Project Document | Radar Analyzer Manual

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ITS Radar Interface

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1 Overview

1.1 Document History

Date	Writer	Main Points
2019-05-22	Yoontae Hwang	Writing a draft

1.2 Explanation of abbreviations and terms

Track The unit in which the radar counts an object (vehicle).

Tracking The term 'tracking' is used when the recognition is made by the radar.

Hotspot Zone The lane that is given with extra attention when recognition process is conducted with radar

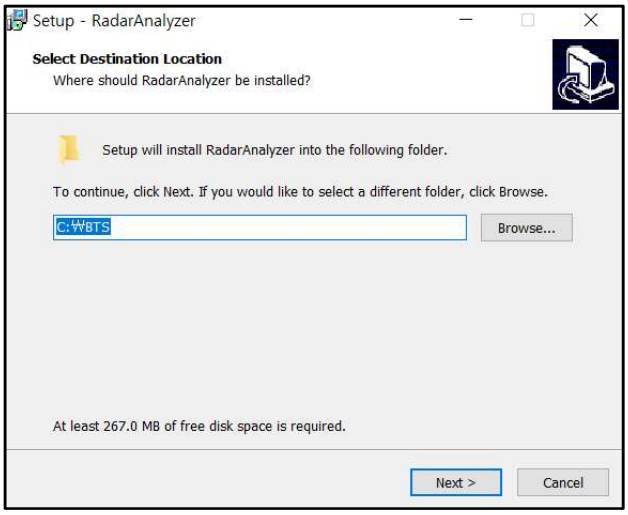
1.3 Legal Notice

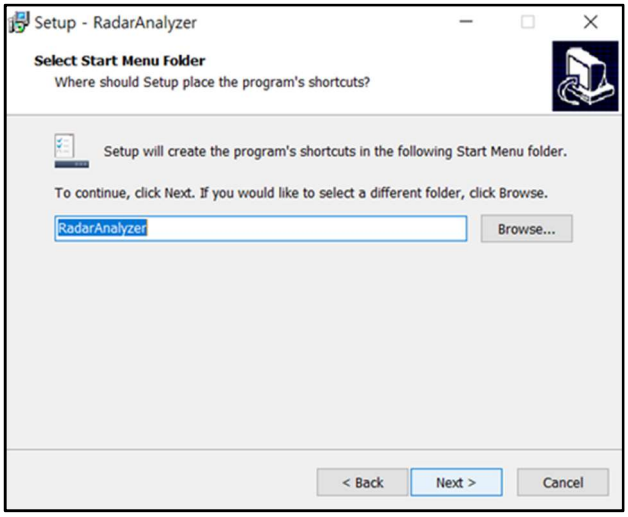
2 Installing and Setting up programs

2.1 Program Installation

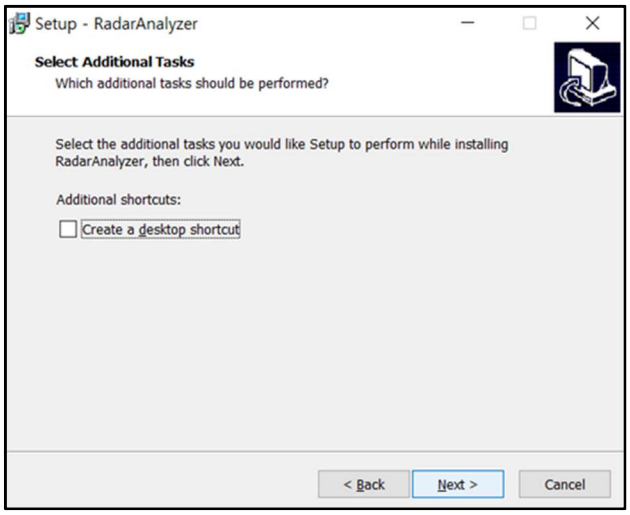
Explanation: Program Installation (Before moving onto the use of Radar Analyzer)

1. (a) Open 'file BTS_Setup.exe'
   (b) Select the location where you want to create the Radar Analyzer program
2. (a) Modify the name of the program you want to download
   (b) Select the location where you want to create the shortcut file.



