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# Activities for integrating additional devices

## Basic support

Devices with fixed measurements are supported without any activity.

## Label Tooltips

* Add <label> to the device.XML
* Add labels to devicexmlresources.properties

## Outlier elimination

Add <Channels> properties 'outlier\_sigma' and 'outlier\_range\_factor' to the device.XML

## Scores

* Extend the device.XML (examples: HoTTAdapter.xml, UltraTrioPlus14.xml)

## Settlements based on Transitions

* Extend the device.XML (examples: HoTTAdapter.xml, UltraTrioPlus14.xml)

## Sampling

### Prerequisite

* The device must implement IHistoDevice

### Check if sampling is helpful

* Device.xmls with <TimeBase><TimeStep> '-1' oder values less than 1000 will show a significant sampling benefit.
* In case of device.xml entries with peak transitions the system overrides the user's setting for the sampling period. It sets the sampling period to a minimum value which guarantees two sample items in the peak threshold period (ref. to Samples.createSamples).  
  The result is that channels with peak transitions will show a moderate benefit from sampling.

### Implement OSD sampling

* Enhance the Device.java class method 'addDataBufferAsRawDataPoints' (rf. to HoTTAdapter)

### Implement Import sampling

* Proceed according to the HoTTbinReaders

# Device.xml

## Options for Device.xml harmonization

Wenn man sich das oben ansieht, dann sind die Histo-bezogenen Anteile recht verteilt in den Device.xmls.

### Settlements

Nun hat auch nicht jeder Lader-Kanal die Möglichkeit der Ri-Messung, denn viele Lader haben keine Stromeinbrüche zur Ri-Messung. Settlements müssen also gezielt gestreut werden.

Es wird heute über die Ordinals zu den Measurements verknüpft. Bei separaten Settlement-XMLs kann das eventuell umstellen und die sprachneutralen Measurement Names referenzieren.

Weiter stellt sich die Frage nach der Skalen-Synchronisation zwischen Measurements und Settlements.

### Scores

Scores kann man überall bei Ladern einfügen.

### Technical issues

Sollen die XMLs zusammengeführt werden?

Stichworte "Document Entities" oder "XInclude"

## Device xmls deletions (03.05.2017)

### Scoregroups for additional channels

<Scoregroup scoregroupId=*"0"*>

<name>Dauer</name>

<symbol></symbol>

<unit>h</unit>

<active>true</active>

<score label=*"duration\_mm"* value=*"Gesamt"* type=*"String"* description=*"Zeitdauer"*/>

<property name=*"factor"* value=*"0.01666667"* type=*"Double"* description=*"interne Darstellung in Minuten"*/>

<property name=*"histo\_top\_placement"* value=*"true"* type=*"Boolean"*/>

<label>Zeitdauer der Log-Aufzeichnung</label>

</Scoregroup>

<Scoregroup scoregroupId=*"1"*>

<name>Zählerwerte</name>

<symbol></symbol>

<unit>Tsd</unit>

<active>false</active>

<score label=*"totalReadings"* value=*"Anzahl gelesene Werte"* type=*"String"* description=*"Anzahl gelesene Werte"*/>

<score label=*"sampledReadings"* value=*"Anzahl Stichprobe"* type=*"String"* description=*"Anzahl Stichprobe"*/>

<label>Anzahl von Messwerten</label>

</Scoregroup>

<Scoregroup scoregroupId=*"2"*>

<name>Versionen</name>

<symbol></symbol>

<unit></unit>

<active>false</active>

<score label=*"logDataVersion"* value=*"Gerät"* type=*"String"*/>

<score label=*"logDataExplorerVersion"* value=*"DataExplorer"* type=*"String"*/>

<score label=*"logFileVersion"* value=*"Log-Datei"* type=*"String"*/>

<label>Versionen der Aufzeichnungs- und Auswertesoftware</label>

</Scoregroup>

<Scoregroup scoregroupId=*"3"*>

<name>Datenmenge</name>

<symbol></symbol>

<unit>kiB</unit>

<active>false</active>

<score label=*"logRecordSetBytes"* value=*"Datensatzgröße"* type=*"String"*/>

<score label=*"logFileBytes"* value=*"Dateigröße"* type=*"String"*/>

<property name=*"factor"* value=*"0.9765625"* type=*"Double"* description=*"kiB conversion factor = 1000 / 1024"*/>

