx	OKx	300sx	600sx
x	1x	2043x	1x	302051x	UINTX	0x	91sx	3min/OKx	OKx	300sx	600sx
x	1x	2044x	1x	302052x	UINTx	0x	91sx	3min/OKx	OKx	300sx	600sx
x	1x	2072x	1x	302176x	UINTX	0x	91 <mark>s</mark> x	3min/OKx	OKx	300sx	600sx
х	2x	2109x	1x	40x	DISCRx	ONx	x	22minx	OKx	x	x -

Figure 4-7: I/O Viewer

5. From the I/O and Acquisition menu, select option **3. RTU Viewer**. The RTU Viewer allows the technician to monitor the polling for each RTU in greater detail.

Putty 204.17.158.21 - Putty		
qqqqqqqqqqqqqqqqqqqqqqqq Device SN: 9D6F51B6 IP ETHO: 163.185.59.64 IP ETH1: 204.17.158.21 Int. Temp: 34C Working I/Os: 84/87	qqqq SITE NAME: SCB3 qqqqqq ION Firmware: 22020 Network Status: STANDBY Signal Strength: 63 Voltage: 14.8V Uptime: 27m 49s	qqqqqqqqqqqqqqqqqqqqqqqq Modem: ONLINE Comms Loss: 0 KB HFDC Buffer: 41 KB RAM: 974 of 487M free Msg Queue: 0
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	q 2014-10-17 17:04:01 UTC qqqq	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
Use Up/Down or FgUp/FgDown qaqaqaqaqaqaqaqaqaqaqaqaq xRTU Ibx NNMEx GOOD taqaqaqaqaqaqaqaqaqaqaqaq x1 x RTU1x 84 x2 x RTU2x x3 x RTU2x x4 x RTU2x x5 x RTU5x x6 x RTU6x x7 x RTU7x	to scroll list. 'q' returns. iqqaqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq	qqqqqqk STATUSx qqqqqu GODDx GOODx GOODx GOODx GOODx GOODx GOODx
waaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa		aaaaaai
		•

Figure 4-8: RTU Viewer

4.2.4 CONFIGURING TEST COMMANDS

Test commands permit the technician to ensure proper communication between the controller and the gateway card.

- 1. Open the terminal emulator (text user interface).
- 2. In the main menu, select option **2. Modbus Port Configuration**.

3. Select option 4. Modbus Test Commands.

🛃 204.17.158.21 - PuTTY		
ddaddaddadaddadadadadada	qqq SITE NAME: SCB3 qqqq	adadadadadadadadadadadada
Device SN: 9D6F51B6	ION Firmware: 22020	Modem: ONLINE
IP ETH0: 163.185.59.64	Network Status: STANDBY	Comms Loss: 0 KB
IP ETH1: 204.17.158.21	Signal Strength: 67	HFDC Buffer: 41 KB
Int. Temp: 34C	Voltage: 14.8V	RAM: 97% of 487M free
Working I/Os: 84/87	Uptime: 29m 22s	Msg Queue: 0
adadadadadadadadadadadada	2014-10-17 17:05:35 UTC q	Idddddddddddddddddddddddd
Issues modbus commands to t	est the RTU and COMM setti	ings.
******	2.4. MODBUS TEST COMMANDS	******
-0. Back/Up One Level		
1. Issue Modbus Test Comma	nd 1: COM3, Uniconn,	SiteID:1
2. Issue Modbus Test Comma	nd 2: COM3, Uniconn,	SiteID:2
3. Issue Modbus Test Comma	nd 3: COM3, Uniconn,	SiteID:3
4. Issue Modbus Test Comma	nd 4: COM3, Uniconn,	SiteID:4
5. Issue Modbus Test Comma	nd 5: COM2, Uniconn,	SiteID:1
6. Issue Modbus Test Comma	nd 6: COM2, Uniconn,	SiteID:2
7. Issue Modbus Test Comma	nd 7: COM2, Uniconn,	SiteID:3
8. Issue Modbus Test Comma	nd 8: COM2, Uniconn,	SiteID:4
9. Configure Modbus Test C	ommands	
		· · · · · · · · · · · · · · · · · · ·