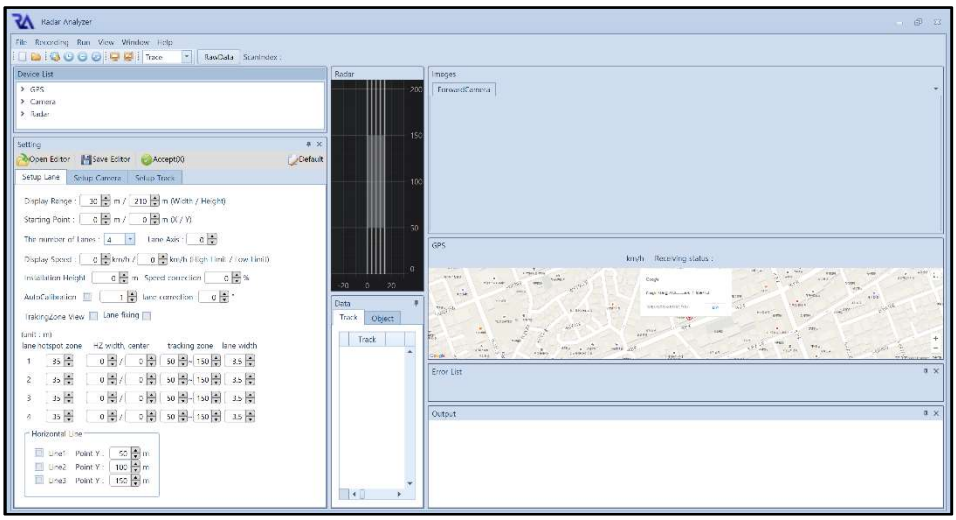


3. Choose whether to create a shortcut file on your desktop.
4. Download and complete files

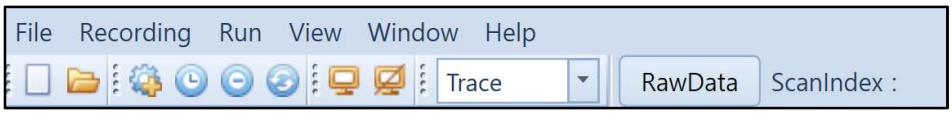


2.2 Program Configuration

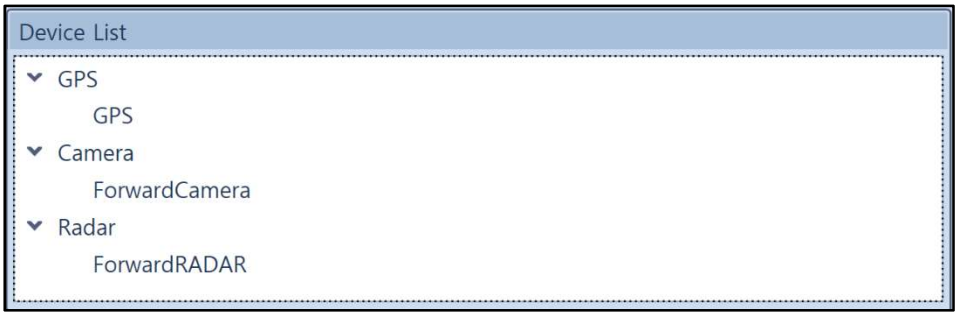
When you run Radar Analyzer, the following basic screen appears: The screen consists of two rows of menu bars at the top and eight windows. In this chapter, the description for each component will be given, and setting up of the Radar Analyzer will be discussed in the following chapter.



1. Menu
   All the functions with Radar Analyzer can be manipulated on the menu. All the data measured by radar can be designated to be recorded and recalled, where the records can be started and/or stopped.

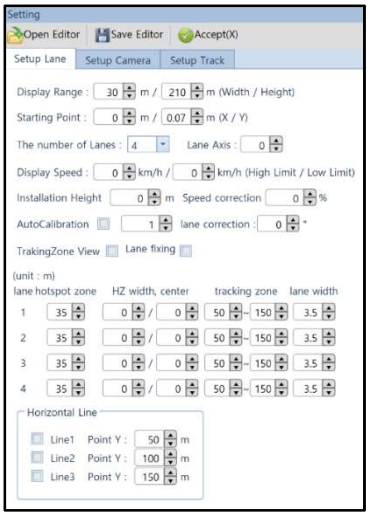


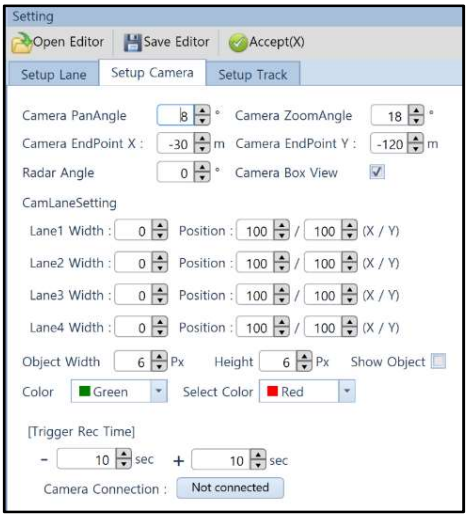
2. Device List
   It consists of a list of various sensors used through the Radar Analyzer. In addition, details of the sensors can be modified.

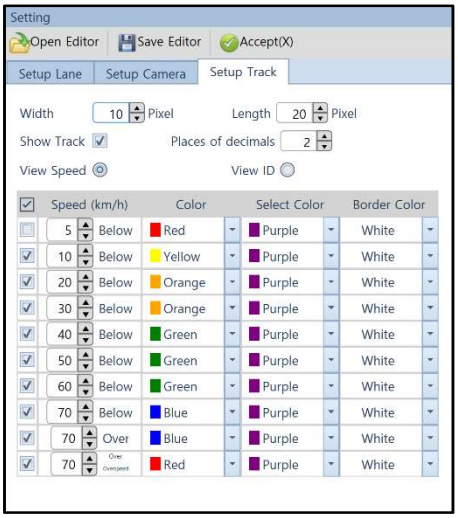


3. Properties
   This section helps the user to (a) correct the inevitable errors of the radar and (b)

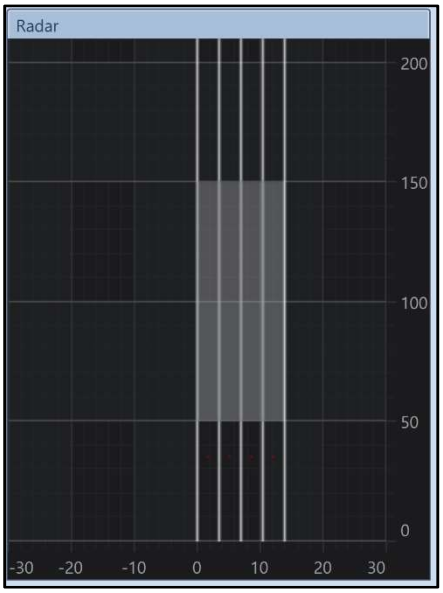
manipulate the optional settings to make it easier for the users to handle radar, video display, and data window. The settings conducted at this phase will influence the visualization of the data. Thus, appropriate setting is important for the facile usage of Radar Analyzer.

