



MSP RAPID ADMS Suite USER GUIDE

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1.0 MSP RAPID ADMS Suite Overview

MSP RAPID ADMS Suite is a combination of application to carry out automatic deformation monitoring for tunnels, viaduct, High / Low rise building, mining sites, DAMs, roads and bridges.

RAPID ADMS Stands for:

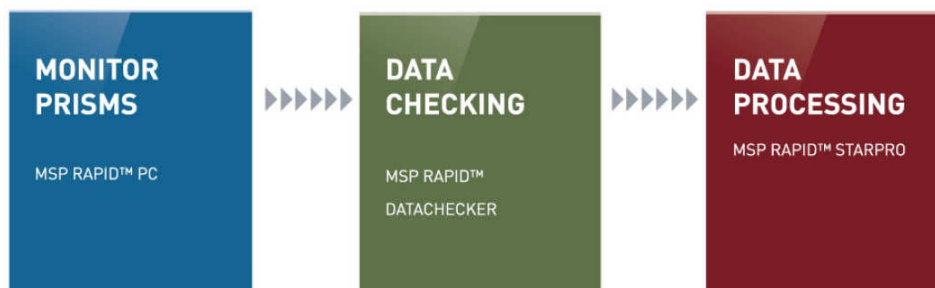
(RAPID) **R**emote **A**utomatic **P**recise **I**ntelligent **D**etector for (ADMS) **A**utomatic **D**eformation **M**onitoring **S**ystem

MSP RAPID PC is the core monitoring Software; it takes control of the Instrument for entire monitoring process. Dictates start and end time for monitoring, location and method to observe in accordance to User requirements. MSP RAPID PC measures data and tabulate results in easy to view and understand readings.

MSP RAPID DataChecker Receive and automatically filter and eliminate “bad” data for processing.

MSP RAPID StarPro automatically calls out the least square adjustment processing engine for calculation then it generates reports and tabulates measurement data into graphical view which users can modify for their customization. MSP RAPID Starpro sends out alarm notification via SMS, email and through alarm siren.

MAIN WORKFLOW FOR MSP RAPID™ ADMS SUITE



2.0 System Requirements

Minimum System Requirements

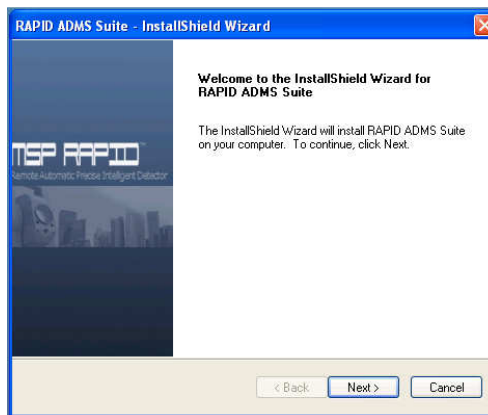
- Microsoft® Windows XP Professional or later
- 256MB of RAM (512MB recommended)
- 400GB of available hard-disk space
- At least 1 PCI Com Port
- USB 2.0 port for licensing dongle
- Minimum 800x600; Recommended 1,024 x 768 or higher
- CD-ROM drive (for installation)

3.0 MSP RAPID PC

3.1 Installing RAPID PC

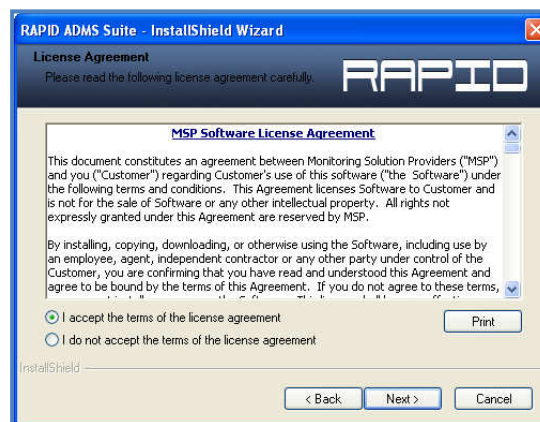
To Install RAPID PC, A CD/DVD-ROM is required for the RAPID Installation CD.

1. Once the RAPID ADMS Installation CD is inserted to the CD/DVD-ROM the RAPID ADMS Installation Wizard will automatically will be displayed.



Click on Next to continue for installation or Cancel to abort installation

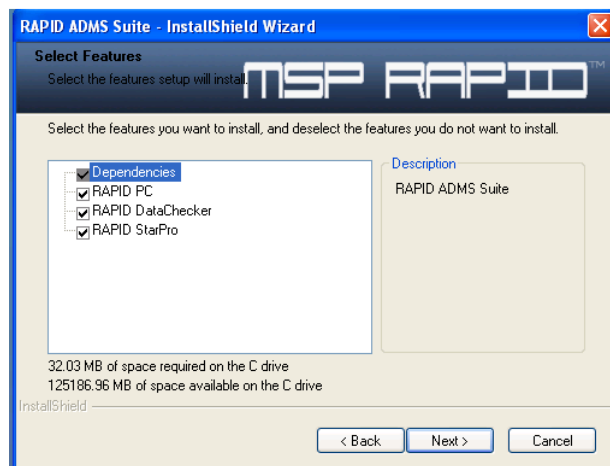
2. Tick the button Software Licensing Agreement. Then Click on Next button to Continue



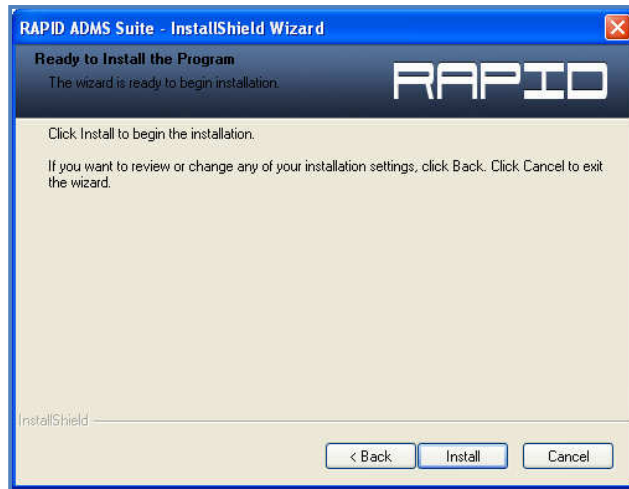
3. Choose the Installation Destination Folder for the RAPID ADMS, It is recommended to use the default settings. Installation folder to C:\Program Files\RAPID ADMS



