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Section 1  Introduction

1.1  This manual

The point list manual describes the outlook and properties of the data points specific to the protection relay. The manual should be used in conjunction with the corresponding communication protocol manual.

1.2  Intended audience

This manual addresses the communication system engineer or system integrator responsible for pre-engineering and engineering for communication setup in a substation from a protection relay perspective.

The system engineer or system integrator must have a basic knowledge of communication in protection and control systems and thorough knowledge of the specific communication protocol.
1.3 Product documentation

1.3.1 Product documentation set

Figure 1: The intended use of documents during the product life cycle


1.3.2 Document revision history

<table>
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<th>Document revision/date</th>
<th>Product version</th>
<th>History</th>
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</thead>
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<tr>
<td>A/2018-02-26</td>
<td>5.0 FP1</td>
<td>First release</td>
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<tr>
<td>B/2019-06-07</td>
<td>5.0 FP1</td>
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1.3.3 Related documentation

<table>
<thead>
<tr>
<th>Name of the document</th>
<th>Document ID</th>
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<tbody>
<tr>
<td>Modbus Communication Protocol Manual</td>
<td>1MAC057386-MB</td>
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</table>

1.4 Symbols and conventions

1.4.1 Symbols

The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.

The information icon alerts the reader of important facts and conditions.

The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Push button navigation in the LHMI menu structure is presented by using the push button icons.
  To navigate between the options, use ↑ and ↓.
- Menu paths are presented in bold.
  Select Main menu/Settings.
- LHMI messages are shown in Courier font.
  To save the changes in nonvolatile memory, select Yes and press →.
Parameter names are shown in italics. The function can be enabled and disabled with the Operation setting.

Parameter values are indicated with quotation marks. The corresponding parameter values are "Enabled" and "Disabled".

Input/output messages and monitored data names are shown in Courier font. When the function picks up, the PICKUP output is set to TRUE.

Dimensions are provided both in inches and mm. If it is not specifically mentioned, the dimension is in mm.

This document assumes that the parameter setting visibility is "Advanced".

### Functions, codes and symbols

#### Table 1: Functions included in the relay

<table>
<thead>
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<th>IEC 60617</th>
<th>ANSI/C37.2-2008</th>
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<td>Three-phase non-directional overcurrent protection, low stage</td>
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<td>3I&gt; (1)</td>
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<td>3I&gt; (2)</td>
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<td>DOPPDR2</td>
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**Interconnection functions**

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<td>PHQVVR2</td>
<td>PQ 3U&lt;&gt; (B)</td>
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<td>Voltage unbalance</td>
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<td>I &lt;-&gt; O ESC (1)</td>
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**Condition monitoring**

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Section 2  Modbus data mappings

2.1  Overview

This document describes the Modbus data points and structures available in the protection relay. The point lists describe a superset of all data available through the standard configuration/s including the optional functionalities.

2.2  Supported functions

2.2.1  Supported functions in REF615

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**Interconnection functions**

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1, 2, ... = Number of included instances. The instances of a protection function represent the number of identical protection function blocks available in the standard configuration. 

() = Optional

1) One of the following can be ordered as an option: Admittance based E/F, Wattmetric based E/F or Harmonics based E/F. The option is an addition to the existing E/F of the original configuration. The optional ground-fault protection has a predefined configuration in the relay. The optional ground-fault protection can be set on or off.

2) “Calculated V0” is always used

3) “Measured IG” is always used

4) Only available with IEC 61850-9-2

---

Section 2
Modbus data mappings

1MAC105331-MB B

Point List Manual
5) Master Trip included and connected to corresponding HSO in the configuration only when BIO0007 module is used. If additionally the ARC option is selected, then AFD is connected in the configuration to the corresponding Master Trip input.
6) Power quality option includes Current total demand distortion, Voltage total harmonic distortion and Voltage variation.
7) Only available with COM0031...0037

2.3 Indications

<table>
<thead>
<tr>
<th>Column name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BitA</td>
<td>Default 0X and 1X bit address for the data.</td>
</tr>
<tr>
<td>RegA</td>
<td>Default 3X and 4X register.bit (00-15) address for the data.</td>
</tr>
<tr>
<td>IEC 61850 name</td>
<td>Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.</td>
</tr>
<tr>
<td>SA name</td>
<td>The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.</td>
</tr>
<tr>
<td>Description</td>
<td>Short description of the signal. See the technical manual for more information.</td>
</tr>
<tr>
<td>Value</td>
<td>Meaning of the value states.</td>
</tr>
</tbody>
</table>

2.3.1 Premapped indications

2.3.1.1 Common data 1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>170.00</td>
<td>.Loc.stVal</td>
<td></td>
<td>Remote/Local state</td>
<td>0/1=Rem/Loc</td>
</tr>
<tr>
<td>1</td>
<td>170.01</td>
<td>.LocKeyHMI.stVal.Station</td>
<td></td>
<td>Station state</td>
<td>1=Station</td>
</tr>
<tr>
<td>2</td>
<td>170.02</td>
<td>.RcdMade.stVal</td>
<td></td>
<td>DR recording made</td>
<td>1=Made</td>
</tr>
<tr>
<td>3</td>
<td>170.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3.1.2 CTRL_CBCILO1 Circuit breaker enable signals (1)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2824</td>
<td>176.08</td>
<td>.EnaOpn.stVal</td>
<td>ENA_OPEN</td>
<td>Open enabled</td>
<td>1=Enabled</td>
</tr>
<tr>
<td>2825</td>
<td>176.09</td>
<td>.EnaCls.stVal</td>
<td>ENA_CLOSE</td>
<td>Close enabled</td>
<td>1=Enabled</td>
</tr>
</tbody>
</table>
### 2.3.1.3 CTRL.CBCSWI1 Circuit breaker (1) mom. position

**Table 6: CTRL.CBCSWI1 Circuit breaker (1) mom. position**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2804</td>
<td>175.04</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2805</td>
<td>175.05</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2806</td>
<td>175.06</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
<tr>
<td>2834</td>
<td>177.02</td>
<td>.SyntItlByps.stVal</td>
<td>ITL_BYPASS</td>
<td>Interlock bypass</td>
<td>1=Bypass</td>
</tr>
<tr>
<td>2835</td>
<td>177.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.4 CTRL.CBCSWI1 Circuit breaker (1) mom+mcd position

**Table 7: CTRL.CBCSWI1 Circuit breaker (1) mom+mcd position**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2816</td>
<td>176.00</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2817</td>
<td>176.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2818</td>
<td>176.02</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2819</td>
<td>176.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2820</td>
<td>176.04</td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2821</td>
<td>176.05</td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2822</td>
<td>176.06</td>
<td>.Pos.stSeld</td>
<td>SELECTED</td>
<td>CB selected for control</td>
<td>1=Selected</td>
</tr>
<tr>
<td>2823</td>
<td>176.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.5 CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1

**Table 8: CTRL.CBXCBR1 Circuit-breaker control (1) – 52-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2836</td>
<td>177.04</td>
<td>.BlkOpn.stVal</td>
<td>BLK_OPEN</td>
<td>Open blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>2837</td>
<td>177.05</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2838</td>
<td>177.06</td>
<td>.BlkCls.stVal</td>
<td>BLK_CLOSE</td>
<td>Close blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>2839</td>
<td>177.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### CTRL.DCSXSWI1 Disconnector position indication (1) – 52-TOC

**Table 9:**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2792</td>
<td>174.08</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2793</td>
<td>174.09</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2794</td>
<td>174.10</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
</tbody>
</table>

### CTRL.DCSXSWI2 Disconnector position indication (2) – 29DS-1

**Table 10:**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2795</td>
<td>174.11</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2796</td>
<td>174.12</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2797</td>
<td>174.13</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
</tbody>
</table>

### CTRL.DCSXSWI3 Disconnector position indication (3) – 29DS-2

**Table 11:**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2799</td>
<td>174.15</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2800</td>
<td>175.00</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
</tbody>
</table>

### CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

**Table 12:**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3472</td>
<td>217.00</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>3473</td>
<td>217.01</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>3474</td>
<td>217.02</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
<tr>
<td>3475</td>
<td>217.03</td>
<td>.Pos.stSeld</td>
<td>-</td>
<td>Control selected</td>
<td>1=Selected</td>
</tr>
</tbody>
</table>

Table continues on next page
### 2.3.1.10 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

#### Table 13: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3476</td>
<td>217.04</td>
<td>.EnaOpn.stVal</td>
<td>ENA_OPEN</td>
<td>Open enabled</td>
<td>1=Enabled</td>
</tr>
<tr>
<td>3477</td>
<td>217.05</td>
<td>.EnaCls.stVal</td>
<td>ENA_CLOSE</td>
<td>Close enabled</td>
<td>1=Enabled</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTRL.DCXSWI1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3478</td>
<td>217.06</td>
<td>.BlkOpn.stVal</td>
<td>BLK_OPEN</td>
<td>Open blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>3479</td>
<td>217.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3480</td>
<td>217.08</td>
<td>.BlkCls.stVal</td>
<td>BLK_CLOSE</td>
<td>Close blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>3481</td>
<td>217.09</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CTRL.DCCILO1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3482</td>
<td>217.10</td>
<td>.ItlByps.stVal</td>
<td>ITL_BYPASS</td>
<td>Interlock bypass</td>
<td>1=Bypass</td>
</tr>
<tr>
<td>3483</td>
<td>217.11</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3.1.11 CTRL.ESXSWI1 Grounding switch indication (1) – 29GS-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2801</td>
<td>175.01</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2802</td>
<td>175.02</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2803</td>
<td>175.03</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
</tbody>
</table>

### 2.3.1.12 CTRL.ESXSWI2 Grounding switch indication (2) – 29GS-2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2807</td>
<td>175.07</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>2808</td>
<td>175.08</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>2809</td>
<td>175.09</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
</tbody>
</table>

### 2.3.1.13 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3496</td>
<td>218.08</td>
<td>.Pos.stVal.Close</td>
<td>-</td>
<td>Close bit</td>
<td>1=Close</td>
</tr>
<tr>
<td>3497</td>
<td>218.09</td>
<td>.Pos.stVal.Open</td>
<td>-</td>
<td>Open bit</td>
<td>1=Open</td>
</tr>
<tr>
<td>3498</td>
<td>218.10</td>
<td>.Pos.stVal.Fault</td>
<td>-</td>
<td>Fault bit</td>
<td>1=Pos(00/11)</td>
</tr>
<tr>
<td>3499</td>
<td>218.11</td>
<td>.Pos.stSeld</td>
<td>-</td>
<td>Control selected</td>
<td>1=Selected</td>
</tr>
<tr>
<td>3500</td>
<td>218.12</td>
<td>.EnaOpn.stVal</td>
<td>ENA_OPEN</td>
<td>Open enabled</td>
<td>1=Enabled</td>
</tr>
<tr>
<td>3501</td>
<td>218.13</td>
<td>.EnaCls.stVal</td>
<td>ENA_CLOSE</td>
<td>Close enabled</td>
<td>1=Enabled</td>
</tr>
<tr>
<td>3502</td>
<td>218.14</td>
<td>.BlkOpn.stVal</td>
<td>BLK_OPEN</td>
<td>Open blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>3503</td>
<td>218.15</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3504</td>
<td>219.00</td>
<td>.BlkCls.stVal</td>
<td>BLK_CLOSE</td>
<td>Close blocked</td>
<td>1=Blocked</td>
</tr>
<tr>
<td>3505</td>
<td>219.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3506</td>
<td>219.02</td>
<td>.ItlByps.stVal</td>
<td>ITL_BYPASS</td>
<td>Interlock bypass</td>
<td>1=Bypass</td>
</tr>
<tr>
<td>3507</td>
<td>219.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3.1.14 LD0.ARC_SARC1 Arc protection (1) – AFD-1

**Table 17: LD0.ARC_SARC1 Arc protection (1) – AFD-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2978</td>
<td>.FADet.stVal</td>
<td>ARC_FLT_DET</td>
<td>Arc detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td></td>
<td>2979</td>
<td>.mcd</td>
<td>LD0.ARCPTRC11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2982</td>
<td>186.06</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>1=Trip</td>
</tr>
<tr>
<td></td>
<td>2983</td>
<td>186.07</td>
<td>.mcd</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.15 LD0.ARC_SARC2 Arc protection (2) – AFD-2

**Table 18: LD0.ARC_SARC2 Arc protection (2) – AFD-2**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2984</td>
<td>.FADet.stVal</td>
<td>ARC_FLT_DET</td>
<td>Arc detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td></td>
<td>2985</td>
<td>.mcd</td>
<td>LD0.ARCPTRC21</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2988</td>
<td>186.12</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>1=Trip</td>
</tr>
<tr>
<td></td>
<td>2989</td>
<td>186.13</td>
<td>.mcd</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.16 LD0.ARC_SARC3 Arc protection (3) – AFD-3

**Table 19: LD0.ARC_SARC3 Arc protection (3) – AFD-3**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2990</td>
<td>.FADet.stVal</td>
<td>ARC_FLT_DET</td>
<td>Arc detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td></td>
<td>2991</td>
<td>.mcd</td>
<td>LD0.ARCPTRC31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2994</td>
<td>187.02</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>1=Trip</td>
</tr>
<tr>
<td></td>
<td>2995</td>
<td>187.03</td>
<td>.mcd</td>
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### 2.3.1.17 LD0.CCBRBRF1 Circuit breaker failure protection (1) – 50BF-1

**Table 20: LD0.CCBRBRF1 Circuit breaker failure protection (1) – 50BF-1**

<table>
<thead>
<tr>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2828</td>
<td>176.12</td>
<td>.Str.general</td>
<td>CB_FAULT_AL</td>
<td>Timer running</td>
<td>1=Running</td>
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<tr>
<td>2829</td>
<td>176.13</td>
<td>.mcd</td>
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<td>2830</td>
<td>176.14</td>
<td>.OpEx.general</td>
<td>TRBU</td>
<td>Fail, external trip</td>
<td>1=Ext.trip</td>
</tr>
<tr>
<td>2831</td>
<td>176.15</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2832</td>
<td>177.00</td>
<td>.OpIn.general</td>
<td>TRRET</td>
<td>Internal re-trip</td>
<td>1=Re-trip</td>
</tr>
<tr>
<td>2833</td>
<td>177.01</td>
<td>.mcd</td>
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### 2.3.1.18 LD0.CCSPVC1 Current circuit supervision (1) – CCM-1

**Table 21: LD0.CCSPVC1 Current circuit supervision (1) – CCM-1**

<table>
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<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>3002</td>
<td>187.10</td>
<td>.SigFailAlm.stVal</td>
<td>ALARM</td>
<td>Alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>3003</td>
<td>187.11</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3004</td>
<td>187.12</td>
<td>.FailACirc.general</td>
<td>FAIL</td>
<td>Failure trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3005</td>
<td>187.13</td>
<td>.mcd</td>
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### 2.3.1.19 LD0.CMHAI1 Current total demand distortion (1) – PQI-1

**Table 22: LD0.CMHAI1 Current total demand distortion (1) – PQI-1**

<table>
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<tr>
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<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3316</td>
<td>207.04</td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td></td>
<td>1=Alarm</td>
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<tr>
<td>3317</td>
<td>207.05</td>
<td>.mcd</td>
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### 2.3.1.20 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC

**Table 23: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC**

<table>
<thead>
<tr>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2752</td>
<td>172.00</td>
<td>.HiAlm.stVal</td>
<td>HIGH_ALARM</td>
<td>High alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2753</td>
<td>172.01</td>
<td>.mcd</td>
<td></td>
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### 2.3.1.21 LD0.DARREC1 Autoreclosing (1) – 79-1

Table 24: LD0.DARREC1 Autoreclosing (1) – 79-1

<table>
<thead>
<tr>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
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<tr>
<td>2754</td>
<td>172.02</td>
<td>.HiWrn.stVal</td>
<td>HIGH_WARN</td>
<td>High warning</td>
<td>1=Warning</td>
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<tr>
<td>2755</td>
<td>172.03</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>2756</td>
<td>172.04</td>
<td>.LoWrn.stVal</td>
<td>LOW_WARN</td>
<td>Low warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td>2757</td>
<td>172.05</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>2758</td>
<td>172.06</td>
<td>.LoAlm.stVal</td>
<td>LOW_ALARM</td>
<td>Low alarm</td>
<td>1=Alarm</td>
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<tr>
<td>2759</td>
<td>172.07</td>
<td>.mcd</td>
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### LD0.DARREC1 Autoreclosing state (1) – 79-1

**Table 25: LD0.DARREC1 Autoreclosing state (1) – 79-1**

<table>
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<th>Description</th>
<th>Values</th>
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</thead>
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<tr>
<td>3064</td>
<td>191.08</td>
<td>.ActRec.stVal</td>
<td>ACTIVE</td>
<td>Reclose active</td>
<td>1=Active</td>
</tr>
<tr>
<td>3065</td>
<td>191.09</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3066</td>
<td>191.10</td>
<td>.PrgDsr.stVal</td>
<td>DISCR_INPRO</td>
<td>Discr.time in progress</td>
<td>1=In progress</td>
</tr>
<tr>
<td>3067</td>
<td>191.11</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3068</td>
<td>191.12</td>
<td>.PrgCutOut.stVal</td>
<td>CUTOUT_INPRO</td>
<td>Cutout time in progress</td>
<td>1=In progress</td>
</tr>
<tr>
<td>3069</td>
<td>191.13</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3070</td>
<td>191.14</td>
<td>.FrqOpAlm.stVal</td>
<td>FRQ_OP_ALM</td>
<td>Frequent op. Alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>3071</td>
<td>191.15</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3072</td>
<td>192.00</td>
<td>.RclTmStr.stVal</td>
<td></td>
<td>Reclaim time started</td>
<td></td>
</tr>
<tr>
<td>3073</td>
<td>192.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3074</td>
<td>192.02</td>
<td>.ProCrd.stVal</td>
<td></td>
<td>Protection coordination</td>
<td>1=In progress</td>
</tr>
<tr>
<td>3075</td>
<td>192.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3076</td>
<td>192.04</td>
<td>.CBManCls.stVal</td>
<td>MAN_CB_CL</td>
<td>CB manually closed</td>
<td>1=CB closed</td>
</tr>
<tr>
<td>3077</td>
<td>192.05</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>3078</td>
<td>192.06</td>
<td>.OpClss.general</td>
<td>CLOSE_CB</td>
<td>Operate (close XCBR)</td>
<td>1=Close CB</td>
</tr>
<tr>
<td>3079</td>
<td>192.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3080</td>
<td>192.08</td>
<td>.OpOpn.general</td>
<td>OPEN_CB</td>
<td>Operate (open XCBR)</td>
<td>1=Open CB</td>
</tr>
<tr>
<td>3081</td>
<td>192.09</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>3082</td>
<td>192.10</td>
<td>.UnsCBCls.stVal</td>
<td>UNSUC_CB</td>
<td>CB closing failed</td>
<td>1=Failed</td>
</tr>
<tr>
<td>3083</td>
<td>192.11</td>
<td>.mcd</td>
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<td></td>
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<tr>
<td>3084</td>
<td>192.12</td>
<td>.WtMstr.stVal</td>
<td>CMD_WAIT</td>
<td>Master signal to follower</td>
<td>1=Signal</td>
</tr>
<tr>
<td>3085</td>
<td>192.13</td>
<td>.mcd</td>
<td></td>
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### 2.3.1.23 LD0.DEFHPDEF1 Directional ground-fault protection, high stage (1) – 67/50N-1

#### Table 26: LD0.DEFHPDEF1 Directional ground-fault protection, high stage (1) – 67/50N-1

<table>
<thead>
<tr>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2928</td>
<td>183.00</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2929</td>
<td>183.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2930</td>
<td>183.02</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>2931</td>
<td>183.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.1.24 LD0.DEFHPDEF2 Directional ground-fault protection, high stage (2) – 67/50N-2

#### Table 27: LD0.DEFHPDEF2 Directional ground-fault protection, high stage (2) – 67/50N-2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
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<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>4128</td>
<td>258</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4129</td>
<td>258.1</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>4130</td>
<td>258.2</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
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<tr>
<td>4131</td>
<td>258.3</td>
<td>.mcd</td>
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### 2.3.1.25 LD0.DEFLPDEF1 Directional ground-fault protection, low stage (1) – 67/51N-1

#### Table 28: LD0.DEFLPDEF1 Directional ground-fault protection, low stage (1) 67/51N-1

<table>
<thead>
<tr>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2920</td>
<td>182.08</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2921</td>
<td>182.09</td>
<td>.mcd</td>
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<td></td>
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<tr>
<td>2922</td>
<td>182.10</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
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</tr>
<tr>
<td>2923</td>
<td>182.11</td>
<td>.mcd</td>
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## 2.3.1.26  LD0.DEFLPDEF2 Directional ground-fault protection, low stage (2) – 67/51N-2

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
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<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2925</td>
<td>182.13</td>
<td>.mcd</td>
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<td></td>
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<tr>
<td>2926</td>
<td>182.14</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>2927</td>
<td>182.15</td>
<td>.mcd</td>
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## 2.3.1.27  LD0.DPHHPDOC1 Three-phase directional overcurrent protection, high stage (1) – 67/50P-1

