Instrument Manual

Interface to Leica TPS Mid-Range Series (300,400,700,800 and FlexLine)

LSS™

Leica
Geosystems

Contents

Instrument Manual - Interface to Leica Mid-Range

Introduction

As modern surveying equipment and methods have evolved, LSS has also developed much more functionality in order to make the most of the techniques available. This is especially true when it comes to data acquisition, field coding and transfer from survey instruments. McCarthy Taylor Systems Ltd has strived to ensure that LSS surveyors are able to make the most of the options available.

This manual has been prepared to help with the configuration of both the survey instrument hardware and LSS software.

Chapter 1

1.1 Install LSS and Testdata

Note: Leica Installs may be required (such as the DBX Reader) on the PC in order to fully connect LSS to Leica Captivate.

It is best to complete all installation steps in one go especially if administrator rights are required.

Select '**Install LSS & Test Data**';

For a new install use '**Full LSS Install Incl Dongle Drivers**'

We can ignore here '**Install Enhanced Test Data**',

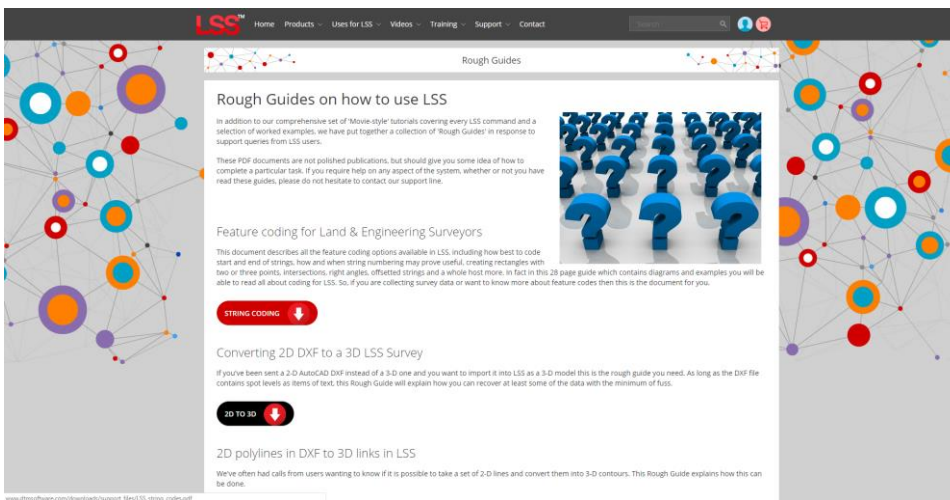which includes examples of Point Cloud data and the files we use in our specialist training courses

1.2 LSS Rough (How to) Guide

In the main window there are some other useful items that can be installed.

The 'How to Guides' are pdfs documents.

1.2.1 LSS String Coding and Reserved Codes
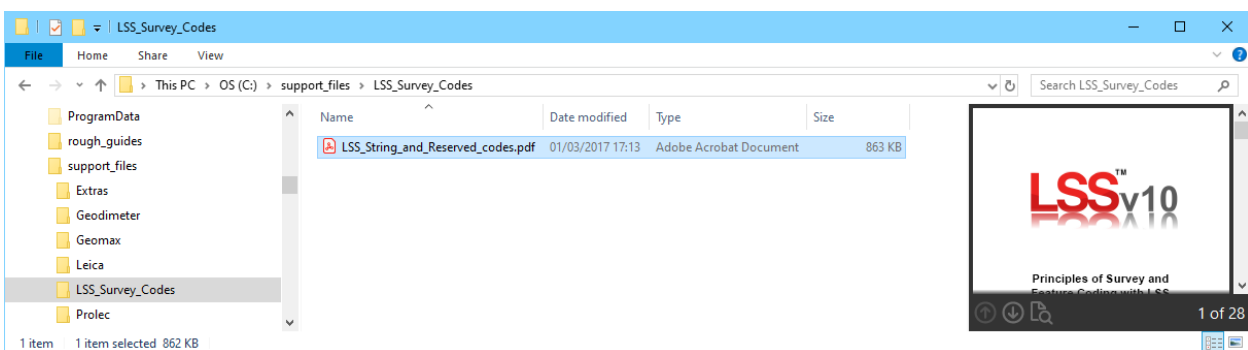

The PDF file '**LSS_String_and_Reserved_codes.pdf**' contains very useful information on the principles of Survey and Feature Coding in LSS as well as a complete list of diagrams and descriptions of all the LSS Reserved codes. It is located on the LSS media folder

'Support_Files\LSS_Survey_Codes'

The rough_guides folder can also be accessed via the Windows Explorer window;
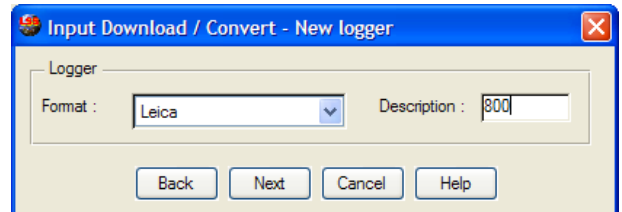
1.3 Configure Logger for TPS Mid-Range

From the main menu select Input / Download/Convert.

Processing for the first time will require a Leica Mid-Range logger to be configured (any new instrument requires this step).

Click 'New' (or 'Change' if other loggers already exist).

Select 'Leica' as the format and enter a Description e.g. 800. Click 'Next'.

Select 'User invokes download via COM port' and tick the box 'No data transfer/download by default'.

Note: It is possible to download directly from the instrument but the use of Leica Geo Office Data Exchange Manager is preferred. By this method the raw GSI data file will already have been downloaded for LSS to convert i.e. no data transfer will be necessary.
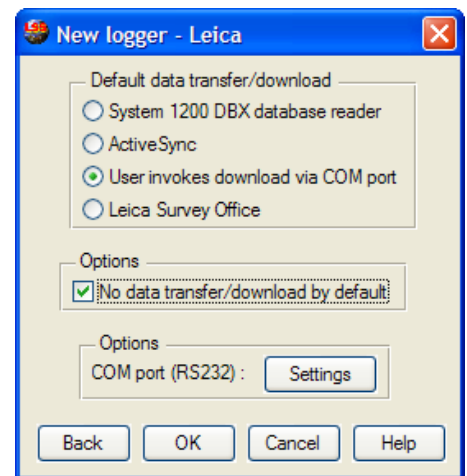
Click 'OK'. Select '300/700 series' and click 'OK' again.

Instrument Manual - Interface to Leica Mid-Range
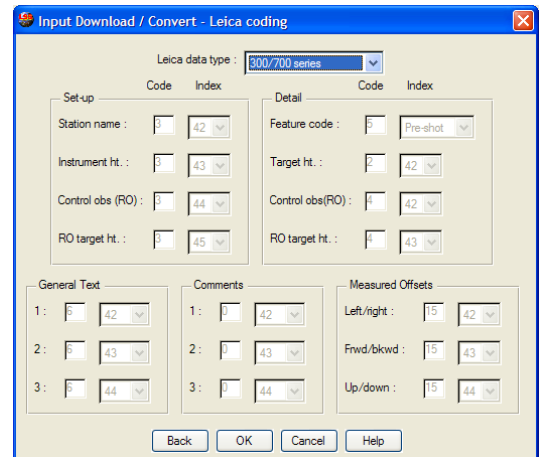
The new logger is added to the list.

