Installation instructions for Series NRX PROFIBUS DP communications adapter module

Instructions apply to:

- Series NRX, Type NF Frame
  ANSI, UL1066, UL489 / IEC, IZMX16, IZM91

- Series NRX, Type RF Frame
  IEC, IZMX40

⚠️ WARNING

1. Only qualified electrical personnel should be permitted to work on the equipment.
2. Always de-energize primary and secondary circuits if a circuit breaker cannot be removed to a safe work location.
3. Drawout circuit breakers should be levered (racked) out to the disconnect position.
4. All circuit breakers should be switched to the off position and mechanism springs discharged.

Failure to follow these steps for all procedures described in this instruction leaflet could result in death, bodily injury, or property damage.

⚠️ WARNING

The instructions contained in this IL and on product labels have to be followed. Observe the five safety rules:
- Disconnecting
- Ensure that devices cannot be accidentally restarted
- Verify isolation from the supply
- Earthing and short-circuiting
- Covering or providing barriers to adjacent live parts

Disconnect the equipment from the supply. Use only authorized spare parts in the repair of the equipment. The specified maintenance intervals as well as the instructions for repair and exchange must be strictly adhered to prevent injury to personnel and damage to the switchboard.
Section 1: General information

The Series NRX® PROFIBUS® DP Communications Adapter Module (PCAM) (Figure 1) is an accessory that will operate as a communicating device in conjunction with a compatible Series NRX trip unit/breaker in a master communications network (Figure 2). The PCAM communicates to a PROFIBUS DP network master using the PROFIBUS-DP-V0 protocol.

Figure 1. Series NRX PROFIBUS DP Communications Adapter Module

Figure 2. PROFIBUS DP Communications Adapter Modules in a PROFIBUS DP Network

Section 2: Installation of PROFIBUS DP communications adapter module

The PROFIBUS DP communications adapter module is a slave device and as such requires a master device for control command initiation. Each PROFIBUS DP communications adapter module provides:

- Circuit breaker open/close/reset control
- Series NRX trip unit source/residual ground selection (if applicable)
- Flashing Status LED indicating module has power
- PROFIBUS DP communication enable/disable selection jumper for remote open/close control
- DIN rail mounting (11 mm H, 28 mm W DIN rail minimum requirement)
- Input power for module from 24 Vdc

The PROFIBUS DP communications adapter module is designed to be installed, operated, and maintained by adequately trained people. These instructions do not cover all details or variations of the equipment for its storage, delivery, installation, checkout, safe operation, or maintenance.

If you have any questions or need additional information or instructions, please contact your local Eaton representative or visit www.eaton.com.

The following instructions apply to drawout circuit breakers only. For fixed-mounted circuit breakers, a separate DIN rail mounting configuration is preferred. Please contact Eaton for additional information.

Proceed with the following seven steps:

Step 1: Using a T-15 Torx, remove the four mounting screws holding the terminal block alignment bracket in place. For the RF Frame this is the left terminal block group when facing the front of the breaker.
Figure 3. Step 1

Step 2: Carefully slide the alignment bracket out from between any mounted terminal blocks and put it aside with its mounting hardware for re-installment after the communications adapter module is connected to the DIN rail.

Figure 4. Step 2

Step 3: Remove the terminal block in location 19/20 by inserting a small screwdriver in the recessed area in the top front of the terminal block as shown, and gently pry down to release and remove the block from the DIN rail.

Figure 5. Step 3

Step 4: Repeat the same procedure performed in Step 3 to remove terminal blocks at locations 21/22, 23/24, and 25/26.

Note: The extra DIN rail mounting screw located in the space where the four terminal blocks were mounted may need to be removed to allow the unit’s pogo pin ground to properly hit the metal DIN rail.

Figure 6. Step 4

Step 5: Tilt the communications module forward to engage the upper part of the DIN rail, and then snap it back into the DIN rail for complete engagement.

Figure 7. Step 5

Step 6: Carefully slide the terminal block alignment bracket back into position. Before securing the bracket in place, inspect it from the bottom to ensure that the teeth on the bracket separate each individual terminal block. One installed terminal block only should be visible between two teeth when the alignment bracket is properly positioned. Secure the terminal block alignment bracket using the four screws previously removed. Hand tighten the four mounting screws.
Figure 8. Step 6

Step 7: A mounted communications module appears as shown and the installation procedure is complete. The module can now be wired in keeping with the information presented in Section 3.

Figure 9. Step 7

Section 3: PROFIBUS DP RS-485 network wiring

Reference material pertaining to PROFIBUS can be obtained from the http://PROFIBUS.com Web site. Refer to the PROFIBUS DP standard for transmission using copper cables (RS-485). A 9-pin D-SUB connector interface is provided.

Section 4: PROFIBUS DP communications module connections

WARNING

ALL APPLICABLE SAFETY CODES, SAFETY STANDARDS, AND SAFETY REGULATIONS MUST BE STRICTLY ADHERED TO WHEN INSTALLING, OPERATING, OR MAINTAINING THIS EQUIPMENT. FAILURE TO COMPLY COULD RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE.

For installation specifics, refer to Figure 3 and Figure 4 on page 2 and page 3 respectively for wiring diagrams, as well as pin-out Table 1 (power connections) and Table 2 (PROFIBUS DP connections).

Table 1. Power Connector Pin-Outs

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>Input Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24 Vdc +</td>
</tr>
<tr>
<td>2</td>
<td>24 Vdc –</td>
</tr>
<tr>
<td>3</td>
<td>Control signal common</td>
</tr>
<tr>
<td>4</td>
<td>Control open signal</td>
</tr>
<tr>
<td>5</td>
<td>Control close signal</td>
</tr>
</tbody>
</table>

1 Module power uses a 5-pin input connector. Power requirement is 24 Vdc, 10 watts.

PROFIBUS DP RS-485 connector

This DB9 connector provides the interface to the PROFIBUS DP RS-485 network. The polarity of the RxD/TxD data lines is “critically” important. Refer to Table 2.

Table 2. PROFIBUS DP RS-485 Connector Pin Outs

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Input/Output Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shield †</td>
</tr>
<tr>
<td>2</td>
<td>M24 (ground for +24V output) ‡</td>
</tr>
<tr>
<td>3</td>
<td>RxD/TxD-P (B-dataline)</td>
</tr>
<tr>
<td>4</td>
<td>CNTR-P/RTS</td>
</tr>
<tr>
<td>5</td>
<td>DGND (data-ground)</td>
</tr>
<tr>
<td>6</td>
<td>VP (plus for 5V supply)</td>
</tr>
<tr>
<td>7</td>
<td>P24 (plus for 24V output) ‡</td>
</tr>
<tr>
<td>8</td>
<td>RxD/TxD-N (A-dataline)</td>
</tr>
<tr>
<td>9</td>
<td>CNTR-N †</td>
</tr>
</tbody>
</table>

† PROFIBUS signals that are not connected on the PCAM.
Section 5: Jumpers and indicator LEDs

Refer to Figure 10 to become familiar with specific jumper and LED locations on the PROFIBUS DP communications adapter module.