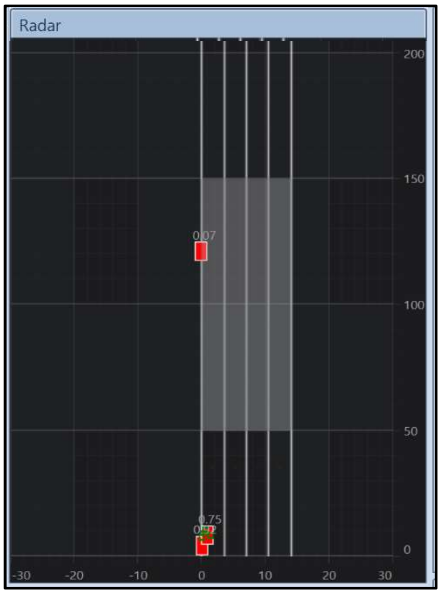




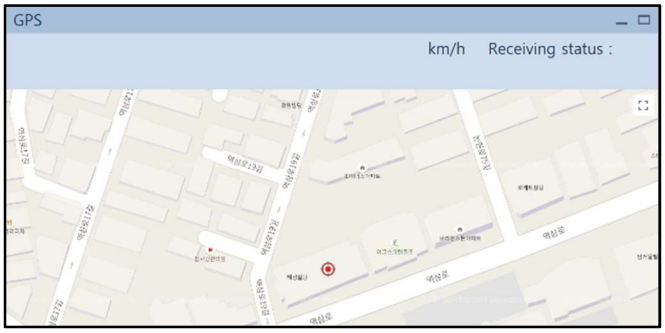


4. Radar
   Based on data measured by Radar, the moving vehicle is recognized as a single track where the movement of the vehicle is made within the lane.



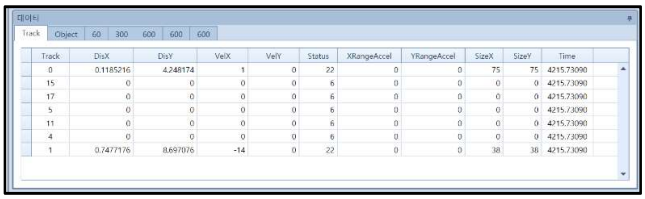


5. GPS
   Provision of the installed location once the Radar is connected with the network.

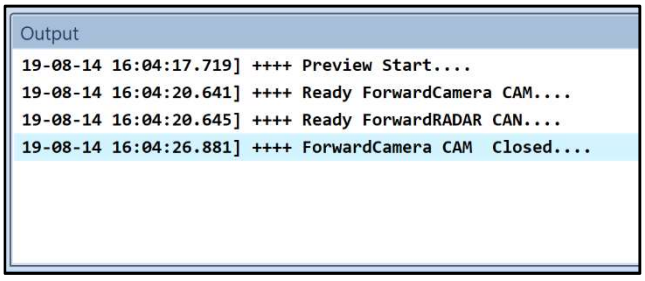


6. Images
   Images taken with a built-in front camera are sent in real-time. The vehicles that are being tracked will have the different color tags depending on the speed information (Note. the color setting can be changed in the Properties window)

7. Data
   Shows data such as the location, velocity, and so on for an object measured by Radar.



8. Output
   It outputs connection status and availability of external devices such as Radars and cameras.

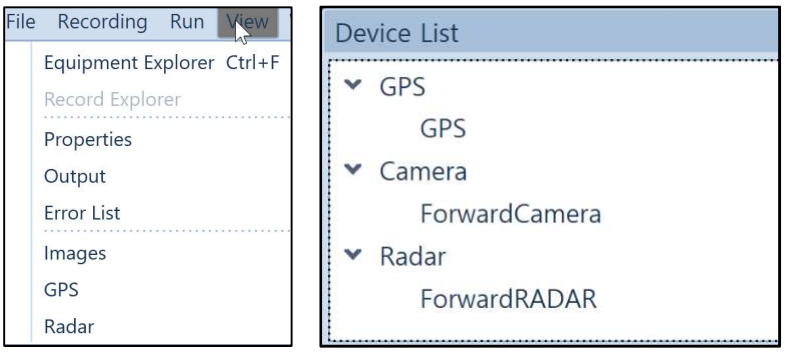


9. Error List
   Outputs errors that occur during use of the Radar Analyzer.

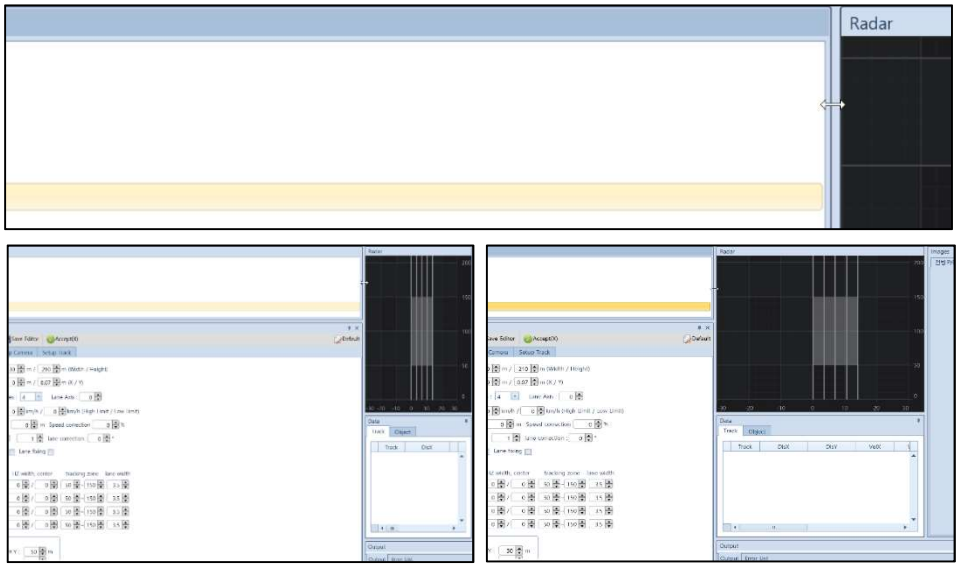
2.3 Program Settings

Before the collection of data through radar, it will be helpful to have a depth understanding of the settings of the aforementioned components to handle Radar Analyzer with an ease.

