

C&I Electric Unit Test Procedure

Revision A

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1. Equipment Requirements

DVM (Digital voltmeter) with ohm and amp functions. (Bel MERIT, DX451) Dual Channel Oscilloscope, 100 MHz, 1GBs (Tektronix, TDS 220) Variable/Isolation AC Transformer (VIT), 0-150 Vac, 4 Amp (Global Specialties, 1504) PC with Windows 95 Operating System NCTT, Test software, Version 2.2.0 or later Field Service Unit with Version 2 Communications Chip (Siliconians) NCI installed Unit Under Test (UUT), in this case the C&I Electric Unit, Fab. Rev. 5.3 or higher, Firmware Ver. 23 or higher (CnI_V23.HEX, CS = 1c59) (Innovatec, Relay, Rev. 5.3 or later)

Note: The information in parentheses is a suggested test equipment Manufacturer and Model. Equivalents may be substituted.

2. PCA Sub-Assembly Power Supply and Battery Charger Function Test

The following test in this section is to be performed before the PCA is installed into the Relay Housing.

2.1. Visual Inspection

- 2.1.1 Verify that the following components are installed with proper orientation / polarity, per assembly drawings: IC's, Transistors, Diodes, Capacitors and Transformer.
- 2.1.2 Check for solder bridges/solder splash across traces or other conductors.

Pass____Fail___

2.2. Continuity Tests

2.2.1 Perform continuity test using DVM between metal tabs of U1, D2 and their heatsinks. It should be open circuit or > 10 Meg Ohms for U1 and > 2 Meg Ohms for D2.

Pass____Fail___

2.2.2 Perform continuity test between input AC line connectors (J3 to J4) and line to ground (J3-H to J1-G and J4-N to J1-G). Should be open circuit or >2 Meg Ohms.

Pass____Fail___

2.3. Power Supply Test

2.3.1.	Connect 220 V variac (with isolation transformer and built-in fuse) to the input connector of
	power supply. Then, slowly bring up the voltage from 0 –85V while monitoring the line current.
	The line current at 85V should be < 15 mA
	PassFail

2.3.2.	Wait few seconds and then verify all LEDs are turned on.		
		Pass	_Fail
2.3.3. Specif	Measure the DC voltage between pins 3 and 21 of NCI connector ication: $5.5 - 5.7$ V DC	or (J7).	
opeen		Pass	_Fail
2.3.4. Spacif	Measure DC voltage between pins 15 and 21 of NCI connector (J7).	
Speci		Pass	_Fail
2.3.5. Specif	Measure DC voltage between pins 17 and 21 of NCI connector (ication: 3.5 to 3.7 Vdc	J7).	
		Pass	_Fail
2.3.6.	Measure DC voltage between pins 2 and 5 of Molex connector (JP2).	
Specif	ication: 12 to 14 Vdc		
-		Pass	_Fail
2.3.7.	Disconnect AC Power to UUT and install NCI unit onto the main slowly up to 85 Vac and repeat the above steps 4.2- 4.6.	board. The	n, bring the voltage
			_Fail
2.3.8.	Bring up the AC line voltage slowly from 85 to 265 Vac and reperint installed (full-load)	eat the abo	ve steps with NCI
		Pass	_Fail

2.4. Battery Charger Tests

2.4.1. Connect battery charger module to C&I main board connector (JP2) and verify that the voltage across BAT + and BAT- on the charger board is set to 6.9 Vdc with 680 Ohm resistor connected across battery leads. Otherwise, adjust R7 Pot to set battery voltage to 6.9Vdc.

Pass__Fail___

2.4.2. Connect battery leads to the battery terminals and verify that voltage across battery terminals has reached to 6.9Vdc (fully charged).

Pass__Fail___

2.4.3. Disconnect AC power to C&I main board and verify that the LEDs stays on (good indication that UUT is powered by battery only).

Pass__Fail___

2.4.4. Remove battery charger module from C&I board with battery leads disconnected from battery terminals. Then connect a dc power supply to battery leads and slowly increase the voltage from 0-6.5 Vdc while monitoring battery status pin (JP1-4). Verify that battery status pin goes high at 5.25 Vdc

Pass__Fail___

2.4.5. Then, lower the dc Power supplies voltage slowly and verify that battery status pin (JP1-4) goes low at 5.0Vdc.

Pass__Fail___

3. PCA Sub-Assembly RF Communications Test

3.1. System Hardware Set-up:

3.1.1. Firmware Installation:

Remove AC line voltage from PCA power leads. Disconnect battery lead from Charger Assembly. Verify installation of the EPROM with appropriate firmware reversion.

