This document contains information on using the eBookingonline.net windows application for controlling lighting and or heating. This application is supported on Windows 8 and Windows 10 and is installed on a PC on your local site.
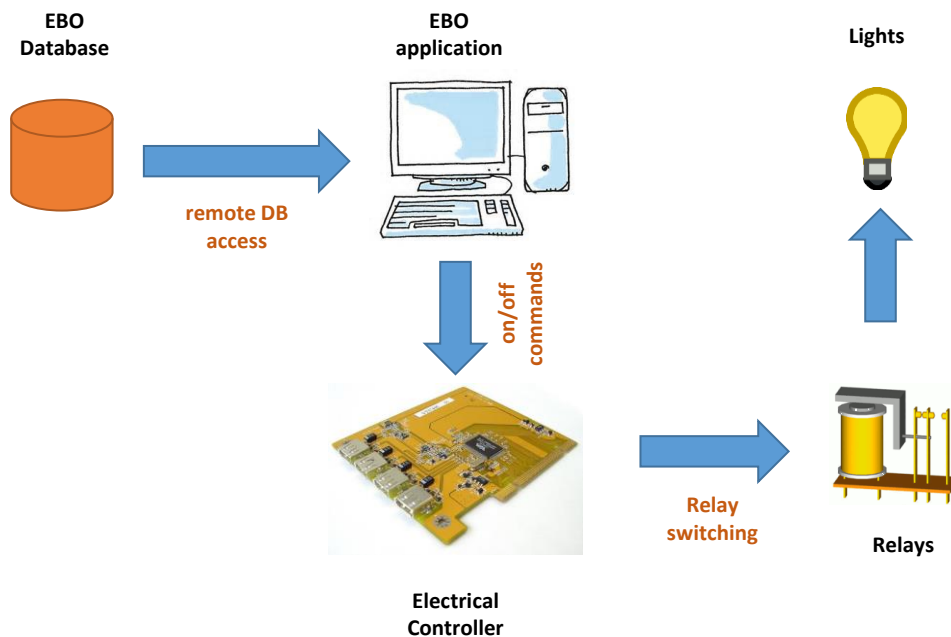
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Warning

Please consult a qualified Electrician for your region and building type. This document does not detail electrical specifications as these will be specific to your building and local electrical compliance laws and standards. This document details the communication of the system and not the electrical switching of the system. eBookingonline.net cannot be held responsible for any electrical faults resulting in any loss.

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About

Controlling lighting or any other electrical system is performed using electrical relays (switches) that are controlled by a central or distributed controller. A small windows based application, supplied by eBookingOnline.net, interfaces the eBookingOnline.net database containing your online bookings with these controllers sending the appropriate messages to either switch on or switch off the relays / switches.

The following diagram illustrates this basic concept.

EBO Database — remote DB access → EBO application — on/off commands → Electrical Controller — Relay switching → Relays → Lights

Prerequisites

In order to communicate with the EBO database remote access will need to be enabled. This allows communication from your club computer hosting the EBO application directly with the database. For security reasons the database is protected by a firewall, to allow communication a static IP address needs to be added to the firewall in order for this system to work. Remote database access is enabled through the main page of the Admin Panel and is detailed in the Administration Guide.

You will also need a Windows based computer to run the application. This computer must use the external IP Address supplied as part of the Remote Database Access request. It is recommended that this be the same computer used by members at your club, for example a Kiosk based system. The PC should not be configured to shut down or enter any sleep mode as the application runs in real-time it needs to be running constantly. Power plans that shutdown monitors or hard disks are fine. Currently the following versions of Windows are supported:

- Windows 8.1
- Windows 10

How does it Work?

Using your unique remote database username and password booking details for the next 24 hours are downloaded from the online system to the local application, the process is then repeated every 3 minutes. This allows the application to have an up to date image of the online bookings and in the event of local Internet failure a snapshot of bookings for the next 24 hours, this enables the local switching of lighting and is known as 'offline' mode. Any bookings made whilst the application is working in 'offline' mode will not available to the application and as such court lighting will not be switched. Once Internet connectivity is restored the application will resume as normal.

The application maps individual courts with addresses in the controllers and checks for bookings every minute. If the court is booked then the application sends an 'ON' message for that court, if not then it sends an 'OFF' message. The controllers are then responsible for switching the associated relay, which in turn switches the electrical circuit for the lights / heating.

The status of the court lights and all upcoming bookings can be viewed using the application but they cannot be switched on or off manually. It is recommended that your electrician installs a bypass system so that lights can be manually turned on and off, e.g. for maintenance.

What Controllers can be used?

There are four types of controllers that eBookingOnline.net support. The preferred model for new installations is the BEM105 controller from Brick Electric (Modbus edition) or the Yotta Control 1869. Please note that the USR devices are still listed for existing clients but in general are no longer available. The latest software has been written using a standard known as MODBUS TCP , so in theory any Modbus TCP compatible controller should work but at the time of writing only the BEM105 and Yotta 1860/1869 has been tested by eBookingonline.net.

1. **Yotta Control 1860 / 1869 –** The Yotta controllers provide 4 relays and 8 relays respectively. They support the Modbus TCP standard using an inbuilt Ethernet (100 Mbps) port. The unit will require an external power supply or can be powered by the micro USB port. Essentially it is an IP enabled device connecting to your local network through wired Ethernet to electrical circuits. In this configuration the application sends ON/OFF messages directly to the controllers over the Ethernet. Typically, the controllers would be located near to the distribution panel for the electrical wiring system. Please note that the device has a total limit of 10 amps @ 240vac, it is advised when using this model for multiple lighting circuits to use external relays that are rated at the appropriate level. In this way the Yotta controller is switching an external relay, which in turn switches the lighting circuit.