4. Select option 9. Configure Modbus Test Commands.

🛃 204.17.158.21 - PuTTY		
qqqqqqqqqqqqqqqqqqqqqqqqqqqq Device SN: 9D6F51B6 IP ETH0: 163.185.59.64 IP ETH1: 204.17.158.21 Int. Temp: 34C Working I/0s: 84/87 qqqqqqqqqqqqqqqqqqqqqqqqqqqqqq	<pre>qqq SITE NAME: SCB3 qqqqqqq ION Firmware: 22020 Network Status: STANDBY Signal Strength: 61 Voltage: 14.8V Uptime: 30m 17s 2014-10-17 17:06:29 UTC qqqq d to configure it.</pre>	aqaqaqaqaqaqaqaqaqaqaqaq Modem: ONLINE Comms Loss: 0 KB HFDC Buffer: 41 KB RAM: 97% of 487M free Msg Queue: 0 aqaqaqaqaqaqaqaqaqaqaqa
<pre>************************************</pre>	MODBUS TEST COMMAND CONFIGURA Uniconn, SiteID:1 Uniconn, SiteID:2	ATION ******************
 Configure #3: COM3, Configure #4: COM3, Configure #5: COM2, Configure #6: COM2, Configure #7: COM2, 	Uniconn, SiteID:3 Uniconn, SiteID:1 Uniconn, SiteID:2 Uniconn, SiteID:3	E
8. Configure #8: COM2,	Uniconn, SiteID:4	

Figure 4-10: Configure Modbus Test Commands

5. Select a test command and configure the parameters as required.

4.2.5 ISSUING TEST COMMANDS AND CONFIRMATION ON TRAFFIC VIEWER

Issuing test commands permits the technician to check the response of the controller and ensure communications. The Traffic Viewer gives the technician an opportunity to see the transmitted and received code associated with each of the configured controllers.

- 1. Open the terminal emulator (text user interface).
- 2. In the main menu, select option **2. Modbus Port Configuration**.
- 3. Select option 2.4 Modbus Test Commands.
- 4. Select a command based on the controller you would like to test. If the command was sent successfully, it will display "Success." Otherwise, it will display "Failed."
- 5. After issuing the command, press 0 to go to menu 2. Modbus Port Configuration.
- 6. Select option 1 (Configure COM3) or 2 (Configure COM2).

7. Select option **7. Modbus Traffic Viewer**. The transmitted and received code will be printed to the screen.

Figure 4-11: Modbus Traffic Viewer

- 8. Verify data received.
- If no data are received, it would indicate a problem with the connection or the controller. Check the physical connection to the controller.
- If garbage data (random data without a pattern) are received, it indicates that there may be a problem with the configuration parameters. Ensure that the parameters set in the COM2 or COM3 configuration, as well as those in the RTU configuration, match those of the controller.

4.3 ADVANCED SETTINGS

The Advanced Settings can be found under the main Menu:

B COM2 - PuTTY	1	
	SITE NAME: SCB3	A
Device SN: 9D7237C3	Firmware rev. : 32582	Modem: N/A
IP ETH0: 163.187.162.173	Network Status: CONNECTED	Comms Loss: 0 KB
IP ETH1: 192.168.1.100	Signal Strength: 0	HFDC Buffer: 0 KB
Int. Temp: 38C	Voltage: 24.1V	RAM: 95% of 487M free
Working I/Os: 84/84	Uptime: 10m 54s	Msg Queue:
	- 2016-05-04 17:27:26 GMT	
Use the Arrow Keys to navi	gate and Enter to open menu :	items. Or, use Number Key
[0-9]. 'Q' exits any scree	n. 'H' toggles this help even	rywhere.
******************	******** MAIN MENU ********	******************
 Network Settings 		
2. Modbus Port Settings		
3. I/O Viewer		
4. Alarm Viewer		
-5. Advanced Settings		
		=
		-

Figure 4-12: Main Screen

It gives access to the following functions:

4.3.1 SITE SETTINGS

Site Settings allows you to modify the name (SCB3 by default).

