



# Leica FlexLine/ FlexLine plus Mining Application



Version 3.0  
English

- when it has to be **right**

**Leica**  
Geosystems




## Introduction



### Symbols

To use equipment in the permitted manner, please refer to the detailed safety instructions in the FlexLine/FlexLine plus User Manual.

The symbols used in this manual have the following meanings:

Type	Description
	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.
	Press the function button <b>F1</b> to <b>F4</b> .
	Navigation keys.

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# 1

## Tolerances

### 1.1

### Defining Tolerances

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#### Description

Before use of the mining applications, tolerance profiles have to be defined and selected. The definition of tolerances can be done either via the Mining Data Manager software or manually on the instrument. This chapter describes defining and selecting tolerances manually. Refer to "6 Mining Data Manager" for details on using the Mining Data Manager software.

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#### Access


1. Select **Programs** from the **Main Menu**.
  2. Select **Tolerances** from the **Programs** menu.
  3. Enter the current PIN.
  4. Press **Cont** to proceed to the tolerance profile screen.
- 



If a wrong PIN has been typed in 5 times, a Personal Unblocking code (PUK) is required, which can be found on the instrument delivery papers. If the entered PUK code is correct, then the PIN code is reset to default value "123456".

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**Define tolerances  
step-by-step**

Step	Description
1.	Select the tolerance profile. <b>Primary</b> , <b>Secondary</b> or <b>Tertiary</b> .
2.	Enter the limits for horizontal direction, horizontal distance and height.
3.	Select the preferred sequence <b>B'F'F''B''</b> , <b>B'F'B''F''</b> , or <b>B'B''F'F''</b> , and number of sets.  B = Backsight point. F = Foresight point.
4.	Repeat steps 1 to 3 for each of the three tolerance profiles.
5.	Set the defined tolerances by pressing <b>Cont.</b>

## 1.2

### Select tolerances step-by-step



## Selecting Tolerance Profiles

Step	Description
1.	Start a mining application.
2.	Select <b>Tolerances</b> .
3.	Select <b>Select Tolerances</b> .
4.	Select either a <b>Primary</b> , <b>Secondary</b> or <b>Tertiary</b> tolerance profile to be applied.
5.	Press <b>Cont</b> to set the selected profile.
6.	Press: <b>Accept</b> to accept the profile in the tolerances summary screen. OR <b>Reject</b> to reject the profile and return to the define tolerance profile screen.

- Tolerances themselves can be changed by using the PIN-protected **Define Tolerance** application. Refer to "1.1 Defining Tolerances".
- If a tolerance was uploaded by the Mining Data Manager software, this tolerance will appear as "Uploaded" and cannot be changed on the instrument.

## 1.3

## Mining PIN (Personal Identification Number)

### Description

The definition of tolerances, EDM and communication settings, is PIN protected to prevent unauthorised changes. The Mining PIN is definable by the user. If a wrong PIN has been typed in 5 times, a Personal Unblocking code (PUK) is required, which can be found on the instrument delivery papers. If the entered PUK code is correct, then the Mining PIN code is reset to default value "123456".

### Set PIN code step-by-step

Step	Description
1.	Select <b>Tools</b> from the <b>Main Menu</b> .
2.	Change to page <b>4/4</b> for Black&White display or to page <b>Mining</b> for Color&Touch display.
3.	Select <b>MiningPIN</b> .
4.	Enter the current Mining PIN in <b>PIN-Code:</b> .
5.	Press <b>Cont.</b>
6.	Enter a personal Mining PIN Code (max. 6 characters numeric) in <b>New PIN-Code:</b> .
7.	Accept with <b>Cont.</b>



The default Mining PIN is "123456".

## 2

### 2.1

## Peg Survey

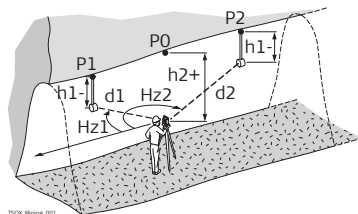
### Overview

#### Description

The application Peg Survey is used:

- to establish a forward peg (point).
- to control the intermediate horizontal angle between backsight and foresight points.
- to check the horizontal distances and heights of the backsight and foresight points.
- to compute the coordinates of the foresight point.

Users can measure several sets in different sequences. The quality of measurement is controlled by the tolerances which are set before starting Peg Survey.



