MSP RAPID On-Board™ USER GUIDE

Monitoring Solution Providers Pte Ltd

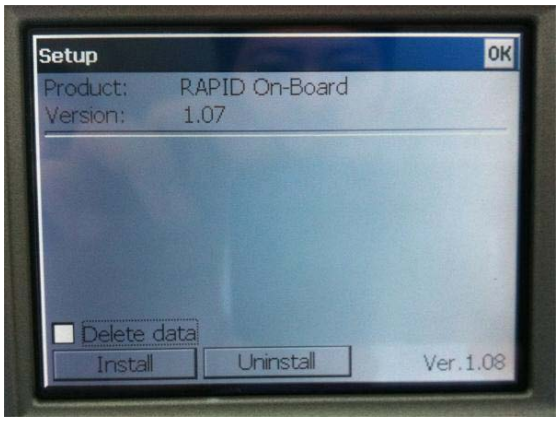
33 Ubi Ave 3
Vertex #05-31
Singapore 408868
Tel: (65) 6747 9766 Fax: (65) 6458 0824
Email: enquiry@mspsystem.com
Sales: sales@mspsystem.com

Table of Contents

1.0 Installing MSP RAPID™ On-Board

1.1 Installing RAPID On-Board to Total Station

To Install RAPID On-Board, save first the Installer package into a Flash drive or to a CF Card. Once plugged in into the USB port/CF card port of the Total Station, Press and Hold F2-F4-9 plus Power ON button. Wait for the Installation window to appear:

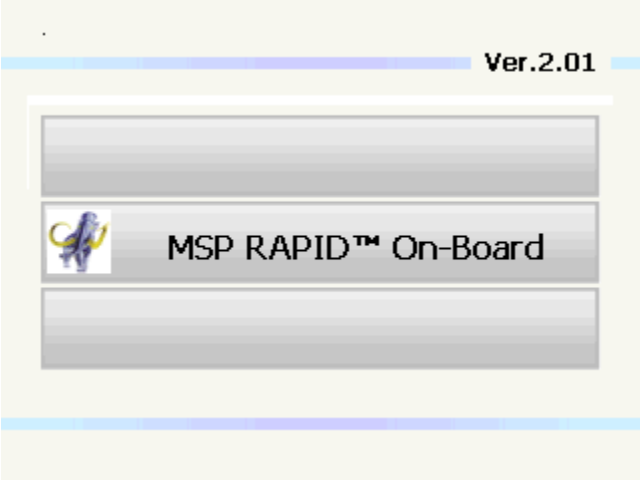


Press the **Install** Button to begin Installation or **Uninstall**, to remove RAPID On-Board application from the Total Station.

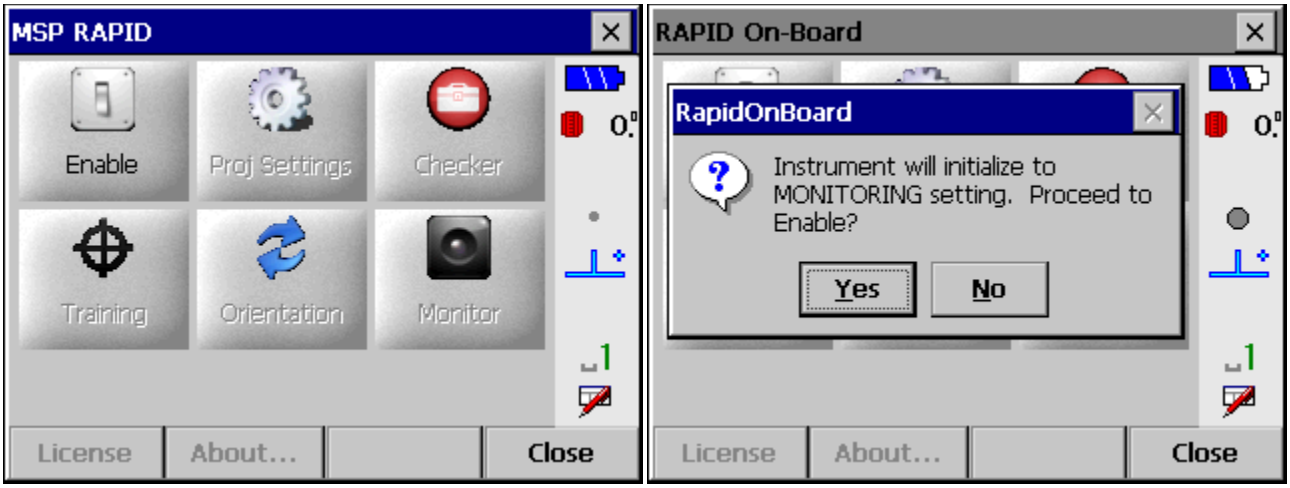
2.0 Operational Procedure

2.1 Enabling Rapid On-Board

To Run the RAPID On-Board Application press the PROGRAM button on the Total Station; Click on the **MSP RAPID™ On-Board** button on the screen to launch the program.

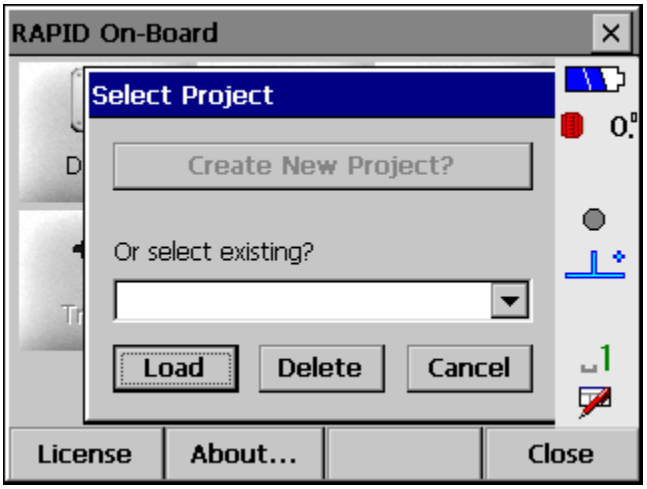


First thing to do when operating the RAPID On-Board is to enable the program. By clicking the **Enable** Button, RAPID On-Board will initialize the Total station into monitoring mode.