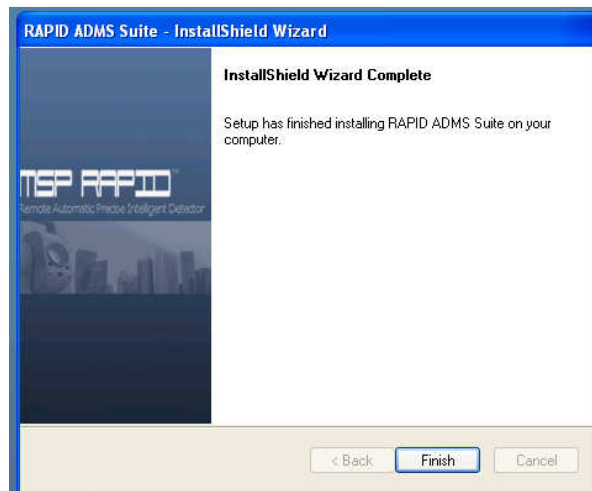
4. Check the RAPID Modules that are to be installed. RAPID ADMS Suite is composed of 5 Modules: MSP RAPID PC, MSP RAPID DataChecker, MSP RAPID StarPro.



5. Click on Install Button to begin installation, Back button to change installation settings or Cancel button to abort installation.

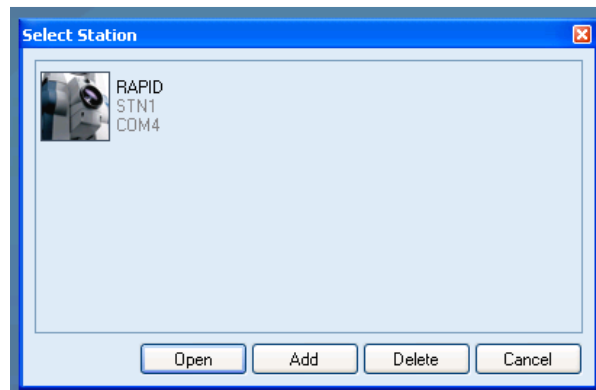


6. Once the Installation is done, click the Finish button. Shortcuts for the RAPID ADMS Modules are automatically displayed on the Windows desktop.



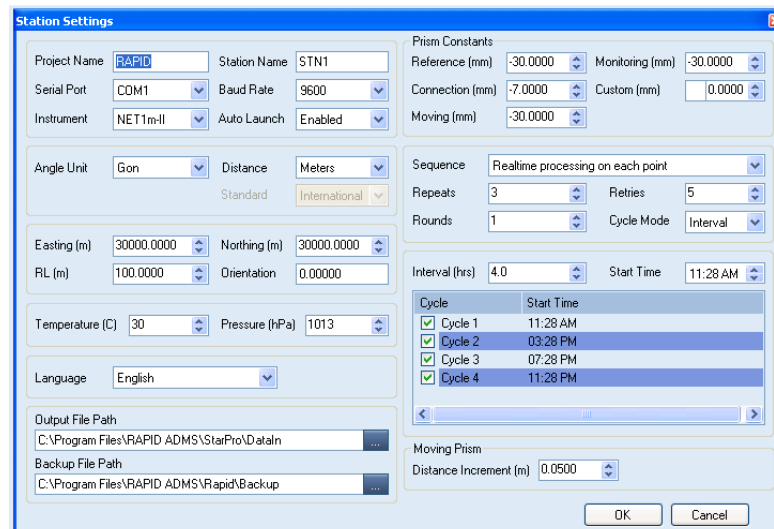
3.2. Setting Up RAPID PC

1. In the initial launching of the RAPID PC, the Project option windows will be displayed.



From here, Users have the option to Open existing project, Add new project or Delete new Project.

2. For adding new Project, It is required for the Users to set up Project Setting Parameters. Setting up Project parameters is done only once.



Station Setting Options:

Project Name: Input the Project Name. Project may be consisting of Letters and Numbers.

Station Name: Set the station name, by default station name should start with “STN”

Serial Port: Set which COMPORT will the instrument be connected, Refer to the PC configuration for the COMPORT numbering

Baud Rate: Sets the communication rate between the computer and the Total Station, PC and the Total Station should have the same baud rate. Default baud rate is 9600.

Instrument: Choose which model of Total station to be used; Net1m-II, Net05, Net1, MS05A, MS1A.

Auto Launch: Choose whether the RAPID PC will automatically run in case of PC was rebooted.

Angle Unit: Gon or Degree/Minute/Seconds

Distance: Meters, Feet, Inches

Easting and Northing: Input the X and Y coordinated, measurement is in meters

RL: Reduced Level, default value is 100m

Orientation: Used when doing a resection, default value is 0.0000

Temperature and Pressure: Varies depends on the site condition, by default value temperature is 30°C and Pressure 1013hPA

Prism constants: Refers to the offset of the centre of the prism, by default -30.00mm for Reference and Monitoring Prism

Output File Path: Set where the data readings will be saved. By default it is set to "C:\Dataout"

Backup File Path: Sets where the data will be back up. Default path is "C:\Program Files\RAPID ADMS\Rapid\Backup"

Sequence: Set how the Total Station will sequentially reads the prism.

- **Reads all points in F1 then back again in F2:** Total Station will read all prisms on Face 1 first, and then will read again on Face 2 mode.
- **Reads each point in F1 and F2:** Total station will take reading on a prism in Face 1 and Face 2 then move to another point.
- **Read all points in F1 only:** Total station will take readings only in Face 1 mode.
- **Read all points in alternating F1-F2 & F2 - F1:**
- **Real-time processing on F1 - F2:** Automatic data process for each prism reading for F1 & F2.
- **Real-time processing on F1:** Automatic data process for each prism reading on F1 only.

Repeats: Set the number on repeats for the Total station to do the sequence

Retries: Sets the number of attempts of Total Station to read a prism. In case the Total station reached the number of retries the Total Station will then move to the next point.

Cycle Mode: Sets whether the Total Station will monitor by time triggered or by non-stop monitoring.

For Interval Monitoring:

Interval: Sets the number of hours between each monitoring. This will affects the number of monitoring cycles per day.

Start time: Sets the time for the Total Station to start monitoring.

Moving Prism

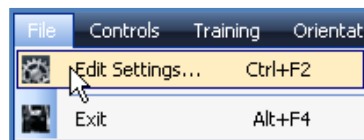
Distance Increment(m): Input the speed of the moving prism.

Click OK button when all the settings are done.