2. **BEM105 Modbus Edition -** The BEM105 from Brick Electric is one of the preferred solutions for controlling lighting. It controls up to four circuits and connects through an inbuilt RJ45 Ethernet port. If more than four circuits are required then multiple controllers can be used. Essentially it is an IP enabled device connecting to your local network through wired Ethernet to electrical circuits. In this configuration the application sends ON/OFF messages directly to the controllers over the Ethernet. Typically, in this configuration the controllers would be located near to the distribution panel for the electrical wiring system. Please note that the device has a total limit of 10 amps @ 240vac, it is advised when using this model for multiple lighting circuits to use external relays that are rated at the appropriate level. In this way the BEM controller is switching an external relay, which in turn switches the lighting circuit.

3. **USR-IO808 EWR Ethernet Controllers (end of life)** The USR IO808 has many controls and inputs, including 8 relays which the EBO application can control the lighting for up to 8 courts. Essentially it is an IP enabled device connecting to your local network either through WIFI or wired Ethernet. In this configuration the application sends ON/OFF messages directly to the controllers over the Wi-Fi or Ethernet. Typically, in this configuration the controllers would be located near to the distribution panel for the electrical wiring system. Please note that the 8-channel device has a total limit of 10 amps @ 240vac, it is advised when using this model for multiple lighting circuits to use external relays that are rated at the appropriate level. In this way the USR controller is switching an external relay, which in turn switches the lighting circuit.

4. **USR-WIFI-IO-83 Ethernet Controllers (end of life)** – These are older USR devices are IP enabled devices and can be controlled either via Wi-Fi or wired Ethernet depending on model. Typically, these devices combine the controller and relay into one unit. As such there is no additional hardware required for the computer hosting the EBO application. In this configuration the application sends ON/OFF messages directly to the controllers over the Wi-Fi or Ethernet.

Typically, in this configuration the controllers would be located near to the distribution panel for the electrical wiring system. Please note that the 8-channel device has a total limit of 10 amps @ 240vac, it is advised when using this model for multiple lighting circuits to use external relays that are rated at the appropriate level. In this way the USR controller is switching an external relay, which in turn switches the lighting circuit.

Configuration of the Courts

Before installing any software configure each court with the correct lighting / heating address in the Admin Panel. It is this IP address that makes the association with each court to the controller. The IP Address you enter is the IP address that you assign to the controller, along with the channel number of the associated relay. For USR-WIFI-IO-83 devices also enter the administration password; this is not used by later USR devices. To enable lights for each court, check the ***enable lighting controls*** check box.

The lighting cost is optional, if supplied this will be used in addition to any other court costs to calculate the total cost of the booking.

There are a few configurable parameters that can be used when to enable the lights, varying the time against the booking time.

Light Offset   This is the time in minutes that the lights will be switched on *before* the time of the booking. This may be useful for outdoor lighting when the lights need to warm up first, or for staggering lighting start up times to reduce power surges.

Night Only   Check this box if lights are only to be used after sunset, typically this is required for outdoor lighting. This requires the longitude and latitude of your location to be configured in the global system configuration. Having these co-ordinates, the system is able to calculate the local sunset time and will offer the option for members at booking time to select whether or not to use the lights.

Bookings that have an end time later than local sunset will be given this option. For special events the lights will be selected by default.

Disable Night Lights Selection By default members will be offered lights when they make a booking, this is dependant on the sunset offset. Checking this box disables this feature, meaning members will have the lights selected automatically for them and charged accordingly

Sunset Offset This option is used in conjunction with night only. The default behaviour for night only is to allow the use of lights after sunset. This offset allows the selection of lights to be adjusted in minutes before sunset. The following is an example to explain this further.

Local Sunset time 19:23

Light Offset is 8 minutes

Sunset Offset is 30 mins

Each court is configured for 30 min slots on the hour and half hour

Court Booking Time	Time Lights will be allowed	Lights Offered	Lights switched on at
18:00 – 18:30	19:23 – 30 mins = 18:53	✘	
18:30 – 19:00	19:23 – 30 mins = 18:53	✓	18:30 – 8 = 18:22
19:00 – 19:30	19:23 – 30 mins = 18:53	✓	19:00 – 8 = 18:52

Yotta Controller Installation

Each Yotta controller requires a static IP address, this can either be manually configured or allocated statically by a DHCP server. The address given to the controller needs to be unique and not be part of the local DHCP scope. For the purposes of this example the address of 192.168.0.51 will be used with a subnet mask of 255.255.255.0. You will need to determine the best IP Address to use by referencing your existing network configurations, typically the broadband router.

A suitable power supply of 10-30V dc will also need to be connected to each device.