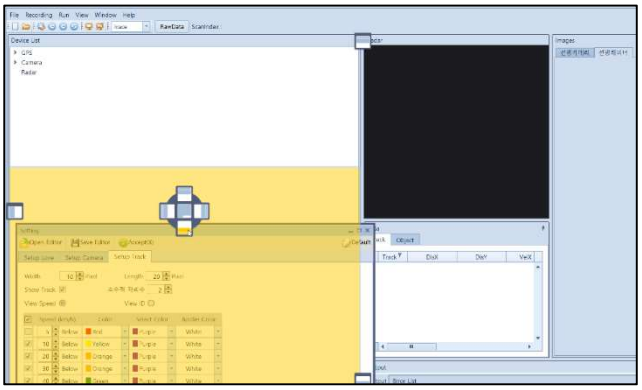
1. Delete, and create layouts
   Radar Analyzer offers various services such as displaying data measured through radar and images driven by the front-camera, and location information through GPS. The spectrum of services required by each and every user will be different, and it is possible to delete under-utilized windows and customize the services according to different users. The Icon 'X' on the upper right corner of (a) error list, (b) output, and (c) property window can be used for the deletion of the services (Note. the recreation of the service can be conducted using 'View tab' at the top).



2. Change layout size and location
   If you are using Radar Analyzer, you may want to check the vehicles tracked by radar more precisely or to view the images of the front camera in more detail. In case of this situation, Radar Analyzer is designed to allow you to change the size of the window. To change the size of a window, you can change the size as much as you want by placing the mouse on the edge of the window and dragging it when an arrow occurs.

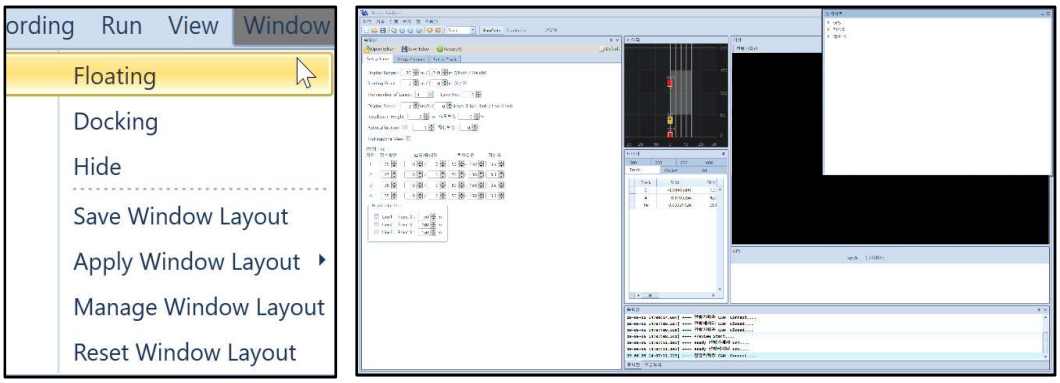


Other customization can be made to fit user's needs. The repositioning & resizing of the layout is possible by simply dragging the required windows to the required position.

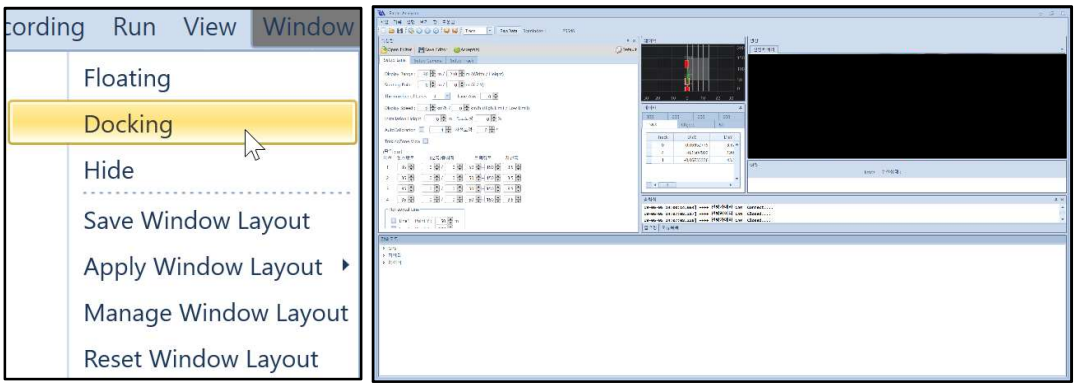


3. Layout Floating and Docking

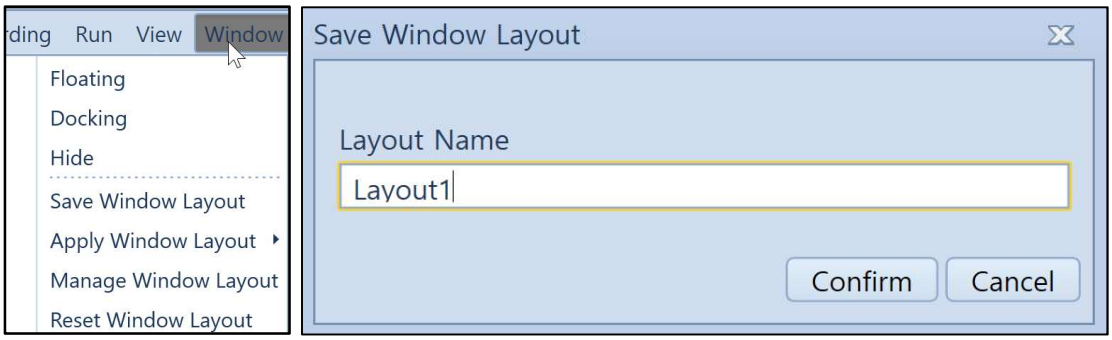
The window that is intriguing according to the user can be separated from the layout and viewed independently to provide more effectiveness. Floating is the function that separates the selected windows from the layout. The below example depicts the Floating Function where Properties window is detached from the layout (Note. Floating and Docking are the terms that need to be understood for the separation, where Docking is only performed after the Floating).



