Subject:	How to read Spirometry Calibration Log? What does it contain?
Distribution:	All Medikro distributors.

Question:

How to read calibration log file content? What information can be found from "SpirometryCalibration.xml"?

Answer:

Medikro Spirometry Software (MSS) records all calibration and/or calibration check actions automatically to a calibration log. Calibration log is in XML-format. XML (Extensible Markup Language) uses a much self-describing syntax and data can be quite easily further processed in many office-productivity tools including Microsoft Office, OpenOffice.org and LibreOffice. As default this log can be found in C:\Medikro\Calibration Log\SpirometryCalibration.xml. Following explains content of Calibration Log.

InspDiff

InspDiff tag indicates the inspiratory difference in % to given volume set in MSS settings. As default this volume is 3000ml. This value is only shown if calibration check is done. For example:

InspDiff="0.001" (0.1%) or
InspDiff="-" (calibration, no calibration check used).

ExpDiff

ExpDiff tag indicates the expiratory difference in % to given volume set in MSS settings. As default this volume is 3000ml. This value is only shown if calibration check is done. For example:

ExpDiff="-0.001" (-0.1%) or
ExpDiff ="-" (calibration, no calibration check used).

CalibCheckInsideLimits

CalibCheckInsideLimits tag indicates if calibration check has been inside or outside of the limit set in MSS settings. Calibration check acceptance limit is as default 3.5. It is written when calibration check (not calibration) is used. For example:

CalibCheckInsideLimits="1" (inside),
CalibCheckInsideLimits="0" (outside) or
CalibCheckInsideLimits="-" (calibration, no calibration check used).

CalibCheckAcceptanceLimit

CalibCheckAcceptanceLimit tag indicates the calibration check acceptance limit set in MSS settings. This value is as default 3.5. It is written when calibration check (not calibration) is used. For example:

CalibCheckAcceptanceLimit="0.035" (+-3.5%) or
CalibCheckAcceptanceLimit="-" (calibration, no calibration check used).

CalibAccepted

CalibAccepted tag indicates if calibration procedure has been accepted by user. For example:

CalibAccepted="1" (accepted),
CalibAccepted="0" (not accepted) or
CalibAccepted="-" (calibration check, no calibration used).

CalibInsideLimits

CalibInsideLimits tag indicates if calibration has been in- or outside of the limit set in MSS settings. This value is as default +-10% (10). It is written when calibration (not calibration check) is used. For example:

CalibInsideLimits="1" (inside),
CalibInsideLimits="0" (outside) or
CalibInsideLimits="-" (calibration check, no calibration used).

CalibAccpetanceLimit

CalibAccpetanceLimit tag indicates the calibration accpetance limit set in MSS settings. This value is as default 10 (+-10%). It is written when calibration (not calibration check) is used. For example:

CalibAccpetanceLimit="0.10" (10%) or
CalibAccpetanceLimit="-" (calibration check).

LinearizationFile

LinearizationFile tag indicates used linearization file name or used calibration code. Calibration code is string of letters and numbers. For example:

LinearizationFile="M9242, lot 1485.cfg" (linearization file used) or
LinearizationFile="Q4QV9Q7" (calibration code used).

Humidity

Humidity tag indicates the ambient relative humidity of the operating environment recorded and entered into the programme or measured by built-in ambient unit or a separate ambient condition measurement unit. Unit is %RH. For example:

Humidity="23.2" (23.2 %RH).

Pressure_hPa

Pressure_hPa tag indicates the ambient atmospheric pressure of the operating environment recorded and entered into the programme or measured by built-in ambient unit or a separate ambient condition measurement unit. Unit is hectopascal (hPa). For example:

Pressure_hPa="978.6" (978.6 hPa).

Temperature_degF

Temperature_degF tag indicates the ambient room temperature of the operating environment recorded and entered into the programme or measured by built-in ambient unit or a separate ambient condition measurement unit. Unit is Fahrenheit. Symbol is °F. For example:

Temperature_degF="70.5" (70.5 °F).

Temperature

Temperature tag indicates the ambient room temperature of the operating environment recorded and entered into the programme or measured by built-in ambient unit or a separate ambient condition measurement unit. Unit is Celsius (centigrade). Symbol is °C. For example:

Temperature="21.4" (21.4 °C).

Ibtps

Ibtps tag indicates inspiratory btps correction factor. Ibtps is generated according the entered or measured ambient condition parameters. For example:

Ibtps="1.1182".

Ebtps

Ebtps tag indicates expiratory btps correction factor. Ebtps is always 1.