Figure 10. Communications Adapter Module (Front View Closeup)

MicroController LED (Status)

This indicator will be flashing green whenever the module is powered up and when the microprocessor is executing instructions. When the Series NRX PROFIBUS DP communications adapter module is connected to a Series NRX trip unit for the first time, this LED will alternately flash red and green to signal a learning process between both units. This automatic process will take approximately 15 seconds and occurs only once during the initial startup. The LED will also flash red if the module is not connected to or unable to communicate with a Series NRX trip unit.

PROFIBUS SYSAULT LED (red)

The LED will be illuminated as described in Table 3.

PROFIBUS BUSFAULT LED (red)

The LED will be illuminated as described in Table 3.

Table 3. PROFIBUS DP LED States

<table>
<thead>
<tr>
<th>SF</th>
<th>BF</th>
<th>PROFIBUS DP State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Off</td>
<td>Everything OK</td>
</tr>
<tr>
<td>Off</td>
<td>On</td>
<td>No communications</td>
</tr>
<tr>
<td>Off</td>
<td>Blinking</td>
<td>Communications, but not in data exchange</td>
</tr>
<tr>
<td>On</td>
<td>On</td>
<td>Configuration not OK</td>
</tr>
</tbody>
</table>

PROFIBUS DP control jumper

This jumper provides the user with a means of enabling or disabling remote communication control commands to the Series NRX trip unit. With jumper placed in the ENABLE position, remote Open and Close Breaker commands can be acted upon. With the jumper in the DISABLE position, these commands will not be accepted.

Source/residual ground selection jumper

This jumper selects the protection configuration for Series NRX trip units with ground fault protection or ground fault alarm functionality. Consult Series NRX trip unit instructions (IL01301051E for Digitrip 520) for further information on ground sensing. This jumper is not applicable and does not function for non-ground fault style trip units.
Section 6: Viewing/setting PROFIBUS DP address

The Series NRX trip unit is used as the means to display and modify the programmed address setting of the PCAM module. All modules are shipped with the SSA (set slave address) of 126. The settable address range is 001–125.

A trip unit containing a full display, such as the Series NRX 1150, will provide the PCAM settings in menu form. To set or view PCAM settings on a Series NRX 520M limited display, the following sequence is used.

To set or view the address, depress and hold the Reset/Battery Test button located on the front of the Series NRX trip unit for approximately 5 seconds until the address information is displayed. **This button must be held in continuously during the process.**

The Series NRX trip unit display will then alternate between “SP00” (denoting the address display mode) and the programmed PROFIBUS DP address value.

To select a new address, depress the trip unit Scroll Display to increment the address value shown. Users may simultaneously depress and hold in the Scroll and Reset/Battery Test buttons for fast advance.

Once the setting has been modified and the Reset/Battery Test button has been released, the new PROFIBUS DP setting will be saved.

<table>
<thead>
<tr>
<th>Table 4. PCAM Communications Setting Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting Number</td>
</tr>
<tr>
<td>Communication address</td>
</tr>
</tbody>
</table>
Section 7: PROFIBUS DP-V0 profiles

The PCAM supports the PROFIBUS DP profile for low voltage switchgear devices (LVSG): Circuit Breaker Device Classification. This classification provides cyclic data exchange structures for one command (outputs from the PROFIBUS master to the PCAM slave device) format (Format 0) and four monitoring (inputs from the PCAM slave device to the PROFIBUS master) formats (Format 0–Format 3). The PCAM also supports an added monitoring format (Format 4), similar to Format 3, except the active energy value is provided with a higher resolution. The configuration data accepted by the PCAM (and described at the end of the GSD file) is defined in Table 5.

Table 5. CFG Data Formats

<table>
<thead>
<tr>
<th>Profile Type</th>
<th>CFG Data</th>
<th>Command Format</th>
<th>Monitoring Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 x 31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0 x 31, 0 x D3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0 x 31, 0 x D7</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0 x 31, 0 x DD</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>0 x 31, 0 x DE</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>0 x 31, 0 x 00</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Cyclic data exchange command structure format

Command structure Format 0 for cyclic data exchange from the PROFIBUS master supported by the PCAM is described in Table 6.

The bits are defined as bit 0 is bit 0 of byte 0; bit 8 is bit 0 of byte 1.

Cyclic data exchange monitoring structure formats

Monitoring structure Formats 0–4 for cyclic data exchange returned from the PCAM to the PROFIBUS master are described in Table 7 through Table 11, respectively.

The state information bytes are required in all monitoring formats. The bits are defined as bit 0 is bit 0 of state byte 0; bit 8 is bit 0 of state byte 1.

The definitions are deciphered from the Primary/Secondary/Cause-Of-Status information reported from the trip unit (see Table 13, Table 14, and Table 15, respectively).

The multi-byte measurement values of Formats 1–4 are transmitted most significant byte first, as required by the PROFIBUS protocol.

Table 6. Cyclic Data Exchange Command Format 0

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Description</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1–0</td>
<td>Circuit breaker:</td>
<td>Open breaker (if remote enabled, see Section 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = no change</td>
<td>Close breaker (if remote enabled, see Section 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = switch OFF</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = switch ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = no change</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Clear last trip</td>
<td>&quot;Reset Trip&quot; issued to trip unit</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Output 0</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Output 1</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Output 2</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Output 3</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Output 4</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9–8</td>
<td>Test mode:</td>
<td>No trip phase current self-test at 3.0 per unit issued to Digitrip 1150 trip unit only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = no test</td>
<td>Not implemented</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = w/o release</td>
<td>Not implemented</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = w/o release</td>
<td>Not implemented</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = with warning</td>
<td>Not implemented</td>
</tr>
<tr>
<td>10</td>
<td>Delete history memory</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Reset min./max. memory</td>
<td>&quot;Reset all min./max. values&quot; issued to trip unit</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Reset temperature min./max. memory</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Output 5</td>
<td>Not implemented</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Reset maintenance information</td>
<td>&quot;Reset trip unit health buffer&quot; issued to trip unit</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Clock synchronization</td>
<td>Not implemented</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. Cyclic Data Exchange Monitoring Format 0