3.1.2. NCI Installation:

Install the NCI with version 2 communications IC (Siliconians) onto the PCA with appropriate antenna, 900 MHz, and 50 Ohms impedance.

3.1.3. Electric Meter RS-232 Communication connection:

Install the Electric Meter to connector J7 as follow:

J7, Pin <mark>12</mark>	=	Transmit	(Pin 2 of the DB9 Meter communications cable)
J7, Pin 11	=	Receive	(Pin 3 of the DB9 Meter communications cable)
J7, Pin <mark>10</mark>	=	Ground	(Pin 5 of the DB9 Meter communications cable)

Power up the electric meter.

3.1.4. Power on test:

Apply 120V AC line voltage to the PCA power leads, observe for the Status Indicator LEDs, make sure the Green and Yellow LEDs are illuminated.

Reconnect battery lead to Charger Assembly.

Pass__Fail___

3.2. NCTT Setting:

Using the PC, start the NCTT program.

Connect the FSU (Field Service Unit) with version 2 communications IC (Siliconians) to the PC.

Select "Setting" → "Option":

Serial Port:	=	Select appropriate Serial Port
Wakeup Interval	=	1.25 Sec
Transmit Power	=	28 dBm
Repeat Interval	=	3 Sec (Min.); Unchecked "Random"
NCI Interaction	=	Checked "Automatic"
Conversion Factor	=	0.00001

Options			
Options			
Serial Port	С СОМ2	с сомз	C COM4
Wakeup Interval	seconds	Transmit Power	⊒ dBm
Repeat Interval	3	seconds	☐ Random
NCI Interaction		Conversion Fact	or Precision
0	к	Cance	el

FIGURE 1

Select "O.K.", then setting NCTT for C&I Electric Communications:

3.3. C&I Electric Communications and Functional Test

3.3.1. General device setup in NCTT:

For "DEVICE", select "Electric IMU" and "Device ID" select "7" For "TRANSMIT", select "CHANNEL" = 0 (Default for untested Relay PCA)

The following Transmit options are "unchecked": "Auto Repeat" "Scan" "Wakeup/IMU"

(The untested Relay UUT Communication Channel defaults initially to Channel 0; if unable to establish a communications link between the FSU and the Relay UUT, try to scan all channels for the UUT. Select "Query Serial Numbers" message type, "Select Scan", and press "Transmit", then observe the reply message to identify the Relay communications channel setting.)

Network Com	munications Test	Tool				_ 🗆 X
<u>File S</u> ettings <u>V</u> i	iew <u>H</u> elp					
Device	Me	ssage Type		- Transmit		
C Gas IMU	Query Serial Nu	mbers	-	Channel		
Electric IMU Relay IMU NCI	Direct Mes Outgoing [sage)ata	Device ID 7	0 [Iransm	i □ Au □ Sc □ □ Wa	to Repeat an akeup/IMU
	None					<u> </u>
	0	lutgoing Messa	ge			
						K F
Llear 5	top	Incoming Data	I			
	Ir	ncoming Messa	qe			
			-			4
COM2	Wakeup 1.25 s	Repeat 3 s	28 dBm		8/22/00	11:52 PM

FIGURE 2

3.3.1. [Query Serial Number]

Select Query Serial Numbers and select "Transmit!"

Observer for the "Incoming Message", make sure the FSU (Field Service Unit) are communicating with the UUT, and reporting the correct serial number for attached Meter (Either Landis & Gyr, Vectron or applicable Device)

