

Wireless Beacon Control Unit

Wireless On/Off Control USER MANUAL



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Introduction

Description of the Wireless Beacon Control Unit (WBCU)

The Wireless Beacon Control Unit (WBCU) is a completely integrated 900MHz radio with a time clock that resides inside each of the flashing beacon cabinets. The WBCU communicates with the WEB I/O master radio and is able to download and store the active schedule locally. The WBCU can operate autonomously in the event of a wireless link loss with the WEB I/O Master radio or the Zone Watch Software. In addition the WBCU provides updates on the status of its schedule and flashing beacons (ON/OFF).

The following ENCOM radio models are compatible with the WBCU:

- ENCOM WEB I/O (Master)

For more information on the other components for the ENCOM Safe 2 School system, visit the website at

<http://www.encomwireless.com/our-solutions/safe2school>

Antennas with WBCU Radios

The WBCU is designed with a Reverse Polarity TNC Female antenna connector. An antenna is not supplied with the WBCU unit; please contact your local ENCOM Wireless dealer for ordering.

To locate your local ENCOM Wireless dealer, please visit our website at:

<http://www.encomwireless.com/ordering-warranty/dealer-locator>

or contact an ENCOM representative via our website at:

<http://www.encomwireless.com/about-us/contact-us>

Acceptable Antennas for use with WBCU Radios

There are two types of antennas typically used for WBCU systems:

- Yagi Antenna
- Omni Antenna

Other types of antennas can be used if the system has special requirements to be met.

Programming Ports

The WBCU has two programming ports: **serial** and **USB** (if hardware supported). In order to use the USB port on the WBCU, a driver must be installed during the installation.

For more information see page 8, **Installing ControlPAK Software**.

LED Indicators

There are seven LED indicators on the WBCU radio as follows:

- **Power LED:** Indicates the radio is powered ON. The LED will be a solid green.
- **RF LINK:** Indicates the WBCU remote radio is wirelessly linked to the corresponding Master. The LED will be a

solid green. A blinking LED light indicates no wireless connection.

- **SCHEDULE ACTIVATED:** Indicates the calendar schedule is being used in the WBCU. A solid green LED indicates an activated calendar schedule and an LED not lit indicates no activated calendar schedule. A blinking LED is to show the schedule is currently overridden.
- **INPUT LEDs':** Not used currently.
- **OUTPUT LEDs':** The LEDs indicate whether outputs are on or off. If an output is ON the LED will be lit green, and if the LED is off it will not be lit.

Test Buttons

There are three Test buttons on the WBCU radio as follows:

- **Test Output 1:** Activates Output 1 on the WBCU unit. The Output 1 LED will be red indicating the output is active. Pressing the Test Output 1 button again will turn off the test to the output.
- **Test Output 2:** Activates Output 2 on the WBCU unit. The Output 2 LED will be red indicating the output is active. Pressing the Test Output 2 button again will turn off the test to the output and resume the schedule for the output.

Data Programming Cable

The WBCU radio comes supplied with a serial programming cable.

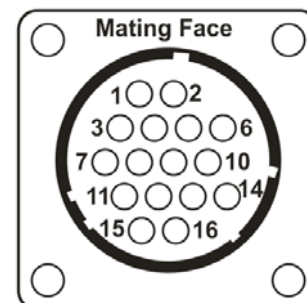
Controller Cable

The following controller cables are available for use with the WBCU radio.

CABLE NUMBER	CABLE NAME
CB-201	WBCU to Naztec Adapter Cable
CB-202	WBCU External Cable (For New Installations)
CB-203	WBCU to ELTEC (AC Power) Adapter Cable
CB-204	WBCU to ELTEC (DC Power) Adapter Cable
CB-205	WBCU AC Cable (For Bench Programming)

WBCU Cable Interface

The following chart lists the wiring cable interface for the WBCU along with the mating connection point as shown below:



WBCU CABLE INTERFACE			
	CABLE WIRING	WIRING DESCRIPTION	WIRING NUMBER
AC Components	AC-L	AC Live	1
	AC-N	AC Neutral	2
	AC-G	AC Ground	3
Relay Components	R1-CO	Relay 1 Common	4
	R1-NC	Relay 1 Normally Closed	5
	R1-NO	Relay 1 Normally Open	10
	R2-CO	Relay 2 Common	6
	R2-NC	Relay 2 Normally Closed	16
	R2-NO	Relay 2 Normally Open	7
Logic Components	O/P 1-OC	Output 1 Open Collector	8
	O/P2-OC	Output Open Collector	9
	S.GND	Signal Ground	14
I/O Components	I/P 1	Input 1	11
	I/P2	Input 2	12
DC Components	12 VDC	12 VDC Power Line	15
	P.GND	DC Power Ground	13

Installing ControlPAK Software

Before you can configure the WBCU radio the ControlPAK software is to be installed.

The shipped CD that is with the WBCU radio contains the ControlPAK software. Alternatively you can download the most recent version from our website at www.encomwireless.com

Ensure that you are using ControlPAK version 4.5.0 or higher.

Technical Specifications for Installing ControlPAK

To run ControlPAK on your PC, you require the following hardware and software:

- Windows XP or later
- 1GB RAM
- 100 MB free hard drive space

After selecting the setup file from the supplied CD or by downloading the latest version of the ControlPAK software from

www.encomwireless.com:

1. Click **Setup.exe** file

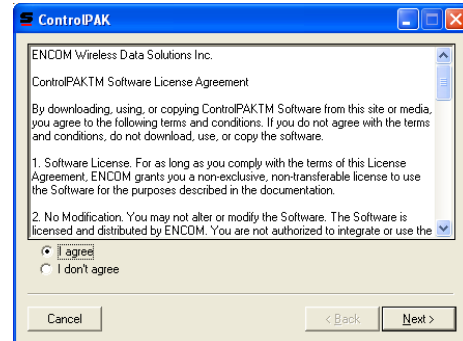


The *ControlPAK Install* screen appears.



2. Click **Next**.

The *ControlPAK Software License Agreement* screen appears.

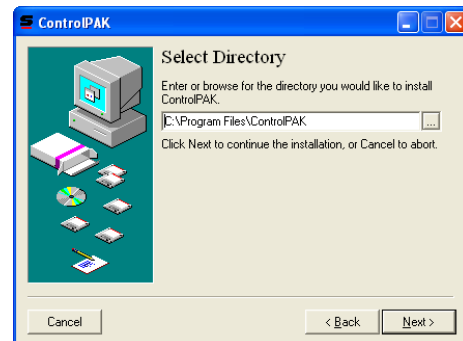


3. Click **I agree**, and then click **Next**.

The *Upgrade/Uninstall* screen appears.

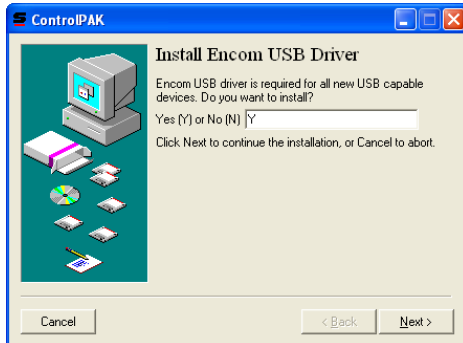
4. Click **Next**.

The *Select Directory* screen appears.



5. Enter the directory in which you would like the ControlPAK software install, or click **Next** to accept the default directory.

6. Install the USB driver by selecting “Y” for this step. Follow the onscreen instructions.



The *Start Copying Files* screen appears.



7. Click **Next**.
The Setup file copies the appropriate files to your computer, and then registers the software.
8. Click **Next**, then click **Finish**.
The ControlPAK icon appears on your desktop.

NOTE: If you are running Windows Vista, you must turn off your User Account Control.

Instructions to do this are located at
<http://windows.microsoft.com/en-CA/windows-vista/Turn-User-Account-Control-on-or-off>

Congratulations, you have successfully installed the ControlPAK software.

Configuring the WBCU Radio

IMPORTANT NOTE:

By default, the WBCU is factory configured to be wirelessly linked to a WEB I/O. The only parameters that need to be changed are:

- Unit Address
- Network Address
- Hop Pattern

The Network Address and Hop Pattern must match across the entire zone. The Unit Address is to be unique for each remote in the network.

