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## MCCI Cricket UI User Guide

*Engineering Report 950001552*  
*Rev G*  
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### **Document Release History**

Rev A	2020-06-30	Initial Release
Rev B	2020-07-10	Improve GUI Panel Name
Rev C	2020-09-23	Mac app menu implementation
Rev D	2021-01-05	Add support for 2101 USB Connection Exerciser and improvement in UI design.
Rev E	2021-02-23	Python implemented to Pep8 coding standard. Package release for Raspberry Pi OS ubuntu18.04
Rev F	2021-05-03	Add support for 2301 USB Connection Exerciser.
Rev G	2021-07-14	Add new feature for Three Computer System, Two Computer System.

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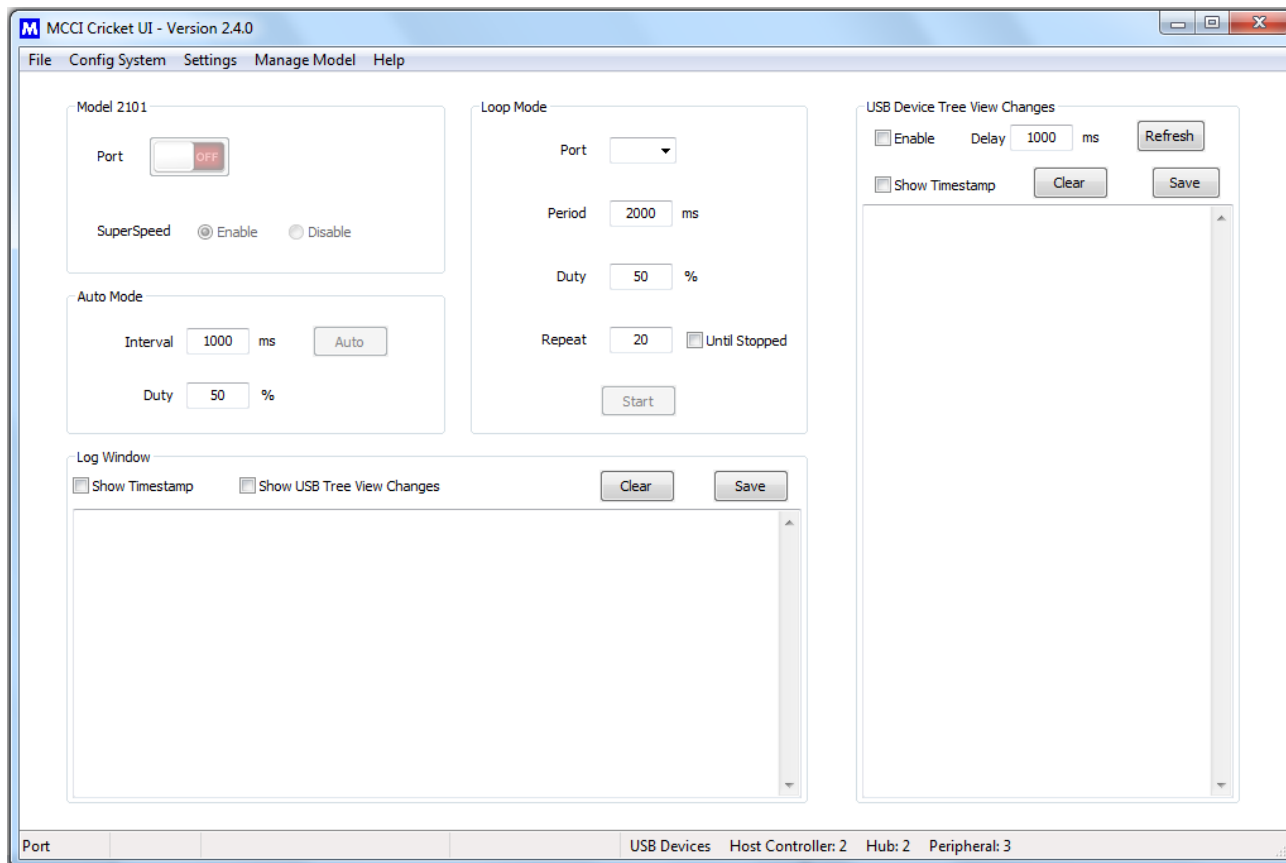
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## 1 Introduction

MCCI developed a common UI “**MCCI® Cricket UI**” to control the “Model 3141 USB4 Switch” and “Model 3201 Enhanced Type-C Connection Exerciser”, “Model 2301 Type-A gen2 Connection Exerciser” and “Model 2101 Connection Exerciser”. This document provides instructions on how to use features provided by the GUI application and other available control options. GUI overview is shown in the Figure 1

Figure 1 MCCI Cricket UI Overview



## 2 Models Supported

### 2.1 Model 3141 USB4™ Switch

The MCCI® Model 3141 USB4™ Switch is a computer-controlled programmable 2:1 switch, connecting two USB Type-C receptacles to a single Type-C plug. It is compatible with USB4 hosts and devices, as well as older protocols such as Thunderbolt™ 3, USB 3.2 gen2 or gen1, USB 2.0, USB Type-C Alternate Modes, and of course Power Delivery.

The Model 3141 USB4 Switch automates connect/disconnect of one or two devices to a USB Type-C port. It can be used in stress testing, switching between peripherals (for example, a dock and a display),

or any automated reconfiguration of a USB Type-C port. For more information, see the [product home page](#) at [www.mcci.com](http://www.mcci.com).

**Figure 2 Model 3141 USB4 Switch**



## **2.2 Model 3201 Enhanced Type-C Connection Exerciser**

The MCCI Model 3201 Enhanced Type-C Connection Exerciser (MUTT ConnEX-C) plugs and unplugs up to 4 USB-C® devices for automated testing of USB Type-C® products. For more information, see the [product home page](#) at [www.mcci.com](http://www.mcci.com).

**Figure 3 Model 3201 Type-C Connection Exerciser**



## **2.3 Model 2101 USB Connection Exerciser**

The MCCI USB 3.0 Connection Exerciser Model 2101 automatically connects and disconnects a USB 2.0 or 3.2 gen1 host and device under push-button or software control. Connections can be single-stepped or repeated. The manual modes are useful for debugging attach/detach scenarios. For more information, see the [product home page](#) at [www.mcci.com](http://www.mcci.com).



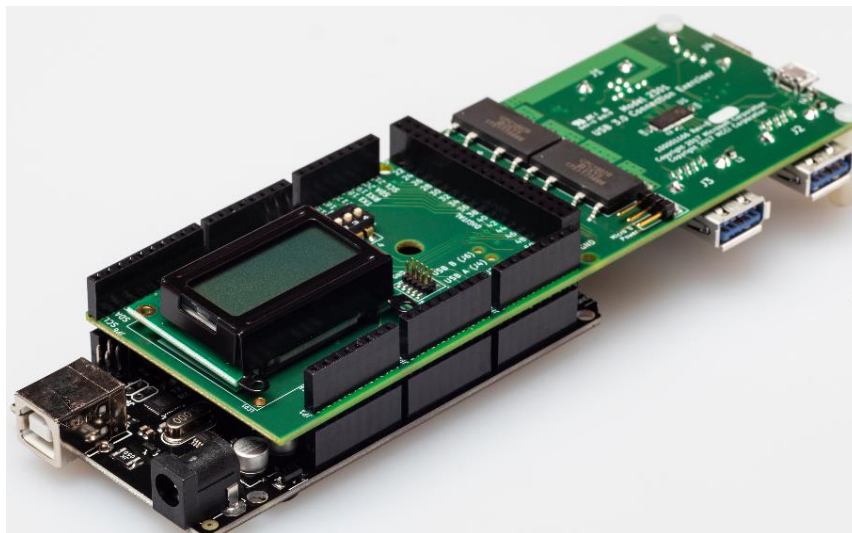
Figure 4 Model 2101 connection Exerciser



## 2.4 Model 2301 Type-A USB 3.2 Gen2 Connection Exerciser

The MCCI Model 2301 Type-A Connection Exerciser provides a four-to-one USB switch to automate interoperability tests for systems USB 3.2 gen1 or gen2. It uses the supplied Arduino-based controller and electronic switches to electrically plug and unplug any of the four different input ports. The Gen2-capable Type-B plug can be connected to either of two Type-A receptacles, to a Standard-A receptacle (USB 2.0 only), or a Micro-B receptacle (USB 2.0 only). The Type-A Gen2 receptacles support USB 3.2 (gen 1 and gen 2) and USB 2.0 (high speed, full speed and low-speed) devices. The Standard-A receptacle supports USB 2.0 devices. . For more information, see the [product home page](http://www.mcci.com) at [www.mcci.com](http://www.mcci.com).

Figure 5 Model 2301 Type-A USB 3.2 Gen2 Connection Exerciser



### **3 Download and Installation**

Download the installation setup for “MCCI USB Switch Cricket UI” software from here, the Knowledge base section in MCCI portal (<https://portal.mcci.com/portal/kb>) and follow the instruction for software installation.

### **4 MCCI Cricket UI Overview**

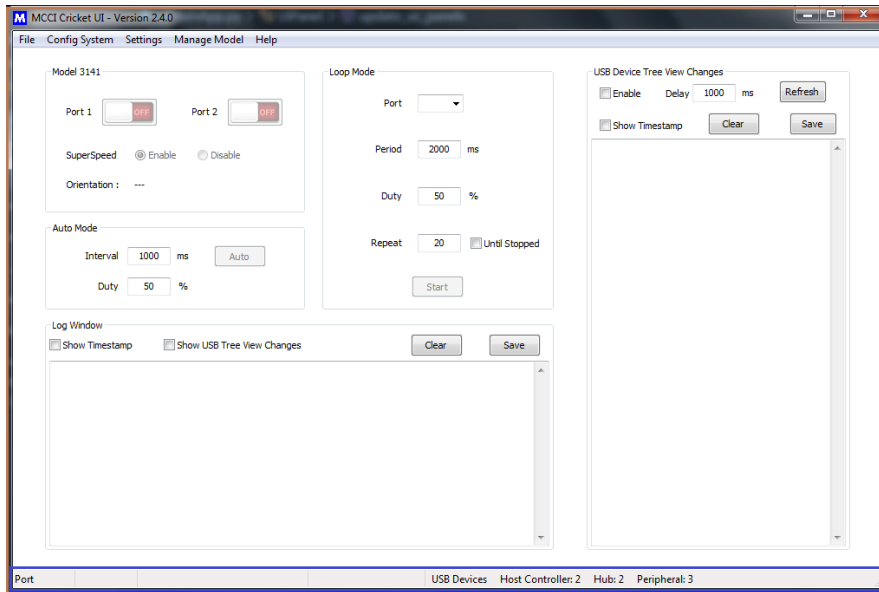
When the installation successfully completes, execute the “Cricket UI” file, from Start → All Programs, or from the shortcut provided on the desktop. When the application starts, the following GUI screen displays as Figure 1, the GUI window contains these following sections:

- Model 3201/Model 3141/Model,2301/Model,2101/Model Ports Control: It has the option to control the ports of the device, this varies for Model 3141, 3201, 2301 and 2101.
- Loop Mode: Switch the selected port in cyclic mode.
- Manage Model: Listed the number of devices attached in it and the user can select the device to be controlled.
- USB Device Tree View Changes: It displays the features of the attached Devices on to the port.
- Log Window: Print the device’s switching activity logs with timestamp.
- Status Bar: It is available at the bottom of the GUI and displays the status of the switch connected and Host system’s USB controller status, port details, et. As shown in Figure 6
- Menu Bar: It has a File and Help menu. As shown below in Figure 7 .