P0	Station
P1	Backsight point
P2	Foresight point
$h_1$	Height of the reflector
$h_2$	Height of the instrument
$d_1$	Distance to backsight point
$d_2$	Distance to foresight point
$H_{z1}$	Horizontal direction to backsight point
$H_{z2}$	Horizontal direction to foresight point

**Known**

- Coordinates of station
- Coordinates of backsight point

**Unknown**

- Coordinates of foresight point
-


## 2.2

## Starting Peg Survey

### Access

1. Select **Programs** from the **Main Menu**.
2. Select **PegSurvey** from the **Programs** menu.
3. Complete the application pre-settings by:
  - Selecting a job, and
  - Confirming the set of tolerances. Refer to "1.2 Selecting Tolerance Profiles".
4. Select **Start** to proceed to **Input Station**.

### Input station step-by-step

Step	Description
1.	Enter the point ID of the station ( <b>Station:</b> ).
2.	<p>For manual entry of instrument height:</p> <ul style="list-style-type: none"><li>• Enter instrument height (<b>hi:</b>) of the station.</li></ul> <p>For measuring the instrument height:</p> <ul style="list-style-type: none"><li>• Turn the telescope to the azimuth with the help of the displayed vertical angle (<b>V:</b>).</li><li>• Press <b>Meas hi</b> to measure distance to the peg.</li></ul> <p> The sign for the instrument height is normally negative.</p>
3.	Press <b>Cont</b> to set the station and instrument height.

**Messages**

The following are important messages or warnings that may appear.

Messages	Description	Measures
<b>Station or BS-point has no valid coordinates !</b>	The point ID entered is not available in the internal memory or it has invalid coordinates.	Re-enter point ID (Step 1.).

**Next step**

Press **Cont** to proceed to the **Information** screen.

**Information**

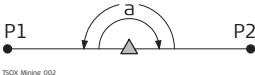
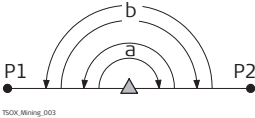

Information   ➡	
Survey will be executed acc. to the following settings:	
Sequence :	B' F' F"B"
No. of Sets:	2
Hz Tol. :	0.0111 g
HD Tol. :	0.010 m
H Tol. :	0.010 m
Cont	

**Cont**

To continue with Peg Survey.

**Description of fields**

Field	Description
<b>No. of Sets</b>	One set means to measure the backsight point (P1) twice and the foresight point (P2) twice, in both faces.

Field	Description
1	 <p>a) I Set</p>
2	 <p>a) I Set b) II Set</p> <p> The user must complete the number of sets as preset in the tolerance settings. A maximum number of 20 sets is supported by the application.</p>
Sequence	<p>Displays the measuring sequence.</p> <p><b>B'F''B''</b> Backsight-Foresight-Foresight-Backsight.</p> <p><b>B'F'B''F'</b> Backsight-Foresight-Backsight-Foresight.</p> <p><b>B'B''F'F''</b> Backsight-Backsight-Foresight-Foresight.</p>
Hz Tol	Tolerated residual in horizontal direction.
HD Tol	Tolerated residual in horizontal distance.
H Tol	Tolerated residual in height.

---

Next step

Step	Description
1.	Press <b>Cont</b> to proceed to the number of sets screen. The number of sets screen displays which set is about to be measured out of the total number of sets remaining. For example, Set 1 of total 3 means the measurement will be the first set of three.
2.	Press <b>BasePI</b> to access the <b>Change of Baseplate</b> screen. In the <b>Change of Baseplate</b> screen, a Hz value can be entered by which the direction should be rotated. OR Press <b>Cont</b> to proceed to the <b>Measure Backsight Point</b> screen. The <b>Measure Backsight Point</b> screen displays information about which backsight point the user has to measure.
3.	Press <b>Cont</b> to proceed to the backsight point measurement screen.

---

## 2.3

## Measuring Peg Survey

### Access

Press **Cont** from the **Measure Backsight Point** screen.

### Backsight Point

Mining		➤
Polar		
Backsight Point	1/2	
PtID:	1	
hr :	-1.800	m
Hz :	50.0000	g
V :	66.6667	g
HD :	30.012	m
Meas Pt   Search   Quit		

### Meas Pt

To start angle and distance measurements and save the measured values.

### Search

To search for a different backsight point.

### Quit

To exit the application and return to the **Peg Survey** settings screen.