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Description</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1–0</td>
<td>Position of circuit breaker:</td>
<td>No communications with trip unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = disconnected</td>
<td>Communications with trip unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = operational</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = not present</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td></td>
<td>State of circuit breaker:</td>
<td>00 = communications with trip unit not yet established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = OFF</td>
<td>01 = Primary status: open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = ON</td>
<td>10 = Primary status: closed, alarm, pickup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = Tripped</td>
<td>11 = Primary status: tripped</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Ready to switch on</td>
<td>1 = (not implemented)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Undervoltage release</td>
<td>1 = Primary status: tripped, cause: 12</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Spring loaded</td>
<td>1 = (not implemented)</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Overload warning</td>
<td>1 = Primary status: alarm, cause: 61, OR Primary status: pickup</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>Setpoint activated</td>
<td>1 = Primary status: alarm, cause: 11, 12, 15, 16, 17, 18, 26, 27</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Warning</td>
<td>1 = Primary status: alarm, cause: all except 61</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Write protection activated</td>
<td>1 if Digitrip 1150 trip unit AND remote enabled, see Section 5</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Input 0</td>
<td>0 = (not implemented)</td>
</tr>
<tr>
<td>14–12</td>
<td></td>
<td>Release reason:</td>
<td>000 = no release</td>
</tr>
<tr>
<td></td>
<td></td>
<td>001 = (Longtime) release</td>
<td>001 = Primary status: tripped, causes: 61 (with I &lt; all other currents)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>010 = (Instantaneous) release</td>
<td>010 = Primary status: tripped, causes: 3, 66, 76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>011 = (Shorttime) release</td>
<td>011 = Primary status: tripped, causes: 62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 = earth fault</td>
<td>100 = Primary status: tripped, causes: 84, 85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>101 = extended protection</td>
<td>101 = Primary status: tripped, causes: all other remaining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110 = over-current in N-wire</td>
<td>110 = Primary status: tripped, causes: 80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>111 = no device information</td>
<td>111 = communications with trip unit not yet established</td>
</tr>
</tbody>
</table>

Table 8. Cyclic Data Exchange Monitoring Format 1

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Data Type</th>
<th>Description</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unsigned8</td>
<td>State 0 (byte 0 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Unsigned8</td>
<td>State 1 (byte 1 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>Unsigned16</td>
<td>I_A (Phase A current)</td>
<td>Amps</td>
</tr>
<tr>
<td>5–4</td>
<td>Unsigned16</td>
<td>I_B (Phase B current)</td>
<td>Amps</td>
</tr>
<tr>
<td>7–6</td>
<td>Unsigned16</td>
<td>I_C (Phase C current)</td>
<td>Amps</td>
</tr>
<tr>
<td>9–8</td>
<td>Unsigned16</td>
<td>I_max (maximum value of I_A, I_B, I_C)</td>
<td>Amps</td>
</tr>
</tbody>
</table>
### Table 9. Cyclic Data Exchange Monitoring Format 2

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Data Type</th>
<th>Description</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unsigned8</td>
<td>State 0 (byte 0 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Unsigned8</td>
<td>State 1 (byte 1 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>Unsigned16</td>
<td>$I_A$ (Phase A current)</td>
<td>Amps</td>
</tr>
<tr>
<td>5–4</td>
<td>Unsigned16</td>
<td>$I_B$ (Phase B current)</td>
<td>Amps</td>
</tr>
<tr>
<td>7–6</td>
<td>Unsigned16</td>
<td>$I_C$ (Phase C current)</td>
<td>Amps</td>
</tr>
<tr>
<td>9–8</td>
<td>Unsigned16</td>
<td>$I_{max}$ (maximum value of $I_A$, $I_B$, $I_C$)</td>
<td>Amps</td>
</tr>
<tr>
<td>11–10</td>
<td>Unsigned16</td>
<td>$I_N$ (neutral current)</td>
<td>Amps</td>
</tr>
<tr>
<td>13–12</td>
<td>Unsigned16</td>
<td>$V_{aB}$ (average line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>15–14</td>
<td>Integer16</td>
<td>cos $\phi_{avg}$ (average of apparent power factor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>17–16</td>
<td>Unsigned16</td>
<td>Energy</td>
<td>MWh</td>
</tr>
</tbody>
</table>

### Table 10. Cyclic Data Exchange Monitoring Format 3

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Data Type</th>
<th>Description</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unsigned8</td>
<td>State 0 (byte 0 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Unsigned8</td>
<td>State 1 (byte 1 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>Unsigned16</td>
<td>$I_A$ (Phase A current)</td>
<td>Amps</td>
</tr>
<tr>
<td>5–4</td>
<td>Unsigned16</td>
<td>$I_B$ (Phase B current)</td>
<td>Amps</td>
</tr>
<tr>
<td>7–6</td>
<td>Unsigned16</td>
<td>$I_C$ (Phase C current)</td>
<td>Amps</td>
</tr>
<tr>
<td>9–8</td>
<td>Unsigned16</td>
<td>$I_{max}$ (maximum value of $I_A$, $I_B$, $I_C$)</td>
<td>Amps</td>
</tr>
<tr>
<td>11–10</td>
<td>Unsigned16</td>
<td>$I_N$ (neutral current)</td>
<td>Amps</td>
</tr>
<tr>
<td>13–12</td>
<td>Unsigned16</td>
<td>$V_{aB}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>15–14</td>
<td>Unsigned16</td>
<td>$V_{bC}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>17–16</td>
<td>Unsigned16</td>
<td>$V_{cA}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>19–18</td>
<td>Unsigned16</td>
<td>$V_{aN}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>21–20</td>
<td>Unsigned16</td>
<td>$V_{bN}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>23–22</td>
<td>Unsigned16</td>
<td>$V_{cN}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>25–24</td>
<td>Integer16</td>
<td>cos $\phi_{avg}$ (average of apparent power factor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>27–26</td>
<td>Unsigned16</td>
<td>Energy</td>
<td>MWh</td>
</tr>
<tr>
<td>29–28</td>
<td>Unsigned16</td>
<td>$S_{total}$ (total apparent power)</td>
<td>kVA</td>
</tr>
</tbody>
</table>
### Table 11. Cyclic Data Exchange Monitoring Format 4

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Data Type</th>
<th>Description</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unsigned8</td>
<td>State 0 (byte 0 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Unsigned8</td>
<td>State 1 (byte 1 of monitoring Format 0, Table 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>Unsigned16</td>
<td>$I_L$ (Phase A current)</td>
<td>Amps</td>
</tr>
<tr>
<td>5–4</td>
<td>Unsigned16</td>
<td>$I_L$ (Phase B current)</td>
<td>Amps</td>
</tr>
<tr>
<td>7–6</td>
<td>Unsigned16</td>
<td>$I_L$ (Phase C current)</td>
<td>Amps</td>
</tr>
<tr>
<td>9–8</td>
<td>Unsigned16</td>
<td>$I_{max}$ (maximum value of $I_L$, $I_L$, $I_L$)</td>
<td>Amps</td>
</tr>
<tr>
<td>11–10</td>
<td>Unsigned16</td>
<td>$I_N$ (neutral current)</td>
<td>Amps</td>
</tr>
<tr>
<td>13–12</td>
<td>Unsigned16</td>
<td>$V_{L1-L2}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>15–14</td>
<td>Unsigned16</td>
<td>$V_{L2-L3}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>17–16</td>
<td>Unsigned16</td>
<td>$V_{L3-L1}$ (line-to-line voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>19–18</td>
<td>Unsigned16</td>
<td>$V_{L1-N}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>21–20</td>
<td>Unsigned16</td>
<td>$V_{L2-N}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>23–22</td>
<td>Unsigned16</td>
<td>$V_{L3-N}$ (line-to-neutral voltage)</td>
<td>Volts</td>
</tr>
<tr>
<td>25–24</td>
<td>Integer16</td>
<td>$\cos \phi_{avg}$ (average of apparent power factor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>29–26</td>
<td>Unsigned32</td>
<td>Energy</td>
<td>kWh</td>
</tr>
<tr>
<td>31–30</td>
<td>Unsigned16</td>
<td>$S_{max}$ (total apparent power)</td>
<td>kVA</td>
</tr>
</tbody>
</table>