# MCCI Cricket UI User Guide

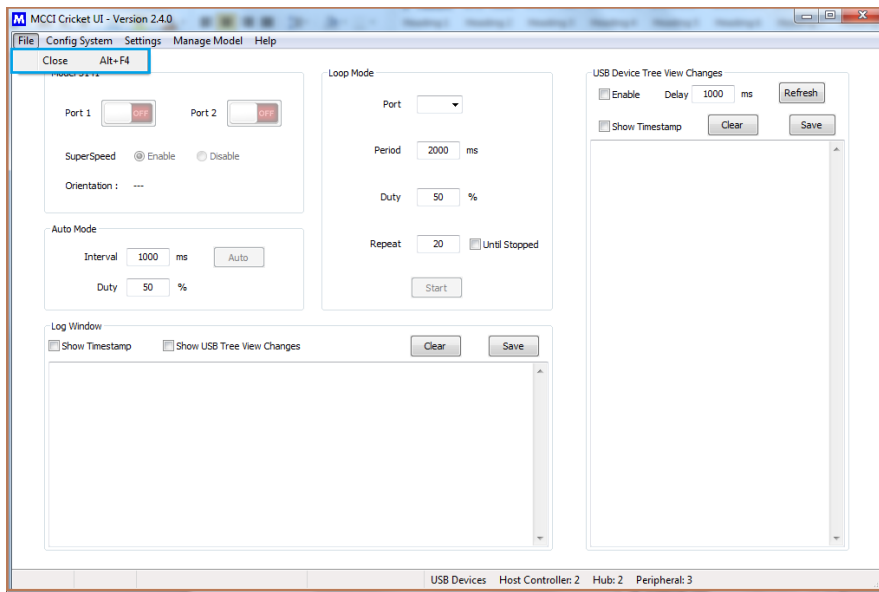
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Figure 6 Status Bar

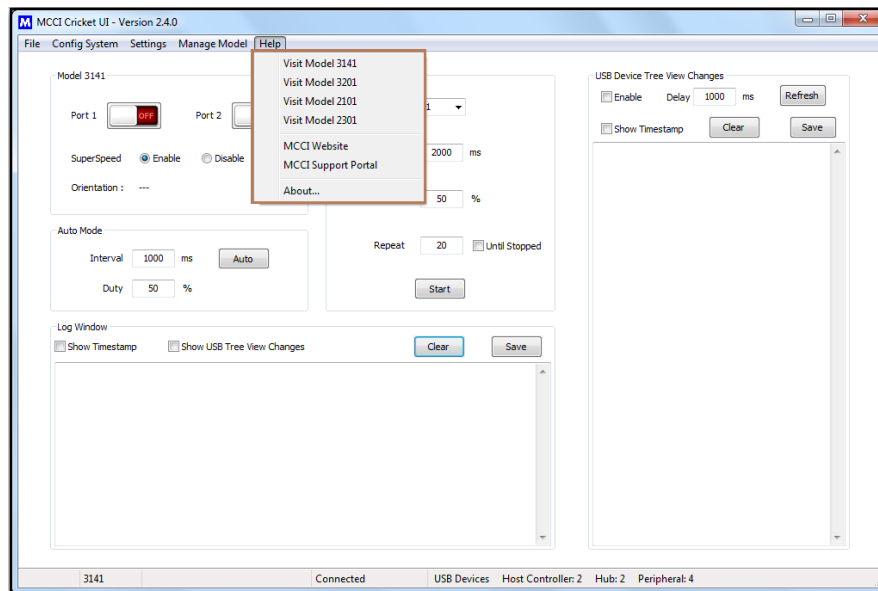


## FILE MENU

Figure 7 Menu Bar



## HELP MENU

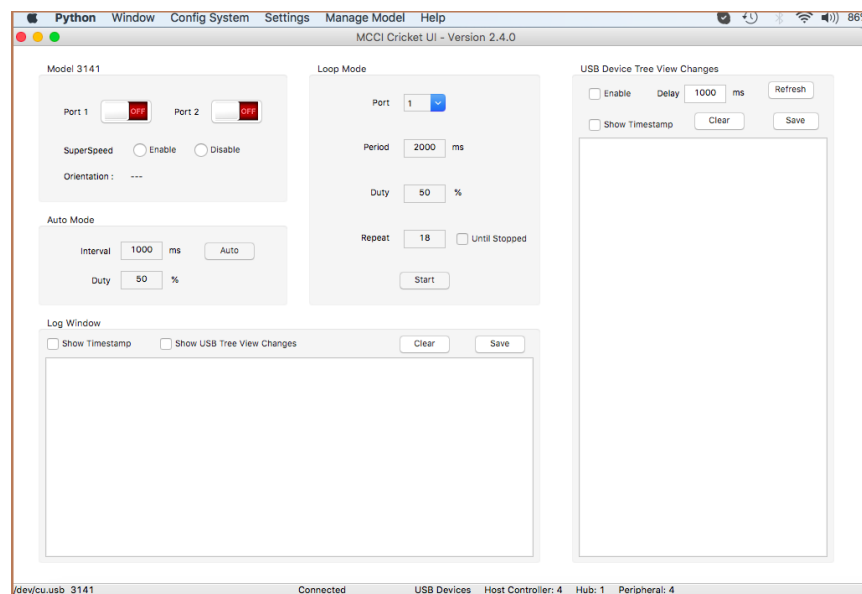


## 5 Mac OS Menu Overview

The menu bar in Mac OS has three menus, (MCCI Cricket UI), Window and Help menu as shown in Figure 8

### Cricket UI APP MENU

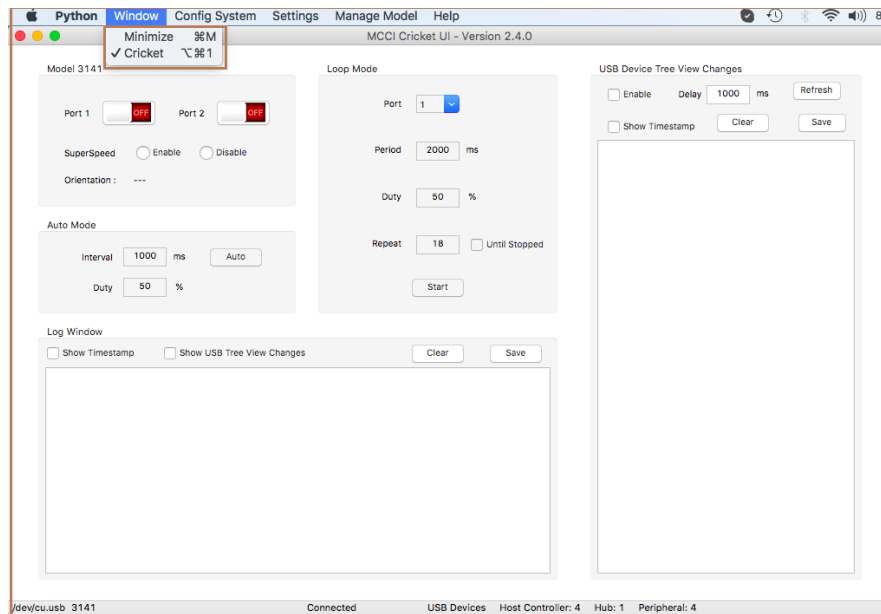
Figure 8 Menu bar in Mac OS



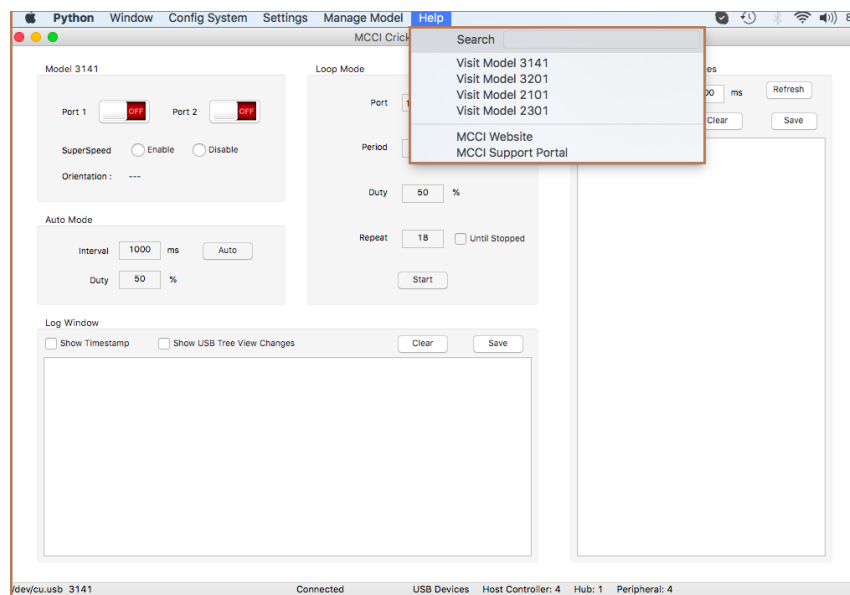
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### WINDOW MENU



### HELP MENU



## 6 Different Computer System

This Cricket UI application consists of three modules, such as User Interface, Device Control and USB Test Host.

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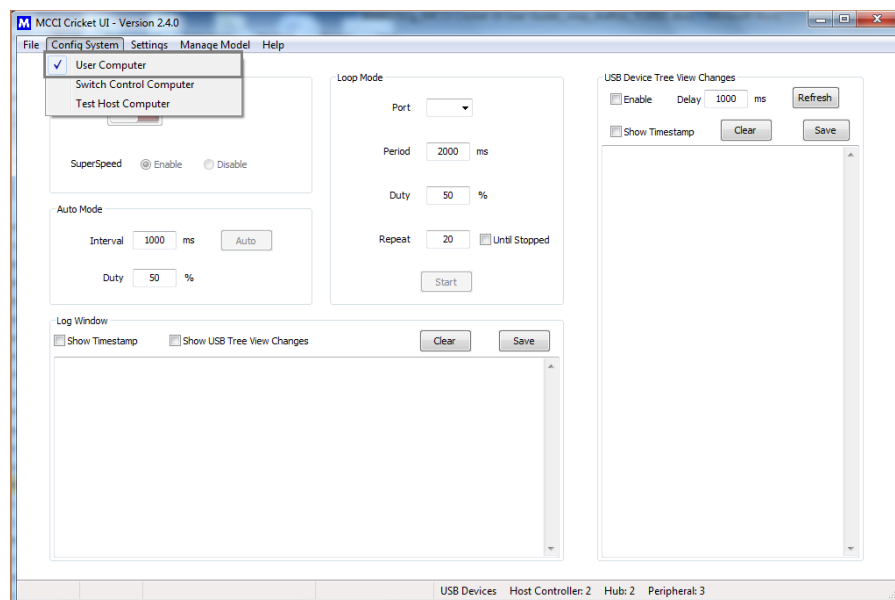
User Interface enables the user to access all features of this application which includes interface and control of all required USB Connection Exercisers (USB Switches), this module is called as User Computer. Device Control module works closely with the connected USB switches gets input from and send responds to the User Interface module, this model is called as Control Computer,

USB Test Host module provides the list of USB devices connected with the computer, User Interface module sends request to this module whenever USB device list is required. This module is called as Test Host Computer.