1. Install the **Yotta Utility** and **Yotta USB Driver** under the REMOTE CONTROL section from http://www.yottacontrol.com/download.html
2. Connect a suitable DC power source to the controller as defined in the Yotta documentation at http://www.yottacontrol.com/download/10X_DM_E.pdf
3. Connect a micro USB cable from the Yotta Controller to the PC with the Yotta Utility and USB Driver software installed.
4. Set the switch on the back of the Yotta controller from NORM to INIT
5. Run the Yotta Utility from the PC

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DO NOT RUN THE YOTTA UTILITY AND THE EBO APPLICATION AT THE SAME TIME

– EVEN FROM DIFFERENT DEVICES

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6. The Yotta Utility will list a number of COM ports. Select the COM port the PC has assigned to the Yotta Controller Driver (COM8 in the example below) and click on the Binoculars (Find Icon)
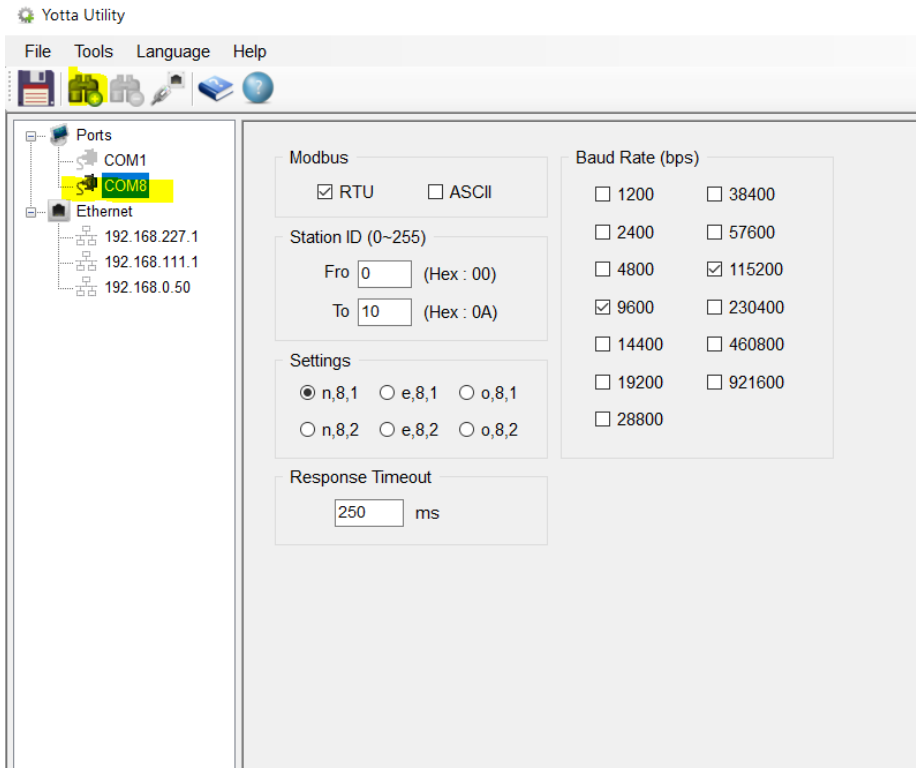

7. If successful, the Yotta Utility will list the discovered controllers under the COM port listing
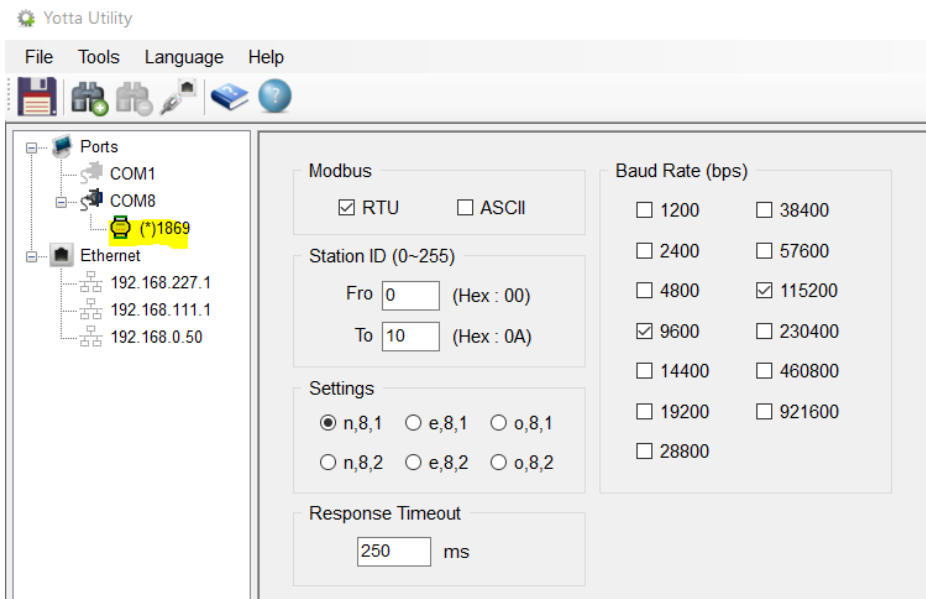
8. Click on this Controller ICON to configure the controller.