### Section 8: PROFIBUS DP-V0 diagnostics

Until the PCAM is parameterized and configured by the PROFIBUS master, a request for diagnostics by the master will result in the PCAM returning only the mandatory 6-byte PROFIBUS diagnostics information.

Once successfully parameterized and configured, the PCAM will append additional device-related diagnostics information to the mandatory PROFIBUS diagnostics information, as described in Table 12. The diagnostics user data, starting at bit 24, is also described in the GSD file (Appendix A).

**Note:** Configuration is required before this additional information can be included because the user-defined "Data Object X invalid" bits are defined by and dependent upon the cyclic data exchange monitoring format selected. Any change in the PCAM diagnostic information is signaled to the PROFIBUS master when the PCAM returns a high priority cyclic data exchange.
Table 12. DP-V0 Unit Diagnostics Definitions

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>00H</td>
<td>08H</td>
<td>Header: device related diagnostics, length (8 bytes)</td>
</tr>
<tr>
<td>8</td>
<td>7–0</td>
<td>81H</td>
<td>Type (status message)</td>
</tr>
<tr>
<td>9</td>
<td>15–8</td>
<td>00H</td>
<td>Slot</td>
</tr>
<tr>
<td>10</td>
<td>23–16</td>
<td>00H</td>
<td>Specifier</td>
</tr>
<tr>
<td>11</td>
<td>24</td>
<td>1</td>
<td>No communications with trip unit</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>1</td>
<td>Data Object 1 invalid (Monitoring Formats 1-4: $I_L$)</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>1</td>
<td>Data Object 2 invalid (Monitoring Formats 1-4: $I_L$)</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>1</td>
<td>Data Object 3 invalid (Monitoring Formats 1-4: $I_L$)</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>1</td>
<td>Data Object 4 invalid (Monitoring Formats 1-4: $I_L$)</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>1</td>
<td>Data Object 5 invalid (Monitoring Formats 2-4: $I_L$)</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>1</td>
<td>Data Object 6 invalid (Monitoring Formats 2: $V_{L1L2}$) (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>1</td>
<td>Data Object 7 invalid (Monitoring Formats 2: $cos \phi_{avg}$) (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td>12</td>
<td>32</td>
<td>1</td>
<td>Data Object 8 invalid (Monitoring Formats 2: Energy) (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>1</td>
<td>Data Object 9 invalid (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>1</td>
<td>Data Object 10 invalid (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>1</td>
<td>Data Object 11 invalid (Monitoring Formats 3-4: $V_{L1L2}$)</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>1</td>
<td>Data Object 12 invalid (Monitoring Formats 3-4: $cos \phi_{avg}$)</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>1</td>
<td>Data Object 13 invalid (Monitoring Formats 3-4: Energy)</td>
</tr>
<tr>
<td></td>
<td>38</td>
<td>1</td>
<td>Data Object 14 invalid (Monitoring Formats 3-4: $S_{total}$)</td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>1</td>
<td>Remote open/closed not enabled (i.e., remote enable switch disabled, see Section 5)</td>
</tr>
<tr>
<td>13</td>
<td>40</td>
<td>1</td>
<td>EEROM error alarm (primary status: alarm, cause: 43)</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>1</td>
<td>RAM error alarm (primary status: alarm, cause: 39)</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>1</td>
<td>Setpoints error alarm (primary status: alarm, cause: 77)</td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>1</td>
<td>Watchdog alarm (primary status: alarm, cause: 46)</td>
</tr>
<tr>
<td></td>
<td>44</td>
<td>1</td>
<td>Check aux. switch alarm (primary status: alarm, cause: 148)</td>
</tr>
<tr>
<td></td>
<td>45</td>
<td>1</td>
<td>Breaker mechanism fault (primary status: alarm, cause: 154)</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>1</td>
<td>Breaker shunt trip problem (primary status: alarm, cause: 157)</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>1</td>
<td>Operations count alarm (primary status: alarm, cause: 31)</td>
</tr>
<tr>
<td>14</td>
<td>48</td>
<td>1</td>
<td>Earth fault alarm (primary status: alarm, cause: 84, 85)</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>1</td>
<td>Low power factor alarm (primary status: alarm, cause: 19)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1</td>
<td>Total harmonic distortion alarm (primary status: alarm, cause: 30)</td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>1</td>
<td>Frequency out of bounds alarm (primary status: alarm, cause: 146)</td>
</tr>
<tr>
<td></td>
<td>52</td>
<td>1</td>
<td>Historic trip occurred (primary status: closed, cause: 82)</td>
</tr>
<tr>
<td></td>
<td>53</td>
<td>1</td>
<td>Breaker in Maintenance Mode (cause: 153)</td>
</tr>
</tbody>
</table>

Section 9: Troubleshooting

The following are the most common issues experienced with the installation of a Series NRX PROFIBUS DP communications adapter module. If you have additional questions or need further information and/or instructions, please contact your local Eaton representative or visit www.eaton.com.

Observation 1—Status LED not flashing
Action—Verify proper input power to module connectors.