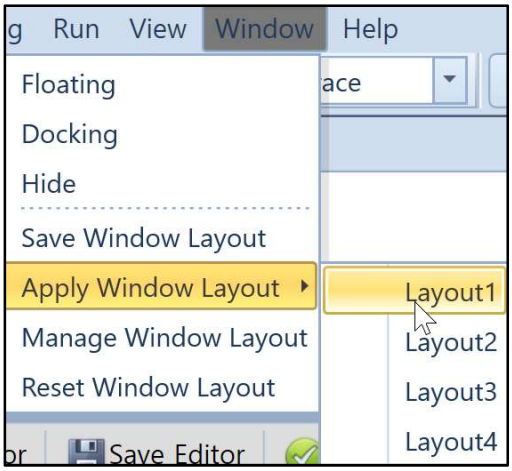
The docking function, as opposed to floating functions, is a function that moves the slotted window back to the layout. The use of Docking Function will return the separated windows back to the layout.



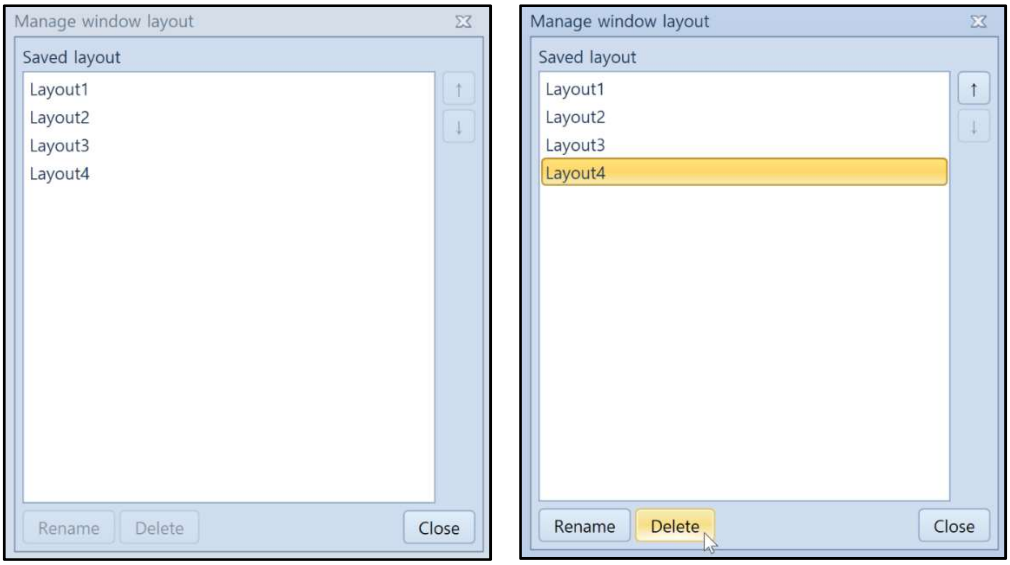
4. Save and Manage Layouts
   It is extremely cumbersome and inefficient to reset a layout created by the previous process each time you run the Radar Analyzer. To prevent users from experiencing this cumbersome process, Radar Analyzer is providing the ability to store, retrieve and manage set-up layouts. First, let me explain about the storage function. Clicking on the window tab in the top menu bar will bring up the list as shown in the bottom left, and clicking Save Window Layout will open the window in the lower right corner. When you create a name for the set layout and click OK, the current layout is saved.



If so, you might be wondering what to do to bring in and use the saved layout. Clicking on the window tab will bring up a list of the layouts you've created so far by placing your mouse over 'Apply Window Layout'. Click on any of the listed layouts to set them up.



If you have saved layouts that are not used and need to be deleted, click Manage Window Layouts on the window tab to see all the saved layouts. You can delete the layout by selecting one that is not in use. You can also change your name.



If you want to use the layouts provided by Radar Analyzer by default, simply click 'Reset Window Layout' and click 'Yes' in the new window that exits.