Click 'Finish'.
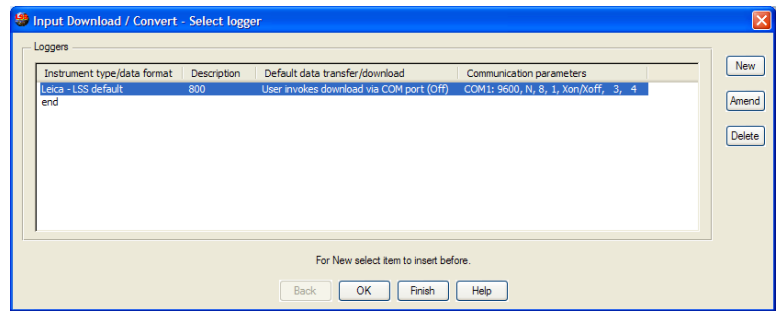
Click 'OK' to the default 'Save' setting which will save these changes permanently to this PC.

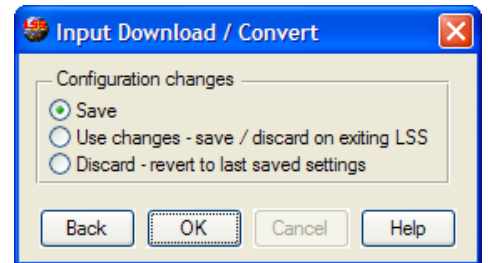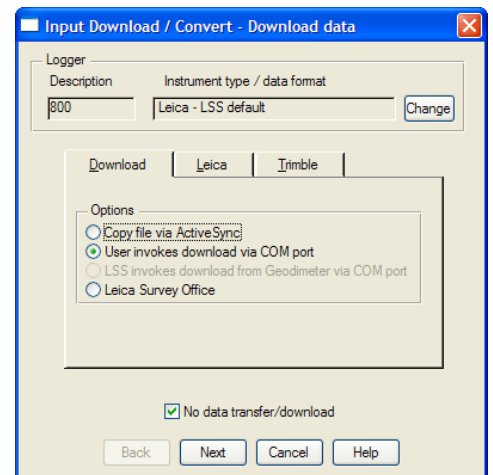We have now added the instrument for LSS to be able to convert the downloaded data.

Click 'Cancel' here to go back to the main menu if not immediately converting data.

**Instrument Manual - Interface to Leica Mid-Range**

1.4 Connect TPS Mid-Range to PC

To connect the instrument to your computer, use either a serial cable (9-pin) or a USB cable (GEV189).

If you are using the USB cable, make sure the driver is installed **before** the cable is attached to the PC. A copy of the driver is available from the supplied LSS media or the Leica website.

The COM port number that the cable is connected to is required. To find this use Start / Control Panel / System / Hardware / Device Manager (the USB cable will be shown as "USB download cable" or "USB-to-Serial...").
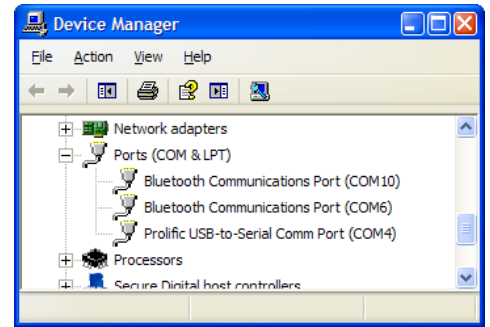
Once the cable is attached, make sure the communication settings are set to the same on both the computer and the instrument.
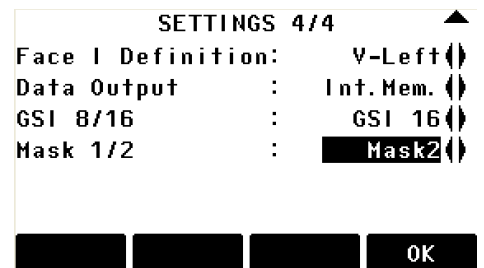
1.3.1 Configure Instrument

Check the communication settings (these will normally be defaulted as shown) using **MENU, PAGE, F2-COMM Parameters**

F4-OK confirms the selection.
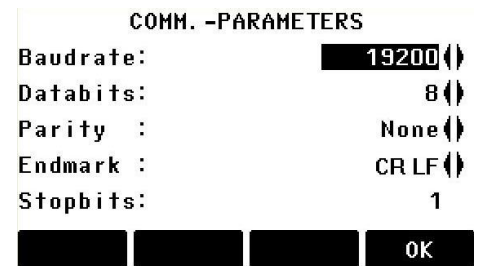
Also check in **MENU, F2-Settings, PAGE** 3 times, and make sure **GSI 16** and **Mask2** are set.

F4-OK confirms the selection.

1.5 Configure Data Exchange Manager

Data Exchange Manager (DEM) is the Leica software used to transfer all types of files to and from Leica instruments including control files such as code lists and format files, as well as for downloading survey data and uploading coordinates. DEM can be found in
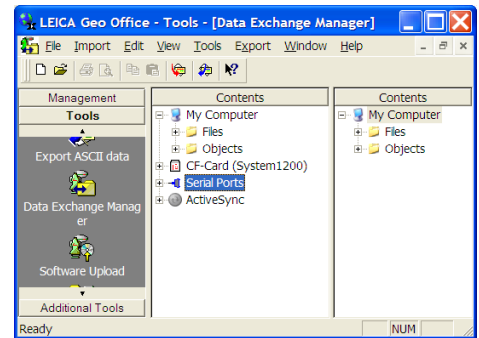
Leica Geo Office (LGO) Tools which is available on the LSS media in the

Support files\Leica\Leica_Geo_Office_Tools_en folder.

The two control files required for using the TPS Mid-Range instrument with LSS are a **code list** and a **format file** both supplied on the LSS media.

In **LGO**, go to **Tools, Data Exchange Manager**.

Right-click on **Serial Ports** and select **Settings**

Select the **COM Settings** tab.

Select the **Port** number the cable is attached to (as above)

Select the **instrument** type and check the communication settings match that on the instrument (as above).

Select **OK** to confirm.
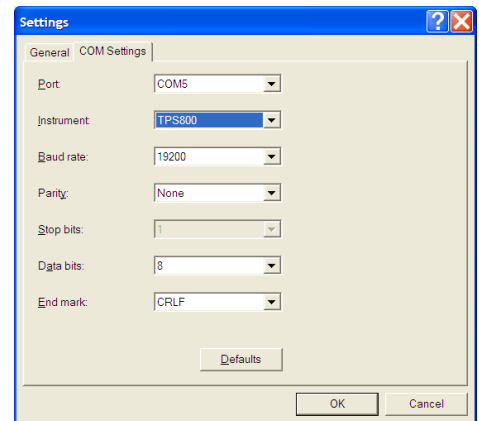
Next to serial ports is a small **+** symbol. Use this to expand and view the available ports.

On the correct port number click the **+** symbol again to initiate communication with the instrument.

The instrument name should appear, e.g. **TCR805**

If there is a communication problem, check all settings, especially the port number and refer to the

Leica **USB download cable setup** guide if using a USB cable.

The right hand pane shows the PC folders and the left hand pane shows the instrument folders.

