



*Manufacturers of Process
Controls and Instrumentation*

Instruction Manual

Model: *RCI-100-XXX*

Function: *Remote Control Signal Interface*

Communication: *XXX=SER: RS-232/485*
 XXX=MDM Modem Dial-Up
 XXX=FSK: Leased Line
 XXX=RF9: 900 Mhz Wireless
 XXX=NET: Ethernet (TCP/IP)

Input: 1 "Dry" Contact and 1 Analog Input

Output: 1 Form 'C' Contacts and 1 Analog Outputs

Power: 117VAC, 50/60Hz
 24 VDC

Serial #: _____

(If special or required)

For Technical Assistance And Questions Call
USA: (231) 788-2900 CANADA: (905) 660-5336

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Standard Features:

Bi-directional Communication using Ethernet/Internet
Point-to-Point Operation
1 Dry Contact and 1 Analog Input
1 'C' Relay Contact and 1 Analog Output
No Calibration Required
Microprocessor Controlled for High Accuracy
Power: 117 VAC 50/60 Hz (Optional 24 VDC)
High Noise Rejection

Function:

The RCI-100-NET is a bi-directional ethernet communication system that exchanges the status of 1 dry contact input and 1 analog input between a host and remote unit or an ethernet enabled device . A basic system consists of A) one host station and one remote station **OR** B) several remote stations and one PC or ethernet enabled device.

In system A), the host unit continually interrogates the remote unit and exchanges its inputs and outputs. Inputs from the host are sent to the outputs of the remote while inputs from the remote are sent to the outputs of the host.

In system B), an ethernet enabled device can access any remote unit and monitor the inputs and control the outputs.

Connection:

Units are connected via a standard 10/100 Ethernet. Regular RJ45 Jacks make for easy installation.

Specifications:

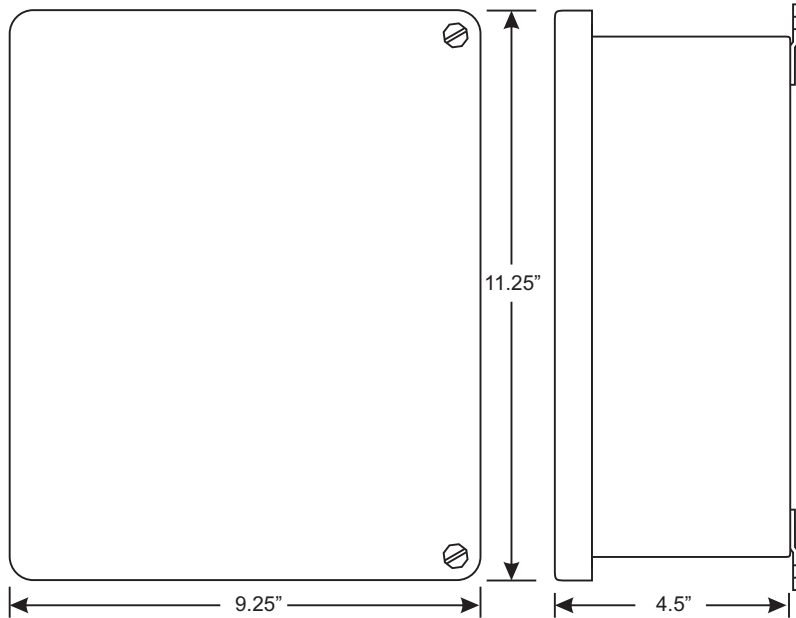
Transmission Medium: 10/100 Ethernet, RJ-45 connection
Operating Temperature: -20 Deg.C. to +50 Deg.C.
Relay Contacts: 10A 1/8Hp @ 125VAC
6A 1/8Hp @ 277VAC
Power: 117 VAC, 60/50 Hz
(24VDC Available)
Enclosure: NEMA4X (NEMA12 available as an option)