## 6.1 User Computer

Open the application in one computer, go to the *Config System* and select the *User Computer* sub menu, now the application runs user interface module in that computer as shown in Figure 9.

Figure 9 Config System - User Computer

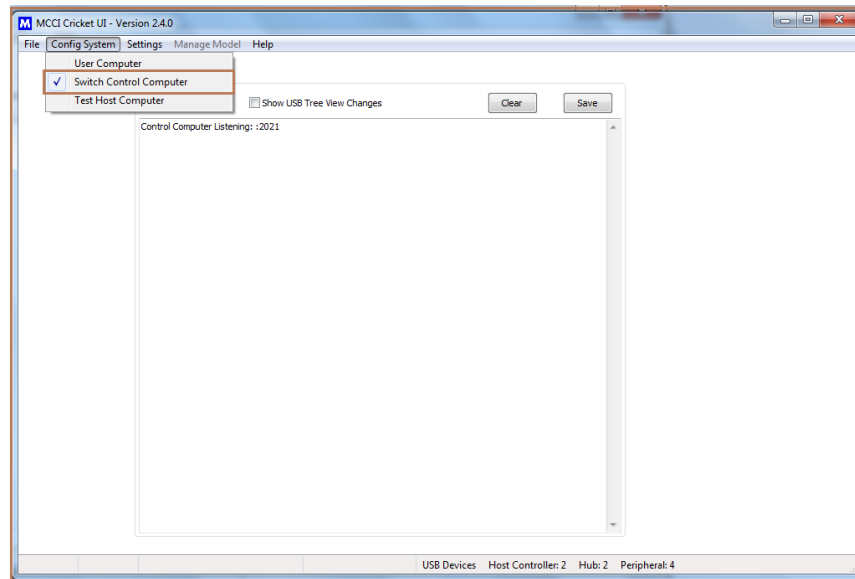


This User Computer acts as a Client in a network, communicates with the Control Computer Server and Test Host Computer server.

## 6.2 Control Computer

Open the application in one computer, go to the *Config System* and select the *Switch Control Computer* sub menu, now the application runs device control module in that computer as shown in Figure 10.

Figure 10 Config System - Control Computer

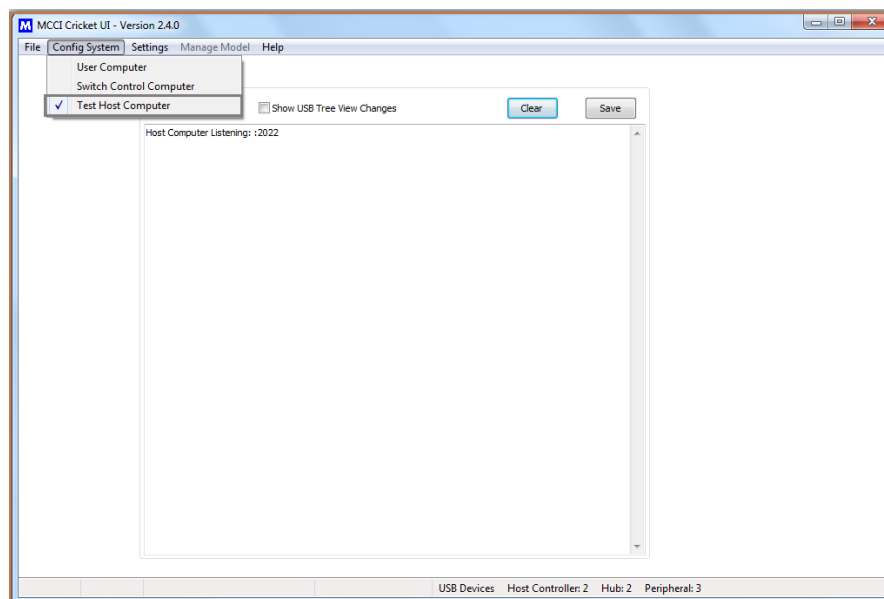


This Control Computer acts as a Device Control Server in a network, responds for the device related queries from the User Computer, also controls the device connected to the computer.

### 6.3 Test Host Computer

Open the application in one computer, go to the *Config System* and select the *Test Host Computer* sub menu, now the application runs as USB Test Host module in that computer as shown in Figure 11.

Figure 11 Config System - Test Host Computer



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This Test Host Computer acts as a server, collect the list of plugged USB devices, sends USB device list to the User Computer, the User Computer will compare with the existing list and list the differences in USB device tree view.

## 6.4 Single Computer System

In this configuration all the three modules are runs in a single computer, user can enable this as shown Table 1 configuration by selecting all sub menu provided under the *Config System* menu as shown in Figure 12.

Figure 12 Single Computer System

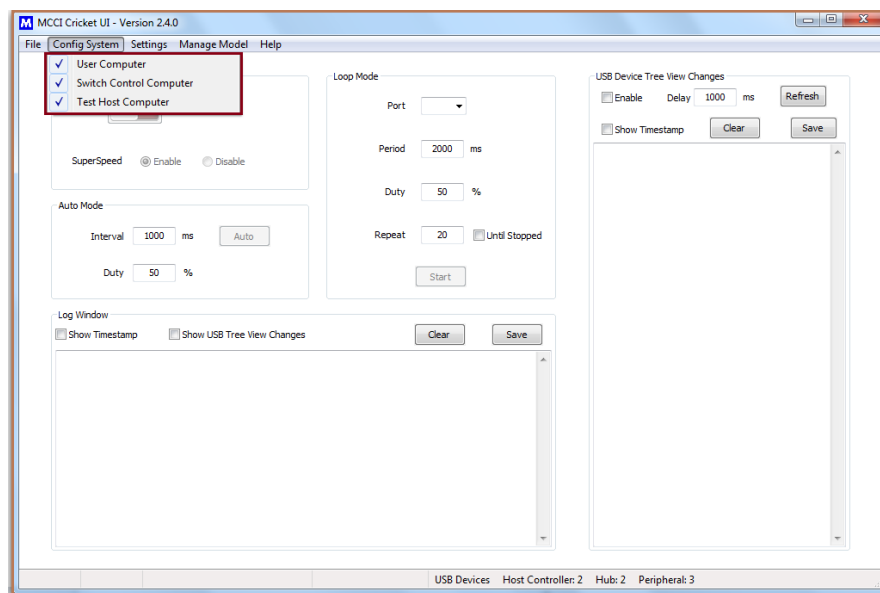


Table 1 Single Computer System

User Computer	Control Computer	Test Host Computer
Computer 1	Computer 1	Computer 1

## 6.5 Two Computer System

In this configuration any of two modules are runs in a computer and the rest one runs in another computer. The user can make different configurations based on the three modules, the possible configurations are provided in the table below Table 2



**Table 2 Two Computer System Configuration**

User Computer	Control Computer	Test Host Computer
Computer 1	Computer 1	Computer 2
Computer 1	Computer 2	Computer 2
Computer 1	Computer 2	Computer 1

User has to launch the application in both Computers, and configure the 'Config System' menu based on the requirement

## 6.6 Three Computer System

In this configuration each module runs in a different computer, the User Computer send device controls to the Control Computer and request USB device list from the Test Host Computer as shown below Table 3 .

**Table 3 Three Computer System Configuration**

User Computer	Control Computer	Test Host Computer
Computer 1	Computer 2	Computer 3

## 7 Interfacing Computer System

This part provides detailed information to the user when the user wants to use this application as Two Computer System or Three Computer System.

### 7.1 Setup requirement

To configure the Two/Three Computer System, all required systems should be connected in a local network under a subnet group. This application uses text based TCP/IP protocol to communicate between the computers, this supports JSON text format.

### 7.2 Setting up Port

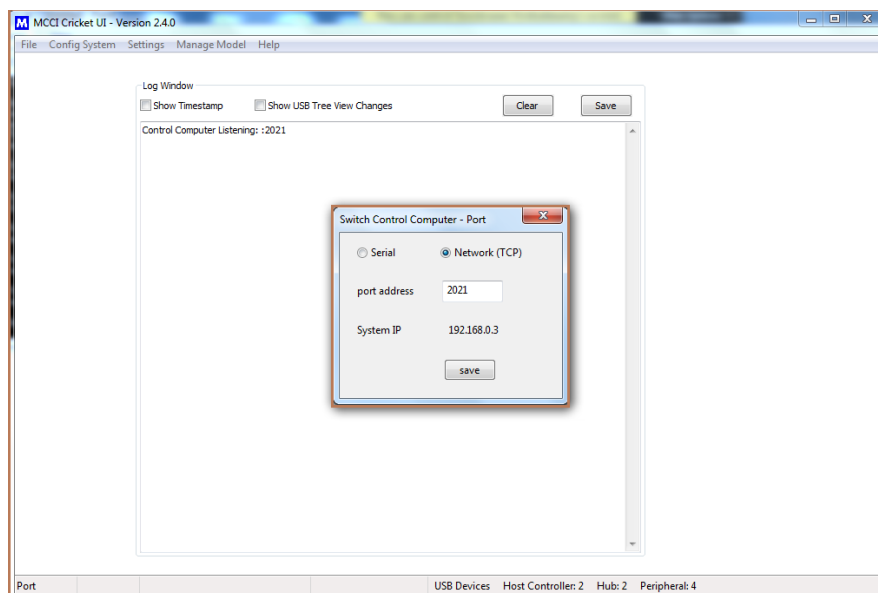
This is required when the User Computer and the Control Computer module are runs in a different computer. User need to open the application in Computer 1 and Computer 2, should select the required

module in each computer. The computer which runs the User Interface module is called as User Computer, the computer which runs the Device Control module is called as Control Computer.

### 7.2.1 Control Computer

In Control Computer, go to the *Settings* menu, select the *Switch Control Computer* sub menu, new settings dialog will open with the title of Switch Control Computer – Port. The first is used to select the interface type, Serial interface is not implemented in this version, user need to select the *Network (TCP)* option. The next input field is used to get the port number from the user, by default it is 2021. User can set the different port number but should ensure that port should be free and not in open by other applications as shown in Figure 13.

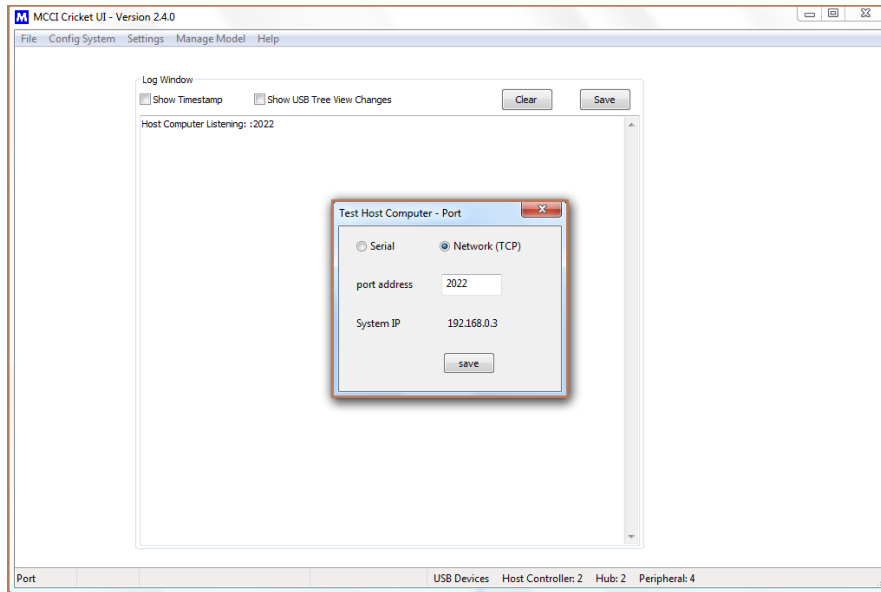
**Figure 13 Port Setting - Control Computer**



### 7.2.2 Test Host Computer

In Test Host Computer, go to the *Settings* menu, select the *Test Host Computer* sub menu, new settings dialog will open with the title of Test Host Computer – Port. The default port number is 2022, the user can set the different port number which if free on the computer as shown in Figure 14.