Expand the left hand **Files** folder to reveal the **Jobs**, **Format Files** and **Codes** folders.

1.6 Copy the LSS Format File to the TPS

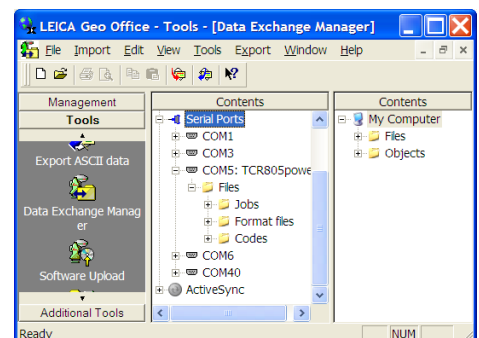The LSS format file **LSSv980raw.FRT** is found on the LSS media in the '**Support_files\Leica\Mid-range\Format**' folder.

For the Flexline use **LSS_Flex.FRT** as found in '**Support_files\Leica\Mid-Range\Format\Flexline**' folder.

The following steps explain the method of transferring this to the TPS Mid-Range;

Copy the format file from the LSS media to a temporary place on the PC hard drive

Drag and drop the format file from the PC (RHS) to the instrument (LHS) 'Format files' folder
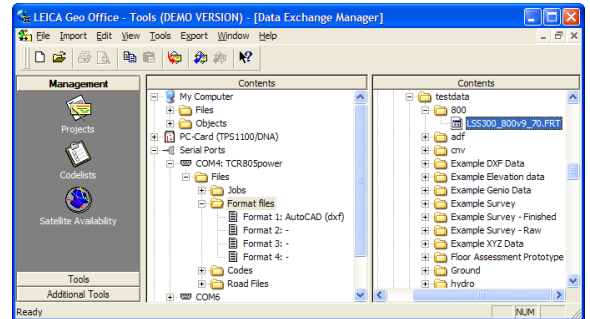
The Data Upload dialog will show the Format file number that it will be inserted under.

Click 'OK' and the Upload format dialog will appear whilst copying the file to the instrument.

When this is finished the copied format file will appear in the instruments Format files folder and can now be used during the data download sequence.
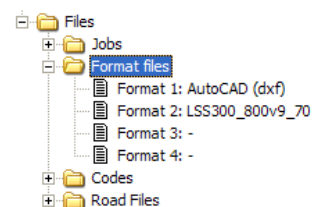
1.7 Copy the LSS Code List to the TPS

The LSS code lists have been built from the LSS prototype legend (supplied with the Testdata) and are found on the LSS media in the 'Support_files\Leica\Mid-Range\Code' folder.

Choose the relevantly named CRF code list file for your instrument.
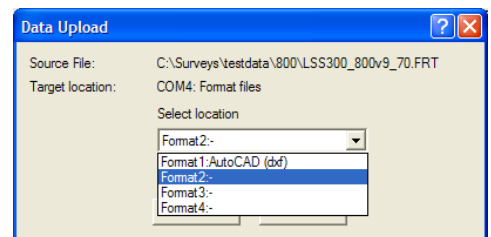
The following steps explain the method of transferring this to the TPS Mid-Range;

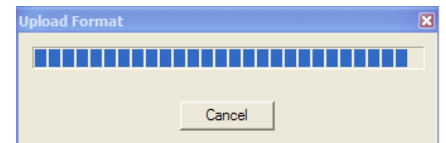Copy the code list from the LSS media to a temporary place on the PC hard drive

Drag and drop the code list from the PC (RHS) to the instrument (LHS) Codes folder
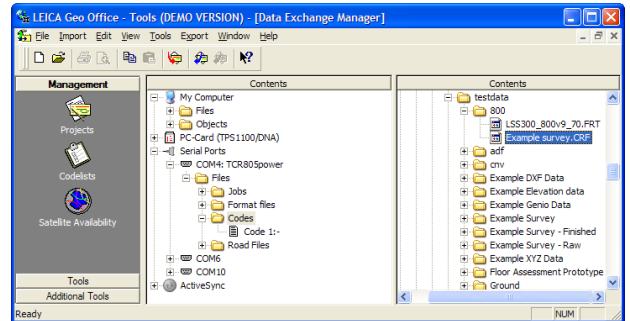
The New Name dialog requests a name for the code list.
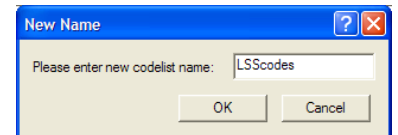
Click 'OK' and the Upload Codelist dialog will appear whilst copying the file to the instrument.
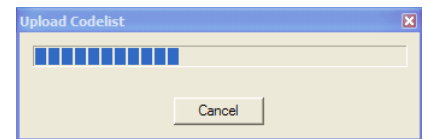
When this is finished the copied code list will appear in the instruments Codes folder and can now be used during a survey.
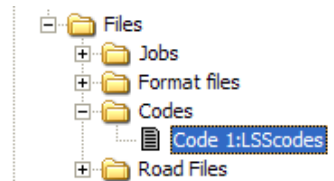
1.8 Copy the LSS Code List to a Flexline

The LSS code list **LSSFlexv980.cls** has been built from the LSS prototype legend (supplied with the Testdata) and is found on the LSS media in the

'**Support_files\Leica\Mid-Range\Code**' folder.

Note: LSS will create a CLS file from Export Upload Code List which can be uploaded direct to the instrument without needing to use FlexOffice.

There are two ways of transferring a code list to the Flexline, either;

Using the USB Stick

Copy the code list from the LSS media to a temporary place on the PC hard drive

Using Explorer Drag and drop the code list file from the PC to the instrument 'Removable Memory\Codes' folder

Using Data Exchange Manager in FlexOffice

Right mouse click on the code list and choose USB Stick which will create the relevant CLS file
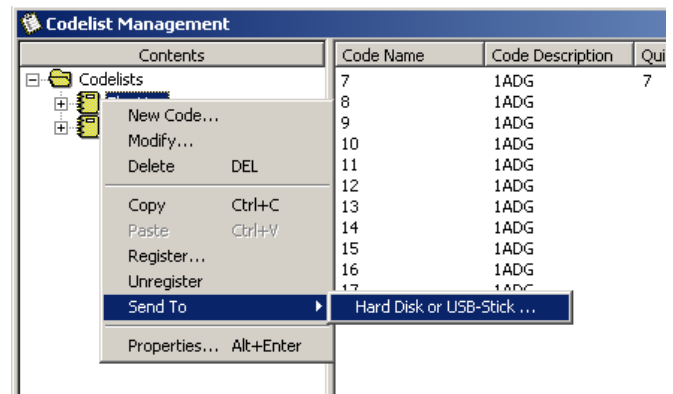
(see section below for a general description of using code lists with the mid-range series in LGO where the steps are the same but LSS creates a CLS file instead of an IDX)

Once the code list is on the instrument use 'Transfer' to register this code list on the instrument using the following steps;

From the main menu select 'Transfer'

Select F2 Import Data

Select Single File from USB Stick

Select the Codes folder within 'Removable Memory', choose the file and F1 OK

Verify the name and F4 OK

Confirm that you are happy to overwrite the current codes loaded on the instrument

The code list will transfer to the instrument memory

F1 OK will return to the main menu.

The code list has now been imported to the instrument.

