



## **User Manual**

Rev D

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## Disclaimer

### Information to user:

Changes not expressly approved by Sunrise Technologies Inc could void the users' authority to operate the equipment and cause unapproved FCC compliance.

The antennas used for the transceivers of the Node and gateway must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions to satisfy RF exposure compliance.

Operation is subjected to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The BB System is authorized to operate on the 2.4GHz, unlicensed short range wireless frequency band (IEEE 802.15.4 <sup>TM</sup> specifications) authorized by the Federal Communications Commission (FCC).

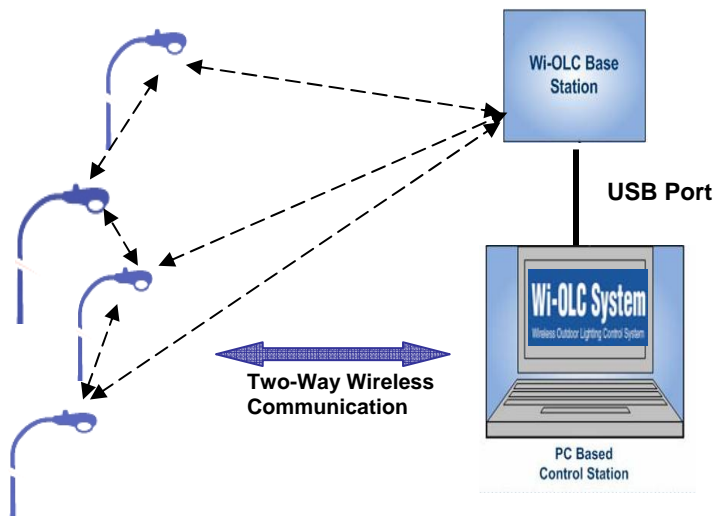
The 2.4GHz Radio Service is under the jurisdiction of the Federal Communications Commission (FCC). Any adjustments or alterations which would alter the performance of the transceiver's original FCC type acceptance, or which would change the frequency or performance are strictly prohibited.

Replacement or substitution of crystals, transistors, ICs, regulator diodes or any other part(s) of a unique nature, with parts other than those recommended by Sunrise Technologies, Inc may cause violations of the technical regulations in Part 15 of the FCC Rules or in violation of type acceptance requirements of the rules.

The FCC with its action in ET Docket 96-8 has adopted a safety standard for human exposure to radio frequency (RF) electromagnetic energy emitted by FCC certified equipment. The Sunrise Technologies Wi-OLC base Station or Photocontrol Node meet the human exposure limits found in OET Bulletin 65, and ANSI/IEEE C95.1. Proper operation of these radios in accordance to the instructions found in this manual will result in exposure substantially below FCC's recommended limits.

**The following safety precaution should be observed:**

- In order to comply with FCC RF exposure limits, the Base Station or the Photocontrol Node should be located at a minimum distance of 20 cm (8 inches) or more from the body of all persons.



## Wi-OLC Wireless Network

### System Overview

The BB System is a Personnel Computer (PC) based system designed to control outdoor lighting fixtures using a combination of photoelectric control and wireless radio technology. The Base station and BB nodes form a mesh communication network using ZigBee Pro wireless radios. The Photocontrol Node incorporates both an electronic photocontrol and radio transceiver.

The Control Panel Software specifically developed for the application performs two main functions, the first is to manage the wireless network and the second to manage the pre-defined lighting schedules.

The control Panel Software in the PC permits the user to override normal photocontrol operation on the basis of hour of the day, day, week, month and year.



**BB System Components**

## **System Requirements**

The BB system uses the following platform for the system:

- Control Panel software – Microsoft Visual Basic 6.0 with MS Access Database, on Windows 2000/XP/Vista using Intel x86 based PC (**User Supplied**).
- Base Station – Telegesis ZigBee Pro USB Dongle or Ethernet Base Station to the Control Panel PC Software.
- OLC Photocontrol Nodes – OLC Photocontrol nodes equipped with ZigBee Pro Mesh Wireless Technology.

## **Getting Started**

### **Control Panel Software/USB Driver Installation**

Install Control Panel Software on a PC dedicated to the BB system by running **Setup. bat** from CD provided. The Setup program will prompt you through the setup process.

## Connect Base Station

- a. Once the USB Driver and Control Panel Software is installed, connect Base station dongle to USB port.
- b. The computer will recognize “New Hardware Found” and it needs to be installed on the computer. Go through the **New Hardware Wizard** to install the USB Driver and a second time to install the Base station on a COM port.
- c. Restart the computer to ensure proper installation of all software components.

## PC Placement

Wireless communication from the Base station to the BB nodes can be affected by walls and other solid obstructions. To achieve maximum reliable communication with the Wi-OLC nodes locate the PC/Base station as close to an outside wall as possible.