**Note: 1 Project may consist of multiple Stations, to do this User may create new project and set different station name*

3.3. RAPIC PC Command Menus

1. File Menu:



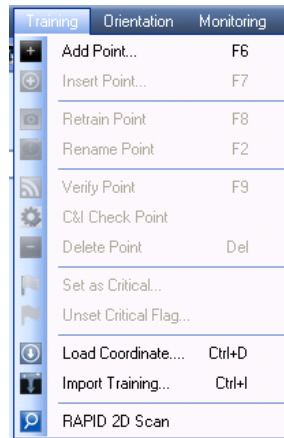
Under the File Menu, Users can Open the Project settings for any parameters needed to be changed.

2. Controls Menu:



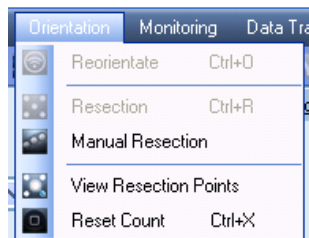
Controls Menu contains the basic commands to control the Total Station. Under Controls Menu users can have full control to the Total Station this Menus are essential when troubleshooting connection between PC and Total Station.

3. Training Menu:



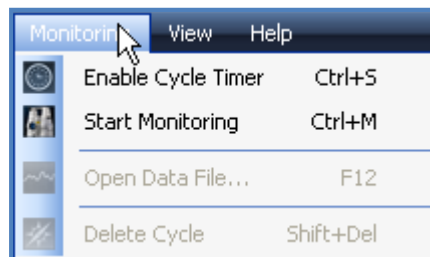
When adding points/prisms to be monitored, Users may Train the points or Import Training data from existing file. When doing a Training of prisms, RAPID PC will register the coordinates of the prism and save all the training data into a file called Training File. Training File is Located under; C:\Program Files\RAPID ADMS\RAPID\Training. Training Files is in *.ini format. It is required for the users to copy the Training file for RAPID Processing. See the Section 6.0 - RAPID PC Monitoring Procedures for the Steps on how to train the points.

4. Orientation Menu



Total Station Re-Orientation is normally done whenever Total Station is moved or changed. When a Total Station is placed or was changed, It is required for the Users to do Re-Orientation in order for the Total Station to monitor known points. Also for Resection, Users are required to do resection when Total Station is moved to a different location.

5. Monitoring Menu



Enable/Disable Cycle Timer: Enable or Disable the timer countdown for the next monitoring cycle.

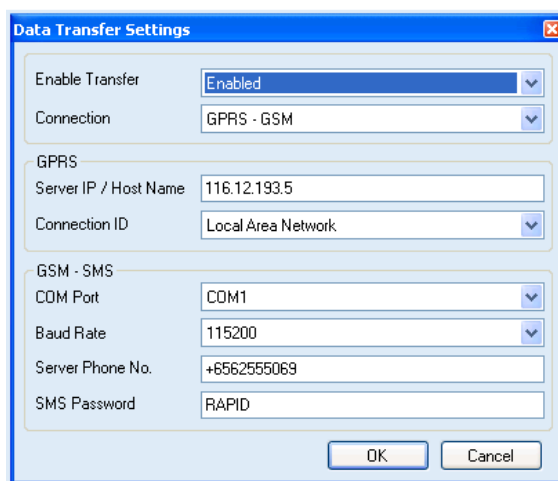
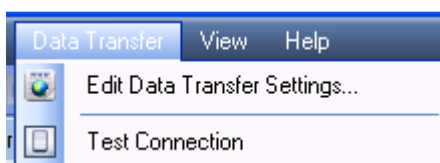
Cycle timer is shown on the lower left side corner of the application.

Start/Stop Monitoring: Sends command to the Total Station to start or to stop monitoring.

Open Data: Opens a data reading from the selected cycle on the left panel. RAPID PC will open tb3 file into a notepad.

Delete Cycle: Delete a data from the selected cycle on the left panel of the application.

6. Data Transfer Menu



Enable Transfer: Enables to automatically send data.

Connection: Choose which connection to be used for data transmission; (GPRS-GSM: GPRS priority and GSM as a secondary connection; GSM-GPRS: GSM priority, GPRS as a secondary connection, GSM –use on GSM connection, GPRS – use only GPRS connection)

GPRS Settings:

Server IP Address: input the IP address on the processing server. As default MSP Server's IP 116.12.193.5 is configured.

Connection ID: Choose which connection to be used from the available network connection from the PC adapters.

GSM Settings:

Note: GSM sends data SMS to the processing server. A GSM modem is required when using GSM transmission.

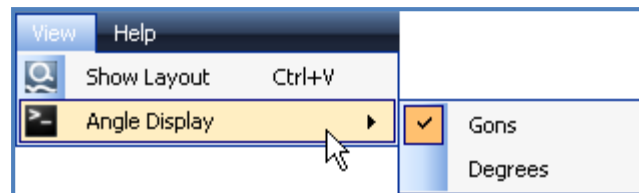
Server Phone Number: Input the phone number of the modem connected to the processing server.

Modem Port: Comport to which the GSM modem is connected.

SMS Password: Input the SIM card password if required.

Click OK when settings are done

7. View Menu



On the View Menu, Users can see the Project Layout and can switch to Degrees view. See below the example of Project Layout View.

*Note:

Monitoring Data are

RAPID PC Raw data file name syntax:

STN#_PROJECTNAME_DD_MM_YYYY_Cycle_#_Epoch_#.rpd

Where:

STN#: Project Station Number

PROJECTNAME: Project name

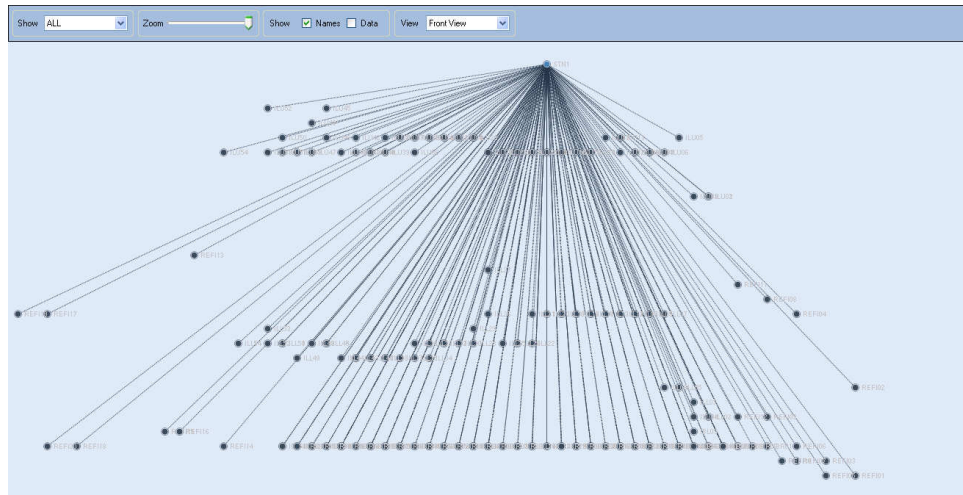
DD: Date

MM: Month

YYYY: Year

Cycle #: Monitoring Cycle

Epoch: Epoch File history



3.4. RAPID PC Monitoring Procedures

Here are the Standard Procedures to be done when doing monitoring using RAPID PC.