9. Click on the **Ethernet Settings** tab and set the following parameters:
    a. Device – 0
    b. Protocol – Modbus TCP/IP
    c. IP address – enter the static IP address, mask and gateway you have assigned from your network. The gateway is optional and only required on a routed network.
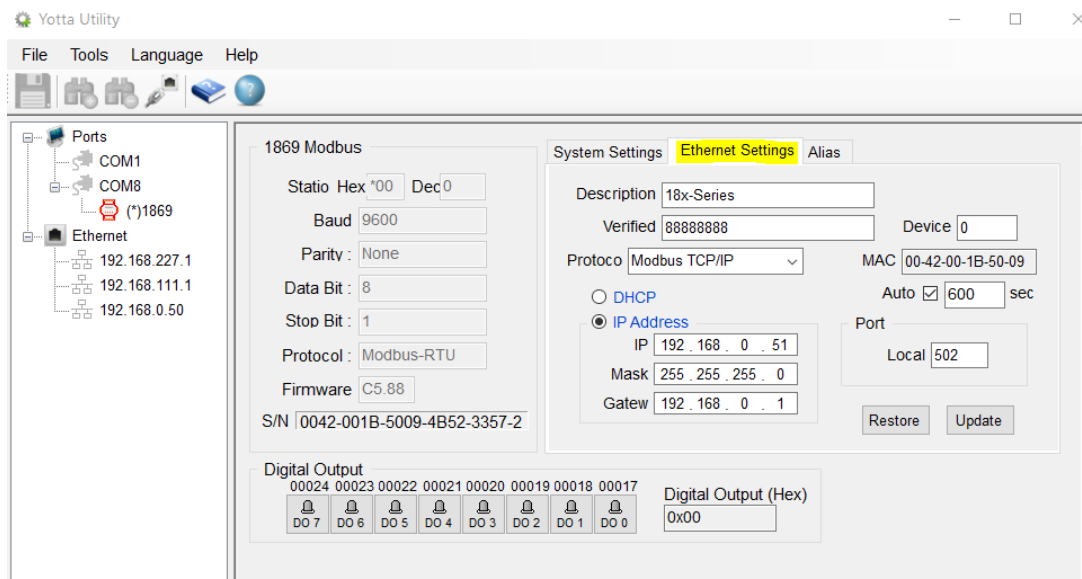
10. Click on **Update** when complete
11. The Yotta Device is now configured. Place the switch on the back to **NORM**, disconnect the USB cable and connect the Yotta Controller to your network using an Ethernet cable.
12. The Yotta Utility will show your COM port as disconnected. Restart the Yotta Utility.
13. To reconnect to the Yotta Controller over the Network select your Local area Network under the **Ethernet** section, change the **Remote** Server IP address to the IP address of your controller and click FIND icon (Binoculars)
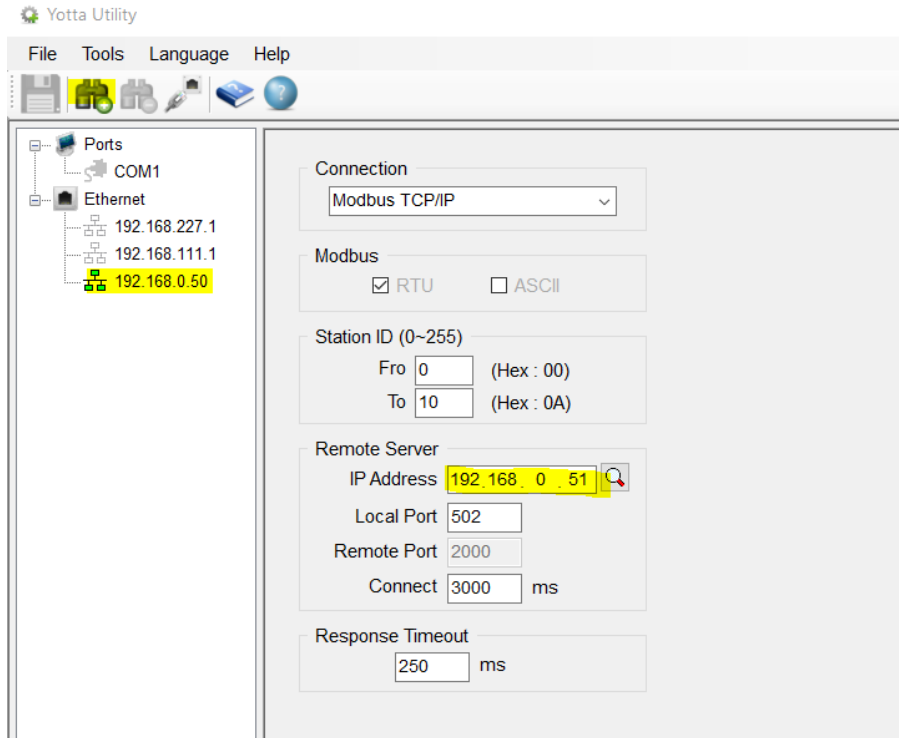
14. If successful the Controller will be listed under the Network. Click on this ICON to control the controller. Please note that you cannot change configuration settings in this mode. These can only be changed via the COM port.
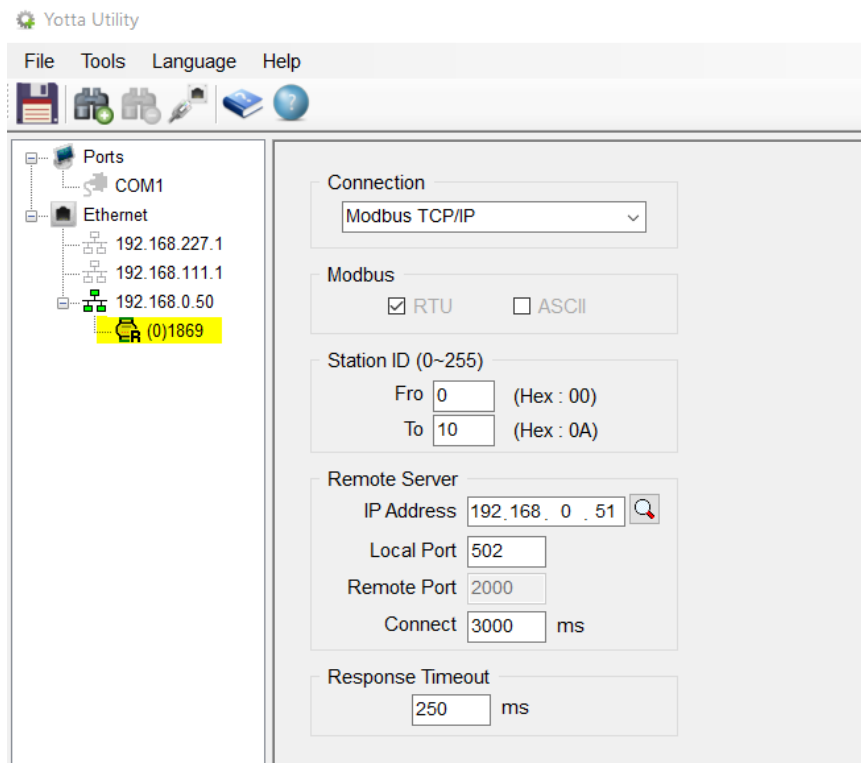
15. You can use this Utility to turn on / off the Digital Outputs (relays) by clicking on the ICON as shown below.
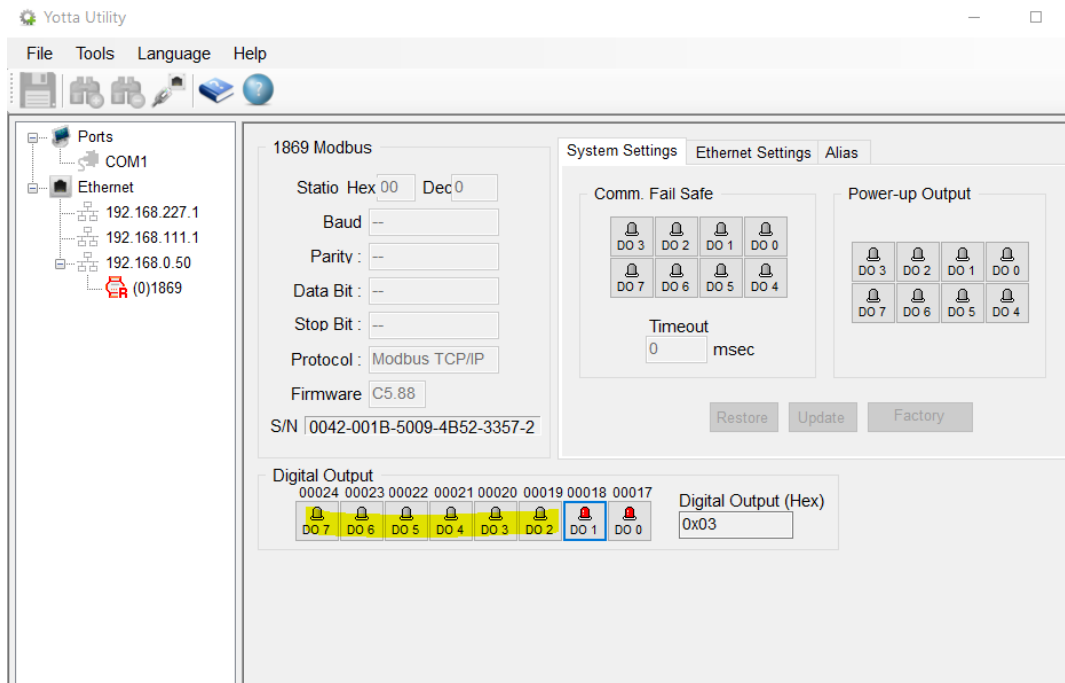
16. Exit the utility once complete.