Observation 2—Status LED flashing green, but module does not change state in response to master command requests
Action—Verify correct module address.
Action—Verify communication cable is connected correctly from master to module.
Appendix A

PROFIBUS DP-V0—GSD Profile Document

;===============================================
; GSD File for Eaton Low Voltage Circuit Breakers
; English Version 1.0
; Date: 2009-02-03
; revised by CC-TDH/P Thiessmeier
; Changes:
; support of mandatory profile 1 (F0)
; changed to modular slave for better support of intel-based plcs
; Date: 2009-02-17
; revised by A.A. Anderson
; Changes:
; User_Prm_Data_Len = 3, to eventually support DP-V1
; Added Unit_Diag_Bit(0024-0052)
; Date: 2009-06-04
; revised by A.A. Anderson
; Changes:
; Added Module = “Add. Data of profile type 4” 0xDE
; Date: 2009-06-29
; revised by A.A. Anderson
; Changes:
; Comments (Slave related Key Words) Only
;===============================================

#PROFIBUS_DP

;===============================================
;General parameters
;===============================================

GSD_Revision = 3
Vendor_Name = “Eaton Corporation”
Model_Name = “Magnum,IZM,NRX” ; “Low Voltage Circuit Breaker”
Revision = “V1.0” ; Revision version of device
;Revision_Number = ; Must agree with RevNum in slave-specific diag
Ident_Number = 0x0BF4
Protocol_Ident = 0 ;0=PROFIBUS DP
Station_Type = 0 ;0=DP Slave
FMS_supp = 0 ;0=Not FMS/DP mixed device
9.6_supp = 1
19.2_supp = 1
31.25_supp = 0
45.45_supp = 1
93.75_supp = 1
187.5_supp = 1
500_supp = 1
1.5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1
MaxTsdr_9.6 = 60 ; Bit Time
MaxTsdr_19.2 = 60 ; Bit Time
MaxTsdr_31.25 = 60 ; Bit Time
MaxTsdr_45.45 = 60 ; Bit Time
MaxTsdr_93.75 = 60 ; Bit Time
MaxTsdr_187.5 = 60 ; Bit Time
MaxTsdr_500 = 100 ; Bit Time
MaxTsdr_1.5M = 150 ; Bit Time
MaxTsdr_3M = 250 ; Bit Time
MaxTsdr_6M = 450 ; Bit Time
MaxTsdr_12M = 800 ; Bit Time
Redundancy = 0 ; 0=Redundant Xmission NotSupported
Repeater_Ctrl_Sig = 2 ; CNTR-P bus signal:
; 0=NotConnected, 1=RS485 2=TTL
24V_Pins = 0 ; M24V & P24V bus signals:
; 0=NotConnected, 1=Input, 2=Output
Implementation_Type = “SPC3” ; Optional
; Bitmap_Device = “DIB_????” ; Optional
; Bitmap_Diag = “DIB_????” ; Optional
; Bitmap_SF = “DIB_????” ; Optional

;===============================================
; Physical Interface parameters (optional)
;===============================================

Physical_Interface = 0 ; Optional RS485-intrinsic
; Transmission_Delay_9.6 = 0 ; Bit Time
; Transmission_Delay_19.2 = 0 ; Bit Time
; Transmission_Delay_31.25 = 0 ; Bit Time
; Transmission_Delay_45.45 = 0 ; Bit Time
Installation instructions for Series NRX PROFIBUS DP communications adapter module

; Transmission_Delay_93.75 = 0 ; Bit Time
; Transmission_Delay_187.5 = 0 ; Bit Time
; Transmission_Delay_500 = 0 ; Bit Time
; Transmission_Delay_1.5M = 0 ; Bit Time
; Transmission_Delay_3M = 0 ; Bit Time
; Transmission_Delay_6M = 0 ; Bit Time
; Transmission_Delay_12M = 0 ; Bit Time
; Reaction_Delay_9.6 = 0 ; Bit Time
; Reaction_Delay_19.2 = 0 ; Bit Time
; Reaction_Delay_31.25 = 0 ; Bit Time
; Reaction_Delay_45.45 = 0 ; Bit Time
; Reaction_Delay_93.75 = 0 ; Bit Time
; Reaction_Delay_187.5 = 0 ; Bit Time
; Reaction_Delay_500 = 0 ; Bit Time
; Reaction_Delay_1.5M = 0 ; Bit Time
; Reaction_Delay_3M = 0 ; Bit Time
; Reaction_Delay_6M = 0 ; Bit Time
; Reaction_Delay_12M = 0 ; Bit Time
; End_Physical_Interface

; =======
; Slave-Specification
; =======
Freeze_Mode_supp = 1 ; 1=Supported
Sync_Mode_supp = 1 ; 1=Supported
Auto_Baud_supp = 1 ; 1=Supported
Set_Slave_Add_supp = 0
; 0=NotSupported (INCOM address setting)

User_Prm_Data_Len = 3
User_Prm_Data = 0x00,0x00,0x00
Max_User_Prm_Data_Len = 3
; Ext_User_Prm_Data_Const(0) = 0x00,0x00,0x00
Min_Slave_Intervall = 1 ; Min interval between two slave list cycles
; Time base: 100us
Modular_Station = 1 ; 0=Compact, 1=Modular device
Max_Module = 2
Max_Input_Len = 32 ; Circuit Breaker Profile input, format 4
Max_Output_Len = 2 ; Circuit Breaker Profile output
Max_Data_Len = 34

Fail_Safe = 0 ; 0=DataMsg with data=0 in CLEAR mode
Modul_Offset = 0 ; Slot number to appear in Cfg tool
Slave_Family = 2@CircuitBreaker@Digitrip
Diag_Update_Delay = 0
Fail_Safe_required = 0
; Info_Text = " " ; Optional additional info about device

Max_Diag_Data_Len = 14 ; 6 Bytes Mandatory by PROFIBUS
Unit_Diag_Bit(0024) = "No Communications with DigiTrip"
Unit_Diag_Bit(0025) = "Data Object 1 invalid"
Unit_Diag_Bit(0026) = "Data Object 2 invalid"
Unit_Diag_Bit(0027) = "Data Object 3 invalid"
Unit_Diag_Bit(0028) = "Data Object 4 invalid"
Unit_Diag_Bit(0029) = "Data Object 5 invalid"
Unit_Diag_Bit(0030) = "Data Object 6 invalid"
Unit_Diag_Bit(0031) = "Data Object 7 invalid"
Unit_Diag_Bit(0032) = "Data Object 8 invalid"
Unit_Diag_Bit(0033) = "Data Object 9 invalid"
Unit_Diag_Bit(0034) = "Data Object 10 invalid"
Unit_Diag_Bit(0035) = "Data Object 11 invalid"
Unit_Diag_Bit(0036) = "Data Object 12 invalid"
Unit_Diag_Bit(0037) = "Data Object 13 invalid"
Unit_Diag_Bit(0038) = "Data Object 14 invalid"
Unit_Diag_Bit(0039) = "Remote Open/Closed Not Enabled"
Unit_Diag_Bit(0040) = "EEROM Error Alarm"
Unit_Diag_Bit(0041) = "RAM Error Alarm"
Unit_Diag_Bit(0042) = "Setpoints Error Alarm"
Unit_Diag_Bit(0043) = "Watchdog Alarm"
Unit_Diag_Bit(0044) = "Check Aux Switch Alarm"
Unit_Diag_Bit(0045) = "Breaker Mechanism Fault"
Unit_Diag_Bit(0046) = "Breaker Shunt Trip Problem"
Unit_Diag_Bit(0047) = "Operations Count Alarm"
Unit_Diag_Bit(0048) = "Earth Fault Alarm"
Unit_Diag_Bit(0049) = "Low Power Factor Alarm"
Unit_Diag_Bit(0050) = "Total Harmonic Distortion Alarm"
Unit_Diag_Bit(0051) = "Frequency Out Of Bounds Alarm"
Unit_Diag_Bit(0052) = "Historic Trip Occurred"
Unit_Diag_Bit(0053) = "Breaker In Maintenance Mode"
; ******************************************************************************
; ** Slave related Key Words for DP extensions **
; ******************************************************************************