With a physical connection established to the computer, the ControlPAK software is now able to be used to configure the WBCU radio.



To access the software, double click on the ControlPAK icon. A main login screen appears as shown:



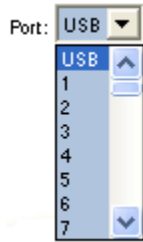
Click on **Contact Closure** and then **Commpak I/O8**. You will now be at the Configuration screen as shown below:



At the top of the Configuration screen you will see settings for Port, Baud, Data, Parity and Stop bits as shown below:



If a USB cable is used, select USB from the Port drop down menu:



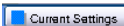
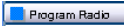
If using a USB-to-Serial cable or a straight through serial cable, set the parameters to the following:

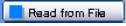


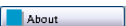

Port: <this will be the COM port of your computer>
Baud: 115200
Data: 8
Parity: N
Stop: 1

Press the **Connect Button** to log into the WBCU.

ControlPAK Navigation Buttons

The left of the Main Configuration screen contains a series of function buttons. They are described in the following table:

Button	Description
	Current Settings uploads a radio's current configuration data into ControlPAK. If you create a custom configuration and make an error, click Current Settings to replace the parameters that are currently displaying on-screen to the settings currently on the radio.
	Program Radio downloads your current on-screen configuration

	to the radio.
	Read From File uploads the radio configuration data from a file into ControlPAK. This allows you to copy a configuration to another radio. NOTE: The radio is not programmed until you click Program Radio .
	Save to File saves the configuration settings to a file for use later on. You must click Program Unit each time you want to download a configuration to a radio; Save to File only saves a file to a folder.
	Spectrum Scan is a Quality of Service tool that allows the user to view the noise level in the frequency spectrum with the selected hopping pattern that is used.
	Provides you with the information about your radio and allows you to upgrade the radio's firmware.
	Return to the ControlPAK Login screen.

WBCU Wireless Setup

The General Setup page allows you to configure your WBCU wireless parameters. The table on the following page describes each of the WBCUs wireless parameters.

SECTION	FIELD NAME	DESCRIPTION
GENERAL SETUP	Unit Address	<ul style="list-style-type: none"> ➤ The Master radio Unit Address is set to 0 by the ControlPAK software and is not user configurable. ➤ The Unit Address is used for Remote Configuration and Remote Diagnostics functions. ➤ The Unit Address must be unique for each Remote and Repeater radio in the zone.
	Network Address	<ul style="list-style-type: none"> ➤ The Network Address is unique to a zone. ➤ By establishing a system under a common Network Address, the network can be isolated from another network to reduce interference. ➤ Only the radios that have the same network address can communicate to each other. ➤ Valid values for the Network Address range from 0 to 254, inclusive.
	Output Power	<ul style="list-style-type: none"> ➤ The default power level for the CommPAK I/O8 is 1 Watt. ➤ The radio transmit power level may be changed to meet your system requirements.
	Primary Hop Pattern	<ul style="list-style-type: none"> ➤ Is used by the Master radio to communicate with: <ol style="list-style-type: none"> 1. Remote radios that communicate directly to the Master radio. 2. Repeater radios that communicate directly to the Master radio. ➤ Is used by Remote radios to communicate: <ol style="list-style-type: none"> 1. Directly to the Master radio. 2. To a Repeater radio. ➤ Is used by a Repeater radio to communicate: <ol style="list-style-type: none"> 1. Directly to the Master radio. 2. With an upstream Repeater radio.
	Repeater Hop Pattern	<ul style="list-style-type: none"> ➤ Is used by the Repeater radio to communicate with: <ol style="list-style-type: none"> 1. Remote radios that communicate directly to the Repeater; these Remote radios will not have any line of site to the Master but only to the Repeater. 2. Downstream Repeaters; these are back-to-back repeaters
	RF Noise Filter	The RF Noise Filter optimizes the selectivity of the CommPAK I/O8 receiver. When it is enabled the filter will improve the rejection of