1. Setup Project Parameters
2. Train Prism Points (Done only on Initial setup)
3. Start Monitoring.
(Optional)
Re-Orientation / Re-Section

3.4.1. How to Train Points:

To do Training of Points, First Users have to manually point the Total Station to a specific Prism. Users may not actually point to the center of the prism, because RAPID PC has the auto center feature. This enables the Total station to auto center to the prism whenever it reads a prism. After pointing to the prism, Users need to Click on Training Menu, then click on Add point (or simply click F6).

By default, Prism name is XYZ001, XYZ002... consecutively. For the Reference Points, It should be named with "REF". By doing this RAPID PC can easily verify which are the reference points. Users may still rename the point after training, by Going to Training Menu then Rename Point.

3.4.2. How to Start Monitoring:

When all the Points have been Trained, Users may Enable Cycle Timer or Start Monitoring immediately. By enabling Cycle timer, RAPID PC will be on standby and wait to finish the counter at the bottom left. By Starting the monitoring immediately, RAPID PC will automatically commence the monitoring cycle.

RAPID PC Shortcut keys

RAPID PC Shortcut key list:

Edit Settings: Ctrl + F2

Exit: Ctrl + F4

Power On: F3

Power Off: F4

Guide Light On: Ctrl + F3

Guide Light Off: Ctrl + F4

Check Level: Ctrl + L

Check Face: Ctrl + F

Change Face: Ctrl + H

Take Reading: F10

Initialize Instrument: F11

Add Point: F6

Insert Point: F7

Retrain Point: F8

Rename Point: F2

Verify Point: F9

Delete Point: Del

Load Coordinate: Ctrl + D

Import Training: Ctrl + I

Re-Orientate: Ctrl + O

Resection: Ctrl + R

Reset Count: Ctrl + X

Enable Cycle Timer: Ctrl + S

Start Monitoring: Ctrl + M

Open Data File: F12

Delete Cycle: Shift + Del

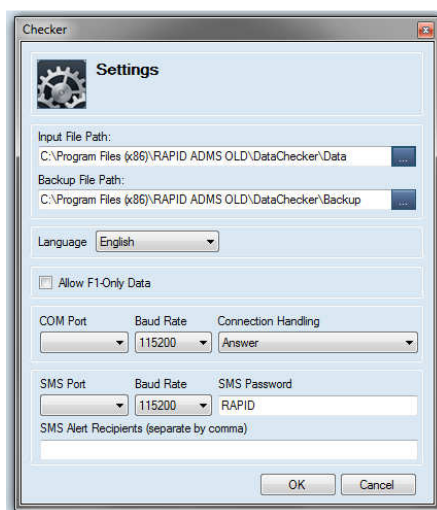
Show Layout: Ctrl + V

4.0 MSP RAPID DataChecker

4.1. Setting up MSP RAPID DataChecker

4.1.1. Configuring MSP RAPID DataChecker File Paths

Open the RAPID DataChecker Application. Click File>Edit Settings



Input File Path: Sets where the RAPID DataChecker will scan for .rpd files.

Backup File Path: Sets where RAPID DataChecker will back up a copy of .rpd files.

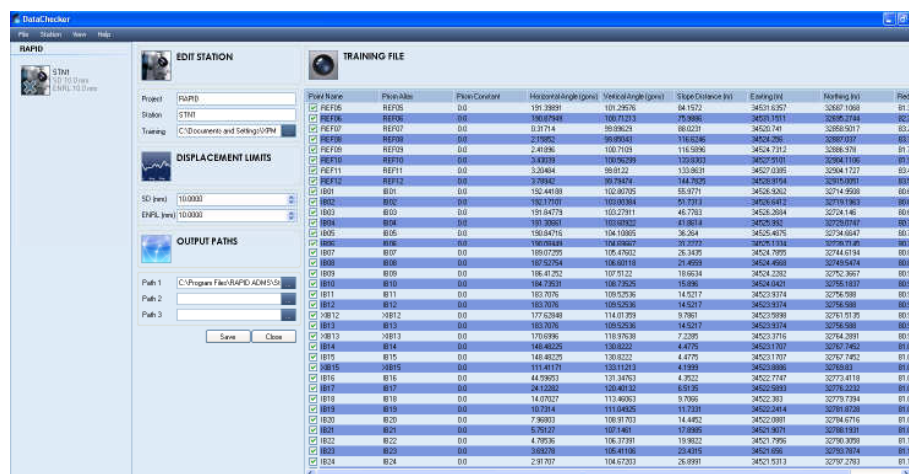
Click **OK** button.

Allow F1 Only Data: Enable this option if the user wants to process data for only F1 cycle monitoring.

Modem Options (Optional): Users have an option to receive SMS notification whenever a data file is received.

4.1.2. Adding new station

Click on Station **Menu >Add Station**



Project Name: Input Project Name. It should match the project name configured on RAPID PC.
Station: Input the Station name. It should match the Station name configured on RAPID PC.
Training: Import the Training file generated by the RAPID PC. By default training files are located at “C:\Program Files\RAPID ADMS\Rapid\training” of the Site PC. Training files may be in *.ini or *.txt format. Imported training file will be shown on the right side panel.

Displacement Limits:

Output Path: Set where the checked data will be saved. DataIn folder of the RAPID StarPro is preferred for RAPID StarPro processing;

example:

“C:\Program Files\RAPID ADMS\StarPro\Projects\PROJECT_NAME\DataIn”

Maximum of 3 output path can be set.

Other Commands:

File>Start/Stop: Start or Stop the RAPID Datachecker for processing. A Status label is located on the lower left corner of the application. RAPID DataChecker is advised to be running 24/7 for continuous processing of data.

Station>Edit: Edit the highlighted Project. Configuration and training file can be changed on this option.

Station>Delete: Removes the highlighted Project from the list.