### Foresight Point

Mining		➤
Polar		
Foresight Point	1/2	
PtID:	PEG-123	
Hz :	50.0000	g
V :	99.0000	g
hr :	-1.800	m
HD :	30.012	m
Meas Pt   Dist   Quit		


### Meas Pt

To start distance and angle measurements without saving the measured values.

### Grade

To edit current grades. Refer to "4 Grades".

### Measure points step-by-step

Step	Description
1.	Enter the reflector height ( <b>hr:</b> ) for the backsight point, if required.
2.	Aim at backsight point and press <b>Meas Pt.</b>
3.	Depending on the measurement sequence selected, enter a desired backsight or foresight point ID ( <b>PtID:</b> ). <b>Cont</b> saves the point ID and proceeds to the measurement screen.
4.	Enter the reflector height ( <b>hr:</b> ) for the point, if required.
5.	Aim at target point and press <b>Meas Pt.</b>
6.	Decide whether to measure an additional point: <ul style="list-style-type: none"> <li>• <b>No</b> Repeat steps 2. and 5. until all sets are measured.</li> <li>• <b>Yes</b> Repeat steps 3. to 5. with a new point.</li> </ul>  A maximum of 7 additional points can be measured.
7.	If the tolerances after a set are not met, the user has the option to continue with the measurements or reject the data. <ul style="list-style-type: none"> <li>• <b>Reject</b> to reject the measurements and remeasure the set again.</li> <li>• <b>Accept</b> to accept the result and continue with the next set.</li> </ul>

### Next step

After each set the **Tolerances Met**, or the **Out of Tolerance** screen displays.

Tolerances met!

Information	
Data 1	Data 2
Tolerances met!	
FS ID :	PEG-123
dHz :	200.0000 g
Hz Tol. :	30.0000 g
dHD BS :	0.001 m
dHD FS :	0.001 m
HD Tol. :	0.500 m
Cont	Quit

**Cont**

To proceed to the results screen.

**Quit**

To exit the application and return to the **Peg Survey** settings screen.

#### Description of fields

Field	Description
BS/FS ID	Point ID for backsight and foresight points.
dHz	Horizontal angle residual.
Hz Tol.	Horizontal angle tolerance.
dHD BS/FS	Horizontal distance residual for the backsight and foresight points.
HD Tol.	Horizontal distance tolerance.
dH BS/FS	Height residual for the backsight and foresight points.
H Tol.	Height tolerance.
Set No.	Set number.

---

**Next step**

Press **Cont** to proceed to the results screen.

---

## 2.4

## Peg Survey Results

### Access

Press **Cont** from the **Tolerances met!** screen.

### Traverse Results

Traverse Results		
Result1	Result2	
BS ID	:	PEG-123
FS ID	:	PEG-121
Avg. Hz	:	50.0000 g
Avg. HD BS:	:	17.319 m
Avg. H BS :	:	110.000 m
Avg. HD FS:	:	17.319 m
Avg. H FS :	:	110.272 m
Cont		Quit

### Cont

To save the data and exit the application.

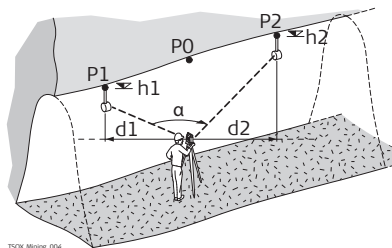
### Quit

To exit the application and return to the **Peg Survey** settings screen.

### Description of fields

Field	Description
BS/FS ID	Point ID for backsight and foresight points.
Avg. Hz	Average horizontal angle between backsight point and foresight point.
Avg. HD BS/FS	Average horizontal distance to backsight and foresight points.
Avg. H BS/FS	Average height to backsight and foresight points.
Sequence	Sequence of measurements.

Field	Description
No. of Sets	Number of sets.



TSOK\_Mining\_004

P0	Station
P1	Backsight point
P2	Foresight point
$\alpha$	Avg. Hz: Averaged horizontal angle
d1	Avg. HD BS: Average horizontal distance to the backsight point
d2	Avg. HD FS: Average horizontal distance to the foresight point
h1	Avg. H BS: Average height of the backsight point
h2	Avg. H FS: Average height of the foresight point

## Saving the data

The following results are stored in the internal memory.

Field	Description
Result	
Avg. Hz	Average horizontal angle between backsight point and foresight point.
Avg. HD	Average horizontal distance to backsight and foresight points.
Avg. H	Average height to backsight and foresight points.