2.2 Create / Load Project

A Project must be selected or created when commencing monitoring of prisms. To create or load an existing Project, First press the Project Setting button on the RAPID On-Board main interface.



For Creating New Project, Press the **Create New Project button**. If a Project is already existing, use the drop down menu for selecting the Project to be used then press the **LOAD** button.

NOTE: If the RAPID On-Board is on a Demo mode, Users can only create 1 Project and can only monitor up to 5 prisms.

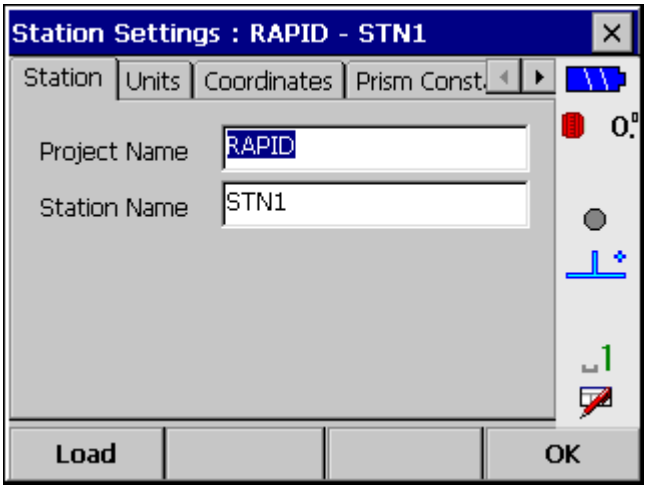
2.3 Setting Project Parameters

Once a Project is created or loaded from an existing Project, Station Settings will automatically be displayed for users to verify the Project and Station settings.

2.3.1 Station Tab:

Project Name: This Field holds the name for the new Job. Enter a name with any combination of letters and numbers. The default Project name is, "**PROJ**".

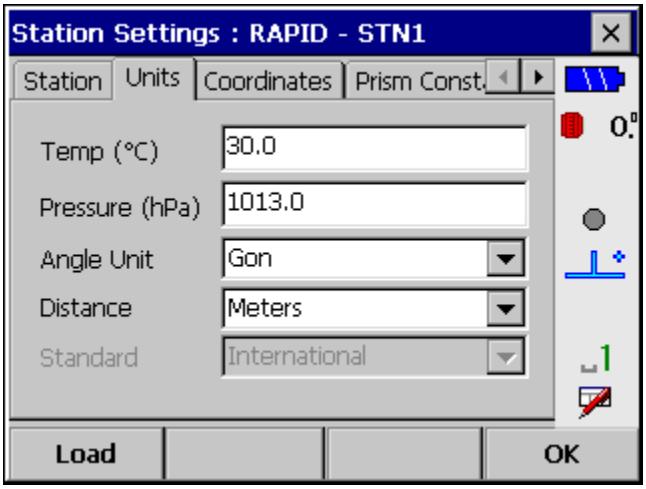
Station Name: The Station number for the Project, One Project can be consisting of multiple Stations. The default station name is **STN1.**



Users may load existing project settings by clicking the Load button on the screen.

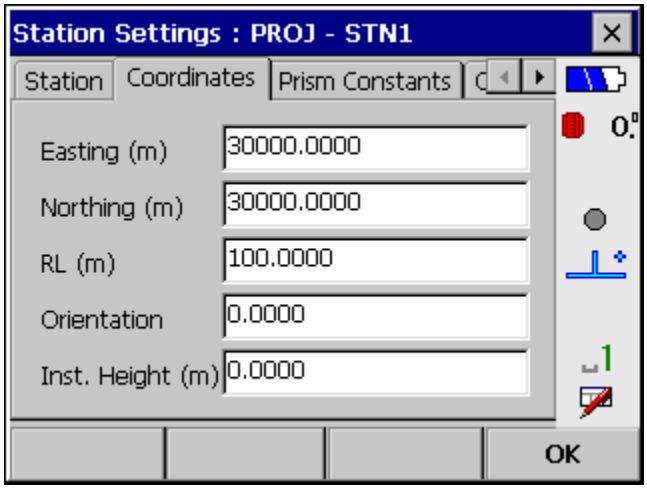
2.3.2 Units Tab:

Temp and Pressure: May also change the temp and pressure; this depends on the site conditions. The default parameters are 30.0 degrees Celsius for Temperature and 1013.0 for Pressure.

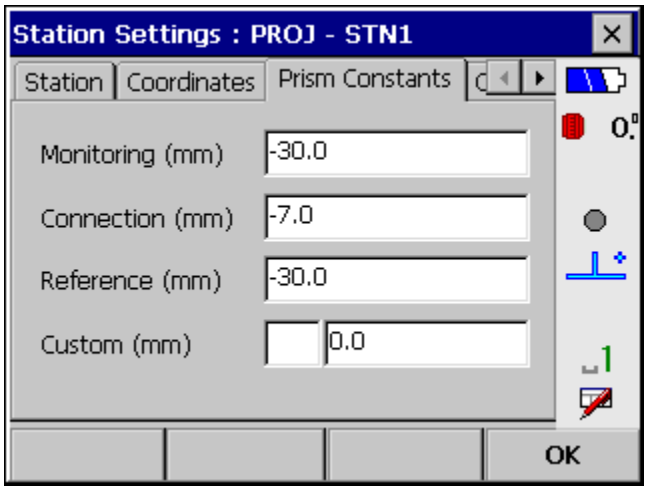


Temperature (°C): Default value 30.0
Pressure (hPa): Default value 1013.0
Angle Unit: Gon / Degrees,Min,Sec
Distance: Meters / Feet / Inches
Standard: US / International

2.3.3 Coordinates Tab:

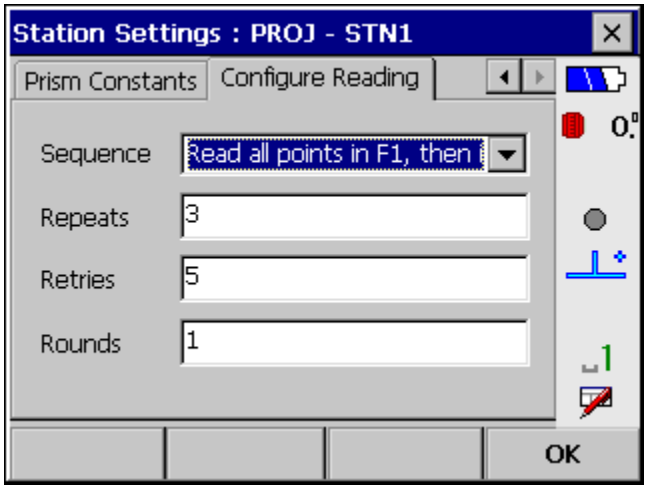


2.3.4 Prism constants Tab:



Monitoring Prism: Default value -30.0
Connection Prism: Default value -7.0
Reference Prism: Default value -30.0

2.3.5 Configure Reading Tab:



Sequence: Set the Total Station on how it will monitor the prisms.