RCI-100-NET

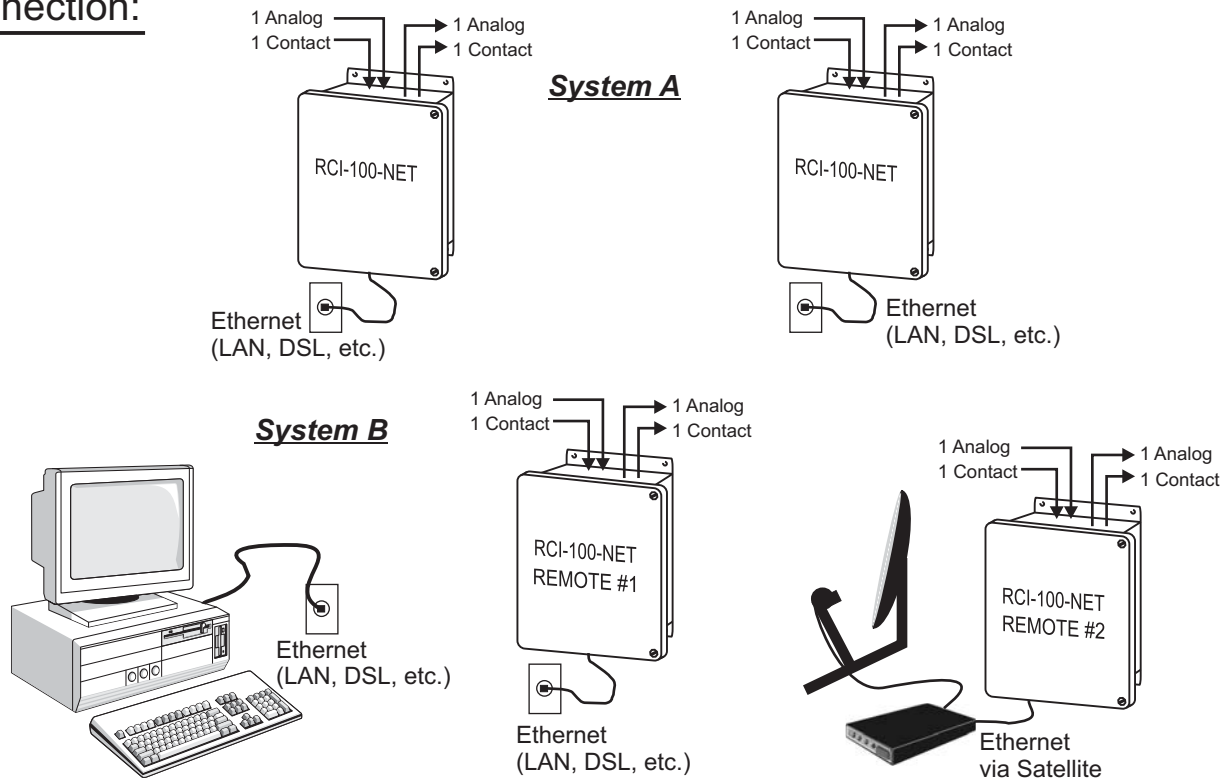
Enclosures & Dimensions:

Options: (Add letters to end of Model Number)

D - 8-Digit Scanning Display



Connection:



Manufactured By:

Pribusin Inc.