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DO NOT RUN THE YOTTA UTILITY AND THE EBO APPLICATION AT THE SAME TIME – EVEN FROM DIFFERENT DEVICES

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BEM105 Installation

Each BEM105 controller requires a static IP address, this can either be manually configured or allocated statically by a DHCP server. The address given to the controller needs to be unique and not be part of the local DHCP scope. For the purposes of this example the address of 192.168.0.78 will be used with a subnet mask of 255.255.255.0. You will need to determine the best IP Address to use by referencing your existing network configurations, typically the broadband router.

A suitable power supply of 5-24V dc will also need to be connected to each device.

The BEM105 devices have an initial IP Address of 192.168.1.105 with a subnet mask of 255.255.255.0. To configure each device you will need to connect a PC to the same network as the BEM controller, for example setting the PC to IP address 192.168.1.106 subnet mask 255.255.255.0. You should be able to ping 192.168.1.105 from the PC to be able to continue.

The BEM105 is configured through a web browser by issuing commands to it. The first command is to set the IP address to your preferred value for your network. These parameters have no effect until they are saved and the device reboots:

1. Set IP address using the web browser url - http://192.168.1.105/ipaddr=*192.168.0.78*
2. Set Subnet Mask using the web browser url - http://192.168.1.105/netmask=*255.255.255.0*
3. You can optionally set the default gateway but in most cases this is not needed as the controller will sit on the same network as the controlling PC.
4. Save the configuration using the url - http://192.168.1.105/save=1
5. Reboot the device using the url - http://192.168.1.105/reboot=1

Once connected to your live network you should be able to ping the device on its new IP address.

To test switching on/off circuits you can use the following commands again through a web browser.