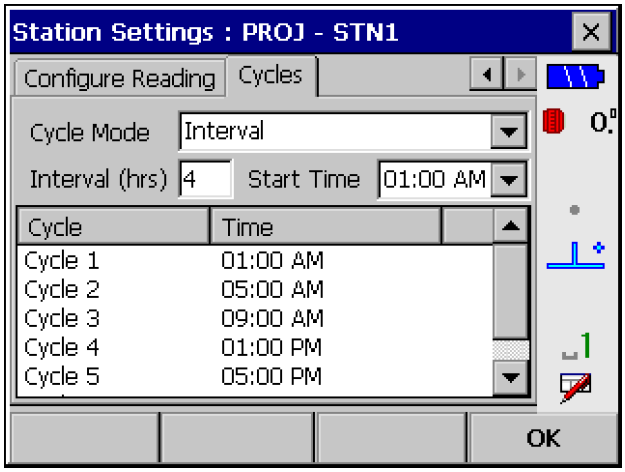
Option 1: Read all points in F1, then in F2
Option 2: Read all point in F1 and F2
Option 3: Read all point in F1 only

Repeats: Set the Total station on how many times it will read each prism

Retries: Set command to Total station on how many times it will retry to read a prism, if first reading attempt failed.

Rounds: Set on many times the Total Station will commence the Sequence.

2.3.6 Monitoring Cycle Options:



RAPID On-Board has a feature of Automatic Cycle Monitoring. User can set the number of monitoring cycles and the time of the monitoring.

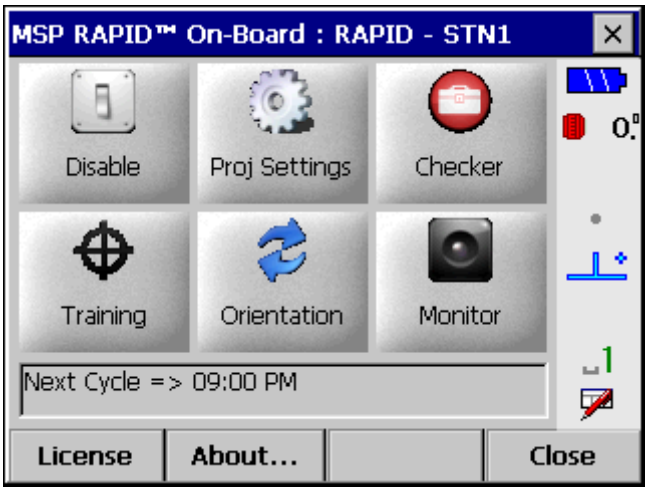
Cycle Mode:

Continuous Mode: When cycles are set to Continuous, the Total Station will start to monitor the prisms continuously until the User will manually Stop the monitoring.

Interval Mode: By setting the Cycles to Interval, Users can adjust on how many cycles and the start time of each monitoring cycles.

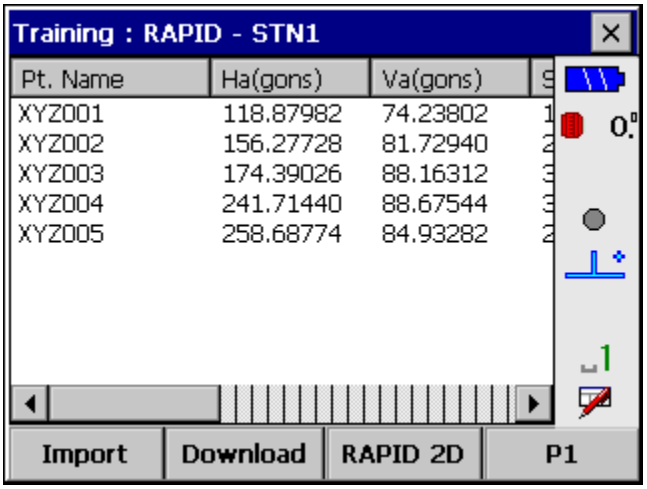
Single Mode: On Single Mode, RAPID On-Board will do the monitoring only once.

Note: *When doing Interval mode on RAPID On-Board, the Total Station must always be powered on. The RAPID On-Board will have a countdown and wait for the next monitoring cycle. A cycle countdown timer will be displayed on the Main Interface when the monitoring mode is on interval. The Total Station will automatically commence the monitoring once it reaches the monitoring cycle time.*



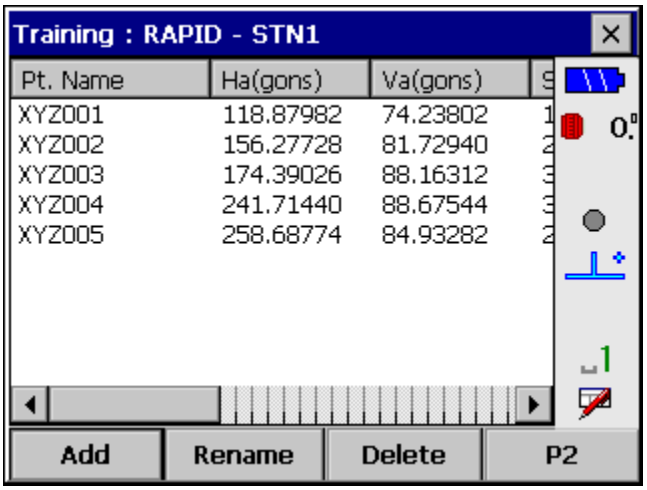
3.0 Training Points / Importing Coordinates

In order to add prism point into the RAPID On-Board, Users may Manually Train Prisms, Load an existing Training file or Coordinate File, Or may use the RAPID 2D Scan function.