Ebtps="1".

ZeroLevel

ZeroLevel tag indicates spirometer pressure sensor adjusted zero level. It gives information about the condition of the measurement device. Acceptance criteria in device final testing is 10240 ± 250 (max 10490 and min 9990). The outside of the limits value may indicate a malfunction in measurement sensor (e.g. device has been dropped to floor or someone has blown directly to pressure tube). For example:

ZeroLevel="10231.72" (ok),
ZeroLevel="2031.52" (not ok) or
ZeroLevel="18231.18" (not ok).

Igain

Igain tag indicates calculated spirometer system gain factor for inspiratory signal after calibration procedure. For example:

Igain="0.9963" (calibration used)
If only calibration check is used, Igain value is always 1.0.

Egain

Egain tag indicates calculated spirometer system gain factor for expiratory signal after calibration procedure. For example:

Egain="1.0077" (calibration used)
If only calibration check is used, Egain value is always 1.0.

Operator

Operator tag indicates the operator identification entered at the Log On phase of the programme. For example:

Operator="Lisa" (Lisa).

Spirometer_SN

Spirometer_SN tag indicates the serial number of the spirometer device. For example:

Spirometer_SN="M9488XXXXXXXX" (Medikro Pro spirometer) or
Spirometer_SN="M9487XXXXXXXX" (Medikro Nano spirometer).

ExternalAmbientUnit_SN

ExternalAmbientUnit_SN tag indicates the serial number of the external ambient unit. For example:

ExternalAmbientUnit_SN="none" (no external ambi unit connected or search of external ambi unit disabled), or
ExternalAmbientUnit_SN="M9489XXXXXXXX" (Medikro Ambi device connected, serialnumber M9489XXXXXXXX).

AmbientFactors

AmbientFactors tag indicates source of the ambient factors. They can be manually entered or read from the Medikro Pro or Medikro Ambi. For example:

AmbientFactors="set manually by user" (no external ambi unit nor Medikro Pro connected or search of external ambi unit disabled, values set manually by user to MSS settings),
AmbientFactors="from M9488XXXXXXXX" (ambient factors from Medikro Pro device, serialnumber M9488XXXXXXXX) or
AmbientFactors ="M9489XXXXXXXX" (ambient factors from Medikro Ambi device, serialnumber M9489XXXXXXXX).

Time

Time tag indicates date and time of the end of calibration or calibration check procedure. Date is in big-endian all-numeric date notation format yyyy(year)-mm(month)-dd(day). A time of day is written in the 24-hour notation format hh(hours):mm(minutes):ss(seconds). For example:

Time="2016-01-27 08:29:29" (27th of January, 2016. 8:29:29 AM).

How to import Calibration Log XML data to MS Excel?

Following describes as a sample how to import XML data like Calibration Log to Microsoft Excel 2013.

1. Open empty MS Excel worksheet.

2. Open "Data" tab and "Get external data" select "From Other Sources" and "From XML Data Import".
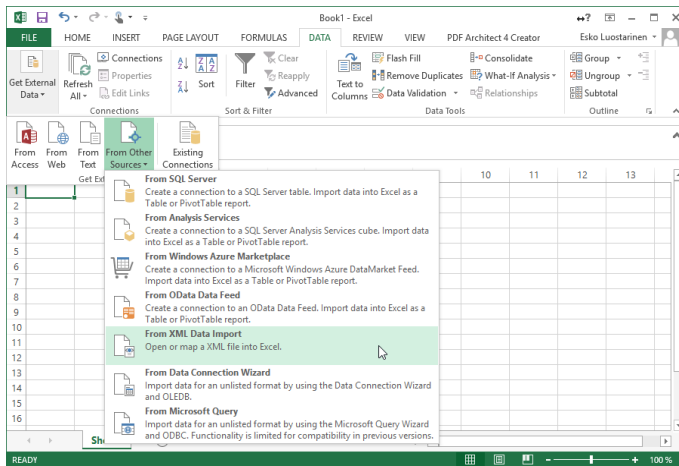

Figure 1.   Get external data from XML data Import.