9	Network Com	munications Test	Tool		_ 🗆 X
Eil	e <u>S</u> ettings <u>V</u> i	ew <u>H</u> elp			
	evice	Me	ssage Type		- Transmit
	Water MU	Query Serial Nu	mbers	•	Channel
	Electric IMU	Direct Mes		- Device ID -	
	Relay IMU	Directimes	saye	7	Iransmit! Wakeun/IMU
) NCI	Outgoing [)ata		
		None			<u>^</u>
L					7
			utgoing Messa	ge	
01	04 00 00 00 07	C4 52 45 41 44 04			
	ilear 🔽 S	top	Incoming Data		
		Message Type:	Query Seria	al Numbers Re	ply 🖄
		Manuracturer SN Inknown Device SN	: UUS/483196		
			•		
			·		×
01	14.00.00.00.07	14 00 00 00 00 00 0	ncoming Messag n no no no no a	ge 10 20 25 27 24 20	2 22 21 20 20 04
In	COM1	44 00 00 00 00 00 00 0	Denes 2 a	0 30 30 37 34 30	
	COMI J N	vakeup 1.25 s	nepeatos	20 06 00	0722700 1:34 PM
FIC	GURE 3				
	DIED				
METER S/N REPO	RIED:				
C&I DEVICE S/N	REPORTED:				
					PassFail

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3.3.2. [Set Serial Number]

Set "Electric USN" = Type in the C&I Serial Number then press "Transmit" Make sure to obtain a "Acknowledgement Message " reply from Incoming Data

Pass	Fail
1 4 3 3	1 an

Network Com	munications Tes	st Tool				_ 🗆 ×
<u>File Settings Vie</u>	ew <u>H</u> elp					
Device C Gas IMU C Water IMU C Electric IMU C Relay IMU C NCI Ma	M Set Serial Num Direct Me Outgoing mufacturer SN: 00	lessage Type ber sssage Data 57483196	Device ID	Transmit Channel 0 <u>I</u> ransm	÷ ┌ Aut it ┌ Sca it ┌ Wa	o Repeat an skeup/IMU
	Electric USN: Cr	153_0001				
		Outaoina Messa	ae			
01 14 00 00 00 07 0	0 30 30 35 37 34	38 33 31 39 36 4	=- 13 6E 49 35 33 !	5F 30 30 30	31 04	H F
Clear 🔽 St	юр	Incoming Data				
U	Message Type Inknown Device Sl Statu	e: Set Serial I N: CnI53_0001 Is: Acknowledge	Number Ackn	owledge		
		Incoming Messa	ge			<u>-</u>
01 0B 00 00 00 07 4	40 43 6E 49 35 33	5F 30 30 30 31 (00 04			
) COM1 (W	∕akeup 1.25 s	Repeat 3 s	28 dBm		8/22/00	1:41 PM

FIGURE 4

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3.3.3. [Set Communication Parameters]

RF CHANNEL	=	INITIAL CHANNEL
LCD UPDATE RATE	=	1
BLINK RATE	=	1

Press "TRANMIT"

Make sure to obtain a "Acknowledgement Message " reply from Incoming Data

Pass	Fail

Network Comn	unications Test Tool		
<u>File Settings View</u>	, <u>H</u> elp		
Device	Message Type	- Transmit	
G Gas IMU	Set Communications Parameter	rs 🔽 Channel	
C Water Mid Electric IMU C Relay IMU C NCI	Direct Message Outgoing Data	Device ID 0	t ☐ Auto Repeat ☐ Scan t ☐ Wakeup/IMU
	Electric SN: CnI53_0001		A
	RF Channel: 0		
LCD Upda	e Rate (sec): 1		
	Blink Rate: 1		
			T
	Outgoing Message		
01 0D 00 00 00 07 8	43 6E 49 35 33 5F 30 30 30 31 00	04 01 04	4 F
Clear 🖵 Sto	D Incoming Data		
	Message Type: Set Communi	ications Parameters A	Acknowledge
Ur	known Device SN: Cnl53_0001		
	Status: Acknowledged		
	Incoming Message		
01 0B 00 00 00 07 0	43 6E 49 35 33 5F 30 30 30 31 00	04	K F
COM1 W	ikeup 1.25 s 🔋 Repeat 3 s 🗍	28 dBm	8/22/00 1:42 PM

FIGURE 5

3.3.4. [Query Status]

Select "Query Status for Message Type" then press "Transmit" Make sure to obtain a reply from Incoming Data