www.pribusin.com
info@pribusin.com

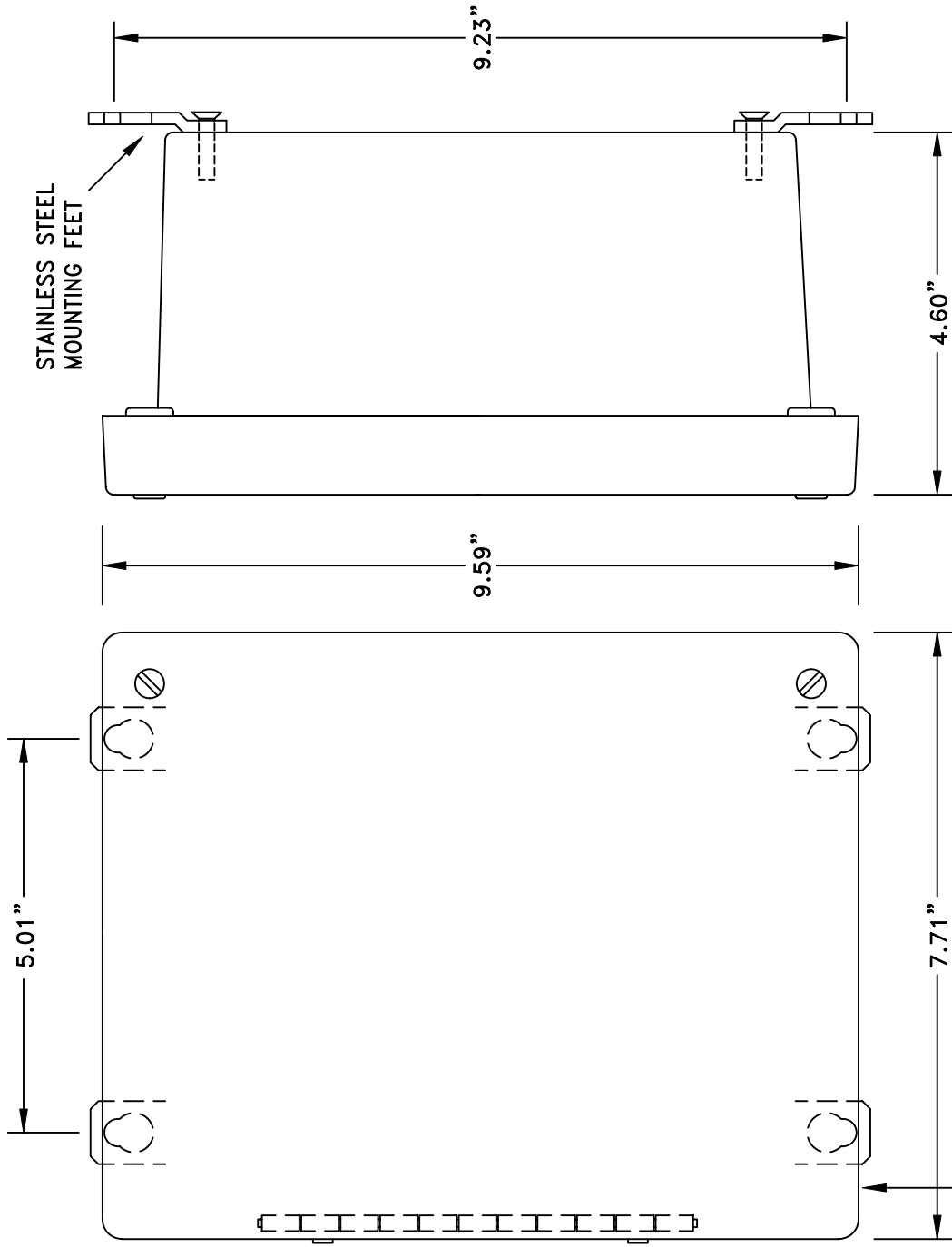
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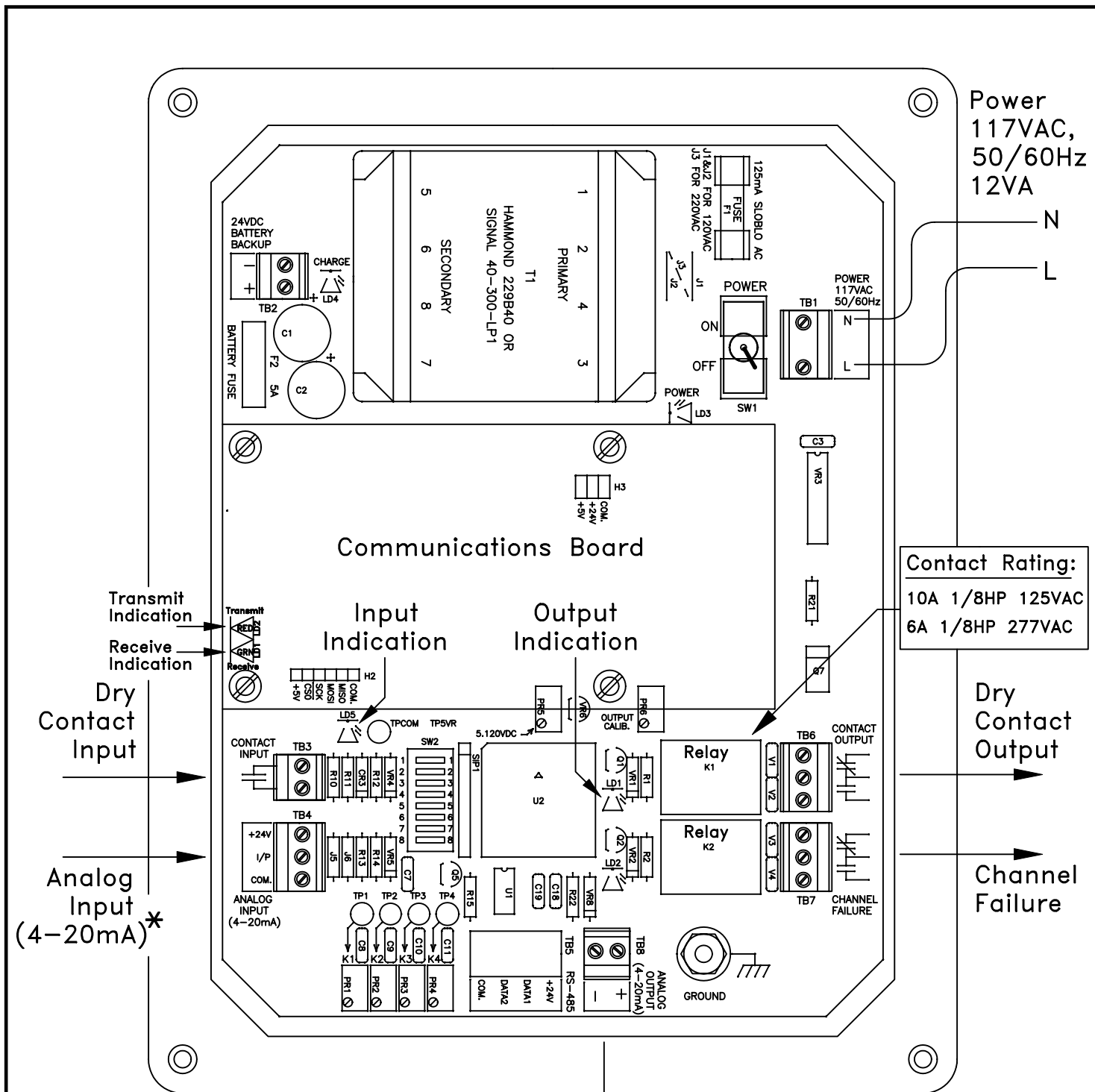
FRONT VIEW