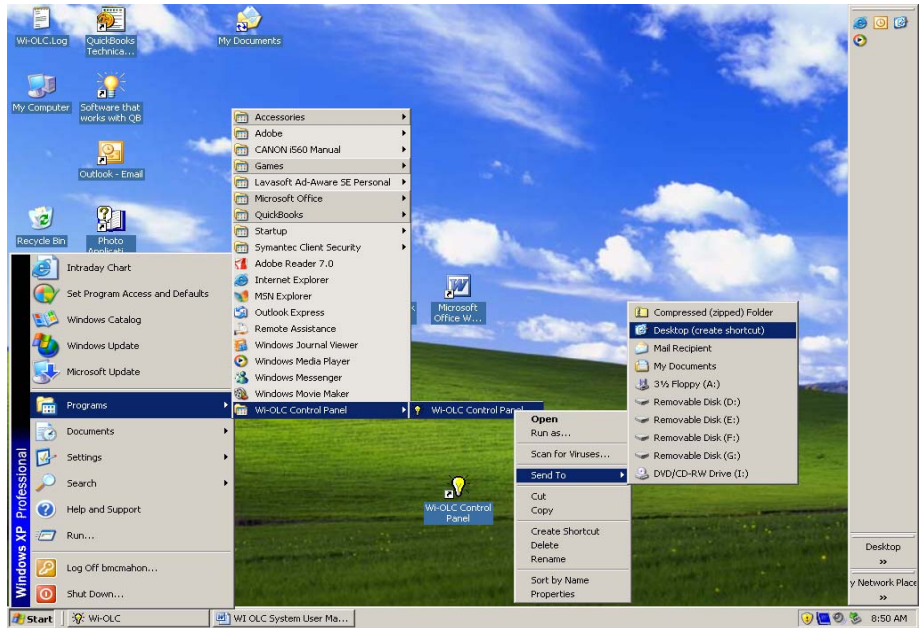
If the PC and Base Station cannot be located at an outside wall, a photocontrol receptacle and Node should be installed next to an outside wall. This will provide a communication link to the first light with Node located outside the building.

The PC must be on at all times with the Control Panel software running which permits real-time monitoring and control of lights. It is recommended that a battery back up be used to assure operation during a loss of power.

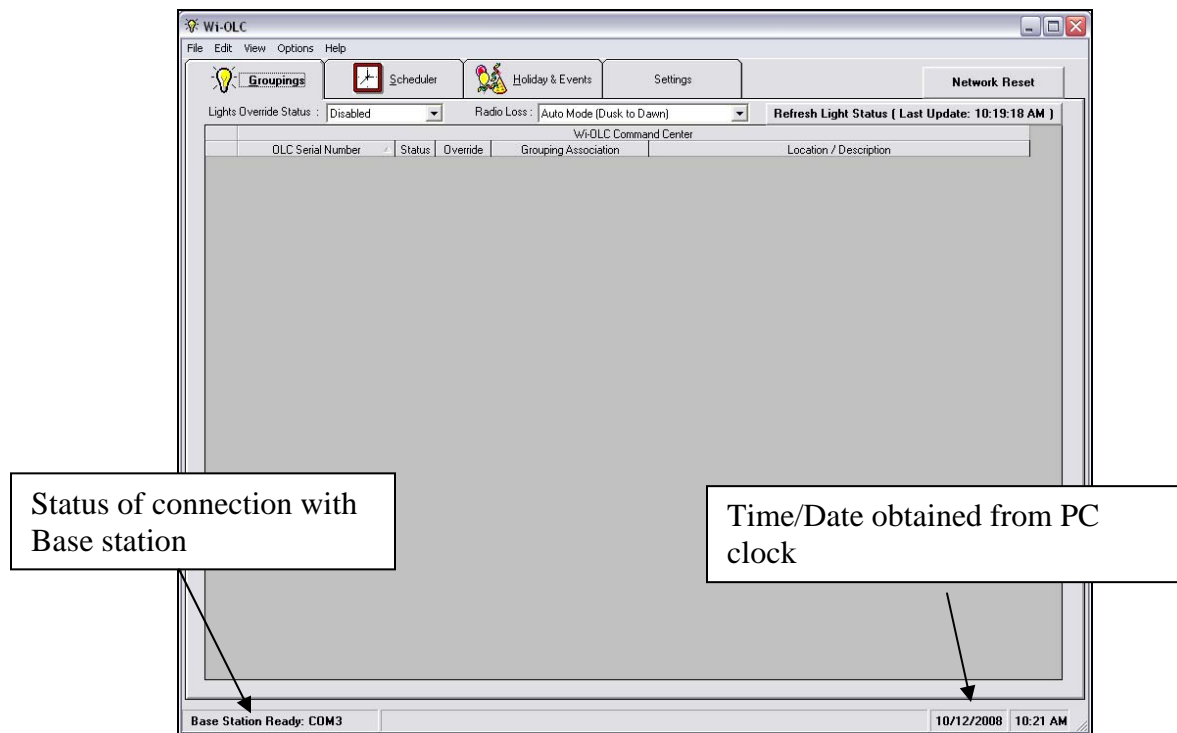
## Start Control Panel Software

1. Start the Control Panel software by going to
  - a. **“Start”** on bottom tool bar on the PC desktop.
  - b. **“Programs”**
  - c. Select **“Wi-OLC Control Panel”** folder.
  - d. Select and right click on **“Wi-OLC Control Panel”** icon,
  - e. Select **“Send to”** and now Click on **“Desktop (create shortcut)”**.
  - f. The following icon will display on the PC Desktop.