<table>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
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<tr>
<td>3026</td>
<td>189.02</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3027</td>
<td>189.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3028</td>
<td>189.04</td>
<td>.Str.phsA</td>
<td>Phs A pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>3029</td>
<td>189.05</td>
<td>.mcd</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3030</td>
<td>189.06</td>
<td>.Str.phsB</td>
<td>Phs B pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>3031</td>
<td>189.07</td>
<td>.mcd</td>
<td></td>
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<tr>
<td>3032</td>
<td>189.08</td>
<td>.Str.phsC</td>
<td>Phs C pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
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<td>3033</td>
<td>189.09</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3034</td>
<td>189.10</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3035</td>
<td>189.11</td>
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## 2.3.1.28  LD0.DPHHPDOC2 Three-phase directional overcurrent protection, high stage (2) – 67/50P-2

<table>
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<th>BitA</th>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>4108</td>
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<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
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<tr>
<td>4109</td>
<td>256.13</td>
<td>.mcd</td>
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Table continues on next page
### 2.3.1.29 LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1) – 67/51P-1

**Table 32:** LD0.DPHLPDOC1 Three-phase directional overcurrent protection, low stage (1) – 67/51P-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
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<th>Values</th>
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<td>General pickup</td>
<td>1=Pickup</td>
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<td>3007</td>
<td>187.15</td>
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</tr>
<tr>
<td>3008</td>
<td>188.00</td>
<td>.Str.phsA</td>
<td></td>
<td>phsA pickup</td>
<td>1=Pickup</td>
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<td>3010</td>
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<td>.Str.phsB</td>
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<td>phsB pickup</td>
<td>1=Pickup</td>
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<td>188.03</td>
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<td>188.04</td>
<td>.Str.phsC</td>
<td></td>
<td>phsC pickup</td>
<td>1=Pickup</td>
</tr>
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<td>188.05</td>
<td>.mcd</td>
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<tr>
<td>3014</td>
<td>188.06</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
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<td>3015</td>
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<td>.mcd</td>
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Table continues on next page

### 2.3.1.30 LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2) – 67/51P-2

**Table 33:** LD0.DPHLPDOC2 Three-phase directional overcurrent protection, low stage (2) – 67/51P-2

<table>
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<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>3016</td>
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<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
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<td>3017</td>
<td>188.09</td>
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<td>3018</td>
<td>188.10</td>
<td>.Str.phsA</td>
<td></td>
<td>phsA pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3019</td>
<td>188.11</td>
<td>.mcd</td>
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<td></td>
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<td>.Str.phsB</td>
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<td>phsC pickup</td>
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### 2.3.1.31
**LD0.DOPPDPR1 Reverse power/directional overpower protection (1) – 32R/32O-1**

*Table 34: LD0.DOPPDPR1 Reverse power/directional overpower protection (1) – 32R/32O-1*

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<td>4186</td>
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<tr>
<td>4188</td>
<td>261.12</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
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<tr>
<td>4189</td>
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### 2.3.1.32
**LD0.DOPPDPR2 Reverse power/directional overpower protection (2) – 32R/32O-2**

*Table 35: LD0.DOPPDPR2 Reverse power/directional overpower protection (2) – 32R/32O-2*

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<td>4192</td>
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<td>TRIP</td>
<td>Stage trip</td>
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### 2.3.1.33 LD0.DQPTUV1 Directional reactive power undervoltage protection (1) – 32Q-27

**Table 36: LD0.DQPTUV1 Directional reactive power undervoltage protection (1) – 32Q-27**

<table>
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<td>Stage pickup</td>
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<td>4203</td>
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<td>4204</td>
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<td>.Op.general</td>
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### 2.3.1.34 LD0.DUPPDPR1 Underpower protection (1) – 32U-1

**Table 37: LD0.DUPPDPR1 Underpower protection (1) – 32U-1**

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<th>Values</th>
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<td>4180</td>
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<td>TRIP</td>
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### 2.3.1.35 LD0.DUPPDPR2 Underpower protection (2) – 32U-2

**Table 38: LD0.DUPPDPR2 Underpower protection (2) – 32U-2**

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<td>4183</td>
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<tr>
<td>4184</td>
<td>261.8</td>
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### 2.3.1.36  
**LD0.EFHPTOC1 Non-directional ground-fault protection, high stage (1) – 50G-1**

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<th>Values</th>
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<td>PICKUP</td>
<td>Stage pickup</td>
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<td>2941</td>
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<tr>
<td>2942</td>
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<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
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**LD0.EFHPTOC2 Non-directional ground-fault protection, high stage (2) – 50G-2**

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<td>4114</td>
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### 2.3.1.38  
**LD0.EFHIPTOC3 Non-directional ground-fault protection, high stage (3) – 50N-1**

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<td>4118</td>
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<td>TRIP</td>
<td>Stage trip</td>
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### 2.3.1.39 LD0.EFIPTOC4 Non-directional ground-fault protection, high stage (4) – 50N-2

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<td>Stage pickup</td>
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<td>4122</td>
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### 2.3.1.40 LD0.EFIPTOC1 Non-directional ground-fault protection, instantaneous stage (1) – 50G-3

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<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
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<td>2945</td>
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<td>2946</td>
<td>184.02</td>
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<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
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<td>184.03</td>
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### 2.3.1.41 LD0.EFIPTOC2 Non-directional ground-fault protection, instantaneous stage (2) – 50N-3

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<td>4125</td>
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<tr>
<td>4126</td>
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<td>TRIP</td>
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2.3.1.42 LD0.EFLPTOC1 Non-directional ground-fault protection, low stage (1) – 51G-1

Table 45: LD0.EFLPTOC1 Non-directional ground-fault protection, low stage (1) – 51G-1

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2.3.1.43 LD0.EFLPTOC2 Non-directional ground-fault protection, low stage (2) – 51N-1

Table 46: LD0.EFLPTOC2 Non-directional ground-fault protection, low stage (2) – 51N-1

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<th>SA name</th>
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<td>2937</td>
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<td>2938</td>
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2.3.1.44 LD0.EFPADM1 Admittance-based ground-fault protection (1) – 21YN-1

Table 47: LD0.EFPADM1 Admittance-based ground-fault protection (1) – 21YN-1

<table>
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<th>SA name</th>
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<td>Stage pickup</td>
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<td>TRIP</td>
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### 2.3.1.45 LD0.EFPADM2 Admittance-based ground-fault protection (2) – 21YN-2

Table 48: LD0.EFPADM2 Admittance-based ground-fault protection (2) – 21YN-2

<table>
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<th>SA name</th>
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<th>Values</th>
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<tr>
<td>2846</td>
<td>177.14</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
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<td>2847</td>
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### 2.3.1.46 LD0.EFPADM3 Admittance-based ground-fault protection (3) – 21YN-3

Table 49: LD0.EFPADM3 Admittance-based ground-fault protection (3) – 21YN-3

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### 2.3.1.47 LD0.FRPFREQ1 Frequency protection (1) – 81-1

Table 50: LD0.FRPFREQ1 Frequency protection (1) – 81-1

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<td>4005</td>
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<tr>
<td>4006</td>
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<td>.Op.general</td>
<td>OPR_FRG</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4007</td>
<td>250.07</td>
<td>.mcd</td>
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### Table 51: LD0.FRPFRQ2 Frequency protection (2) – 81-2

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.FRPTRC2</td>
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<td>Stage 2 pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4008</td>
<td>250.08</td>
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<td>PICKUP</td>
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<td></td>
</tr>
<tr>
<td>4009</td>
<td>250.09</td>
<td>.mcd</td>
<td></td>
<td>Overfrequency</td>
<td></td>
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<tr>
<td>4010</td>
<td>250.10</td>
<td>.Op.general</td>
<td>OPR_OFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4011</td>
<td>250.11</td>
<td>.mcd</td>
<td></td>
<td>Underfrequency</td>
<td></td>
</tr>
<tr>
<td>4012</td>
<td>250.12</td>
<td>.Op.general</td>
<td>OPR_UFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4013</td>
<td>250.13</td>
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<td></td>
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<tr>
<td>4015</td>
<td>250.15</td>
<td>.mcd</td>
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### Table 52: LD0.FRPFRQ3 Frequency protection (3) – 81-3

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<th>Description</th>
<th>Values</th>
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<tr>
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<td>LD0.FRPTRC3</td>
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<td>Stage 3 pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4016</td>
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<td>.Str.general</td>
<td>PICKUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4017</td>
<td>251.01</td>
<td>.mcd</td>
<td></td>
<td>Overfrequency</td>
<td></td>
</tr>
<tr>
<td>4018</td>
<td>251.02</td>
<td>.Op.general</td>
<td>OPR_OFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4019</td>
<td>251.03</td>
<td>.mcd</td>
<td></td>
<td>Underfrequency</td>
<td></td>
</tr>
<tr>
<td>4020</td>
<td>251.04</td>
<td>.Op.general</td>
<td>OPR_UFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4021</td>
<td>251.05</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4022</td>
<td>251.06</td>
<td>.Op.general</td>
<td>OPR_FRG</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4023</td>
<td>251.07</td>
<td>.mcd</td>
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</table>
### 2.3.1.50  
**LD0.FRPFREQ4 Frequency protection (4) – 81-4**

*Table 53: LD0.FRPFREQ4 Frequency protection (4) – 81-4*

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>4136</td>
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<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage 1 pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4137</td>
<td>258.9</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4138</td>
<td>258.1</td>
<td>.Op.general</td>
<td>OPR_OFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4139</td>
<td>258.11</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4140</td>
<td>258.12</td>
<td>.Op.general</td>
<td>OPR_UFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4141</td>
<td>258.13</td>
<td>.mcd</td>
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<td></td>
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<tr>
<td>4142</td>
<td>258.14</td>
<td>.Op.general</td>
<td>OPR_FRG</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4143</td>
<td>258.15</td>
<td>.mcd</td>
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</tr>
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### 2.3.1.51  
**LD0.FRPFREQ5 Frequency protection (5) – 81-5**

*Table 54: LD0.FRPFREQ5 Frequency protection (5) – 81-5*

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>4146</td>
<td>259.2</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage 2 pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4147</td>
<td>259.3</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4148</td>
<td>259.4</td>
<td>.Op.general</td>
<td>OPR_OFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4149</td>
<td>259.5</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>4150</td>
<td>259.6</td>
<td>.Op.general</td>
<td>OPR_UFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4151</td>
<td>259.7</td>
<td>.mcd</td>
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<tr>
<td>4152</td>
<td>259.8</td>
<td>.Op.general</td>
<td>OPR_FRG</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4153</td>
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<td>.mcd</td>
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### 2.3.1.52 LD0.FRPFREQ6 Frequency protection (6) – 81-6

Table 55: LD0.FRPFREQ6 Frequency protection (6) – 81-6

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td>4154</td>
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<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage 3 pickup</td>
<td>1=Pickup</td>
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<tr>
<td>4154</td>
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<td>.mcd</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>LD0.FRPTOF6</td>
<td></td>
<td>Overfrequency</td>
<td></td>
</tr>
<tr>
<td>4156</td>
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<td>.Op.general</td>
<td>OPR_OFRQ</td>
<td>Trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4157</td>
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<td>.mcd</td>
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<td>LD0.FRPTUF6</td>
<td></td>
<td>Underfrequency</td>
<td></td>
</tr>
<tr>
<td>4159</td>
<td>259.15</td>
<td>.mcd</td>
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<td></td>
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<td>LD0.FRPFRC6</td>
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<td>Frequency gradient</td>
<td></td>
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<tr>
<td>4160</td>
<td>260</td>
<td>.Op.general</td>
<td>OPR_FRG</td>
<td>Trip</td>
<td>1=Trip</td>
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<tr>
<td>4161</td>
<td>260.1</td>
<td>.mcd</td>
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</table>

### 2.3.1.53 LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA-1

Table 56: LD0.HAEFPTOC1 Harmonics-based ground-fault protection (1) – 51NHA-1

<table>
<thead>
<tr>
<th>BitA</th>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td>3312</td>
<td>207.00</td>
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<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3313</td>
<td>207.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3314</td>
<td>207.02</td>
<td>.Op.general</td>
<td>TRIP</td>
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<tr>
<td>3315</td>
<td>207.03</td>
<td>.mcd</td>
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### 2.3.1.54 LD0.HIAPDIF1 High-impedance differential protection for phase A (1)

Table 57: LD0.HIAPDIF1 High-impedance differential protection for phase A (1) – 87A-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>4162</td>
<td>260.2</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4163</td>
<td>260.3</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4164</td>
<td>260.4</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4165</td>
<td>260.5</td>
<td>.mcd</td>
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### 2.3.1.55 LD0.HIBPDIF1 High-impedance differential protection for phase B (1) – 87B-1

Table 58: **LD0.HIBPDIF1 High-impedance differential protection for phase B (1) – 87B-1**

<table>
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<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>4166</td>
<td>260.6</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4167</td>
<td>260.7</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4168</td>
<td>260.8</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4169</td>
<td>260.9</td>
<td>.mcd</td>
<td></td>
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</table>

### 2.3.1.56 LD0.HICPDIF1 High-impedance differential protection for phase C (1) – 87C-1

Table 59: **LD0.HICPDIF1 High-impedance differential protection for phase C (1) – 87C-1**

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>4170</td>
<td>260.1</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4171</td>
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<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4172</td>
<td>260.12</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
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</tr>
<tr>
<td>4173</td>
<td>260.13</td>
<td>.mcd</td>
<td></td>
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### 2.3.1.57 LD0.INRPHAR1 Three-phase inrush detector (1) – INR-1

Table 60: **LD0.INRPHAR1 Three-phase inrush detector (1) – INR-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2964</td>
<td>185.04</td>
<td>.Str.general</td>
<td>BLK2H</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2965</td>
<td>185.05</td>
<td>.mcd</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2966</td>
<td>185.06</td>
<td>.Str.phsA</td>
<td>Phs A pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>2967</td>
<td>185.07</td>
<td>.mcd</td>
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</tr>
<tr>
<td>2968</td>
<td>185.08</td>
<td>.Str.phsB</td>
<td>Phs B pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>2969</td>
<td>185.09</td>
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<tr>
<td>2970</td>
<td>185.10</td>
<td>.Str.phsC</td>
<td>Phs C pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>2971</td>
<td>185.11</td>
<td>.mcd</td>
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</table>
2.3.1.58  

LD0.INTRPTEF1 Transient/intermittent ground-fault protection (1) – 67NIEF-1

Table 61:  

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2948</td>
<td>184.04</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2949</td>
<td>184.05</td>
<td>.mcd</td>
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<td></td>
</tr>
<tr>
<td>2950</td>
<td>184.06</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>2951</td>
<td>184.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3.1.59  

LD0.LEDGGIO1 Indication LED states Color1/Color2 – LED

These LED indication points interpret the case when a signal is wired to both the OK and ALARM inputs, but inverted to the other. This means that the LED toggles between red and green colors. The default color for ALARM is red and green for OK. Colors can, however, be reconfigured with a setting parameter.

![Figure 2: Signal wired to both OK and ALARM inputs – inverted to the other](image1)

If the OK and ALARM inputs are wired to separate indication signals, the LED will have three legal states and cannot be expressed with one bit only. In this case, it is possible to combine this LED bit interpretation with the corresponding value from the other LED state interpretation.

![Figure 3: Separate signals wired to OK and ALARM inputs](image2)
**Table 62: LD0.LEDGGIO1 Indication LED states Color1/Color2 – LED**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3520</td>
<td>220.00</td>
<td>.LEDSt1.stVal</td>
<td>-</td>
<td>LED 1 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3521</td>
<td>220.01</td>
<td>.LEDSt2.stVal</td>
<td>-</td>
<td>LED 2 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3522</td>
<td>220.02</td>
<td>.LEDSt3.stVal</td>
<td>-</td>
<td>LED 3 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3523</td>
<td>220.03</td>
<td>.LEDSt4.stVal</td>
<td>-</td>
<td>LED 4 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3524</td>
<td>220.04</td>
<td>.LEDSt5.stVal</td>
<td>-</td>
<td>LED 5 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3525</td>
<td>220.05</td>
<td>.LEDSt6.stVal</td>
<td>-</td>
<td>LED 6 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3526</td>
<td>220.06</td>
<td>.LEDSt7.stVal</td>
<td>-</td>
<td>LED 7 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3527</td>
<td>220.07</td>
<td>.LEDSt8.stVal</td>
<td>-</td>
<td>LED 8 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3528</td>
<td>220.08</td>
<td>.LEDSt9.stVal</td>
<td>-</td>
<td>LED 9 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3529</td>
<td>220.09</td>
<td>.LEDSt10.stVal</td>
<td>-</td>
<td>LED 10 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3530</td>
<td>220.10</td>
<td>.LEDSt11.stVal</td>
<td>-</td>
<td>LED 11 state</td>
<td>0/1=Color1/2</td>
</tr>
<tr>
<td>3531</td>
<td>220.11</td>
<td>&lt;reserved&gt;</td>
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<td></td>
<td>0</td>
</tr>
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</table>

### 2.3.1.60 LD0.LEDGGIO1 Indication LED states OFF/ColorX – LED

These LED indication points interpret the case when an indication signal is wired to either the OK or ALARM input of the LED function block. The default color for ALARM is red and green for OK. Colors can, however, be reconfigured with a setting parameter.

![Signal wired to either OK or Alarm input](image-url)
### Table 63: LD0.LEDGIO1 Indication LED states OFF/ColorX – LED

<table>
<thead>
<tr>
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### 2.3.1.61 LD0.LEDPTRC1 Global conditioning (1)

### Table 64: LD0.LEDPTRC1 Global conditioning (1)

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### 2.3.1.62 LD0.LVRTPTUV1 Low-voltage ride-through protection (1) – 27RT-1

### Table 65: LD0.LVRTPTUV1 Low-voltage ride-through protection (1) – 27RT-1

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### 2.3.1.65 LD0.MFADPSDE1 Multifrequency admittance-based ground-fault protection (1) – 67YN-1

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### 2.3.1.66 LD0.MVGAPC1 Move (8 pcs) (1) – MV-1

#### Table 69: LD0.MVGAPC1 Move (8 pcs) (1) – MV-1

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<th>Values</th>
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<td>Input 2</td>
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### 2.3.1.67 LD0.MVGAPC2 Move (8 pcs) (2) – MV-2

#### Table 70: LD0.MVGAPC2 Move (8 pcs) (2) – MV-2

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### Section 2
Modbus data mappings

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#### 2.3.1.68
**LD0.NSPTOC1 Negative-sequence overcurrent protection (1) – 46-1**

Table 71: **LD0.NSPTOC1 Negative-sequence overcurrent protection (1) – 46-1**

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<th>Values</th>
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<td>.mcd</td>
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<td>184.14</td>
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<td>Stage trip</td>
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#### 2.3.1.69
**LD0.NSPTOC2 Negative-sequence overcurrent protection (2) – 46-2**

Table 72: **LD0.NSPTOC2 Negative-sequence overcurrent protection (2) – 46-2**

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#### 2.3.1.70
**LD0.NSPTOV1 Negative-sequence overvoltage protection (1) – 47-1**

Table 73: **LD0.NSPTOV1 Negative-sequence overvoltage protection (1) – 47-1**

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### 2.3.1.71 LD0.PDNSPTOC1 Phase discontinuity protection (1) – 46PD-1

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### 2.3.1.72 LD0.PHHPTOC1 Three-phase non-directional overcurrent protection, high stage (1) – 50P-1

**Table 75:**  
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<th>Values</th>
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### 2.3.1.73 LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2) – 50P-2

**Table 76:** LD0.PHHPTOC2 Three-phase non-directional overcurrent protection, high stage (2) – 50P-2

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<td>.mcd</td>
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<td>.Str.phsC</td>
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### 2.3.1.74 LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1) – 50P-3

**Table 77:** LD0.PHIPTOC1 Three-phase non-directional overcurrent protection, instantaneous stage (1) – 50P-3

<table>
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### 2.3.1.75 LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1

**Table 78: LD0.PHIZ1 High-impedance fault detection (1) – HIZ-1**

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<th>Values</th>
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### 2.3.1.76 LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1

**Table 79: LD0.PHLPTOC1 Three-phase non-directional overcurrent protection, low stage (1) – 51P-1**

<table>
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<th>Description</th>
<th>Values</th>
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### 2.3.1.77 LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2

**Table 80: LD0.PHLPTOC2 Three-phase non-directional overcurrent protection, low stage (2) – 51P-2**

<table>
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### 2.3.1.78 LD0.PHPTOV1 Three-phase overvoltage protection (1) – 59-1

Table 81: **LD0.PHPTOV1 Three-phase overvoltage protection (1) – 59-1**

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### 2.3.1.79 LD0.PHPTOV2 Three-phase overvoltage protection (2) – 59-2

Table 82: **LD0.PHPTOV2 Three-phase overvoltage protection (2) – 59-2**

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Table continues on next page
### Table 83: LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3

