

# Tyrata Simulator

# User Manual

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## 1. System Overview

This desktop program serves as the data simulator & generator for Tyrata system. Specifically, the simulator & generator program consists of the following components:

- 1.1. Tire sensor information initialization & modification
- 1.2. Data generation & simulation configuration
- 1.3. Data file save & import
- 1.4. Data Transmission via Bluetooth

## 2. Getting Started

### **System Requirements**

Windows 10 PC (with Bluetooth support)

### **Launching the Application**

To launch the application, double click .exe. The main user interface of the launched application is shown in Figure.4

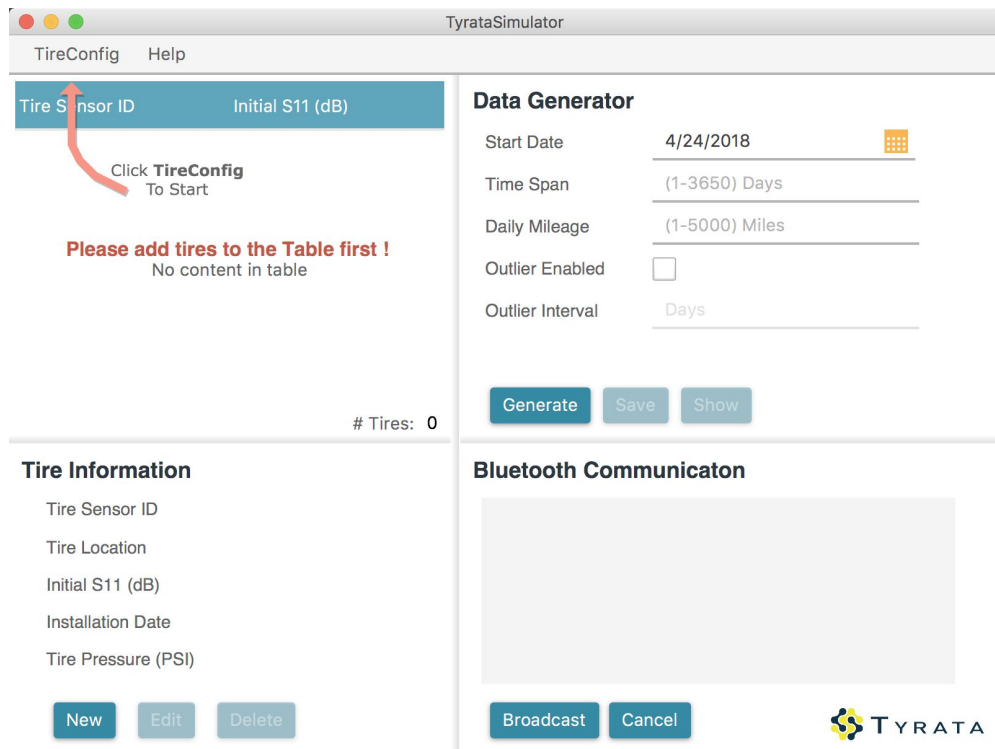


Figure. 4. Main interface

## Initializing Tire Sensor Information

To generate tire sensor information,

1. Click "Tire Config" on Menu bar and then click "Generate Tires", as shown in Figure.5.
2. Enter the number of tire sensors and click "OK", as shown in Figure.6.

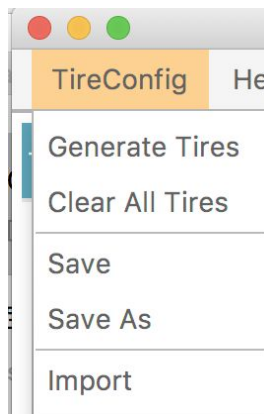


Figure.5. TireConfig menu

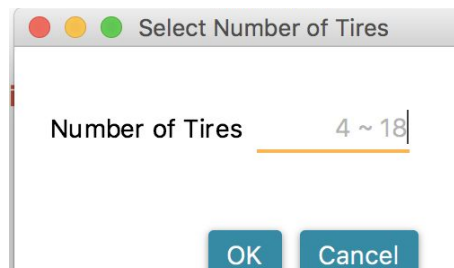
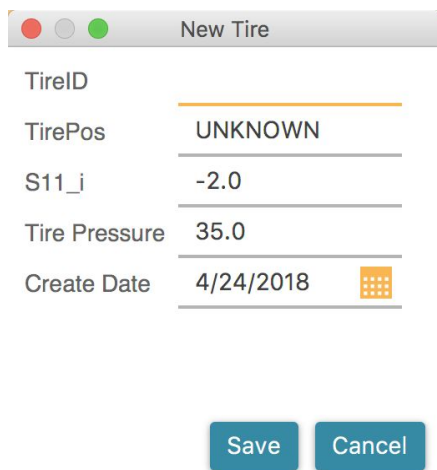


Figure.6. Enter the number of tires

After quick generation of tire sensor information, you can view the current generated tire sensor information on the lower left section of the main user interface shown in Figure.4.