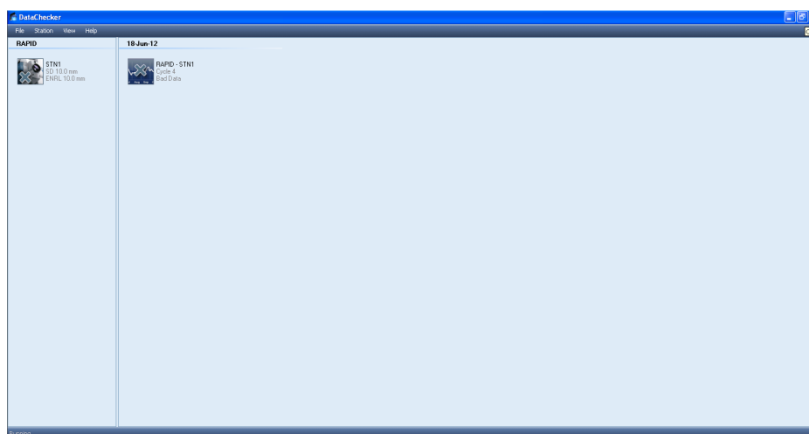
View>Refresh: Refresh the project’s view and clear the list of the processed data.

4.1.3. Data Recieving

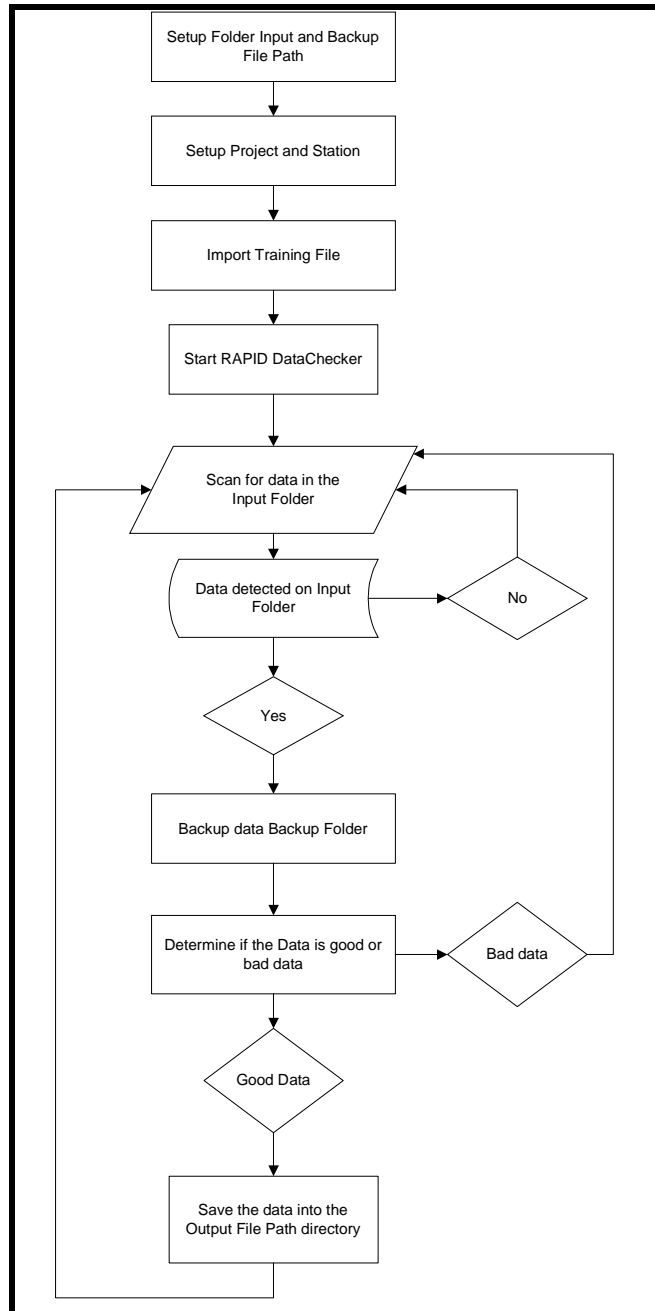
MSP RAPID DataChecker is capable of auto receiving Monitoring data from MSP RAPID PC. Data received will automatically be stored under the Input file folder (...\\RAPID ADMS\\DataChecker\\Data)

4.2. Starting the MSP RAPID DataChecker

To start scanning of data, Go to **File** Menu, and then click on **Start**. Once the RAPID DataChecker is running it will keep on scanning for any incoming files to be checked.



4.3. MSP RAPID DataChecker WorkFlow



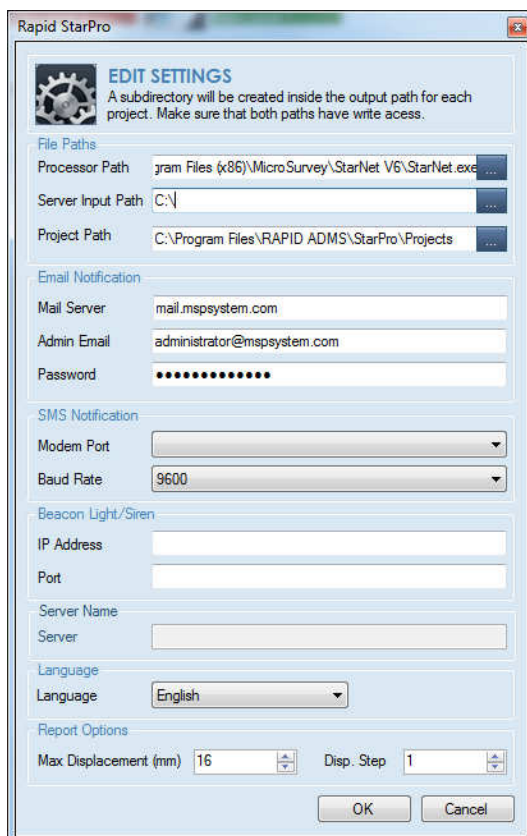
5.0 MSP RAPID StarPro

5.1. Setting up MSP RAPID StarPro

Note: RAPID StarPro requires least square software Installed on the Processing PC. StarNet Dongle license is required for processing multiple data.

5.1.1. Configuring MSP RAPID StarPro Settings

Open the MSP RAPID StarPro application; Click File>Edit Settings:



The screenshot shows the 'EDIT SETTINGS' dialog box for the Rapid StarPro application. The dialog is titled 'EDIT SETTINGS' and includes a warning: 'A subdirectory will be created inside the output path for each project. Make sure that both paths have write access.' The settings are organized into several sections:

- File Paths:** Processor Path (Program Files (x86)\MicroSurvey\StarNet V6\StarNet.exe), Server Input Path (C:\), Project Path (C:\Program Files\RAPID ADMS\StarPro\Projects).
- Email Notification:** Mail Server (mail.mpsystem.com), Admin Email (administrator@mpssystem.com), Password (masked).
- SMS Notification:** Modem Port (dropdown), Baud Rate (9600).
- Beacon Light/Siren:** IP Address, Port, Server Name, Server (text boxes).
- Language:** Language (English).
- Report Options:** Max Displacement (mm) (16), Disp. Step (1).