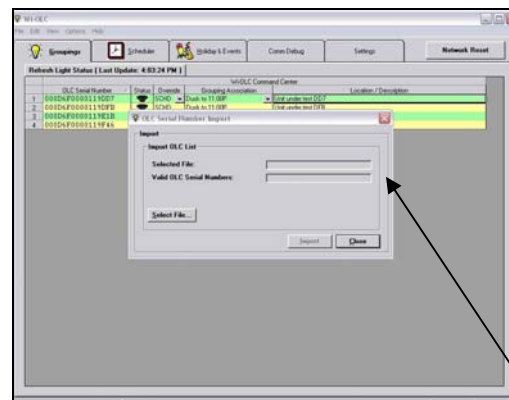


2. Double Click on the “**Wi-OLC control Panel**” icon to start the Control Panel Software. See figure below.



## Importing Wi-OLC Nodes Serial Number List

1. For the system to recognize the Wi-OLC nodes as part of this network the Wi-OLC serial numbers (MAC Addresses) must be entered into the Control Panel Database.
2. A database file with serial numbers (MAC Addresses) is provided on a CD with each set of Wi-OLC nodes supplied.
3. Insert the “**Import List**” CD.
4. The list can be imported to the Control Panel software by selecting:
  - a. File → Import OLC List..., See figure below.
  - b. Click on “Select File...” browse to the CD-ROM drive.
  - c. Under the “Files type” select “All Files (\*.\*)”.
  - d. Select “OLC List.txt” file.
  - e. Click “Open”.
  - f. Click “Import”.
  - g. Click “Close”.
  - h. Importing the Wi-OLC Nodes.

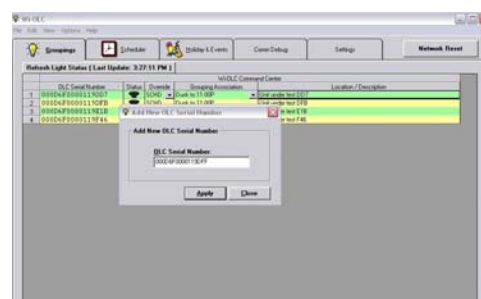


Select **File** in upper tool bar - Import OLC List....

Up Load Serial Number File

## Manual Entering BB Nodes Serial Number

1. Enter 16 digit alpha-numeric numbers into database by selecting:
  - a. File → Add OLC Serial Number..., See figure below.
  - b. Use numerical and upper case letter. Example: 000D6F00002606F6
  - c. Click “Apply”.
  - d. Click “Close”.

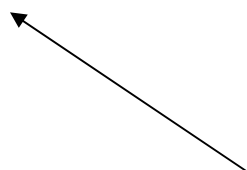


54 Commercial Street \*

) 821-1597 Fax: (508)822-0593

Select **File** in upper tool bar - Add OLC Serial Number....

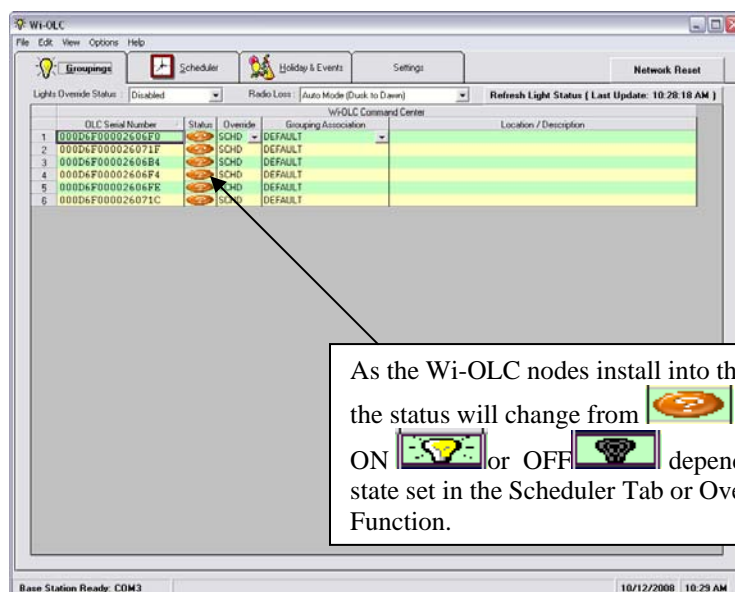




Manual Serial Number Entry

## BB Node Commissioned into Control Panel Software

The first time the Wi-OLC nodes are commissioned into the network they go through a process of finding the best RF path to the Base station. This process can take several minutes for large networks.



## Installing BB Nodes on Outdoor Light Fixtures

1. When installing Wi-OLC nodes make sure Control Panel Software is running.
2. Remove the existing photocontrol and replace it with the Wi-OLC node. An internal **RED** LED will flash and continue to flash until the Control Panel Software has confirmed the serial number is in the OLC Serial Number list in the Grouping Tab.
3. The Wi-OLC node will respond to the internal light sensor and can be “Glove Tested” to check light and fixture is working properly.