PuTTY		
	SITE NAME: SCB3	
Device SN: 9D7237C3	Firmware rev. : 32582	Modem: N/A
IP ETH0: 163.187.162.173	Network Status: CONNECTED	Comms Loss: 0 KB
IP ETH1: 192.168.1.100	Signal Strength: 0	HFDC Buffer: 0 KB
Int. Temp: 38C	Voltage: 24.1V	RAM: 95% of 487M free
Working I/Os: 84/84	Uptime: 13m 26s	Msg Queue:
	- 2016-05-04 17:29:57 GMT	
These advanced options are	for adjusting and viewing sy	stem internals. Please co
nsult equipment manufactur	er before making changes.	
******	5. ADVANCED OPTIONS SETTINGS	*****************
0. Back/Up One Level		
1. I/O and Acquisition		
-2. Site Settings		
 Gateway Settings 		
4. Actions, Diagnostics and	nd Logs	
5. Create T-Log		
6. Create "Lite" T-Log		
7. Create and Upload "Info	ouch" I-Log	
8. Report board		
9. Copyright Notices and	Attributions	
		=
		*

Figure 4-13: Site Setting

4.3.2 ACTIONS, DIAGNOSTICS AND LOGS

The **Actions**, **Diagnostics and Logs** option allows you to perform a factory reset that will restore the original configuration of the running firmware version.

Figure 4-14: Actions, Diagnostics and Logs

To perform a factory reset, select 4. Factory Reset (including Network Settings).

Putty			-) ×
dddddddddddddddddddddddd	qqq SITE NAME: SCB3 (ddddddddddd	dddddd	dddda	dddddd
Device SN: 9D51B0C2	Firmware rev. : 21209	01 Moder	n: ONLIN	E	
IP ETH0: 10.243.11.150	Network Status: CONNE	CTED Comm	5 Loss:	0 KB	
IP ETH1:	Signal Strength: 31	HFDC	Buffer:	0 KI	3
IP WAN0: 10.243.11.150	Voltage: 24.0V	RAM:	97% of	487M	free
Working I/Os: 106/106	Uptime: 5d 0h 14m 10s	Int.	Temp: 3	3C	
qqqqqqqqqqqqqqqqqqqqqqqqqq Past logs are files on file:	2023-02-13 09:21:24 G system. Live log is cu	MT qqqqqqqqq rrent stream	qqqqqqqq ing log	qqqqq from	qqqqqqq ION. A
dding a filter affects both	log file and live log	viewing. On	ly lines	mate	ching f
ilter are displayed. Diagnos	stic level applied imme	ediately.			
****** 5.4. 2	ACTIONS, DIAGNOSTICS, A	AND LOGS ***	******	****	******
0. Back/Up One Level					
1. Zap Data Configs (and Da	ata)				
2. Zap All Configs (and Dat	ta)				
Diagnostic Level: 0					
 Factory Reset 					
-5. Factory Reset (including	g Network Settings)				
6. Filter Items					
7. Show past logs(with filt	ters).				
8. Show live Log(with filte	ers).				

Figure 4-15: Factory Reset

When this option is selected, you must type the reason for the factory reset. Then press **Ente**r and the factory reset will take place. The gateway card will automatically reset, and the original configuration will be loaded upon reboot.

Figure 4-16: Factory Reset

4.3.3 REBOOT BOARD

The Reboot board option performs a card reset.

B COM2 - PuTTY		
	SITE NAME: SCB3	A
Device SN: 9D7237C3	Firmware rev. : 32582	Modem: N/A
IP ETH0: 163.187.162.173	Network Status: CONNECTED	Comms Loss: 0 KB
IP ETH1: 192.168.1.100	Signal Strength: 0	HFDC Buffer: 0 KB
Int. Temp: 38C	Voltage: 24.1V	RAM: 95% of 487M free
Working I/Os: 84/84	Uptime: 11m 13s	Msg Queue:
	- 2016-05-04 17:27:45 GMT	
These advanced options are	for adjusting and viewing sys	stem internals. Please co
nsult equipment manufacture	er before making changes.	
******	5. ADVANCED OPTIONS SETTINGS	*****************
0. Back/Up One Level		
1. I/O and Acquisition		
2. Site Settings		
3. Gateway Settings		
4. Actions, Diagnostics an	id Logs	
5. Create T-Log		
6. Create "Lite" I-Log	······································	
7. Create and opioad "init	buen. I-Log	
Copyright Notices and I	ttributions	
5. Copyright Notices and A	ACCELIDUCIONS	
		=

Figure 4-17: Reboot Board

4.4 UPGRADING THE INSTRUCT ESP GATEWAY CARD FIRMWARE

The following steps outline the process to manually upgrade the gateway card firmware. While the firmware may be remotely upgraded over the network, there may be occasions where the installer may perform a local upgrade.