Buttons for 'OK' and 'Cancel' are located at the bottom right of the dialog.

File Paths:

Processor Path: Locate the executable file for the StarPro Processing Engine; Example: StarNet.exe

Server InoutPath (Optional): Directory where the process data will be pointed into the Database.

Project Path: Set the Project Folder, In which all the generated reports, raw data backup and processing logs will be stored.

Alarm Notification:

Admin Email: One email address is required for sending out Email notifications. e-mail Mail server and password is required for the e-mail settings.

Modem Port: PC ComPort where the modem is connected. Modem will be required for SMS Alarm notifications.

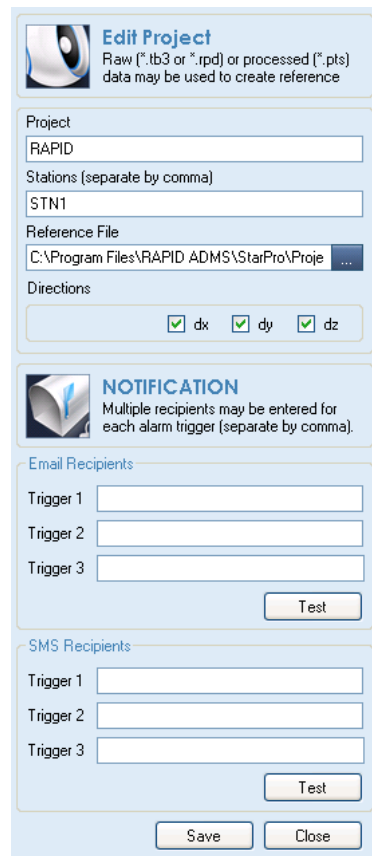
Beacon Light/Siren: Alarm light or Siren with Ethernet capable can be connected to the MSP RAPID StarPro. Input the Device IP Address and the port number.

Report Option:

Report Displacement: User's may set the maximum and the minimum displacement for the report generation. the default value is 16mm.

5.1.2. Creating/Adding new Project

1. On the Project Menu, click on Add Project.
2. The Project Settings will be displayed, Fill out the necessary settings for the Project:



Edit Project
Raw (*.tb3 or *.rpd) or processed (*.pts) data may be used to create reference

Project
RAPID

Stations (separate by comma)
STN1

Reference File
C:\Program Files\RAPID ADMS\StarPro\Proje ...

Directions
 dx dy dz

NOTIFICATION
Multiple recipients may be entered for each alarm trigger (separate by comma).

Email Recipients

Trigger 1
Trigger 2
Trigger 3
Test

SMS Recipients

Trigger 1
Trigger 2
Trigger 3
Test

Save Close

Project: Input the Project Name.

Station: Input the Project's Stations, one or more station can be input. Station names should be separated by coma.

Reference File: Import the reference file. TB3 file or processed .PTS data can be imported. Once the Reference file was successfully loaded, Reference file will be shown on the right panel of the application.

Directions: Users can choose which directions should be processed by StarPro. (dx, dy, dz)

Email Recipients: Input the list of emails that will be notified whenever a trigger alert was reached. Multiple emails can be input (separated by coma).

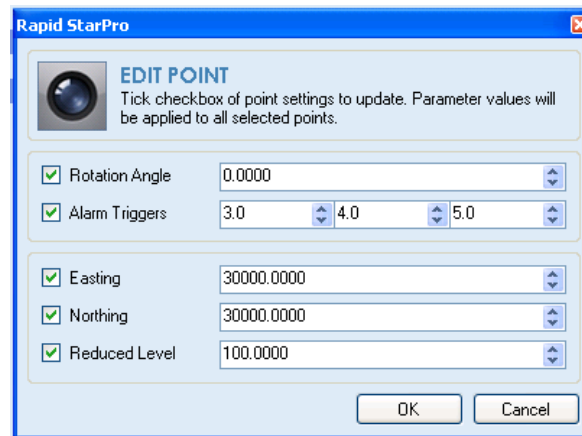
Click on Test Button to verify if the email can be sent successfully.

SMS Recipients: Input the phone numbers that will be notified wherever a trigger alert was reached. SMS Alert will contain the Project Name, Date, Time, Monitoring cycle, Point name which reached the trigger alert and the value.

Click on Test Button to verify if the SMS can be sent successfully.

5.1.3. Editing the Reference File

1. On the listed reference file on the right panel of the application, Right click on the point or Select All to edit multiple points.
2. Check the check box of the settings to be changed. Rotation Angle, Alarm Triggers, Easting, northing and reduced level can be adjusted.



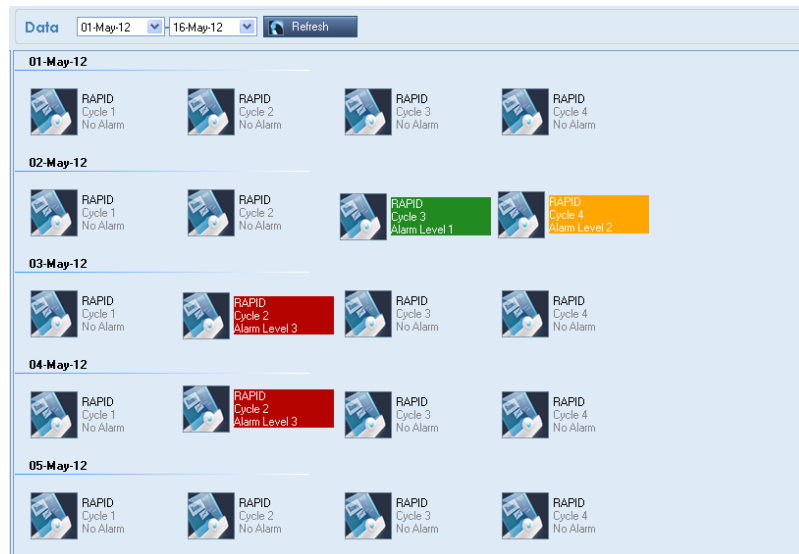
Click OK to save the changes.

5.1.4. Data Processing:

1. Make sure StarPro is running to start data processing, Start or Stop data processing by clicking File Menu>Start/Stop Processing.
2. MSP RAPID StarPro automatically detects the input files on the directory of Input File Path (“C:\Program Files\RAPID ADMS\StarPro\DataIn”)
3. Input files are shown on the middle panel of the application.



4. Processed data will be listed on the Data Panel of the application.



Data that reached a trigger level will be highlighted. Green color for level 1, Orange for Level 2, Red for level 3. Tabulated readings can be viewed by double clicking the data and will be opened on Microsoft Excel.