Pass__Fail___

Network Cor	mmunications Tes	it Tool			
File Settings	<u>View H</u> elp				
Device	 M	essage Type		Transmit	
C Water IMU	Query Status		<u> </u>	Channel	
Electric IMU Belay IMU	Direct Me	ssage			uto Repeat can
O NCI	Outgoing	Data			/akeup/IMU
	Electric USN: Cr	153_0001			<u>^</u>
		Outaoina Messa			
	7 82 43 6E 49 35 33	5E 30 30 30 31	ngo 104		R F
Clear	Stop	Incoming Data	•		
	Message Tupi	e: Queru Stal	us Renlu		-
	Unknown Device Si	N: Cnl53 0001	аз перу		
	Supervisor SW Ve	er: 0.2			
Co	mmunications SW Ve	er: 2.0			
	Transmit Cour	nt: 216			
	LCD Update Ra	te Osec.			
	Віілк нас	e: U			-
		Incoming Messa	ige		
01 1E 00 00 00 0	7 02 43 6E 49 35 33	5F 30 30 30 31	02 20 00 D8 00	00 00 00 00 00 00 00 00	
COM1	Wakeup 1.25 s	Repeat 3 s	28 dBm	8/22/00	1:47 PM

FIGURE 6

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4. Final Assembly Test

The following test is to be performed after the PCA Assembly has been tested and install into appropriate Relay housing unit.

4.1. General Test

Repeat step 3.3.2. and step 3.3.3., if necessary.

4.1.1. [Set Clock]

Select "Set Clock" message, enter the applicable data then press "Transmit" Observe "Acknowledged Message " reply in Incoming Data (See Figure 7)

Network Com	nmunications 1	est Tool			
<u>File S</u> ettings <u>V</u> i	iew <u>H</u> elp				
Device		Message Type		- Transmit	
C Gas IMU	Set Clock		•	Channel	
Electric IMU Relay IMU NCI	Direct	Message ing Data	Device ID 7	0 ÷ Γ Iransmit! Γ	Auto Repeat Scan Wakeup/IMU
	Electric SN:	Cnl53_0001			-
	24 Hour Time:	19:00:00			
	Month:	August			-
	Day:	22			
	Year:	2000			
					.
		Outgoing Messa	ige		
01 10 00 00 00 07	F9 43 6E 49 35	33 5F 30 30 30 31 1	19 00 00 08 22 (00 04	4
<u>Clear</u> S	itop	Incoming Data	3		
	Message Ty	ype: Set Clock a	Acknowledge		<u> </u>
	Unkhown De St	vice: 7 atus: Unknown Co	ode.		
					*
	79 42 65 49 25	22 EE 20 20 20 21	ige 00.04		
	73 43 0E 43 33	Beneat 3 s	28 dBm	8/2	2/00 7·14 PM

Pass__Fail__

FIGURE 7

4.1.2. [Query Clock]

Select "Query Clock" message, enter the appropriate Relay Serial Number, and press "Transmit"

Observe "Acknowledged Message" reply in the Incoming Data fields (See Figure 8) Verify Calendar and Clock settings.

Pass__Fail__

Network Com	nmunications Test	Tool					×I
<u>File S</u> ettings <u>V</u> i	iew <u>H</u> elp						
Device	Ме	ssage Type		- Transmit			3
C Gas IMU	Query Clock		•	Channel			
C Water MO Electric IMU C Relay IMU C NCI	Direct Mes	sage)ata	Device ID	0 Transm		o Repeat an akeup/IMU	J
	Electric USN: Cnl	53_0001					~
							7
		utgoing Messa	age				
01 0A 00 00 00 07	F8 43 6E 49 35 33 5	F 30 30 30 31	04			<u> </u>	Þ
Clear 🗖 S	itop	Incoming Data	э				
	Message Type:	Query Clo	ck Reply				^
	Unknown Device	: 7					
	Lime	: 19:01:15 · 09/22/00					
	Date	. 08/22/00					
							-
	Ir	ncoming Messa	age				
01 10 00 00 00 07	78 43 6E 49 35 33 5	F 30 30 30 31	19 01 15 08 22 (00 04		<u>ا</u>	F
COM1 N	Wakeup 1.25 s	Repeat 3 s	28 dBm	[8/22/00	7:15 PM	1

FIGURE 8

4.2. Alarms Test:

4.2.1. [Set Alarm Option]

Electric USN	=	UUT Serial Number
Set Alarm Active Mask	=	FFFFFFF (8)
Set Alarm Priority Mask	=	FFFFFFF (8)
Alarm Timer	=	1 (Optional)
Alarm Channel	=	INITIAL CHANNEL (Same as Communications Channel)