Notes :

Flexline firmware - There were issues associated with early versions of the firmware which have now been corrected. To implement these corrections it is necessary to have a firmware version v2.35 (2012) or later, and the format file **LSS_Flex.FRT** as supplied by LSSv10 media.

This Flexline format file uses both block types of reflector constant (58) and ppm (59) rather than the previously combined values in the 51 block.

Chapter 2

2.1 Creating a New Survey in LSS

A survey must be open to process the data in LSS and we will do this exercise in a new survey.

Select **File New DTM** from the main menu.

Click Browse against 'New survey' in the dialogue below.

We can create a new folder for the new survey to go in and call it *e.g.*
C:\ Surveys\Leica TPS Workshop\

Enter the survey name, *e.g.*
LEICA TPS WORKSHOP SURVEY;

Select it in the 'Save in' box
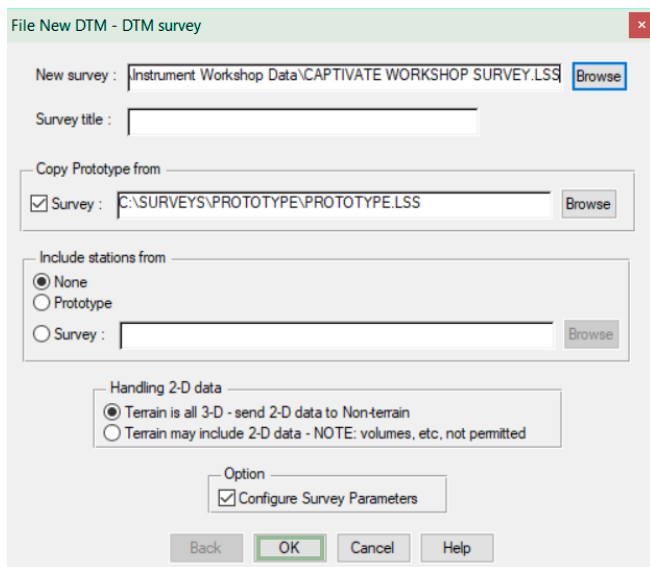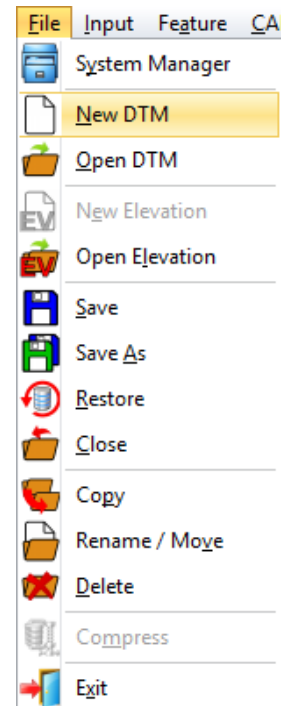
Click 'Save'.
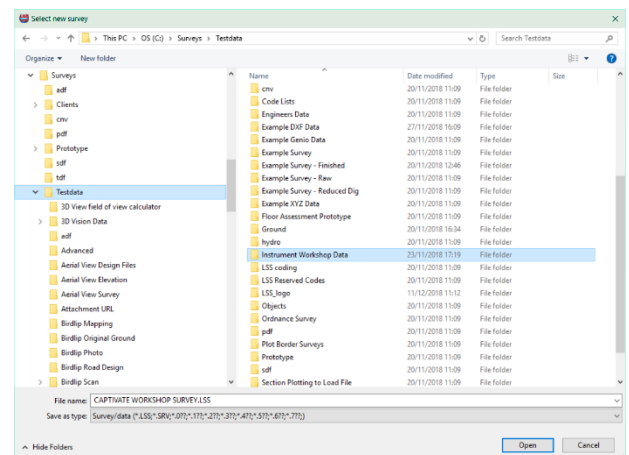
This will return to the 'File New DTM' dialog with the path and name of the intended LSS survey.

If required we enter Survey title, or if left blank, LSS will use the survey name as the title.

Note: the LSS Prototype is found in Testdata and also in Prototype directory, and either can be used here. It is assumed that the surveyor will look to create their own prototype for their features in say C:\Surveys\Prototype and so will not be accessing the original LSS prototype in Testdata.

The 'Prototype' will be as per 'New Survey Parameters' (described earlier).

If we had stations already at the site we could bring them in here,
(We will set the survey so any 2-D data will go to the survey's Non-terrain).

Tick '**Configure Survey Parameters**', then Click 'OK'

Ticking the '**Configure Survey Parameters**' allows us to revisit the parameters set during the initialisation process and is worth checking through:

We can alter the Survey Title,

Change the handling of 2-D data,

Adjust other survey parameters.

For GPS data and the Ordnance Survey National Grid TN15 transformation, the 'Default scale factor' can be set here

'Control tolerances'
can be adjusted if necessary

This window can also be invoked by the command **Configure Survey Parameters**.

If we continually have to reset a particular parameter, then it might be worth reconfiguring the

New Survey template values in **Configure Hardware & System - New Survey Parameters**.

Note: It is worth saving the survey immediately after initialisation, provided all the parameters are correct of course. This will also set a "Restore point" prior to loading the survey data, and this will help with addressing **Input Load** issues when processing the survey.

2.2 Downloading the Survey Data using Data Exchange Manager

Expand the **Jobs** folder to reveal a list of the jobs saved on the instrument.

Each job contains a **fixpoints** file and **measurement data** file. Fixpoints contains control points or manually entered points. Measurement data contains all the observation measurements including station setup information.
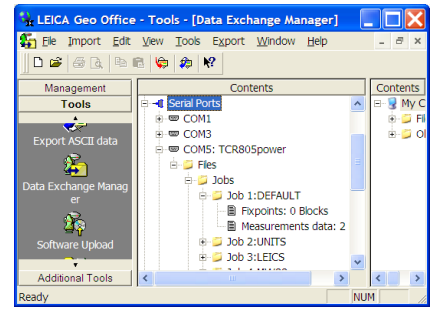
Note: there are other onboard options to downloading data from a Flexline e.g. RS232, USB, and Bluetooth.

On the right hand side of the screen, expand the **Files** folder to reveal your C: drive on your computer. Select a folder to store your data.

To transfer a 'measurement data' file, drag it from the instrument side on the left hand side to the LSS survey folder (that you may have just created) on the right side.
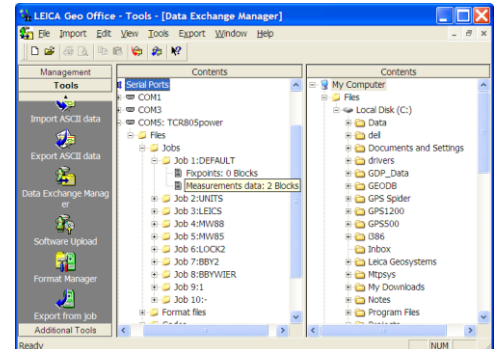
A new **Download** dialogue box should appear as indicated.

Enter a filename and the extension you wish to save it as, e.g. LSSSurvey.ASC

The filename defaults to the name of the Job and is given a suffix automatically e.g. .GSI or .ASC. Either of these is acceptable.

