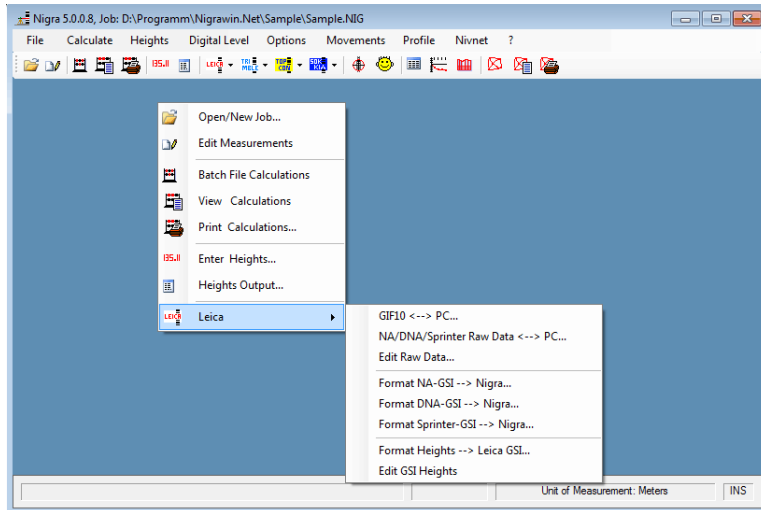


THE SOFTWARE FOR YOUR LEVELLINGS - NIGRA!

Nigra is a software for the evaluation of levellings data registered with digital levels. Nigra processes data from the following levels:

- Leica LS10/LS15/DNA03/DNA10/NA2000/2002/3000/3003, Sprinter 100M/150M/200M/250M
- Geozone Geomax ZDL700, Stonex D2
- Trimble DiNi 10/11/12/20/21/22 (10T/11T/12T in levelling mode), 0.3 mm, 0.7 mm
- Topcon DL-101/102/101c/102c, DL-501, DL-502, DL-503
- SOKKIA SDL1X, SDL30, SDL50

Nigra includes the data transfer for the preceding listed digital levels (Leica levels NA2002/3003 since software version 3.2), editing of raw data, reformatting of raw data in the Nigra measurement file, height database or a special profile file (profile file not for SOKKIA SDL30/50), alphanumeric header data (e.g. date, observer, order,



etc.), alternative coding of header data at the measuring time, correction of the readings with mean staff meter, linear coefficient of extension and staff offset (e.g. if using staff lengthening - not for SOKKIA SDL30/50), alphanumeric point number extensions to max. 14 characters, creating the raw data for setouts.

Additional Features:

- **Manual data input (with editor)**
- Additional **data transfer** for Zeiss Dac 10 and Leica Gif10 and all devices which need no producer special transfer dialog (e.g., Zeiss Dac E, Leica NA 2002/3003/DNA03/DNA10/Sprinter 100M/150M/200M/250M).
- **Calculations** for levellings with side shots,

height differences, line adjustments and instrument checks, creation of a net file for the network adjustment **Nivnet** inclusive calculation of standard deviation for 1 km double levelling.

- **Printer output in many different languages:** The text for outputs can be customized by the user. With this function it is possible to realize printer outputs in many languages. Files for German and English are supplied with Nigra.
- Output of calculations, movement lists and other ASCII files in **PDF** (for Acrobat Reader) or **HTML** format.
- Calculations and height outputs in the **units of measurement Meters, Feet and Inches.**

• **Microsoft Access compatible height database** for a great number of points. Data fields: maximum of 14 characters for alphanumeric point number, height, X-, Y-coordinates, date, calculation number, mean value difference, remark. Output of heights as text file (ASCII standard format und **free customizing ASCII formats**), import of heights from various column formatted ASCII-files into the Nigra height file. (Via this interface it is also possible to import ASCII-heights from DELTA/DOS.)

- **Internal text editor** for large files.
- **Movement measurements:** Creation of movement lists for a maximum of 9999 measurement periods directly from the height file with the following *variants*:

- Reduction to point of origin, for example for the determination of the tilt behavior of a building.

- Reduction to a reference point or a reference height.

- Comparison of theoretical - actual height and actual - theoretical height.