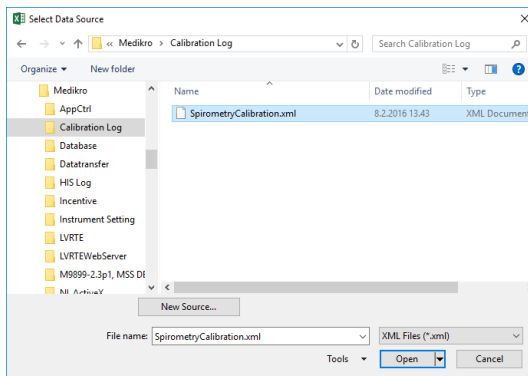3. Select Data source. As default this log can be found in C:\Medikro\Calibration Log\SpirometryCalibration.xml.

Figure 2.   Selecting Calibration Log as data source.
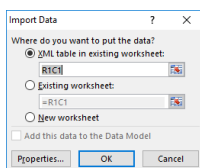
4. Import data to empty sheet.

Figure 3.   Importing Calibration Log to sheet.

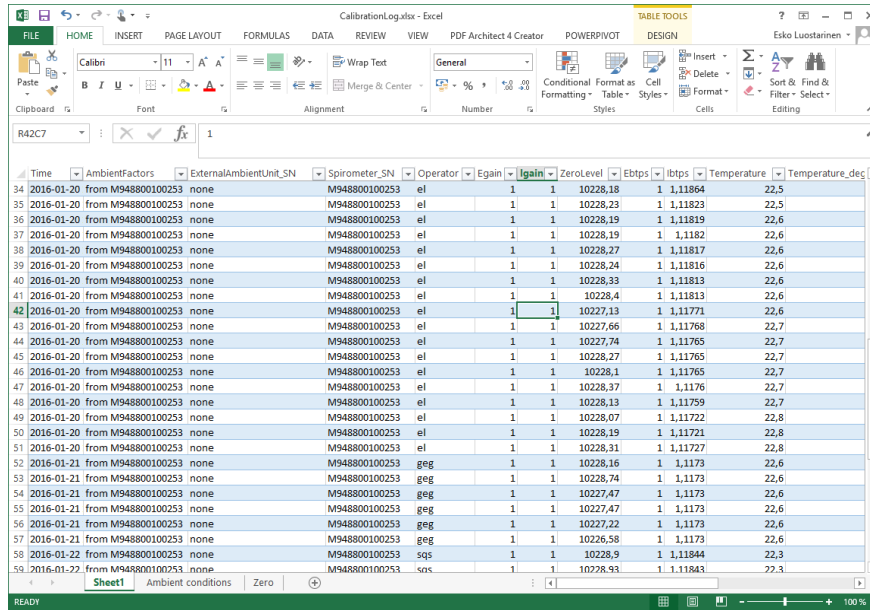5. Now XML data is visible in MS Excel sheet. Data can be sorted and calculated in different ways.

Figure 4.   XML data is visible in MS Excel sheet.

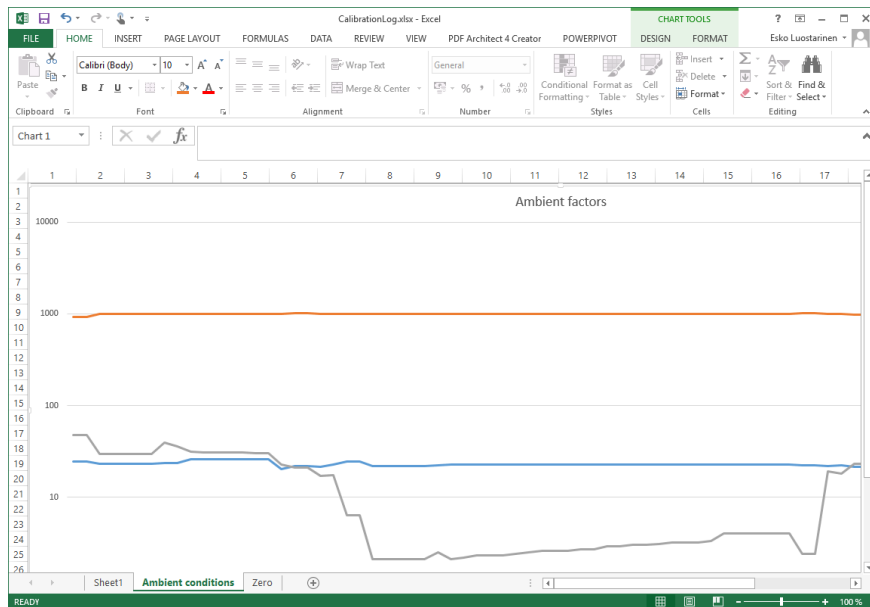6. Data can be further processed for example to graphs.

Figure 5.   Further processed data.

For more information please contact Medikro technical support:

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