Select the Format file **LSSv980raw.FRT**

Press **Start** to begin the transfer.
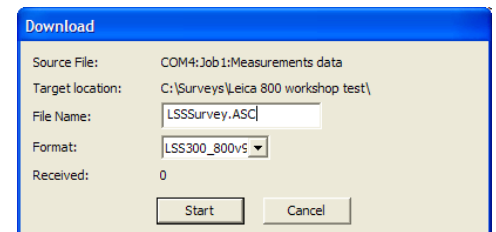
The Received blocks should start counting up and the instrument should say **Downloading Observations.**

The file is now ready to be converted by the next step in the LSS Input /Download and Convert option in LSS.
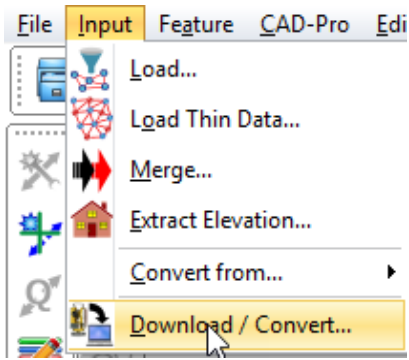
In LSS we select **Input Download / Convert** to invoke the Download data window.

The TPS should already have been configured on this PC.

'Change' allows us to make amendments to the logger.

If 'Leica Job (DBX) reader' is not shown nor is it present on the logger list when

'Change' is selected then we have not already configured a logger.

To rectify click 'New' and follow the dialog boxes or refer to the '**Configure Logger**' section above.

Note: If a Leica GSI file e.g. '.SVY', from reading a Job via Legacy mode, already exists on the C: drive, we can tick 'No DBX read (convert GSI data file)'.

This will skip straight to the conversion dialog where the file is selected as the 'Downloaded file'.

Click 'Next'

Select the relevant folder

If the LSS load file input box is empty and 'Next' is clicked then LSS will automatically provide the next available load file number for the current survey.

The settings for Included data and GPS QA warning values are remembered.

Back to top
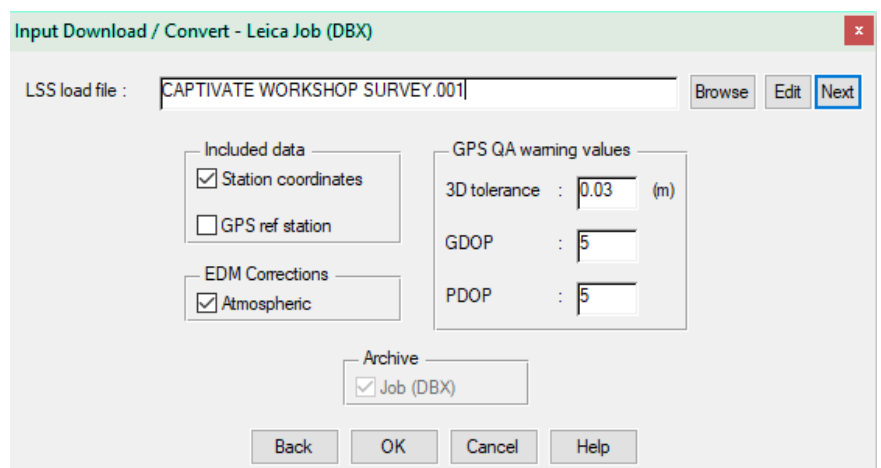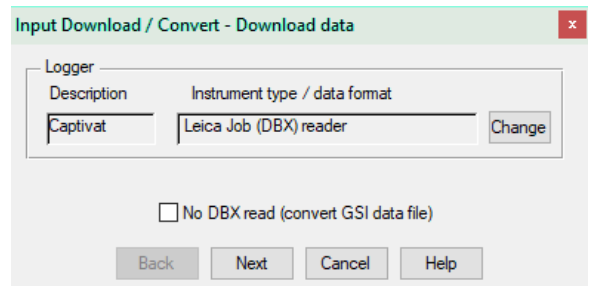
The Included data options relate to the requirement for Control stations in the Load file. The GPS ref station might be selected e.g. if the Job references an on-site base station.

Click 'OK' to process the Job, create the Load file, and automatically invoke **Input Load**.

Note: If the survey does not exist then **File New** will occur prior to **Input Load**.

Note: A report is written at the bottom of the Load file showing the QA information, as well as the number of converted stations, set-ups, observations, text etc.

2.4 Data Processing – Input Load

2.4.1 Introduction

The 'LSS Load Input file' is the format by which all external data is processed in LSS.

Loading data into a survey model

The **Input Load** command will invoke the following window, highlighting the correct load file i.e. '.001' if 'Save and Load' has been chosen at the end of the conversion process. .

A Load Report file will be generated – we will accept the default _nnn.TXT file type for this exercise.

A conversion file can be invoked if, for example, the field codes on the logger require changing to the LSS feature codes in the survey's legend

Leave the options as per default, but please note the layout changes in version 10

And the options to set up annotations for features, particularly for utilities surveys

'Next'.

Clicking the 'Edit' button next to the Load file **001** will open the Load file in the editor configured / reviewed earlier
(see over the page for the Load file and an explanation of the load format command lines).

The Load file can be viewed and edited to address any issues raised during **Input Load**.

'Next' will start the **Input Load** survey process but usually we will want to open the load file first to check through all the set ups, target heights and feature coding.

```
 10, LSS load file using Leica Stylesheet v0.988
 20, Created 2018/12/18 11:12:31
 30, Job Name, LSS CAPTIVATE
 40, Description, Workshop Survey
 50, Date 2018-12-13, Time 12:29:06.31
 60, Instrument Type TS16 I R1000,  Ser. No. 1
 71, METRES
 81, DMS
 9
101, VASD
1121, A, 1000.000, 1000.000, 100.000, -ST
120
130, Setup coords
140
150, Dt2018-12-13-13:14:16.37
16
172, A, 1000.000, 1000.000, 100.000
18
19
202, B, 1000.000, 1010.038, 99.459
210
220, Setup setOrientation
230, ----------------------
240, Set-on station A, Instrument height 1.585
253, A,,, 1.585
260
270, Atmos (ppm/scale) = 0.00 / 1.000000000
280, EDM Target 1.6000m (0mm) Leica Circ Prism
290, Control obs
305, B, 0.00.000, 93.00.012, 10.050, 1.600, -ST
310, Control obs
325, B, 0.00.008, 93.00.029, 10.052, 1.600, -ST
330, Control obs
345, C, 291.22.082, 89.36.152, 18.286, 1.600, -ST
358, Image, Img_C_181218_092612.JPG
365, 1, 257.22.160, 90.16.231, 20.156, 1.600, K1
375, 2, 265.11.151, 90.27.101, 22.417, 1.600, K1
385, 3, 265.11.151, 90.12.515, 22.489, 1.600, -SO0.000/0.000, KT1, K1
395, 4, 268.24.566, 90.42.199, 25.998, 1.600, CS1, K1
405, 5, 276.36.582, 90.37.380, 25.338, 1.600, CS1, K2
416, Start K2
425, 6, 276.43.461, 90.24.589, 25.340, 1.600, -SO0.000/0.000, KT2, K2
435, 7, 276.43.465, 90.24.590, 25.340, 1.600, PGY, K2
445, 8, 286.28.022, 90.57.047, 18.196, 1.600, ..DK, K3
455, 9, 296.02.258, 91.19.203, 18.595, 1.600, K3
465, 10, 303.20.260, 91.30.390, 19.310, 1.600, K3
476, End K3
485, 11, 281.18.226, 90.17.061, 24.551, 1.600, PD5, PS6
496, Apple
506, 8m
518, Image, Img_0011_181218_092826.JPG
525, 12, 306.44.422, 91.27.492, 20.010, 1.600, B1
536, Start B1
545, 13, 307.15.544, 91.29.551, 19.696, 1.600, B1
555, 14, 307.15.544, 91.29.551, 19.696, 1.600, B2
566, Start B2
575, 15, 310.24.240, 91.31.511, 18.794, 1.600, -RIN, B1
586, -RIN
595, 16, 319.01.130, 91.07.051, 14.586, 1.600, B2
605, 17, 324.15.356, 92.11.479, 13.700, 1.600, B2
615, 18, 327.56.217, 92.22.550, 12.899, 1.600, -NPL, B2
```