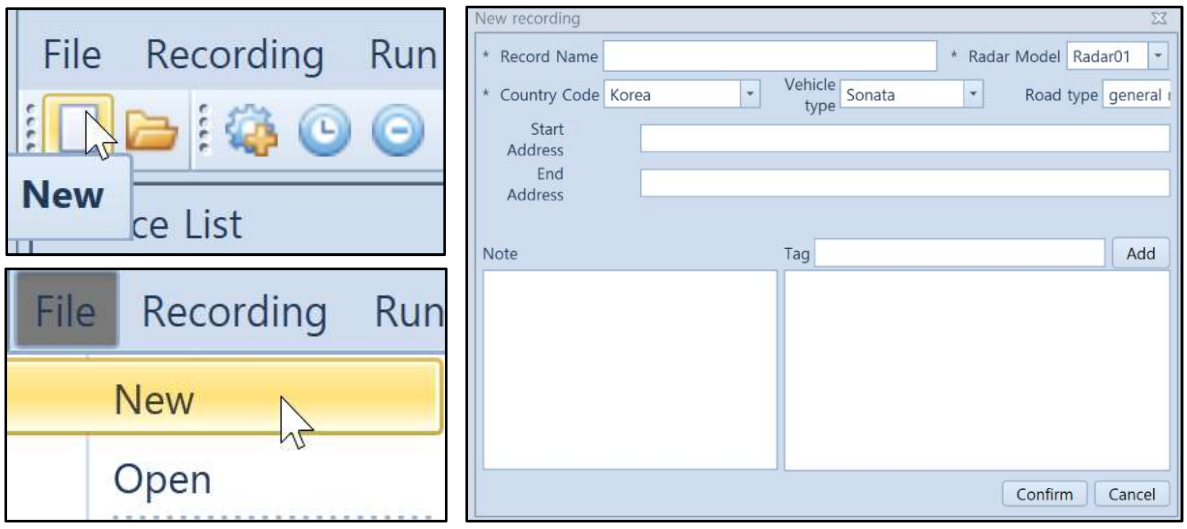
3 Data Recording using Radar Analyzer

Radar Analyzer stores the speed, acceleration, ID and distance of the vehicle measured by the radar in a record file within the Radar Analyzer file. This stored data is called Logging Data and logging data can be replayed using the Radar Analyzer.

3.1 Creating and Managing files

Let me explain how to create and manage a file for storing data measured by radar.

1. Creating a file
   (a) Press 'New' on the top-line file tab of the top menu bar
   (b) Press 'Icon' at the further left of the bottom of the menu bar
   Both methods can open a new record window and create new files.
   Once the file is opened and is saved, the file will be saved as BTS/Rec/Record Pat.

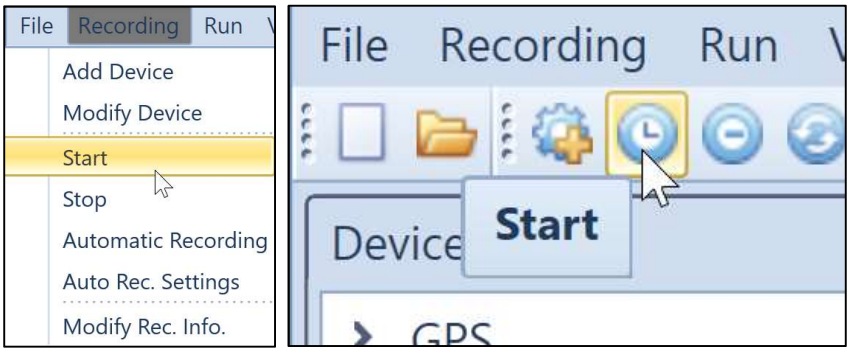


   The data can be stored by using 'record start' function (note. detailed manual will be provided for the record start function). It is to note that the saved data cannot be adjusted with the current s/w version that the stoppage of the recording must be handled cautiously.

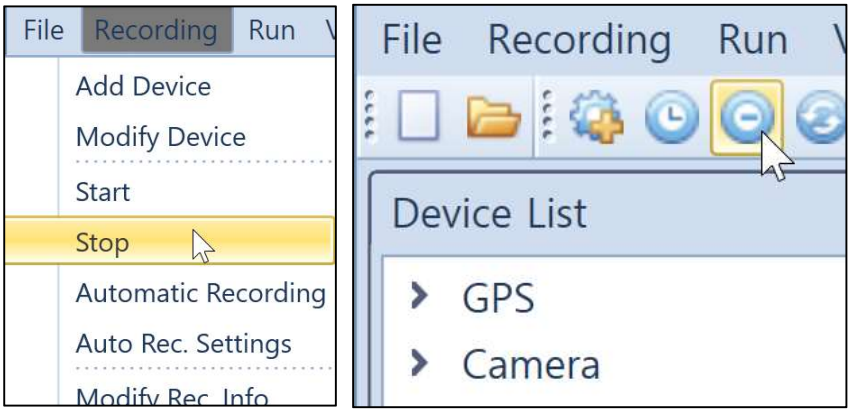
3.2 Recording and Checking

Since the radar and the PC are well connected and the data measurement setup is complete, we will measure and record the data using the radar and check it out.

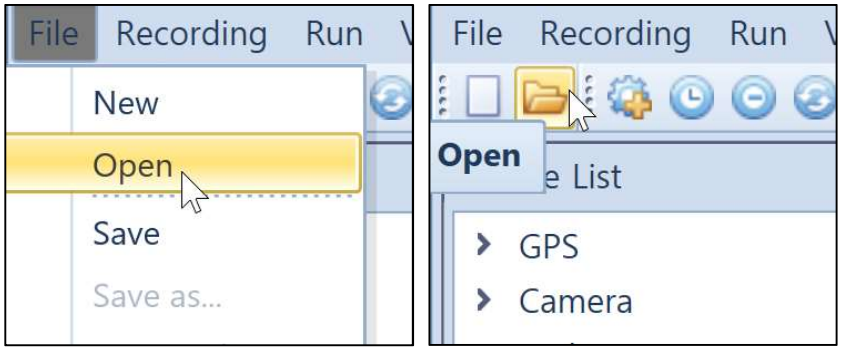
1. Recording
   To record data measured by the radar, 'Start Recording' must be selected (where it is found in sub-list of the Record on the top menu, or Start Recording Icon at the bottom line). Once the function is activated, the data obtained from the radar and images from the front-camera will be displayed.



To stop or end recording, press 'Stop Recording (where it is found in sub-list of the record on the top menu, or Stop Recording Icon at the bottom line). When this function is performed, all the functions including data measurement by radar and images taken by the front-camera are stopped.