Switch on channel 1 - http://*device_ip*/k01=1

Switch off channel 1 - http://*device_ip*/k01=0

We also recommend setting a password for the device for security purposes, they are 6 characters in length:

Enable password protection - http://*device_ip*/pwenable=1

Change the default password of 123456 to abcdef - http://192.168.1.105/ pw=123456&newpw=abcdef

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For further information please consult the BEM105 full documentation at
https://brickelectric.com

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To continue the installation of PC controller software please go to the section **Installing the EBO Package to Manage the Controller**

USR-IO808-EWR Relay installation

The USR-IO808 EWR wifi controller requires a static IP address, this can either be manually configured or allocated statically by a DHCP server. The address given to the controller needs to be unique and not be part of the local DHCP scope. For the purposes of this example the address of 192.168.0.78 will be used with a subnet mask of 255.255.255.0. You will need to determine the best IP Address to use by referencing your existing network configurations, typically the broadband router.

The USR devices are initially configured through a Web GUI. When first powered on the controller will act as a Wifi Access Port with a SSID of USR-WIFIO-83. The first task is to connect a PC or tablet to this wireless network and reconfigure the USR device with the correct IP address and mode of STA.

1. Power on the USR device and connect a wireless device to the wifi network SSID **IO808-EWR**, the default password is **www.usr.cn**
2. Once connected point the device's browser to http://192.168.10.1. The default username and password are both **admin** (lowercase).
3. The opening page for Working Mode Selection should be displayed. Select **STA Mode** and click on Apply but do not restart the system

4. From the left hand menu select STA Interface Settings. Set the AP's SSID to your local WIFI network along with the security type and pass phrase. In the WAN connection drop dropdown select STATIC (fixed IP) and complete the form with the IP address assigned for your USR controller Click on Apply but do not restart the system

5. From the left hand menu select Device Management. It is strongly recommended to change the Admin default password. Once complete Click on the restart button to affect changes.

You can use the USR installation package to control and test the USR controller. This is available from www.usriot.com , the version at the time of this document is V1.1.00


Once unzipped and installed on a PC running on the same network, the following screen will be displayed. Click on the **By TCP** icon highlight below, and then click on **Search Dev**:
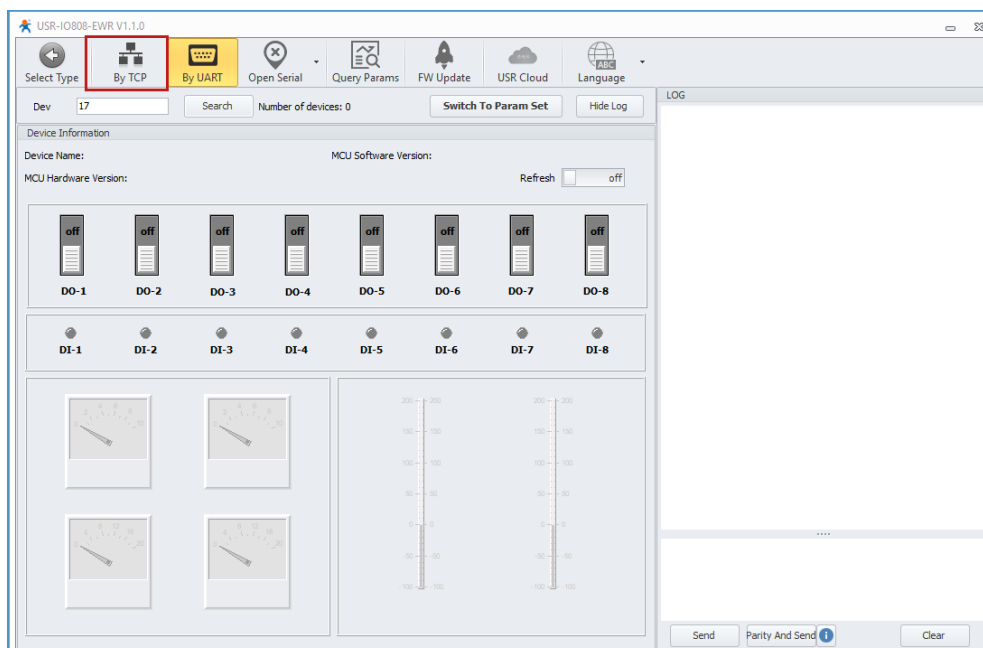
If successful communication is established between the PC and the Controller then there should be a green message with the IP address of the USR controller in the Log pane.
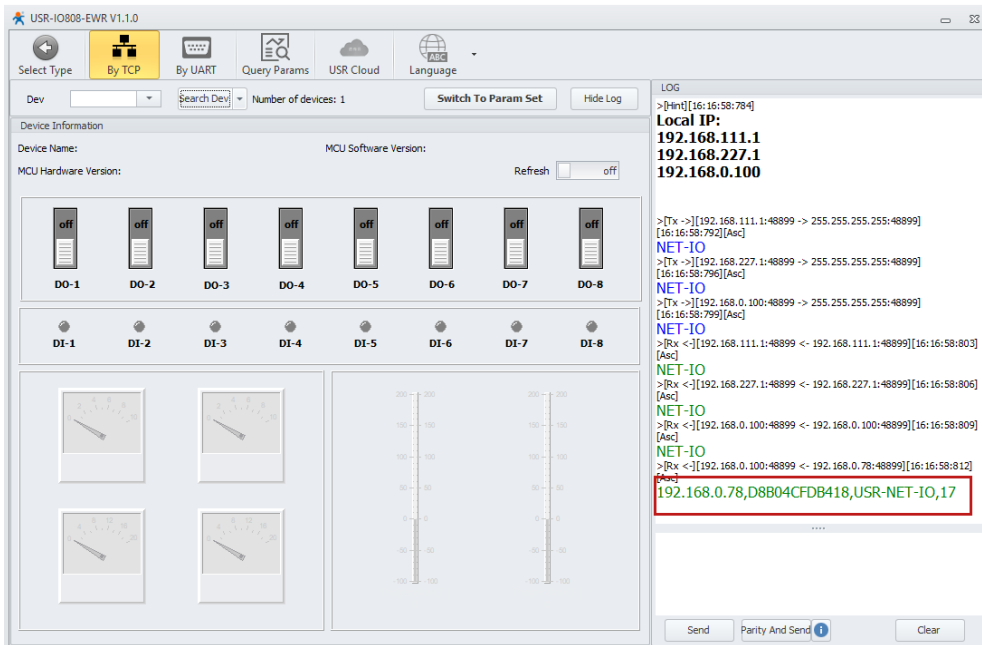
Next click on the **Dev** drop down and select the USR controller. You can now turn on or off any of the replays using the graphical interface.
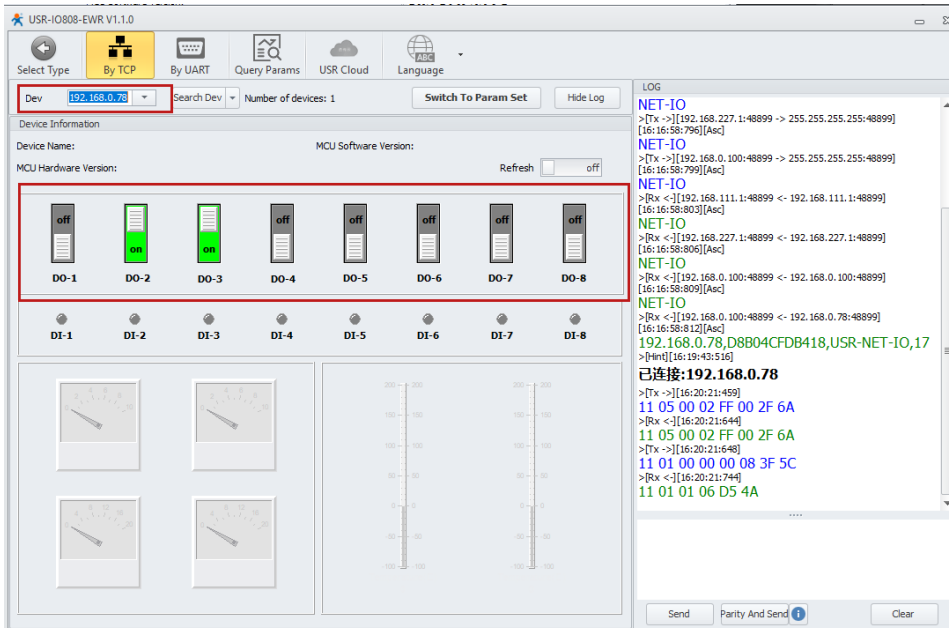