CAPTIVATE WORKSHOP SURVE

0D Ln 1 Col 0 Sel 0

A load file can contain either radial observations, coordinate observations or both, which can be opened in HiEditor;

2.4.2 An Explanation of the LSS Load File Format

Radial and coordinate record types

0 = Comment line containing information that will not be processed by LSS, such as the surveyors name, date and time of the survey.

1 = Parameters record containing e.g. survey units and angular settings.

2 = Station coordinate record.

20 = Station coordinate control observation used as a check and commonly encountered with GPS survey equipment to verify a survey station position.

6 = An item of general annotation (normally text entered on an instrument as a comment or note). Such annotation will be shown in the LSS survey centred on the previously surveyed point.

9 = End of file marker. It is not necessary to have one of these at the end of the file.

Radial only record types

3 = An instrument setup record with set-on station, followed by backsight station, backsight angle, instrument height, vertical angle collimation and station scale factor. Some of the fields may be blank as in this load file as LSS will be getting information from lines which follow.

4 = A control observation where the final field is the station name. If there is a 4 record following a setup record, this will provide any missing information in the setup record. This is identical to a '5,' record with a '-ST' code.

5 = A 'detail' record which contains an observation to a surveyed point with the feature code appearing in the last field. Multiple features may be specified and separated by either a comma or a forward slash.
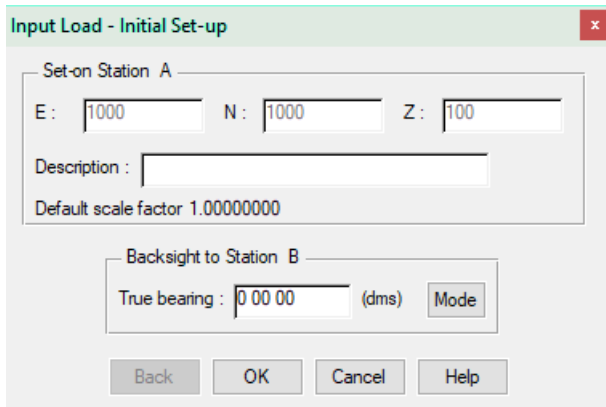
This record type may also be a control observation, where '-ST' is the code, with the station name either following this or being taken from the observation number field.

We may also use the special or Reserved codes, described in detail in the next session.

Coordinate only record types (not shown in this example)

21 = A coordinate record. Instead of collecting radial data it is possible to collect and convert coordinates, e.g. for GPS survey data. These survey data can also use Reserved codes.

If the survey is empty and no station coordinates are provided prior to the first instrument set-up in the Load file, then an Initial Set-up dialog will be presented to verify the station coordinates and orientation.

Click 'OK'.

Otherwise the station coordinates from the Leica instrument are loaded along with the detail.

As the load file is processed so a report is produced showing all relevant information e.g. comments, setups and control observations. Any warnings or errors found in the data set will cause the processing to pause. An error will not allow **Input Load** to complete.

The end of the Input Load Report should appear, with a note

*** Warning(s) issued *** recognising that some warnings had been issued.

Any misclosures that exceed the 'warning' parameter are labelled Large differences, and Load will pause. Likewise for any that exceed the 'error' parameter except that here Load will not complete.

If we scroll back up the following report file, we might find 'Warning : Feature does not exist.' and 'Warning : Large Difference.' Warnings have been generated during the **Input Load** process. Otherwise, click 'Continue' to update DTM and 'OK' to close window.

If a loaded feature is not found in the Legend, then the 'Warning : Feature does not exist.' is created. We will also be prompted to save new feature selections to a CNV file.

For each control observation, the combined 3D measured 'slope distance' is compared with any stored values and tested against the 'Control Tolerance' warning and error values set in 'Survey Parameters'.

Those control observations with 'Warning : Large Difference.' next to them, are where the warning tolerance (0.01m) was exceeded (but not the error tolerance).

Note: The load file header includes the following information as comments;

Coordinate system used (including the geoid and CSCS files used).
Transformation name and type
Projection Scale factor

Note: The processing will also include comments on;
Which detail observations have zero values and have been removed
Whether a station observation is being used as 1d, 2d or 3d.

> 1d stations observations are commented out and not used, unless it is the only one in the set-up, in which case the load file set-up record uses its values as the backsight name and horizontal angle.

2d station observations have their target heights removed so that height differences are not attempted to be reported

Whether a station coordinate is 1d, 2d or 3d.

If a station's xyz coordinates are all zero then it is ignored.

If it is 1d it is reported but not used

If it is 2d it is reported and used.

Note: The set-ups in the load file are annotated with the Set-up type

Note: if an observed station does not exist in the survey, then the **first** observation is used to compute its coordinates – they are not meaned here. Subsequent station 'shots' become 'check' observations'.

Note: if any errors are encountered the load will not be permitted. It will be necessary to review these errors and maybe respecify the error tolerance to allow the load.
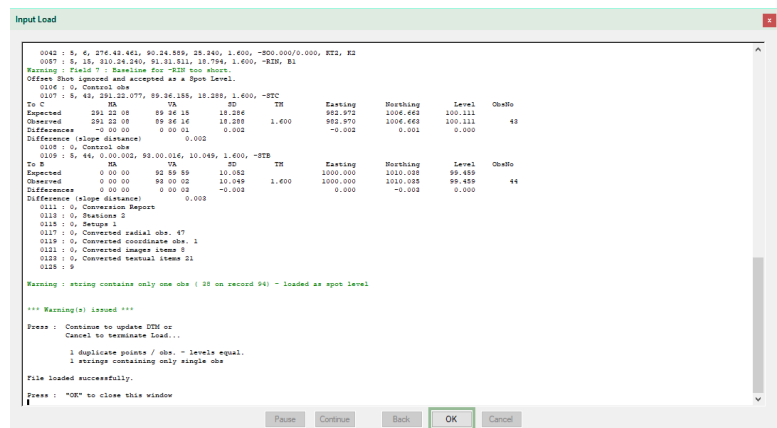
Often errors occur simply because the stations have been incorrectly labelled during the set-ups, or there is one poor observation.