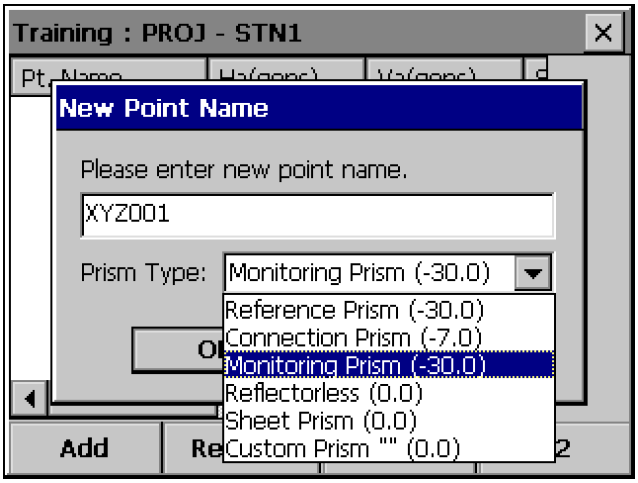


3.1 Manual Training of Points:

At the Training Menu, Press the P1 Button to go the next page of commands.



Adding Point:



When adding a prism point on the RAPID On-Board, Users must first point the Total Station to the Prism, then press on **Add** button.

Users can select which type of prism is to be added. In the Prism Type drop down menu there are 5 types of prism to select, with its designated prism constants.

Reference Prism (-30.0)
Connection Prism (-7.0)
Monitoring Prism (-30.0)
Reflectorless (0.0)
Sheet Prism (0.0)
Custom Prism “” (0.0)

Once prism name and prism type is configured, RAPID On-Board will take the reading for the point and register it to the Training File along with its prism constant. Users are able to rename and delete points after training of points.

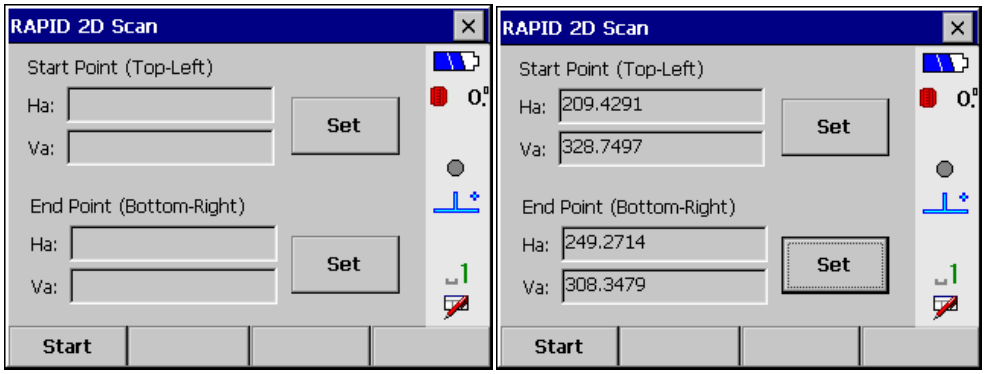
Importing a Training File or Coordinate File

To load an existing Coordinate File or a Training File, Press the **Import** button on the First page of the Training Menu commands. Users may use a Flash drive or a CF card for loading files.

3.2 Rapid 2D

This Function is specially designed for SOKKIA NET-AX Series and TOPCON MS-AX Series Total Stations. This feature enables users to scan prisms in an assumed coordinates and

save it into the training file. To use this Function on RAPID On-Board, Go to the Training Menu and press the RAPID 2D Button.



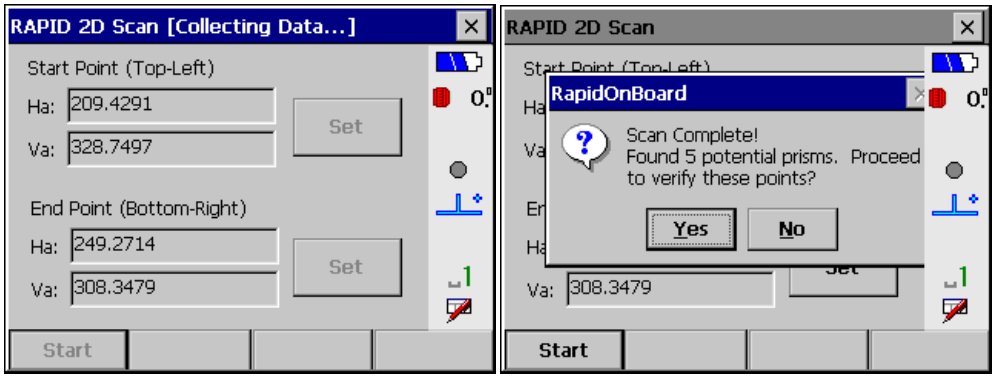
Start Point: At the Start Point, Point the Total Station to the Assumed Top Left where the Total Station will start scanning. Press Set to get the Ha and Va.

End Pont: Point the Total Station to the Bottom Right of the assumed location of the prisms.

Note that when the area is "horizontally long", the Total Station will scan from Top left to the right, then move down a bit, then from right to left, then so forth and so on.

When the area is "vertically long", the Total Station will scan from Top left to bottom, then move right a bit, then from bottom to top, then so forth and so on.