SIDE VIEW

NEMA 4X AM SERIES FIBERGLASS ENCLOSURE
 WITH STAINLESS STEEL HINGE
 AND SCREW COVER

Pribusin Inc. ©

CHKD:	DATE: OCT. 02/01	DRN: KS
NEMA 4X AM SERIES FIBERGLASS ENCLOSURE (BOX SIZE: 8" x 6" x 4")		
DWG. NO.:	106470-2	REV. A



Analog Input (4-20mA)*

* 4-20 mA input and output ranges extend to 0 mA to 20 mA.

Analog Output (4-20mA)*

Pribusin Inc. ©		
CHKD:	DATE: Jan. 28/02	DRN: KS
Model: RCI-100-XXX Remote Control Signal Interface Panel Layout/Connections		
DWG. NO.:	106547	REV. A

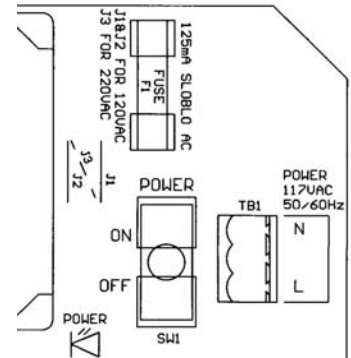
RCI-100 Connections:

The RCI-100 is the main board of an RCI-100-XXX Telemetry system. It provides the input and output signal connections as well as the power supply for the unit. A separate communications board is added to the RCI-100 to allow it to communicate with other units. This communications board may have its own configuration that is in a separate section of this manual. The following configuration applies only to the RCI-100 board and is common to all communications interfaces.

AC Power & Fuse:

The RCI-100 is typically powered from 120VAC and protected by a 125mA SLOBLO fuse. It can be wired for 240VAC operation by removing (desoldering) power jumpers J1 & J2 and installing (soldering) jumper J3.

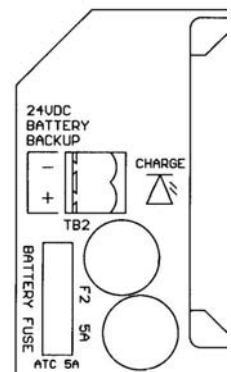
When changing the RCI-100 to 240VAC power make sure to change the fuse to half of its value, 62mA. This is important since at 240VAC the RCI-100 requires only half the current as if it were powered from 120VAC. Proper protection is only achieved by reducing the fuse value as mentioned above.



DC Power & Battery Backup:

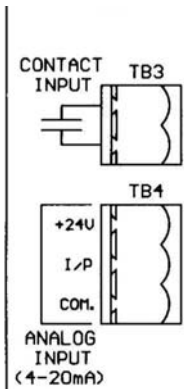
The RCI-100 may also be powered from a 24VDC source which could be a battery or a DC power supply. The 24VDC power input is polarity protected with a fuse to prevent damage to the RCI-100 by inadvertent reverse polarity. A DC fuse provision is also provided if this power option is utilized. Insert a 5A automotive type blade fuse into the Battery Fuse socket.

If a battery is used, it must be an 18VDC Lead-Acid type rechargeable battery. This battery is most easily made up of three 6VDC batteries connected in series. We suggest using a spill-proof gel-cell type battery to prevent accidental leakage of the corrosive acid inside the batteries. The size of the batteries can vary from 1Ah to 20Ah depending on the length of time the RCI is to operate on battery power. Keep in mind that it takes 20 times longer to bring a 20Ah battery back to full charge compared to a 1Ah battery.



To enable the internal battery charging circuit, turn on switch SW1-6.