		interfering signals but the radio sensitivity typically decreases by 6 dBm.																				
GENERAL SETUP	Frequency Zone	<p>Allows you to select a Frequency Zone that you DO NOT want the radio to use in its Hop Pattern.</p> <p>Select Enable all Frequency Zones if you want the radio to use the enter band:</p> <div data-bbox="581 596 1344 1318" style="border: 1px solid black; padding: 5px;"> <p>Radio Frequency Zone Selection</p> <p>De-select the frequency zone that you want the radio NOT to hop into. This will allow the radio to co-located with other Direct Sequence Spread Spectrum Radios in the same location without interfering with each other.</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">902.0 - 904.6 & 925.0 - 927.6 MHz</td> <td style="text-align: center;">911.0 - 915.6 MHz</td> </tr> <tr> <td style="text-align: center;">902.0 - 906.6 MHz</td> <td style="text-align: center;">912.0 - 916.6 MHz</td> </tr> <tr> <td style="text-align: center;">903.0 - 907.6 MHz</td> <td style="text-align: center;">913.0 - 917.6 MHz</td> </tr> <tr> <td style="text-align: center;">904.0 - 908.6 MHz</td> <td style="text-align: center;">914.0 - 918.6 MHz</td> </tr> <tr> <td style="text-align: center;">905.0 - 909.6 MHz</td> <td style="text-align: center;">915.0 - 919.6 MHz</td> </tr> <tr> <td style="text-align: center;">906.0 - 910.6 MHz</td> <td style="text-align: center;">916.0 - 920.6 MHz</td> </tr> <tr> <td style="text-align: center;">907.0 - 911.6 MHz</td> <td style="text-align: center;">917.0 - 921.6 MHz</td> </tr> <tr> <td style="text-align: center;">908.0 - 912.6 MHz</td> <td style="text-align: center;">918.0 - 922.6 MHz</td> </tr> <tr> <td style="text-align: center;">909.0 - 913.6 MHz</td> <td style="text-align: center;">919.0 - 923.6 MHz</td> </tr> <tr> <td style="text-align: center;">910.0 - 914.6 MHz</td> <td style="text-align: center;">920.0 - 924.6 MHz</td> </tr> </table> <p><input checked="" type="radio"/> Enable all Frequency Zones</p> <p style="text-align: right;"> <input type="button" value="OK"/> <input type="button" value="Cancel"/> </p> </div>	902.0 - 904.6 & 925.0 - 927.6 MHz	911.0 - 915.6 MHz	902.0 - 906.6 MHz	912.0 - 916.6 MHz	903.0 - 907.6 MHz	913.0 - 917.6 MHz	904.0 - 908.6 MHz	914.0 - 918.6 MHz	905.0 - 909.6 MHz	915.0 - 919.6 MHz	906.0 - 910.6 MHz	916.0 - 920.6 MHz	907.0 - 911.6 MHz	917.0 - 921.6 MHz	908.0 - 912.6 MHz	918.0 - 922.6 MHz	909.0 - 913.6 MHz	919.0 - 923.6 MHz	910.0 - 914.6 MHz	920.0 - 924.6 MHz
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905.0 - 909.6 MHz	915.0 - 919.6 MHz																					
906.0 - 910.6 MHz	916.0 - 920.6 MHz																					
907.0 - 911.6 MHz	917.0 - 921.6 MHz																					
908.0 - 912.6 MHz	918.0 - 922.6 MHz																					
909.0 - 913.6 MHz	919.0 - 923.6 MHz																					
910.0 - 914.6 MHz	920.0 - 924.6 MHz																					
	Serial Interface Setup	This section will be greyed out and unaccessible for users of WBCU radios with firmware version 2.1.0 or higher.																				
	I/O Configuration	<p>The I/O Mapping Setup allows for I/O Mapping, a Scheduler, and Encom Protocol to be set.</p> <div data-bbox="911 1583 1099 1661" style="border: 1px solid blue; padding: 5px; text-align: center; color: red; font-weight: bold;"> <p>I/O Configuration</p> </div> <p>For more information, go the section on Configuring the I/O Mapping Setup.</p>																				

Setting as a Repeater

The WBCU radio has the ability to also act as a Repeater radio in the system. In a Repeater configuration the WBCU will have two hop patterns: **Primary** and **Repeater**.