Field	Description
<b>Residual</b>	
dHz	Horizontal angle residual.
dHD	Horizontal distance residual.
dH	Height residual.
<b>Coordinates foresight point</b>	
E	Easting.
N	Northing.
H	Height point.
GrEl	Grade elevation.

### Next step

Press **Cont** to save the data and exit the application. The **Continue with...** screen appears for access to the **Grades** or **Offset** applications. Refer to "4.2 Starting Grades" and "5.2 Starting Offset".

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# 3

## Line Peg

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### Description

The application Line Peg is used to mark a new line peg. This application is similar to Peg Survey except there is only one set of measurements required.

For the Line Peg application, follow the procedure described in "2 Peg Survey".

---

# 4

## 4.1

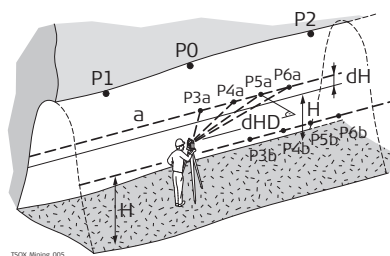
# Grades

## Overview

### Description

The Grades application is used:

- to mark gradelines along the side walls of the mines or tunnels.
- to input the slope gradient and an offset concerning the grade point.
- to compute the stake out height difference.
- to map the positions of the grade points along the gradelines.



P0	Station
P1	Backsight point
P2	Foresight point
a	New gradeline
P3a - P6a	Measured points
P3b - P6b	New gradeline points
dHD	Horizontal distance along the foresight line
H	Current height of gradeline above mine floor
dH	Height difference to new gradeline

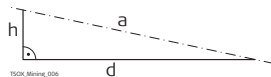
### Known

- Coordinates and grade elevation of station
- Coordinates and grade elevation of backsight point
- Slope gradient, station to foresight point
- Height difference (dH) between current gradeline and new gradeline

### Unknown

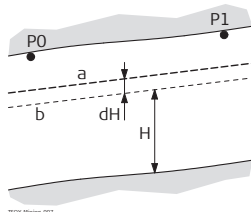
- Stake out height difference (dHgt) between measured point and gradeline point
- Horizontal distance (dHD) along the foresight line

### Slope gradient



- a     Gradeline  
h     Height  
d     Vertical distance

### Height difference



- P0     Station  
P1     Foresight point  
a     New gradeline  
b     Current gradeline  
H     Current height of gradeline above mine floor  
dH     Height difference between current gradeline and new gradeline

## 4.2

## Starting Grades

### Access

The Grade application is started by either selecting it in the **Programs** menu or after measuring in the applications **PegSurvey** and **LinePeg**.

When started from the **Programs** menu, station data must be entered and a measurement made to backsight and foresight points first, before the Grade&Off application can be used.

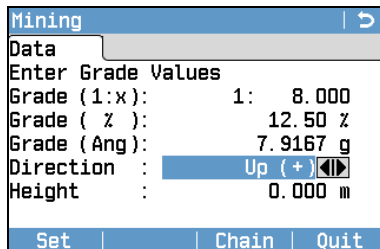
### Starting grades step-by-step

Step	Description
1.	Select <b>Programs</b> from the <b>Main Menu</b> .
2.	Select <b>Grade&amp;Off</b> from the <b>Programs</b> menu, and complete the application pre-settings by: <ul style="list-style-type: none"><li>• Selecting a job, and</li><li>• Confirming the set of tolerances. Refer to "1.2 Selecting Tolerance Profiles".</li></ul>
3.	Select <b>Start</b> to proceed to the <b>Mining - Enter Station Data</b> screen.
4.	Input station data and measure to the backsight and foresight points. Refer to "2 Peg Survey" for details on this process.
5.	Accept the tolerances from the measurements.
6.	In the <b>Continue with...</b> screen, press <b>Grades</b> to start the Grade application.

## Enter Grade Values

Enter the slope gradient as a proportion, for example 1:150, and the height difference.

If the slope gradient from the station to the foresight point is the same as the slope gradient from the backsight point to the station then no gradient needs to be entered.



Mining	
Data	
Enter Grade Values	
Grade (1:x):	1: 8.000
Grade ( % ):	12.50 %
Grade (Ang):	7.9167 g
Direction :	Up (+) ◀▶
Height :	0.000 m
Set	Chain Quit

### Set

To save the current values.