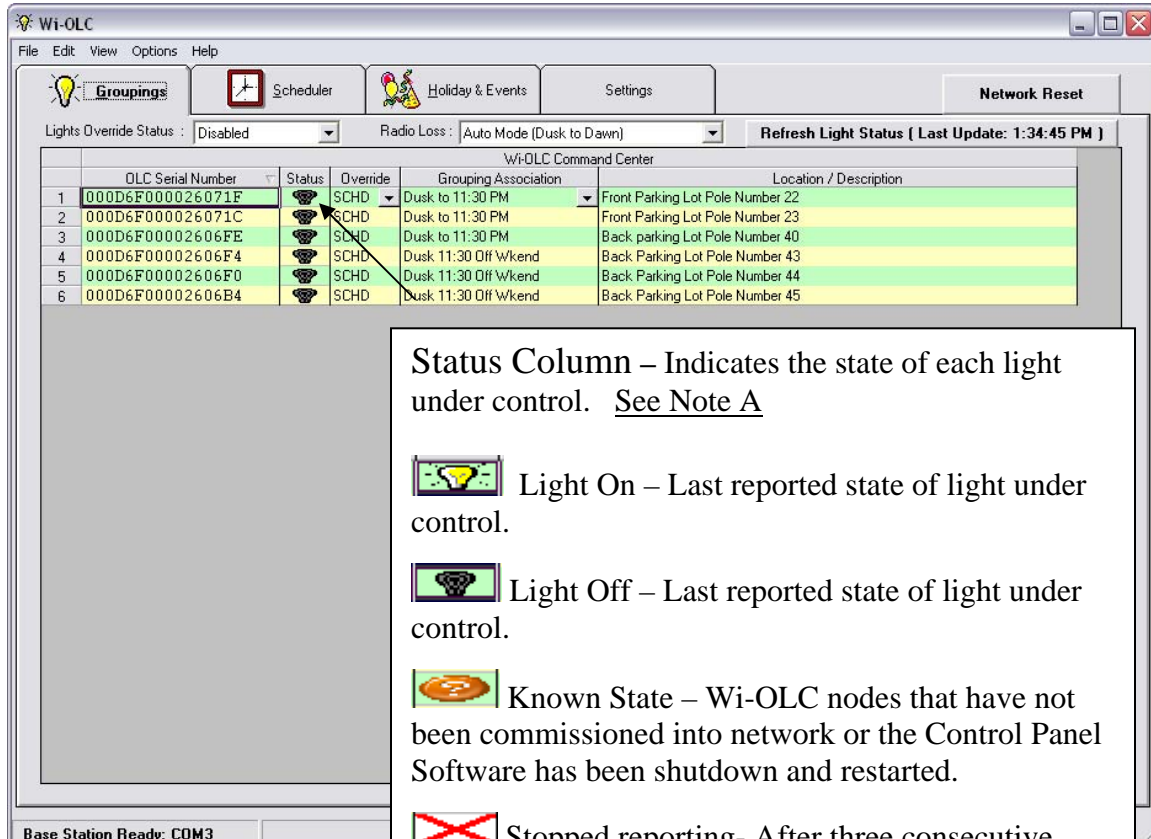


**Typical Installation**





4. Commence the node installations on the luminaires (lighting fixtures) located the shortest distance from the base station. Additional nodes should be installed progressively at a further distance from the previously installed nodes.
5. This will provide a mesh communication network. The **maximum** line of sight communication range from one node to another node is approximately **2000 feet**.

## Grouping Tab

The Group Tap is used to identify the individual Wi-OLC and assign it to a specific group of lights. This Tab is also used to describe the physical location of each Wi-OLC Node.



**Status Column** – Indicates the state of each light under control. See Note A

-  Light On – Last reported state of light under control.
-  Light Off – Last reported state of light under control.
-  Known State – Wi-OLC nodes that have not been commissioned into network or the Control Panel Software has been shutdown and restarted.
-  Stopped reporting- After three consecutive polls with no response from the Wi-OLC node, the red “X” will be displayed.

## OLC Serial Number Column

Each Wi-OLC node is assigned a serial number to identify it for network management as well as monitoring and control purposes. To delete for any reason the Wi-OLC node from the system by highlighting the record and then select Edit in the upper tool bar and the option to delete can be selected.

## Location/Description Column

In order to keep track of each Wi-OLC node a open field is provided to enter data associated with the specific installation.

**Note A:** The Light Status icons shown in the Control Panel Status column DO NOT indicate the actual on or off state of the lamp. It will show only the Photocontrol node relay contact position (open or closed).

## Groupings Tab – Continued

**Wi-OLC**

File Edit View Options Help

Groups Scheduler Holiday & Events Settings Network Reset

Lights Override Status : Disabled Radio Loss : Auto Mode (Dusk to Dawn) Refresh Light Status ( Last Update: 1:34:45 PM )

	OLC Serial Number	Status	Override	Grouping Association	Location / Description
1	000D6F000026071F		SCHD	Dusk to 11:30 PM	Front Parking Lot Pole Number 22
2	000D6F000026071C		SCHD	Dusk to 11:30 PM	Front Parking Lot Pole Number 23
3	000D6F00002606FE		SCHD	Dusk to 11:30 PM	Back Parking Lot Pole Number 40
4	000D6F00002606F4		SCHD	Dusk 11:30 Off Wkend	Back Parking Lot Pole Number 43
5	000D6F00002606F0		SCHD	Dusk 11:30 Off Wkend	Back Parking Lot Pole Number 44
6	000D6F00002606B4		SCHD	Dusk 11:30 Off Wkend	Back Parking Lot Pole Number 45

**Override Column –** Selecting **ON** or **OFF** will Override all scheduler operation for individual light. The light will need to be put back in SCHD for the light to be back under Scheduler control.