To correct these click 'Back' and then 'Edit' to open up the load file. Some editor programs allow 'CTRL+G' to go to the line directly.
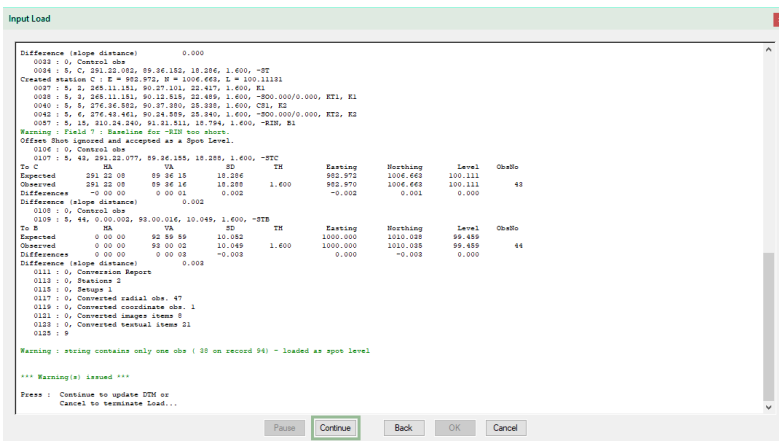
If available, Click 'Continue' at each pause / prompt

'OK' to complete the load.

Chapter 3

3.1 Exporting Data to Survey Instruments

LSS exports data to most types of survey instruments using the same logger configuration as 'Input / Download and Convert'.

3.1.1 Export / Survey Instrument – Survey Data

From the main menu, select 'Export/Upload data to survey instruments'.

Note: The logger parameters can be altered by clicking 'Change' or by using Configure / Hardware & System / logger.

Specify a name for the exported file and click 'Next'. This dialog allows the selection of observation and station data.

The defaults assume that the 'Observations' will be exported using the Selection filter. Click 'Next'.

Note: The observations can have the code added to the point number, which can be related to the SPF chainage.

If chosen the Selection filter dialog will offer the opportunity of multiple observation selection criteria. As soon as there are observations selected then the 'Cancel' button is replaced by 'Finish'. Click 'Finish' once all required data is highlighted.

Note: The data selected by the Selection filter is grouped in the export set first as complete strings and then as individual points related to their loaded order. To export the observations in the order they were located use 'Individual observations' from the previous dialog.
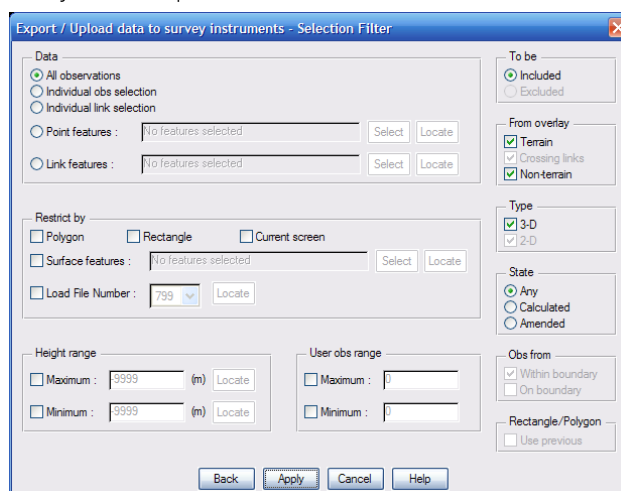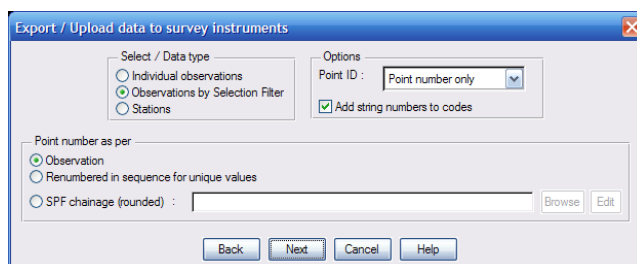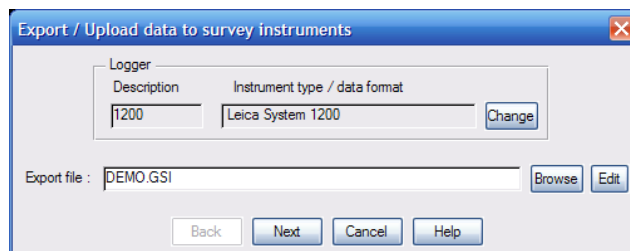
There is the possibility of repeating several selection criteria to the same data set.

**Note:** If required click 'Add more data' and repeat the process.

Note: For a Fix point job file of just stations create a separate GSI file and follow the sequence above selecting Stations. This will export all the stations in the current survey.
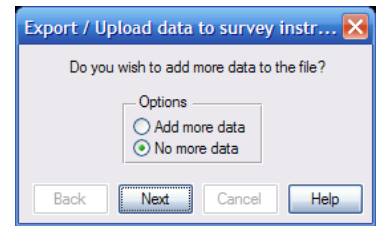
3.1.2 Use Data Exchange Manager to Upload to the Instrument

On the right hand side of the screen, expand the Files folder to reveal your C: drive on your computer. Select the folder where the LSS survey is to see the fixed points GSI file that you have just exported.

Expand the **Jobs** folder and drag and drop the GSI file into the appropriate job folder.
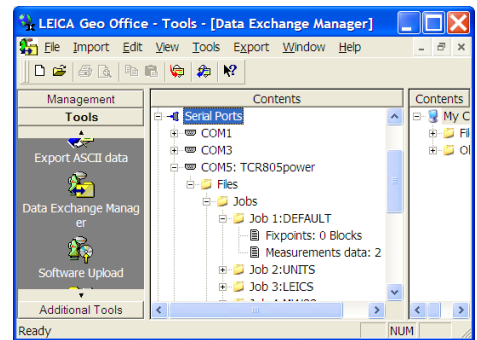
If the Job folder is empty Data Exchange Manager asks for job name and creates a new one of that name.

The data is now ready for use on the instrument for setting-out etc

Note: This upload sequence also applies to the Flexline using Flexoffice

The LSS option 'Export / Upload code list to survey instruments' will produce a Leica code list text file which can be imported to the Leica Code List Manager in Leica GeoOffice or FlexOffice. However, we suggest that for new users the LSS prototype legend (supplied with Testdata on the LSS media) is used as a standard starting point for which there is a pre-built Leica code list available in the 'support_files\leica\Mid-Range\Code' folder of the LSS media. Please refer to the 'Transferring a code list...' in the documentation above that explains how to copy these files onto the device.

As a consequence it is suggested that the Export code list option is best used for sending additional features to the existing Leica code list as they are added to the LSS prototype template. Follow the process below to create a new code list in Leica Geo Office and then cut and paste the new features to the existing code list before placing it back on the instrument.

Use LSS to generate the code list

Within a survey containing the prototype legend use the option' Export / Code list to survey instrument / Leica'.

'Select' the required point features.

Tick the 'Use trailing digits as dimension attributes' under Points if there are dimension items e.g. PT1, PT2, ...,PT20 etc. This will allow LSS to export these as a single feature with a Mandatory integer attribute for a more efficient code list.

Note: It is important in this instance to have an extra feature without the numeric suffix e.g. PT, within the legend so that LSS can convert the items cleanly during the survey processing. This feature must **NOT** be selected here.

'Select' the required link features.

Tick the'Include attributes for string numbers (links only)' under Links if required. This will add a Normal integer attribute, with a default of 0, so that each link feature can have a string number if required for multiple string coding management.
Leave the 'Extra LSS codes' box ticked to create all the Reserved codes as Free codes.