<label>Größe der Log-Aufzeichnung</label>

</Scoregroup>

<Scoregroup scoregroupId=*"4"*>

<name>Laufzeiten</name>

<symbol></symbol>

<unit>ms</unit>

<active>false</active>

<score label=*"elapsedHistoRecordSet\_ms"* value=*"Datensatz lesen"* type=*"String"*/>

<label>Rechnerlaufzeit bei der Auswertung der Log-Aufzeichnung</label>

</Scoregroup>

### Full set of settlements for HoTTAdapter

<Settlement settlementId="0">

<name>R\_i Peak deltaFactor Strom-</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="0" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="1">

<name>R\_i Peak deltaFactor Strom+</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="1" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="2">

<name>R\_i Peak Delta-Faktor Strom- Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_step\_sec" comment="Zeitpunkt der Messung des Stromeinbruchs"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="3">

<name>R\_i Peak Delta-Faktor Strom+ Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="1" figureType="time\_step\_sec" comment="Zeitpunkt der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="23" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="4">

<name>R\_i Peak deltaFactor Strom- Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_sum\_sec" comment="Dauer der Messung des Stromeinbruchs"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Darstellung als Sekunden"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="5">

<name>R\_i Peak deltaFactor Strom+ Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="1" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Darstellung als Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="25" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="6">

<name>R\_i Peak deltaFactor Strom- Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_sum\_sec" comment="Anzahl von Messungen von Stromeinbrüchen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="7">

<name>R\_i Peak deltaFactor Strom+ Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="1" figureType="time\_sum\_sec" comment="Anzahl von Messungen von Stromspitzen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="27" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="8">

<name>engineClimb</name>

<symbol>h</symbol>

<unit>m</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="2" calculusType="delta" unsigned="false" referenceGroupId="13" leveling="minmax" referenceGroupIdDivisor="1" deltaBasis="bothAvg" comment="Höhe aufsummieren"/>

</evaluation>

</Settlement>

<Settlement settlementId="9">

<name>Kapazität pro Höhenmeter</name>

<symbol>vh</symbol>

<unit>mAh/m</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="2" calculusType="ratio" unsigned="false" referenceGroupId="3" leveling="minmax" referenceGroupIdDivisor="13" divisorLeveling="minmax" deltaBasis="bothAvg" comment="delta Kapazität / delta Höhe"/>

</evaluation>

</Settlement>

<Settlement settlementId="10">

<name>R\_i Pulse deltaFactor Strom-</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="3" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage pulse value by the current pulse value. Determine the pulse value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="11">

<name>R\_i Pulse deltaFactor Strom+</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="4" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage pulse value by the current pulse value. Determine the pulse value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="12">

<name>R\_i Slope deltaFactor Strom-</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="6" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage slope delta value by the current slope delta value. Determine the slope delta value by comparing the smoothed threshold extremum value with the smoothed reference values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="13">

<name>R\_i Slope deltaFactor Strom+</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="7" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage slope delta value by the current slope delta value. Determine the slope delta value by comparing the smoothed threshold extremum value with the smoothed reference values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="14">

<name>R\_i Slope deltaFactor Strom- Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_sum\_sec" comment="Anzahl von Messungen von Stromeinbrüchen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="27" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="15">

<name>R\_i Slope deltaFactor Strom+ Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="7" figureType="time\_sum\_sec" comment="Anzahl von Messungen von Stromanstiegen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="27" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="16">