Pass__Fail___

Network Com	nmunications Test Tool	_ 🗆 X
<u>File S</u> ettings <u>V</u> i	/iew Help	
- Device	Message Type Transmit	
C Gas IMU C Water IMU	Set Alarm Options Channel	
Electric IMU		o Repeat
C Relay IMU	7 + Transmit va	n keun/IMIT
O NCI	Outgoing Data	Keup/IMO
	Electric USN: CnI53_0001	<u> </u>
Alar	irm Active Mask: FFFFFFF	
Alar	rm Priority Mask: FFFFFFF	
	Alarm Timer: 1	
	Alarm Channel: 0	
	Outgoing Message	
01 14 00 00 00 07	7 90 43 6E 49 35 33 5F 30 30 30 31 FF FF FF FF FF FF FF FF FF 01 00 04	4 Þ
Clear 🔽 S	Stop Incoming Data	
	Message Type: Set Alarm Options Acknowledge	<u>^</u>
t	Unknown Device SN: Cnl53_0001	
	Status: Acknowledged	
	Incoming Message	
01 0B 00 00 00 07	7 10 43 6E 49 35 33 5F 30 30 30 31 00 04	₹
	Wakeup 1.25 s Repeat 3 s 28 dBm 8/22/00	1:44 PM

FIGURE 9

4.2.2. Tamper Alarm Function Test:

Open the C&I UUT cover (Will release the Tamper Switch) Verify the Tamper Alarm message is sent

A							
Network Com	munications Test	Tool					X
<u>File Settings Vi</u>	ew <u>H</u> elp						
Device	Mes	sage Type		_ Transmit			
C Gas IMU	Query Status		•	Channel			
C Water IMU	·				극 🗖 Aut	o Repea	ač j
Electric IMU C Relay IMU	Direct Mess	age			Sca	an	
	0. (<u>T</u> ransm	iit 🗖 Wa	ikeup/IN	4U
	Uutgoing Da	ata	·				
	Electric USN: CnI53	3_0001					É
							7
	0u	itgoing Messa	ige				
01 0A 00 00 00 07	82 43 6E 49 35 33 5F	30 30 30 31	04			1	
<u>Clear</u> S	itop li	ncoming Data	I.				
	Message Type:	Send Alarn	n				
	Jnknown Device SN:	Cnl53_0001					
	Counts Mode:	Period					
	Calibration Mode:	Normal					
	AC Power Failed:	No Error					
	AC Power Restored:	No Error					
	Internal:	No Error					-
	Inc	coming Messa	ige				
01 0E 00 00 00 07	3F 43 6E 49 35 33 5F	30 30 30 31	00 04 00 00 04			1	\mathbf{F}
COM1 V	Wakeup 1.25 s	Repeat 3 s	28 dBm		8/22/00	7:06	PM

Pass__Fail___

FIGURE 10

4.2.3. Power Failure Alarm Function Test:

Disconnect the ac power to the C&I UUT; verify the Power Failure Alarm Message is sent

Network Con	nmunications Test	Tool					×
<u>File S</u> ettings <u>V</u>	jew <u>H</u> elp						
Device	Ме	ssage Type		Transmit-			
C Gas IMU	Query Serial Nu	nbers	•	Channel			
C Water MO C Electric IMU C Relay IMU C NCI	Direct Mes	sage Jata	Device ID 7	0 ÷	¦ ∏ Auto ∏ Sca ∏ Wal	o Repea n keup/IM	10 10
	None						
							F
		utgoing Messa	ige				
01 04 00 00 00 07	C4 52 45 41 44 04						
Clear 🔽 S	itop	Incoming Data	1				
	Message Type:	Send Alarr	n				
	Unknown Device SN:	Cnl53_0001					
	Counts Mode:	Period					
	Calibration Mode:	Normal					
	AC Power Failed:	Error					
	AU Power Restored:	No Error				_	
	Internal	NO EITOT					-
	Ir	coming Messa	ige				
01 0E 00 00 00 07	' 3F 43 6E 49 35 33 5	F 30 30 30 31	00 84 00 00 04				\mathbb{P}
COM1 V	Wakeup 1.25 s	Repeat 3 s	28 dBm		8/22/00	7:07 F	PM