- 1. Download the latest gateway card firmware (InTouch ID 6117586).
- 2. Move/copy the firmware to the USB flash drive formatted with the FAT32 file system (default).

	Teib			
Organize 👻 🖬 🖬 Open	✓ Burn New folder			H • 🔟 🤅
Favorites	Name	Date modified 7/18/2013 8:50 AM	Type File folder	Size
🗦 Libraries	USB_acc-4.0.ion-001.mx51-001_20130717_r11350.tar	7/18/2013 8:53 AM	TAR File	7,480 KI

Figure 4-18: Copy Firmware

Note:

Make sure there is only one copy of the firmware (*.tar file) on the USB flash drive.

3. Connect to the gateway card Engineering port (COM2), using the serial cable.

Figure 4-19: COM2 Connection

- 4. Open a terminal program (PuTTY is recommended) and connect to the gateway card, using serial port COMx with the COM port settings below:
 - Baud Rate: 38,400
 - Data Bits: 8
 - Stop Bits: 1
 - Parity: None

😵 PuTTY Configuration	×
Category:	Basic options for your PuTTY session Specify the destination you want to connect to Secial line
Keyboard Bell Features Window	COM1 38400 Connection type: Raw Telnet Rlogin SSH Serial
···· Appearance ···· Behaviour ···· Translation ···· Selection	Load, save or delete a stored session Saved Sessions
Colours Connection Connection Proxy Telnet Rlogin SSH	Default Settings Load Save Delete
- Serial	Close window on exit: Always Never Only on clean exit

Figure 4-20: COM Port Setting

5. Power up the INSTRUCT ESP Intelligent Controller and wait for the system to fully boot up. Log in to the administrator interface using "admin" for both username and password.

🔂 COM1 - PuTTY
Bad inittab entry at line 15
Mounting kernel file systems: /sys /dev/pts /proc/bus/usb.
Mounting tmp file systems (tmpfs): /tmp.
scsi 0:0:0:0: Direct-Access Generic Flash Disk 8.07 PQ: 0 ANSI: 2
sd 0:0:0:0: [sda] 8275968 512-byte logical blocks: (4.23 GB/3.94 GiB)
sd 0:0:0:0: [sda] Write Protect is off
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] Assuming drive cache: write through
sda: sdal
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] Attached SCSI removable disk
Creating nodes via configuration file done
Mounting /dev/sdal on /media/sdal: done.
Mounting fstab configured file systemsmount: mounting /dev/mmcblk0p1 oJFFS2 d
oesn't use OOB.
n /sacarai failed: No such file of directory
mount: mounting /dev/mmcbikipi on /sdcard2 failed: No such file or directory
dest use oos.
done
Sharting gualog domant. OK
Starting system demon: OK
Dagwordd

Figure 4-21: Log In

6. Check the existing firmware version.

Figure 4-22: Check FW Version

7. Insert the USB flash drive into the USB port in the gateway card. Make sure the green LED light next to gateway card Engineering port and the USB flash drive shines with a steady light and is not blinking.

Figure 4-23: Plug in USB Flash Drive

Do not type anything on the administrator interface during the upgrading process, or the autoboot process will stop. Wait until the login prompt returns.