Inputs:

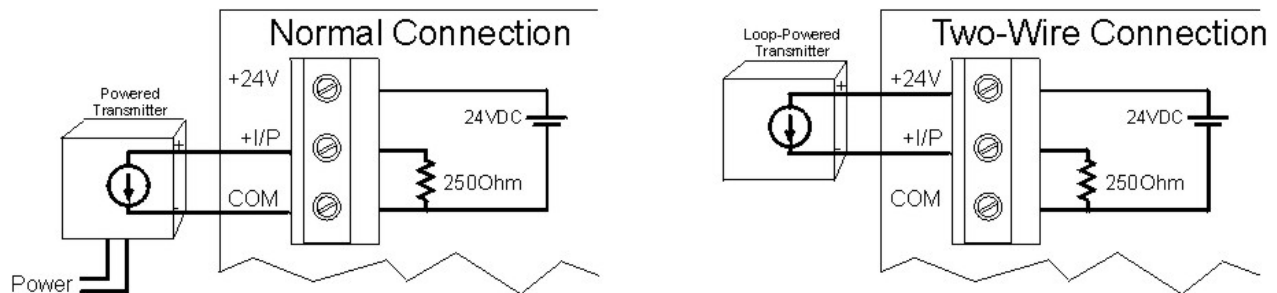


The RCI-100 has one dry contact input and one 0-20mA input. The dry contact input is excited with 24VDC and will source approximately 20mA when the contact is closed. A red LED lights up when the contact input is closed.

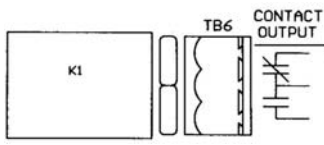
The analog input is configured as a 0-20mA input and has a 250 Ω input impedance. The input terminal has three connections: +24V, I/P, COM. The +24V power output may be used to power field transmitters. Up to 500mA may be used to power a transmitter. The input signal is connected to I/P(+) and COM(-).

The analog input is connected to the RCI-800 in two fashions: 1) Normal (3-wire connection) or 2) two-wire connection. On a 3-wire connected input, an external power supply or the +24V power output terminal of the RCI provides power to the field transmitter. The field transmitter has a current source that provides the 4-20mA signal back to the RCI-100. If using the power supply of the RCI-100, the field transmitter may draw up to 125mA.

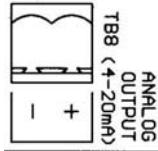
On a 2-wire connected input, the field transmitter receives power from the RCI-100 and superimposes the signal onto the power return path. A maximum of 20mA will flow in such a connection. Make sure to consult the field transmitter manual to determine how to connect it to the RCI-100.



Outputs:



The RCI-100 has one form 'C' relay contact output and one 0-20mA analog output. The relay contact is capable of switching 120VAC, 10A or 240VAC, 6A. An energy absorbing varistor is installed across each contact to limit switching transients. A second relay contact acts as a communications fail indicator. If no communication occurred within 30 seconds, this relay contact will energize. Upon re-established communication this relay will de-energize again.



The analog output is typically configured as a 0-20mA output and can drive into a 1000Ω load, provided that the power supply to the unit is not below 24VDC. The output is not isolated from the input. Care must be taken when connecting the output to different devices so that no inadvertent ground loops are established.

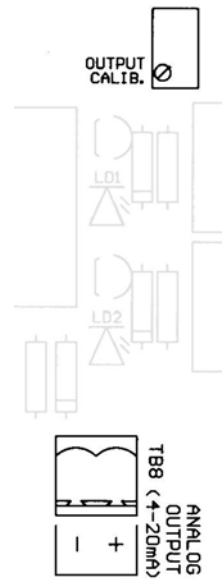
Output Calibration & Input Testing:

The output on the RCI-100 is factory calibrated and should not require any adjustments. To check the calibration of the output and relays use switch SW2-7 & SW2-8 as shown below to set them to known states. If an output should require some adjustment, close SW2-8 only and turn the OUTPUT CALIB. trim pot until the output reads 20mA.

SW2-7	SW2-8	Function
OPEN	OPEN	Normal Operation
OPEN	CLOSED	Outputs=20mA, Relays=Energized
CLOSED	OPEN	Outputs=0mA, Relays=De-energized
CLOSED	CLOSED	Outputs=Inputs, Relays=Contact Inputs

If both switches are CLOSED, the analog and contact inputs are passed straight through to the analog and relay outputs. This may help in troubleshooting input and output signals.

Make sure both switches are OPEN before resuming normal operation.



RCI-100 Configuration:

The RCI-100 requires no configuration other than for its communication fail operation. In the event of a communications failure on the communications board, the RCI-100 can be set up to take various actions on its outputs. This may be desirable in order to place connected devices into a safe operating mode. By default factory setting, all outputs remain at their last known state if a communications failure occurs.