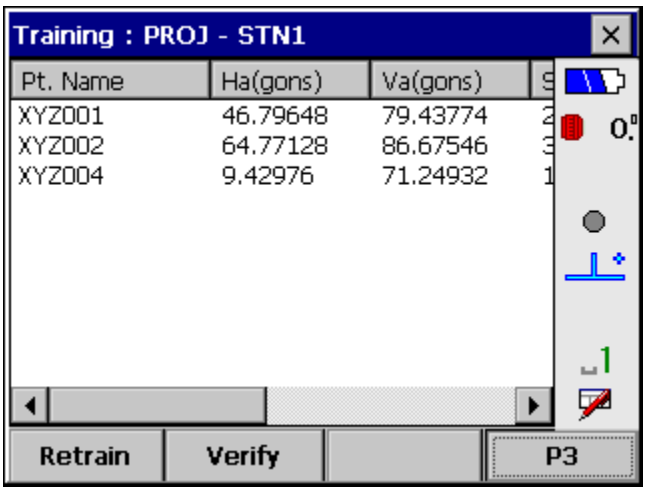
Once the Scanning is complete, **"Collecting Data"** status will be displayed at the top of the screen. RAPID On-Board is now gathering all the recognized prism point.



After Scanning and Collecting data is complete, a pop up window will appear. Verifying on how many points did the Total Station get from executing RAPID 2D.

Proceed to verify points:
Yes: RAPID On-Board will take reading on every point and register it to the Training File.

No: Gathered points will not be verified and will not be registered to the training file.



3.3 Other functions:

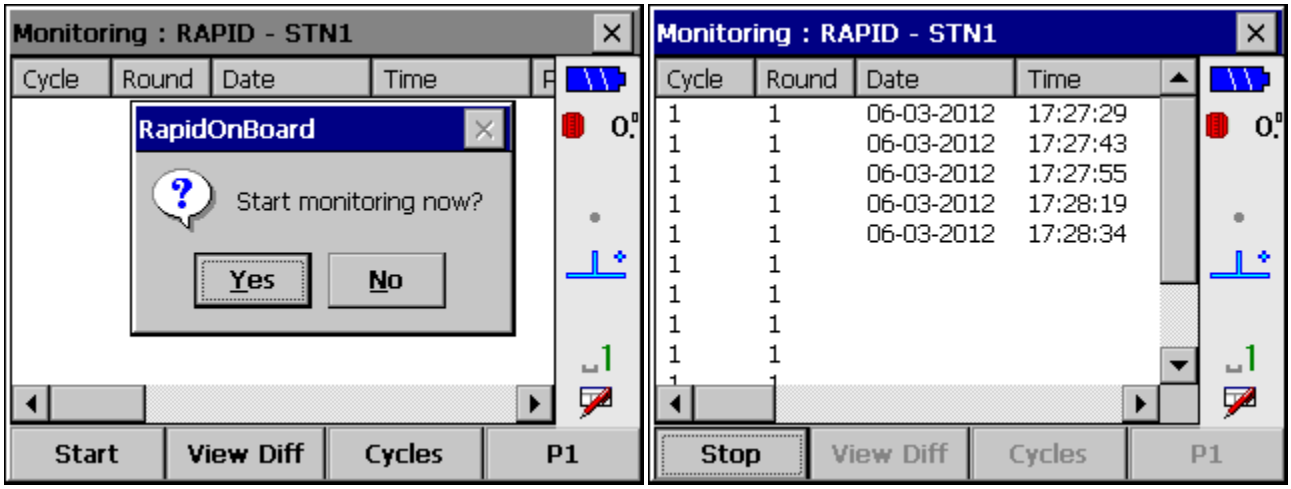
Retrain Point: Choose first the point to be retrained, and then press the retrain button. Make sure that the Total Station is pointing at the prism before pressing the Retrain button. By doing Retraining, RAPID On-Board will update the Training file.

Verify Point: Choose first the Point to be verified. By running the Verify command, the RAPID On-Board will verify the coordinates of the prism.

Note: Training Files can be downloaded from RAPID On-Board by pressing the Download button under the Training Menu. Training Files are in *.ini Format.

3.3.1 Monitoring of Prisms

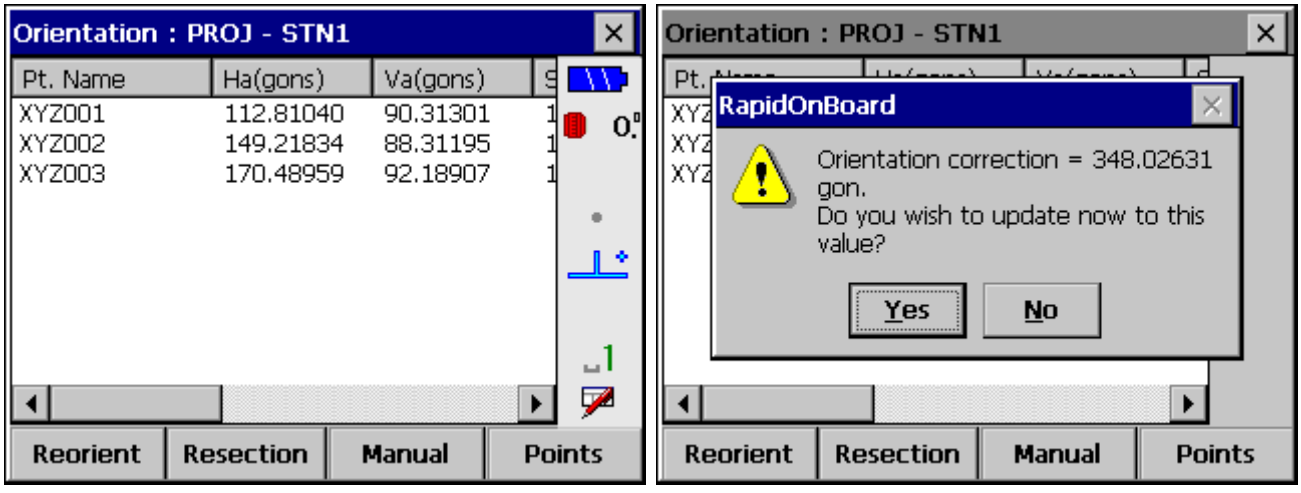
To Start Monitoring of Prisms, Press the Monitor Button at the Main Menu. Then Press the Start Button to commence monitoring.



Press **YES** to Start monitoring

3.3.2 ReOrientation

Reorientation of the Total Station is a process where the User sets back an instrument into a known point. Reorientation is done whenever the Total Station is replaced with another. The station position is still the same, but the instrument is replaced. Trained points are necessary for doing Reorientation.