### Chain

To enter a chain length instead of a gradient.

### Quit

To exit the application and return to the **Continue with...** screen.

## Next Step

Press **Set** to set the entered values and proceed to the **Mark Gradeline** screen.

## 4.3

## Gradeline Marking

### Access

Press **Set** from the **Grades** screen.

### Mark Gradeline

Mining		>	
Polar			
Mark Gradeline			
PtID:	2		
dHD :	12.246	m	
dH :	107.254	m	
Hz :	50.0000	g	
HD :	17.319	m	
Meas Pt   Dist   Back   Quit			

### Meas Pt

To start angle and distance measurements and save the measured values.

### Dist

To start distance and angle measurements without saving the measured values.

### Back



To return to the previous screen.

### Quit

To exit the application and return to the **Grades** screen.

### Description of fields

Field	Description
PtID	Point ID of the measured point.
dHD	Difference in horizontal distance between the measured point and the grade point.

Field	Description
	 If the sign is negative the stake out point is further away than the measured point. If the sign is positive the stake out point is closer than the measured point.
<b>dH</b>	Difference in height between the measured point and the grade point.  If the sign is negative the stake out point is above the measured point. If the sign is positive the stake out point is below the measured point.
<b>Hz</b>	Current horizontal angle.
<b>HD</b>	Measured horizontal distance.

### Gradeline marking step-by-step

Step	Description
1.	Enter a desired point ID ( <b>PtID:</b> ).
2.	Aim at the target point and press <b>Meas Pt</b> . The height difference ( <b>dH:</b> ) and horizontal distance difference ( <b>dHD:</b> ) will display.
3.	Turn the telescope until the height difference ( <b>dH:</b> ) is zero, then repeat the measurement.

**Next step**

Press **Meas Pt** to measure and record data for the current point and proceed to measure another point.

---

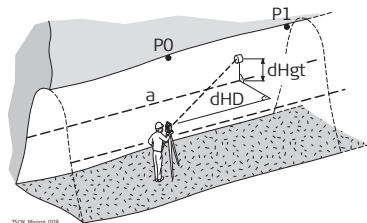
## 4.4

## Grade Results

## Description

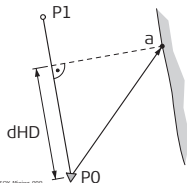
The Grades application computes the height difference ( $dH$ ) between the measured point and the stake out point, and the difference in horizontal distance ( $dHD$ ) along the foresight line.

## Profile view



TSCM, Mining, 008

## Top view



TSCM, Mining, 009

P0 Station  
 P1 Foresight point  
 a Gradeline  
 $dH$  Difference in height  
 $dHD$  Difference in horizontal distance

P0 Station  
 P1 Foresight point  
 a New gradeline point  
 $dHD$  Difference in horizontal distance

## Saving the data

The following results are stored in the internal memory.

Field	Description
<b>Measurement data</b>	
PtID	Point ID.
Hz	Horizontal angle.
V	Vertical angle.
HD	Horizontal distance.
SD	Slope distance.
dH	Height difference.
<b>Coordinates of new gradeline point</b>	
E	Easting.
N	Northing.
H	Height.
<b>Grades Result</b>	
daH	Stake out height difference.
daHD	Horizontal distance along the foresight line.
Grd	Slope gradient.
GE	Grade elevation.

## 5

## Offset

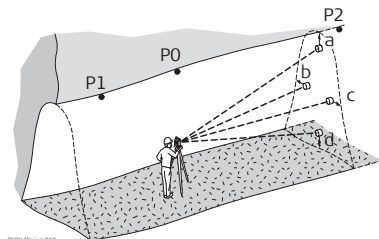
### 5.1

### Overview

#### Description

The Offset application is used:

- to record sections of the tunnels for volume computation and mapping.
- to input an offset value, left, right, up or down.
- to compute, after measurement, the actual coordinates of the tunnel walls.



P0	Station
P1	Backsight point
P2	Foresight point
a	Up
b	Left
c	Right
d	Down

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#### Known

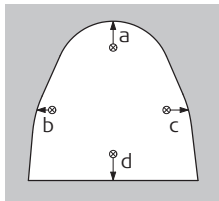
- Coordinates of station
- Coordinates of backsight point
- Offset value

#### Unknown

- Point coordinates of the tunnel walls

## Offset

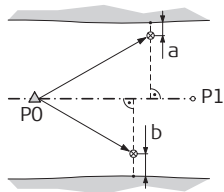
### Profile view



TSOK\_Mining\_011

- a Up
- b Left
- c Right
- d Down

### Top view



TSOK\_Mining\_012

- P0 Station
- P1 Foresight point
- a Offset left
- b Offset right

## 5.2

## Starting Offset

### Access


The Offset application is started by either selecting it in the **Programs** menu or after measuring in the applications **PegSurvey** and **LinePeg**.