A Primary Hop pattern is used to communicate to the Master in the system. The Repeater Hop pattern will be used to only communicate to the downstream Remote radios that do not have line of site back to the Master radio.

In order to set the WBCU as a Repeater, from the **General Setup** page select the Repeater Setup button:

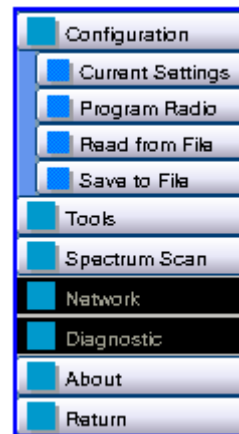


The ControlPAK software will navigate you to the **Repeater Setup Wizard**. The Repeater Setup Wizard will walk you through the process of programming as a Repeater:



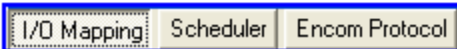
Follow the on screen steps and press the **OK** button upon completion of the Repeater Setup.

The ControlPAK software will navigate you back to the General Setup where the settings are to be reviewed and the radio programmed with the configuration by pressing the Program Radio Button on the left hand menu:



I/O Setup

The WBCU is able to have an I/O device mapped to the inputs of the radio and a schedule mapped to the radio's internal memory. The I/O Configuration button will take you to I/O Configuration Menus:

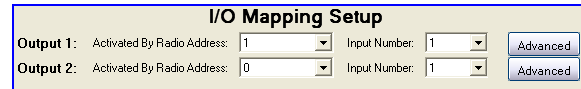
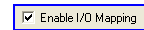


I/O Mapping Setup

The I/O Mapping is used in applications where the system requires a manual override switch to be interfaced with the WBCU.

The manual override switch can be used in systems where a certain WBCU remote unit needs to be manually overridden from its standard schedule.

Place a check mark in the Enable I/O Mapping box and this will allow the I/O Mapping Setup fields to be active:



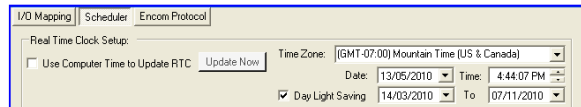
By **default** the I/O Mapping is set to be **disabled**.

Scheduler

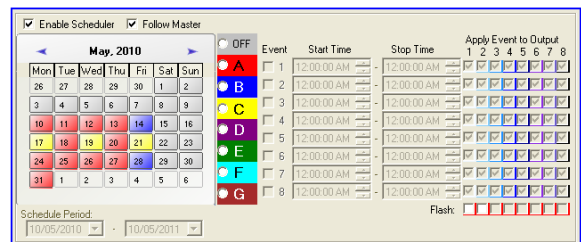
The Scheduler is used to set an independent schedule to the WBCU or to have the WBCU schedule received from a WEB I/O.

There are two sections associated with the set up:

- Real Time Clock Setup


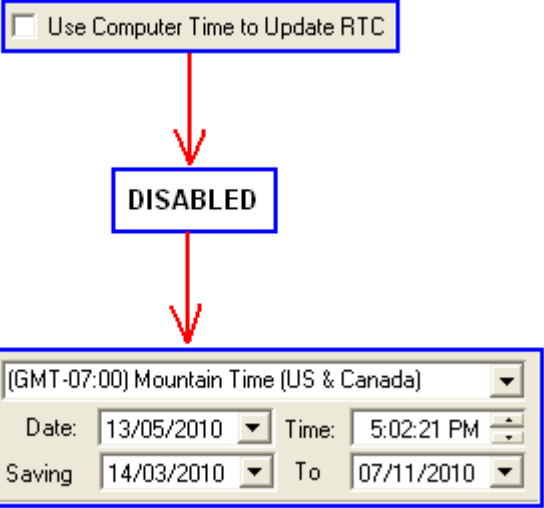
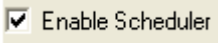
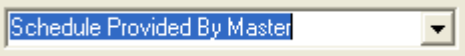