Figure 14 Port Setting - Test Host Computer



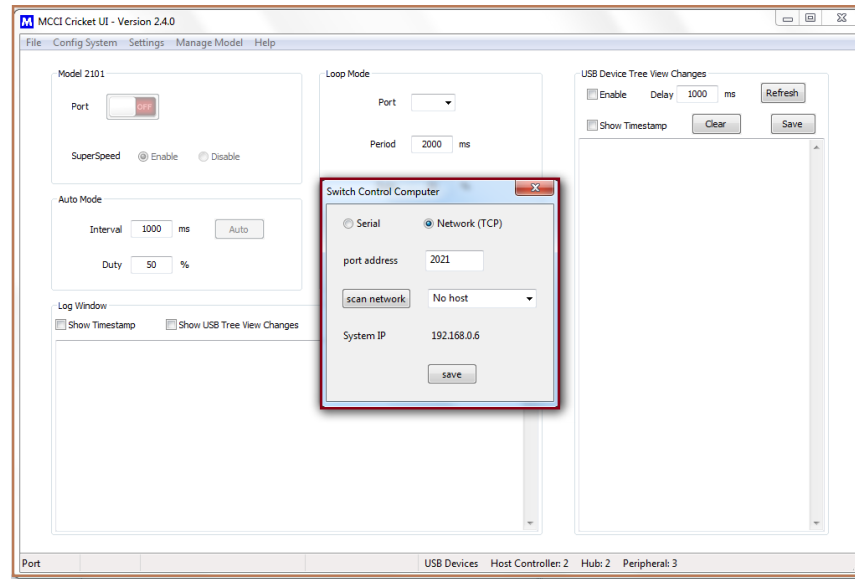
## 7.3 Connect Computers

This section describes about how to make connection between User Computer and Control Computer, Test Host Computer. After assigning Port numbers to the Control Computer and Test Host Computer, user has to establish the interface in the User Computer.

### 7.3.1 Connecting Control Computer

In the User Computer, go to the *Settings* menu, select the *Switch Control Computer* sub menu, a settings dialog will appear with the title of Switch Control Computer, where user has to provide the Port number of the Control Computer then click the *scan network* to search for the Control Computer which is available in the local network. It will list the IP address of the available Control Computers in the selection control, user has to select and click *save* to store the configuration as shown in Figure 15 .

Figure 15 Interface Control Computer

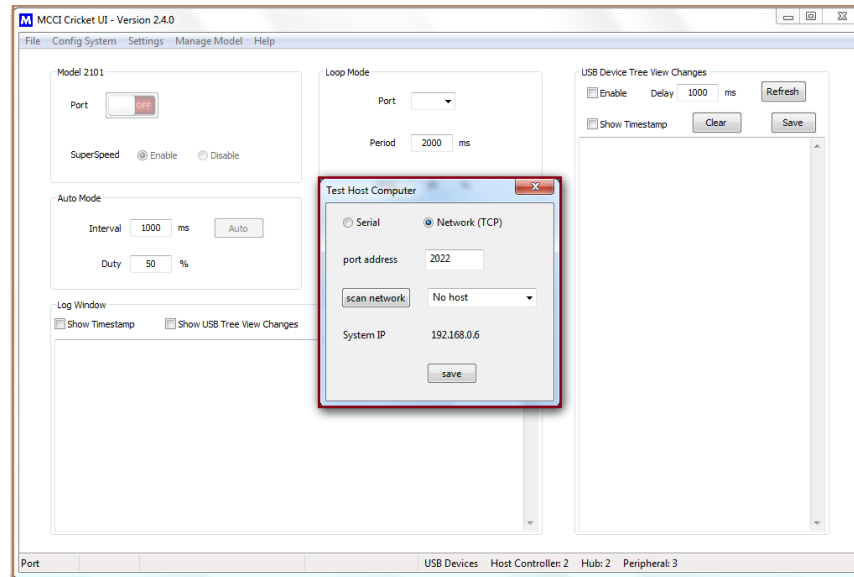


For controlling the device/model, the user computer uses the stored Port number and IP address to establish communication between User Computer and Control Computer.

### 7.3.2 Connecting Test Host Computer

In the User Computer, go to the *Settings* menu, select the *Test Host Computer* sub menu, a settings dialog will appear with the title of Test Host Computer, where user has to provide the Port number of the Test Host Computer then click the *scan network* to search for the Test Host Computer which is available in the local network. It will list the IP address of the available Test Host Computers in the selection control, user has to select and click *save* to store the configuration as shown in Figure 16.

Figure 16 Interface Test Host Computer



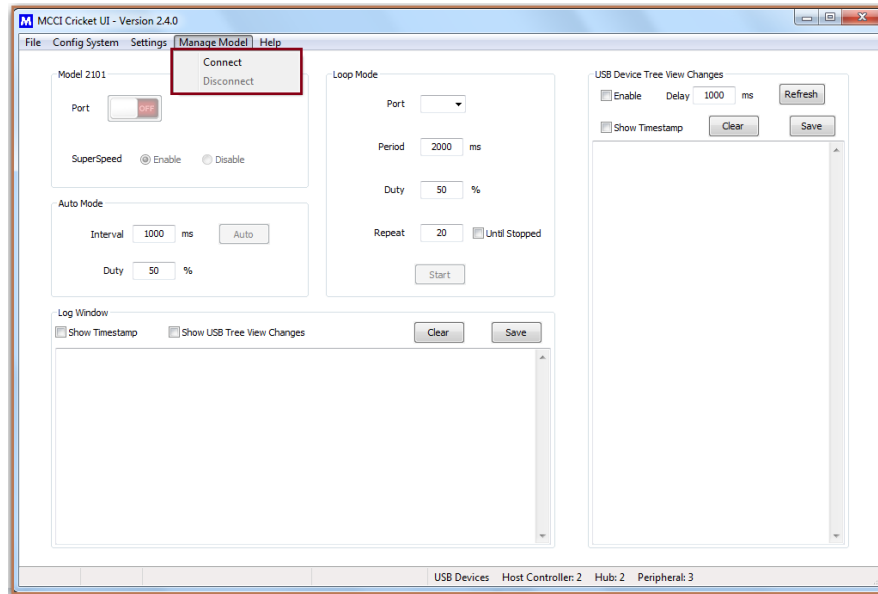
For getting plugged USB device list, the user computer uses the stored Port number and IP address to establish communication between User Computer and Test Host Computer.

## 8 GUI Feature and Options

### 8.1 Manage Model

The GUI can automatically detect the 3141, 3201, 2301 and 2101 device models. The device models 3201, 3141, 2301 and 2101 can be selected from the Manage Model as show in below Figure 17.

Figure 17 Manage Model Menu



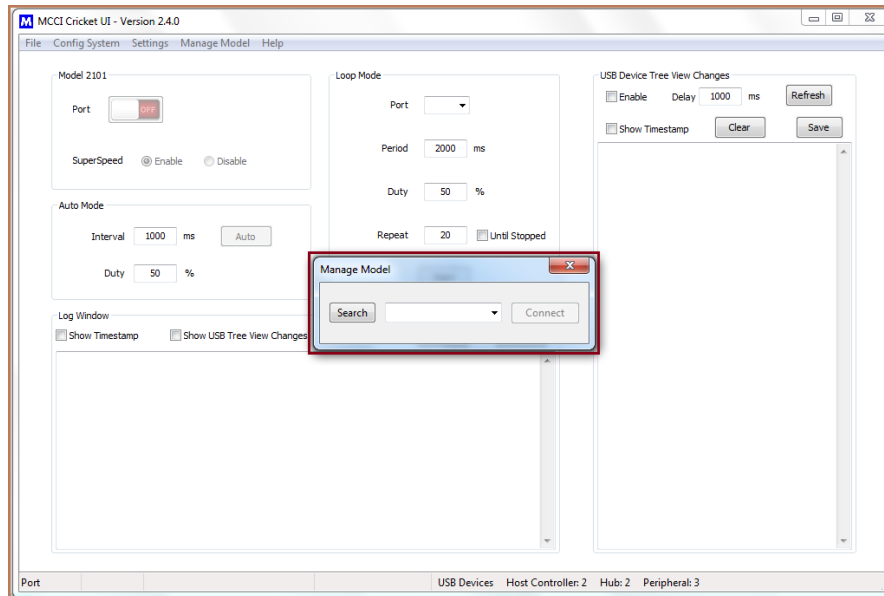
Click the **Search** button to get the list of connected, supported USB models, select a model from the drop down menu and click **Connect** button to select the model. The Model panel gets changed based on the connected model as shown in below Figure 18.

The Manage Model control options and descriptions are mentioned in Table 4

Table 4 Manage Model Menu

Control Option	Description
<b>Search</b>	Clicking on that Search Button will show the attached devices in the USB bus/network
<b>Connect Menu</b>	Clicking on that Connect Button, connect the selected device
<b>Disconnect Menu</b>	Clicking on that Disconnect Button, Disconnect the selected device

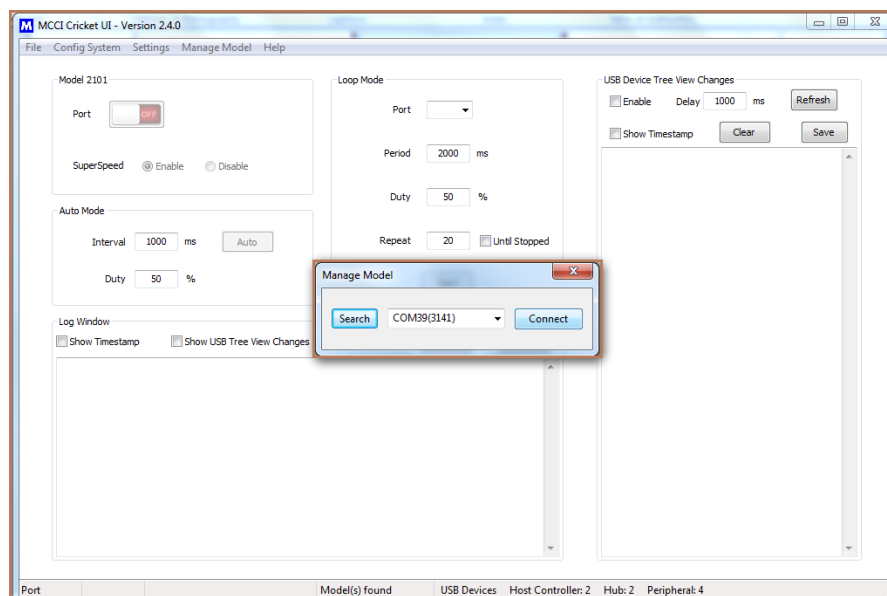
Figure 18 Manage Model Dialog



### 8.1.1 Connect menu

- Go to Manage Model
- Click on Connect Menu then open Manage Model dialog box
- Searching the device from Switching control computer server.
- List of available devices is listed in combo box.
- Connect the device as shown in below Figure 19.