When started from the **Programs** menu, station data must be entered and a measurement made to backsight and foresight points first, before the Offset application can be used.

### Starting offset step-by-step

Step	Description
1.	Select <b>Programs</b> from the <b>Main Menu</b> .
2.	Select <b>Grades&amp;Off</b> from the <b>Programs</b> menu, and complete the application pre-settings by: <ul style="list-style-type: none"><li>• Selecting a job, and</li><li>• Confirming the set of tolerances. Refer to "1.2 Selecting Tolerance Profiles".</li></ul>
3.	Select <b>Start</b> to proceed to the <b>Mining - Enter Station Data</b> screen.
4.	Input station data and measure to the backsight and foresight points. Refer to "2 Peg Survey" for details on this process.
5.	Accept the tolerances from the measurements.
6.	In the <b>Continue with...</b> screen, press <b>Offset</b> to start the Offset application.

## OFFSET

Mining		↩
Polar		
Offset		
PtID	:	122
Offset	:	0.100 m
Offset Dir.	:	Left 
Code	:	VW
H <sub>z</sub>	:	50.0000 g
HD	:	17.321 m
Meas Pt   Dist   Quit		

### Meas Pt

To start angle and distance measurements and save the measured values.


### Dist

To start distance and angle measurements without saving the measured values.

### Quit

To exit the application and return to the **Continue with...** screen.

## Offset step-by-step

Step	Description
1.	Enter a desired point ID ( <b>PtID:</b> ) and the offset value.
2.	Select the offset definition, <b>Left</b> , <b>Right</b> , <b>Up</b> or <b>Down</b> .
3.	Aim at the target point and press <b>Meas Pt</b> . The measurement is triggered and stored.  After storing, the application returns to the <b>Offset</b> screen.
4.	To measure a new point, repeat steps 1. to 3.

### Next step

Press **Meas Pt** to measure and record data for the current point and proceed to measure another point.

## 5.3



### Saving the data

## Offset Results

The measurement data is already corrected according to the offset values.

The following results are stored in the internal memory.

Field	Description
<b>Measurement data</b>	
PtID	Point ID.
Hz	Horizontal angle.
V	Vertical angle.
HD	Horizontal distance.
SD	Slope distance.
<b>Offset information</b>	
Offset	Offset value.
OffsetDir	Offset direction (left, up, right, down).
<b>Coordinates of new offset point</b>	
E	Easting.
N	Northing.
H	Height.

## 6

## Mining Data Manager

### 6.1

### Overview

---

#### Description

The Mining Data Manager is part of FlexOffice. The Mining Data Manager is a Windows-based program used for the data exchange between the instrument and a computer.

---

#### Installation on the computer

The installation program for FlexOffice can be found on the DVD supplied or downloaded. Please note that FlexOffice can only be installed under the operating systems MS Windows 2000, XP, Vista and Windows 7.

---

#### Program content

The Mining Data Manager can be used for the following purposes:

##### **Creating fixpoint files**

Creating and editing of fixpoint files such as coordinates.

##### **Defining and uploading tolerances**

Defining, editing (password protected), and uploading tolerances.

##### **Data import and export**

Importing and exporting fixpoint files (ASCII format).

##### **Data transfer between computer and instrument**

Uploading of fixpoint files and tolerances, downloading of fixpoint files and measurement data, and conversion of measurement data to various formats for peg calculation and archiving.

---

## 6.2

## Functionality


### Creating fixpoint files step-by-step

In the Data Input module, the Mining Data Manager allows users to create, view, modify and save coordinate lists.