**Grouping Association Column –** This field assigns each OLC Node to specific group.

Base Station Ready: COM3 10/11/2008 1:35 PM

## Scheduler Tab

This Tab setups each of the Lighting Control Groups. Each group can be setup for 7 Day repeating schedule, Monday-Friday, Weekend and many other schedule combinations.

**State Column**

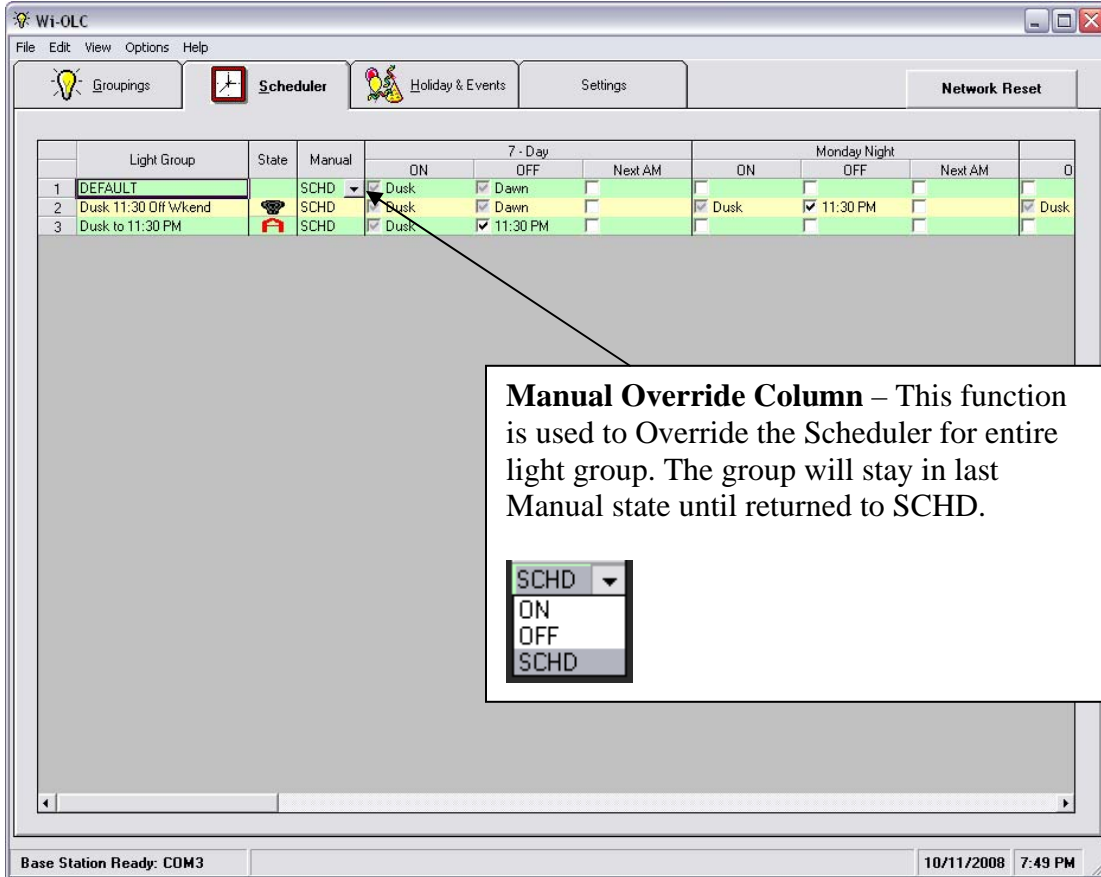
- Blank indicates group is not used to control any of Wi-OLC nodes or Group is under Manual Control.
- Light group Off and under control of the Scheduler.
- Light group is On and under control the Scheduler.
- Light group is in Auto State, meaning the light is under local control of the internal light sensor in Wi-OLC node.

Base Station Ready: COM3

## Light Group Column

Light control groups are added in the Groups tab by Selecting **Add Group** in the Group Association Column or by selecting File in the upper Tool Bar and selecting Add Group. Once the Group is added it can setup with a Schedule.

## Scheduler Tab - Continued



**Manual Override Column** – This function is used to Override the Scheduler for entire light group. The group will stay in last Manual state until returned to SCHD.