DPV1_Slave = 0
C1_Read_Write_supp = 1
C2_Read_Write_supp = 1
C1_Max_Data_Len = 22
C2_Max_Data_Len = 48
C1_Response_Timeout = 50 ;in units of 10ms, optional
C2_Response_Timeout = 50 ;in units of 10ms, optional
C1_Read_Write_required = 0
C2_Read_Write_required = 0
C2_Max_Count_Channels = 1
Max_Initiate_PDU_Length = 52
Diagnostic_Alarm_supp = 0
Process_Alarm_supp = 0
Pull_Plug_Alarm_supp = 0
Status_Alarm_supp = 0
Update_Alarm_supp = 0
Manufacturer_Specific_Alarm_supp = 0
Extra_Alarm_SAP_supp = 0
Alarm_Sequence_Mode_Count = 0
Alarm_Type_Mode_supp = 0
Diagnostic_Alarm_required = 0
Process_Alarm_required = 0
Pull_Plug_Alarm_required = 0
Status_Alarm_required = 0
Update_Alarm_required = 0
Manufacturer_Specific_Alarm_required = 0
DPV1_Data_Types = 0
WD_Base_1ms_supp = 1
Check_Cfg_Mode = 0
Publisher_supp = 0

Module = “Profile type 1” 0x31
1
EndModule

Module = “Add. data of profile type 2” 0xD3
2
Ext_Module_Prm_Data_Len = 0
EndModule

Module = “Add. Data of profile type 3” 0xD7
3
Ext_Module_Prm_Data_Len = 0
EndModule

Module = “Add. Data of profile type 4” 0xDD
4
Ext_Module_Prm_Data_Len = 0
EndModule

Module = “Add. Data of profile type 5” 0xDE
5
Ext_Module_Prm_Data_Len = 0
EndModule

Module = “No additional data” 0x00
6
EndModule

SlotDefinition
Slot (1) = “Profile type 1”  1  1-1
Slot (2) = “Additional data” 2   2-6
EndSlotDefinition
Appendix B

Primary/Secondary/Cause

The Primary/Secondary/Cause status information are binary encoded values. The definition of primary status byte is listed in Table 13. The definition of the secondary status byte is listed in Table 14. The definition of the cause-of-status word (pertaining to the primary status) is listed in Table 15.

Table 13. Primary Status Code Definitions

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unknown</td>
</tr>
<tr>
<td>1</td>
<td>Open</td>
</tr>
<tr>
<td>2</td>
<td>Closed</td>
</tr>
<tr>
<td>3</td>
<td>Tripped</td>
</tr>
<tr>
<td>4</td>
<td>Alarmed</td>
</tr>
<tr>
<td>13</td>
<td>Picked-up</td>
</tr>
</tbody>
</table>

Table 14. Secondary Status Code Definitions

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unknown</td>
</tr>
<tr>
<td>3</td>
<td>Test mode</td>
</tr>
<tr>
<td>7</td>
<td>Powered up</td>
</tr>
<tr>
<td>8</td>
<td>Alarm</td>
</tr>
</tbody>
</table>

Table 15. Cause-of-Status Code Definitions

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unknown</td>
<td>65</td>
<td>Reverse power</td>
</tr>
<tr>
<td>1</td>
<td>Normal operating mode</td>
<td>66</td>
<td>Fixed instantaneous phase overcurrent #2</td>
</tr>
<tr>
<td>3</td>
<td>Instantaneous phase overcurrent</td>
<td>67</td>
<td>Reverse phase</td>
</tr>
<tr>
<td>11</td>
<td>Overvoltage</td>
<td>68</td>
<td>Reverse sequence</td>
</tr>
<tr>
<td>12</td>
<td>Undervoltage</td>
<td>69</td>
<td>Phase current loss</td>
</tr>
<tr>
<td>15</td>
<td>Underfrequency</td>
<td>71</td>
<td>Alarm active</td>
</tr>
<tr>
<td>16</td>
<td>Overfrequency</td>
<td>72</td>
<td>Bad frame</td>
</tr>
<tr>
<td>17</td>
<td>Current unbalance</td>
<td>73</td>
<td>Phase currents near pickup</td>
</tr>
<tr>
<td>18</td>
<td>Voltage unbalance</td>
<td>75</td>
<td>Making current release</td>
</tr>
<tr>
<td>19</td>
<td>Apparent power factor</td>
<td>76</td>
<td>Fixed instantaneous phase overcurrent #3</td>
</tr>
<tr>
<td>26</td>
<td>Power demand</td>
<td>77</td>
<td>Set points error</td>
</tr>
<tr>
<td>27</td>
<td>VA demand</td>
<td>78</td>
<td>Over-temperature</td>
</tr>
<tr>
<td>30</td>
<td>Total harmonic distortion</td>
<td>80</td>
<td>Long delay neutral overcurrent</td>
</tr>
<tr>
<td>31</td>
<td>Operations count</td>
<td>82</td>
<td>Historical data</td>
</tr>
<tr>
<td>33</td>
<td>Control via communications</td>
<td>84</td>
<td>Ground fault (instantaneous or delay)</td>
</tr>
<tr>
<td>37</td>
<td>Coil supervision</td>
<td>85</td>
<td>Earth fault (instantaneous or delay)</td>
</tr>
<tr>
<td>39</td>
<td>RAM error</td>
<td>146</td>
<td>Frequency out of range</td>
</tr>
<tr>
<td>43</td>
<td>EEROM error</td>
<td>148</td>
<td>Check auxiliary switch</td>
</tr>
<tr>
<td>46</td>
<td>Watchdog</td>
<td>149</td>
<td>Overcurrent</td>
</tr>
<tr>
<td>61</td>
<td>Long delay phase overcurrent</td>
<td>153</td>
<td>Maintenance mode</td>
</tr>
<tr>
<td>62</td>
<td>Short delay phase overcurrent</td>
<td>154</td>
<td>Breaker mech. fault</td>
</tr>
<tr>
<td>63</td>
<td>Fixed instantaneous phase overcurrent #1</td>
<td>156</td>
<td>Disconnect position</td>
</tr>
<tr>
<td>64</td>
<td>Bad/missing rating plug</td>
<td>157</td>
<td>Shunt trip problem</td>
</tr>
</tbody>
</table>
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Montageanweisung für PROFIBUS-DP-Kommunikationsbaugruppe NRX

Die Montageanweisung ist für folgende Baugrößen gültig:

Series NRX, Type NF Frame
ANSI, UL1066, UL489 / IEC, IZM16, IZM91

Series NRX RF (IEC), IZMX40

⚠️ WARNUNG ⚠️

(1) DIE INSTANDHALTUNG DARF NUR DURCH ENTSprechend Elektronisch QUALIFIZIERTES PERSONAL ERFOlGEN.
(2) VOR BEGINN DER ARBEITEN MUSS DER SPANNUNGSFREIE ZUSTAND DER SCHALTANLAGE HERGESTELLT UND WÄHREND DER ARBEITEN SICHERGESTELLT SEIN.
(3) SCHALTER IN AUSFAHRTECHNIK MÜSSEN IN TRENNSTELLUNG GEFAHREN WERDEN.
(4) DIE SCHALTER SIND AUF AUS ZU STELLEN UND DER FEDERSPEICHER IST ZU ENTSPANNEN.