8. Go to the administrator interface (i.e., PuTTY) and wait for the gateway card to reboot.

子 COM11 - PuTTY	-	X		
The system is going down NOW!	XOKX	x	~	
Sent SIGTERM to all processes	mqqj	x		
x		x		
waaaadaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	30	Idj		
Sent SIGKILL to all processes	Upgrade complete			
Requesting system reboot	system restarting after upgrade			
Restarting system.				
U-Boot 2009.08 - DUB-1.1.7 - (Nov	v 02 2011 - 18:44:49) - GCC 4.4.3			
for ConnectCore i.MX51 on a JumpS	Start Kit Development Board			
I2C: readv				
NAND: 2048 MB				
DRAM: 512 MB				
MMC: FSL_ESDHC: 0, FSL_ESDHC: 1				
In: serial				
Out: serial				
Err: serial				
Net: FEC0 [PRIME]				
Autoscript from TFTP [not avai	ilable]			
Hit any key to stop autoboot: 2			-	

Figure 4-24: Upgrade Complete

- 9. Log in to the administrator interface using "admin" for both username and password.
- Check the listed firmware version in the dashboard (top center). Make sure that the version number matches the gateway card firmware version 212xxxxxx. Refer to InTouch <u>6117586</u> for the latest firmware version.

Figure 4-25: Check firmware version

l Note:

The USB flash drive can be connected to the PC again and inspected for the presence of a "SUCESS" file.

	with Removal	ne Disk (P)
		II • 🔟 🔞
Date modified	Туре	Size
Apr-22-2015 5:14 AM	File folder	
Apr-22-2015 5:14 AM	File	0 KB
2202 tar.ran Feb-02-2015 12:12 PM	RAN File	9,080 KB
	Date modified Apr-22-2015 5:14 AM Apr-22-2015 5:14 AM 22022 (tar.ap) Feb-02-2015 12:12 PM	Date modified Type Apr-22-2015 5:14 AM File folder Apr-22-2015 5:14 AM File 2020 Feb-02-2015 12:12 PM RAN File

USB flash drive

- 1) When the USB flash drive is plugged into the computer, **ran** should appear at the end of the firmware file name. Example: **USB_acc-4_0_ion-001_mx51-001_20141013_r22020.tar.ran**.
- 2) If the firmware upgrade is successful, a new file called UPGRADE_SUCCESS and a new folder called test_reports are created. The test_reports folder stores the report generated during the production testing and is pulled out from the gateway card during the upgrading.
- 3) If the firmware upgrade fails, a new file called **UPGRADE_FAIL** and a new folder called **test_reports** are created.
- 4) If the USB flash drive will be used to upgrade the firmware for another gateway card, then:
 - Delete the **UPGRADE_SUCCESS** or **UPGRADE_FAIL** file and the **test_reports** folder on the USB flash drive.
 - Remove the .ran text from the firmware file name, for example: USB_acc-4_0_ion-001_mx51-001_20141013_r22020.tar.
- 5) Verify USB flash drive files before starting the firmware upgrade process for another gateway card.

Section 5: Maintenance

5.1 DEVICE MAINTENANCE

5.1.1 DEVICE CLEANING

Use only a damp cloth to clean the instrument to avoid static electricity.

5.1.2 DEVICE REPAIR

 CAUTION! There are no user-serviceable parts within this product. Any attempt to repair the device may invalidate the warranty.
 ATTENTION! Il n'y a à l'intérieur aucun élément susceptible d'être changé ou modifié par l'utilisateur. Toute tentative de réparation de l'appareil peut invalider la garantie.

5.2 DEVICE TROUBLESHOOTING

Please observe all safety warnings and precautions at the front of this handbook.

The following steps are intended to assist the installer in troubleshooting common hardware problems. Follow the steps in sequence until the problem is corrected. For advanced troubleshooting assistance please contact LiftControlSystems@sensiaglobal.com.

5.2.1 CAPTURING TROUBLESHOOTING LOGS (T-LOGS)

In the event of a site issue that requires external support from InTouch or Engineering, you may generate a Troubleshooting Log, or *T-Log*. The following steps outline the process needed to generate and retrieve a T-Log.

- 1. Insert a FAT32 formatted removable USB flash drive into the gateway card.
- 2. Connect to the gateway card Engineering port (COM2), open a terminal program (PuTTY is recommended) and log into the administrator interface using "admin" for username and password.