SCHD  
ON  
OFF  
SCHD

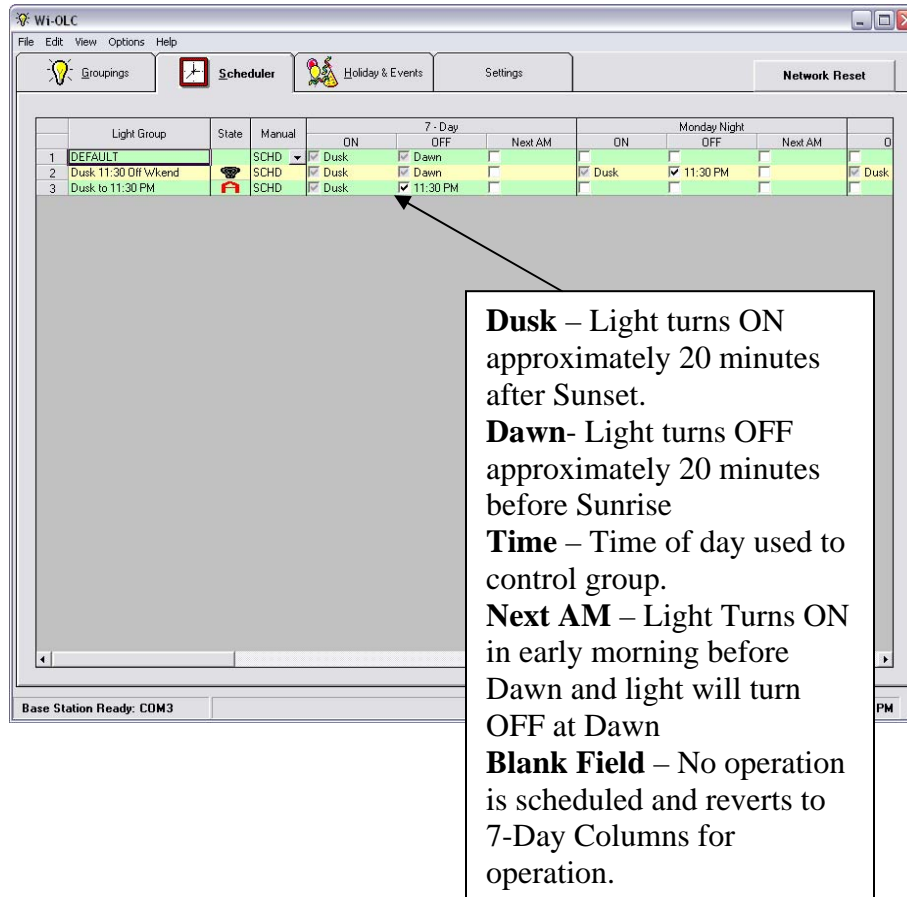
Light Group	State	Manual	ON	7 - Day OFF	Next AM	ON	Monday Night OFF	Next AM	0
1 DEFAULT	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> Dawn		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM	<input checked="" type="checkbox"/> Dusk	
2 Dusk 11:30 Off Wkend	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> Dawn		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM	<input checked="" type="checkbox"/> Dusk	
3 Dusk to 11:30 PM	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM	<input checked="" type="checkbox"/> Dusk	

Base Station Ready: COM3 10/11/2008 7:49 PM

## Scheduler Tab –Continued

### BB Node Scheduling

The scheduler's logic works from left to right. The default setting is for Dusk to Dawn operation on a 7-Day schedule. Any changes made to the columns to the right will override the 7-Day schedule.



Light Group	State	Manual	7 - Day			Monday Night		
			ON	OFF	Next AM	ON	OFF	Next AM
1 DEFAULT	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> Dawn				
2 Dusk 11:30 Off Wknd	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> Dawn		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM	<input checked="" type="checkbox"/> Dusk
3 Dusk to 11:30 PM	SCHD		<input checked="" type="checkbox"/> Dusk	<input checked="" type="checkbox"/> 11:30 PM				

**Dusk** – Light turns ON approximately 20 minutes after Sunset.  
**Dawn**- Light turns OFF approximately 20 minutes before Sunrise  
**Time** – Time of day used to control group.  
**Next AM** – Light Turns ON in early morning before Dawn and light will turn OFF at Dawn  
**Blank Field** – No operation is scheduled and reverts to 7-Day Columns for operation.

### On/Off/Next AM Columns

The Scheduler can be setup on a 7-Day repeating schedule for different times for each day of the week. There are also columns provided for Holidays and Special Events that permit on/off schedules other than normal operation.

## Scheduler Tab –Continued

### Disable Light Group for Entire Night

Selecting OFF in both ON and OFF columns keeps lights off for an entire night.

The screenshot shows the Scheduler Tab interface with a table of light group schedules. The table has columns for Light Group, State, Manual, and scheduling options for Saturday Night, Sunday Night, and Holiday. A callout box highlights the 'OFF' selection in the 'ON' and 'OFF' columns for Saturday Night.

Light Group	State	Manual	Saturday Night			Sunday Night			Holiday		
			ON	OFF	Next AM	ON	OFF	Next AM	ON	OFF	Next AM
1 DEFAULT	SCHD										
2 Dusk 11:30 Off W/Weekend	SCHD		OFF	OFF		OFF	OFF		OFF	OFF	
3 Dusk to 11:30 PM	SCHD										

A selection is provided in both ON and OFF Columns to keep light Off for all night.