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**2.3.1.80**

**LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3**

Table 83:  
LD0.PHPTOV3 Three-phase overvoltage protection (3) – 59-3

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<th>Description</th>
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### Table 84: LD0.PHPTUV1 Three-phase undervoltage protection (1) – 27-1

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### 2.3.1.82 LD0.PHPTUV2 Three-phase undervoltage protection (2) – 27-2

#### Table 85: LD0.PHPTUV2 Three-phase undervoltage protection (2) – 27-2

<table>
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### 2.3.1.83 LD0.PHPTUV3 Three-phase undervoltage protection (3) – 27-3

#### Table 86: LD0.PHPTUV3 Three-phase undervoltage protection (3) – 27-3

<table>
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</tr>
<tr>
<td>3164</td>
<td>197.12</td>
<td>.Str.phsC</td>
<td>phs C pickup</td>
<td>1=Pickup</td>
<td></td>
</tr>
<tr>
<td>3165</td>
<td>197.13</td>
<td>.mcd</td>
<td></td>
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<tr>
<td>3167</td>
<td>197.15</td>
<td>.mcd</td>
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</table>
### 2.3.1.84 LD0. PHPTUC1 Loss of phase (1) – 37-1

**Table 87: LD0. PHPTUC1 Loss of phase (1) – 37-1**

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>4194</td>
<td>262.2</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>4195</td>
<td>262.3</td>
<td>.mcd</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4196</td>
<td>262.4</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>4197</td>
<td>262.5</td>
<td>.mcd</td>
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### 2.3.1.85 LD0.PHQVVR1 Voltage variation (1) – PQSS-1

**Table 88: LD0.PHQVVR1 Voltage variation (1) – PQSS-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3328</td>
<td>208.00</td>
<td>.VarStrGen.stVal</td>
<td>-</td>
<td>Variation event detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td>3329</td>
<td>208.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3330</td>
<td>208.02</td>
<td>.VarEnd.stVal</td>
<td>-</td>
<td>Variation event ended</td>
<td>1=Ended</td>
</tr>
<tr>
<td>3331</td>
<td>208.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3332</td>
<td>208.04</td>
<td>.SwlOp.stVal</td>
<td>-</td>
<td>Swell event detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td>3333</td>
<td>208.05</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3334</td>
<td>208.06</td>
<td>.DipOp.stVal</td>
<td>-</td>
<td>Dip event detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td>3335</td>
<td>208.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3336</td>
<td>208.08</td>
<td>.IntrOp.stVal</td>
<td>-</td>
<td>Interruption event detected</td>
<td>1=Detected</td>
</tr>
<tr>
<td>3337</td>
<td>208.09</td>
<td>.mcd</td>
<td></td>
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### 2.3.1.86 LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1

**Table 89: LD0.PSPTUV1 Positive-sequence undervoltage protection (1) – 47U-1**

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3118</td>
<td>194.14</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3119</td>
<td>194.15</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3120</td>
<td>195.00</td>
<td>.Str.phsA</td>
<td>Phs A pickup</td>
<td></td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3121</td>
<td>195.01</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>3122</td>
<td>195.02</td>
<td>.Str.phsB</td>
<td>Phs B pickup</td>
<td></td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3123</td>
<td>195.03</td>
<td>.mcd</td>
<td></td>
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### LD0.RESCMMXU1 Residual current measurement (1) – IG-1

**Table 90:** LD0.RESCMMXU1 Residual current measurement (1) – IG-1

<table>
<thead>
<tr>
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<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>3124</td>
<td>195.04</td>
<td>.Str.phsC</td>
<td></td>
<td>Phs C pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3125</td>
<td>195.05</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3126</td>
<td>195.06</td>
<td>.Op.general</td>
<td></td>
<td>General trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3127</td>
<td>195.07</td>
<td>.mcd</td>
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### LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

**Table 91:** LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

<table>
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<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2760</td>
<td>172.08</td>
<td>.HiAlm.stVal</td>
<td>HIGH_ALARM</td>
<td>High alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2761</td>
<td>172.09</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2762</td>
<td>172.10</td>
<td>.HiWrn.stVal</td>
<td>HIGH_WARN</td>
<td>High warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td>2763</td>
<td>172.11</td>
<td>.mcd</td>
<td></td>
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### LD0.ROVPTOV1 Residual overvoltage protection (1) – 59G-1

**Table 92:** LD0.ROVPTOV1 Residual overvoltage protection (1) – 59G-1

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3168</td>
<td>198.00</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3169</td>
<td>198.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3170</td>
<td>198.02</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3171</td>
<td>198.03</td>
<td>.mcd</td>
<td></td>
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2.3.1.90 LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1

Table 93: LD0.ROVPTOV2 Residual overvoltage protection (2) – 59N-1

<table>
<thead>
<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>3172</td>
<td>198.04</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3173</td>
<td>198.05</td>
<td>.mcd</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3174</td>
<td>198.06</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3175</td>
<td>198.07</td>
<td>.mcd</td>
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2.3.1.91 LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2

Table 94: LD0.ROVPTOV3 Residual overvoltage protection (3) – 59N-2

<table>
<thead>
<tr>
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<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>3176</td>
<td>198.08</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3177</td>
<td>198.09</td>
<td>.mcd</td>
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<td></td>
</tr>
<tr>
<td>3178</td>
<td>198.10</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
</tr>
<tr>
<td>3179</td>
<td>198.11</td>
<td>.mcd</td>
<td></td>
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2.3.1.92 LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1

Table 95: LD0.SECRSYN1 Synchronism and energizing check (1) – 25-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3882</td>
<td>242.10</td>
<td>.SynPrg</td>
<td>SYNC_INPRO</td>
<td>Synch. in progress</td>
<td>1=In progress</td>
</tr>
<tr>
<td>3883</td>
<td>242.11</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3884</td>
<td>242.12</td>
<td>.FailCmd</td>
<td>CMD_FAIL_AL</td>
<td>Close request fail</td>
<td>1=Failed</td>
</tr>
<tr>
<td>3885</td>
<td>242.13</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3886</td>
<td>242.14</td>
<td>.FailSyn</td>
<td>CL_FAIL_AL</td>
<td>Close cmd fail</td>
<td>1=Failed</td>
</tr>
<tr>
<td>3887</td>
<td>242.15</td>
<td>.mcd</td>
<td></td>
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## 2.3.1.93 LD0.SEQSPVC1 Fuse failure supervision (1) – 60-1

### Table 96: LD0.SEQSPVC1 Fuse failure supervision (1) – 60-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2996</td>
<td>187.04</td>
<td>.Str.general</td>
<td>FUSEF_U</td>
<td>1=Pickup</td>
</tr>
<tr>
<td></td>
<td>2997</td>
<td>187.05</td>
<td>.mcd</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2998</td>
<td>187.06</td>
<td>.Str3Ph.general</td>
<td>FUSEF_3PH</td>
<td>3-phase pickup</td>
</tr>
<tr>
<td></td>
<td>2999</td>
<td>187.07</td>
<td>.mcd</td>
<td></td>
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## 2.3.1.94 LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

### Table 97: LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td></td>
<td>3632</td>
<td>227.00</td>
<td>.SPCS01.stVal</td>
<td>Output state 1</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3633</td>
<td>227.01</td>
<td>.mcd</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3634</td>
<td>227.02</td>
<td>.SPCS02.stVal</td>
<td>Output state 2</td>
<td>0/1=Off/On</td>
</tr>
<tr>
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<td>3635</td>
<td>227.03</td>
<td>.mcd</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3636</td>
<td>227.04</td>
<td>.SPCS03.stVal</td>
<td>Output state 3</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3637</td>
<td>227.05</td>
<td>.mcd</td>
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<tr>
<td></td>
<td>3638</td>
<td>227.06</td>
<td>.SPCS04.stVal</td>
<td>Output state 4</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3639</td>
<td>227.07</td>
<td>.mcd</td>
<td></td>
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<td></td>
<td>3640</td>
<td>227.08</td>
<td>.SPCS05.stVal</td>
<td>Output state 5</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3641</td>
<td>227.09</td>
<td>.mcd</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3642</td>
<td>227.10</td>
<td>.SPCS06.stVal</td>
<td>Output state 6</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3643</td>
<td>227.11</td>
<td>.mcd</td>
<td></td>
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<td></td>
<td>3644</td>
<td>227.12</td>
<td>.SPCS07.stVal</td>
<td>Output state 7</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3645</td>
<td>227.13</td>
<td>.mcd</td>
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<td></td>
<td>3646</td>
<td>227.14</td>
<td>.SPCS08.stVal</td>
<td>Output state 8</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3647</td>
<td>227.15</td>
<td>.mcd</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3648</td>
<td>228.00</td>
<td>.SPCS09.stVal</td>
<td>Output state 9</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3649</td>
<td>228.01</td>
<td>.mcd</td>
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<td>3650</td>
<td>228.02</td>
<td>.SPCS10.stVal</td>
<td>Output state 10</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td></td>
<td>3651</td>
<td>228.03</td>
<td>.mcd</td>
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<td>3652</td>
<td>228.04</td>
<td>.SPCS11.stVal</td>
<td>Output state 11</td>
<td>0/1=Off/On</td>
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<td>3653</td>
<td>228.05</td>
<td>.mcd</td>
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<tr>
<th>BitA</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>3654</td>
<td>228.06</td>
<td>.SPCS12.stVal</td>
<td>Ouput state 12</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3655</td>
<td>228.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3656</td>
<td>228.08</td>
<td>.SPCS13.stVal</td>
<td>Ouput state 13</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
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<td>3657</td>
<td>228.09</td>
<td>.mcd</td>
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<tr>
<td>3658</td>
<td>228.10</td>
<td>.SPCS14.stVal</td>
<td>Ouput state 14</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3659</td>
<td>228.11</td>
<td>.mcd</td>
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<td></td>
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</tr>
<tr>
<td>3660</td>
<td>228.12</td>
<td>.SPCS15.stVal</td>
<td>Ouput state 15</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3661</td>
<td>228.13</td>
<td>.mcd</td>
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<td></td>
</tr>
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<td>3662</td>
<td>228.14</td>
<td>.SPCS16.stVal</td>
<td>Ouput state 16</td>
<td>0/1=Off/On</td>
<td></td>
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<tr>
<td>3663</td>
<td>228.15</td>
<td>.mcd</td>
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### 2.3.1.95 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

**Table 98:** LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2848</td>
<td>178.00</td>
<td>.OpnAlm.stVal</td>
<td>TRV_T_OP_ALM</td>
<td>Opn travel time alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2849</td>
<td>178.01</td>
<td>.ClsAlm.stVal</td>
<td>TRV_T_CL_ALM</td>
<td>Cls travel time alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2850</td>
<td>178.02</td>
<td>.SprChaAlm.stVal</td>
<td>SPR_CHR_ALM</td>
<td>Spring charge alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2851</td>
<td>178.03</td>
<td>.OpCntAlm.stVal</td>
<td>OPR_ALM</td>
<td>CB operations alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2852</td>
<td>178.04</td>
<td>.OpCntLO.stVal</td>
<td>OPR_LO</td>
<td>CB operations lockout</td>
<td>1=Lockout</td>
</tr>
<tr>
<td>2853</td>
<td>178.05</td>
<td>.LonTmAlm.stVal</td>
<td>MON_ALM</td>
<td>CB inactive alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2854</td>
<td>178.06</td>
<td>.InsAlm.stVal</td>
<td>PRES_ALM</td>
<td>Low pressure alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2855</td>
<td>178.07</td>
<td>.InsBlk.stVal</td>
<td>PRES_LO</td>
<td>Low pressure lockout</td>
<td>1=Lockout</td>
</tr>
<tr>
<td>2856</td>
<td>178.08</td>
<td>.APwrAlm.stVal</td>
<td>IPOW_ALM</td>
<td>Lyt alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2857</td>
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<td>.APwrLO.stVal</td>
<td>IPOW_LO</td>
<td>Lyt lockout</td>
<td>1=Lockout</td>
</tr>
<tr>
<td>2858</td>
<td>178.10</td>
<td>.RmnNumOpAlm.stVal</td>
<td>CB_LIFE_ALM</td>
<td>CB lifetime alarm</td>
<td>1=Alarm</td>
</tr>
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### 2.3.1.96 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

Table 99: **LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 81850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>2972</td>
<td>185.12</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>General pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>2973</td>
<td>185.13</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2974</td>
<td>185.14</td>
<td>.AlmThm.general</td>
<td>ALARM</td>
<td>Thermal alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2975</td>
<td>185.15</td>
<td>.mcd</td>
<td></td>
<td></td>
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<tr>
<td>2976</td>
<td>186.00</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>General trip</td>
<td>1=Trip</td>
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<tr>
<td>2977</td>
<td>186.01</td>
<td>.mcd</td>
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### 2.3.1.97 LD0.TCSSCBR1 Trip circuit supervision (1) – TCM-1

Table 100: **LD0.TCSSCBR1 Trip circuit supervision (1) – TCM-1**

<table>
<thead>
<tr>
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<th>IEC 81850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td>2780</td>
<td>173.12</td>
<td>.CircAlm.stVal</td>
<td>ALARM</td>
<td>Supervision alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2781</td>
<td>173.13</td>
<td>.mcd</td>
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### 2.3.1.98 LD0.TCSSCBR2 Trip circuit supervision (2) – TCM-2

Table 101: **LD0.TCSSCBR2 Trip circuit supervision (2) – TCM-2**

<table>
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<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2782</td>
<td>173.14</td>
<td>.CircAlm.stVal</td>
<td>ALARM</td>
<td>Supervision alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td>2783</td>
<td>173.15</td>
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### 2.3.1.99 LD0.TRPPTRC1 Master trip (1) – 86/94-1

Table 102: **LD0.TRPPTRC1 Master trip (1) – 86/94-1**

<table>
<thead>
<tr>
<th>BitA</th>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
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<tr>
<td>2741</td>
<td>171.05</td>
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<tr>
<td>2742</td>
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<td>.Tr.general</td>
<td>-</td>
<td>Trip output signal</td>
<td>1=Trip</td>
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<tr>
<td>2743</td>
<td>171.07</td>
<td>.mcd</td>
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### 2.3.1.100 LD0.TRPPTRC2 Master trip (2) – 86/94-2

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<th>SA name</th>
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<th>Values</th>
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</thead>
<tbody>
<tr>
<td>2744</td>
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<td>.Op.general</td>
<td>-</td>
<td>Op. input signal</td>
<td>1=Operate</td>
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<tr>
<td>2745</td>
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<td>2746</td>
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<td>.Tr.general</td>
<td>-</td>
<td>Trip output signal</td>
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<td>2747</td>
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### 2.3.1.101 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

<table>
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<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>3318</td>
<td>207.06</td>
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<td>ALARM</td>
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<td>1=Alarm</td>
</tr>
<tr>
<td>3319</td>
<td>207.07</td>
<td>.mcd</td>
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### 2.3.1.102 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td>2784</td>
<td>174.00</td>
<td>.HiAlm.stVal</td>
<td>HIGH_ALARM</td>
<td>High alarm</td>
<td>1=Alarm</td>
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<td>2785</td>
<td>174.01</td>
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<td>2786</td>
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<td>.HiWrn.stVal</td>
<td>HIGH_WARN</td>
<td>High warning</td>
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<tr>
<td>2787</td>
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<td>2788</td>
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<td>.LoWrn.stVal</td>
<td>LOW_WARN</td>
<td>Low warning</td>
<td>1=Warning</td>
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<tr>
<td>2789</td>
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<td>2790</td>
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<td>.LoAlm.stVal</td>
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### LD0.VVSSPAM1 Voltage vector shift protection (1) – 78V-1

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<td>263.1</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
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<tr>
<td>4219</td>
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### LD0.WPWDE1 Wattmetric-based ground-fault protection (1) – 32N-1

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<th>Description</th>
<th>Values</th>
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<tr>
<td>3296</td>
<td>206.00</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3297</td>
<td>206.01</td>
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<tr>
<td>3298</td>
<td>206.02</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
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<tr>
<td>3299</td>
<td>206.03</td>
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### LD0.WPWDE2 Wattmetric-based ground-fault protection (2) – 32N-2

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<th>SA name</th>
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<th>Values</th>
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<td>LD0.WPWDE2</td>
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<tr>
<td>3300</td>
<td>206.04</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3301</td>
<td>206.05</td>
<td>.mcd</td>
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<tr>
<td>3302</td>
<td>206.06</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td>1=Trip</td>
</tr>
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<td>3303</td>
<td>206.07</td>
<td>.mcd</td>
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### LD0.WPWDE3 Wattmetric-based ground-fault protection (3) – 32N-3

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<th>Description</th>
<th>Values</th>
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<tbody>
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<td>LD0.WPWDE3</td>
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<tr>
<td>3304</td>
<td>206.08</td>
<td>.Str.general</td>
<td>PICKUP</td>
<td>Stage pickup</td>
<td>1=Pickup</td>
</tr>
<tr>
<td>3305</td>
<td>206.09</td>
<td>.mcd</td>
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<td></td>
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</tr>
<tr>
<td>3306</td>
<td>206.10</td>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
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</tr>
<tr>
<td>3307</td>
<td>206.11</td>
<td>.mcd</td>
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### 2.3.1.107 LD0.XAGGIO130 Physical I/O states (AIM card XA130)

**Table 110:** LD0.XAGGIO130 Physical I/O states (AIM card XA130)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3280</td>
<td>205.00</td>
<td>.Ind1.stVal</td>
<td>XA130-Input 1 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3281</td>
<td>205.01</td>
<td>.mcd</td>
<td>Mom only alternative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3282</td>
<td>205.02</td>
<td>.Ind2.stVal</td>
<td>XA130-Input 2 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3283</td>
<td>205.03</td>
<td>.mcd</td>
<td>Mom only alternative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3284</td>
<td>205.04</td>
<td>.Ind3.stVal</td>
<td>XA130-Input 3 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
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<td>3285</td>
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<td>.Ind4.stVal</td>
<td>XA130-Input 4 State</td>
<td>0/1=Off/On</td>
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</tr>
<tr>
<td>3287</td>
<td>205.07</td>
<td>.mcd</td>
<td>Mom only alternative</td>
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### 2.3.1.108 LD0.XBGGIO110 Physical I/O states (BIO card XB110)

**Table 111:** LD0.XBGGIO110 Physical I/O states (BIO card XB110)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
<tr>
<td>3216</td>
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<td>.Ind1.stVal</td>
<td>X110-Input 1 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3217</td>
<td>201.01</td>
<td>.mcd</td>
<td>Mom only alternative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3218</td>
<td>201.02</td>
<td>.Ind2.stVal</td>
<td>X110-Input 2 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>3219</td>
<td>201.03</td>
<td>.mcd</td>
<td>Mom only alternative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3220</td>
<td>201.04</td>
<td>.Ind3.stVal</td>
<td>X110-Input 3 State</td>
<td>0/1=Off/On</td>
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<td>.Ind4.stVal</td>
<td>X110-Input 4 State</td>
<td>0/1=Off/On</td>
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</tr>
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<td>3224</td>
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<td>.Ind5.stVal</td>
<td>X110-Input 5 State</td>
<td>0/1=Off/On</td>
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<td>3225</td>
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Table continues on next page
### LD0.XGGIO100 Physical I/O states (PSM card X100)

**Table 112: LD0.XGGIO100 Physical I/O states (PSM card X100)**

<table>
<thead>
<tr>
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<th>RegA</th>
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<th>Description</th>
<th>Values</th>
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<td>.mcd</td>
<td>X100-Output 1 State</td>
<td>0/1=Off/On</td>
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<tr>
<td>3249</td>
<td>203.01</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
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<tr>
<td>3250</td>
<td>203.02</td>
<td>.SPCSO2.stVal</td>
<td>.mcd</td>
<td>X100-Output 2 State</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>3251</td>
<td>203.03</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
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</tr>
<tr>
<td>3252</td>
<td>203.04</td>
<td>.SPCSO3.stVal</td>
<td>.mcd</td>
<td>X100-Output 3 State</td>
<td>0/1=Off/On</td>
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<td>203.05</td>
<td>.mcd</td>
<td>.mom-only</td>
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<td>.SPCSO4.stVal</td>
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Table continues on next page
### 2.3.1.110 LD0.XGGIO110 Physical I/O states (BIO card X110)

**Table 113: LD0.XGGIO110 Physical I/O states (BIO card X110)**

<table>
<thead>
<tr>
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<th>RegA</th>
<th>IEC 61850 name</th>
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<th>Description</th>
<th>Values</th>
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<td>X110-Input 1 State</td>
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</tr>
<tr>
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<td>201.02</td>
<td>.Ind2.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
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<td>.mcd</td>
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<td>.Ind3.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3221</td>
<td>201.05</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3222</td>
<td>201.06</td>
<td>.Ind4.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3223</td>
<td>201.07</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3224</td>
<td>201.08</td>
<td>.Ind5.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3225</td>
<td>201.09</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3226</td>
<td>201.10</td>
<td>.Ind6.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3227</td>
<td>201.11</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3228</td>
<td>201.12</td>
<td>.Ind7.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3229</td>
<td>201.13</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3230</td>
<td>201.14</td>
<td>.Ind8.stVal</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3231</td>
<td>201.15</td>
<td>.mcd</td>
<td>.mom-only</td>
<td>Mom only alternative</td>
<td></td>
</tr>
</tbody>
</table>

Table continues on next page
## LD0.XGGIO120 Physical I/O states (AIM card X120)

**Table 114:** LD0.XGGIO120 Physical I/O states (AIM card X120)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.XGGIO120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3200</td>
<td>200.00</td>
<td>.Ind1.stVal</td>
<td></td>
<td>X120-Input 1 State</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>3201</td>
<td>200.01</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3202</td>
<td>200.02</td>
<td>.Ind2.stVal</td>
<td></td>
<td>X120-Input 2 State</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>3203</td>
<td>200.03</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3204</td>
<td>200.04</td>
<td>.Ind3.stVal</td>
<td></td>
<td>X120-Input 3 State</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>3205</td>
<td>200.05</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3206</td>
<td>200.06</td>
<td>.Ind4.stVal</td>
<td></td>
<td>X120-Input 4 State</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>3207</td>
<td>200.07</td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- "mcd" indicates a Modbus data mapping.
- "mom-only" indicates a Mom only alternative.
2.3.1.112 LD0.XGGIO130 Physical I/O states (BIO card X130)

Table 115: LD0.XGGIO130 Physical I/O states (BIO card X130)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>3184</td>
<td>199.00</td>
<td>.Ind1.stVal</td>
<td>X130-Input 1 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.01</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3186</td>
<td>199.02</td>
<td>.Ind2.stVal</td>
<td>X130-Input 2 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.03</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3188</td>
<td>199.04</td>
<td>.Ind3.stVal</td>
<td>X130-Input 3 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.05</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3190</td>
<td>199.06</td>
<td>.Ind4.stVal</td>
<td>X130-Input 4 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.07</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3192</td>
<td>199.08</td>
<td>.Ind5.stVal</td>
<td>X130-Input 5 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.09</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3194</td>
<td>199.10</td>
<td>.Ind6.stVal</td>
<td>X130-Input 6 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>199.11</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3264</td>
<td>204.00</td>
<td>.SPCSO1.stVal</td>
<td>X130-Output 1 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>204.01</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3266</td>
<td>204.02</td>
<td>.SPCSO2.stVal</td>
<td>X130-Output 2 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>204.03</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
<tr>
<td>3268</td>
<td>204.04</td>
<td>.SPCSO3.stVal</td>
<td>X130-Output 3 State</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td></td>
<td>204.05</td>
<td>.mcd</td>
<td></td>
<td>Mom only alternative</td>
<td></td>
</tr>
</tbody>
</table>

2.3.2 Unmapped indications

Unmapped indications are indication data that have no initial Modbus mapping locations, but can be added to the user-definable Modbus area using the Communication...
Management tool in PCM600. If Modbus events are enabled for these indication signals, the event identification is the user-definable area address.