BEIM BETRIEB ELEKTRISCHER GERÄTE STEHEN ZWANGSLÄUFIG BESTIMMTE TEILE DIESES GERÄTES UNTER GEFAHRLICHER SPANNUNG. UNSACHGEMÄßer UMGANG MIT DIESEN GERÄTEN KANN DESHALB ZU TOD ODER SCHWEREN KÖRPERVERLETZUNGEN SOWIE ERHEBlichen SACHSCHÄDEN FÜHREN.

⚠️ WARNUNG ⚠️

BEACHTEN SIE BEI INSTANDHALTUNGSMASSNAHMEN AN DIESEM GERÄT ALLE IN DIESEM AWA UND AUF DEM PRODUKT SELBST AUFGEFÜHRTE HINWEISE. DIE FÜNF SICHERHEITSREGELN SIND EINZUHALTEN
– FREISCHALTEN
– GEgen Wiedereinschalten SICHERN
– SPANNUNGSFREIHEIT FESTSTELLEN
– ERDEN UND KURZSCHLIESSEN
– BENACHBART, UNTER SPANNUNG STEHende TEile ABDEcken ODER ABSCHRANKEN

DAS GERÄT IST VOM NETZ ZU TRENNEN. ES DÜRFEN NUR VOM HERSTELLER ZUGELASSENE ERSATZTEILE VERWENDET WERDEN. DIE VORGESCHRIBENEN WARTUNGSINTERVALLE SOlCHE DIE ANWEISUNGEN FÜR REPARATUR UND AUSTAUSCH SIND UNBEDINGT EINZUHALTEN, UM SCHÄDEN AN PERSONEN UND ANLAGEN ZU VERMEIDEN.
Abschnitt 1: Allgemeine Informationen

Das PROFIBUS®-DP-Kommunikationsbaugruppe der Baureihe NRX (Abbildung 1) ist ein Zubehörteil, der in einem Leit-Kommunikationsnetzwerk in Verbindung mit einem kompatiblen Leistungsschalter oder Auslöseeinheit NRX als Kommunikationsbaustein dient (Abbildung 2). Diese Baugruppe ist vom Typ PCAM.

Die Kommunikationsbaugruppe kommuniziert mit einem PROFIBUS-DP-Netzwerk-Master über das Protokoll PROFIBUS-DP-V0.

Abbildung 1. PROFIBUS-DP- Kommunikationsbaugruppe NRX

Das PROFIBUS-DP-Kommunikationsadaptermodul ist ein reines Slave-Gerät und benötigt daher einen Master zu Initiierung der Steuerbefehle. Jedes Kommunikationsadaptermodul verfügt über:
• Schalter öffnen/schließen/zurücksetzen
• Auslöseeinheit NRX für Quelle/Erdsluss (wenn verfügbar)
• Eine blinkende Statusleuchte zeigt an, dass das Modul aktiv ist
• Steckbrücke zur Aktivierung/Deaktivierung der PROFIBUS-DP-Kommunikation, um eine Fernsteuerung zum Ein-/Ausschalten des Leistungsschalters zu ermöglichen
• DIN-Hutschienenmontage (Minimalanforderungen der Hutschiene: Höhe: 11mm, Breite: 28 mm)
• Die Eingangsleistung des Moduls beträgt 24 Vdc


Wenn Sie Fragen haben oder weiteren Informationen oder Anweisungen benötigen, wenden Sie sich bitte an Ihre nächstgelegene Eaton-Vertretung oder besuchen Sie www.eaton.com.

Kapitel 2: Installation einer PROFIBUS-DP-Kommunikationsbaugruppe

Anmerkungen: In dieser Montageanweisung wird die Baugröße NRX-NF für Illustrationszwecke gezeigt. Die Anweisungen gelten auch für die Baugröße NRX-RF.


Halten Sie die folgenden Werkzeuge bereit:
• #T-15 Torx
• Kleiner Schlitzschraubendreher


Fahren Sie mit den folgenden sieben Schritten fort:

Schritt 1: Entfernen Sie mit einem T-15 Torx/Schraubendreher die vier Befestigungsschrauben, welche den Ausrichthalter des Klemmenblocks fixieren.
Montageanweisung für PROFIBUS-DP-Kommunikationsbaugruppe NRX

Montageanweisung IL01301035E
gültig ab März 2011

Abbildung 3. Schritt 1

Schritt 2: Schieben Sie nun die Ausrichthalterung zwischen einem beliebigen Klemmenblock vorsichtig nach außen und legen Sie diesen nun mit dem gesamten Montagezubehör für den späteren Wiedereinbau, nach der Installation des Kommunikationsadaptermoduls auf der DIN-Hutschiene, beiseite.

Abbildung 4. Schritt 2


Abbildung 5. Schritt 3


Abbildung 6. Schritt 4

Schritt 5: Kippen Sie nun das Kommunikationsmodul nach vorne, und setzen Sie es auf der DIN-Hutschiene auf und rasten Sie es dann vollständig auf der DIN-Hutschiene auf.

Abbildung 7. Schritt 5


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**Abbildung 8. Schritt 6**

**Schritt 7:** Die Installation ist somit abgeschlossen. Das Modul kann nun, unter Berücksichtigung der in Abschnitt 3 aufgeführten Informationen, verdrahtet werden.

**Abbildung 9. Schritt 7**

**Kapitel 3: Netzwerkverkabelung PROFIBUS DP RS 485**


**Kapitel 4: Anschlüsse der PROFIBUS-DP-Kommunikationsbaugruppe**

![Warnung](image)

**WARNUNG**

BEI DER INSTALLATION, DEM BETRIEB UND DER WARTUNG DIESES GERÄTES MÜSSEN STETS ALLE ANZUWENDENDEN SICHERHEITSRICHTLINIEN, -NORMEN UND -GESETZE STRIKT EINGEHALTEN WERDEN. NICHTBEACHTUNG KANN ZU SACHSCHÄDEN, VERLETZUNGEN ODER TOD FÜHREN.


