

**Example of a raw data file**

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Leica TPS-1000 Series
410001+00000020 42...+00007142
410002+00000021 42...+00007142
410003+00000022 42...+00592000
410004+00000001 42...+00000001 43...+00005.27 44...+00005.44 45...+00000002
410005+00000003 42...+00000004 43...+00000001
110006+00000002 21.324+35959570 22.324+08950310 31..01+00452914 51..1.+0000+000
410007+00000005 42...+00000234
410008+00000002 42...+00005.56
110009+00000003 21.324+09952470 22.324+08959170 31..01+00265964 51..1.+0009+000
110010+00000003 21.324+27952480 22.324+27000420 31..01+00452917 51..1.+0009+000
110012+00000002 21.324+35959570 22.324+08950260 31..01+00452917 51..1.+0009+000
110013+00000003 21.324+09952480 22.324+08959160 31..01+00265964 51..1.+0009+000
110014+00000003 21.324+27952530 22.324+27000430 31..01+00265965 51..1.+0009+000
110015+00000002 21.324+17959590 22.324+27009210 31..01+00452918 51..1.+0009+000
    
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110014+00000003 21.324+27952530 22.324+27000430 31..01+00265965 51..1.+0009+000
    
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**The following is a breakdown of the data block shown above (in bold)**

The Data Block contains five words. The first two characters of each word is **the Word Identifier**. The third through sixth characters of the first word contain the **Data Block Number**. The third through the sixth characters of subsequent words contain information pertaining to the data. (For further information refer to your instrument manuals.) Actual data is contained in the seventh through fifteenth characters.

**110014+00000003** (word index 11 = Observations, Data Block = 14, NR = 3)

**21.324+27952530** (word index 21 = Horizontal Circle, in the .324 the **3** indicates the automatic height index and monitoring of level up: on; and the **2** indicates the angle: hz.-correction for tilt of standing axis: on; and the **4** indicates degrees, minutes seconds is used. Horizontal Circle reading = 279° 52' 53.0".)

**22.324+27000430** (word index 22 = Vertical Circle, in the .324 the **3** indicates the automatic height index and monitoring of level up: on; and the **2** indicates the angle: hz.-correction for tilt of standing axis: on; and the **4** indicates degrees, minutes seconds is used. Vertical Circle reading = 270° 00' 43.0")

**31..01+00265965** (word index 31 = Slope Distance, in the ..01, the **0** signifies the data is original as measured by the instrument and the **1** signifies that it is in feet to three decimal places (1/1000 ft.), slope distance = 265.965 feet.)

**51..1.+0009+000** (word index 51 = PPM/Prism Offset, the ..1. indicates that the PPM/Prism Offset was entered via the keyboard; PPM = 9, and Offset = 0.)

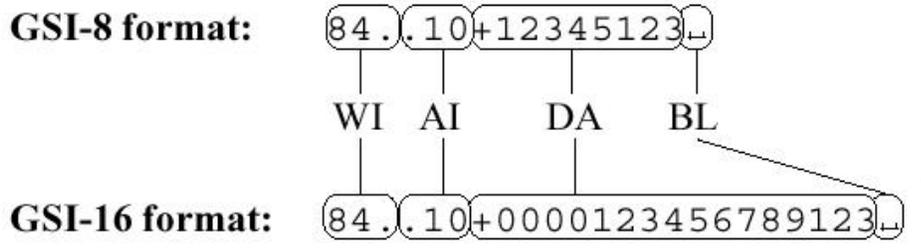
Below is an example of the GSI storage format with 8 or 16 character. This is page 205 of the TPS 1000 System Manual.

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From Version 2.20 onwards, there is a choice of two GSI formats, with word lengths of 8 and 16 characters respectively. When 16 characters are stored and supported the following special conditions apply:

A measurement block is tagged with \* at the first position.

A data word includes the data at positions 7 to 23 instead of at 7 to 15.



- WI Word index
  - AI Additional information
  - DA Data
  - BL Blank = separating character
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**Word Index Table**

These are pages 209 and 210 in the TPS 1000 System Manual.

Each word has a two-digit word index to identify it. These two digits occupy the first two positions of the word. Word index numbers lie in the range 01 to 99. The word indices are listed on the following pages. In some applications special word indices are used. They are described in the application manuals.