Pass__Fail___

FIGURE 11

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4.2.4. Power Restore Alarm Function Test

Re-connect the ac power to the C&I UUT; verify the Power Failure Restore Status Report

Network	Communications 1	est Tool			_ 🗆 ×
File Setting	s <u>V</u> iew <u>H</u> elp				
Device		Message Type		Transmit	
C Water IM	Query Serial	Numbers	•	Channel	
C Water IN C Electric I C Relay IM C NCI	MU Direct	Message	Device ID 7	0 → F Au I Sc Iransmit! F Wa	to Repeat an akeup/IMU
	None				
		Outgoing Mess	300		
01 04 00 00 0	IN N7 C4 52 45 41 44 (nd Nd	ago		R F
Clear	☐ Stop	Incoming Dat	a		
	Message Tr	vpe: Send Alar	m		-
	Unknown Device	SN: Cnl53_0001			
	Counts M	ode: Period			
	Calibration M	ode: Normal			
	AC Power Fa	ailed: Error			
	AC Power Rest	ored: No Error			
	Inte	ernal: No Error			-
		Incoming Mess	age		
01 OE 00 00 0)0 07 3F 43 6E 49 35		00 84 00 00 04		
COM1	Wakeup 1.25 s	Repeat 3 s	28 dBm	8/22/00	7:07 PM

Pass__Fail___

FIGURE 12

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4.2.5. Disabling Alarm Transmit Function Test

Repeat step 4.2.1 and set "Alarm Active Mask" and "Alarm priority Mask" to 0:

Electric USN	=	UUT Serial Number
Set Alarm Active Mask	=	0000000 (8)
Set Alarm Priority Mask	=	0000000 (8)
Alarm Timer	=	1 (Optional)
Alarm Channel	=	INITIAL CHANNEL (Same as Communications Channel)

4.2.5.1. Activate "Tamper" switch; observe for none alarm send message transmits.

4.2.5.2. Disconnect AC power; observe for none alarm send message transmits.

4.2.5.3. Reconnect AC powers; observe for none alarm send message transmits.

Network Con	nmunications T	est Tool			
<u>File S</u> ettings <u>V</u> i	iew <u>H</u> elp				
Device		Message Type		- Transmit	
C Gas IMU C Water IMU	Set Alarm Op	tions	•	Channel	
C Electric IMU C Relay IMU C NCI	Direct N Outgoir	1essage ng Data	Device ID	0 ÷ □ Iransmit! □	Auto Repeat Scan Wakeup/IMU
	Electric USN:	Cnl53_0001			<u>–</u>
Alar	m Active Mask:	0000000			
Alar	m Priority Mask:	0000000			
	Alarm Timer:	1			
	Alarm Channel:)			
					_
		Outgoing Messa	ge		
01 14 00 00 00 07	90 43 6E 49 35 3	3 5F 30 30 30 31 0	00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 01 00 04	4 F
Clear S	itop	Incoming Data			
	Message Ty	pe: Set Alarm (Detions Ackno	owledge	<u> </u>
	Unknown Device	SN: Cnl53_0001	ad .		
	516	itus: Acknowledge	90		
					<u>_</u>
		Incoming Messa	ge		
01 0B 00 00 00 07	10 43 6E 49 35 3	3 5F 30 30 30 31 (00 04		
COM1 V	Wakeup 1.25 s	Repeat 3 s	28 dBm	8/22/	00 7:22 PM

Pass__Fail___

FIGURE 13

4.3. Actuators Test:

4.3.5. [Set Actuator 1 Output]

Type in Electric USN	=	C&I UUT Serial Number
Set Actuator 1	=	ON
Set Actuator 2	=	OFF

Press "Transmit"

Make sure to obtain a "Acknowledgement Message " reply from Incoming Data

Use DVM to verify between Pin 1, J10 (Actuator 1 Output) and Pin 3, J10 (Actuator 1) Common are "Closed"

Use DVM to verify between Pin 2, J10 (Actuator 2 Output) and Pin 4, J10 (Actuator 2) Common are "Open"