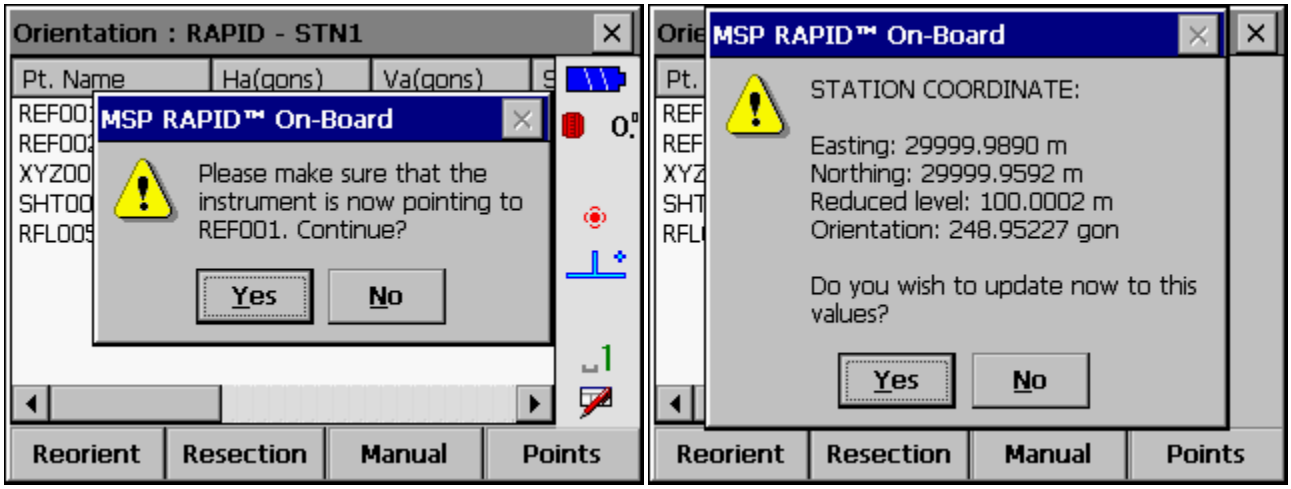
To do Reorientation, Users have to manually point the Total Station to a known point. Then on the RAPID On-Board Screen choose the point to which the Total Station is pointing to. Click on **Reorient** button**.** RAPID On-Board will verify that the Total Station is pointing to the specific prism. Once the instrument is done reading the prism, it will ask a confirmation like above.

3.3.3 ReSection

Resection is done when the Total Station is placed in a different position from the initial position. In doing resection, two or more known points are required to do Resection.

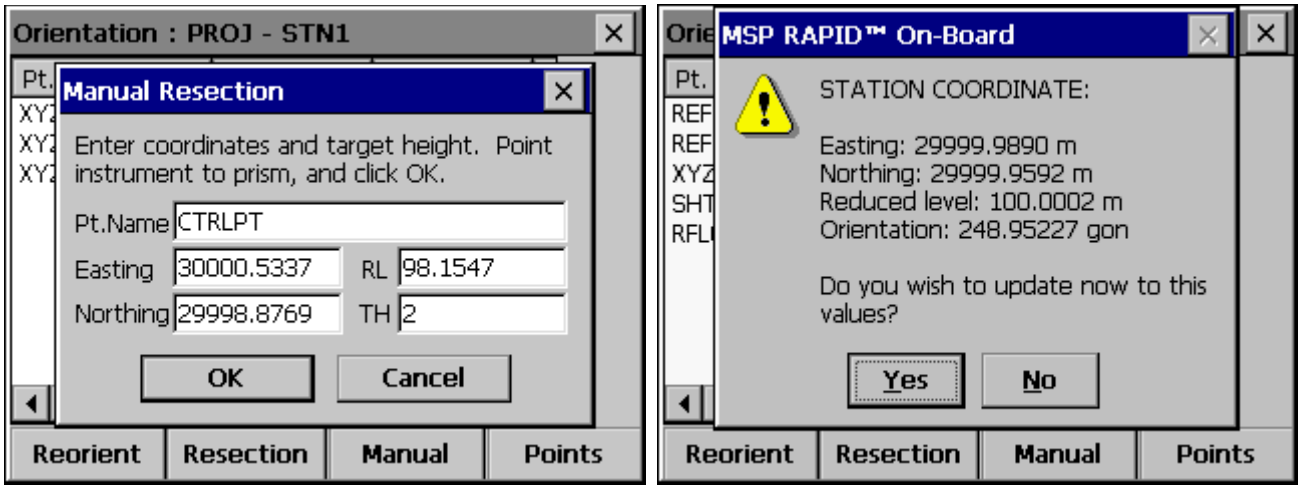
3.3.3.1 Resection from Training

To do Resection from training points, first Point the total Station to the first known point. Click the Resection. Do the same step for the next number of prisms.

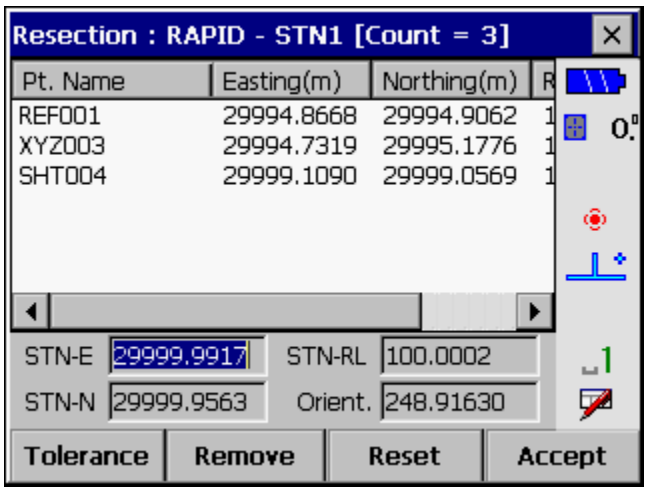


3.3.3.2 Manual Resection

To do manual resection, first Point the total Station to a known point. Click the Manual. A dialog box appears; key-in a name, the coordinates, and the target height. And click OK. Do the same step for the next number of prisms.



To review the resection points before accepting the result, just click No when the above question is asked "… Do you wish to update now to these values?" Then click on Points to see all the resection points taken.