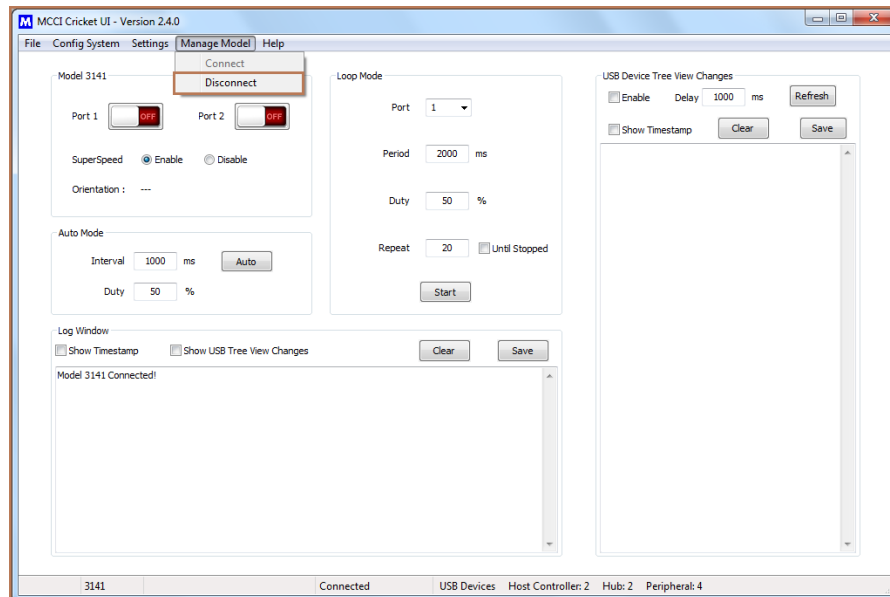
Figure 19 Manage Model Connect device



### 8.1.2 Disconnect menu

Need to disconnect the device go to Manage Model menu click on disconnect button as shown in below Figure 20 .

Figure 20 Disconnect the Model Device



## 8.2 Model 3201 UI Control Window

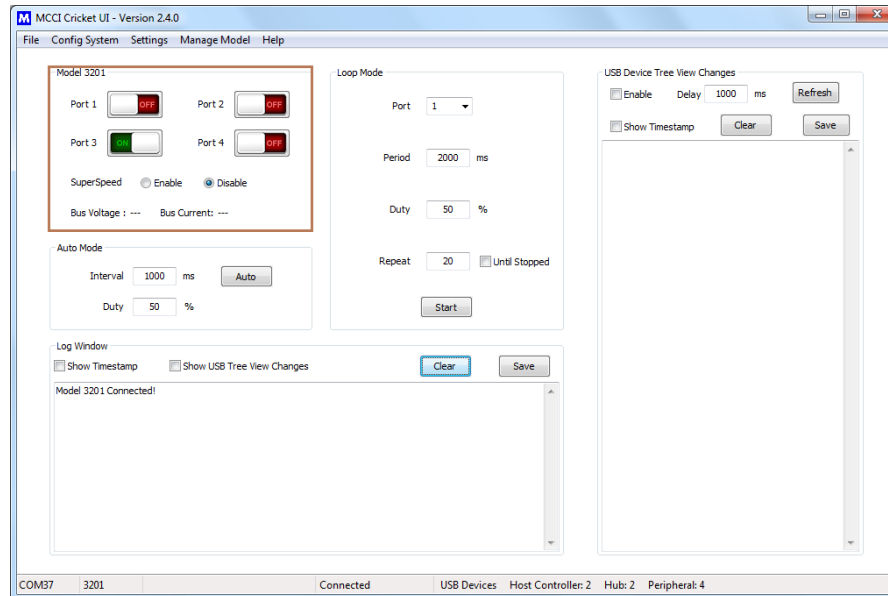
The control window of Model 3201 appears in the UI, when the Model 3201 device is selected from the Manage Model Panel as shown in Figure 21 .

The control options of Model 3201 are explained below:

- The **Port** buttons, which will get activated after the device is connected.
- **ON/OFF** switch to control the port state.
- Radio buttons to select Super Speed (**Enable**) or High Speed (**Disable**) lines.
- Volts and Amps button
  - Clicking on the **Volts** button will print the Bus Voltage
  - Clicking on the **Amps** button will print the Current Flow with the direction.
    - Negative value - Current flow from SUT (System Under Test) to DUT (Devices Under Test)
    - Positive value - Current flow from DUT to SUT
- **Auto** switch (continuously switch between the ports in the defined **interval** and **Duty**)



Figure 21 Model 3201 UI Control Window



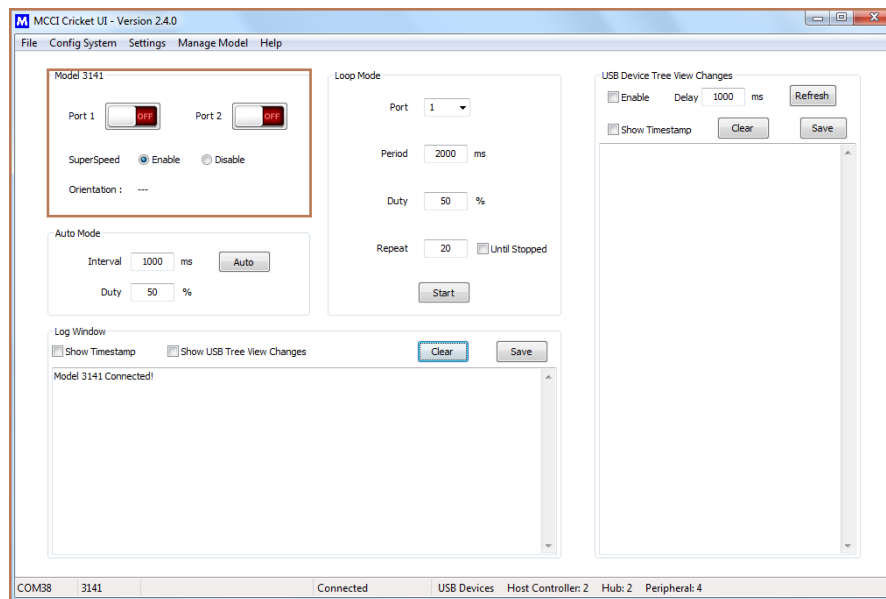
### 8.3 Model 3141 UI Control Window

The control window of Model 3141 appears in the UI, when the Model 3141 device is selected from the Manage Model Panel as shown in Figure 22.

The control options of Model 3141 are explained below:

- The **Port** buttons will get activated after the device is connected.
- **ON/OFF** switch to control the port state.
- Radio buttons to **Enable/Disable** SuperSpeed lines (NOTE: Supports ONLY SuperSpeed).
- **Check Orientation** button to show the Type-C connector connection (Normal/Flip)
- **Auto** mode button (continuously switch between the ports in the defined **interval** and **Duty**) to provide switching interval.

Figure 22 Model 3141 UI Control Window



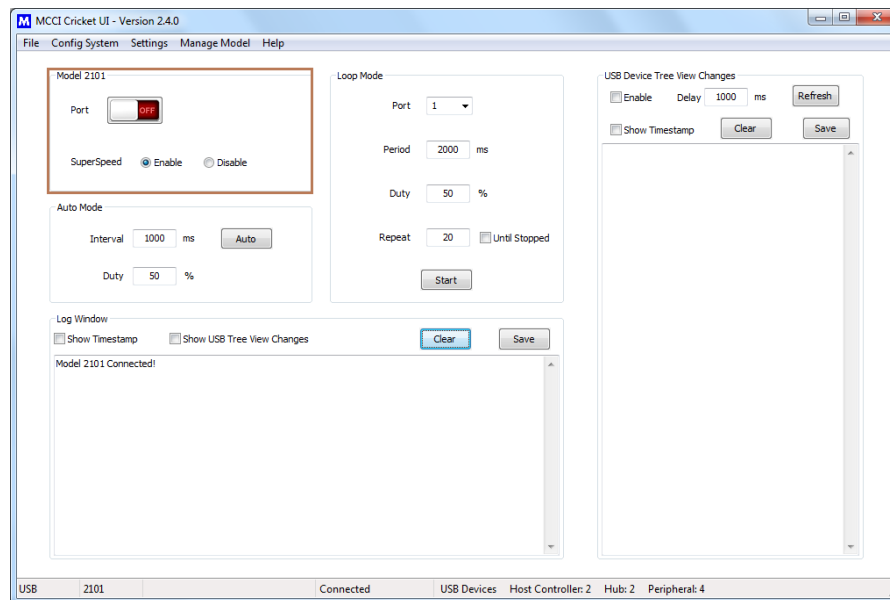
## 8.4 Model 2101 UI Control Window

The control window of Model 2101 appears in the UI, when the Model 2101 device is selected from the Manage Model Panel as shown in Figure 23

The control options of Model 2101 are explained below:

- The **Port** button will get activated after the device is connected.
- **ON/OFF** switch to control the port state.
- **Auto** mode button controls for selecting speed.
  - Radio buttons to select SuperSpeed (**Enable**) or High Speed (**Disable**) lines.

Figure 23 Model 2101 UI Control Window



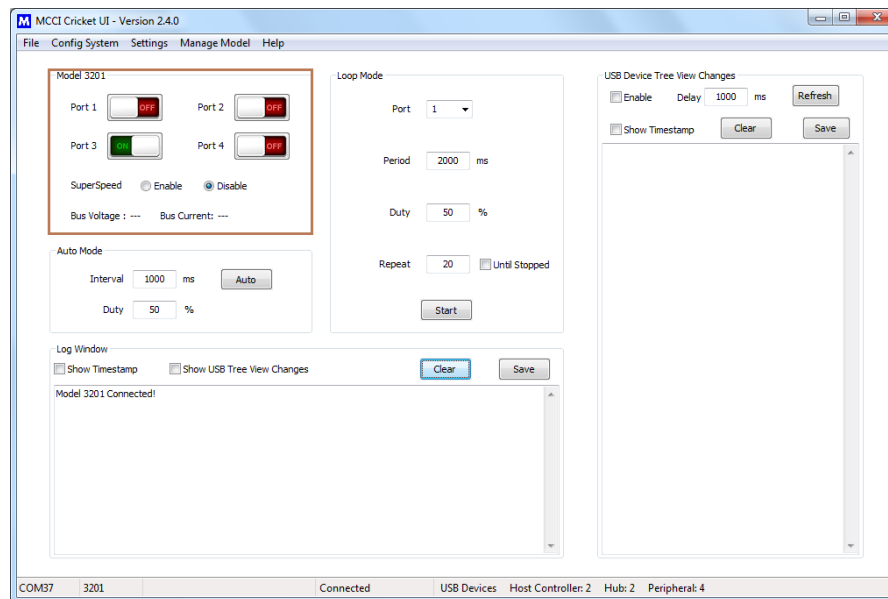
## 8.5 Model 2301 UI Control Window

The control window of Model 2301 appears in the UI, when the Model 2301 device is selected from the Manage Model Panel as shown in Figure 24

The control options of Model 2301 are explained below:

- The **Port** buttons, which will get activated after the device is connected.
- **ON/OFF** switch to control the port state.
- 
- Radio buttons to select Super Speed (**Enable**) or High Speed (**Disable**) lines.
- Volts and Amps button
  - Clicking on the **Volts** button will print the Bus Voltage
  - Clicking on the **Amps** button will print the Current Flow with the direction.
    - Negative value - Current flow from SUT (System Under Test) to DUT (Devices Under Test)
    - Positive value - Current flow from DUT to SUT
- **Auto** switch (continuously switch between the ports in the defined **interval** and **Duty**)

Figure 24 Model 2301 UI



## 8.6 Modes of Operation

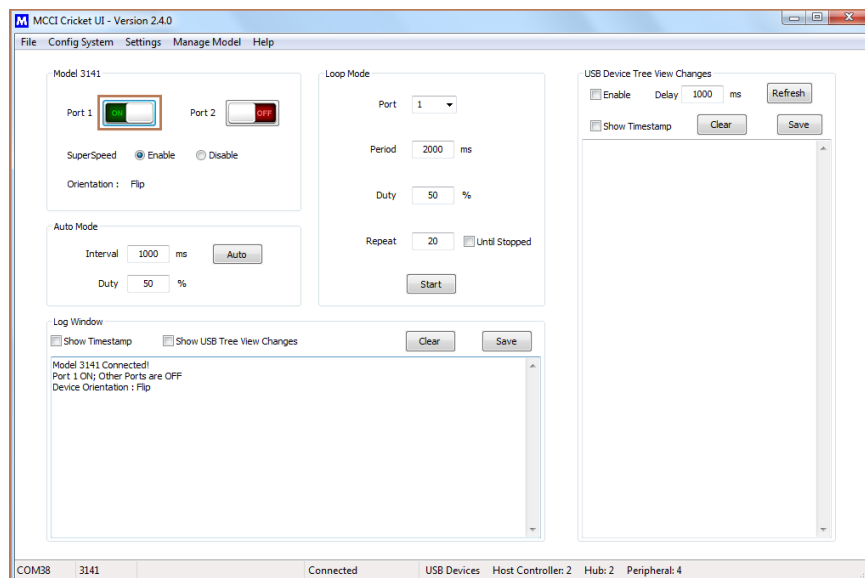
In order to control the device, the GUI has supported 3 modes of operation

- Manual Mode
- Auto Mode
- Loop Mode

This section contains the detailed explanation about the modes.

## 8.6.1 Manual Mode

Figure 25 Manual Mode



- The Port switch can be controlled manually using available button(s) in the UI as shown in the Figure 25.
- ON/OFF button is used to enable/disable the ports of the connecting device.
- Enable/Disable the SuperSpeed lines anytime using the radio button.
- Icon(s) and description for all Models are mentioned in Table 5.

Table 5 Manual Mode Control Options

Icons	Description
<b>PORT &lt;n&gt;</b>	Select the active port switch button.
<b>ON/OFF</b>	The selected port should be ON /OFF
<b>Super speed Enable and Disable</b>	Enable/Disable the Super Speed option

## 8.6.2 Auto Mode

- In GUI, the Auto mode is used to switch between the available Port(s) of the selected devices continuously with configured Interval/delay (Default is **1000ms**) and Duty (default is **50%**).
- Duty cycle is the ratio of time allocated for the switch to be ON compared to the time the load switch to be OFF.
- User can't change the Port and Speed in the middle of Auto mode execution
- This mode (Model 3201) can Start/Stop using the Auto button shown in Figure 26.
- This mode (Model 3141) can Start/Stop using the Auto button shown in Figure 27.

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- This mode (Model 2101) can Start/Stop using the **Auto** button shown in Figure 28
- This mode (Model 2301) can Start/Stop using the **Auto** button shown in Figure 29

Figure 26 Model 3201 Auto Mode Controls

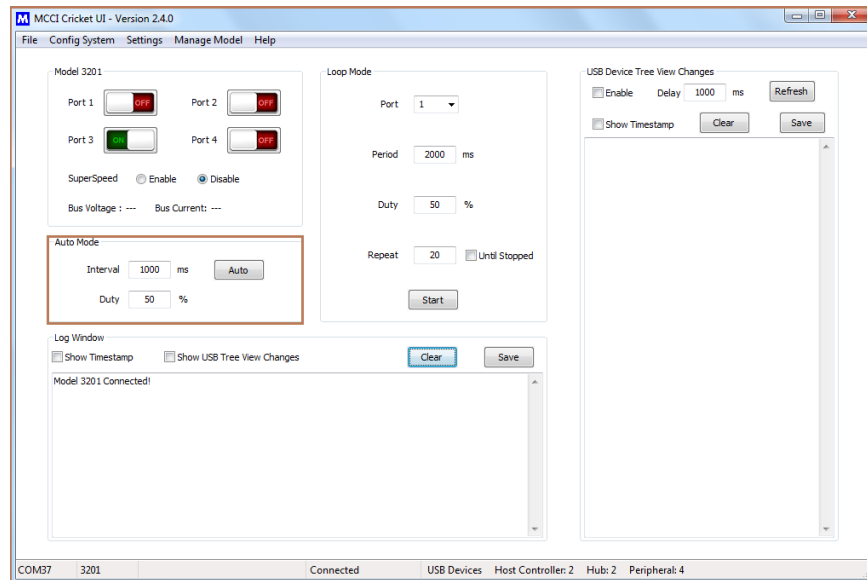


Figure 27 Model 3141 Auto Mode Controls

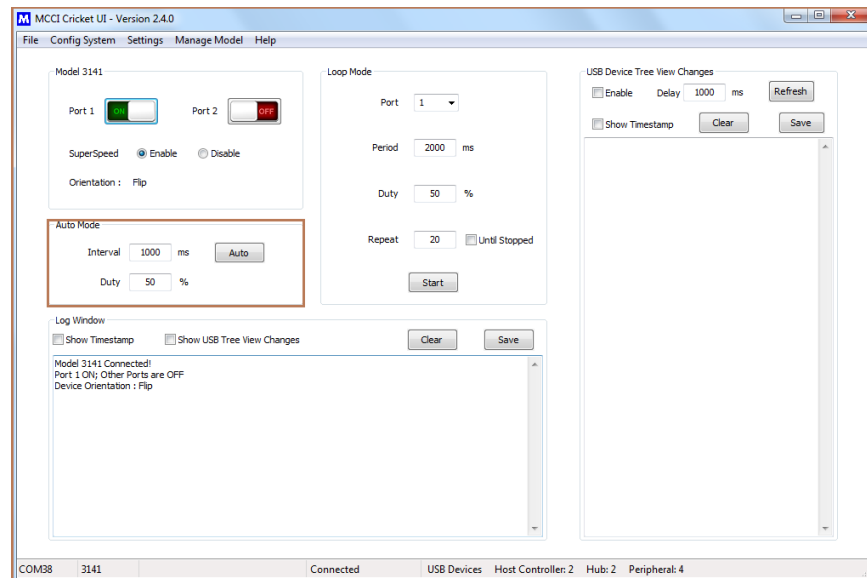


Figure 28 Model 2101 Auto Mode Controls

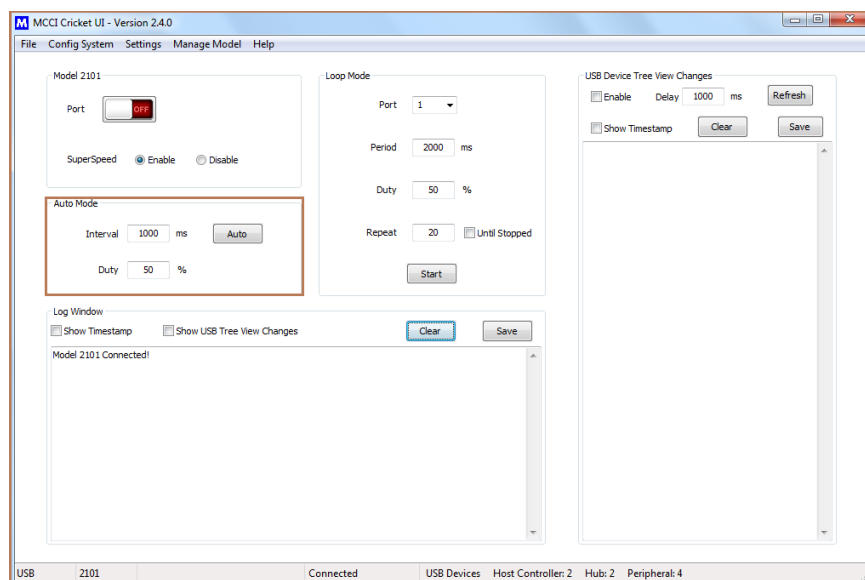
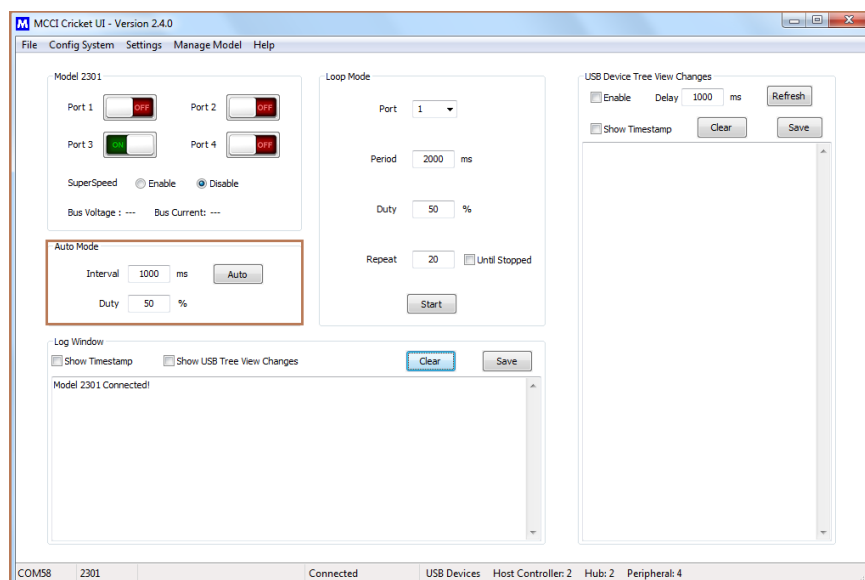


Figure 29 Model 2301 Auto mode Controls



Note: If USB Device Tree Changes option is enabled, Then Delay specifies in that window is override the auto-mode interval.

The Model 3201/3141/2101/2301 auto mode control options and description are mentioned in Table 6.