Note: This option will also export the 'String codes' and 'Code words' code groups that contain a mixture of free and point codes for extra functionality. OffsetLR, OffsetFB and OffsetUD are identical to the relevant reserved code offsets and SetupFr, SetupPt and CTLObsRO are for use when not using the instrument set-up and coordinate menus. The primary String codes and Code words are;

       'CTLObsID' – for point coding a control observation for the instrument and LSS simultaneously.
       '.' 'start a new string' and '..' 'start a new string from the previous point'
       'Notes' – for adding general text at an observation
       'Freecode' – for adding multiple codes to one shot only
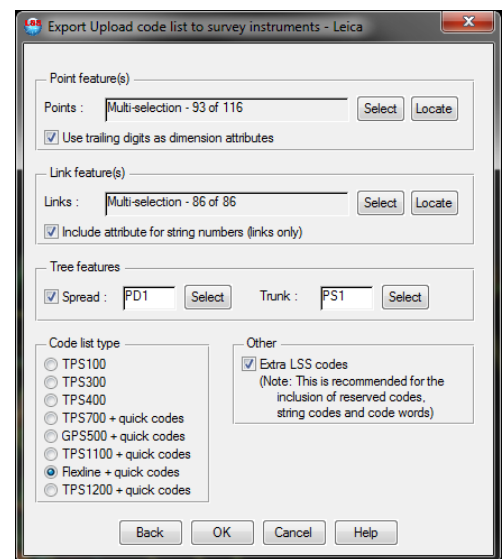
The 'Tree feature' requires two Point features with digit suffixes for dimensions, the first feature represents the spread and the second the trunk e.g. PD1 and PS1.

Note: The features included in this option (including PD2, PD3 etc) must not be included on the Point feature list. The Tree feature has several attributes combined to make it a tree function including adding height and species information as well as the spread and trunk.

Select your instrument type and click 'OK' (If you are using Flexline please refer to the section above called 'Transferring a code list' Note: The CLS file that is exported from this option is also able to be imported directly onto the Flexline as per the directions above..

Provide the filename for the code list and

Click 'OK'.

**Instrument Manual - Interface to Leica Mid-Range**
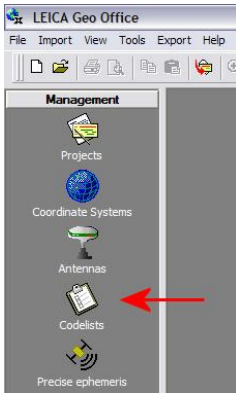
Click on the **Codelists** icon to open the **Codelist Management** screen in *Leica Geo Office* (*LGO*).

Note: If you are using a Flexline instrument the steps are the same except you will be using FlexOffice (identical look and feel) and the code list file type to import will be CLS instead of IDX

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Right click on the mouse in the **Contents** panel, which is displaying the folder with the caption **Codelists**. If this is not present then click on **Codelists** under the **Management** pane.

Select **Register…** option to open the **Register Codelist** panel.
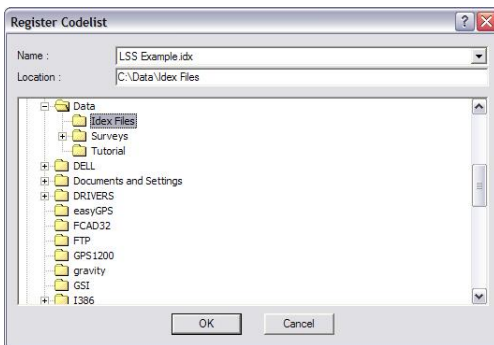
Browse the code list file folder.

The full file name will be displayed in the top line of the panel against the prompt **Name:**

Note: Once an IDX or CLS code list file has been imported its name will appear duplicated on this list but with the Leica standard code list CRF suffix.

Note: click on the drop down arrow to the right of the top line if there is more than one suitable file in this folder.

Once the correct file name is displayed in the top line, click on **OK** to **Register** the code list file
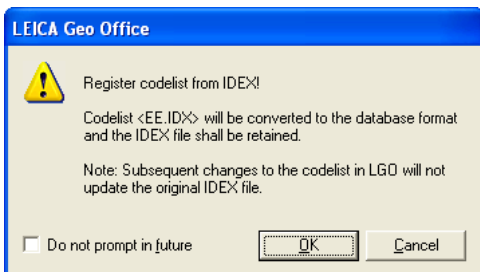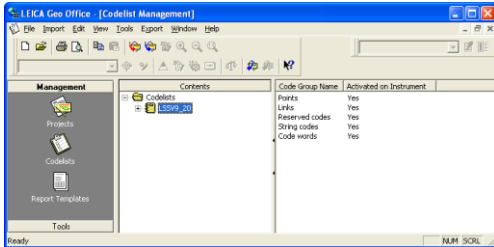
A dialog will appear saying 'Register codelist from IDEX' with a warning that the IDX or CLS file will not maintain the changes in the code list edits.
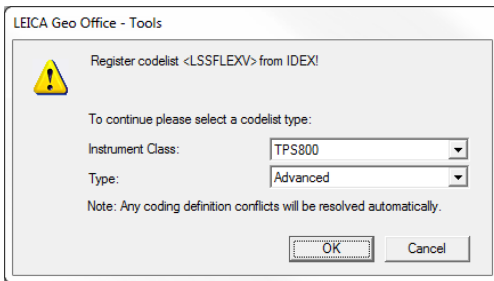
Use the pull-down arrow to the right of the **Instrument Class:** field and select the Instrument Class that the **Codelist** is for e.g. TPS800 or TS02/06/09 (Flexline)

Leave the **Type:** field as **Advanced**.

Click **OK**.

After a few seconds the new Codelist will be displayed under the Codelists folder with the same name as the imported IDX or CLS file. (*If you wish to rename your Codelist, right click on the Codelists file name and select* **Modify...**)

Note: There is a limit to the amount of code list information that can be imported via an IDX or CLS file. If necessary Points, Links and Extra LSS codes can be exported separately and *Cut* and *Paste* in LGO/FlexOffice.
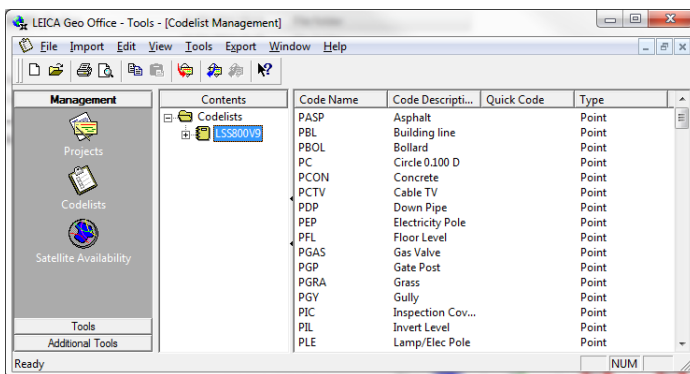
The Codelist can now be edited in the normal way.

Note: Clicking on the + next to the file name will display the **Codes**.

Conclusion

Using this manual, we hope that you will be in a position to start making the most of the survey instrument.

We strive to cover and support as much of the capabilities as possible but there are always new methods and developments, so do keep in contact by visiting the LSS Help and other on-line resources or call our support line.

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