OFF  
Dusk  
OFF

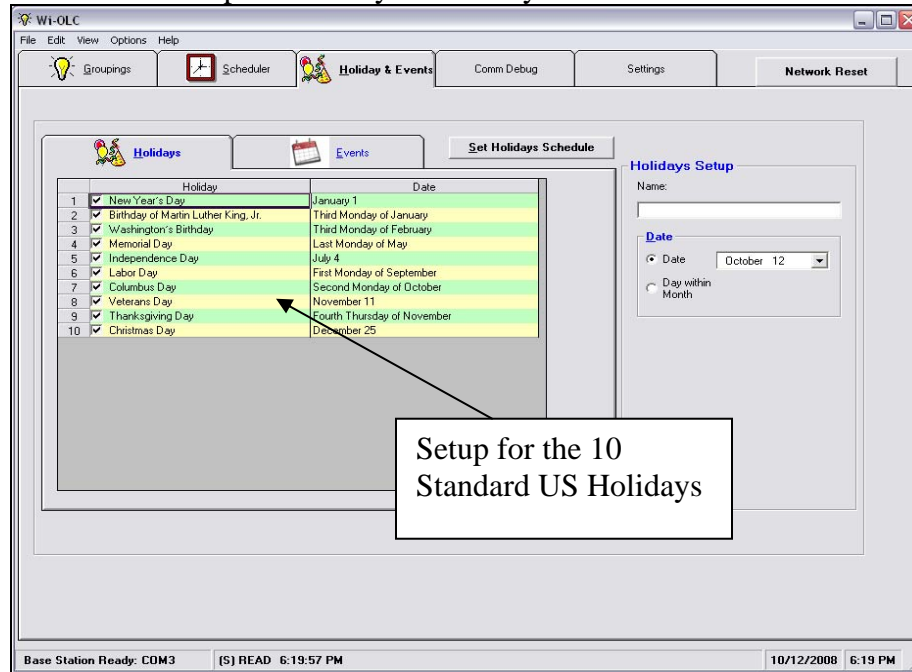
Base Station Ready: COM3 10/12/2008 11:35 AM



## Holiday & Events Tab

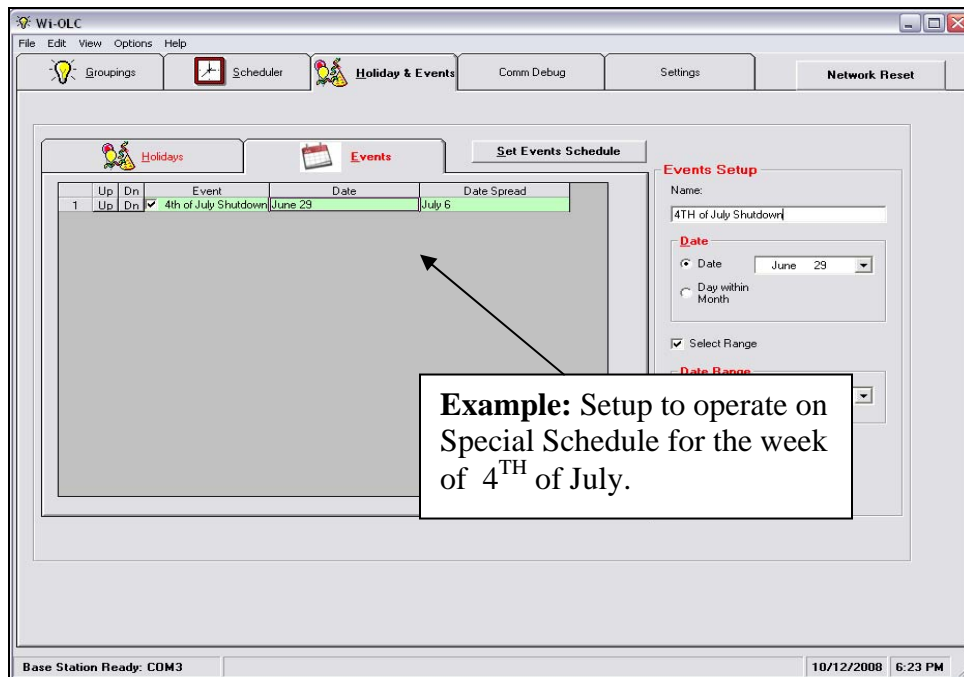
### Holiday Tap

This section sets up the holidays for use by the Scheduler.



### Special Events Tap

The option is available to setup a string continuous days to act as a special Event period.



## Network Reset Command

Upon receiving a Network Reset message from the Control Panel, the OLC nodes perform a network initialization. Network reset institutes the “join the network” procedure and resets the Base station.

The screenshot shows the Wi-OLC software interface. At the top, there are tabs for Groupings, Scheduler, Holiday & Events, Settings, and Network Reset. Below the tabs, there are dropdown menus for Lights Override Status (Disabled) and Radio Loss (Auto Mode [Dusk to Dawn]). A button labeled 'Refresh Light Status ( Last Update: 10:28:18 AM )' is visible. Below these, there is a table titled 'Wi-OLC Command Center' with columns for OLC Serial Number, Status, Override, Grouping Association, and Location / Description. The table contains six rows of data, each with a status icon of a light bulb. A callout box points to the status icons, stating: 'The state of the Wi-OLC nodes are changed to indicating unknown state.' Another callout box points to the 'Network Reset' button, stating: 'Pressing Network Reset will send out a reset command to All Wi-OLC nodes in network and re-connect the Base Station to the Control Panel software. Depending on the number of Wi-OLC nodes it may take several minutes.'

	OLC Serial Number	Status	Override	Grouping Association	Location / Description
1	000D6F00002606F0		SCHD	DEFAULT	
2	000D6F000026071F		SCHD	DEFAULT	
3	000D6F00002606B4		SCHD	DEFAULT	
4	000D6F00002606F4		SCHD	DEFAULT	
5	000D6F00002606FE		SCHD	DEFAULT	
6	000D6F000026071C		SCHD	DEFAULT	

Base Station Ready: COM3

## Override Feature

An override function is provided in the case all schedules need to be overridden and all lights are to be turned ON or OFF immediately.