To add a new tire sensor, delete a generated tire sensor, or edit the information about a tire sensor,

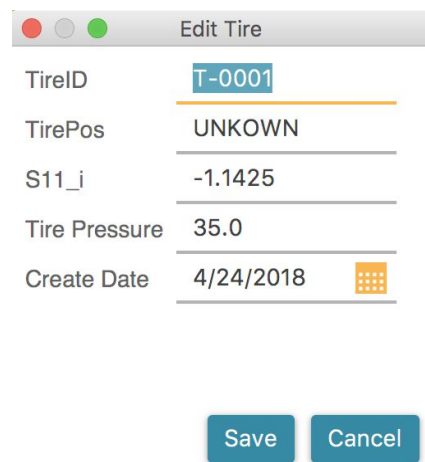
- Click “New” button to add a new tire sensor. Enter the specific sensor information in the new “New Tire” window popped up, as shown in Figure.7.
- Click “Edit” button to modify the information about a current tire sensor in the “Edit Tire” window popped up, as shown in Figure.8.
- Click “Delete” button to delete the selected tire sensor information record.



TireID	
TirePos	UNKNOWN
S11_i	-2.0
Tire Pressure	35.0
Create Date	4/24/2018

Save Cancel

Figure. 7. New Tire



TireID	T-0001
TirePos	UNKOWN
S11_i	-1.1425
Tire Pressure	35.0
Create Date	4/24/2018

Save Cancel

Figure. 8. Edit Tire

To clear all tire sensor information records, click “TireConfig” button on the menu bar and select “Clear All Tires”, as shown in Figure. 5.

### **Saving/Importing Tire Sensor Information**

To save the current tire sensor information records for later use,

- Click “Tire Config” on menu bar and then click “Save” or “Save As”, as shown in Figure. 5.

To import a local tire sensor information XML file,


- Click “Tire Config” on menu bar and then click “Import”, as shown in Figure. 5.

## Generating S11 Data

To generate s11 data points,

- Fill out all the fields on the upper right section of the main user interface, as shown in Figure.9. The units of Time Span, Daily Mileage, and Outlier Interval are days, miles, and days, respectively.
- If needed, check the “Outlier Enable” checkbox and enter the expected outlier generation frequency/period in “Outlier Interval” field.
- Click “Generate” button to generate specified S11 data.
- Click “Show” button to show the generated S11 data, as shown in Figure. 10.
- Click “Save” button to save the generated S11 data into a local XML file.

### Data Generator

Start Date	4/24/2018	
Time Span	365	
Daily Mileage	15	
Outlier Enabled	<input checked="" type="checkbox"/>	
Outlier Interval	30	

GenerateSaveShow

Figure. 9. Data Generator

Generated Data

Timestamp:2018-04-25  
Mileage: 15  
Sensor ID: T-0001  
S11: -1.6322228648286379  
Pressure: 35.0  
Sensor ID: T-0002  
S11: -1.1945250060807118  
Pressure: 35.0  
Sensor ID: T-0003  
S11: -2.2083690891588312  
Pressure: 35.0  
Sensor ID: T-0004

Close

Figure. 10. Show Generated Data

## Sending the Generated Data to Mobile App via Bluetooth

To send the Generated Data to Mobile App:

- Click on the broadcast button, a dialogue box will prompt, letting you choose the XML file you want to transmit via Bluetooth as shown in Figure.11
- After you have chosen the file you want to transmit, the white screen at the right-bottom corner will show the status of the bluetooth connection (Figure.12)

- Before you start next bluetooth connection, you should first cancel or close the currently running bluetooth connection by clicking on the “Cancel” button as shown in Figure. 13

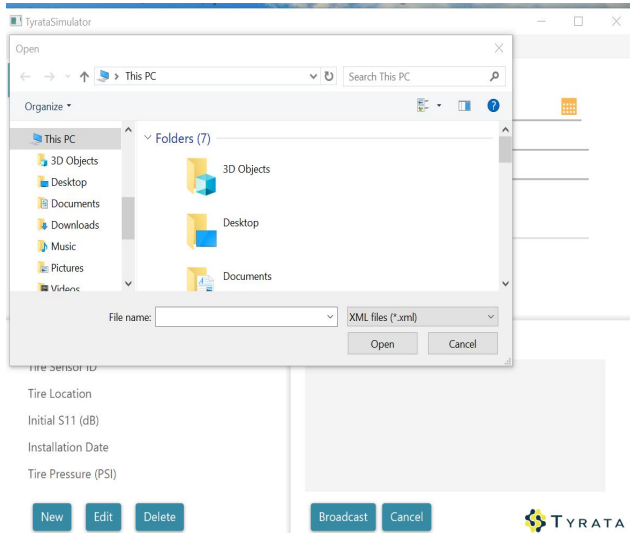


Figure. 11. Chosing file via Broadcast button

## Bluetooth Comms

Creating Bluetooth Connection to Android Mobile!  
Waiting for Android Mobile to connect...

Broadcast

Cancel



Figure. 12. Bluetooth Status Notification

## Bluetooth Comms

Creating Bluetooth Connection to Android Mobile!  
Waiting for Android Mobile to connect...  
Shutting down BroadCasting ...  
Bluetooth Connection has been cancelled!

Broadcast

Cancel



Figure. 13. Cacnel Bluetooth Connection