### 2.3.2.1 All premapped three-phase protection function stages, trip/phase-dependent objects added

#### Table 116: All premapped three-phase protection function stages, trip/phase-dependent objects added

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD0.xxxxxxxxx (various)</td>
<td>.Op.phsA</td>
<td>Phs A trip</td>
<td>1 = Trip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Op.phsB</td>
<td>Phs B trip</td>
<td>1 = Trip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Op.phsC</td>
<td>Phs C trip</td>
<td>1 = Trip</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2.3.2.2 Common data 2

#### Table 117: Common data 2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD0.LDEV1</td>
<td>.StLstOv.stVal</td>
<td>Internal ind. overflow</td>
<td>1=Overflow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.MeasLstOv.stVal</td>
<td>Internal meas. overflow</td>
<td>1=Overflow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.ChgLizg.stVal</td>
<td>Configuration changed</td>
<td>1=Changed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.FacSet.stVal</td>
<td>Factory settings in use</td>
<td>1=In use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD0.GNRLLTMS1</td>
<td>.TmChSt1.stVal</td>
<td>Time synch. status</td>
<td>0/1=Down/Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD0.SCHLCCH1</td>
<td>.Chd.stVal</td>
<td>Ethernet channel 1 live</td>
<td>1=Live</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD0.SCHLCCH2</td>
<td>.Chd.stVal</td>
<td>Ethernet channel 2 live</td>
<td>1=Live</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table continues on next page
### 2.3.2.3 LD0.CBPSOF1 Switch onto fault (1) – SOTF-1

**Table 118: LD0.CBPSOF1 Switch onto fault (1) – SOTF-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>.ChLiv.stVal</td>
<td>CH3LIV</td>
<td>Ethernet channel 3 live</td>
<td></td>
<td>1=Live</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>.Op.general</td>
<td>TRIP</td>
<td>Stage trip</td>
<td></td>
<td>1=Trip</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.4 LD0.DARREC1 Autoreclosing (1) – 79-1

**Table 119: LD0.DARREC1 Autoreclosing (1) – 79-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>.InhRec.stVal</td>
<td>INHIBIT_RECL</td>
<td>Inhibit reclose</td>
<td></td>
<td>1=Inhibit</td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.InBlkThm.stVal</td>
<td>BLK_THERM</td>
<td>Thermal block</td>
<td></td>
<td>1=Block</td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.5 LD0.DIAGLCCH1 Ethernet supervision (1)

**Table 120: LD0.DIAGLCCH1 Ethernet supervision (1)**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>.ChLiv.stVal</td>
<td>CHLIV</td>
<td>Ethernet channel live</td>
<td></td>
<td>1=Live</td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.RedChLiv.stVal</td>
<td>REDCHLIV</td>
<td>Red. Ethernet channel live</td>
<td></td>
<td>1=Live</td>
<td></td>
</tr>
<tr>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3.2.6 LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1) – MCS-A

Table 121: LD0.HZCCASPVC1 Current transformer supervision for high-impedance protection scheme for phase A (1) – MCS-A

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.HZCCASPVC1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td>Phase A alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3.2.7 LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1) – MCS-B

Table 122: LD0.HZCCBSPVC1 Current transformer supervision for high-impedance protection scheme for phase B (1) – MCS-B

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.HZCCBSPVC1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td>Phase A alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3.2.8 LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1) – MCS-C

Table 123: LD0.HZCCCSPVC1 Current transformer supervision for high-impedance protection scheme for phase C (1) – MCS-C

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.HZCCCSPVC1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td>Phase A alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.3.2.9 LD0.IL1TCTR1 Three-phase CT supervision (1)

Table 124: LD0.IL1TCTR1 Three-phase CT supervision (1)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.IL1TCTR1</td>
<td></td>
<td>Alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td>Alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Wm.stVal</td>
<td>WARNING</td>
<td>Warning</td>
<td>1=Warning</td>
</tr>
</tbody>
</table>
### 2.3.2.10 LD0.LDPRLRC1 Load profile record (1) – LoadProf

**Table 125: LD0.LDPRLRC1 Load profile record (1) – LoadProf**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.LDPRLRC1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.MemWrn.stVal</td>
<td>MemWrn</td>
<td>Recording memory warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td>MemWrn</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.MemAlm.stVal</td>
<td>MemAlm</td>
<td>Recording memory alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td>MemAlm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.11 LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1

**Table 126: LD0.MAPGAPC1 Multipurpose protection (1) – MAP-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.MAPGAPC1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Str.general</td>
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### 2.3.2.12 LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2

**Table 127: LD0.MAPGAPC2 Multipurpose protection (2) – MAP-2**

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## 2.3.2.13 LD0.MAPGAPC3 Multipurpose protection (3) – MAP-3

Table 128: **LD0.MAPGAPC3 Multipurpose protection (3) – MAP-3**

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## 2.3.2.14 LD0.MAPGAPC4 Multipurpose protection (4) – MAP-4

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## 2.3.2.15 LD0.MAPGAPC5 Multipurpose protection (5) – MAP-5

Table 130: **LD0.MAPGAPC5 Multipurpose protection (5) – MAP-5**

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### 2.3.2.16 LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6

**Table 131: LD0.MAPGAPC6 Multipurpose protection (6) – MAP-6**

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### 2.3.2.17 LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7

**Table 132: LD0.MAPGAPC7 Multipurpose protection (7) – MAP-7**

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### 2.3.2.18 LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8

**Table 133: LD0.MAPGAPC8 Multipurpose protection (8) – MAP-8**

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### Table 134: LD0.MAPGAPC9 Multipurpose protection (9) – MAP-9

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### Table 135: LD0.MAPGAPC10 Multipurpose protection (10) – MAP-10

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### Table 136: LD0.MAPGAPC11 Multipurpose protection (11) – MAP-11

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### 2.3.2.22 LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12

Table 137: LD0.MAPGAPC12 Multipurpose protection (12) – MAP-12

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### 2.3.2.23 LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13

Table 138: LD0.MAPGAPC13 Multipurpose protection (13) – MAP-13

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### 2.3.2.24 LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14

Table 139: LD0.MAPGAPC14 Multipurpose protection (14) – MAP-14

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### 2.3.2.25 LD0.MAPGAPC15 Multipurpose protection (15) – MAP-15

**Table 140: LD0.MAPGAPC15 Multipurpose protection (15) – MAP-15**

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### 2.3.2.26 LD0.MAPGAPC16 Multipurpose protection (16) – MAP-16

**Table 141: LD0.MAPGAPC16 Multipurpose protection (16) – MAP-16**

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### 2.3.2.27 LD0.MAPGAPC17 Multipurpose protection (17) – MAP-17

**Table 142: LD0.MAPGAPC17 Multipurpose protection (17) – MAP-17**

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### 2.3.2.28 LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18

**Table 143: LD0.MAPGAPC18 Multipurpose protection (18) – MAP-18**

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### 2.3.2.29 LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

**Table 144: LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1**

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<td>OpTmAlm.stVal</td>
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### 2.3.2.30 LD0.MSVPR1 Three-phase remnant undervoltage protection (1) – 27R-1

**Table 145: LD0.MSVPR1 Three-phase remnant undervoltage protection (1) – 27R-1**

<table>
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<th>SA name</th>
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### 2.3.2.31 LD0.MSVPR2 Three-phase remnant undervoltage protection (2) – 27R-2

**Table 146: LD0.MSVPR2 Three-phase remnant undervoltage protection (2) – 27R-1**

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<td>Low remanent voltage</td>
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### 2.3.2.32 LD0.NSPTOV2 Negative-sequence overvoltage protection (2) – 47-2

Table 147: 

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<td>.Str.phsB</td>
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<td></td>
<td>.Op.general</td>
<td>TRIP</td>
<td>1=Trip</td>
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<td>.mcd</td>
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<td>.Op.phsC</td>
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### 2.3.2.33 LD0.PSPTUV2 Positive-sequence undervoltage protection (2) – 47U-2

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<td>.mcd</td>
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<td></td>
<td></td>
<td>.Str.phsB</td>
<td>Phs B pickup</td>
<td>1=Pickup</td>
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<td></td>
<td>.Str.phsC</td>
<td>Phs C pickup</td>
<td>1=Pickup</td>
</tr>
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<td>.Op.general</td>
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<th>Description</th>
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<tr>
<td>.Op.phsB</td>
<td>.mcd</td>
<td>Phs B trip</td>
<td></td>
<td>1=Trip</td>
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<tr>
<td>.Op.phsC</td>
<td>.mcd</td>
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### 2.3.2.34 LD0.RESTCTR1 IG CT supervision (1)

**Table 149: LD0.RESTCTR1 IG CT supervision (1)**

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<td>.Alm.stVal</td>
<td>.mcd</td>
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<td>WARNING</td>
<td>Warning</td>
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<td>.Wrn.stVal</td>
<td>.mcd</td>
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### 2.3.2.35 LD0.RESTCTR2 IG CT supervision (2)

**Table 150: LD0.RESTCTR2 IG CT supervision (2)**

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<td>1=Alarm</td>
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<td>.Alm.stVal</td>
<td>.mcd</td>
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<td>WARNING</td>
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<td>1=Warning</td>
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<td>.Wrn.stVal</td>
<td>.mcd</td>
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### 2.3.2.36 LD0.RESTVTR1 VG VT supervision (1)

**Table 151: LD0.RESTVTR1 VG VT supervision (1)**

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<td>.Alm.stVal</td>
<td>.mcd</td>
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<td>WARNING</td>
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### 2.3.2.37 LD0.SCEFRLFLO1 Fault locator (1) – 21FL-1

**Table 152: LD0.SCEFRLFLO1 Fault locator (1) – 21FL-1**

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<td>Fault locator alarm</td>
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<td>.mcd</td>
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<tr>
<td>.TrgSt.stVal</td>
<td>TRIGG</td>
<td>Distance calculation trig</td>
<td>1 = Triggered</td>
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Table continues on next page

### 2.3.2.38 LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

**Table 153: LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1**

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<td>.SPCSO2.stVal</td>
<td>Ouput state 2</td>
<td>0/1=Off/On</td>
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<td>.mcd</td>
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<td>.SPCSO3.stVal</td>
<td>Ouput state 3</td>
<td>0/1=Off/On</td>
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<td>.SPCSO4.stVal</td>
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<td>0/1=Off/On</td>
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<td>.mcd</td>
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<td>.SPCSO5.stVal</td>
<td>Ouput state 5</td>
<td>0/1=Off/On</td>
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<td>.SPCSO6.stVal</td>
<td>Ouput state 6</td>
<td>0/1=Off/On</td>
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<td>.SPCSO7.stVal</td>
<td>Ouput state 7</td>
<td>0/1=Off/On</td>
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<td>.SPCSO8.stVal</td>
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<td>0/1=Off/On</td>
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<td>.SPCSO9.stVal</td>
<td>Ouput state 9</td>
<td>0/1=Off/On</td>
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<td>.mcd</td>
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<td>.SPCSO10.stVal</td>
<td>Ouput state 10</td>
<td>0/1=Off/On</td>
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<td>.SPCSO11.stVal</td>
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### 2.3.2.39 LD0.TRPPTRC3 Master trip (3) – 86/94-3

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<td>.SPCSO13.stVal</td>
<td></td>
<td>Ouput state 13</td>
<td>0/1=Off/On</td>
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<td>.SPCSO14.stVal</td>
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<td>Ouput state 14</td>
<td>0/1=Off/On</td>
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<td>.SPCSO15.stVal</td>
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<td>0/1=Off/On</td>
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### 2.3.2.40 LD0.TRPPTRC4 Master trip (4) – 86/94-4

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### 2.3.2.41 LD0.TRPPTRC5 Master trip (5) – 86/94-5

Table 156: LD0.TRPPTRC5 Master trip (5) – 86/94-5

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<tr>
<td></td>
<td>.Tr.general</td>
<td>Trip output signal</td>
<td></td>
<td>1 = Trip</td>
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### 2.3.2.42 LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1

Table 157: LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1

<table>
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<td>.UpCntSt.stVal</td>
<td>UPCNT_STS</td>
<td>Status of the up counting</td>
<td>1= up counting</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.43 LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

Table 158: LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.UDFCNT2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.DnCntSt.stVal</td>
<td>DNCNT_STS</td>
<td>Status of the down counting</td>
<td>1= down counting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.UpCntSt.stVal</td>
<td>UPCNT_STS</td>
<td>Status of the up counting</td>
<td>1= up counting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3.2.44 LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LD0. UDFCNT3</td>
<td>.DnCntSt.stVal</td>
<td>DNCNT_STS</td>
<td>Status of the down counting</td>
<td>1= down counting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD0. UDFCNT3</td>
<td>.UpCntSt.stVal</td>
<td>UPCNT_STS</td>
<td>Status of the up counting</td>
<td>1= up counting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.45 LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LD0. UDFCNT4</td>
<td>.DnCntSt.stVal</td>
<td>DNCNT_STS</td>
<td>Status of the down counting</td>
<td>1= down counting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD0. UDFCNT4</td>
<td>.UpCntSt.stVal</td>
<td>UPCNT_STS</td>
<td>Status of the up counting</td>
<td>1= up counting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.46 LD0.UL1TVTR1 Three-phase VT supervision (1)

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LD0.UL1TVTR1</td>
<td>.Alm.stVal</td>
<td>ALARM</td>
<td>Alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD0.UL1TVTR1</td>
<td>.Wrn.stVal</td>
<td>WARNING</td>
<td>Warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.3.2.47 LD0.UL1TVTR2 Three-phase VT supervision (2)

Table 162: **LD0.UL1TVTR2 Three-phase VT supervision (2)**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.UL1TVTR2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Alm.stVal</td>
<td>.mcd</td>
<td>ALARM</td>
<td>Alarm</td>
<td>1=Alarm</td>
<td></td>
</tr>
<tr>
<td>.Wrn.stVal</td>
<td>.mcd</td>
<td>WARNING</td>
<td>Warning</td>
<td>1=Warning</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.48 LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2

Table 163: **LD0.VMHAI2 Voltage total harmonic distortion (2) – PQVPH-2**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.VMHAI2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.Alm.stVal</td>
<td>.mcd</td>
<td>ALARM</td>
<td>Alarm</td>
<td>1=Alarm</td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.49 LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)

Table 164: **LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.VMMXU2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.HiAlm.stVal</td>
<td>.mcd</td>
<td>HIGH_ALARM</td>
<td>High alarm</td>
<td>1 = Alarm</td>
<td></td>
</tr>
<tr>
<td>.HiWrn.stVal</td>
<td>.mcd</td>
<td>HIGH_WARN</td>
<td>High warning</td>
<td>1 = Warning</td>
<td></td>
</tr>
<tr>
<td>.LoWrn.stVal</td>
<td>.mcd</td>
<td>LOW_WARN</td>
<td>Low warning</td>
<td>1 = Warning</td>
<td></td>
</tr>
<tr>
<td>.LoAlm.stVal</td>
<td>.mcd</td>
<td>LOW_ALARM</td>
<td>Low alarm</td>
<td>1 = Alarm</td>
<td></td>
</tr>
</tbody>
</table>
### 2.3.2.50 LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1

**Table 165: LD0.VSQVUB1 Voltage unbalance (1) – PQVUB-1**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.VSQVUB1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.VarStr.stVal</td>
<td></td>
<td>Unbalance alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.HiPctVUnb.stVal</td>
<td></td>
<td>Percentile Unbalance alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.51 LD0.XARGGIO130 Alarm/warning

**Table 166: LD0.XARGGIO130 Alarm/warning**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.XARGGIO130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td></td>
<td>XARGGIO130 alarm</td>
<td>1 = Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Wrn.stVal</td>
<td></td>
<td>XARGGIO130 warning</td>
<td>1 = Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.3.2.52 LD0.XRGGIO130 Alarm/warning

**Table 167: LD0.XRGGIO130 Alarm/warning**

<table>
<thead>
<tr>
<th>BitA</th>
<th>RegA</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD0.XRGGIO130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Alm.stVal</td>
<td></td>
<td>XRGGIO130 alarm</td>
<td>1=Alarm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.Wrn.stVal</td>
<td></td>
<td>XRGGIO130 warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.mcd</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.4 Registers

Table 168: Explanations of columns in register tables

<table>
<thead>
<tr>
<th>Column name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RegA</td>
<td>Default 3X and 4X register address for the data.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of the register. The alternatives are u16, u32 (unsigned 16 and 32 bits integer) or i16, i32 (signed 16 and 32 bit integer).</td>
</tr>
<tr>
<td>Scale</td>
<td>Scale factor as default. Also, an adjustable offset value exists that is set to 0 by default.</td>
</tr>
<tr>
<td>IEC 61850 name</td>
<td>Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.</td>
</tr>
<tr>
<td>SA name</td>
<td>The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.</td>
</tr>
<tr>
<td>Description</td>
<td>Short description of the signal. See the technical manual for more information. Also, if a register is writable, it is stated here.</td>
</tr>
<tr>
<td>Values</td>
<td>The value range of the original IEC 61850 value, that is, before scaling.</td>
</tr>
</tbody>
</table>

2.4.1 Premapped registers

2.4.1.1 Active parameter setting group - read and write

Table 169: Active parameter setting group - read and write

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2301</td>
<td>u16</td>
<td>1</td>
<td></td>
<td></td>
<td>Active setting group</td>
<td>1...6</td>
</tr>
</tbody>
</table>

2.4.1.2 Control structure 1

Table 170: Control structure 1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>
### 2.4.1.3 Control structure 2

**Table 171: Control structure 2**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>

### 2.4.1.4 Control structure 3

**Table 172: Control structure 3**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8012</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>

### 2.4.1.5 Control structure 4

**Table 173: Control structure 4**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8017</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8018</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8019</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>
### 2.4.1.6 Control structure 5

**Table 174: Control structure 5**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8021</td>
<td>Execute</td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8022</td>
<td>Password</td>
<td>acc to setting</td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8023</td>
<td>Password</td>
<td>acc to setting</td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8024</td>
<td>Control</td>
<td>&lt; single bit &gt;</td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8025</td>
<td>Confirm</td>
<td>&lt; single bit &gt;</td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>

### 2.4.1.7 Control structure 6

**Table 175: Control structure 6**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8026</td>
<td>Execute</td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8027</td>
<td>Password</td>
<td>acc to setting</td>
<td></td>
<td></td>
<td>Password reg 1</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8028</td>
<td>Password</td>
<td>acc to setting</td>
<td></td>
<td></td>
<td>Password reg 2</td>
<td>acc to setting</td>
</tr>
<tr>
<td>8029</td>
<td>Control</td>
<td>&lt; single bit &gt;</td>
<td></td>
<td></td>
<td>Control register</td>
<td>&lt; single bit &gt;</td>
</tr>
<tr>
<td>8030</td>
<td>Confirm</td>
<td>&lt; single bit &gt;</td>
<td></td>
<td></td>
<td>Confirm register</td>
<td>&lt; single bit &gt;</td>
</tr>
</tbody>
</table>

### 2.4.1.8 Control structure 7

**Table 176: Control structure 7**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>8031</td>
<td>Execute</td>
<td></td>
<td></td>
<td></td>
<td>Execute register</td>
<td>1</td>
</tr>
<tr>
<td>8032</td>
<td>Password</td>
<td>acc to setting</td>
<td></td>
<td></td>
<td>Password reg 1</td>
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### 2.4.1.9  Control structure 8

**Table 177: Control structure 8**

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### 2.4.1.10  Device ID string

**Table 178: Device ID string**

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1) See the technical manual.