<name>R\_i</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="1" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference value (and recovery extremum value in case of peaks and pulses)."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="17">

<name>R\_i Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_step\_sec" comment="Startzeitpunkt der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="23" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="false">

<exposed trail="count"/>

<disclosed trail="q2"/>

</trailDisplay>

</Settlement>

<Settlement settlementId="18">

<name>R\_i Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_sum\_sec" comment="Dauer der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Darstellung als Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="25" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="q2"/>

</Settlement>

<Settlement settlementId="19">

<name>R\_i Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_sum\_sec" comment="Anzahl von Messungen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="27" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="20">

<name>R\_i Zelle 1</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="6" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="21">

<name>R\_i Zelle 2</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="7" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="22">

<name>R\_i Zelle 3</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="8" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="23">

<name>R\_i Zelle 4</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="9" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="24">

<name>R\_i Zelle 5</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="10" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="25">

<name>R\_i Zelle 6</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="11" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="26">

<name>R\_i Zellen</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="200" leveling="smooth\_minmax" referenceGroupIdDivisor="2" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="based on slope and peak transitions - this delivers the best results"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="21" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="27">

<name>R\_i Strom-Messwert</name>

<symbol>I</symbol>

<unit>A</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="delta" unsigned="false" referenceGroupId="2" leveling="smooth\_minmax" referenceGroupIdDivisor="1" deltaBasis="bothAvg" comment="Current delta value used for Ri calculation. Minmax leveling is based on a minimum quantile; the delta value takes an average value from the reference and recovery levels and subtracts the threshold level value. For test only."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Wert entspricht somit Ampere"/>

<property name="scale\_sync\_ref\_ordinal" value="2" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="28">

<name>R\_i relativer Strom-Messwert</name>

<symbol></symbol>

<unit>%</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="relative\_delta\_percent" unsigned="false" referenceGroupId="2" leveling="smooth\_minmax" referenceGroupIdDivisor="1" deltaBasis="bothAvg" comment="A value close to 100% gives the best accuracy for Ri calculation. For test only"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient holds the current delta value devided by the current spread (= I\_max minus I\_min)"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

### Full set of settlements for UltraTrioPlus14

<Settlement settlementId="0">

<name>R\_i Peak Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="0" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="1">

<name>R\_i Peak Delta-Faktor Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_step\_sec" comment="Zeitpunkt der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="2">

<name>R\_i Peak Delta-Faktor Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Darstellung als Sekunden"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="3">

<name>R\_i Peak Delta-Faktor Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_step\_sec" comment="Wert wird nur als Grundlage für das Zählen benötigt"/>

</evaluation>

<property name="factor" value="1" type="Double"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="4">

<name>R\_i Peak Delta-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="1" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="5">

<name>R\_i Peak Trigger-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="2" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="6">

<name>R\_i Puls Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="3" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="7">

<name>R\_i Puls Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="3" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Umrechnung auf Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="14" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="8">

<name>R\_i Puls Delta-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="4" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="9">

<name>R\_i Puls Trigger-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="5" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="10">

<name>R\_i Slope Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="6" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="11">

<name>R\_i Slope Delta-Faktor Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_step\_sec" comment="Zeitpunkt der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="14" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="12">

<name>R\_i Slope Delta-Faktor Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Umrechnung auf Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="15" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="13">

<name>R\_i Slope Delta-Faktor Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_step\_sec" comment="Wert wird nur als Grundlage für das Zählen benötigt"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="16" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="14">

<name>R\_i Slope Delta-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="7" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="15">

<name>R\_i Slope Trigger-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="8" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="16">

<name>R\_i Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="17">

<name>R\_i Delta-Faktor Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_step\_sec" comment="Zeitpunkt der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="14" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="18">

<name>R\_i Delta-Faktor Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_sum\_sec" comment="Dauer der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Umrechnung auf Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="15" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="19">