Point	Base E	Base N	Base RL	Easting	Northing	Reduced Level	dE	dN
STN1	30000	30000	100	30000	30000	100	0	
REF001	29998.8502	29999.0449	100.7306	29998.8502	29999.0449	100.7306	0	
REF002	29997.8469	29999.7688	100.7296	29997.8469	29999.7688	100.7296	0	
XYZ002	30024.7219	29909.4347	113.8181	30024.7297	29909.4371	113.8208	7.8	
XYZ003	30016.024	29913.539	113.8561	30016.0317	29913.541	113.8591	7.7	
XYZ004	30000.8244	30001.9244	100.747	30000.8243	30001.9244	100.747	-0.1	

5.2. Reports

5.2.1. Generating Reports

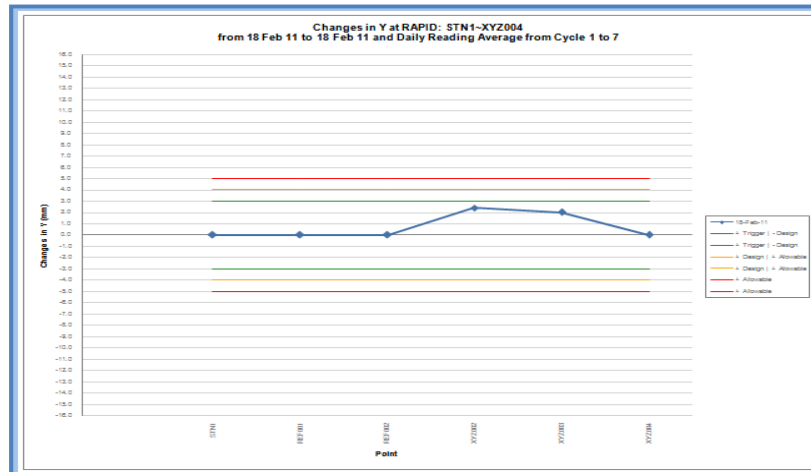
Note: Microsoft Excel is required for viewing reports.

1. Right click on a data or highlight multiple data, choose the type of report to generate:

Daily Profile:

Daily profile report shows the following image.

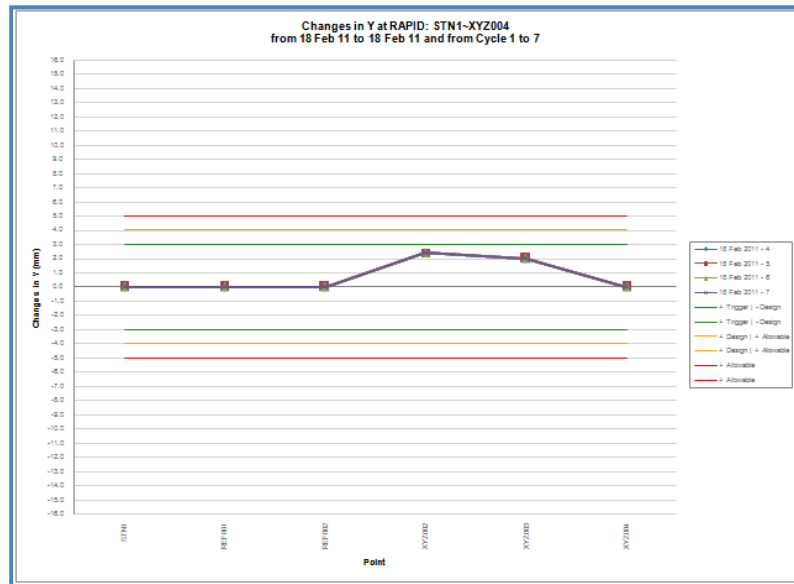
Date	Cycle	STN1	REF001	REF002	XYZ002	XYZ003	XYZ004
18-Feb-11	4	0.0	0.0	0.0	2.4	2.0	0.0
	5	0.0	0.0	0.0	2.4	2.0	0.0
	6	0.0	0.0	0.0	2.4	2.0	0.0
	7	0.0	0.0	0.0	2.4	2.0	0.0
Date		STN1	REF001	REF002	XYZ002	XYZ003	XYZ004
18-Feb-11		0.0	0.0	0.0	2.4	2.0	0.0
Max(+Ve)		2.4	0.0	0.0	2.4	2.0	0.0
Min(-Ve)		0.0	0.0	0.0	0.0	0.0	0.0



Cycle Profile:

Cycle profile report shows the following image.

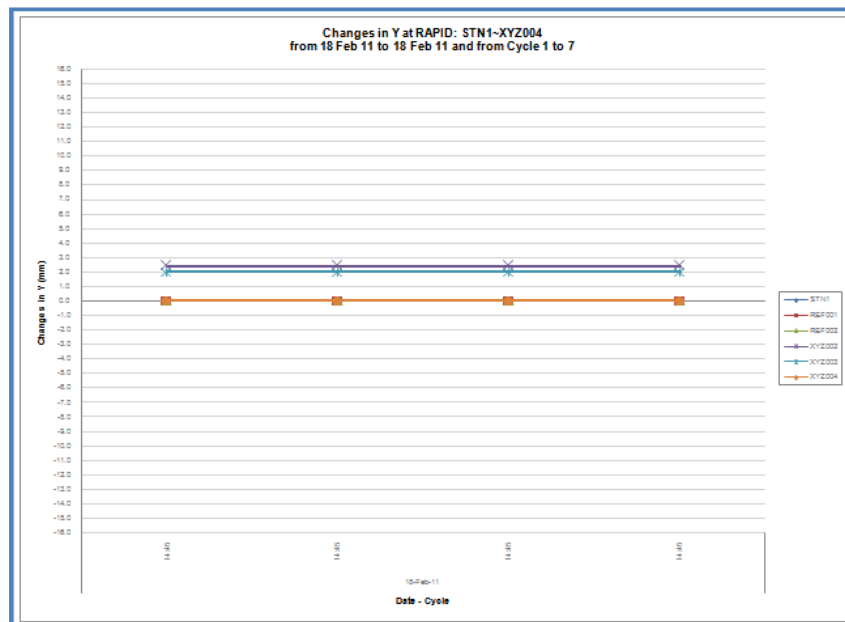
Date	Cycle	STN1	REF001	REF002	XYZ002	XYZ003	XYZ004
18-Feb-11	4	0.0	0.0	0.0	2.4	2.0	0.0
	5	0.0	0.0	0.0	2.4	2.0	0.0
	6	0.0	0.0	0.0	2.4	2.0	0.0
	7	0.0	0.0	0.0	2.4	2.0	0.0