### 2.4.1.11  Event record structure

**Table 179: Event record structure**

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### Modbus data mappings

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## Modbus data mappings

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Record 7 data to read: If selected

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Timestamp of record

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<td>1)</td>
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Record 8 data to read: If selected

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>9329</td>
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<td>9330</td>
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<td></td>
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<td>- Unread records left</td>
<td>0...499</td>
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Timestamp of record

<table>
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<td>- Year, Month</td>
<td>Year/Month</td>
</tr>
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<td>9332</td>
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<td>- Day, Hour</td>
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Record 9 data to read: If selected

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<td>- Record sequence num</td>
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</table>

Table continues on next page
### 2.4.1.12 Fault record structure header

#### Table 180: Fault record structure header

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<td>- Year, Month</td>
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</tr>
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<td>Min/Sec</td>
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<td>Millisecond</td>
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</table>

1) See the technical manual.

---

**Section 2**

Modbus data mappings

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REF615 ANSI

Point List Manual
### Fault record data

The table shows all potential data available in the fault record application. Which data is actually recorded depends on the functions available and enabled in the protection relay's configuration.

#### Table 181: Fault record data

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<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
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<td>0...65535</td>
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<td>Unread records left</td>
<td>0...99</td>
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<td>9405</td>
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<td>Year, month</td>
<td>Year/Month</td>
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<td>Day/Hour</td>
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2.4.1.13
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<td>.Max50DifAB.mag</td>
<td>Max. diff. current phs B</td>
<td>0.000…80.000 [pu]</td>
<td></td>
</tr>
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<td>9424</td>
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<td>Max. diff. current phs C</td>
<td>0.000…80.000 [pu]</td>
<td></td>
</tr>
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<td>1000</td>
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<td>Max. bias current phs A</td>
<td>0.000…50.000 [pu]</td>
<td></td>
</tr>
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</tr>
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</tr>
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<td>Diff. current phs B</td>
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</tr>
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<td>.RstAPhsB.mag</td>
<td>Bias current phs B</td>
<td>0.000…50.000 [pu]</td>
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</tr>
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<td>0.000…50.000 [pu]</td>
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</tr>
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</tr>
<tr>
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<td>0.000…50.000 [×In]</td>
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<td>0.000…50.000 [×In]</td>
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<td>.APhsA1.mag</td>
<td>Current phs A(1)</td>
<td>0.000…50.000 [×In]</td>
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</tr>
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<td>Current phs B(1)</td>
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</tr>
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<td>Current phs C(1)</td>
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</tr>
<tr>
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<td>u16</td>
<td>1000</td>
<td>.ARes1.mag</td>
<td>Current Io(1)</td>
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<td>Current Io-Calc(1)</td>
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</table>

Table continues on next page
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<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
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<td>Voltage phs B(1)</td>
<td>0.000…4.000 [×Un]</td>
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<td></td>
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<td>-10.00…10.00 [Hz/s]</td>
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<td>i16</td>
<td>100</td>
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<td>Conductance Yo</td>
<td>-1000.00…1000.00 [mS]</td>
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<td>100</td>
<td>.SusNeut.mag</td>
<td></td>
<td>Susceptance Yo</td>
<td>-1000.00…1000.00 [mS]</td>
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<td>i32</td>
<td>100</td>
<td>.PPLoopRis.mag</td>
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<td>Fault loop resistance</td>
<td>-1000.00…1000.00 [ohm]</td>
</tr>
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<td>i32</td>
<td></td>
<td></td>
<td></td>
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<td>.PPLoopReact.mag</td>
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<td>Fault loop reactance</td>
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<td>9465</td>
<td>i32</td>
<td></td>
<td></td>
<td></td>
<td>(Low word)</td>
<td></td>
</tr>
<tr>
<td>9466</td>
<td>u16</td>
<td>1000</td>
<td>.CBClrTm.mag</td>
<td></td>
<td>Breaker clear time</td>
<td>0.000…3.000 [s]</td>
</tr>
<tr>
<td>9467</td>
<td>u16</td>
<td>1000</td>
<td>.APhsA2.mag</td>
<td></td>
<td>Current phs A(2)</td>
<td>0.000…50.000 [×In]</td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>9468</td>
<td>u16</td>
<td>1000</td>
<td>.APhsB2.mag</td>
<td></td>
<td>Current phs B(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9469</td>
<td>u16</td>
<td>1000</td>
<td>.APhsC2.mag</td>
<td></td>
<td>Current phs C(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9470</td>
<td>u16</td>
<td>1000</td>
<td>.ARes2.mag</td>
<td></td>
<td>Current Io(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9471</td>
<td>u16</td>
<td>1000</td>
<td>.AResClc2.mag</td>
<td></td>
<td>Current Io-Calc(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9472</td>
<td>u16</td>
<td>1000</td>
<td>.APsSeq2.mag</td>
<td></td>
<td>Current Ps-Seq(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9473</td>
<td>u16</td>
<td>1000</td>
<td>.ANgSeq2.mag</td>
<td></td>
<td>Current Ng-Seq(2)</td>
<td>0.000...50.000 [×In]</td>
</tr>
<tr>
<td>9474</td>
<td>u16</td>
<td>1000</td>
<td>.PhVPhsA2.mag</td>
<td></td>
<td>Voltage phs A(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9475</td>
<td>u16</td>
<td>1000</td>
<td>.PhVPhsB2.mag</td>
<td></td>
<td>Voltage phs B(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9476</td>
<td>u16</td>
<td>1000</td>
<td>.PhVPhsC2.mag</td>
<td></td>
<td>Voltage phs C(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9477</td>
<td>u16</td>
<td>1000</td>
<td>.PPVPhsAB2.mag</td>
<td></td>
<td>Voltage phs AB(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9478</td>
<td>u16</td>
<td>1000</td>
<td>.PPVPhsBC2.mag</td>
<td></td>
<td>Voltage phs BC(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9479</td>
<td>u16</td>
<td>1000</td>
<td>.PPVPhsCA2.mag</td>
<td></td>
<td>Voltage phs CA(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9480</td>
<td>u16</td>
<td>1000</td>
<td>.VRes2.mag</td>
<td></td>
<td>Voltage Uo(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9481</td>
<td>u16</td>
<td>1000</td>
<td>.VZro2.mag</td>
<td></td>
<td>Voltage Zro-Seq(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9482</td>
<td>u16</td>
<td>1000</td>
<td>.VPsSeq2.mag</td>
<td></td>
<td>Voltage Ps-Seq(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9483</td>
<td>u16</td>
<td>1000</td>
<td>.VNgSeq2.mag</td>
<td></td>
<td>Voltage Ng-Seq(2)</td>
<td>0.000...4.000 [×Un]</td>
</tr>
<tr>
<td>9484</td>
<td>i16</td>
<td>100</td>
<td>.DifANAngVN1.mag</td>
<td></td>
<td>Angle Uo-io(1)</td>
<td>-180.00...180.00 [deg]</td>
</tr>
<tr>
<td>9485</td>
<td>i16</td>
<td>100</td>
<td>.DifAAAngVBC1.mag</td>
<td></td>
<td>Angle UBC-IA(1)</td>
<td>-180.00...180.00 [deg]</td>
</tr>
<tr>
<td>9486</td>
<td>i16</td>
<td>100</td>
<td>.DifABAngVCA1.mag</td>
<td></td>
<td>Angle UCA-IB(1)</td>
<td>-180.00...180.00 [deg]</td>
</tr>
<tr>
<td>9487</td>
<td>i16</td>
<td>100</td>
<td>.DifACAngVAB1.mag</td>
<td></td>
<td>Angle UAB-IC(1)</td>
<td>-180.00...180.00 [deg]</td>
</tr>
<tr>
<td>9488</td>
<td>i16</td>
<td>100</td>
<td>.DifANAngVN2.mag</td>
<td></td>
<td>Angle Uo-io(2)</td>
<td>-180.00...180.00 [deg]</td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>9489</td>
<td>i16</td>
<td>100</td>
<td>.DifAAAngVBC2.mag.</td>
<td></td>
<td>Angle UBC-IA(2)</td>
<td>-180.00…180.00 [deg]</td>
</tr>
<tr>
<td>9490</td>
<td>i16</td>
<td>100</td>
<td>.DifABAngVCA2.mag</td>
<td></td>
<td>Angle UCA-IB(2)</td>
<td>-180.00…180.00 [deg]</td>
</tr>
<tr>
<td>9491</td>
<td>i16</td>
<td>100</td>
<td>.DifACAngVAB2.mag</td>
<td></td>
<td>Angle UAB-IC(2)</td>
<td>-180.00…180.00 [deg]</td>
</tr>
</tbody>
</table>

2.4.1.14 Protection relay's real-time clock (in local time mode) - read and write (synchronize)

Table 182: Protection relay's real-time clock (in local time mode) - read and write (synchronize)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>9201</td>
<td></td>
<td></td>
<td>Control register</td>
<td></td>
<td></td>
<td>0…2(^1)</td>
</tr>
<tr>
<td>9202</td>
<td></td>
<td></td>
<td>Year</td>
<td></td>
<td></td>
<td>2000…2999</td>
</tr>
<tr>
<td>9203</td>
<td></td>
<td></td>
<td>Month</td>
<td></td>
<td></td>
<td>1…12</td>
</tr>
<tr>
<td>9204</td>
<td></td>
<td></td>
<td>Day</td>
<td></td>
<td></td>
<td>1…31</td>
</tr>
<tr>
<td>9205</td>
<td></td>
<td></td>
<td>Hour</td>
<td></td>
<td></td>
<td>0…23</td>
</tr>
<tr>
<td>9206</td>
<td></td>
<td></td>
<td>Minute</td>
<td></td>
<td></td>
<td>0…59</td>
</tr>
<tr>
<td>9207</td>
<td></td>
<td></td>
<td>Second</td>
<td></td>
<td></td>
<td>0…59</td>
</tr>
<tr>
<td>9208</td>
<td></td>
<td></td>
<td>Millisecond</td>
<td></td>
<td></td>
<td>0…999</td>
</tr>
</tbody>
</table>

1) See the technical manual.

2.4.1.15 Protection relay's real-time clock (in UTC time mode) - read and write (synchronize)

Table 183: Protection relay's real-time clock (in UTC time mode) - read and write (synchronize)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>9211</td>
<td></td>
<td></td>
<td>Control register</td>
<td></td>
<td></td>
<td>0…2(^1)</td>
</tr>
<tr>
<td>9212</td>
<td></td>
<td></td>
<td>Year</td>
<td></td>
<td></td>
<td>2000…2999</td>
</tr>
<tr>
<td>9213</td>
<td></td>
<td></td>
<td>Month</td>
<td></td>
<td></td>
<td>1…12</td>
</tr>
<tr>
<td>9214</td>
<td></td>
<td></td>
<td>Day</td>
<td></td>
<td></td>
<td>1…31</td>
</tr>
<tr>
<td>9215</td>
<td></td>
<td></td>
<td>Hour</td>
<td></td>
<td></td>
<td>0…23</td>
</tr>
<tr>
<td>9216</td>
<td></td>
<td></td>
<td>Minute</td>
<td></td>
<td></td>
<td>0…59</td>
</tr>
<tr>
<td>9217</td>
<td></td>
<td></td>
<td>Second</td>
<td></td>
<td></td>
<td>0…59</td>
</tr>
<tr>
<td>9218</td>
<td></td>
<td></td>
<td>Millisecond</td>
<td></td>
<td></td>
<td>0…999</td>
</tr>
</tbody>
</table>

1) See the technical manual.
### 2.4.1.16 Indication bits mirrored in registers

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>170.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Indication bit 2720 (0x1700)</td>
<td></td>
</tr>
<tr>
<td>170.01</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Indication bit 2721 (0x1701)</td>
<td></td>
</tr>
<tr>
<td>170.14</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Indication bit 2734 (0x170E)</td>
<td></td>
</tr>
<tr>
<td>170.15</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Indication bit 2735 (0x170F)</td>
<td></td>
</tr>
<tr>
<td>171.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Indication bit 2736 (0x1710)</td>
<td></td>
</tr>
</tbody>
</table>

### 2.4.1.17 SSR1 System status register (1) device health

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>128.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Device global error</td>
<td>1=Error</td>
</tr>
<tr>
<td>128.01</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Device global warning</td>
<td>1=Warning</td>
</tr>
<tr>
<td>128.02</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.03</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.04</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.05</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.06</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.07</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.08</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.09</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.10</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.11</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.12</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.13</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.14</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
<tr>
<td>128.15</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; reserved &gt;</td>
<td>0</td>
</tr>
</tbody>
</table>
### 2.4.1.18 SSR2 System status register (2) protection relay's mode and state

**Table 186:** SSR2 System status register (2) protection relay's mode and state

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>129.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Device test mode</td>
<td>1=Test mode</td>
</tr>
<tr>
<td>129.01</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.02</td>
<td>Bit</td>
<td></td>
<td>Remote/Local state</td>
<td></td>
<td></td>
<td>0/1=Rem/Loc</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Active setting group</td>
<td></td>
<td></td>
<td>SG=1...6</td>
</tr>
<tr>
<td>129.03</td>
<td>Bit</td>
<td></td>
<td>- bit 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>129.04</td>
<td>Bit</td>
<td></td>
<td>- bit 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>129.05</td>
<td>Bit</td>
<td></td>
<td>- bit 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>129.06</td>
<td>Bit</td>
<td></td>
<td>Protection relay's timesynch failure</td>
<td></td>
<td></td>
<td>1=Failure</td>
</tr>
<tr>
<td>129.07</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.08</td>
<td>Bit</td>
<td></td>
<td>Last reset cause a</td>
<td></td>
<td></td>
<td>1=Cold start</td>
</tr>
<tr>
<td>129.09</td>
<td>Bit</td>
<td></td>
<td>Last reset cause b</td>
<td></td>
<td></td>
<td>1=Watchdog</td>
</tr>
<tr>
<td>129.10</td>
<td>Bit</td>
<td></td>
<td>Last reset cause c</td>
<td></td>
<td></td>
<td>1=Warm start</td>
</tr>
<tr>
<td>129.11</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.12</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.13</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.14</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>129.15</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### 2.4.1.19 SSR3 System status register (3) data available 1 (client-dependent)

**Table 187:** SSR3 System status register (3) data available 1 (client-dependent)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Unread event records available</td>
<td>1=Available</td>
</tr>
<tr>
<td>130.01</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Unread fault records available</td>
<td>1=Available</td>
</tr>
<tr>
<td>130.02</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>130.03</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>130.04</td>
<td>Bit</td>
<td></td>
<td>Any momentary bit updated</td>
<td></td>
<td></td>
<td>1=Updated</td>
</tr>
<tr>
<td>130.05</td>
<td>Bit</td>
<td></td>
<td>Any mcd bit set</td>
<td></td>
<td></td>
<td>1=Set</td>
</tr>
<tr>
<td>130.06</td>
<td>Bit</td>
<td></td>
<td>Device restart bit</td>
<td></td>
<td></td>
<td>1=IED restart</td>
</tr>
<tr>
<td>130.07</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>130.08</td>
<td>Bit</td>
<td></td>
<td>Event record selected</td>
<td></td>
<td></td>
<td>1=Selected</td>
</tr>
<tr>
<td>130.09</td>
<td>Bit</td>
<td></td>
<td>Fault record selected</td>
<td></td>
<td></td>
<td>1=Selected</td>
</tr>
<tr>
<td>130.10</td>
<td>Bit</td>
<td></td>
<td>&lt; reserved &gt;</td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

Table continues on next page
2.4.1.20  SSR4 System status register (4) data available 2 (client-dependent, user-definable)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>130.11</td>
<td>Bit</td>
<td>&lt; reserved &gt;</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.12</td>
<td>Bit</td>
<td>&lt; reserved &gt;</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.13</td>
<td>Bit</td>
<td>&lt; reserved &gt;</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.14</td>
<td>Bit</td>
<td>&lt; reserved &gt;</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130.15</td>
<td>Bit</td>
<td>&lt; reserved &gt;</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.4.1.21  SSR5 System status register (5) device alive register

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>132</td>
<td>u16</td>
<td>1</td>
<td>Device alive counter</td>
<td>0...65535</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.4.1.22 SSR6 System status register (6) control command status (client-dependent)

Table 190: SSR6 System status register (6) control command status (client-dependent)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>133.00</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 0</td>
<td></td>
</tr>
<tr>
<td>133.01</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 1</td>
<td></td>
</tr>
<tr>
<td>133.02</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 2</td>
<td></td>
</tr>
<tr>
<td>133.03</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 3</td>
<td></td>
</tr>
<tr>
<td>133.04</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 4</td>
<td></td>
</tr>
<tr>
<td>133.05</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 5</td>
<td></td>
</tr>
<tr>
<td>133.06</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 6</td>
<td></td>
</tr>
<tr>
<td>133.07</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>- bit 7</td>
<td></td>
</tr>
<tr>
<td>133.08</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.09</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.10</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.11</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.12</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.13</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.14</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>133.15</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) See the technical manual.

2.4.1.23 System diagnostic values

Table 191: System diagnostic values

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2050</td>
<td>u16</td>
<td>1</td>
<td>.DevWm.stVal</td>
<td>Warning</td>
<td>Last warning code</td>
<td>1)</td>
</tr>
<tr>
<td>2051</td>
<td>u16</td>
<td>1</td>
<td>.DevFail.stVal</td>
<td>Internal fault</td>
<td>Last internal fault code</td>
<td>1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DR.RDRE1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2052</td>
<td>u16</td>
<td>1</td>
<td>.FltNum.stVal</td>
<td>Num. of DR recordings</td>
<td>0...N</td>
<td></td>
</tr>
<tr>
<td>2053</td>
<td>u16</td>
<td>1</td>
<td>.MemUsed.stVal</td>
<td>DR memory used</td>
<td>0...100 [%]</td>
<td></td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2054</td>
<td>u16</td>
<td>1</td>
<td>.NumPwrUp.stVal</td>
<td>LD0.LP.hd1.stVal</td>
<td>Num. of cold starts</td>
<td>0...65535</td>
</tr>
<tr>
<td>2055</td>
<td>u16</td>
<td>1</td>
<td>.WrmStr.stVal</td>
<td>LD0.LDEV1</td>
<td>Num. of warm starts</td>
<td>0...65535</td>
</tr>
<tr>
<td>2056</td>
<td>u16</td>
<td>1</td>
<td>.WacTrg.stVal</td>
<td></td>
<td>Num. of watchdog resets</td>
<td>0...65535</td>
</tr>
<tr>
<td>2057</td>
<td>u16</td>
<td>1</td>
<td>.ChgAckCnt.stVal</td>
<td>LD0.LDEV1</td>
<td>Num. of conf. changes</td>
<td>0...65535</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1</td>
<td>.ParChgCnt.stVal</td>
<td>LD0.LLN0</td>
<td>Num. of setting changes</td>
<td>0...65535</td>
</tr>
</tbody>
</table>

1) See the technical manual.