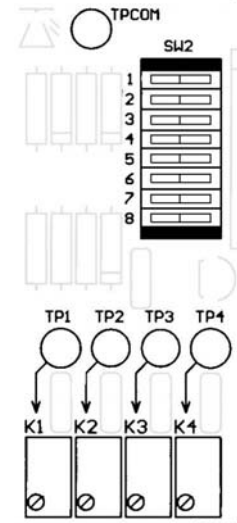
SW2-	Function	OFF	ON
1	Relay Fail Mode	No Change	See SW2-2
2	Relay Fail Status	De-Energize	Energize
3	Output Fail Mode	No Change	Ramp to K1*
4			
5			
6	Battery Charger	OFF	ON
7	I/O Calibration		
8	I/O Calibration		

- * If SW2-3=CLOSED then the analog output will ramp to the setting of K1. The output will change at a rate determined by the setting of K2. The settings of the trim pots can be read on test points TP_{1,2} using a voltmeter. The test points read a voltage of 0-5V for a 0-100% adjustment.

$$TP_1 = \frac{Output}{20} \times 5Volt$$

$$TP_2 = \frac{RampRate}{60} \times 5Volt$$

where, *Output* = 0-20 (mA) and *Ramp Rate* = 0-60 (seconds) (5 sec. minimum)



NET (Ethernet) Communication Option:

The –NET communications option to the RCI series utilizes serial tunneling via Ethernet to exchange the signal data between a host and a remote. Currently only point-to-point operation is supported.

In a **Point-to-Point** topology one host communicates with one remote. The two exchange all their signals with one another. The remote is configured as remote #1 even though it is the only remote in the system.

All configurations are done via two banks of DIP Switches. SW1 is not used and all positions must be OPEN. SW2 assigns the Remote and Host Channel Numbers and Host/Remote Mode. The switches are located on the communications board on the left-hand side.



Operating Mode Configuration:

The Ethernet communication board has two banks of 8-position DIP switches: SW1 and SW2. The function of these switches is slightly different for a host unit and a remote unit. We recommend powering the unit down while making any changes to the configuration. **SW1 is not used. Make sure all switches are in the open position.**

SW1-	HOST	REMOTE
1		
2		
3		
4		
5		
6		
7		
8	SP Reset Disable	SP Reset Disable

SW2-	HOST	REMOTE
1	# of Channels on Remote	# of Channels on Remote
2	# of Channels on Remote	# of Channels on Remote
3	# of Channels on Host	
4	# of Channels on Host	
5		
6		
7		
8	Host / Remote Select	Host / Remote Select

Host Configuration:

To make an RCI-100 operate as a host unit, make sure that SW2-8 is closed.

Next, set the **number of channels of the remote** using SW2-1, -2. One channel is considered 1 analog input/output plus 1 contact input/output. Hence an RCI-100 can have at most 1 channel.

SW2-1	SW2-2	Channels on Remote
OPEN	OPEN	1

Next, set the **number of channels of the host** using SW2-3, -4. An RCI-100 can at most have 1 channel. This is the number of channels that will be exchanged between the host and each remote.

SW2-3	SW2-4	Channels on Host
OPEN	OPEN	1

Remote Configuration:

To make an RCI-100 operate as a REMOTE unit, make sure that SW1-8 is open.

Next, set the **number of channels on the remote** using SW2-1, -2. One channel is considered 1 analog input/output plus 1 contact input/output. Hence an RCI-100 can have at most 1 channel.

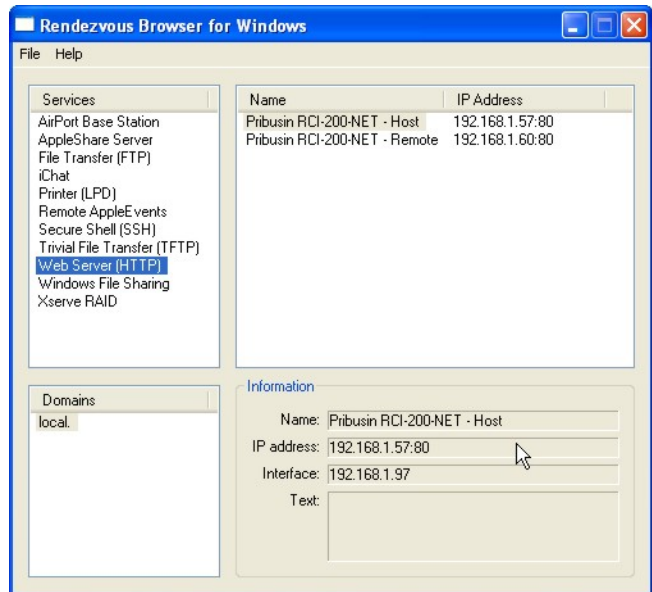
SW2-1	SW2-2	Channels on Remote
OPEN	OPEN	1

Ethernet Configuration:

The RCI-100-NET uses an embedded Ethernet module called Siteplayer. It is the interface between the RCI and the Ethernet connection. In order to establish a connection between two RCI-100-NET units, the Siteplayer must be configured to the specific network parameters where it is to be deployed. This configuration is done with a web interface on the Siteplayer. Most parameters are factory preset and should not be changed by the user or a loss of connection may result.