**WORD-INDEX TABLE**

Word index	Description
<b>General</b>	
11	Point number (includes block number)
12	Instrument serial number
13	Instrument type
18	Time format 1, pos. 8-9 year, 10-11 seconds, 12-14 msec
19	Time format 2, pos. 8-9 month, 10-11 day, 12-13 hour, 14-15 min
<b>Angle</b>	
21	Horizontal circle (Hz)
22	Vertical angle (V)
<b>Distances</b>	
31	Slope distance
32	Horizontal distance
33	Height difference

Word index	Description
<b>Code blocks</b>	
41	Code number (includes block number)
42 - 49	Information 1-8
<b>Additional distance information</b>	
51	Constants (ppm,mm)
52	Number of measurements, standard deviation
53	Signal strength
58	Reflector constant (1/10mm)
59	ppm
<b>Remarks</b>	
71 - 79	Rem 1-9
<b>Coordinates</b>	
81	Easting (target)
82	Northing (target)
83	Elevation (target)
84	Station easting (Eo)
85	Sation northing (No)
86	Station elevation (Ho)
87	Reflector height (above ground)
88	Instrument height (above ground)

All words can be used in measurement blocks except words 41-49, which are reserved.

A code block begins with 41, the word index for a code number.

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WILD GIF-10
410001+00000020 42....+10842V02
410002+00000021 42....+00007330
410003+00000022 42....+00261001
410004+?......1
110005+00003000 83..16+00187430
110006+00003000 32..00+00016380 331106+00010198
110007+00004000 32..00+00017260 332106+00007177
110008+00004000 573..0-00000880 574..0+00033650 83..06+00190451
110009+00004000 32..00+00019390 331106+00007600
110013+00004001 32..00+00019490 332106+00006824
110014+00004001 573..0-00000850 574..0+00116940 83..06+00190458
110015+00004001 32..00+00018220 331106+00006660
110016+00003000 32..00+00015370 332106+00009686
110017+00003000 573..0+00002000 574..0+00150530 83..06+00187432
! ----+

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The data format for the digital level is much the same as the total station GSI format. Data is recorded in blocks. Each block is composed of data words. Each block is 16 characters in length.

**410004+?......1**

There are two possible leveling methods. Method 1 as shown in the data word above (in bold) is indicated by **?......1**. This method is *Backsight Foresight Backsight Foresight*, which is the most used. Method 2 is *Backsight Foresight Foresight Backsight*, which was used for high order leveling. Now method 1 is used for first, second and third order leveling.

**110006+00003000 32..00+00016380 331106+00010198**

A break down of the data block shown above is as follows:

**110006+00003000** (word index 11 = Observations, Data Block = 6, NR = 3000)

**32..00+00016380** (word index 32 = **0** at position 5, measured without earth-curvature correction, system accuracy standard; **0** at position 6, meters the last place 1mm, distance = 16.380 meters.)

**331106+00010198** (word index 331 = Staff reading of backsight, **1** at position 4, compensator flag; **0** at position 5, measured without earth-curvature correction, system accuracy standard; **6** at position 6, meters, last place 0.1mm; Staff reading = 1.0198 meters.)

Page 10-1 of the NA2002 manual shows the position 1 – 6 and numbers 0 – 9 with an explanation of the meaning of a number in a certain position. For example in word index **32..00+00016380** the first 0 is in position 5. In position 5 the 0 indicates that; it was measured, without earth-curvature correction and the system accuracy is standard.

Position 6 is also a 0. In position 6 the 0 indicates that; the measurement was in meters and the last place is 1mm.

Position:    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6  
               . . . . . ± n n n n n n n n x

Position 1-3: Word identification using WIs.

Position 4:    1 = Compensator flag

Position 5:    0 = measured; without earth-curvature correction, system accuracy standard  
                   1 = entered manually; without earth-curvature correction  
                   2 = measured; with earth-curvature correction, system accuracy Standard  
                   4 = the last of several measurements transmitted (result)  
                   5 = entered manually; with earth-curvature correction  
                   6 = measured; without earth-curvature correction, system accuracy enhanced  
                   7 = measured; with earth-curvature correction, system accuracy enhanced

Position 6:    Units and decimal places  
                   6 = meters, last place 0.1mm  
                   1 = foot, last place 0.001 ft.  
                   0 = meters, last place 1mm  
                   7 = foot, last place 0.0001 ft. (NA3003 only)  
                   8 = meters, last place 0.01mm (NA3003 only)  
                   9 = inch, last place 0.0005 inch (NA3003 only)

**Word Indices**

- WI = 11        Point number
- WI = 32        Distance to rod
- WI = 330       Rod reading in MEAS ONLY
- WI = 331       Rod reading, backsight / B 1
- WI = 332       Rod reading, foresight / F 1
- WI = 335       Rod reading, B 2
- WI = 336       Rod reading, F 2
- WI = 333       Rod reading, intermediate sight
- WI = 334       Rod reading, setting out
- WI = 374       Setting out difference *Required minus actual*
- WI = 52        Number of measurements, and standard deviation of the single measurement
- WI = 521       Number of measurements, and band width (median mode)
- WI = 57        Integration time [sec] for values from 3 to 9 seconds
- WI = 41        Code number
- WI = 571       Station difference S
- WI = 572       Cumulative station difference  $\sum S$
- WI = 573       Difference in sighting distance d
- WI = 574       Total distance D
- WI = 83        Ground height

