Shift Bell Controller
X-600 Modular Series

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SHIFT BELL CONTROLLER INTRODUCTION

This application allows you to set multiple schedules to control shift bells. You can then use a simple switch to control which schedule is active, or push a button to ring the bells at an unscheduled time. You can use this application as it is written here, or you can expand and add your own functionality to give you the all the features that you are looking for in a shift bell system.

EQUIPMENT NEEDED

- 1 – X-600M Industrial I/O Web Server
- 3 – WebRelay units with power supplies (each unit needs to have an unique IP address)
- 3 – Bells and their power supplies
- 1 – Ethernet cable
- 1 – 9-28V Power Supplies (24V recommended)

INSTRUCTIONS

Basic Setup and Wiring

Begin by connecting a 9-28 VDC power supply (24V power supply recommended) to the **Vin+** and **Vin-** terminals on the X-600M, and the three WebRelay Units (A regulated power supply is recommended). Verify that the power supply is rated for the operating current of the X-600M and the WebRelay units. (For more information see **Section 2.3.2** of the X-600M User's Manual).

Connect each of the WebRelays' Ethernet ports, and the X-600M's Ethernet port to an Ethernet hub, switch, or router. (For more information see **Section 2.3.6** of the X-600M User's Manual).

For wiring the bells, wire the positive wire from the bell to the positive wire of the power source like you would normally. Then take the ground wire that runs from the power source to the bell and cut it somewhere in the middle so that so that you can wire one of the cut ends to the common (C) of the WebRelay and the other cut end into the normally open (NO) of the WebRelay.

Note: Be sure that all the connections to any of the devices are clean and don't have the possibility of shorting out, and that all the screws on the terminal connector are tight.

Adding/Configuring Devices

To access the X-600M setup pages, type its IP address into the address bar of your internet browser followed by `/setup.html` (i.e., 192.168.1.2/setup.html). Log into the setup pages by typing the default username, `admin` and password, `webrelay` and navigate to the **Devices** menu tab. (For more information see **Section 3.3** of the X-600M User's Manual).

If the WebRelay devices are all on the same sub-net as the X-600M, click the **Find New Devices** button, then click the **Add** button to add/register each device, otherwise you will need to add them manually. Repeat this process for all of the WebRelays you will be using.

For this application you will only need to add/register the WebRelay devices and their respective relays.

To add a relay, navigate to the **I/O** menu tab and click on **Relay**, then click **Add New Relay**.

A pop-up window will appear and prompt you to select the device where the relay is located and to enter a name and description. We recommend changing the name, and description of each relay to make them easier to configure; however, for this example we have left all the names at their defaults.

Repeat this process for all of the relays you will be using.

Calendar Events

After adding the WebRelay devices and their relays, click on the **Control/Logic** menu tab, and then click the **Calendar Events** sub-menu.

Click **Add New Event** and in the *Description* enter "Ring Bells at 8am."

The *Event Group* should be *eventGroup2*.

Uncheck the *All Day* box in the *Start/Stop* line, and then change the time to *8:00am* for both of the time boxes.

Set *Repeat* to *Weekly* every *1* Week(s) and *Ends* should be set to *Never*. Now you can select which days the event will occur. Then add the event by clicking the **Add** button at the bottom of the dialog box.

Continue to add events for the "Normal Schedule" changing the descriptions, and the time boxes (e.g., *12:00pm, 1:00pm, 5:00pm)*.

Once you have added the events for the "Normal Schedule" we can delete the events that occur on holidays.

In the "Calendar Event List" click **Switch View**. Here you can view the events in a calendar format. Click on the event that you want to delete for a holiday. Once you have clicked on the event, several options will appear. You can edit the event, delete the entire event, disable the event once on that date or on that date each year, or you can disable the event a certain day every year (e.g. The third Monday every August).

Repeat this process for each holiday. For an alternative way to add a holiday schedule, please see the "Calendar Events" section in the advance shift bell controller example.

Conditional Events

Once all the calendar events have been added, navigate to the **Conditional Events** sub-menu to add the control events.

Click **Add New Event**. This event will allow us to trigger relays to ring multiple bells at the same time.

Add a *Description* (e.g., `Ring Bells)`, and change the *Type* to *Digital*.

Set the *I/O* to the relay on the first WebRelay module *(relay1* if you have left the default names).

Set the *Condition* to *On*, and the *Event Group* to *eventGroup1*.

Actions

Now that the events have been set up we can tie actions to those events. We'll begin by pulsing the relay on the first WebRelay module when the calendar events are triggered.

Click **Add New Action**, and enter a *Description*. This can be similar to the description in the control event.

Change the *Type* to *Pulse Relay*, and in the *Event Source* choose the first calendar event (if you left the default names it will be *calEvent1*).

Select the relay on the first WebRelay (*relay1*) from the *Relay* drop-down box.

In the *Pulse Time* drop-down box, choose *Constant* and set its value to `1.5`

Repeat these steps for each of the calendar events that you have created.

Next we will add the actions to send the pulse command to the rest of the WebRelay units. Click **Add New Action**, and add a *Description*.

Set *Type* to *Pulse Relay*, and the *Event Source* to the third conditional event (default *condEvent1*).

Select one of the relays on the WebRelay units (*relay2*, *relay3*, etc.) from the *Relay* drop-down box.

Set the *Pulse Time* to *Constant* and give it a value of `1.5`.

Repeat these steps for the remaining relays from the WebRelay devices.

Dashboards

To finish, we will add the dashboards. Navigate to the **Edit Dashboards** menu tab.

You will notice that a panel has been added by default so we just need to add a widget. Do this by clicking the small "+" button in the top right-hand corner of the panel. This widget will display all of the bell information, so you can give it a title (e.g., `Shift Bell Controls`).

Then add a new component to the widget by clicking the "+" button in the top right-hand corner of the widget.

Choose *Relay* as the *Type*. Then in the *Data Source* select one of the configured relays, and set all the buttons to disabled.

You can then set the on and off labels, as well as the colors of those labels.

Repeat steps for all the relays of your choosing.

Now that all of the settings have been added be sure to click the **Commit Settings** button in the upper right-hand corner of the screen to activate your new shift bell controller!

Once this is done your bells will begin to ring on the "Normal Schedule" with the option to change to the "Holiday Schedule". You can also click on *View Dashboard* and see what schedule the bells are currently set to, or if they are currently ringing.