### 2.4.1.24

**Time and reason for latest protection relay reset**

**Table 192: Time and reason for latest protection relay reset**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>9221</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Year</td>
<td></td>
<td>2000...2999</td>
</tr>
<tr>
<td>9222</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Month</td>
<td></td>
<td>1...12</td>
</tr>
<tr>
<td>9223</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Day</td>
<td></td>
<td>1...31</td>
</tr>
<tr>
<td>9224</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Hour</td>
<td></td>
<td>0...23</td>
</tr>
<tr>
<td>9225</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Minute</td>
<td></td>
<td>0...59</td>
</tr>
<tr>
<td>9226</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Second</td>
<td></td>
<td>0...59</td>
</tr>
<tr>
<td>9227</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Millisecond</td>
<td></td>
<td>0...999</td>
</tr>
<tr>
<td>9228</td>
<td>u16</td>
<td>1</td>
<td></td>
<td>Reset reason</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9228.0</td>
<td>Bit</td>
<td></td>
<td></td>
<td>- bit 0</td>
<td></td>
<td>1=Cold start</td>
</tr>
<tr>
<td>9228.1</td>
<td>Bit</td>
<td></td>
<td></td>
<td>- bit 1</td>
<td></td>
<td>1=Watchdog</td>
</tr>
<tr>
<td>9228.2</td>
<td>Bit</td>
<td></td>
<td></td>
<td>- bit 2</td>
<td></td>
<td>1=Warm start</td>
</tr>
</tbody>
</table>

### 2.4.1.25

**User-definable bits [Alt.2], visible on 0x,1x,3x and 4x**

**Table 193: User-definable bits [Alt.2], visible on 0x,1x,3x and 4x**

<table>
<thead>
<tr>
<th>BitA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0)</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>&lt; not mappable - not visible &gt;</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Usr reg 1.Bit 01</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Usr reg 1.Bit 02</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bit</td>
<td></td>
<td></td>
<td></td>
<td>Usr reg 1.Bit 03</td>
<td></td>
</tr>
<tr>
<td>:</td>
<td>:</td>
<td></td>
<td></td>
<td></td>
<td>:</td>
<td>:</td>
</tr>
<tr>
<td>:</td>
<td>:</td>
<td></td>
<td></td>
<td></td>
<td>:</td>
<td>:</td>
</tr>
</tbody>
</table>

Table continues on next page
### 2.4.1.26 User-definable registers [Alt.1], visible on 3x and 4x

**Table 194: User-definable registers [Alt.1], visible on 3x and 4x**

<table>
<thead>
<tr>
<th>Reg</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0)</td>
<td>Reg</td>
<td></td>
<td></td>
<td></td>
<td>&lt; not mappable - not visible &gt;</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Reg</td>
<td></td>
<td></td>
<td></td>
<td>User register 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Reg</td>
<td></td>
<td></td>
<td></td>
<td>User register 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>:</td>
<td>:</td>
<td></td>
<td></td>
<td>:</td>
<td></td>
</tr>
<tr>
<td>127</td>
<td>Reg</td>
<td></td>
<td></td>
<td></td>
<td>User register 127</td>
<td></td>
</tr>
</tbody>
</table>

### 2.4.1.27 CTRL.CBCSW1 Circuit breaker operation counter (1)

**Table 195: CTRL.CBCSWI1 Circuit breaker operation counter (1)**

<table>
<thead>
<tr>
<th>Reg</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2027</td>
<td>u16</td>
<td>1</td>
<td>CTRL.CBCSW1</td>
<td>.OpCntRs.stVal</td>
<td>Operation counter</td>
<td>0…65535</td>
</tr>
</tbody>
</table>

### 2.4.1.28 LD0.ARCSCARCx1 Arc protection (x1) – AFD

**Table 196: LD0.ARCSSARCx1 Arc protection (x1) – AFD**

<table>
<thead>
<tr>
<th>Reg</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2028</td>
<td>u16</td>
<td>1</td>
<td>LD0.ARCSCARC11</td>
<td>.FACntRs.stVal</td>
<td>Fault arc 1 counter</td>
<td>0…65535</td>
</tr>
<tr>
<td>2029</td>
<td>u16</td>
<td>1</td>
<td>LD0.ARCSCARC21</td>
<td>.FACntRs.stVal</td>
<td>Fault arc 2 counter</td>
<td>0…65535</td>
</tr>
<tr>
<td>2030</td>
<td>u16</td>
<td>1</td>
<td>LD0.ARCSCARC31</td>
<td>.FACntRs.stVal</td>
<td>Fault arc 3 counter</td>
<td>0…65535</td>
</tr>
</tbody>
</table>
### 2.4.1.29 LD0.CMHAI1 Current total demand distortion (1) – PQI-1

Table 197: LD0.CMHAI1 Current total demand distortion (1) – PQI-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.CMHAI1</td>
<td></td>
<td>3-second mean value:</td>
<td></td>
</tr>
<tr>
<td>2150</td>
<td>u16</td>
<td>100</td>
<td>.TddA.phsA.cVal.mag</td>
<td>3SMHTDD_A</td>
<td>- phsA</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2151</td>
<td>u16</td>
<td>100</td>
<td>.TddA.phsB.cVal.mag</td>
<td>3SMHTDD_B</td>
<td>- phsB</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2152</td>
<td>u16</td>
<td>100</td>
<td>.TddA.phsC.cVal.mag</td>
<td>3SMHTDD_C</td>
<td>- phsC</td>
<td>0...500.00 [%]</td>
</tr>
</tbody>
</table>

Demand value:

|      |      |       | .DmdTddA.phsA.cVal.mag    | DMD_TDD_A    | - phsA                               | 0...500.00 [%]  |
|      |      |       | .DmdTddA.phsB.cVal.mag    | DMD_TDD_B    | - phsB                               | 0...500.00 [%]  |
|      |      |       | .DmdTddA.phsC.cVal.mag    | DMD_TDD_C    | - phsC                               | 0...500.00 [%]  |

Max demand value:

|      |      |       | .MaxDmdTddA.phsA.cVal.mag | -           | - phsA                               | 0...500.00 [%]  |
|      |      |       | .MaxDmdTddA.phsB.cVal.mag | -           | - phsB                               | 0...500.00 [%]  |
|      |      |       | .MaxDmdTddA.phsC.cVal.mag | -           | - phsC                               | 0...500.00 [%]  |

### 2.4.1.30 LD0.CMMXU1 Phase current demand values (1) – IA, IB, IC

Table 198: LD0.CMMXU1 Phase current demand values (1) – IA, IB, IC

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.CAVMMXU1</td>
<td></td>
<td>Demand value</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsA.cVal.mag</td>
<td>I_DMD_A</td>
<td>Phs A amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
<tr>
<td>2002</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsB.cVal.mag</td>
<td>I_DMD_B</td>
<td>Phs B amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
<tr>
<td>2003</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsC.cVal.mag</td>
<td>I_DMD_C</td>
<td>Phs C amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Year - month</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Day - hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Minute - second</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Milliseconds</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Time quality</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.CMAMMXU1</td>
<td></td>
<td>Max demand values</td>
<td></td>
</tr>
</tbody>
</table>

Table continues on next page

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### 2.4.1.31 LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC

**Table 199: LD0.CMMXU1 Three-phase current measurement (1) – IA, IB, IC**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.CMMXU1</td>
<td>I_INST_A</td>
<td>Phase current</td>
<td></td>
</tr>
<tr>
<td>138</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsA.instCVal.mag</td>
<td>I_INST_A</td>
<td>Phs A amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
<tr>
<td>139</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsB.instCVal.mag</td>
<td>I_INST_B</td>
<td>Phs B amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
<tr>
<td>140</td>
<td>u16</td>
<td>1000</td>
<td>.A.phsC.instCVal.mag</td>
<td>I_INST_C</td>
<td>Phs C amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
</tbody>
</table>
### 2.4.1.32 LD0.CSMSQI1 Sequence current measurement (1) – I₁, I₂, I₀

#### Table 200: LD0.CSMSQI1 Sequence current measurement (1) – I₁, I₂, I₀

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>143</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c1.instCVal.mag</td>
<td>I₁_INST</td>
<td>Positive amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
<tr>
<td>144</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c2.instCVal.mag</td>
<td>I₂_INST</td>
<td>Negative amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
<tr>
<td>145</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c2.instCVal.mag</td>
<td>I₃_INST</td>
<td>Zero amplitude</td>
<td>0.00...40.0 [xIn]</td>
</tr>
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### 2.4.1.33 LD0.DARREC1 Autoreclosing counters (1) – 79-1

#### Table 201: LD0.DARREC1 Autoreclosing counters (1) – 79-1

<table>
<thead>
<tr>
<th>RegA</th>
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<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>2031</td>
<td>u16</td>
<td>1</td>
<td>.RecCnt1.stVal</td>
<td>CNT_SHOT1</td>
<td>AR 1st shot counter</td>
<td>0...65535</td>
</tr>
<tr>
<td>2032</td>
<td>u16</td>
<td>1</td>
<td>.RecCnt2.stVal</td>
<td>CNT_SHOT2</td>
<td>AR 2nd shot counter</td>
<td>0...65535</td>
</tr>
<tr>
<td>2033</td>
<td>u16</td>
<td>1</td>
<td>.RecCnt3.stVal</td>
<td>CNT_SHOT3</td>
<td>AR 3rd shot counter</td>
<td>0...65535</td>
</tr>
<tr>
<td>2034</td>
<td>u16</td>
<td>1</td>
<td>.RecCnt4.stVal</td>
<td>CNT_SHOT4</td>
<td>AR 4th shot counter</td>
<td>0...65535</td>
</tr>
<tr>
<td>2035</td>
<td>u16</td>
<td>1</td>
<td>.RecCnt5.stVal</td>
<td>CNT_SHOT5</td>
<td>AR 5th shot counter</td>
<td>0...65535</td>
</tr>
<tr>
<td>2036</td>
<td>u16</td>
<td>1</td>
<td>.FrqOpCnt.stVal</td>
<td>FRQ_OPR_CNT</td>
<td>0...65535</td>
<td></td>
</tr>
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### 2.4.1.34 LD0.DARREC1 Autoreclosing values (1) – 79-1

#### Table 202: LD0.DARREC1 Autoreclosing values (1) – 79-1

<table>
<thead>
<tr>
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<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td>i16</td>
<td>1</td>
<td>.AutoRecSt.stVal</td>
<td>STATUS</td>
<td>AR state</td>
<td>-2...4 1)</td>
</tr>
<tr>
<td>136</td>
<td>u16</td>
<td>1</td>
<td>.ShotPtrntr.stVal</td>
<td>SHOT_PTR</td>
<td>AR shot pointer value</td>
<td>0...6</td>
</tr>
<tr>
<td>137</td>
<td>u16</td>
<td>1</td>
<td>.OpCntRs.stVal</td>
<td>COUNTER</td>
<td>AR operation counter</td>
<td>0...65535</td>
</tr>
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</table>

1) See the technical manual.
### 2.4.1.35 LD0.FMMXU1 Frequency measurement (1) – f-1

Table 203: LD0.FMMXU1 Frequency measurement (1) – f-1

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<thead>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>168</td>
<td>u16</td>
<td>100</td>
<td>.Hz.mag</td>
<td>F_DB</td>
<td>Frequency</td>
<td>35.00...75.00 [Hz]</td>
</tr>
</tbody>
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### 2.4.1.36 LD0.HAEFMHAI1 Current harmonics (1)

Table 204: LD0.HAEFMHAI1 Current harmonics (1)

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<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>151</td>
<td>u16</td>
<td>10</td>
<td>.HRmsA.res.cVal.mag</td>
<td>I_HARM_RES</td>
<td>Current harmonics</td>
<td>0..250.0 [A]</td>
</tr>
</tbody>
</table>

### 2.4.1.37 LD0.PEMMTR1 Three-phase energy measurements (1)

Table 205: LD0.PEMMTR1 Three-phase energy measurements (1)

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<tr>
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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>2037</td>
<td>u32</td>
<td>1</td>
<td>.SupWh.actVal</td>
<td></td>
<td>Reverse active energy (high)</td>
<td>0...1E10 [kWh]</td>
</tr>
<tr>
<td>2038</td>
<td></td>
<td></td>
<td>.SupWh.actVal</td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>2039</td>
<td>u32</td>
<td>1</td>
<td>.SupVArh.actVal</td>
<td></td>
<td>Reverse reactive energy (high)</td>
<td>0...1E10 [kVArh]</td>
</tr>
<tr>
<td>2040</td>
<td></td>
<td></td>
<td>.SupVArh.actVal</td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>2041</td>
<td>u32</td>
<td>1</td>
<td>.DemWh.actVal</td>
<td></td>
<td>Forward active energy (high)</td>
<td>0...1E10 [kWh]</td>
</tr>
<tr>
<td>2042</td>
<td></td>
<td></td>
<td>.DemWh.actVal</td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>2043</td>
<td>u32</td>
<td>1</td>
<td>.DemVArh.actVal</td>
<td></td>
<td>Forward reactive energy (high)</td>
<td>0...1E10 [kVArh]</td>
</tr>
<tr>
<td>2044</td>
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<td>.DemVArh.actVal</td>
<td></td>
<td>(low word)</td>
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### 2.4.1.38 LD0.PEMMXU1 Power measurement demand values (1) – P, E-1

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tr>
<td></td>
<td>i32</td>
<td>1</td>
<td>LD0.PEAVMMXU1</td>
<td>TotW.mag</td>
<td>Demand value</td>
<td></td>
</tr>
<tr>
<td>1939</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Active power P (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>1940</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Low word)</td>
<td></td>
</tr>
<tr>
<td>1941</td>
<td></td>
<td></td>
<td>LD0.PEMMMXU1</td>
<td>TotVAr.mag</td>
<td>Reactive power Q (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>1942</td>
<td></td>
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<td></td>
<td>(Low word)</td>
<td></td>
</tr>
<tr>
<td>1943</td>
<td></td>
<td></td>
<td>LD0.PEMIMMXU1</td>
<td>TotVA.mag</td>
<td>Apparent power S (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>1944</td>
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<td>1945</td>
<td>i16</td>
<td>1000</td>
<td>LD0.PEMMXU1</td>
<td>TotPF.mag</td>
<td>Power factor</td>
<td>-1...1</td>
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### 2.4.1.39 LD0.PEMMXU1 Three-phase power and energy measurement (1) – P, E-1

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<th>Description</th>
<th>Values</th>
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<tr>
<td></td>
<td>i32</td>
<td>1</td>
<td>LD0.PEMMXU1</td>
<td>TotW.instMag</td>
<td>Total active power P (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>161</td>
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<td>P_INST</td>
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<tr>
<td>162</td>
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<td>.TotW.instMag</td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>163</td>
<td></td>
<td></td>
<td>TotVAr.instMag</td>
<td>Q_INST</td>
<td>Total reactive power Q (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>164</td>
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<td></td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>165</td>
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<td></td>
<td>TotVA.instMag</td>
<td>S_INST</td>
<td>Total apparent power S (high)</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>166</td>
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<td></td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>167</td>
<td>i16</td>
<td>1000</td>
<td>LD0.PEMMXU1</td>
<td>TotPF.instMag</td>
<td>Average power factor</td>
<td>-1...1</td>
</tr>
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<td>PF_INST</td>
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## 2.4.1.40 LD0.PHQVVR1 Voltage variation (1) – PQSS-1

<table>
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<th>RegA</th>
<th>Type</th>
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<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tr>
<td>2100</td>
<td>u32</td>
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<td>LD0.PH1QVVR1</td>
<td>.SwlInstCnt.stVal</td>
<td>Inst counter (high)</td>
<td>0…</td>
</tr>
<tr>
<td>2101</td>
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<td></td>
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<td>- (Low word)</td>
<td>2147483647</td>
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<tr>
<td>2102</td>
<td>u32</td>
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<td>.SwlMomCnt.stVal</td>
<td>Mom counter (high)</td>
<td>0…</td>
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<td>2103</td>
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<td>- (Low word)</td>
<td>2147483647</td>
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<tr>
<td>2104</td>
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<td>.SwlTmpCnt.stVal</td>
<td>Temp counter (high)</td>
<td>0…</td>
</tr>
<tr>
<td>2105</td>
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<td>- (Low word)</td>
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<tr>
<td>2106</td>
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<td>.SwlMaxCnt.stVal</td>
<td>Max. duration counter (high)</td>
<td>0…</td>
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<td>- (Low word)</td>
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<td>2108</td>
<td>u32</td>
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<td>LD0.PH1QVVR1</td>
<td>.DipInstCnt.stVal</td>
<td>Inst counter (high)</td>
<td>0…</td>
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<tr>
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<td>- (Low word)</td>
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<tr>
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<td>.DipMomCnt.stVal</td>
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<td>0…</td>
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<td></td>
<td>.DipTmpCnt.stVal</td>
<td>Temp counter (high)</td>
<td>0…</td>
</tr>
<tr>
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<td>- (Low word)</td>
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<td>Max. duration counter (high)</td>
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<td>- (Low word)</td>
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<td>.IntrMomCnt.stVal</td>
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<td>- (Low word)</td>
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<tr>
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<td>u32</td>
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<td>Temp counter (high)</td>
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<td>.IntrSstCnt.stVal</td>
<td>Sustain counter (high)</td>
<td>0…</td>
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<td>- (Low word)</td>
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<td>.IntrMaxCnt.stVal</td>
<td>Max. duration counter (high)</td>
<td>0…</td>
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### 2.4.1.41 LD0.RESCMMXU1 Residual current demand value (1) – IG-1

**Table 209: LD0.RESCMMXU1 Residual current demand value (1) – IG-1**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
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<td></td>
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<td>LD0.RCAVMMXU1</td>
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<td>Demand value</td>
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</tr>
<tr>
<td>1989</td>
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<td>1000</td>
<td>.A.res.cVal.mag</td>
<td>I_DMD_RES</td>
<td>Residual amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Year - month</td>
<td></td>
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<tr>
<td>1991</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Day - hour</td>
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<tr>
<td>1992</td>
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<td></td>
<td></td>
<td></td>
<td>Minute - second</td>
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<tr>
<td>1993</td>
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<td>Time quality</td>
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<td>LD0.RCMAMMXU1</td>
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<td>Max. demand value</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>u16</td>
<td>1000</td>
<td>.A.res.cVal.mag</td>
<td>Max demand Io</td>
<td>Residual amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
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<td>Year - month</td>
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<td>Minute - second</td>
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<td>Milliseconds</td>
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<td>Min. demand value</td>
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<td>u16</td>
<td>1000</td>
<td>.A.res.cVal.mag</td>
<td>Min demand Io</td>
<td>Residual amplitude</td>
<td>0.00…50.0 [xIn]</td>
</tr>
</tbody>
</table>

### 2.4.1.42 LD0.RESCMMXU1 Residual current measurement (1) – IG-1

**Table 210: LD0.RESCMMXU1 Residual current measurement (1) – IG-1**

<table>
<thead>
<tr>
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<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>LD0.RESCMMXU1</td>
<td></td>
<td>Residual current (1)</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>u16</td>
<td>1000</td>
<td>.A.res.instCVal.mag</td>
<td>I0_INST</td>
<td>- amplitude</td>
<td>0.00…40.0 [xIn]</td>
</tr>
</tbody>
</table>
### 2.4.1.43 LD0.RESVMMXU1 Residual voltage demand value (1) – VG-1

#### Table 211: LD0.RESVMMXU1 Residual voltage demand value (1) – VG-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>u16</td>
<td>1000</td>
<td>.PhV.res.cVal.mag</td>
<td>U_DMD_RES</td>
<td>Residual amplitude</td>
<td>0.00…4.0 [xUn]</td>
</tr>
<tr>
<td>1983</td>
<td>u16</td>
<td>1000</td>
<td>.PhV.res.cVal.mag</td>
<td>Max demand Uo</td>
<td>Residual amplitude</td>
<td>0.00…4.0 [xUn]</td>
</tr>
<tr>
<td>1988</td>
<td>U16</td>
<td>1000</td>
<td>.PhV.res.cVal.mag</td>
<td>Min demand Io</td>
<td>Residual amplitude</td>
<td>0.00…4.0 [xUn]</td>
</tr>
</tbody>
</table>

### 2.4.1.44 LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

#### Table 212: LD0.RESVMMXU1 Residual voltage measurement (1) – VG-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>142</td>
<td>U16</td>
<td>1000</td>
<td>.A.res.instCVal.mag</td>
<td>U0_INST</td>
<td>- amplitude</td>
<td>0.00…4.0 [xUn]</td>
</tr>
</tbody>
</table>

### 2.4.1.45 LD0.SECRSYN1 Synchronism and energizing check (1) – 25

#### Table 213: LD0.SECRSYN1 Synchronism and energizing check (1) – 25

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>169</td>
<td>U16</td>
<td>1</td>
<td>.EnSt.stVal</td>
<td>ENERG_STATE</td>
<td>Energ. state of line and bus</td>
<td>0…4 1)</td>
</tr>
</tbody>
</table>

1) See the technical manual.
### 2.4.1.46 LD0.SSCBR1 Circuit-breaker condition monitoring (1) – 52CM-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SSCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2060</td>
<td>u16</td>
<td>1</td>
<td>.lnaTmCnt.stVal</td>
<td>INA_DAYS</td>
<td>CB inactive days</td>
<td>0...65535</td>
</tr>
<tr>
<td>2061</td>
<td>u16</td>
<td>1</td>
<td>.OpTmOpn.mag</td>
<td>T_TRV_OP</td>
<td>Open travel time</td>
<td>0...60000 [ms]</td>
</tr>
<tr>
<td>2062</td>
<td>u16</td>
<td>1</td>
<td>.OpTmCls.mag</td>
<td>T_TRV_CL</td>
<td>Close travel time</td>
<td>0...60000 [ms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SSOPM1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2063</td>
<td>u16</td>
<td>100</td>
<td>.TmSprChr.mag</td>
<td>T_SPR_CHR</td>
<td>Spring charge time</td>
<td>0.00...99.99 [s]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH1SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2064</td>
<td>i16</td>
<td>1</td>
<td>.RmnNumOp.stVal</td>
<td>CB_LIFE_A</td>
<td>Remain.life phs A</td>
<td>+/- 9999</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH2SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2065</td>
<td>i16</td>
<td>1</td>
<td>.RmnNumOp.stVal</td>
<td>CB_LIFE_B</td>
<td>Remain.life phs B</td>
<td>+/- 9999</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH3SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2066</td>
<td>i16</td>
<td>1</td>
<td>.RmnNumOp.stVal</td>
<td>CB_LIFE_C</td>
<td>Remain.life phs C</td>
<td>+/- 9999</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH1SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2067</td>
<td>u16</td>
<td>1</td>
<td>.AccmAPwr.mag</td>
<td>IPOW_A</td>
<td>Iyt phs A</td>
<td>0...1E6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH2SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2068</td>
<td>u16</td>
<td>1</td>
<td>.AccmAPwr.mag</td>
<td>IPOW_B</td>
<td>Iyt phs B</td>
<td>0...1E6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.SPH3SCBR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2069</td>
<td>u16</td>
<td>1</td>
<td>.AccmAPwr.mag</td>
<td>IPOW_C</td>
<td>Iyt phs C</td>
<td>0...1E6</td>
</tr>
</tbody>
</table>