In order to gain access to the Siteplayer for the first time when it is connected to a network we suggest using the Rendezvous browser. It is available for download from our website at www.pribusin.com/rci100net.html. Click on the Web Servers service in the left window and you should see your RCI-100-NET units appear in the right window.

To access the Siteplayer web configuration, simply double-click the name in the right window and a browser will open and point to the currently assigned IP address of the Siteplayer. By default the Siteplayer uses DHCP to obtain an IP address on the network. This will have to be changed to a fixed IP address at least on the Remote so that the Host can find it and connect to it.



Before proceeding with the Siteplayer programming, we suggest disabling the automatic reset function which the RCI uses to revive a Siteplayer that has become unresponsive. If this step is not performed while programming the Siteplayer, some newly changed parameters may revert to their previous state unbeknownst to the user and cause possible confusion. To disable the automatic reset function, turn SW1-8 to the ON (down) position during programming. **Be sure to turn SW1-8 back to its OFF (up) position after programming is completed.**

Next, a login window will appear and you need to enter a username and password. Factory defaults are **user** and **password**.

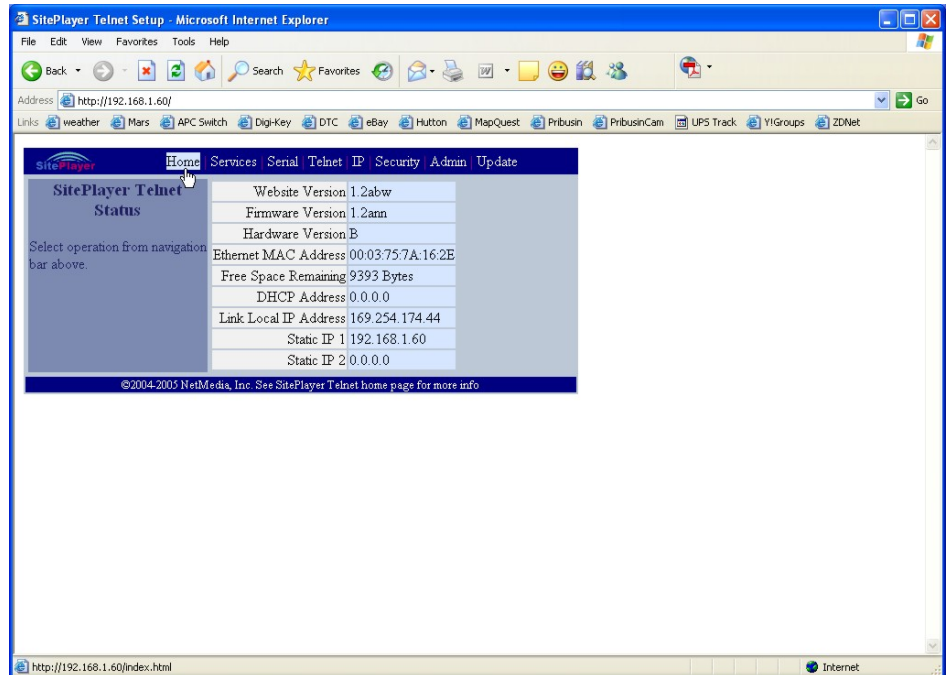
We recommend that these be changed before the system is deployed for final installation.



You should now see the main Siteplayer Home page.

Across the top are several text links that allow access to the various configuration pages.

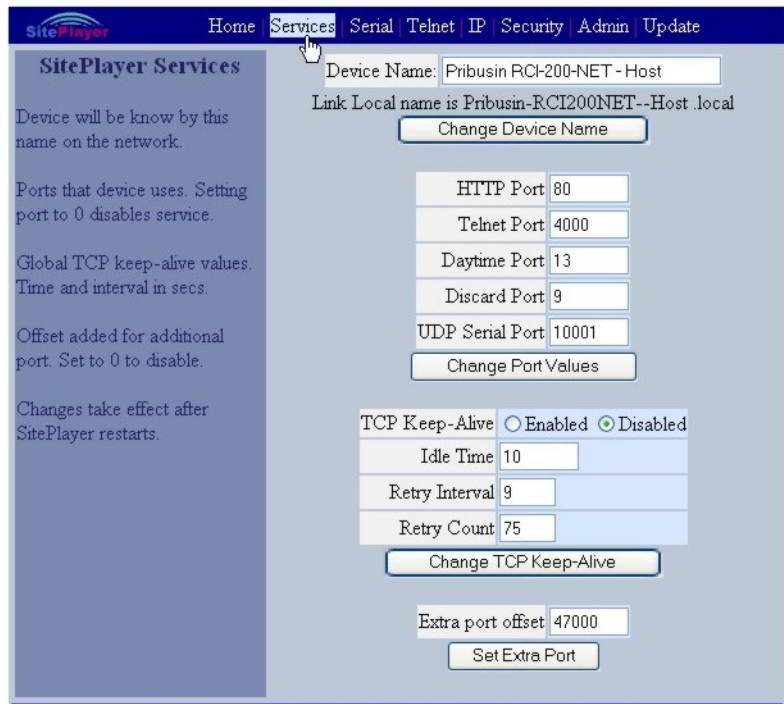
Following will be a description of these pages.