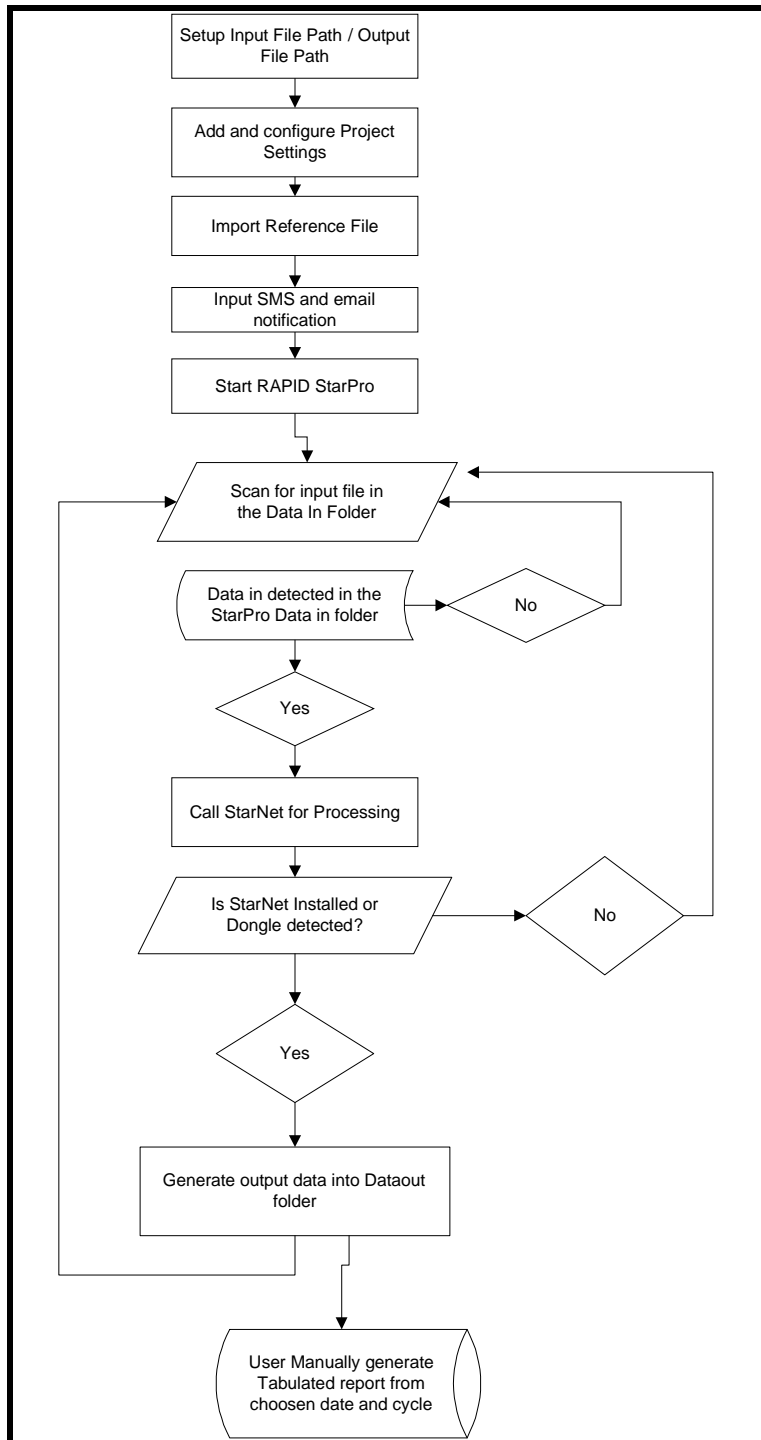
History Report:

History report shows the following image.

Date	Cycle	STN1	REF001	REF002	XYZ002	XYZ003	XYZ004
18-Feb-11	14:45	0.0	0.0	0.0	2.4	2.0	0.0
	14:45	0.0	0.0	0.0	2.4	2.0	0.0
	14:45	0.0	0.0	0.0	2.4	2.0	0.0
	14:45	0.0	0.0	0.0	2.4	2.0	0.0



5.3. MSP RAPID StarPro Workflow



6.0 Licensing

8.1 Licensing Key

MSP RAPID ADMS Suite is protected by a USB dongle key. MSP RAPID ADMS License package is included at the MSP RAPID USB Dongle; the license package will determine which application in the MSP RAPID ADMS Suite is activated. Without RAPID License dongle RAPID PC can only operate on demo mode. On Demo mode users can only train up to 5 prisms and 1 round of cycle and can only be used for 30 days. Please contact your nearest distributor to request for a hardware key.

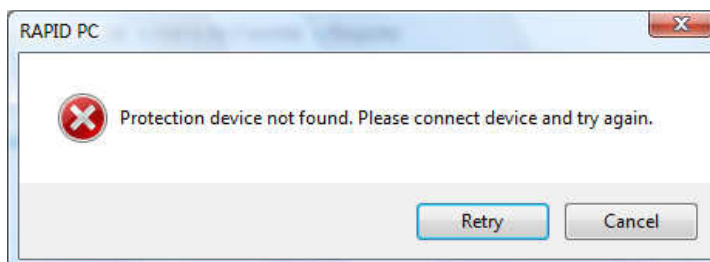
Two type of RAPIDUSB Dongle key:

MSP RAPID USB Dongle key for Site: This contains License for MSP RAPID PC.

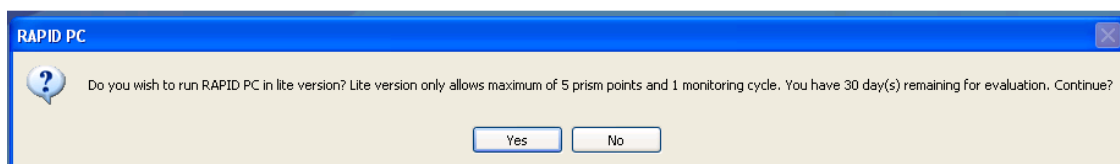
MSP RAPID USB Dongle key for Office: This contains License for MSP RAPID DataChecker, MSP RAPID StarPro.

Using USB Dongle License Key:

Launching RAPID ADMS Software without license, a notification window will be displayed.



Insert the RAPID USB Dongle key in order to use the full feature of Rapid PC. If RAPID PC is to run on demo mode, click on cancel:



An option to the user will be displayed whether to continue on Demo mode or to exit application.

Note: Only RAPID PC can run on demo mode. MSP RAPID DataChecker, MSP RAPID StarPro cannot run on demo mode.