Serial port settings are as follows:

- Baud Rate: 38,400
- Data Bits: 8
- Stop Bits: 1
- Parity: None

3. Select option 4. Advanced Configuration.

Figure 5-1: TUI Main Menu

4. Select option **4**, Create Full T-Log.

Figure 5-2: Create Full T-Log

5. Enter the reason for creating the T-Log.

PuTTY 204.17.159.230 - PuTTY			
Device SN: 9D6A10AC IP ETH0: IP ETH1: 204.17.159.230 Int. Temp: 49C Working I/Os: 81/81	SITE NAME: SCB3 ION Firmware: 11307 Network Status: STANDBY Signal Strength: 63 Voltage: 14.7V Modbus Perf.: - 2013-07-18 15:32:23 UTC -	Modem: ONLINE Comms Loss: 0 KB HFDC Buffer: 0 KB RAM: 97% of 487M Msg Queue: 0	free
2013-07-18 15:32:23 UTC These advanced options are for adjusting and viewing system internals. Please co nsult equipment manufacturer before making changes. ************************************			

Figure 5-3: Entering a T-Log Reason

6. Select 1. Run!.

🖉 204.17.159.230 - PuTTY		
	SITE NAME: SCB3	A
Device SN: 9D6A10AC	ION Firmware: 11307	Modem: ONLINE
IP ETHO:	Network Status: STANDBY	Comms Loss: 0 KB
IP ETH1: 204.17.159.230	Signal Strength: 62	HFDC Buffer: 0 KB
Int. Temp: 50C	Voltage: 14.7V	RAM: 97% of 487M free
Working I/Os: 81/81	Modbus Perf .:	Msg Queue: 0
	- 2013-07-18 15:33:03 UTC -	
Start the command with "Ru	an!". Arrow down into the out	put to scroll it and back
out to return to the menu.	'Q' quits screen, but stays	running
******	*** 4.4. CREATE FULL T-LOG **	******************
0. Back/Up One Level		
-1. Run!		
Nothing to display 'q'	exits.	=
		*

Figure 5-4: Running the T-Log

7. Wait until the unit provides confirmation that the T-Log action has been completed. This can take several minutes if there is a significant amount of log data to be collected.

PuTTY 204.17.159.230 - PuTTY				
		A		
Device SN: 9D6A10AC	ION Firmware: 11307	Modem: ONLINE		
IP ETHO:	Network Status: STANDBY	Comms Loss: 0 KB		
IP ETH1: 204.17.159.230	Signal Strength: 63	HFDC Buffer: 0 KB		
Int. Temp: 49C	Voltage: 14.7V	RAM: 96% of 487M free		
Working I/Os: 81/81	Modbus Perf.:	Msg Queue: 0		
	- 2013-07-18 15:34:26 UTC -			
Start the command with "Run	n!". Arrow down into the out	tput to scroll it and back		
out to return to the menu.	'Q' quits screen, but stays	s running		
********************	** 4.4. CREATE FULL T-LOG **	***************		
0. Back/Up One Level				
Collecting application beha	Collecting application behavior for about 30 seconds			
Compressing T-Log				
End of Output.				
		-		

Figure 5-5: T-Log Complete

- 8. Once the T-Log process is complete, wait 20s and then remove the USB drive from the gateway card.
- 9. Connect the removable USB flash drive to a PC to retrieve the T-Log file and submit it to InTouch / Engineering for analysis.

<u>File Edit V</u> iew	Tools	Help			-
Organize 🔻 Sha	re with	✓ Burn New folder		853	- 🗆 🤅
🔆 Favorites	-	Name	Date modified	Туре	Size
	=	🔒 _old	7/18/2013 8:50 AM	File folder	
🥽 Libraries	-	test_reports	7/18/2013 3:07 PM	File folder	
		T-Log_9D6A109A-20130718_150827.dmp	7/18/2013 3:20 PM	DMP File	22,493 KE
Computer		UPGRADE_SUCCESS	7/18/2013 3:07 PM	File	0 KI
> 鰰 System (C:) > 뒏 Data (D:)	-	USB_acc-4.0.ion-001.mx51-001_20130717_r11350.t	7/18/2013 8:53 AM	RAN File	7,480 KI

5.2.2 SERIAL COMMUNICATION TROUBLESHOOTING

Tip

Most communication problems between the gateway card and the connected RTU devices (such as the INSTRUCT ESP Intelligent Controller) are due to incorrect/incomplete wiring or incorrect communication settings.