The **Services** page allows the device name to be changed. We recommend you do not interchange the Host and Remote device names. Feel free to change the Host to something like 'Main Street Station – Host'. Keep the words Host and Remote in the device names as they are.

The **Telnet Port** is factory preset to 4000. You may change it but be sure to change it on both the Host and Remote and on the **Services** page and the **Telnet** page.

Leave all other settings as they are shown. Do not enable TCP Keep-Alive as it may interfere in establishing a connection.



The **Serial** page configures the serial interface settings between the Siteplayer and the RCI-100-NET.

DO NOT MAKE ANY CHANGES TO THIS PAGE.

Serial Port
Serial port parameters are changed here. Changes are immediate and are retained in persistent storage.

Baud Rate: 9600
Data Bits and Parity: 7 Bits Even Parity
Flow Control: None
Set Parameters

UDP Serial Configuration
UDP Serial configuration is changed here.

UDP Remote IP: 0.0.0.0
Remote IP is: Fixed Changeable
UDP Timeout: 20
Set UDP Configuration

Buffer Management
You can change how Siteplayer's buffers are managed.

Buffer Threshold: 125
End of Buffer Byte is: Disabled Enabled
End of Buffer Byte: 10
Bit stall delay is: Disabled Enabled
Bit stall delay: 15
Set Buffer Management

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The **Telnet** page configures the telnet client and server modes. The RCI-100-NET Remote is a Telnet Server and the RCI-100-NET Host is a Telnet Client. The client will attempt to connect to the server and must therefore know the server's IP address.

The server (Remote) must therefore have a fixed IP address. This may be a local IP address such as 192.168.x.x if the units are connected to the same local network. The IP address is configured on the **IP** page.

The client (Host) must be told the IP address of the server in **Remote IP**. After entering the IP address, click the Set 'Telnet Configuration' button and the Siteplayer will restart.

Telnet Configuration
Shows Current Telnet connection status

Initiate connections (Client), receive connections (Server) or emulate AT-modem commands.

Configure the client's conditions which initiate a connection to the remote server.

Transfer mode selects Binary or Network Virtual Terminal (remote serial port control).

Set remote Telnet info to connect to.

Set retry period and idle timeout in seconds.

Changes take effect after SitePlayer restarts.

Current Connection State	ESTABLISHED
Current Remote IP	192.168.1.60
Current Remote Port	4000
SitePlayer Mode	<input checked="" type="radio"/> Client <input type="radio"/> Server <input type="radio"/> AT-Command
Server Disconnects or Client Connects/Disconnects on	<input type="checkbox"/> DSR <input type="checkbox"/> DCD <input type="checkbox"/> RI
Clear Buffer on	<input checked="" type="checkbox"/> Connect <input checked="" type="checkbox"/> Disconnect
Client Connects on	<input checked="" type="radio"/> Any character <input type="radio"/> Other
Data Transfer Mode	<input checked="" type="radio"/> Binary <input type="radio"/> NVT
Remote IP	192.168.1.60
Remote Port	4000
Retry Period	20
Idle Disconnect Timeout	10
DTR Output State	Connect Low

Set Telnet Configuration

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On the **IP Configuration** page, you can assign the fixed IP address for the server (Remote) as well as the Gateway and subnet mask.

Click the 'Set Fixed IPs' button when done. The Siteplayer will restart.

By default, the DHCP is enabled, allowing the unit to receive an IP address on a new network. Once a fixed IP address has been assigned, the DHCP must be disabled.

The **Siteplayer Security** page allows access to the web configuration utility to be restricted. Factory default username and password are: **user** and **password**.

You may also setup authorized IP addresses that may connect to the server (Remote) to further prevent unauthorized access.

The **Administration** page allows for a remote restart of the siteplayer by clicking the 'Restart Siteplayer' button.

The LED parameters have no function.



When all parameters have been set correctly and both units are connected to the Ethernet connection, the client (Host) will try to establish a connection with the server (Remote). Once this is accomplished, the yellow Link LED (LD3) will light indicating a connection. At that point the red and green Transmit and receive LEDs should begin flashing alternately on both units.

Be sure to turn SW1-8 back to its OFF (up) position after programming is completed.