* Input from .xlsx file

|  |  |  |
| --- | --- | --- |
| Column | Measurement | Unit |
| 1 | Right Gap | Volt |
| 2 | Left Gap | Volt |
| 3 | Load | Volt |

|  |  |  |
| --- | --- | --- |
| Column | Conversion equation | Unit |
| 1 | Y=(16+X)\*1000-offset | μm |
| 2 | Y=(16+((X/250\*1000)-4)\*(10/16))\*1000-offset | μm |
| 3 | Y=X\*112.3898+558.30904-offset | N |

\*TDMS file is a special format exported from NI Labview, which can be read by Microsoft Excel with a plug-in program (you can find it on NI official website). I have already helped you convert it into .xlsx file. Their original units are all volts, which should be converted to micron and newton as shown above.

* Other test condition

|  |  |  |
| --- | --- | --- |
| Name | Unit | Value |
| Sampling rate | Hz | 1000 |
| Speed | m/s | 0.5 |

All the data are sampling at 1kHz, and this case’s running speed is 0.5m/s, where one data point corresponds to 0.0005m.

* Lubrication process

For this case, the lubrication happens at around point 1394 and ends at around 1410. You may notice there are some vibrations in the case, including high frequency part and low frequency part. For the extraction of the lubrication process, we’d better to keep the low frequency part. But there is a difference between the beginning and the end of this process. Some simple data processing methods may help us, such as using two boundary points to create a linear function. Capturing the low frequency vibration in the case may be another method. However, sometime these sinusoidal waves change over time. (As the band saw system cannot run very stably all the time)