Network Commun	nications Test Tool			_ 🗆 ×
<u>File Settings View</u>	Help			
Device	Message Type		- Transmit	
C Gas IMU	t Actuator Outputs	•	Channel	
 Electric IMU Relay IMU NCI 	Direct Message Outgoing Data	Device ID 7	0 ÷ F Au F Sc Iransmit! F Wa	to Repeat an akeup/IMU
Ele	 ctric USN: CnI53_0001			^
/	Actuator 1: On			-
<i>/</i>	Actuator 2: Off			-
	Outgoing Me	ssage		
01 0B 00 00 00 07 C6 4	3 6E 49 35 33 5F 30 30 30	31 01 04		
Clear 🔽 Stop	Incoming D	ata		
м	essage Type: Set Actu	ators Acknowle	dge	<u>^</u>
Unkn	own Device SN: CnI53_00	01		
	Status: Acknowle	dged		
				-
	Incoming Me	ssage		
01 0B 00 00 00 07 46 4	3 6E 49 35 33 5F 30 30 30	31 00 04		Ⅰ ►
COM1 Wake	up 1.25 s Repeat 3 :	28 dBm	8/22/00	7:17 PM

Pass__Fail___

FIGURE 13

4.3.6. [Set Actuator 2 Output]

Type in Electric USN	=	C&I UUT Serial Number
Set Actuator 1	=	OFF
Set Actuator 2	=	ON

Press "Transmit"

Make sure to obtain a "Acknowledgement Message " reply from Incoming Data

Use DVM to verify between Pin 1, J10 (Actuator 1 Output) and Pin 3, J10 (Actuator 1) Common are "Open"

Use DVM to verify between Pin 2, J10 (Actuator 2 Output) and Pin 4, J10 (Actuator 2) Common are "Close"

Pass__Fail___

Network Con	munications T	est Tool					X
File Settings V	iew <u>H</u> elp	escrool					
- Device	Message Type Transmit						
C Gas IMU	Set Actuator Outputs Channel						
Water IMU Electric IMU Relay IMU NCI	Direct I Outgoi	Message ng Data	Device ID	0 <u>I</u> ransm	ill E Wa	to Repea an akeup/IM	ie: U
	Electric USN:	Cnl53_0001					E
	Actuator 1:	Off				•	
	Actuator 2:	On				•	
							-
Outgoing Message							
01 08 00 00 00 07	C6 43 6E 49 35	33 5F 30 30 30 31	02 04			4	▶
Clear Stop Incoming Data							
	Message Ty	pe: Set Actuat	ors Acknow	ledge			<u> </u>
	Unknown Device St	: SN: Eni53_0001 atus: Acknowledg	ьч				
		atus. Actriometag					
						_	
							-
	46 43 6E 49 35 3	33 5F 30 30 30 31	00.04		0.100.100		
L COMI '	wakeup 1.25 s	Repeat 3 s	28 dBm		8/22/00	1 7:19 F	M

FIGURE 14

4.4. Battery Power Sustain Test:

- 4.4.5. Disconnect the ac power to the C&I UUT
- 4.4.6. [Query Serial Number]

Verify to obtain the correct Serial Number report for the C&I UUT.

	PassFail				
Network Communications Test Tool					
<u>File Settings View Help</u>					
Device Message Type © Gas IMU Set Serial Number © Water IMU Electric IMU © Relay IMU Direct Message © NCI Outgoing Data Manufacturer SN: 0057483196 Electric USN: Cnl53_0001	Transmit Channel 0 2 Auto Repeat Scan Iransmit! Wakeup/IMU				
Outgoing Message	E 30 30 30 31 04				
Clear Stop Incoming Data					
Message Type: Set Serial Number Ackn Unknown Device SN: Cnl53_0001 Status: Acknowledged	owledge				
	<u>-</u>				
Incoming Message					
01 0B 00 00 00 07 40 43 6E 49 35 33 5F 30 30 30 31 00 04					
COM1 Wakeup 1.25 s Repeat 3 s 28 dBm	8/22/00 1:41 PM				

FIGURE 15

5. Shipping Preparation:

IMPORTANT!:

Make sure to disconnect the hook-up wire from the Battery charger to the Positive (+) terminal of the battery!

Battery Disconnect Check: Initial_____

- Mechanical Inspection: Inspect all harware, screw and nut, wires and cables for propper fitting.
- Cosmetic Inspection: Inspect for cosmetic defective.