<name>R\_i Delta-Faktor Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_step\_sec" comment="Anzahl von Messungen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="16" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

## Device xmls deletions (31.05.2017)

### Full set of settlements for UltraDuoPlus60

<Settlements>

<Settlement settlementId="0">

<name>R\_i Peak Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="0" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="1">

<name>R\_i Peak Delta-Faktor Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_step\_sec" comment="Zeitpunkt der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="2">

<name>R\_i Peak Delta-Faktor Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Darstellung als Sekunden"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="3">

<name>R\_i Peak Delta-Faktor Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="0" figureType="time\_step\_sec" comment="Wert wird nur als Grundlage für das Zählen benötigt"/>

</evaluation>

<property name="factor" value="1" type="Double"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="4">

<name>R\_i Zelle 1</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="8" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="5">

<name>R\_i Zelle 2</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="9" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="6">

<name>R\_i Zelle 3</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="10" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="7">

<name>R\_i Zelle 4</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="11" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="8">

<name>R\_i Zelle 5</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="12" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="9">

<name>R\_i Zelle 6</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="14" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="Voltage delta devided by current delta, based on the smoothed reference ad recovery levels average"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="10">

<name>R\_i Slope Delta-Faktor</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="6" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="Divide the voltage peak value by the current peak value. Determine the peak value by comparing the smoothed threshold extremum value with the smoothed reference and recovery extremum values."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="11">

<name>R\_i Slope Delta-Faktor Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_step\_sec" comment="Zeitpunkt der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="14" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="12">

<name>R\_i Slope Delta-Faktor Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_sum\_sec" comment="Dauer der Messung der Stromspitze"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Umrechnung auf Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="15" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="13">

<name>R\_i Slope Delta-Faktor Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="6" figureType="time\_step\_sec" comment="Wert wird nur als Grundlage für das Zählen benötigt"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="16" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="14">

<name>R\_i Slope Delta-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="7" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="For test only."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="15">

<name>R\_i Slope Trigger-Festwert</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="8" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="reference" comment="For test only."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="16">

<name>R\_i</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="0" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="based on slope and peak transitions - this delivers the best results for logs without cell voltages"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="17">

<name>R\_i Messzeitpunkt</name>

<symbol>t</symbol>

<unit>min</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_step\_sec" comment="Zeitpunkt der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="0.01666667" type="Double" description="Umrechnung auf Minuten"/>

<property name="scale\_sync\_ref\_ordinal" value="14" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="18">

<name>R\_i Messdauer</name>

<symbol>t\_r</symbol>

<unit>sec</unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_sum\_sec" comment="Dauer der Messung des Schwellwertes"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Umrechnung auf Sekunden"/>

<property name="scale\_sync\_ref\_ordinal" value="15" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="19">

<name>R\_i Messungen</name>

<symbol>Anzahl</symbol>

<unit></unit>

<active>true</active>

<evaluation>

<transitionFigure transitionGroupId="100" figureType="time\_step\_sec" comment="Anzahl von Messungen"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Keine Umrechnung"/>

<property name="scale\_sync\_ref\_ordinal" value="16" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="true" defaultTrail="count"/>

</Settlement>

<Settlement settlementId="20">

<name>R\_i Zellen</name>

<symbol>Ri</symbol>

<unit>mOhm</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="ratio\_permille" unsigned="true" referenceGroupId="200" leveling="smooth\_minmax" referenceGroupIdDivisor="1" divisorLeveling="smooth\_minmax" deltaBasis="bothAvg" comment="based on slope and peak transitions - this delivers the best results"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient wird in Promille geliefert und entspricht somit milliOhm"/>

<property name="scale\_sync\_ref\_ordinal" value="13" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="21">

<name>R\_i Strom-Messwert</name>

<symbol>I</symbol>

<unit>A</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="delta" unsigned="false" referenceGroupId="1" leveling="smooth\_minmax" deltaBasis="bothAvg" comment="Current delta value used for Ri calculation. Minmax leveling is based on a minimum quantile; the delta value takes an average value from the reference and recovery levels and subtracts the threshold level value. For test only."/>