Table 6 Auto Mode Control Options

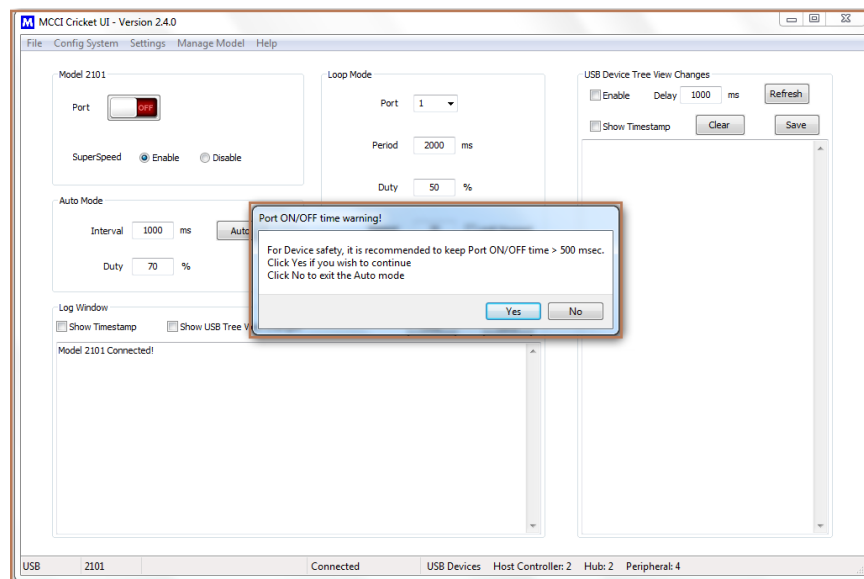
Control Option	Description
<b>Duty</b>	Percentage of ON time in total time period (ON + OFF).
<b>Interval</b>	Auto-mode switching interval (Default 1000 MS)
<b>Auto/Stop</b>	Start/Stop the auto mode

Whenever the Auto control is clicked, the program will compare the Interval time with the USB Device Tree Changes delay, if it is less than that, then warning message will be displayed with two options, the warning message shown in Figure 30.

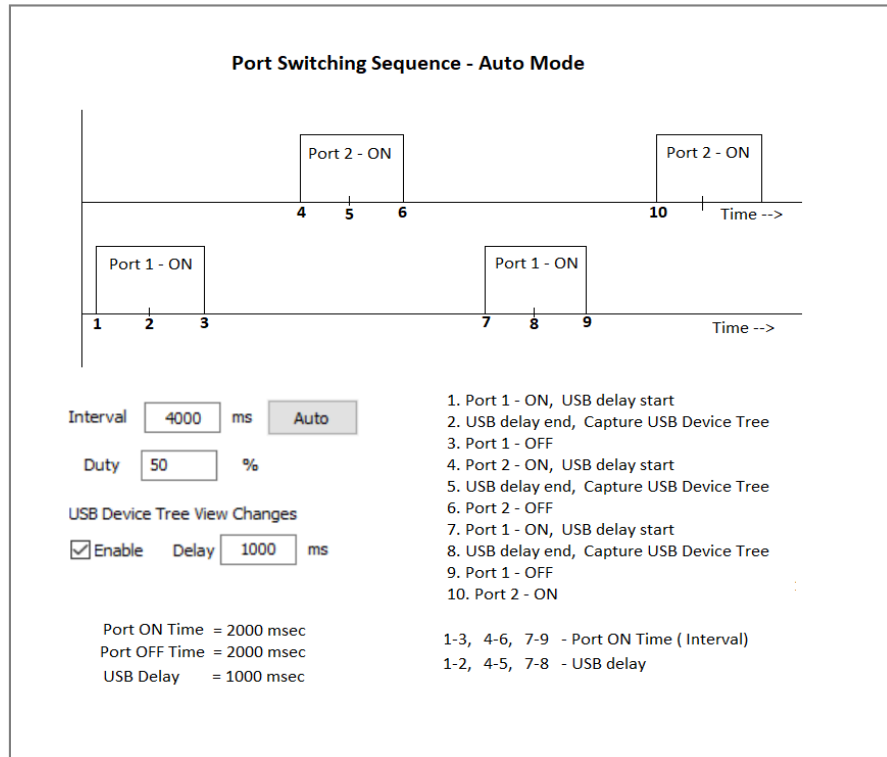
Option 1: Click Yes – to start the Auto mode without USB Device Tree Changes option.

Option 2: Click No – to cancel the Auto mode start action, then the User needs to update the Interval time manually.

Figure 30 USB device tree delay warning-Auto Mode



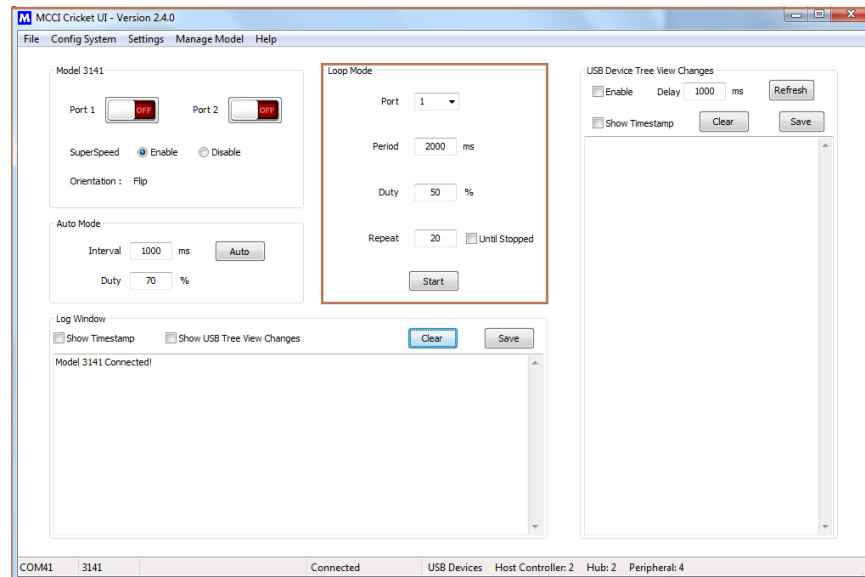




### 8.6.3 Loop Mode

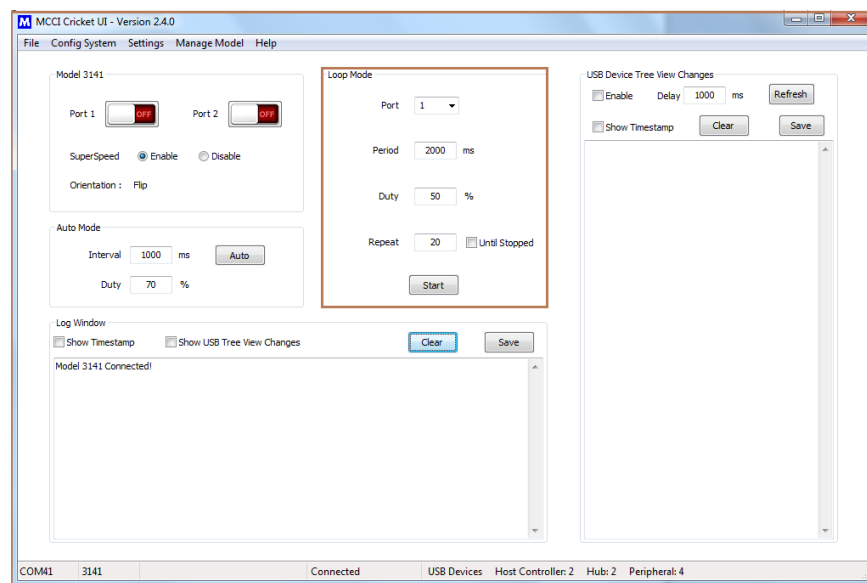
Here, the Loop Mode execution is similar in all devices as shown in Figure 31.

Figure 31 Loop Mode in Cricket UI



- In the loop mode the connected device port numbers will be automatically detected, Select a port number from **Port** drop down menu, the detected port will be switched ON and OFF based on the repeat cycles given the **Period**, **Duty** will determine the ratio of the ON/OFF time for the selected port(s).
- Click on the **Start** button to start the loop mode operation.
- Click on the **Stop** button to stop the loop mode operation.
- User can't change the Port and Speed in the middle of loop mode execution.
- Loop mode control and its default values are shown in Figure 32.

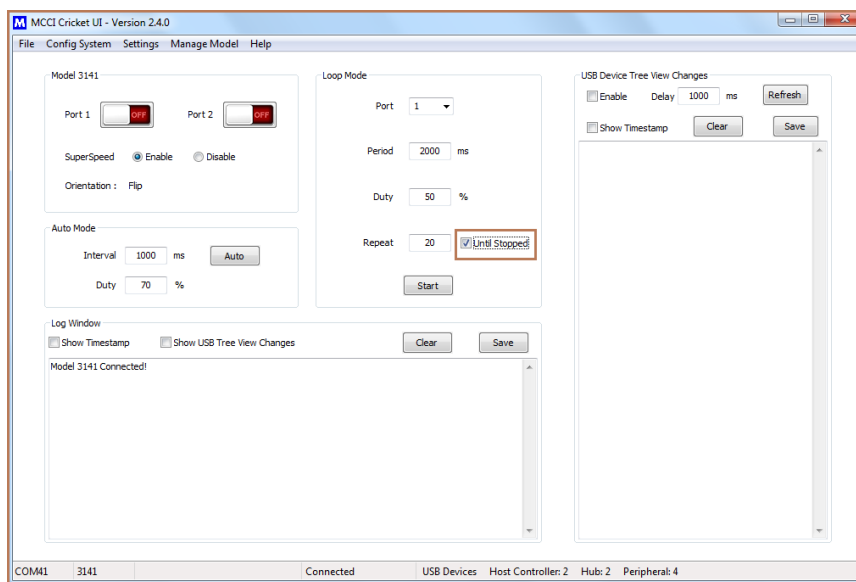
**Figure 32 Loop Mode controls**



#### **8.6.4 Until Stopped**

- In the loop mode the connected device port numbers will be automatically detected, Select a port number from **Port** drop down menu, the detected port will be switched ON and OFF based on the given the **Period**, **Duty** will determine the ratio of the ON/OFF time for the selected port(s).
- If the “Until stopped” checkbox is checked.
- The port will work depending on the configuration until the “**Stop**” button is pressed.
- Click on the **Start** button to start the loop mode operation.
- Click on the **Stop** button to stop the loop mode operation.
- User can't change the Port and Speed in the middle of loop mode execution shown in Figure 33.

Figure 33 Loop Mode Controls "Until Stopped"



The loop control options and descriptions are mentioned in below Table 7.

Table 7 Loop Mode Control Options

Control Option	Description
<b>Port</b>	Select a port number from drop down menu.
<b>Period</b>	Time between two successive ON/OFF cycle (MS).
<b>Duty</b>	Percentage of ON/OFF Time in total time period (ON + OFF).
<b>Cycle</b>	Number of cycles.
<b>Until Stopped</b>	Until stopped the loop.
<b>Start/Stop</b>	Start the loop / Stop the loop.

The Model Cricket UI Loop mode configuration default values and Descriptions are mentioned in Table 8

Table 8 Loop Mode Configuration Default Values

Parameter	Default Values
<b>Port</b>	Port are updated in depends on connecting device.
<b>Period</b>	2000 MS
<b>Duty</b>	50%
<b>Cycle</b>	20

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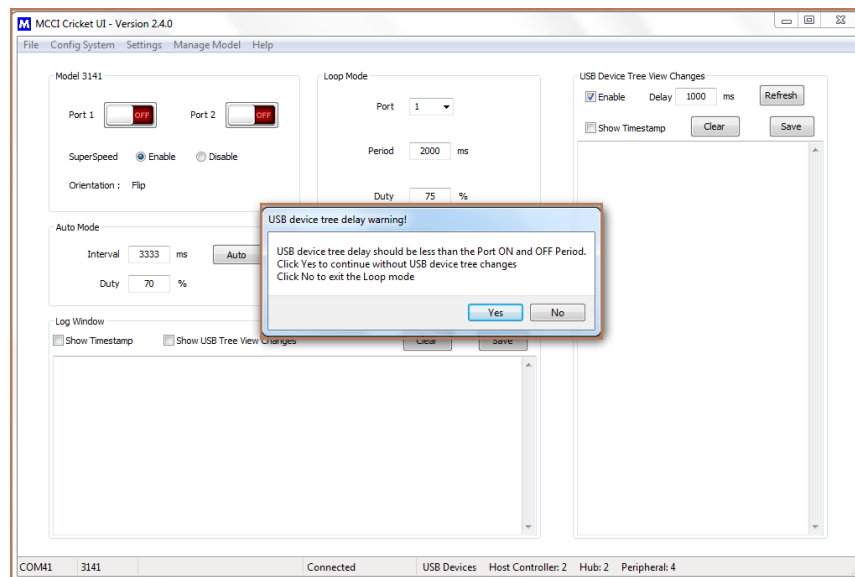
Note: If USB Device Tree Changes option is enabled, Then Delay specifies in that window is override the auto-mode interval.