### 2.4.1.47 LD0.T1PTTR1 Three-phase thermal protection for feeders, cables and distribution transformers (1) – 49F-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.T1PTTR1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>146</td>
<td>i16</td>
<td>1</td>
<td>.Tmp.mag</td>
<td>TEMP</td>
<td>Object temperature</td>
<td>-100.0...9999.9 [C]</td>
</tr>
<tr>
<td>147</td>
<td>u16</td>
<td>1</td>
<td>.TmpRL.mag</td>
<td>TEMP_RL</td>
<td>Relative temperature</td>
<td>0.00...99.99 [C]</td>
</tr>
<tr>
<td>148</td>
<td>i16</td>
<td>1</td>
<td>.TmpUsed.mag</td>
<td>TEMP_AMB</td>
<td>Ambient temperature</td>
<td>-99...9999.99 [C]</td>
</tr>
<tr>
<td>149</td>
<td>u16</td>
<td>1</td>
<td>.OpTm.stVal</td>
<td>T_OPERATE</td>
<td>Time to operate</td>
<td>0...60000 [s]</td>
</tr>
<tr>
<td>150</td>
<td>u16</td>
<td>1</td>
<td>.BlkThmRsTm.stVal</td>
<td>T_ENA_CLOSE</td>
<td>Time to deactivate block</td>
<td>0...60000 [s]</td>
</tr>
</tbody>
</table>
## 2.4.1.48 LD0.VMHAI1 Voltage total harmonic distortion (1) – PQVPH-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2170</td>
<td>u16</td>
<td>100</td>
<td>ThdPhV.phsA.cVal.mag</td>
<td>3SMHTHD_A</td>
<td>- Phs A</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2171</td>
<td>u16</td>
<td>100</td>
<td>ThdPhV.phsB.cVal.mag</td>
<td>3SMHTDD_B</td>
<td>- Phs B</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2172</td>
<td>u16</td>
<td>100</td>
<td>ThdPhV.phsC.cVal.mag</td>
<td>3SMHTDD_C</td>
<td>- Phs C</td>
<td>0...500.00 [%]</td>
</tr>
</tbody>
</table>

### Demand value:

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2173</td>
<td>u16</td>
<td>100</td>
<td>DmdThdPhV.phsA.cVal.mag</td>
<td>DMD_TDD_A</td>
<td>- Phs A</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2174</td>
<td>u16</td>
<td>100</td>
<td>DmdThdPhV.phsB.cVal.mag</td>
<td>DMD_TDD_B</td>
<td>- Phs B</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2175</td>
<td>u16</td>
<td>100</td>
<td>DmdThdPhV.phsC.cVal.mag</td>
<td>DMD_TDD_C</td>
<td>- Phs C</td>
<td>0...500.00 [%]</td>
</tr>
</tbody>
</table>

### Max demand value

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2176</td>
<td>u16</td>
<td>100</td>
<td>MaxDmdThdV.phsA.cVal.mag</td>
<td>-</td>
<td>- Phs A</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2177</td>
<td>u16</td>
<td>100</td>
<td>MaxDmdThdV.phsB.cVal.mag</td>
<td>-</td>
<td>- Phs B</td>
<td>0...500.00 [%]</td>
</tr>
<tr>
<td>2178</td>
<td>u16</td>
<td>100</td>
<td>MaxDmdThdV.phsC.cVal.mag</td>
<td>-</td>
<td>- Phs C</td>
<td>0...500.00 [%]</td>
</tr>
</tbody>
</table>

## 2.4.1.49 LD0.VMMXU1 Three-phase voltage measurement (1) – VA, VB, VC

### Phase-ground voltage (1)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>u16</td>
<td>1000</td>
<td>phV.phsA.cVal.mag</td>
<td>U_DB_A</td>
<td>- Phs A amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
<tr>
<td>153</td>
<td>u16</td>
<td>1000</td>
<td>phV.phsB.cVal.mag</td>
<td>U_DB_B</td>
<td>- Phs B amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
<tr>
<td>154</td>
<td>u16</td>
<td>1000</td>
<td>phV.phsC.cVal.mag</td>
<td>U_DB_C</td>
<td>- Phs C amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
</tbody>
</table>

### Phase-phase voltage (1)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>u16</td>
<td>1000</td>
<td>PPV.phsAB.cVal.mag</td>
<td>U_DB_AB</td>
<td>- Phs AB amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
<tr>
<td>156</td>
<td>u16</td>
<td>1000</td>
<td>PPV.phsBC.cVal.mag</td>
<td>U_DB_BC</td>
<td>- Phs BC amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
<tr>
<td>157</td>
<td>u16</td>
<td>1000</td>
<td>PPV.phsCA.cVal.mag</td>
<td>U_DB_CA</td>
<td>- Phs CA amplitude</td>
<td>0.00...4.00 [xUn]</td>
</tr>
</tbody>
</table>
2.4.1.50 LD0.VMMXU1 Voltage demand values (1) – VA, VB, VC

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1954</td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsA.cVal.mag</td>
<td>U_DMD_A</td>
<td>Phs A amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td>1955</td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsB.cVal.mag</td>
<td>U_DMD_B</td>
<td>Phs B amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td>1956</td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsC.cVal.mag</td>
<td>U_DMD_C</td>
<td>Phs C amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td>1957</td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsAB.cVal.mag</td>
<td>U_DMD_AB</td>
<td>Phs AB amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td>1958</td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsBC.cVal.mag</td>
<td>U_DMD_BC</td>
<td>Phs BC amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td>1959</td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsCA.cVal.mag</td>
<td>U_DMD_CA</td>
<td>Phs CA amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
</tbody>
</table>

2.4.1.51 LD0.VSMSQI1 Sequence voltage measurement (1) – V1, V2, V0

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>158</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c1.instCVal.mag</td>
<td>U1_INST</td>
<td>- Positive amplitude</td>
<td>0.00…4.00 [xUn]</td>
</tr>
<tr>
<td>159</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c2.instCVal.mag</td>
<td>U2_INST</td>
<td>- Negative amplitude</td>
<td>0.00…4.00 [xUn]</td>
</tr>
<tr>
<td>160</td>
<td>u16</td>
<td>1000</td>
<td>.SeqA.c2.instCVal.mag</td>
<td>U3_INST</td>
<td>- Zero amplitude</td>
<td>0.00…4.00 [xUn]</td>
</tr>
</tbody>
</table>

2.4.2 Unmapped registers

Unmapped registers are register data that have no initial Modbus mapping locations, but can be added to the user-definable Modbus area using the Communication Management tool in PCM600. The initial register type settings of these objects have little meaning, since it is always possible to redefine the settings completely for the user-definable register.
### 2.4.2.1 CTRL.LLN0 Local, Remote, Station, Off and Combinations

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>u16</td>
<td>1</td>
<td>CTRL.LLN0</td>
<td>.LocKeyHMI.stVal</td>
<td>0=Off; 1=Loc; 2=Rem; 3=Stat; 4=L+R; 5=L+S; 6=L+S+R; 7=S+R</td>
<td>0…7</td>
</tr>
</tbody>
</table>

### 2.4.2.2 LD0.LLN0/LPHD1/LDEV1 System values

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>u16</td>
<td>1</td>
<td>LD0.LLN0</td>
<td>.ParChgCnt.stVal</td>
<td>Num. of setting changes</td>
<td>0…65535</td>
</tr>
</tbody>
</table>

### 2.4.2.3 LD0.MDSOPT1 Runtime counter for machines and devices (1) – OPTM-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>u16</td>
<td>1</td>
<td>LD0.MDSOPT1</td>
<td>.OpTmh.stVal</td>
<td>OPR_TIME Total operation hours</td>
<td>0…299999</td>
</tr>
</tbody>
</table>

### 2.4.2.4 LD0.MVI4GAPC1 Integer value move (1) – MVI4-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i32</td>
<td>1</td>
<td>LD0.MVI4GAPC1</td>
<td>.ISCS01</td>
<td>Integer value 1 (high)</td>
<td>-/+2147483647</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.ISCS02</td>
<td>Integer value 2 (high)</td>
<td>-/+2147483647</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.ISCS03</td>
<td>Integer value 3 (high)</td>
<td>-/+2147483647</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.ISCS04</td>
<td>Integer value 4 (high)</td>
<td>-/+2147483647</td>
</tr>
</tbody>
</table>
### LD0.PHQVVR2 Voltage variation (2) – PQSS-2

**Table 224: LD0.PHQVVR2 Voltage variation (2) – PQSS-2**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>LD0.PHQVVR2</td>
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<td>.SwlInstCnt.stVal</td>
<td>INSTSWELLCNT</td>
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<td>0…2147483647</td>
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<td>.SwlMomCnt.stVal</td>
<td>MOMSWELLCNT</td>
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<td>MAXDURSWELLCNT</td>
<td>- Max. duration counter (high)</td>
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<td>Voltage dip</td>
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<td>u32</td>
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<td>INSTDIPCNT</td>
<td>- Inst counter (high)</td>
<td>0…2147483647</td>
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<td>- Mom counter (high)</td>
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<td>- (Low word)</td>
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<td>TEMPDIPCNT</td>
<td>- Temp counter (high)</td>
<td>0…2147483647</td>
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<td>- (Low word)</td>
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<td>- (Low word)</td>
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<td>Voltage dip</td>
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</tr>
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<td></td>
<td>- (Low word)</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>.IntrTmpCnt.stVal</td>
<td>TEMPINTCNT</td>
<td>- Temp counter (high)</td>
<td>0…2147483647</td>
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<td>- (Low word)</td>
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<td>- (Low word)</td>
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<tr>
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<td></td>
<td>.IntrMaxCnt.stVal</td>
<td>MAXDURINTCNT</td>
<td>- Max. duration counter (high)</td>
<td>0…2147483647</td>
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### 2.4.2.6 LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1

**Table 225: LD0.SCA4GAPC1 Analog value scaling (1) – SCA4-1**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut1.mag</td>
<td>AO1_VALUE</td>
<td>Analog value 1 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut2.mag</td>
<td>AO2_VALUE</td>
<td>Analog value 2 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut3.mag</td>
<td>AO3_VALUE</td>
<td>Analog value 3 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut4.mag</td>
<td>AO4_VALUE</td>
<td>Analog value 4 after scaling</td>
<td>0...N</td>
</tr>
</tbody>
</table>

### 2.4.2.7 LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2

**Table 226: LD0.SCA4GAPC2 Analog value scaling (2) – SCA4-2**

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut1.mag</td>
<td>AO1_VALUE</td>
<td>Analog value 1 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut2.mag</td>
<td>AO2_VALUE</td>
<td>Analog value 2 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut3.mag</td>
<td>AO3_VALUE</td>
<td>Analog value 3 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut4.mag</td>
<td>AO4_VALUE</td>
<td>Analog value 4 after scaling</td>
<td>0...N</td>
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### 2.4.2.8 LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3

**Table 227: LD0.SCA4GAPC3 Analog value scaling (3) – SCA4-3**

<table>
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<tr>
<th>RegA</th>
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<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut1.mag</td>
<td>AO1_VALUE</td>
<td>Analog value 1 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut2.mag</td>
<td>AO2_VALUE</td>
<td>Analog value 2 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut3.mag</td>
<td>AO3_VALUE</td>
<td>Analog value 3 after scaling</td>
<td>0...N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut4.mag</td>
<td>AO4_VALUE</td>
<td>Analog value 4 after scaling</td>
<td>0...N</td>
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### 2.4.2.9 LD0.SCA4GAPC4 Analog value scaling (4) – SCA4-4

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<th>Values</th>
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</thead>
<tbody>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut1.mag</td>
<td>AO1_VALUE</td>
<td>Analog value 1 after scaling</td>
<td>0…N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut2.mag</td>
<td>AO2_VALUE</td>
<td>Analog value 2 after scaling</td>
<td>0…N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut3.mag</td>
<td>AO3_VALUE</td>
<td>Analog value 3 after scaling</td>
<td>0…N</td>
</tr>
<tr>
<td>i16</td>
<td>i16</td>
<td>1000</td>
<td>.AnValOut4.mag</td>
<td>AO4_VALUE</td>
<td>Analog value 4 after scaling</td>
<td>0…N</td>
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### 2.4.2.10 LD0.SCEFRFLO1 Fault locator (1) – 21FL-1

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<th>Description</th>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>u16</td>
<td>u16</td>
<td>1</td>
<td>.FltDiskm.mag</td>
<td>FLT_DISTANCE</td>
<td>Fault distance in pu</td>
<td>0…3000.0000 [pu]</td>
</tr>
<tr>
<td>u16</td>
<td>u16</td>
<td>1</td>
<td>.FltLoop.stVal</td>
<td>FAULT_LOOP</td>
<td>Fault impedance loop</td>
<td>0…7 (see doc)</td>
</tr>
<tr>
<td>u16</td>
<td>u16</td>
<td>1</td>
<td>.FltPtR.mag</td>
<td>RF</td>
<td>Fault point resistance</td>
<td>0.0…1000000. 0 [ohm]</td>
</tr>
<tr>
<td>u16</td>
<td>u16</td>
<td>1</td>
<td>.FltX.mag</td>
<td>XFLOOP</td>
<td>Fault loop reactance</td>
<td>0.0…1000000. 0 [ohm]</td>
</tr>
<tr>
<td>u16</td>
<td>u16</td>
<td>1</td>
<td>.PhGndCapac.mag</td>
<td>XCOF_CALC</td>
<td>Est. PhE capacitive reactance</td>
<td>0.0…1000000. 0 [ohm]</td>
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<tr>
<td>u16</td>
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<td>1</td>
<td>.FltDisQ.stVal</td>
<td>FLT_DIST_Q</td>
<td>Fault distance quality</td>
<td>0…511</td>
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</table>

### 2.4.2.11 LD0.SPEMMTR1 Single-phase power and energy measurement (1)

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
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<td>u32</td>
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<td>1</td>
<td>.SupWh.actVal</td>
<td>S_Calc</td>
<td>Accumulated Reverse active energy (high) , phase A</td>
<td>0...1E10 [kWh]</td>
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Table continues on next page
### Modbus data mappings

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<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<tbody>
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<td>.SupWh.actVal</td>
<td>(low word)</td>
<td>Accumulated Reverse reactive energy (high), phase A</td>
<td>0...1E10 kWh</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>.SupVArh.actVal</td>
<td>(low word)</td>
<td>Accumulated Reverse reactive energy (high), phase A</td>
<td>0...1E10 kWh</td>
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<td>u32</td>
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<td>.DmdWh.actVal</td>
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<td>0...1E10 kWh</td>
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<td>Accumulated Forward reactive energy (high), phase A</td>
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<td>.EnValRs.Oper.ctlVal</td>
<td>(low word)</td>
<td>Reset of accumulated energy reading</td>
<td>0...1E10 kWh</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>.EnValRs.Oper.ctlVal</td>
<td>(low word)</td>
<td>Reset of accumulated energy reading</td>
<td>0...1E10 kWh</td>
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<tr>
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<td>u32</td>
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<td>.SupWh.actVal</td>
<td>(low word)</td>
<td>Accumulated Reverse active energy (high), phase B</td>
<td>0...1E10 kWh</td>
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<td>.SupVArh.actVal</td>
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<td>Accumulated Reverse reactive energy (high), phase B</td>
<td>0...1E10 kWh</td>
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<td>(low word)</td>
<td>Accumulated Forward active energy (high), phase B</td>
<td>0...1E10 kWh</td>
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<td>.DmdVArh.actVal</td>
<td>(low word)</td>
<td>Accumulated Forward reactive energy (high), phase B</td>
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<td>.SupWh.actVal</td>
<td>(low word)</td>
<td>Accumulated Reverse active energy (high), phase C</td>
<td>0...1E10 kWh</td>
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<td>.SupVArh.actVal</td>
<td>(low word)</td>
<td>Accumulated Reverse reactive energy (high), phase C</td>
<td>0...1E10 kWh</td>
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<td>u32</td>
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<td>.DmdWh.actVal</td>
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<td>0...1E10 kWh</td>
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<td>.DmdVArh.actVal</td>
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Table continues on next page
### 2.4.2.12 LD0.SPEMMXU1 Single-phase power and energy measurement demand values (1) – SP, SE-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
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<td>Accumulated Forward reactive energy (high) , phase C</td>
<td>0...1E10[kWh]</td>
</tr>
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<td></td>
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<td>.DmdVArh.actVal</td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
</tbody>
</table>

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**Table 231:** LD0.SPEMMXU1 Single-phase power and energy measurement demand values (1) – SP, SE-1

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
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<td>i32</td>
<td>1</td>
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<td>.W.phsA.cVal.mag</td>
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<td>Active power P (high) , phase A</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>i32</td>
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<td>.W.phsB.cVal.mag</td>
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<td>Active power P (high) , phase B</td>
<td>-/+ 999,999</td>
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<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.W.phsC.cVal.mag</td>
<td></td>
<td>Active power P (high) , phase C</td>
<td>-/+ 999,999</td>
</tr>
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<td></td>
<td>(low word)</td>
<td></td>
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<tr>
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<td>.VAr.phsA.cVal.mag</td>
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<td>Reactive power Q (high) , phase A</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>(low word)</td>
<td></td>
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<tr>
<td>i32</td>
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<td></td>
<td>.VAr.phsB.cVal.mag</td>
<td></td>
<td>Reactive power Q (high) , phase B</td>
<td>-/+ 999,999</td>
</tr>
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<td>(low word)</td>
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<tr>
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<td></td>
<td>.VAr.phsC.cVal.mag</td>
<td></td>
<td>Reactive power Q (high) , phase C</td>
<td>-/+ 999,999</td>
</tr>
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<td>.VA.phsA.cVal.mag</td>
<td></td>
<td>Apparent power S (high) , phase A</td>
<td>-/+ 999,999</td>
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<td>.VA.phsB.cVal.mag</td>
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<td>Apparent power S (high) , phase B</td>
<td>-/+ 999,999</td>
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<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.VA.phsC.cVal.mag</td>
<td></td>
<td>Apparent power S (high) , phase C</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(low word)</td>
<td></td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsA.cVal.mag</td>
<td></td>
<td>Power factor , phase A</td>
<td>-1…1</td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsB.cVal.mag</td>
<td></td>
<td>Power factor, phase B</td>
<td>-1…1</td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsC.cVal.mag</td>
<td></td>
<td>Power factor , phase C</td>
<td>-1…1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LD0.SPEMAMMXU1</td>
<td>Max demand value</td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.W.phsA.cVal.mag</td>
<td>PL1-kW:1</td>
<td>Total active power, phase A</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.W.phsB.cVal.mag</td>
<td>PL2-kW:1</td>
<td>Total active power, phase B</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.W.phsC.cVal.mag</td>
<td>PL3-kW:1</td>
<td>Total active power, phase C</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.VAr.phsA.cVal.mag</td>
<td>QL1-VAr:1</td>
<td>Total reactive power, phase A</td>
<td>-/+ 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.VAr.phsB.cVal.mag</td>
<td>QL2-VAr:1</td>
<td>Total reactive power, phase B</td>
<td>-/+ 999,999</td>
</tr>
</tbody>
</table>

Table continues on next page
<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.Var.phsC.instCVal.mag</td>
<td>QL3-VAr:1</td>
<td>Total reactive power, phase C</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.Var.phsA.instCVal.mag</td>
<td>SL1-kVA:1</td>
<td>Total apparent power, phase A</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.Var.phsB.instCVal.mag</td>
<td>SL2-kVA:1</td>
<td>Total apparent power, phase B</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>i32</td>
<td>1</td>
<td></td>
<td>.Var.phsC.instCVal.mag</td>
<td>SL3-kVA:1</td>
<td>Total apparent power, phase C</td>
<td>+/- 999,999</td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsA.instCVal.mag</td>
<td>PFL1:1</td>
<td>Average power factor, phase A</td>
<td>-1...1</td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsB.instCVal.mag</td>
<td>PFL2:1</td>
<td>Average power factor, phase B</td>
<td>-1...1</td>
</tr>
<tr>
<td>i16</td>
<td>1000</td>
<td></td>
<td>.PF.phsC.instCVal.mag</td>
<td>PFL3:1</td>
<td>Average power factor, phase C</td>
<td>-1...1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.RcdRs.Oper.ctlVal</td>
<td></td>
<td></td>
<td>(Demands)</td>
</tr>
</tbody>
</table>

### 2.4.2.14 LD0.VMMXU2 Three-phase voltage measurement (2) – VA, VB, VC (2)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PhV.phsA.cVal.mag</td>
<td>U_DB_A</td>
<td>Phs A amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PhV.phsB.cVal.mag</td>
<td>U_DB_B</td>
<td>Phs B amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PhV.phsC.cVal.mag</td>
<td>U_DB_C</td>
<td>Phs C amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD0.VMMXU2</td>
<td></td>
<td>Phase-ground voltage (2)</td>
<td></td>
</tr>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PPV.phsAB.cVal.mag</td>
<td>U_DB_AB</td>
<td>Phs AB amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PPV.phsBC.cVal.mag</td>
<td>U_DB_BC</td>
<td>Phs BC amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
<tr>
<td>u16</td>
<td>1000</td>
<td></td>
<td>.PPV.phsCA.cVal.mag</td>
<td>U_DB_CA</td>
<td>Phs CA amplitude</td>
<td>0.00..4.00 [xUn]</td>
</tr>
</tbody>
</table>
### 2.4.2.15 LD0.VMMXU2 Voltage demand values (2) – VA, VB, VC (2)

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsA.cVal.mag</td>
<td>U_DMD_A</td>
<td>Phs A amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsB.cVal.mag</td>
<td>U_DMD_B</td>
<td>Phs B amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PhV.phsC.cVal.mag</td>
<td>U_DMD_C</td>
<td>Phs C amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsAB.cVal.mag</td>
<td>U_DMD_AB</td>
<td>Phs AB amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsBC.cVal.mag</td>
<td>U_DMD_BC</td>
<td>Phs BC amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
<tr>
<td></td>
<td>u16</td>
<td>1000</td>
<td>.PPV.phsCA.cVal.mag</td>
<td>U_DMD_CA</td>
<td>Phs CA amplitude</td>
<td>0.00…4.0 [×Un]</td>
</tr>
</tbody>
</table>

Table continues on next page.

