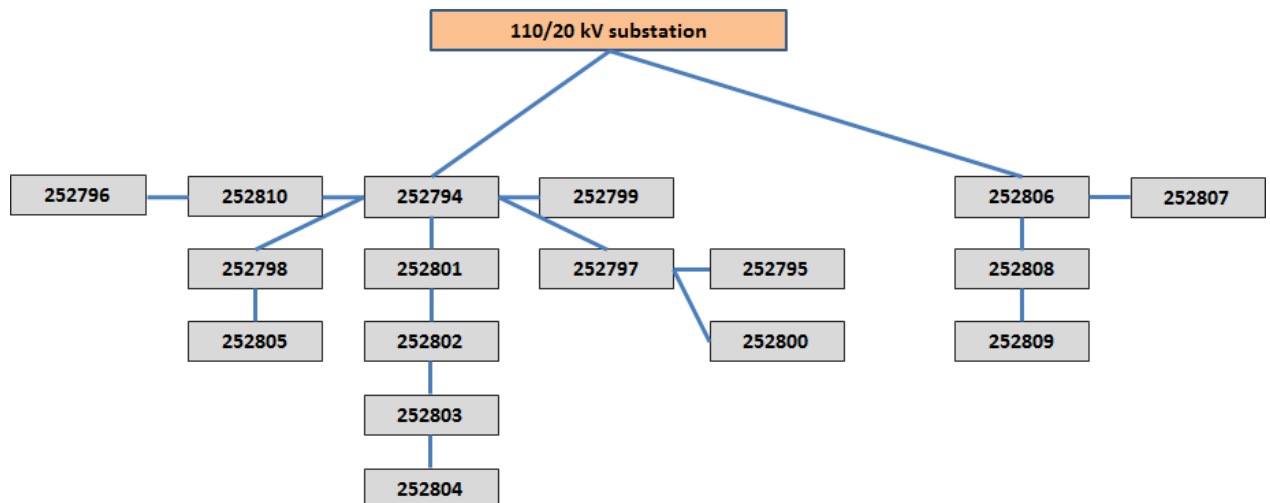
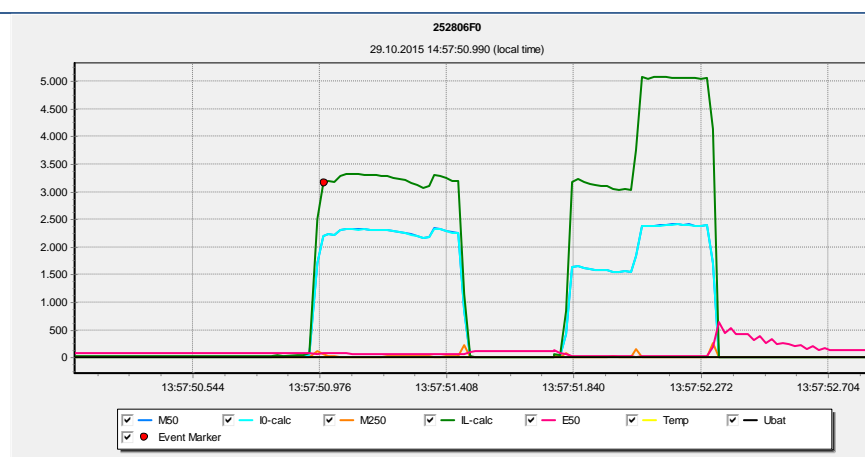


## Disturbance diagrams captured by Sipronika LOK 200

**Devices: Sipronika LOK 200**
**Location: xxx**

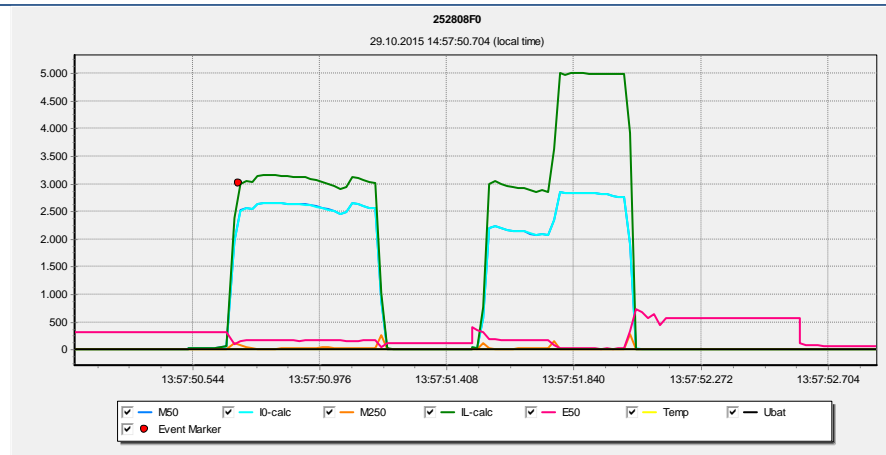
Legend of curves:

- E50 - Electric field: the resultant of MV line voltage, affected by geometrical line conductor's asymmetry and presence of  $U_0$ , used as input data for Earth-fault detection algorithm;
- M50 - Magnetic field, base frequency 50 Hz: the resultant of MV line current, affected by geometrical line conductor's asymmetry and presence of  $I_0$ , used as input data for earth-fault and short-circuit detection algorithm;
- I0-calc – Calculated/estimated residual current  $I_0$ , used as input data for Earth-fault detection algorithm;
- M250 - Magnetic field, harmonic frequency 250 Hz: the resultant of MV line current (250 Hz), affected by geometrical line conductor's asymmetry and presence of  $I_0$ ;
- IL-calc - Line current: calculated/estimated line current, used as input data for short-circuit detection algorithm;
- Ubat - Battery voltage;
- Temp - Device's temperature;
- Chart time note: on the x axis is UTC time, time on the top of the chart is CET (Ljubljana, Vienna, ..., as the chart was generated on our local computer in Ljubljana). Finnish time is UTC+2 (winter).