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Miller & Stanton Company
NigraWin - Levelling, Version 5.0          05-08-2012   Page: 1
Job: Sample

Test Levelling
Calculation No.: 1
Location      Sankt Augustin
Order         12. Movement Measurement
Line          12/95                    Date           01-08-2012
Weather       sunny                      Observer       Miller
Level         Leica NA3003 345678 Staff       Nedo 5416
Staff graduation 1 cm                Reading sequence BF BF(S)
Comments      Levelling with side shots
Calculation of Mean Values: new - calculated height is inserted

Misclosure =          1.6 mm          Max. error E (3) =    3.6 mm

Distance  Back      Side      Fore      Height      Point No.
25.26    1.4235
15.47           2.9007
15.47           2.9017
15.47           2.0000
26.15           0.0279
31.59    1.2622
30.99           0.0011
18.54    1.5197
12.43          -0.1052
18.44           2.600

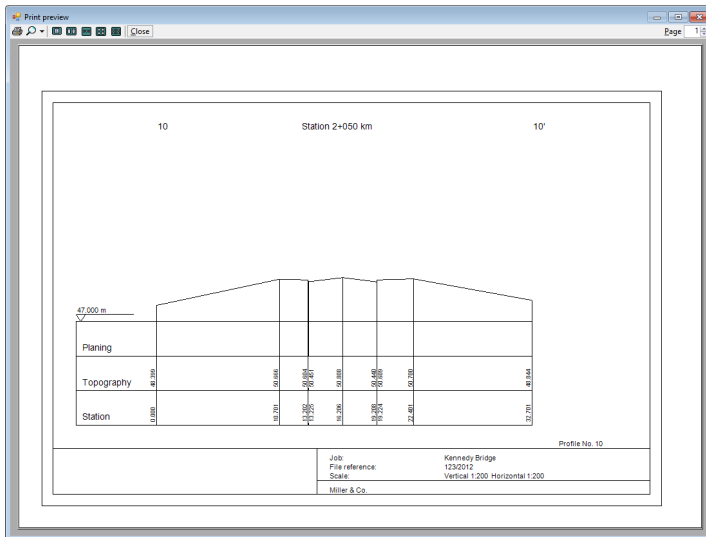
50.63814      1504
51.89991      1505m
53.52500      1506
50.82000      1560

Sum total distances      =    150.97 m   Delta-H=    1.57640 m
Sum backsight distances  =     75.39 m
Sum foresight distances  =     75.58 m
    
```

Nigra Calculation Output

Graphic functions:

Longitudinal and **cross sections** creation from **levellings** and **X,Y,Z-coordinates** of tacheometric surveys. Distances and heights are placed so that they are not overwritten, even if follow each other very closely.



Creation details: Many scales for heights and distances, many paper formats, 0 - 3 decimal places for heights and distances, raising the profile base, reduction of distances to any point of profile, addition of a start distance (e.g., for longitudinal profiles), variable text for the lines *Planning*, *Topography and Distance*, calculation of profile areas. In addition to the topographic profile, it is also possible to create profiles from planning heights.

Furthermore, **Nigra** allows the creation of movement plots as *time-movement curves* from the data of the heights file. The scales for the time axis and movements can be chosen, also various line types, plotter pens or layers. Several movement curves can put together to one output.

The graphic files are created in the **HPGL and DXF format**. So that the output to a HPGL/HPGL2 plotter

and the import to most of the CAD software is guaranteed. Nigra shows the HPGL files on the screen and prints them on the Windows printer.

• Network Adjustment Nivnet - sales finished

by Prof. Dr.-Ing. Fröhlich/Sankt Augustin. The network files for Nivnet are created by Nigra from the measurement data and the heights in the Nigra height file. **The Nivnet software is only available in German Language**. Units of measurement are meters and feet.

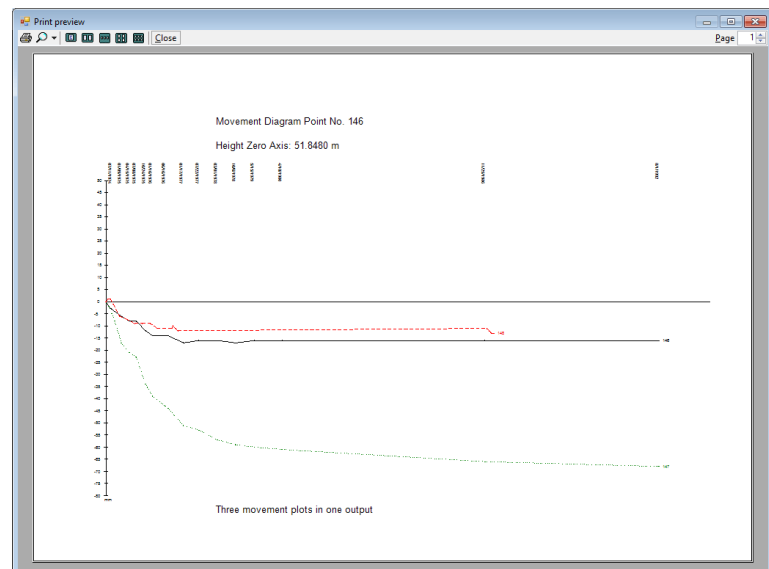
Calculation limits: A maximum of 200 points (new and connecting points) and a maximum of 1000 observations (Nivnet200) or 1000 points and 3000 observations (Nivnet1000).

Methods:

Constrained network adjustment (principle of least squares), free network adjustment, free network adjustment with transformation. Integrated is also a network solvability, which simplifies error detection in case of net defects.

Nivnet-x as additional software for preprocessing (mean value), L1-Norm and automatic minimal-looping

Please note: Nivnet has been successfully tested on Windows to version 11. Nivnet is however no longer being developed, so the use in future versions of Windows cannot be guaranteed.



System Requirements: PC with operating system Microsoft Windows 7/8/8.1/10/11.

Nigra comes on CD-ROM with printed short reference **Getting Started Guide**. Pricing for the first license:

Products	Euro	Order No.
Nigra 7	485,00 EUR	50002
Nigra for Leica Sprinter/Geozone Geomax ZDL700/Stonex D2 ¹⁾	250,00 EUR	50005
Upgrade of Delta/DOS to Nigra	Ask for special offer	50091

EGM countries (only if the VAT ID is missing): All prices plus 19% sales tax. Shipping and handling costs are 15,00 EUR for each shipment. Changes of costs and technical equipment are reserved.

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 Web: <https://www.trukkssoft.de>

¹⁾ In Nigra for Leica Sprinter/ Geozone Geomax ZDL700/Stonex D2 the following modules are not available: Support of digital level Trimble (Zeiss), Topcon, Sokkia, Leica DNA und NA, evaluation of movements measurements, creation of profiles, creation of network files.

Nigra measuring data file