- 1. The gateway card and/or LiftIQ shows **No RTU** or **RTU Backoff** (no communication between the card and the connected RTUs).
 - a. The gateway card is set to use the wrong COM port for Modbus communication.

To set the communication between the host controller and card, the COM3 with correct RS485 mode should be used. If RTUs other than host controller are connected, COM2 should be used.

b. The RS-485 wiring is incorrect.

Make sure the (+) wires are connected to other (+) wires, and vice versa for (-). Recheck the wiring diagrams as per section.

c. Several devices have the same Modbus address.

Each device on the Modbus network must have a unique Modbus address. Valid addresses are 1–247 inclusive.

d. The INSTRUCT ESP Intelligent Controller is incorrectly configured.

Ensure the controller Port settings for the gateway card are set to the following:

- Function: SCB
- Access: FULL

For other RTUs, using the cable not specifically designed for the communication application (RS-485) may result in intermittent communications, poor communication performance, or may prevent communication all together. Do not use a power cable or an untwisted cable for RS-485 applications.

- e. Incorrect cable type for application
- f. Electrical noise/interference

Ensure communication cables are not routed along high-capacity power cables. Confirm the cable shield is correctly bonded to earth-ground at one end only.

g. Poor connections

Check that each communication wire is securely fastened to its connection point. If this is an existing installation, check for signs of corrosion or mechanical cable damage caused by vibration.

h. Corroded terminals

Corrosion can affect connectors. Check for signs of corrosion/rust and on connection points.

i. Protocol mismatch

Confirm that all slave devices are configured for Modbus RTU protocol.

- j. Baud rates (4800, 9600, 19200, 38400, 57600) on all devices do not match.
- k. The data bits (8) on all devices do not match.

Confirm that all devices are using the same number of data bits specified by the gateway card COM Port configuration.

I. The stop bits (1, 2) on all devices do not match.

Confirm that all devices are using the same number of stop bits specified by the gateway card COM Port configuration.

- m. The parity (Even, Odd, None) on all devices does not match. Confirm that all devices are using the same parity setting as specified by the gateway card COM Port configuration.
- 2. The gateway card is receiving valid Modbus responses with strange or unexpected numbers. The number format of the connected device is not set, the connected device responds with unsigned integer numbers, or the number format does not match the format the gateway card is expecting.

Confirm that the device is set to output unsigned integer numbers unless otherwise specified by the GDN List template. This is a common issue on the Schlumberger Phoenix ISP panel, typically caused by connecting to the panel with PumpView software. PumpView will reset the ISP data type to an IEEE floating point.

- The well cannot be started via the LiftIQ interface. The RTU is set for READ ONLY access. Confirm that the problematic device has FULL or READ/WRITE access through the Modbus serial port connected to the gateway card.
- Setpoints and values cannot be changed via the LiftIQ interface. The RTU is set for READ ONLY
 access. Confirm that the problematic device has FULL or READ/WRITE access through the Modbus
 serial port connected to the gateway card.

For further information on Modbus serial communication troubleshooting, please refer to InTouch Content ID <u>4201401</u>.

5.3 SERVICE

5.3.1 RECOMMENDED SPARES

When requesting assistance or spare parts, please provide the instrument model and serial numbers to ensure that the correct options are supplied.

5.3.2 REPACKING FOR SHIPMENT

When shipping the device to Sensia for service or repair, we recommend the box-in-box technique. Place the instrument in all its original packaging, and then place this box inside a strong outer box, with about 60 to 100 mm internal cushioning material, closed and sealed by H-taping with pressure sensitive tape.

If the original packaging is not available, pack the module in electrostatic discharge (ESD) shielding packaging, and then place it into static-free (low charging) packaging materials to avoid additional damage to your device.

Appendix A: Parts, Spares, Tools, and Supplies

A.1 Ordering Part Numbers

Part Number	Description
103381133	INSTRUCT ESP Gateway card
50370539	INSTRUCT ESP Gateway Cellular Modem Kit (Global)

Appendix B: Terminal Emulators

A terminal emulator is required to interact with the gateway card firmware and perform the initial configuration and setup of the card. The Text User Interface was specifically designed to be flexible and agnostic to the terminal emulation program used, so users may experiment with terminal emulators until they find one they prefer. Some programs are more stable and feature-filled than others. Below are some recommended terminal application options.