**Indicator: 252806F0**


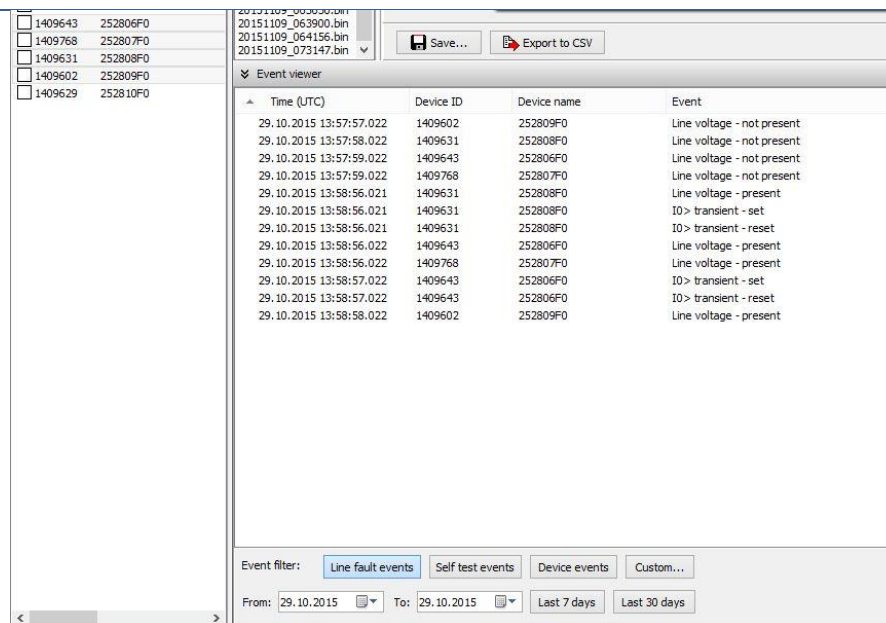
1. Phase-to-phase short circuit behind indicator
2. At the end of the fault can be seen the rise of E50 (red curve) presence of residual voltage  $U_0$
3. After 60 s was successful automatic reclosing (not on this chart). The device correctly detected Transient fault type.

### Indicator: 252808F0



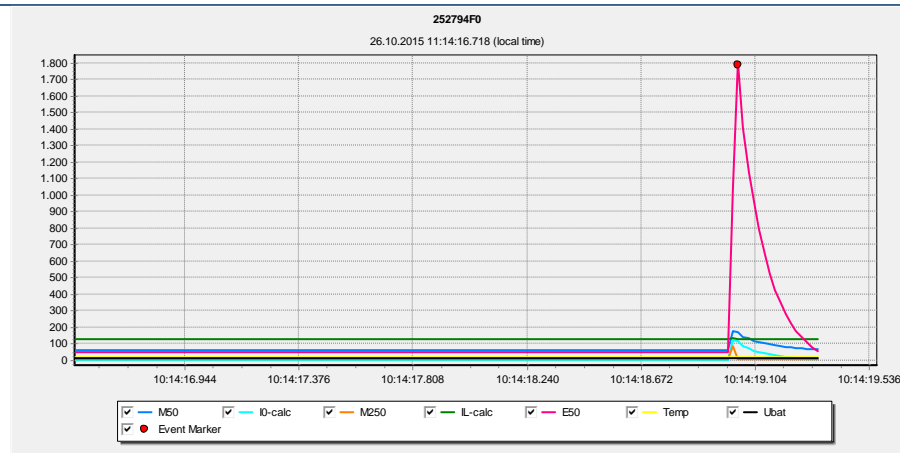
1. Phase-to-phase short circuit behind indicator
2. At the end of the fault can be seen the rise of E50 (red curve) presence of residual voltage U0
3. After 60 s was successful automatic reclosing (not on this chart). The device correctly detected Transient fault type.

### Event log for 29.10.2015



Time (UTC)	Device ID	Device name	Event
29.10.2015 13:57:57.022	1409602	252809F0	Line voltage - not present
29.10.2015 13:57:58.022	1409631	252808F0	Line voltage - not present
29.10.2015 13:57:59.022	1409643	252806F0	Line voltage - not present
29.10.2015 13:57:59.022	1409768	252807F0	Line voltage - not present
29.10.2015 13:58:56.021	1409631	252808F0	Line voltage - present
29.10.2015 13:58:56.021	1409631	252808F0	I0> transient - set
29.10.2015 13:58:56.021	1409631	252808F0	I0> transient - reset
29.10.2015 13:58:56.022	1409643	252806F0	Line voltage - present
29.10.2015 13:58:56.022	1409768	252807F0	Line voltage - present
29.10.2015 13:58:57.022	1409643	252806F0	I0> transient - set
29.10.2015 13:58:57.022	1409643	252806F0	I0> transient - reset
29.10.2015 13:58:58.022	1409602	252809F0	Line voltage - present

1. Screenshot of Event log for indicators 252806F0, 252807F0, 252808F0 and 252809F0
2. Events were downloaded from device's local memory
3. All indicators detected events on 29.10.2015 as expected.

**Indicator: 252794F0**

1. Breakdown to the ground on 26.10.2015 @10:14:19 UTC (12:14:19 local time) in duration of one cycle.
2. Event has been "seen" by all devices in the network – increase of E50 and one cycle increase of I0.