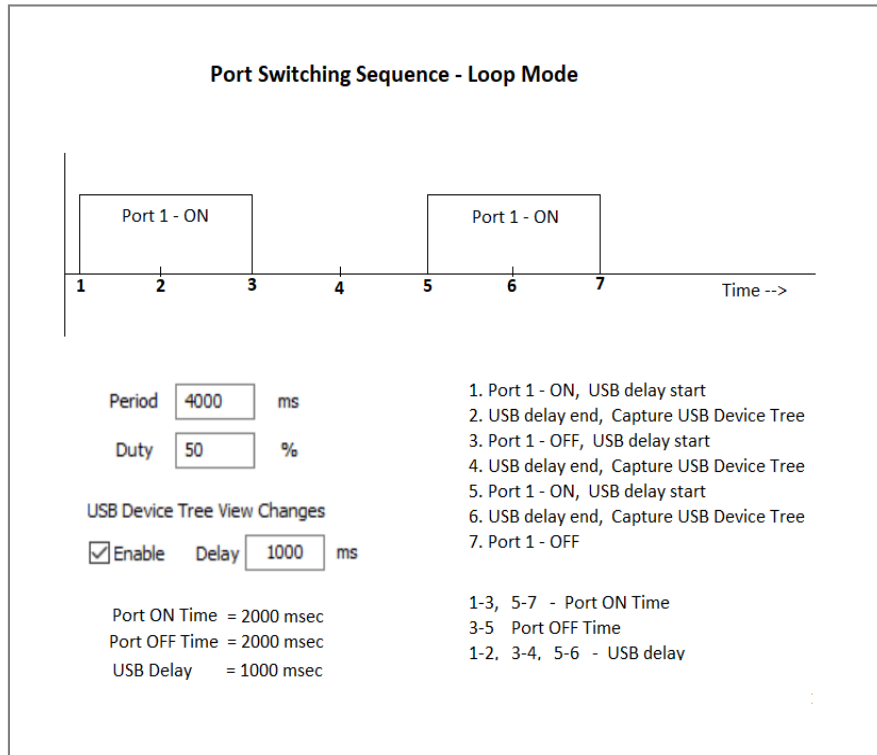
Whenever the Start control is clicked, the program will compare the Period (ON Time and OFF Time) with the USB Device Tree Changes delay, if it is less than that, then warning message will be displayed with two options, the warning message is shown in Figure 34.

Option 1: Click yes to start the Loop mode without USB Device Tree Changes option.

Option 2: Click No to cancel the Loop mode start action, then user need to update the Period and Duty manually

Figure 34 USB device tree delay warning-Loop Mode





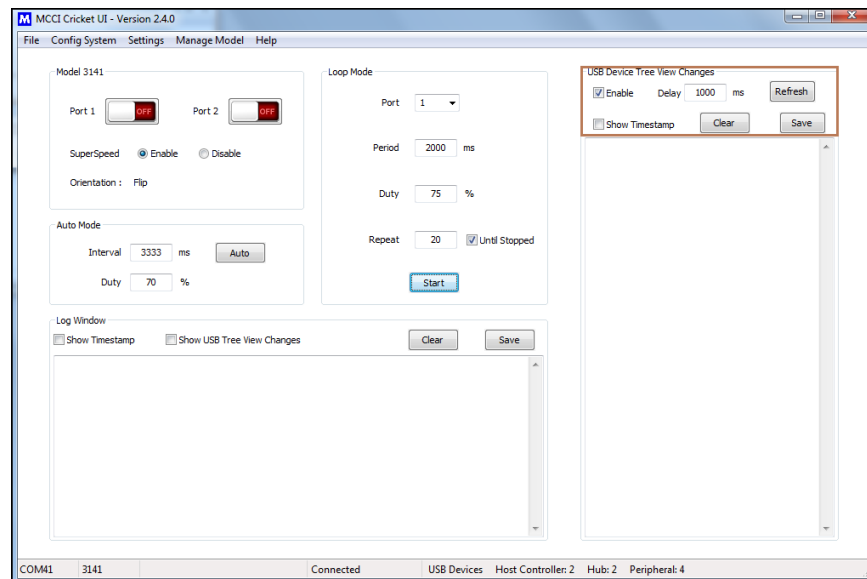
## 8.7 USB Tree View Changes

This feature is convenient for the users to check the plug-in/plug-out list of the USB devices after every port state changes.

The options of the USB Tree View changes are explained in this section. The respective UI window is shown in the Figure 35.

- **Enable:** Tick the checkbox to enable USB device tree changes feature.
- **Delay:** Minimum delay required for port connect/disconnect feature of the device (Depends on connected device enumeration time)
- **Refresh:** Gets the list of connected USB device(s) and display the Device information in the “USB Device Tree View Changes” panel.
- **Show Timestamp:** Option to log the device information (connect, disconnect, et) with timestamp.
- **Clear:** Clears the device log window
- **Save:** Save the device log to a file in a desired location.

Figure 35 USB Device Tree View Change Control Options



### 8.7.1 USB Delay Override

Auto Mode:

Whenever Show USB Tree View Changes option is enabled, the program will compare the Interval time with the USB Device Tree View Changes Delay, if it is less, then the Interval time will be overridden by the USB Device Tree View Changes Delay.

For example, Interval = 1000 MS, Delay = 2000 MS, Duty = 50%, when the Show USB Tree View Changes option is enabled, then the Interval will be updated as 1500 MS by the program.

Loop Mode:

Whenever Show USB Tree View Changes option is enabled, the program will compare the Period (Port ON and OFF Time) with the USB Device Tree View Changes delay, if it is less, then the Period will be calculated based on the USB Device Tree Changes Delay, and the Duty to make both Port ON and OFF Time equal to the USB Device Tree Changes delay.

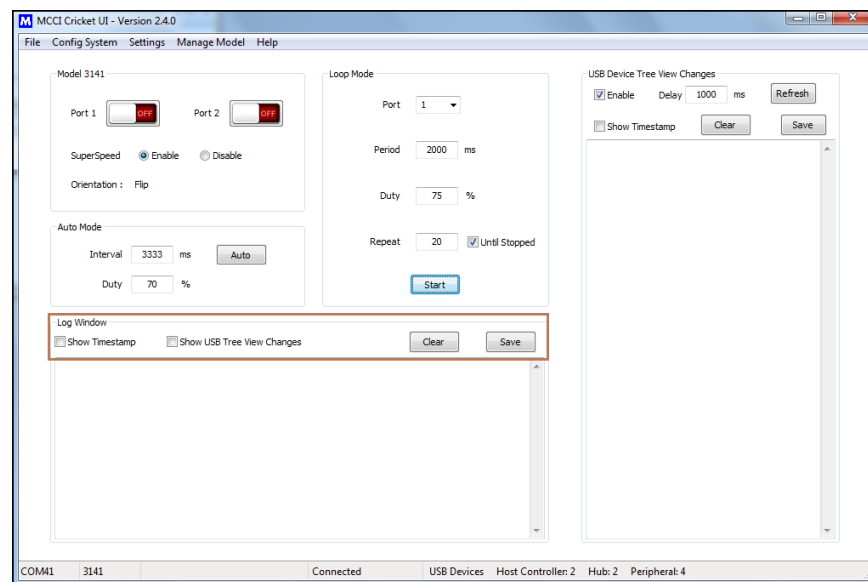
For example, Period = 4000 MS, Duty = 75%, Delay = 2000 Ms. Based on the Period and Duty Port ON Time = 3000 MS, Port OFF Time = 1000 Ms. When the Show USB Tree View Changes option is enabled, then the Period will be updated as 8000 MS to make the Port OFF Time equal to the Delay which is 2000 Ms.

## 9 Log Window

The log window helps to log the device activities, it has an option to enable and disable the timestamp. Log window UI show in Figure 36.

- Show Timestamp: Option to log the device information with timestamp
- Show USB Tree View Changes: Option to display the USB device tree view changes log in the log window
- Clear: Clears the log window
- Save: Save the log to a file in selected location.

Figure 36 Log Window



### 9.1 Disconnect & Close the Application

#### 9.1.1 Disconnect

To disconnect a device, click the **Disconnect** option from the **Manage Model** panel and the selected device can be disconnected.

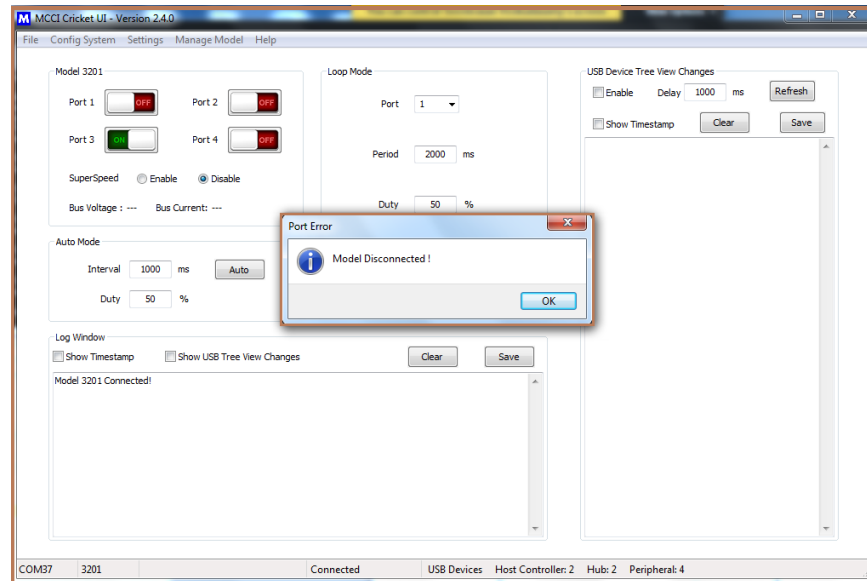
#### 9.1.2 Close

To close the application, Click **Close** from the **File** Menu as displayed in. The application will be closed.

### 9.2 Disconnect Pop-up Notification

If the connected Model 3201, 3141, 2101 or 2301 device is plugged out while notification message will pop up as **“Switch Disconnected!”** and the notification is shown in the Figure 37.

Figure 37 Disconnect Pop-up Notification



## 10 Getting Help

If you have a question about using the GUI usage or operation, please visit MCCI's support community. Feel free to post a question! We'll do our best to assist, and you may benefit from the experience of others. You may also post private questions to MCCI by [opening a ticket](#) or by sending email to [techsupport@mcci.com](mailto:techsupport@mcci.com).