```

RTower Brigde
x2345678901234567890123456789012345678901234567890123456789012
x      1      2      3      4      5      6      7
xDistance<--- Back      Side      Fore ---><--- Point Number -->
C1
HSankt Augustin      Location
H      Location
H12. Movement Measur Order
Hement      Order
H12/05      Line
H01-16-2013      Date
Hsunny      Weather
HMiller      Observer
HLeica NA3003 345678 Level
HNedo 5416      Staff
HLevelling with side Comments
H shots      Comments
H00      2.Col.:0=Side,1=no Side,4=Line, 5=Level test
*      3.Col.:0=BF,BBFF,2=BFFB,4=BFBF,5=FBBF,4.Col.:a=altern.
H1      Number of staff scales
H0      Scale constant for 2 staff graduation
H3      Difference tolerance between scales
H1      Staff graduation 1=cm,foot,inch, 0.5=1/2cm
H1      With distances, 1=yes, 0=no
H3      Decimal places for heights in calculations
H3      Decimal places for readings in calculations
E13m      E/Mean value/Error class/Unit of measure
D 25.26 b1.423      1503
D 15.47      s2.900      1503.5
0 15.47      s2.901      1503.5
2 15.47      s2.899      1503.5
D 15.47      s2      200
D 26.15      f0.022      1504
D 31.59 b1.262      1504
0 30.99      f.001      1505
D 18.54 b1.520      1505
D 12.43      s-.105      1506
D 18.44      f2.6      1560
E

```

Nigra calculations output

Miller & Stanton Company
 NigraWin - Levelling, Version 5.1
 Job: Sample

01-31-2013 Page: 1

Tower Brigde
 Calculation No.: 1
 Location Sankt Augustin
 Order 12. Movement Measurement
 Line 12/05 Date 01-16-2013
 Weather sunny Observer Miller
 Level Leica NA3003 345678 Staff Nedo 5416
 Staff graduation 1 cm Reading sequence BF BF(S)
 Comments Levelling with side shots
 Calculation of Mean Values: new - calculated height is inserted

Misclosure = -4.0 mm Max. error E (3) = 4.2 mm

Distance	Back	Side	Fore	Height	Point No.
25.26	1.423			49.242	1503
15.47		2.900		47.764	1503.5
15.47		2.901		47.763	1503.5m
15.47		2.899		47.765	1503.5o
15.47		2.000		48.664	200
26.15			0.022	50.642	1504
31.59	1.262				
30.99			0.001	51.901	1505m
18.54	1.520				
12.43		-0.105		53.525	1506
18.44			2.600	50.820	1560

Sum total distances = 150.97 m Delta-H= 1.58200 m
 Sum backsight distances = 75.39 m
 Sum foresight distances = 75.58 m