### 2.4.2.16 LD0.XARGGIO130 RTD input values

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn1.mag</td>
<td>AI_VAL1</td>
<td>RTD input 1 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn2.mag</td>
<td>AI_VAL2</td>
<td>RTD input 2 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn3.mag</td>
<td>AI_VAL3</td>
<td>RTD input 3 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn4.mag</td>
<td>AI_VAL4</td>
<td>RTD input 4 in ohms</td>
<td>+/- 10000.00</td>
</tr>
</tbody>
</table>

### 2.4.2.17 LD0.XRGGIO130 RTD input values

<table>
<thead>
<tr>
<th>RegA</th>
<th>Type</th>
<th>Scale</th>
<th>IEC 61580 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn1.mag</td>
<td>AI_VAL1</td>
<td>RTD input 1 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn2.mag</td>
<td>AI_VAL2</td>
<td>RTD input 2 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn3.mag</td>
<td>AI_VAL3</td>
<td>RTD input 3 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn4.mag</td>
<td>AI_VAL4</td>
<td>RTD input 4 in ohms</td>
<td>+/- 10000.00</td>
</tr>
<tr>
<td></td>
<td>i16</td>
<td>1</td>
<td>.AnIn5.mag</td>
<td>AI_VAL5</td>
<td>RTD input 5 in ohms</td>
<td>+/- 10000.00</td>
</tr>
</tbody>
</table>

Table continues on next page.
### 2.5 Controls

#### Table 237: Explanations of the controls table columns

<table>
<thead>
<tr>
<th>Column name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0xA</td>
<td>Coil (OX) address for control value.</td>
</tr>
<tr>
<td>CS</td>
<td>Control structure and bit within the structure for control value.</td>
</tr>
<tr>
<td>IEC 61850 name</td>
<td>Original IED data object identification. Described in the IEC 61850 format as Logical Device.Logical Node and thereafter .Data Object.Data Attribute. Logical Node is the same as the application function block name.</td>
</tr>
<tr>
<td>SA name</td>
<td>The signal may have a defined label that is visible, for example, in the Application Configuration tool in PCM600.</td>
</tr>
<tr>
<td>Description</td>
<td>Short description of the signal. See the technical manual for more information.</td>
</tr>
<tr>
<td>Value</td>
<td>Meaning of the written value.</td>
</tr>
</tbody>
</table>

### 2.5.1 Reset, acknowledge and trigger points

#### Table 238: Reset, acknowledge and trigger points

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2060</td>
<td>LD0.LLN0</td>
<td>.IndLEDRs.Oper.ctlVal</td>
<td>Reset indications and LEDs</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2061</td>
<td>2.00</td>
<td>LD0.PEMMXU1</td>
<td>.ProgLEDRs.Oper.ctlVal</td>
<td>Reset Alarm LEDs</td>
<td>1=Reset</td>
</tr>
<tr>
<td></td>
<td>2062</td>
<td>LD0.DARREC1</td>
<td>.RcdRs.Oper.ctlVal</td>
<td>Reset Power max demands</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2063</td>
<td>2.03</td>
<td>LD0.SSCBR1</td>
<td>.RecRs.Oper.ctlVal</td>
<td>Reset reclosing</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2064</td>
<td>2.04</td>
<td></td>
<td>.CntRs.Oper.ctlVal</td>
<td>Reset reclosing counters</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2065</td>
<td>2.05</td>
<td></td>
<td>.RsAccmAPwr.Oper.ctlVal</td>
<td>Reset CB accum. energy</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2066</td>
<td>2.06</td>
<td></td>
<td>.RsCBWear.Oper.ctlVal</td>
<td>Reset CB wear data</td>
<td>1=Reset</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DR.RDRE1</td>
<td></td>
</tr>
<tr>
<td>2067</td>
<td>2.07</td>
<td></td>
<td>.RcdTrg.Oper.ctlVal</td>
<td>Trig DR recording</td>
<td>1=Trig</td>
</tr>
</tbody>
</table>

Table continues on next page
### CTRL.CBCSWI1 Circuit breaker control (1)

**Table 239: CTRL.CBCSWI1 Circuit breaker control (1)**

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2048</td>
<td>1.00</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.CBCSWI1</td>
<td>Select open</td>
<td>1=Select</td>
</tr>
<tr>
<td>2049</td>
<td>1.01</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Select close</td>
<td>1=Select</td>
</tr>
<tr>
<td>2050</td>
<td>1.02</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Cancel selection</td>
<td>1=Cancel</td>
</tr>
<tr>
<td>2051</td>
<td>1.03</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Execute selection</td>
<td>1=Execute</td>
</tr>
<tr>
<td>2052</td>
<td>1.04</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Direct open</td>
<td>1=Open</td>
</tr>
<tr>
<td>2053</td>
<td>1.05</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Direct close</td>
<td>1=Close</td>
</tr>
</tbody>
</table>

### CTRL.CBCSWI2 Circuit breaker control (2)

**Table 240: CTRL.CBCSWI2 Circuit breaker control (2)**

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2156</td>
<td>8</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.CBCSWI2</td>
<td>Select open</td>
<td>1=Select</td>
</tr>
<tr>
<td>2157</td>
<td>8.01</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Select close</td>
<td>1=Select</td>
</tr>
<tr>
<td>2158</td>
<td>8.02</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Cancel selection</td>
<td>1=Cancel</td>
</tr>
<tr>
<td>2159</td>
<td>8.03</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Execute selection</td>
<td>1=Execute</td>
</tr>
<tr>
<td>2160</td>
<td>8.04</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Direct open</td>
<td>1=Open</td>
</tr>
<tr>
<td>2161</td>
<td>8.05</td>
<td>.Pos.Oper.ctlVal</td>
<td></td>
<td>Direct close</td>
<td>1=Close</td>
</tr>
</tbody>
</table>
### 2.5.4 CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

Table 241: CTRL.DCXSWI1 Disconnector control (1) – 29DS-1

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2144</td>
<td>7.00</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Select open</td>
<td>1=Select</td>
</tr>
<tr>
<td>2145</td>
<td>7.01</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Select close</td>
<td>1=Select</td>
</tr>
<tr>
<td>2146</td>
<td>7.02</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Cancel selection</td>
<td>1=Cancel</td>
</tr>
<tr>
<td>2147</td>
<td>7.03</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Execute selection</td>
<td>1=Execute</td>
</tr>
<tr>
<td>2148</td>
<td>7.04</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Direct open</td>
<td>1=Open</td>
</tr>
<tr>
<td>2149</td>
<td>7.05</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI1</td>
<td>Direct close</td>
<td>1=Close</td>
</tr>
</tbody>
</table>

### 2.5.5 CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

Table 242: CTRL.DCXSWI2 Disconnector control (2) – 29DS-2

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2150</td>
<td>7.06</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Select open</td>
<td>1=Select</td>
</tr>
<tr>
<td>2151</td>
<td>7.07</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Select close</td>
<td>1=Select</td>
</tr>
<tr>
<td>2152</td>
<td>7.08</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Cancel selection</td>
<td>1=Cancel</td>
</tr>
<tr>
<td>2153</td>
<td>7.09</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Execute selection</td>
<td>1=Execute</td>
</tr>
<tr>
<td>2154</td>
<td>7.10</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Direct open</td>
<td>1=Open</td>
</tr>
<tr>
<td>2155</td>
<td>7.11</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.DCCSWI2</td>
<td>Direct close</td>
<td>1=Close</td>
</tr>
</tbody>
</table>

### 2.5.6 CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

Table 243: CTRL.ESXSWI1 Grounding switch control (1) – 29GS-1

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2054</td>
<td>1.06</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Select open</td>
<td>1=Select</td>
</tr>
<tr>
<td>2055</td>
<td>1.07</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Select close</td>
<td>1=Select</td>
</tr>
<tr>
<td>2056</td>
<td>1.08</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Cancel selection</td>
<td>1=Cancel</td>
</tr>
<tr>
<td>2057</td>
<td>1.09</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Execute selection</td>
<td>1=Execute</td>
</tr>
<tr>
<td>2058</td>
<td>1.10</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Direct open</td>
<td>1=Open</td>
</tr>
<tr>
<td>2059</td>
<td>1.11</td>
<td>.Pos.Oper.ctlVal</td>
<td>CTRL.ESXSWI1</td>
<td>Direct close</td>
<td>1=Close</td>
</tr>
</tbody>
</table>
2.5.7 LD0.LDEV1 Protection relay's warm reset (1)

Table 244: LD0.LDEV1 Protection relay's warm reset (1)

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2080</td>
<td>3.00</td>
<td>.WrmStrCmd.Oper.ctlVal</td>
<td>LD0.LDEV1</td>
<td>Warm reboot of protection relay</td>
<td>1=Reboot</td>
</tr>
</tbody>
</table>

2.5.8 LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "1". Persistent-type outputs can be written with both values "1" and "0". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

Table 245: LD0.SPCGAPC1 Generic control point (16 pcs) (1) – SPC-1

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2112</td>
<td>5.00</td>
<td>.SPCS01.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 1 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2113</td>
<td>5.01</td>
<td>.SPCS02.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 2 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2114</td>
<td>5.02</td>
<td>.SPCS03.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 3 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2115</td>
<td>5.03</td>
<td>.SPCS04.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 4 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2116</td>
<td>5.04</td>
<td>.SPCS05.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 5 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2117</td>
<td>5.05</td>
<td>.SPCS06.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 6 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2118</td>
<td>5.06</td>
<td>.SPCS07.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 7 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2119</td>
<td>5.07</td>
<td>.SPCS08.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 8 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2120</td>
<td>5.08</td>
<td>.SPCS09.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 9 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2121</td>
<td>5.09</td>
<td>.SPCS10.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 10 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2122</td>
<td>5.10</td>
<td>.SPCS11.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 11 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2123</td>
<td>5.11</td>
<td>.SPCS12.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 12 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2124</td>
<td>5.12</td>
<td>.SPCS13.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 13 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2125</td>
<td>5.13</td>
<td>.SPCS14.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 14 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2126</td>
<td>5.14</td>
<td>.SPCS15.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 15 control</td>
<td>0/1=Off/On</td>
</tr>
<tr>
<td>2127</td>
<td>5.15</td>
<td>.SPCS16.ctlVal</td>
<td>SPCGAPC1</td>
<td>Output 16 control</td>
<td>0/1=Off/On</td>
</tr>
</tbody>
</table>

2.5.9 LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

The binary outputs can be configured either as pulse- or persistent-type outputs. Pulse-type outputs are triggered with the write value "1". Persistent-type outputs can be written.
with both values "1" and "0". The setting mode "toggled" for local operation corresponds to "persistent" for remote operation.

### Table 246: LD0.SPCGAPC2 Generic control point (16 pcs) (2) – SPC-2

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2128</td>
<td>6.00</td>
<td>.SPCS01.ctlVal</td>
<td>Output 1 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2129</td>
<td>6.01</td>
<td>.SPCS02.ctlVal</td>
<td>Output 2 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2130</td>
<td>6.02</td>
<td>.SPCS03.ctlVal</td>
<td>Output 3 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2131</td>
<td>6.03</td>
<td>.SPCS04.ctlVal</td>
<td>Output 4 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2132</td>
<td>6.04</td>
<td>.SPCS05.ctlVal</td>
<td>Output 5 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2133</td>
<td>6.05</td>
<td>.SPCS06.ctlVal</td>
<td>Output 6 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2134</td>
<td>6.06</td>
<td>.SPCS07.ctlVal</td>
<td>Output 7 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2135</td>
<td>6.07</td>
<td>.SPCS08.ctlVal</td>
<td>Output 8 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2136</td>
<td>6.08</td>
<td>.SPCS09.ctlVal</td>
<td>Output 9 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2137</td>
<td>6.09</td>
<td>.SPCS10.ctlVal</td>
<td>Output 10 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2138</td>
<td>6.10</td>
<td>.SPCS11.ctlVal</td>
<td>Output 11 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2139</td>
<td>6.11</td>
<td>.SPCS12.ctlVal</td>
<td>Output 12 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2140</td>
<td>6.12</td>
<td>.SPCS13.ctlVal</td>
<td>Output 13 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2141</td>
<td>6.13</td>
<td>.SPCS14.ctlVal</td>
<td>Output 14 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2142</td>
<td>6.14</td>
<td>.SPCS15.ctlVal</td>
<td>Output 15 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
<tr>
<td>2143</td>
<td>6.15</td>
<td>.SPCS16.ctlVal</td>
<td>Output 16 control</td>
<td>0/1=Off/On</td>
<td></td>
</tr>
</tbody>
</table>

### 2.5.10 LD0.SRGAPC1 Set-reset (8 pcs) (1) – SR-1

### Table 247: LD0.SRGAPC1 Set-reset (8 pcs) (1) – SR-1

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2096</td>
<td>4.00</td>
<td>.Rs1.Oper.ctlVal</td>
<td>Reset flip-flop 1</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2097</td>
<td>4.01</td>
<td>.Rs2.Oper.ctlVal</td>
<td>Reset flip-flop 2</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2098</td>
<td>4.02</td>
<td>.Rs3.Oper.ctlVal</td>
<td>Reset flip-flop 3</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2099</td>
<td>4.03</td>
<td>.Rs4.Oper.ctlVal</td>
<td>Reset flip-flop 4</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2100</td>
<td>4.04</td>
<td>.Rs5.Oper.ctlVal</td>
<td>Reset flip-flop 5</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2101</td>
<td>4.05</td>
<td>.Rs6.Oper.ctlVal</td>
<td>Reset flip-flop 6</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2102</td>
<td>4.06</td>
<td>.Rs7.Oper.ctlVal</td>
<td>Reset flip-flop 7</td>
<td>1=Reset</td>
<td></td>
</tr>
<tr>
<td>2103</td>
<td>4.07</td>
<td>.Rs8.Oper.ctlVal</td>
<td>Reset flip-flop 8</td>
<td>1=Reset</td>
<td></td>
</tr>
</tbody>
</table>
2.5.11 **LD0.SRGAPC2 Set-reset (8 pcs) (2) – SR-2**

*Table 248: LD0.SRGAPC2 Set-reset (8 pcs) (2) – SR-2*

<table>
<thead>
<tr>
<th>0xA</th>
<th>CS</th>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>2104</td>
<td>4.08</td>
<td>.Rs1.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 1</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2105</td>
<td>4.09</td>
<td>.Rs2.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 2</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2106</td>
<td>4.10</td>
<td>.Rs3.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 3</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2107</td>
<td>4.11</td>
<td>.Rs4.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 4</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2108</td>
<td>4.12</td>
<td>.Rs5.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 5</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2109</td>
<td>4.13</td>
<td>.Rs6.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 6</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2110</td>
<td>4.14</td>
<td>.Rs7.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 7</td>
<td>1=Reset</td>
</tr>
<tr>
<td>2111</td>
<td>4.15</td>
<td>.Rs8.Oper.ctlVal</td>
<td></td>
<td>Reset flip-flop 8</td>
<td>1=Reset</td>
</tr>
</tbody>
</table>

2.5.12 **Unmapped control points**

*Table 249: Unmapped control points*

<table>
<thead>
<tr>
<th>IEC 61850 name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD0.LLN0.MeasStatRs.Oper.ctlVal</td>
<td>Reset all min. and max. demands</td>
<td>1=Reset</td>
</tr>
<tr>
<td>LD0.LLN0.PQRs.Oper.ctlVal</td>
<td>Reset all power quality data</td>
<td>1=Reset</td>
</tr>
<tr>
<td>LD0.FLTRFRC1.RcdRs.Oper.ctlVal</td>
<td>Reset fault record data</td>
<td>1=Reset</td>
</tr>
</tbody>
</table>

2.5.13 **Unmapped controls**

2.5.13.1 **LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1**

*Table 250: LD0.UDFCNT1 Multipurpose generic up-down counter (1) – CTR-1*

<table>
<thead>
<tr>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RsCnt.Oper.ctlVal</td>
<td>Reset counter</td>
<td>Resets counter value</td>
<td>0=Cancel; 1=Reset</td>
</tr>
<tr>
<td>LodCnt.Oper.ctlVal</td>
<td>Load counter</td>
<td>Loads the counter to preset value</td>
<td>0=Cancel; 1=Load</td>
</tr>
</tbody>
</table>
### 2.5.13.2 LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

Table 251: LD0.UDFCNT2 Multipurpose generic up-down counter (2) – CTR-2

<table>
<thead>
<tr>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RsCnt.Oper.ctlVal</td>
<td>Reset counter</td>
<td>Resets counter value</td>
<td>0=Cancel; 1=Reset</td>
</tr>
<tr>
<td>LodCnt.Oper.ctlVal</td>
<td>Load counter</td>
<td>Loads the counter to preset value</td>
<td>0=Cancel; 1=Load</td>
</tr>
</tbody>
</table>

### 2.5.13.3 LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3

Table 252: LD0.UDFCNT3 Multipurpose generic up-down counter (3) – CTR-3

<table>
<thead>
<tr>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RsCnt.Oper.ctlVal</td>
<td>Reset counter</td>
<td>Resets counter value</td>
<td>0=Cancel; 1=Reset</td>
</tr>
<tr>
<td>LodCnt.Oper.ctlVal</td>
<td>Load counter</td>
<td>Loads the counter to preset value</td>
<td>0=Cancel; 1=Load</td>
</tr>
</tbody>
</table>

### 2.5.13.4 LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4

Table 253: LD0.UDFCNT4 Multipurpose generic up-down counter (4) – CTR-4

<table>
<thead>
<tr>
<th>IEC 61850 name</th>
<th>SA name</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RsCnt.Oper.ctlVal</td>
<td>Reset counter</td>
<td>Resets counter value</td>
<td>0=Cancel; 1=Reset</td>
</tr>
<tr>
<td>LodCnt.Oper.ctlVal</td>
<td>Load counter</td>
<td>Loads the counter to preset value</td>
<td>0=Cancel; 1=Load</td>
</tr>
</tbody>
</table>
# Section 3 Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>EMC</td>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>HSO</td>
<td>High-speed output</td>
</tr>
<tr>
<td>IEC 61850</td>
<td>International standard for substation communication and modeling</td>
</tr>
<tr>
<td>IEC 61850-9-2</td>
<td>A communication protocol based on the IEC 61850 standard series</td>
</tr>
<tr>
<td>IED</td>
<td>Intelligent electronic device</td>
</tr>
<tr>
<td>LED</td>
<td>Light-emitting diode</td>
</tr>
<tr>
<td>LHMI</td>
<td>Local human-machine interface</td>
</tr>
<tr>
<td>Modbus</td>
<td>A serial communication protocol developed by the Modicon company in 1979. Originally used for communication in PLCs and RTU devices.</td>
</tr>
<tr>
<td>PCM600</td>
<td>Protection and Control IED Manager</td>
</tr>
<tr>
<td>UL</td>
<td>Underwriters Laboratories</td>
</tr>
</tbody>
</table>