To continue the installation of PC controller software please go to the section **Installing the EBO Package to Manage the Controller**

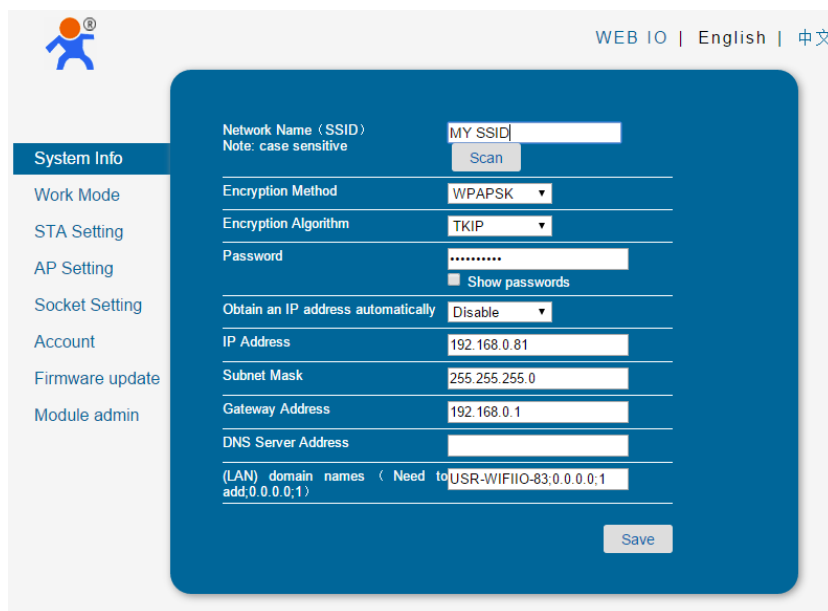## USR-WiFi-IO-83 Relay Installation

The USR Wifi controller requires a static IP address, this can either be manually configured or allocated statically by a DHCP server. The address given to the controller needs to be unique and not be part of the local DHCP scope. For the purposes of this example the address of 192.168.0.81 will be used with a subnet mask of 255.255.255.0. You will need to determine the best IP Address to use by referencing your existing network configurations, typically the broadband router.