- Calendar Interface



Real Time Clock Setup

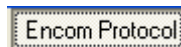
The table on the following page describes each field:

SECTION	FIELD NAME	DESCRIPTION
REAL TIME CLOCK SETUP	Use Computer Time to Update RTC	<ul style="list-style-type: none"> ➤ Check mark enabled in the Use Computer Time to Update RTC box. The WBCU will use the time on the computer to update its Real Time Clock. ➤ Press the Update Now button to synchronize the PC time to the WBCU  <ul style="list-style-type: none"> ➤ Disabling the Use Computer Time to Update RTC will allow the user to enter in the Time Zone, Date, Time, and Day Light Saving time period for the WBCU. 
SCHEDULE SETUP	Enable Scheduler	<p>By default the scheduler is always enabled. To disable the scheduler remove the check mark from the Enable Scheduler box.</p>  <p>A schedule can be either provided by a Master radio (WEB I/O) or a local schedule can be created. Use the drop down menu to select the schedule option.</p> 

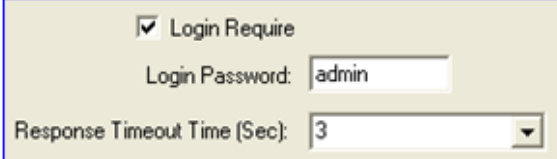
<p>CALENDAR SETUP</p>	<p>Monthly Calendar</p>	<p>The Calendar is normally Read Only. Refer to Appendix I for Standalone Operation.</p> <p>The monthly calendar displays the time events that are to occur on a particular day in a color coded format. By default, with no schedule applied to the WBCU the calendar dates will be all grey denoting no time events are scheduled:</p>  <p>The Schedule Period will reflect the start date and stop date for the stored schedule in a WBCU. By default the Schedule Period will be grayed out until a schedule is applied in the WBCU.</p>
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ENCOM Protocol

Click on the ENCOM Protocol tab to access the login parameters.



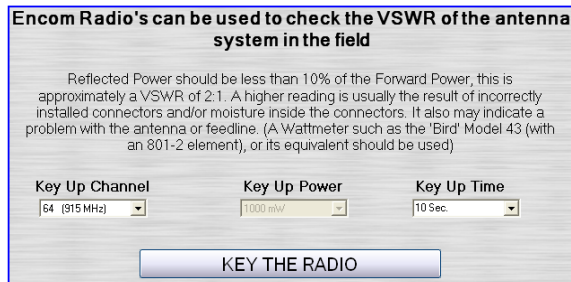
The ENCOM Protocol allows a user to set the password that is needed to log into the WBCU. The default password is: **admin**. It is recommended to keep the default password.



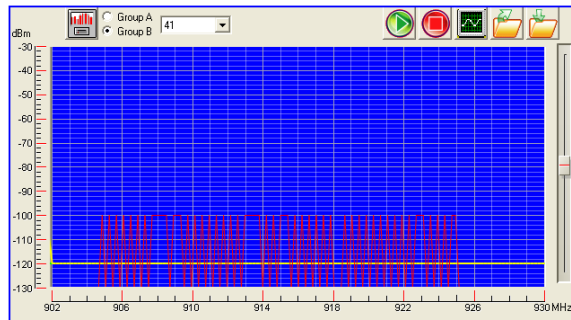
Using the Diagnostic Tools

This section describes ControlPAK’s Diagnostic Tools that are available for use. There are two Diagnostic Tools:

- VSWR Antenna Test



- Spectrum Scan Test



VSWR Antenna Test

The Voltage Standing Wave Ratio (VSWR) test measures the amount of reflected power that is traveling back into the antenna from the cable length and antenna.

The reflected power should be less than 10% of the forward power; this is approximately a VSWR ratio of 2:1.

A higher reading is usually the result of incorrectly installed connectors and/or moisture inside the connectors and/or the antenna or feedline.

It is recommended to use a Bird Wattmeter for an in depth and accurate measurement.

To run the VSWR Antenna Test:

1. Select Tools and select the frequency channel to test for reflection. By default it is set at 915 MHz.
2. Select the Key Up Time. By default it is set to 10 seconds.
3. Press Key The Radio button to start the test.

