



Tech Note – TN[023]  
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# Introduction

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The Ctek Z4200, Z4300 and Z4400 SkyRouter products provide reliable communications for the Rain Bird irrigation controllers on any CDMA/EvDO or GPRS/EDGE/HSPA network. In addition, the PowerMinder option can be added for solar and low power installation, if required. All units equipped with the Ctek PowerMinder option draw less than one-hundred microamperes in stand-by mode making this option the ideal choice for solar operation.

## Scope

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This TechNote specifically addresses the serial pad and serial port settings that are used with specific Rain Bird controllers. PowerMinder is covered in TN0020 and cellular activation and other administrative settings are covered in the User Manual for the specific SkyRouter model you are using.

Settings for the Rain Bird Maxicom and IQ controllers are provided for both Direct Connect and External Modem configurations.

## Getting Connected

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SkyRouter administration is performed using a standard web browser. A user may connect locally through the RJ45 Ethernet port or remotely over the cellular network. The IP address for a local connection is 192.168.1.10. The IP address for a cellular connection will be assigned by the wireless carrier and may be either static or dynamic depending on the carrier and rate plan you have selected. In both the local and remote cases the default user ID for login is *ctek* and the default password is *ctek*.

# Configuring The SkyRouter

Once connected and logged in the user is presented with a menu as shown in Figure 1. The two screen selections circled in red will be used to configure the SkyRouter for use with a Rain Bird controller. The Wireless Status screen circled in yellow is the primary source of information when troubleshooting cellular connection problems.



Figure 1

## Configuring The Serial Port

Selecting the RS-232/485 button shown in Figure 1 will bring up the serial port configuration screen shown in Figure 2. For Rain Bird configurations only the RS-232 settings will be used.

**RS-232 (DB-9) Configuration**

Bit Rate:  300  1200  2400  4800  9600  
 19200  38400  57600  115200

Character Length:  7 Bit  8 Bit

Parity:  None  Odd  Even

Flow Control:  None  Rts/Cts  X-on/X-off

Service:  None  TCP PAD  UDP PAD  PPP

**RS-485 (Aux) Configuration**

Bit Rate:  300  1200  2400  4800  9600  
 19200  38400  57600  115200

Character Length:  7 Bit  8 Bit

Parity:  None  Odd  Even

Service:  None  TCP PAD  UDP PAD

**Figure 2**

Bit Rate:

Select 38400 for IQ controllers

Select 2400 for Maxicom controllers

Character Length: Select 8 Bit for all controllers

Parity: Select none for all controllers

Flow Control: Select None for all controllers

Service: Select TCP PAD for all controllers

Once these settings are made and confirmed on the screen press Update. When an Update confirmation is received press Home which will return you to the top level menu (Figure 1).

### Configuring The TCP PAD

Selecting the Serial Options button shown in Figure 1 will cause an intermediate level serial options menu to be presented as shown in Figure 3.



**Figure 3**

From the menu shown in Figure 3 select the RS-232(DB9) TCP PAD option. This screen is shown in Figure 4 and a discussion of the required settings follows Figure 4.



## DB9 TCP PAD Configuration

<b>Call Setup Parameters</b>		
Answer Mode: <input type="radio"/> AT Cmd <input checked="" type="radio"/> Auto	AT Cmd Response: <input checked="" type="radio"/> On <input type="radio"/> Off	DTR Call Control: <input type="radio"/> On <input checked="" type="radio"/> Off
Dial Mode: <input checked="" type="radio"/> AT Cmd <input type="radio"/> Auto	AT Cmd Echo: <input checked="" type="radio"/> On <input type="radio"/> Off	Local Echo: <input type="radio"/> On <input checked="" type="radio"/> Off
AT Escape Sequence: <input checked="" type="radio"/> On <input type="radio"/> Off		
<b>Outbound IP Parameters</b>		
(Default) Destination 1 IP Address: <input type="text"/>	Destination 1 Port Number: <input type="text"/>	
Destination 2 IP Address: <input type="text"/>	Destination 2 Port Number: <input type="text"/>	
Destination 3 IP Address: <input type="text"/>	Destination 3 Port Number: <input type="text"/>	
Destination 4 IP Address: <input type="text"/>	Destination 4 Port Number: <input type="text"/>	
<b>Inbound IP Parameters</b>		
Listen Port Number: <input type="text" value="7078"/>		
<input checked="" type="radio"/> Accept calls from all IP addresses		
<input type="radio"/> Accept calls from only following IP addresses:		
<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	
<input type="text"/>	<input type="text"/>	
<b>Data Management Parameters</b>		
Termination character (dec): <input type="text" value="13"/>	Block check length: <input type="text" value="0"/>	Session timer (0-60 min): <input type="text" value="0"/>
Transmit timer (100ms ticks): <input type="text" value="10"/>	Maximum block size: <input type="text" value="80"/>	Inactivity timer (0-60 min): <input type="text" value="60"/>

**Figure 4**

**Answer Mode:** Set to Auto

**AT Command Response:**

For Direct Connect Mode set to Off

For External Modem Mode set to On

**DTR Call Control:** Set to Off

**Dial Mode:** Set to AT Cmd

**AT Cmd Echo:**

For Direct Connect Mode set to Off

For External Modem Mode set to On

**Local Echo:** Set to Off

**AT Escape Sequence:** Set to Off

[The screen panel labeled Outbound IP Parameters is not used.]