PuTTY

PuTTY is a free application available for Windows and Unix platforms. It may be downloaded from: <u>http://www.chiark.greenend.org.uk/~sgtatham/PuTTY/</u>. While it is not the most attractive or user-friendly application, it is the most stable and robust option for interacting with the gateway card.

Setting up Serial Communications

To set up PuTTY serial communications for Windows 7 through 10 systems, follow these steps:

- 1. Download a terminal program. Refer to the PuTTY documentation for details on setup and operation: <u>http://www.chiark.greenend.org.uk/~sgtatham/PuTTY/download.html.</u>
- 2. Open the program.
- 3. Set up PuTTY configuration for Serial connection type.

Repute the second secon		×	
Category:			
- Session	Basic options for your PuTTY session		
Logging	Specify the destination you want to connect t	0	
Keyboard	Serial li <u>n</u> e	Speed	
Bell	COM1	38400	
	Connection type: ◎ Ra <u>w</u> ◎ <u>T</u> elnet ◎ Rlogin ◎ <u>S</u> S	H 💿 Se <u>r</u> ial	
Behaviour Translation Selection Colours Data Proxy Telnet Riogin SSH Serial	Load, save or delete a stored session Sav <u>e</u> d Sessions Default Settings PAC4	Load Sa <u>v</u> e Delete	
	Close window on e <u>y</u> it Always Never Only on c	lean exit	
About	Open	Cancel	

PuTTY Configuration

4. Click **Open** to log into the terminal.

```
Mounting tmp file systems (tmpfs): /tmp.

scsi 0:0:0:0: Direct-Access Patriot Memory PMAP PQ: 0 ANSI: 4

Creating nodes via configuration file... done

Mounting fstab configured file systems...mount: mounting /dev/mmcblk0p1 oJFFS2 d

oesn't use 00B.

n /sdcard1 failed: No such file or directory

mount: mounting /dev/mmcblk1p1 on /sdcard2 failed: No such file or directory

JFFS2 doesn't use 00B.

done

JFFS2 doesn't use 00B.

sd 0:0:0:0: [sda] 15265792 512-byte logical blocks: (7.81 GB/7.27 GiB)

sd 0:0:0:0: [sda] Mrite Protect is off

sd 0:0:0:0: [sda] Assuming drive cache: write through

sd 0:0:0:0: [sda] Assuming drive cache: write through

sd 0:0:0:0: [sda] Assuming drive cache: write through

sd 0:0:0:0: [sda] Attached SCSI removable disk

Empty flash at 0x7080e0c0 ends at 0x7080f000

jffs2_scan_inode_node(): CRC failed on node at 0x70819fc8: Read 0xffffffff, calc

ulated 0x3cefadb

Empty flash at 0x7081450 ends at 0x7081b000

Starting syslog daemon: OK

Starting vsftpd server: OK

(none) login:
```

TUI Login

Appendix C: References

Manual, INSTRUCT ESP Intelligent Controller (InTouch ID 6128576): Refer to INSTRUCT ESP Intelligent Controller User Manual for controller related installation and troubleshooting.

Appendix D: INSTRUCT ESP Gateway Card Support Resources

PRODUCT DOCUMENTATION

This manual is the main product documentation for the INSTRUCT ESP Gateway card.

GUIDES AND RELEASE NOTES

General guides, best practices, technical alerts, firmware, and software release notes are available at InTouch <u>7745571</u> reference page.

TECHNICAL SUPPORT

You can reach us via the Lift Control Systems Custom Service email:

liftcontrolsystems@sensiaglobal.com

 For Schlumberger customers, an InTouch ticket should be raised to Well Production System – ALS-ESP Surface Electrical helpdesk.

Business Line:*

Related To:*

Well Production Systems	·	ALS - ESP Surface Electrical
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HOW TO REACH US

You can find more information about Sensia and about the INSTRUCT ESP Gateway Card information here:

Sensia Home Page: Sensia Lift Control Solutions Page: Contact Us: https://www.sensiaglobal.com/ https://www.sensiaglobal.com/Sensia-Lift-Control-Systems https://www.sensiaglobal.com/Contact

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