Spectrum Scan Test

The Spectrum Scan acts as a spectrum analyzer running a frequency scan across the 900MHz frequency range to analyze for noise.

A yellow line or spiked line will appear indicating the strength of the noise in a particular frequency range.

The red bars overlapping the yellow noise line indicate the current hopping pattern that is in use. In order to minimize the noise interference a different hopping pattern can be selected and overlay on the noise pattern.

To run the Spectrum Scan Test:

1. Select the red bar graph button to overlay your hopping pattern on the spectrum scan.



2. Select the hopping pattern number you are using or would like to analyze from Group A or B.
3. Press the green start button to run the spectrum analysis test. The yellow line will indicate the noise in the

environment. The red button will stop the test.



Save the Spectrum Scans for later use for technical support assistance from your local Encom Wireless dealer for your area.

Appendix I: Standalone Time Clock

The WBCU can also be used as a standalone unit that can hold a user defined schedule for operation.

From the ControlPAK login page, double click on the green square in the bottom left hand corner.

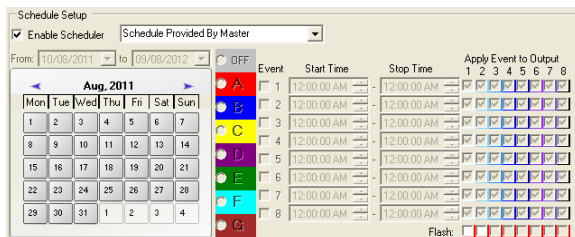


A dialogue box will appear; type in the word **radio**. You do not need to hit enter.

Go to **Contact Closure** then **Commpak I/O8**; log into the WBCU radio.

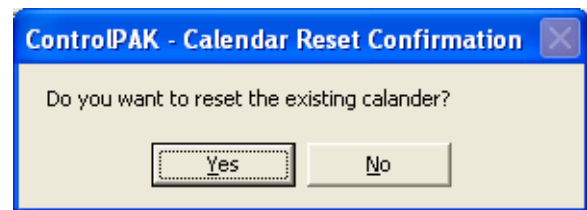
Click the **I/O Configuration** button.

The **Scheduler Tab** the **Schedule Setup** allows you to convert the WBCU to a standalone unit.



By default the WBCU option will be set to **Schedule Provided By Master**. Use the drop down menu to select **Use My Local Schedule**.

A warning will inform the user that the calendar will be reset; press Yes to continue.

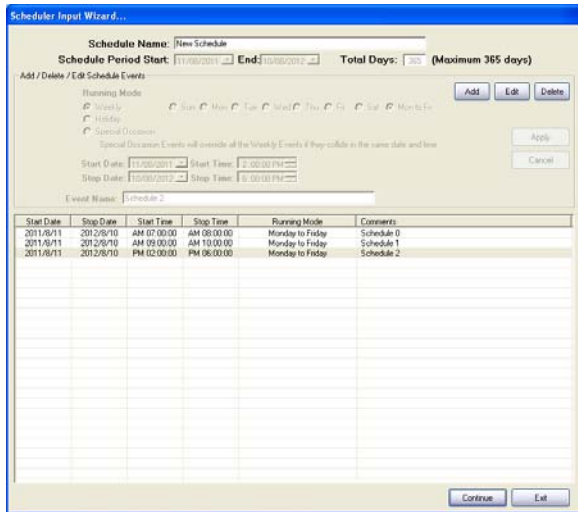


Press the **Change Schedule** button.

Change Schedule

Select **Schedule Input Wizard**. This will allow you to add in your schedule events. Press the **Add** button to activate the fields to enter in your event information. Select the necessary day, time, and name information for your event and press the **Apply** button.

This will add your event to the list. Repeat this step for each additional time event to be added to the standalone WBCU operation.



Press the **Continue** button to add the listed events into the Calendar. You will be taken back to the **Schedule Setup** portion of the software.

The calendar will now house the events that were created during the Wizard process.

Press the **Program Radio** button to download this configuration to the WBCU.

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