The USR devices are configured through a Web GUI. When first powered on they act as a Wifi Access Port with a SSID of USR-WIFIO-83. The first task is to connect to this wireless network and reconfigure the USR device with the correct IP address and mode of STA.

6. Power on the USR device and connect a wireless device to the wifi network USR-WIFIIO-83.
7. Once connected point the device's browser to http://10.10.100.254. The default username and password are both **admin** (lowercase).
8. Click on settings.
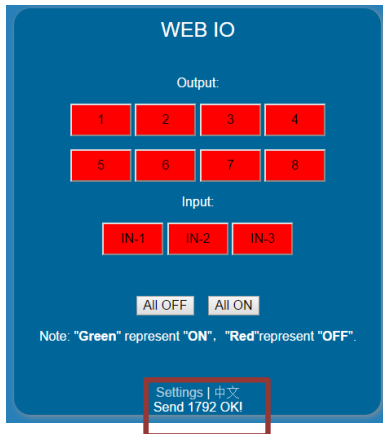
9. From the left hand menu select work mode and set the Mode to **STA mode**. IF the RJ45 port is to be used ensured that this is selected in **LAN mode**. Click **Save** but do not restart the system.
10. From the left hand menu select STA Setting and click the SCAN button to find your local Wifi network that the USR device is to connect to. Select the Wifi network and enter any password required to connect with the appropriate Encryption settings for you wireless network. Set **Obtain an IP address automatically** to **disable** and enter your manual IP Address, Subnet mask and default gateway IP addresses. Click **Save** but do not restart the system. The configuration should look similar to the following:

11. From the left hand menu select Account. Here it is strongly advisable to change the admin password. Failure to do this will leave the device open for anyone to switch the lights on/off. Click **Save** and then click **Restart** to restart the system with the new settings.
12. Verify that the link light of the USR device lights, this confirms that the Wifi settings are correct and that the device is connected to the Wifi network.
13. Using a browser connect to the USR IP Address. This interface can be used as a test interface to switch on / off channels of the USR device.

Please DO NOT use the mobile app for switching the USR device in conjunction with the EBO application. This can cause the system to fail.
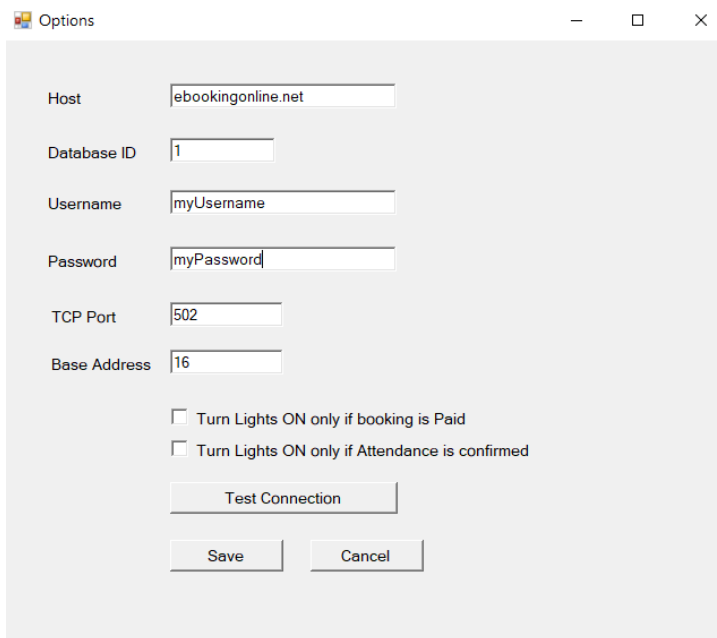
Installing the EBO Package to Manage the Controller

Once the Yotta, BEM105 or USR system has been verified by testing it using the Controller's Web Page the EBO package can be installed; leave the controller connected for the installation of the EBO application. Ensure that the courts have been configured with the correct IP address information for your controllers, failure to do so may cause errors and the application to run slowly trying to find devices that are not connected. Unzip the contents of the package supplied by EBO and double-click on the **setup.exe** icon. The password to unzip the package is EBO.

When prompted 'Are you sure you want to install this application?' click on **Install** to continue. Note that if the Controller is not connected or cannot be found a message box will appear indicating this, if this is the case click on yes to confirm, the application can still be installed but will not work until the Controller is online.

The EBO application will now be running in the background. Open the system tray in the bottom right-hand corner and a small EB icon will be present, right-click this selecting **options**, the following dialogue box will appear.

- In the host field fill in ebookingonline.net
- For the Database ID enter your club ID
- For the Username and Password enter your remote Database access credentials.
- Set the options that you require, for Yotta and BEM controllers the default TCP port of 502 is required.
- The BEM operates on a Base Address of 0, whilst the Yotta uses a base address of 16

Once complete click on the test connection button; this will test these credentials and your connection to the EBO database. Once successful click **Save** to continue. The application will be minimized back to the system tray.

Open the application once more from the system tray, selecting the **open** option. The application has two windows, the top window showing the configured courts from the database along with their IP Address and a second window showing any upcoming bookings for the next 24 hours. The use of the refresh buttons can be used at any time to refresh these windows. Please note that each lighting circuit takes approximately 5 seconds to poll, so a Controller with 8 channels can take up to 40 seconds to respond. If the status of the application is 'Offline' then access to the Database cannot be established, in such a case select tools and options from the menu to check and test connection parameters.

The application is now set up and the Controller relays will be switched in and out based on whether a court has been booked.