</evaluation>

<property name="factor" value="1" type="Double" description="Wert entspricht somit Ampere"/>

<property name="scale\_sync\_ref\_ordinal" value="1" type="Integer"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

</Settlement>

<Settlement settlementId="22">

<name>R\_i relativer Strom-Messwert</name>

<symbol></symbol>

<unit>%</unit>

<active>true</active>

<evaluation>

<transitionCalculus transitionGroupId="100" calculusType="relative\_delta\_percent" unsigned="false" referenceGroupId="1" leveling="smooth\_minmax" deltaBasis="bothAvg" comment="A value close to 100% gives the best accuracy for Ri calculation. For test only"/>

</evaluation>

<property name="factor" value="1" type="Double" description="Quotient holds the current delta value devided by the current spread (= I\_max minus I\_min)"/>

<property name="histo\_top\_placement" value="true" type="Boolean"/>

<trailDisplay discloseAll="false">

<exposed trail="real\_max"/>

<disclosed trail="q2"/>

</trailDisplay>

</Settlement>

</Settlements>

<ReferenceGroups>

<ReferenceGroup referenceGroupId="0" referenceRule="sum" comment="voltage">

<MeasurementMapping measurementOrdinal="0"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="1" referenceRule="sum" comment="current">

<MeasurementMapping measurementOrdinal="1"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="8" referenceRule="sum" comment="voltage 1">

<MeasurementMapping measurementOrdinal="8"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="200" referenceRule="sum" comment="voltage sum cell 1 to 7">

<MeasurementMapping measurementOrdinal="8"/>

<MeasurementMapping measurementOrdinal="9"/>

<MeasurementMapping measurementOrdinal="10"/>

<MeasurementMapping measurementOrdinal="11"/>

<MeasurementMapping measurementOrdinal="12"/>

<MeasurementMapping measurementOrdinal="13"/>

<MeasurementMapping measurementOrdinal="14"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="9" referenceRule="sum" comment="voltage 2">

<MeasurementMapping measurementOrdinal="9"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="10" referenceRule="sum" comment="voltage 3">

<MeasurementMapping measurementOrdinal="10"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="11" referenceRule="sum" comment="voltage 4">

<MeasurementMapping measurementOrdinal="11"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="12" referenceRule="sum" comment="voltage 5">

<MeasurementMapping measurementOrdinal="12"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="13" referenceRule="sum" comment="voltage 6">

<MeasurementMapping measurementOrdinal="13"/>

</ReferenceGroup>

<ReferenceGroup referenceGroupId="14" referenceRule="sum" comment="voltage 7">

<MeasurementMapping measurementOrdinal="14"/>

</ReferenceGroup>

</ReferenceGroups>

<TransitionGroups>

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<TransitionGroup transitionGroupId="2" comment="for test only">

<TransitionMapping transitionId="2"/>

</TransitionGroup>

<TransitionGroup transitionGroupId="3">

<TransitionMapping transitionId="3"/>

</TransitionGroup>

<TransitionGroup transitionGroupId="4" comment="for test only">

<TransitionMapping transitionId="4"/>

</TransitionGroup>

<TransitionGroup transitionGroupId="100" comment="R\_i transitions based on current values">

<TransitionMapping transitionId="0"/>

<TransitionMapping transitionId="3"/>

<TransitionMapping transitionId="6"/>

</TransitionGroup>

<TransitionGroup transitionGroupId="5" comment="for test only">

<TransitionMapping transitionId="5"/>

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<TransitionGroup transitionGroupId="7" comment="for test only">

<TransitionMapping transitionId="7"/>

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<TransitionGroup transitionGroupId="8" comment="for test only">