The screenshot shows the Wi-OLC software interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Options', and 'Help'. Below the menu bar are several tabs: 'Groupings', 'Scheduler', 'Holiday & Events', 'Settings', and 'Network Reset'. The 'Lights Override Status' is currently set to 'Disabled'. A dropdown menu is open, showing the following options: 'Disabled', 'All Lights ON', 'All Lights OFF', and 'All Lights Auto'. The 'All Lights Auto' option is highlighted. Below the dropdown menu, there is a table with the following columns: 'OLC Serial Number', 'Status', 'Override', 'Grouping Association', and 'Location / Description'. The table contains six rows of data, each representing a different light pole. The status of all lights is currently 'SCHD' (Schedule).

**Lights Override Status Dropdown Box**  
Selecting **All Lights ON** or **All Lights OFF** will turn lights ON or OFF until commanded to return from Override state.

Selecting **All Lights Auto** puts all the lights into Dusk to Dawn control (Wi-OLC node internal light sensor) until commanded to return from Override state.

OLC Serial Number	Status	Override	Grouping Association	Location / Description
000D6F000026071F	SCHD	SCHD	Dusk to 11:30 PM	Front Parking Lot Pole Number 22
000D6F000026071C	SCHD	SCHD	Dusk to 11:30 PM	Front Parking Lot Pole Number 23
000D6F00002606FE	SCHD	SCHD	Dusk to 11:30 PM	Back parking Lot Pole Number 40
000D6F00002606F4	SCHD	SCHD	Dusk 11:30 Off Wknd	Back Parking Lot Pole Number 43
000D6F00002606F0	SCHD	SCHD	Dusk 11:30 Off Wknd	Back Parking Lot Pole Number 44
000D6F00002606B4	SCHD	SCHD	Dusk 11:30 Off Wknd	Back Parking Lot Pole Number 45

Base Station Ready: COM3

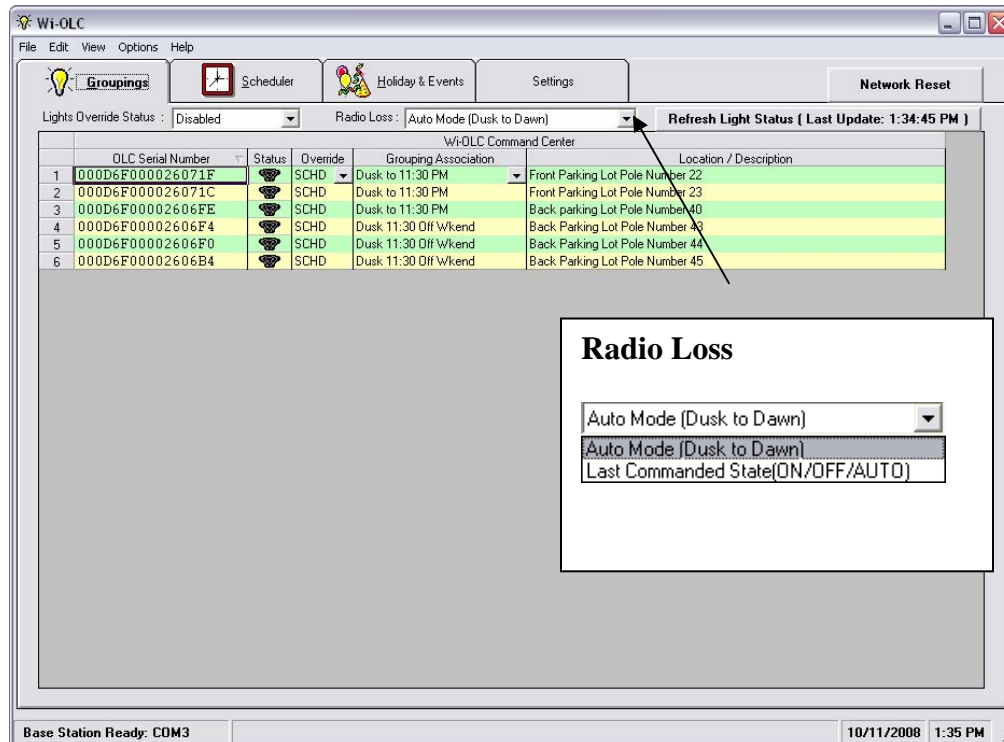
10/11/2008 1:35 PM

## Disable (Override)

In order to return lights to their normal Schedules, the **Disable** function must be selected. This will send a command to the all BB nodes to return to normal schedules.

## Radio Loss Feature

The Loss of Radio function to the node can occur if the Control Panel Software is shutdown or there is a failure in the Base station. If for any reason BB nodes do not receive a periodic Poll Request from the Control Panel for 3 Polling Periods it will go to the **Loss of Radio** mode of Operation.



### Auto Mode (Dusk to Dawn)

Selecting Auto in Radio Loss Section mode will cause the BB nodes to revert to local control using its internal light sensor and turn the light ON at Dusk and OFF at Dawn.

### Last Commanded State

Selecting Last Commanded state in Radio Loss will cause the lights to remain in there last commanded state (ON/OFF/Auto).

**NODE BAR CODE LABEL****LOCATION**