In the screen panel labeled Inbound IP Parameters make the following settings:

**Listen Port Number:** Set to 10001

*Note: The port redirector or client software used to access this controller must also be set to port 10001.*

**Accept Calls From All IP Address:** Select this option

*Note: The Accept calls from only the following IP addresses could be used as an additional security measure if, and only if the client computer accessing this controller is assigned a static IP address. We do not recommend experimenting with this setting until proper operation under the Accept calls from all IP addresses setting has been completely verified.*

**Termination Character:** Set to 13

**Block Check Length:** Set to 0

**Session Timer:** Set to 15 [Causes the session to be terminated after 15 minutes to minimize cellular plan usage]

**Transmit Timer:** Set to 1

**Maximum Block Size:** Set to 80

**Inactivity Timer:** Set to 60 [another cellular plan safeguard]

1. Once these settings are made and confirmed on the screen press Update. When an Update confirmation is received press Home which will return you to the top level menu (Figure 1). At this point in time you must do a **Restart** from the SkyRouter's top level menu in order for these changes to take effect.



# Theory Of Operation

The Ctek SkyRouter's Serial PAD software accepts requests for controller data originating at the client machine being used to access the Rain Bird controller. Typically these requests originate on the client as serial messages and are then reformatted by port redirection software on the client for TCP/IP transmission over the cellular network on the TCP/IP port (10001) assigned. The Serial PAD function on the Ctek SkyRouter reformats this traffic as serial data and transmits it to the Rain Bird controller over the RS-232 serial connection.

Serial response traffic originating at the Rain Bird controller is accepted by the SkyRouter's PAD and formatted as TCP/IP messages for transmission over the cellular network on the TCP port (10001) assigned during set up. The TCP/IP traffic containing the serial payload is transmitted to back to the requesting client where the port redirector software on the client converts the TCP/IP traffic back to serial messages and makes it available on a windows com port or the equivalent if some other client OS is being used. See figure 5 below.

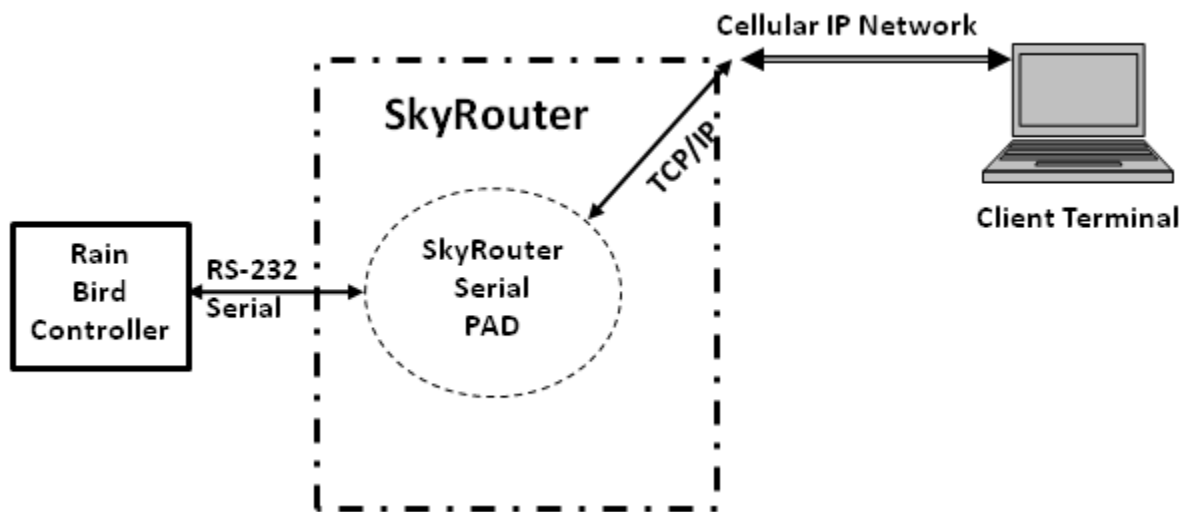


Figure 5