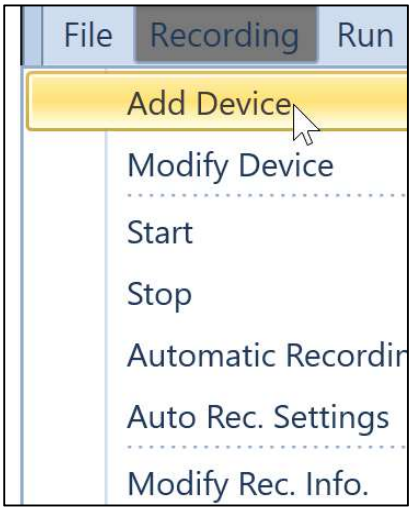
2. Checking the record
   To retrieve a file that previously saved the record, you can use the "Open" button on the File tab at the top of the menu bar or the "Open" icon at the bottom of the menu bar. By default, the file is stored in the Record folder and can be loaded (*.rec).



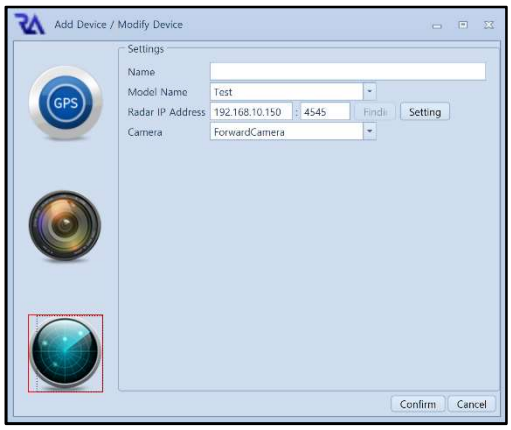
3.3 Equipment Management

Before measuring data with radar, make sure that the radar is in a measurable condition and that the radar is well connected to the PC.

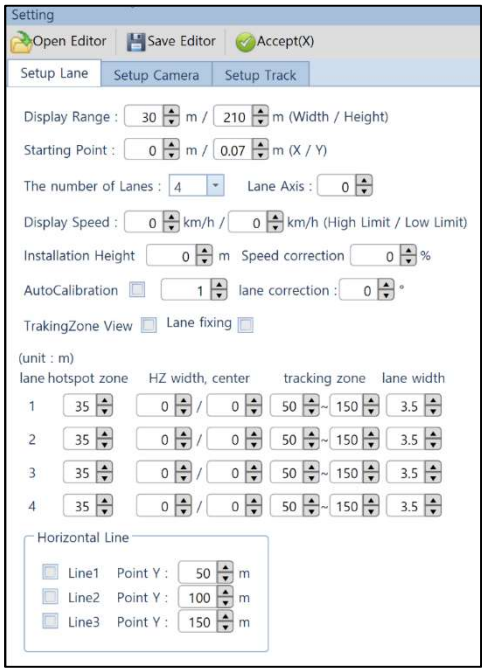
1. Add Device
   If the radar and the PC are well connected, the radar can be added to the equipment list so that data can be received. The device can be added through 'Add Equipement' Function (found in Recording tab of the menu bar or the Add Device icon on the bottom of the menu bar).

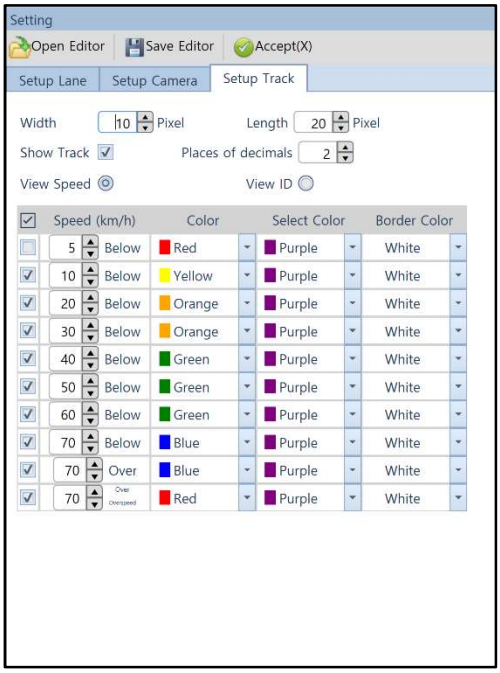


   The preceding activities will result in an Add/Modify Device window. In addition, GPS, front-cameras and radar can be connected in this window.



2. Device Settings
   In order to use the radar efficiently, the following properties window should be used. The three tabs in the Properties window allow you to set up the visual parts of the radar and the visual window. Setup line and Setup Track establishes the way radar window is displayed.





The radar window functions to show the movements of objects detected by the radar on a randomly set lane. At this point, the radar window can be modified using a property window to more effectively check the movements of objects. For example, a radar window, by default, has four lanes, and if the radar is located on a two-lane road, it should be able to change the drawing so that only two lanes are drawn. Setting up the visual effects of these radar windows is the function of the Setup Lane tab. The Setup Track also has the ability to set the visual effects of the tracked vehicle in the radar window.

<Setup Lane>

① Display Range

The Display Range, which controls the length and width of the lane in the radar window.

② Starting Point

The starting point can change the coordinates of the lane in the radar window.

③ The number of Lanes

The number of Lanes is an item that controls the number of lanes drawn in the radar window.

④ Lane Axis

Lane Axis is the section to modify the direction of the radar if it does not have same direction to that of the lanes.

⑤ Display Speed

Display Speed limits the speed so that objects that are not within the speed range are not

shown in the radar window.

⑥ Installation Height
Radar measures the data assuming that it is at the same height as the object it detects. In general, however, the radar is installed about 8 meters above the ground, resulting in errors. Errors due to the installed position of these radars can be corrected using the Installation Height item.

⑦ Auto Calibration
After radar is installed, it can be tilted for several reasons. In the event of such an error, it is possible to correct the tilt with the Auto Calibration item.