The resection points list show all resection points with their coordinates. The calculated station coordinates and orientation are also shown. The following functions can be done on this screen.

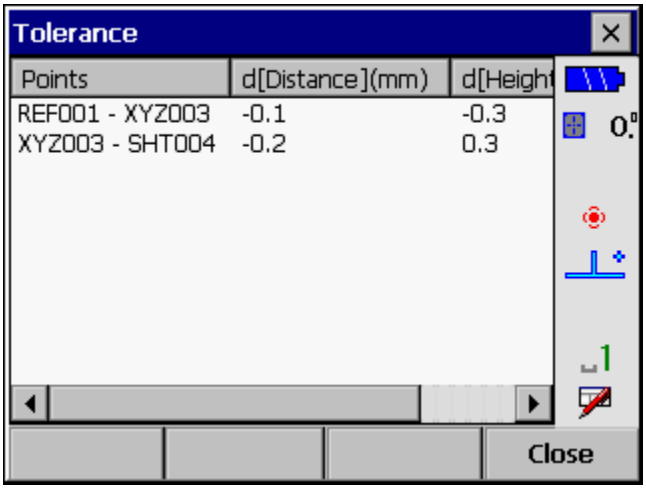
Tolerance: To go to the Tolerance screen.

Remove: To remove a resection point from the list.

Reset: To clear the resection points list.

Accept: To accept the result of the resection.

The Tolerance screen shows a list of resection points being compared, and their tolerances. The "d[Distance]" column shows the difference in Horizontal Distance between true and arbitrary coordinates. The "d[Height Diff]" column shows the difference in Height Diff (dRL).

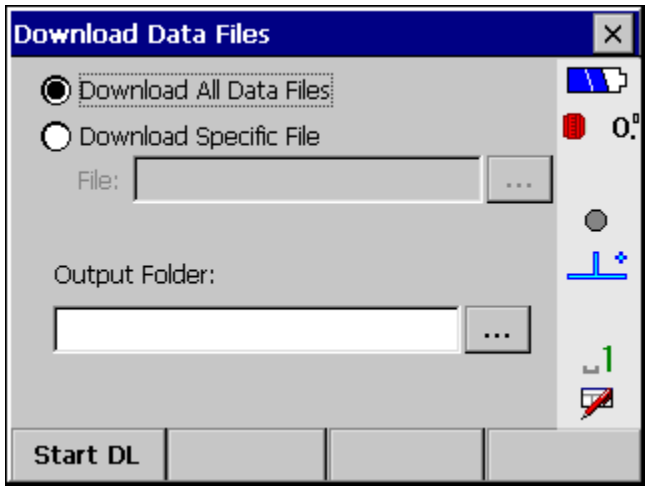


3.3.4 Downloading Monitoring Data

Once the Monitoring cycle is complete, Users may download the monitoring data from the Total Station. First, Users should plug in a Flash drive or a CF card to the Total Station; this is where RAPID On-Board will save the data.

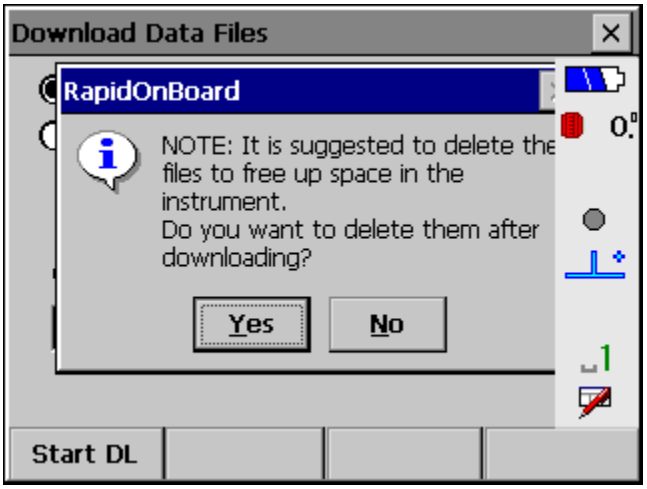
Save As: By Pressing the Save as Button, Users will be able to download the current or the last monitoring data done by RAPID On-Board

Download: By pressing the Download Button; Users will be able to download all monitoring data or just a specific monitoring data stored in the Total Station.



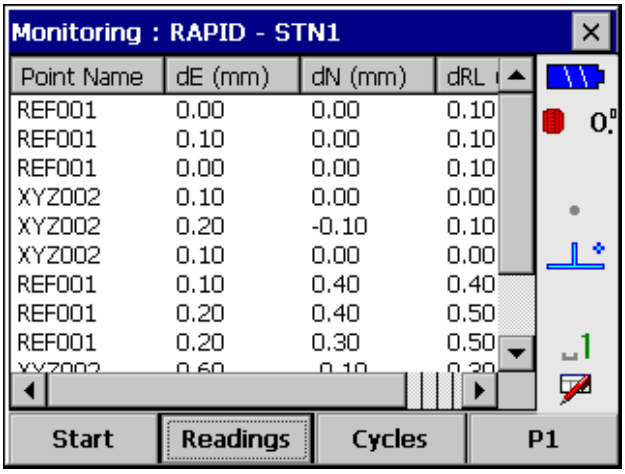
Users are required to choose the Output Folder; this is where the data will be downloaded to.