<TransitionMapping transitionId="8"/>

</TransitionGroup>

</TransitionGroups>

<Transitions>

<Transition transitionId="0" refOrdinal="1" classType="peak" valueType="deltaFactor" thresholdValue="-0.9" recoveryValue="-0.1" referenceTimeMsec="5000" thresholdTimeMsec="7000" peakMinimumTimeMsec="2000" recoveryTimeMsec="5000" comment="Stromeinbruch auf wenigstens ein Zehntel mit Wiederanstieg auf mindestens 90%; Dauer höchstens 7 Sekunden"/>

<Transition transitionId="1" refOrdinal="1" classType="peak" valueType="deltaValue" thresholdValue="-0.1" recoveryValue="-0.01" referenceTimeMsec="5000" thresholdTimeMsec="7000" peakMinimumTimeMsec="2000" recoveryTimeMsec="5000" comment="Nur zur Illustration: Stromeinbruch UM mindestens 100 mA mit Wiederanstieg um mindestens 90 mA; Dauer höchstens 7 Sekunden"/>

<Transition transitionId="2" refOrdinal="1" classType="peak" valueType="lowerThreshold" thresholdValue="0.15" recoveryValue="0.19" referenceTimeMsec="5000" thresholdTimeMsec="7000" peakMinimumTimeMsec="2000" recoveryTimeMsec="5000" comment="Nur zur Illustration: Stromeinbruch AUF wenigstens 100 mA mit Wiederanstieg auf mindestens 190 mA; Dauer höchstens 7 Sekunden"/>

<Transition transitionId="3" refOrdinal="1" classType="pulse" valueType="deltaFactor" thresholdValue="-0.9" recoveryValue="-0.1" referenceTimeMsec="5000" thresholdTimeMsec="3000" recoveryTimeMsec="5000" comment="Stromeinbruch auf wenigstens ein Zehntel mit Wiederanstieg auf mindestens 90%; Pulsdauer mindestens 3 Sekunden"/>

<Transition transitionId="4" refOrdinal="1" classType="pulse" valueType="deltaValue" thresholdValue="-0.3" recoveryValue="-0.2" referenceTimeMsec="5000" thresholdTimeMsec="3000" recoveryTimeMsec="5000" comment="Nur zur Illustration: Stromeinbruch UM mindestens 300 mA mit Wiederanstieg um mindestens 100 mA; Pulsdauer mindestens 3 Sekunden"/>

<Transition transitionId="5" refOrdinal="1" classType="pulse" valueType="lowerThreshold" thresholdValue="0.1" recoveryValue="0.16" referenceTimeMsec="5000" thresholdTimeMsec="3000" recoveryTimeMsec="5000" comment="Nur zur Illustration: Stromeinbruch AUF wenigstens 100 mA mit Wiederanstieg auf mindestens 160 mA; Pulsdauer mindestens 3 Sekunden"/>

<Transition transitionId="6" refOrdinal="1" classType="slope" valueType="deltaFactor" thresholdValue="-0.9" referenceTimeMsec="5000" thresholdTimeMsec="3000" comment="Stromeinbruch auf wenigstens ein Zehntel; Einbruchdauer mindestens 3 Sekunden"/>

<Transition transitionId="7" refOrdinal="1" classType="slope" valueType="deltaValue" thresholdValue="-0.1" referenceTimeMsec="5000" thresholdTimeMsec="3000" comment="Nur zur Illustration: Stromeinbruch UM mindestens 100 mA; Einbruchdauer mindestens 3 Sekunden"/>

<Transition transitionId="8" refOrdinal="1" classType="slope" valueType="lowerThreshold" thresholdValue="0.15" referenceTimeMsec="5000" thresholdTimeMsec="3000" comment="Nur zur Illustration: Stromeinbruch AUF wenigstens 150 mA; Einbruchdauer mindestens 3 Sekunden"/>

</Transitions>