⑧ Tracking Zone View
Tracking Zone View is used with items on the hotspot zone at the bottom. The hotspot zone items have items that modify the length of the hotspot zone and items called HZ Width/Center for visual implementation. In addition, the area where the vehicle is to be tracked can be set through the tracking zone, which is not visible from the radar window even if the radar detects the vehicle when the vehicle passes the tracking zone. If you check the Tracking Zone View after you have set up all of the tracking zones, the settings for the tracking zone are also reflected. In other words, if the Tracking Zone View is not checked even when the tracking zone is set, its contents are not reflected. At the bottom is an item called Horizontal Line, which functions as drawing a horizontal line to make the distance clearer.

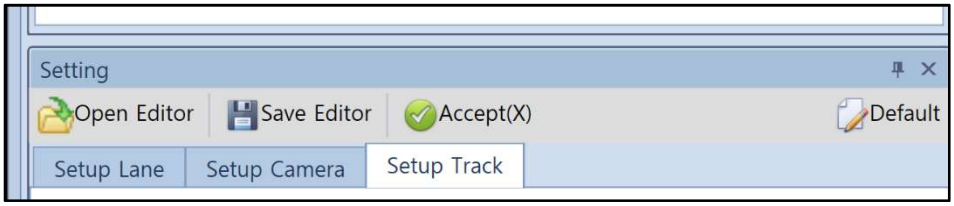
<Setup Track>
① Width와 Length
Width and Length can adjust the size of the rectangle that implements the tracked vehicle.

② Show Track
You must check Show Track to create a rectangle that implements the tracked vehicle.

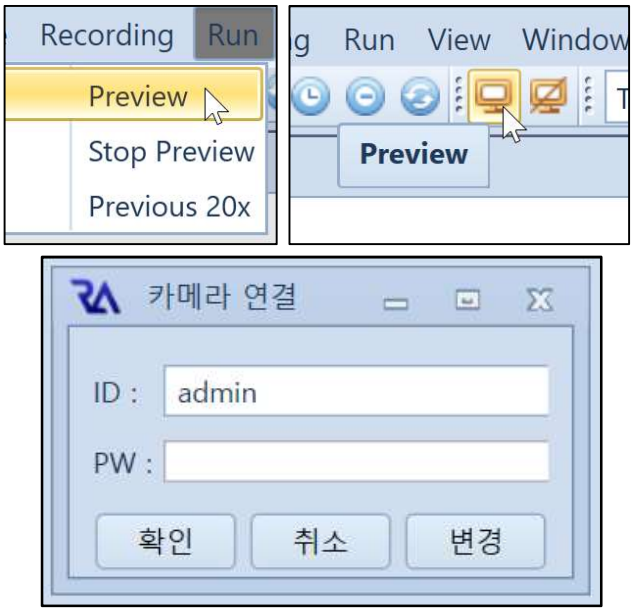
③ View Speed
With View Speed, the vehicle's speed is derived from a rectangle. And the decimal places of speed can also be set.

④ View ID
You can use the View ID to identify the vehicle. This makes it easier to identify the information of the vehicle to be identified.

If all settings are finished using the Properties pane, you should reflect these settings using the Accept button just below the Properties pane. And if you want to go back to the settings that are basically implemented, you can use the Default button.



Once the setup has been completed to use the equipment, the radar should be connected to the Radar Analyzer. The main reason for using the Radar Analyzer is to simultaneously check the images taken from the camera. Therefore, the camera must be connected. To connect the camera to the Radar Analyzer, you can run the preview function on the Run tab at the top of the menu bar or the preview icon at the bottom of the menu bar. When executed, a camera connection window opens, which enters the password, and the password is 'default'. Press the OK button to connect the camera.



4 Improvements

Radar Analyzer is a draft of the manual for use, so there may be insufficient or missing explanations. In addition, there are features that are not yet implemented or that are insufficient because the Radar Analyzer is designed to meet the needs of users of various purposes. Therefore, we would prefer to inform users of the improvements they perceive so that they do not experience inconvenience in using Radar Analyzer.

1. Add Help Tab Features
   For the Help tab on the far right side of the menu bar, there are many features that are not yet supported Help will also be provided based on manual documentation to make it easier for users to use Radar Analyzer. The product code will allow users to manage the service and update the program online. Support features will be implemented in the shortest possible time so that users won't have difficulty using the Radar Analyzer.

2. Specify shortcuts
   Other features do not yet have shortcuts, except for the settings on the File tab and the equipment list on the View tab. More shortcuts will be designated to make it more convenient for users.

3. Floating and Docking function
   In the list of window tabs, there is a function called floating and docking. Running a floating function with a window selected can remove the window from its layout, but it may be inconvenient to use it, depending on your PC, by going up to the screen. Floating functions can be disabled through the docking function, but will be modified to make it easier for users to use them because the floating features they really wanted to implement are not implemented properly.

4. Save Icon error
   Occasionally, clicking the Save icon results in an error that causes the program to shut down automatically The obvious reasons are currently under control, but if this error occurs, we recommend shutting down and restarting your PC or using the File tab.

If you find any improvements you have found in your use, please contact us on the next page and we will make changes.

5 Contact

For additional questions or technical support, please contact Bitsensing at:

Address:
165, Yeoksam-ro, Gangnam-gu, Seoul 06247, Republic of Korea

Office Number / Fax Number:

Office Number: +82.70.7114.1010
Fax Number: +82.70.7159.1352

Homepage / Email address:

Homepage: http://bitsensing.com/
Email: sales@bitsensing.com

Information to user

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

Declaration of Conformity in English

This device complies with Industry Canada licence-exempt RSS standard(s).
Operation is subject to the following two conditions:
(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with the minimum distance 20cm between the radiator & your body.

Déclaration de conformité en francais

Le present appareil est conforme aux CNR d'Industrie Canada applicables aus appareils radio exempts de licence. Léxploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisaeur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

DÉCLARATION D'EXPOSITION AUX RADIATIONS

Cet equipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cetéquipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.