***Note*: By choosing Download all Data Files; RAPID On-Board will give an option to the users whether to delete files from the Total Station after Download. This is suggested to free up the Storage space of the Total Station.**



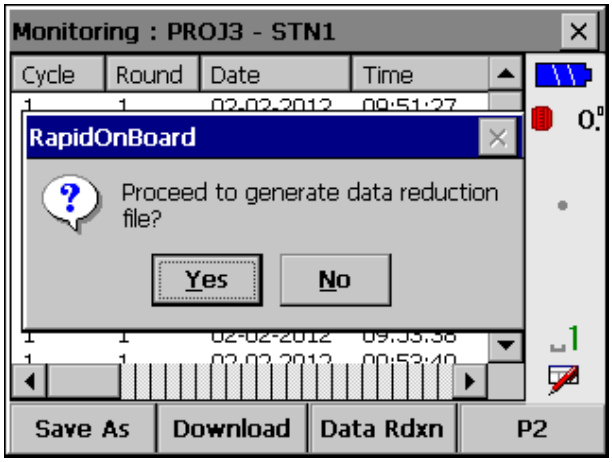
3.3.5 View Difference

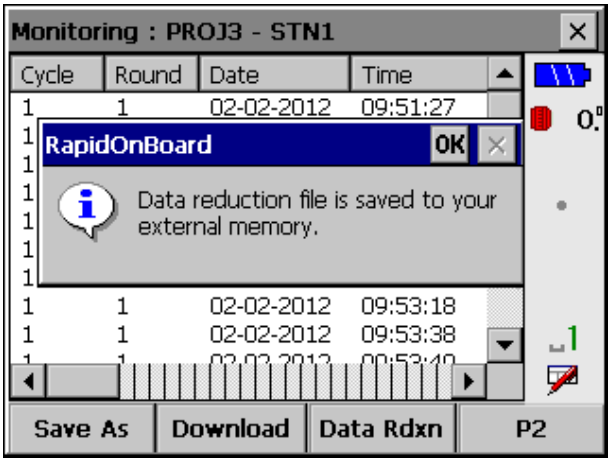
After a monitoring cycle is finished, Users can view the Difference between the Training File and the last Monitoring Cycle.



3.3.6 Data Reduction

After a monitoring cycle is finished, Users can generate a Data Reduction file, via the “Data Rdxn” button on Page 2 (P2) buttons of Monitoring screen. The data reduction file will be automatically saved to an external memory (e.g. USB thumb drive), so an external memory must be plugged-in.





A sample generated file is shown below.

Microsoft Excel - STN1_PROJ3_02-Feb-2012_Cycle_1_DataRdxn.xls

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
2	Stn At :	STN1		Temp :	30		Instr No.:	101577					
3	Inst Hgt :	0		Pressure :	1013								
4	Date :	2/2/2012		Time :	14:40								
5	Remarks :												
6	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
7			Horizontal				Vertical			Slope			
8	Station	Measured	Reduced	Mean	diff	Measured	Mean	diff	Distance	Mean	diff		
9	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
10	XYZ001	65-50-45.4				81-00-24.9	09-00-07.7	0.8	1.1374	1.1374	0		
11	XYZ002	97-57-16.4	32-06-31.0	32-05-55.8	5	79-09-21.1	10-51-20.8	-2.2	1.1222	1.1222	0		
12	XYZ003	119-16-55.8	53-26-10.4	53-25-51.7	3.5	82-49-56.8	07-10-34.3	-0.9	1.2336	1.2335	-0.1		
13	XYZ003	299-15-39.2	53-25-33.0			277-11-05.4			1.2335				
14	XYZ002	277-55-26.7	32-05-20.5			280-52-02.7			1.1221				
15	XYZ001	245-50-06.2				279-00-40.2			1.1373				
16													
17	XYZ001	65-50-49.7				81-00-26.2	09-00-05.3	-1.6	1.1374	1.1374	0		
18	XYZ002	97-57-11.2	32-06-21.5	32-05-50.0	-0.8	79-09-23.5	10-51-20.3	-2.7	1.1222	1.1222	0		
19	XYZ003	119-16-52.1	53-26-02.4	53-25-46.5	-1.7	82-49-51.3	07-10-39.1	3.9	1.2336	1.2336	0		
20	XYZ003	299-15-38.9	53-25-30.5			277-11-09.5			1.2336				
21	XYZ002	277-55-26.9	32-05-18.5			280-52-04.1			1.1221				
22	XYZ001	245-50-08.4				279-00-36.8			1.1374				
23													
24	XYZ001	65-50-48.8				81-00-18.8	09-00-07.6	0.7	1.1374	1.1374	0		
25	XYZ002	97-57-09.3	32-06-20.5	32-05-49.3	-1.5	79-09-21.7	10-51-26.1	3.1	1.1223	1.1222	0		
26	XYZ003	119-16-51.6	53-26-02.8	53-25-44.8	-3.4	82-49-57.9	07-10-34.4	-0.8	1.2336	1.2336	0		
27	XYZ003	299-15-34.7	53-25-26.8			277-11-06.7			1.2336				
28	XYZ002	277-55-25.9	32-05-18.0			280-52-13.9			1.122				
29	XYZ001	245-50-07.9				279-00-33.9			1.1373				
30													
31	XYZ001	65-50-49.9				81-00-21.2	09-00-07.1	0.2	1.1374	1.1374	0		
32	XYZ002	97-57-06.4	32-06-16.5	32-05-48.2	-2.6	79-09-21.4	10-51-24.6	1.6	1.1223	1.1222	0		
33	XYZ003	119-16-52.6	53-26-02.7	53-25-49.7	1.5	82-49-49.0	07-10-33.0	-2.2	1.2336	1.2336	0		
34	XYZ003	299-15-44.4	53-25-36.6			277-10-54.9			1.2336				
35	XYZ002	277-55-27.7	32-05-19.9			280-52-10.6			1.1221				
36	XYZ001	245-50-07.8				279-00-35.3			1.1373				
37													
38	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
39	XYZ001						09-00-06.9	0.5		1.1374	0		
40	XYZ002			32-05-50.8	1.5		10-51-23.0	1.2		1.1222	0		
41	XYZ003			53-25-48.2	1.3		07-10-35.2	1.2		1.2336	0		
42	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
43	XYZ001				HD =	1.1234							
44	XYZ002				HD =	1.1021							
45	XYZ003				HD =	1.2239							
46	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------		
47													
48													

STN1_PROJ3_02-Feb-2012_Cycle_1_

4.0 Licensing

RAPID On-Board demo version is limited to 1 job and 5 prisms to train. The demo version has 30-days evaluation period. RAPID On-Board requires license file to fully maximize the software's feature.

If already have a license file stored in a MSP RAPID™ On-Board USB dongle, Plug in the MSP RAPID™ On-Board USB Dongle to the Total Station. Then click on the Import button when the "Demo notification" pop up from the screen. Browse the license file (.msp) on the MSP RAPID™ On-Board USB Dongle.

Please contact MSP Support for licensing. support@mspsystem.com