Step	Description																												
1.	Open a new project: <b>File - &gt; New Project....</b> Enter the project name and file location.																												
2.	Enter point IDs, and for each one: coordinates, a backsight reference point, and a grade elevation. <table><tr><th colspan="7">Points</th></tr><tr><th>Point Id</th><th>Date/Time</th><th>Easting</th><th>Northing</th><th>Ortho. Height</th><th>Backsight Id</th><th>Grade Elevation</th></tr><tr><td>100</td><td>03/16/2011 13:57:12</td><td>100.0000</td><td>100.0000</td><td>100.0000</td><td></td><td>0.0000</td></tr><tr><td>120</td><td>03/16/2011 12:57:51</td><td>100.0000</td><td>100.0000</td><td>100.0000</td><td>12</td><td>20.0000</td></tr></table>	Points							Point Id	Date/Time	Easting	Northing	Ortho. Height	Backsight Id	Grade Elevation	100	03/16/2011 13:57:12	100.0000	100.0000	100.0000		0.0000	120	03/16/2011 12:57:51	100.0000	100.0000	100.0000	12	20.0000
Points																													
Point Id	Date/Time	Easting	Northing	Ortho. Height	Backsight Id	Grade Elevation																							
100	03/16/2011 13:57:12	100.0000	100.0000	100.0000		0.0000																							
120	03/16/2011 12:57:51	100.0000	100.0000	100.0000	12	20.0000																							

### Define tolerances step-by-step


For defining tolerances ensure that the unit setting on the instrument, select **Settings - > Regional**, is identical to the units set in the Mining Data Manager, select **Settings - > Units**.

Step	Description
1.	Open tolerances: <b>Settings - &gt; Tolerances</b> .
2.	Enter the password. The default password is "123456".   To create a new password: <b>Settings - &gt; Password</b> .

Step	Description
	<div data-bbox="463 171 1033 629"> <p><b>Tolerances</b></p> <p>Profile: <span>Primary ▾</span></p> <p>Horizontal angle limit: <span>324.00000</span> <span>°</span></p> <p>Horizontal distance limit: <span>0.100000</span> <span>m</span></p> <p>Height limit: <span>0.100000</span> <span>m</span></p> <p>Measurement sequence: <span>Back-Fore-Fore-Back (BFFB) ▾</span></p> <p>Number of sets: <span>3</span></p> <p><span>Save</span></p> <p>Enter password and press unlock to change the tolerance settings.</p> <p><span></span> <span>Unlock</span></p> </div>
3.	Select a profile. <b>Primary</b> , <b>Secondary</b> , or <b>Tertiary</b> .
4.	Enter the values for: <ul style="list-style-type: none"> <li>• <b>Horizontal angle limit:</b></li> <li>• <b>Horizontal distance limit:</b></li> <li>• <b>Height limit:</b></li> </ul>
5.	Select a measuring sequence: <b>Back-Fore-Fore-Back (BFFB)</b> , <b>Back-Fore-Back-Fore (BFBF)</b> or <b>Back-Back-Fore-Fore (BBFF)</b> .

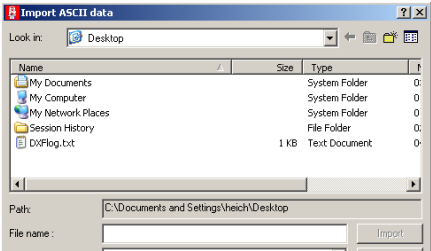
Step	Description
6.	Enter the number of sets.
7.	Press <b>Save</b> to save the tolerances.
8.	Refer to "Uploading step-by-step" to upload tolerances to the instrument.

### Uploading step-by-step

Step	Description
1.	Connect the instrument via the serial interface RS232 or the USB cable to the computer. The instrument interface settings must be set to <b>Port: RS232, Port: USB</b> or <b>Port: Automatically</b> .
2.	In Mining Data Manager, open a project: <b>Project - &gt; Open</b> .
3.	Choose Upload: <b>Data Upload - &gt; Send to instrument</b> .
4.	Select a job folder on the instrument to save the data into.  If the selected job already has data, all existing data will be overwritten by the new file being uploaded.
5.	Enter a jobname, operator and comments. Operator and comments are optional.
6.	Select a tolerance type and select <b>Upload</b> .
7.	The file uploading will begin and a status bar will indicate the progress.

## Process imported fixpoint files step-by-step

The Mining Data Manager allows import of fixpoint files in ASCII format.

Step	Description
1.	Open an ASCII formatted file: <b>Import - &gt; ASCII Data....</b> 
2.	Search and select the ASCII file.
3.	Open the selected file.
4.	Follow the wizard onscreen instructions to convert the ASCII file into the correct format.
5.	Select the project to which the data are assigned. Press <b>Assign</b> and <b>Close</b> .

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