**Tabelle 1. Anschlussbelegung Spannungsversorgung**

<table>
<thead>
<tr>
<th>Pin Nummer</th>
<th>Eingangssignal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24 Vdc +</td>
</tr>
<tr>
<td>2</td>
<td>24 Vdc –</td>
</tr>
<tr>
<td>3</td>
<td>Steuersignal Masse</td>
</tr>
<tr>
<td>4</td>
<td>Steuersignal „Öffnen“</td>
</tr>
<tr>
<td>5</td>
<td>Steuersignal „Schließen“</td>
</tr>
</tbody>
</table>

1 Die Spannungsversorgung des Moduls ist über einen 5-poligen Steckverbinder. Leistungsbedarf ist 24 Vdc, 10 Watt.

**PROFIBUS DP RS-485 Stecker**


**Tabelle 2. Anschlussbelegung RS-485 PROFIBUS DP**

<table>
<thead>
<tr>
<th>Klemme Nr.</th>
<th>Ein-/Ausgangssignal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Schirm</td>
</tr>
<tr>
<td>2</td>
<td>M24 (Masse für Ausgang +24 V)</td>
</tr>
<tr>
<td>3</td>
<td>RxD/TxD-P (Datenleitung B)</td>
</tr>
<tr>
<td>4</td>
<td>CNTR-P / RTS</td>
</tr>
<tr>
<td>5</td>
<td>DGND (Daten Masse)</td>
</tr>
<tr>
<td>6</td>
<td>VP (plus für 5V-Versorgung)</td>
</tr>
<tr>
<td>7</td>
<td>P24 (plus für 24V-Ausgang)</td>
</tr>
<tr>
<td>8</td>
<td>RxD/TxD-N (Datenleitung A)</td>
</tr>
<tr>
<td>9</td>
<td>CNTR-N</td>
</tr>
</tbody>
</table>

1 PROFIBUS-Signale, die nicht an der Kommunikationsbaugruppe angeschlossen sind.
Abschnitt 5: Brücken und Anzeige-LEDs

Eine Übersicht zu den jeweiligen Positionen der Steckbrücken und LEDs auf der PROFIBUS-DP-Kommunikationsbaugruppe finden Sie in Abb. 10.

Abbildung 10. Kommunikationsadaptermodul (Frontansicht)

Mikrocontroller LED (Status)


Leuchte PROFIBUS-Systemfehler (SYS) (rot)

Die Anzeige leuchtet auf wie in Tabelle 1 beschrieben.

Leuchte PROFIBUS-Busfehler (BUS) (rot)

Die Anzeige leuchtet auf wie in Tabelle 1 beschrieben.

Tabelle 3. Leuchte PROFIBUS DP

<table>
<thead>
<tr>
<th>SF</th>
<th>BF</th>
<th>PROFIBUS DP-Zustand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aus</td>
<td>Aus</td>
<td>i.O.</td>
</tr>
<tr>
<td>Aus</td>
<td>Ein</td>
<td>Keine Kommunikation</td>
</tr>
<tr>
<td>Aus</td>
<td>Blinkt</td>
<td>Kommunikations aber kein Datenaustausch</td>
</tr>
<tr>
<td>Ein</td>
<td>Ein</td>
<td>Konfigurationsfehler</td>
</tr>
</tbody>
</table>

Steckbrücke PROFIBUS DP


Steckbrücke zur Auswahl zwischen Quelle/Erdschluss

Über diese Steckbrücke kann die Schutzkonfiguration der Auslöseeinheiten NRX mit Erdschluss- oder Erdschlussalarmfunktion konfiguriert werden. Weitere Informationen zur Erdungserkennung finden Sie in den Handbüchern (IL 70C1619) der Auslöseeinheiten NRX. Diese Steckbrücke hat bei Auslöseeinheiten ohne Erdschlusserkennung keine Funktion.
Montageanweisung IL01301035E
gültig ab Maerz 2011

Montageanweisung für PROFIBUS-DP-Kommunikationsbaugruppe NRX

Abschnitt 6: PROFIBUS-DP-Adressen anzeigen/einstellen


Verfügt die Auslöseeinheit über eine vollständige Anzeige, wie beispielsweise das NRX 1150, können die Einstellungen der Kommunikationsbaugruppe über das Menü aufgerufen werden. Zur Anzeige oder Bearbeitung der Einstellungen der Kommunikationsbaugruppe mit dem einfachen Display des NRX 520M, verwenden Sie die folgende Vorgehensweise.

Betätigen und halten Sie die Prüftaste Reset/Battery auf der Frontseite der Auslöseeinheit Serie NRX für ca. 5 Sekunden, bis die Adressinformation angezeigt wird, um die Adresse aufzurufen und einzustellen. **Diese Taste muss während der gesamte Dauer des Vorgangs gedrückt bleiben.** Die Anzeige der Auslöseeinheit wechselt dann zwischen „SP00“ (welches den Anzeigemodus der Adresse kennzeichnet) und der programmierten PROFIBUS DP-Adresse.

Betätigen Sie nun die Scroll-Anzeige der Auslöseeinheit und erhöhen sie den angezeigten Adresswert, um einen neue Adresse auszuwählen. Für einen schnelleren Vorlauf, halten Sie beide Tasten (Scroll und Reset/Battery Test) gleichzeitig.

Um Ihre Änderungen zu speichern, lassen Sie die Taste Reset/Battery wieder los.

Abbildung 11. Kommunikationssteuerung (Verdrahtung SR und ST)
Montageanweisung für PROFIBUS-DP-Kommunikationsbaugruppe NRX

Tabelle 4. Einstellbare Adressen der Kommunikationsbaugruppe

<table>
<thead>
<tr>
<th>Kommunikations Adresse</th>
<th>Einstellungsnr.</th>
<th>Zulässiger Wertebereich</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP00</td>
<td>001–125</td>
<td></td>
</tr>
</tbody>
</table>

Abschnitt 7: PROFIBUS DP-V0-Profile


Tabelle 5. CFG Daten Formats

<table>
<thead>
<tr>
<th>Profile</th>
<th>CFG Daten</th>
<th>Kommandoformat</th>
<th>Kontrollformat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 x 31</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0 x 31, 0 x D3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0 x 31, 0 x D7</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0 x 31, 0 x DD</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>0 x 31, 0 x DE</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>0 x 31, 0 x DD</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Befehlsstruktur Format 0 für den zyklischen Datenaustausch

Die von dem PCAM-Modul unterstützte Befehlsstruktur Format 0 für den zyklischen Datenaustausch vom PROFIBUS-Master ist in Tabelle 3 beschrieben. Die Bits werden wie folgt definiert: Bit 0 ist Bit 0 von Byte 0; Bit 8 ist Bit 0 von Byte 1.

Befehlsstruktur-Formate für Überwachung des zyklischen Datenaustausches

Kontrollstrukturen Formate 0 bis 4 für die Antwort vom PCAM-Modul an den PROFIBUS-Master sind in Tabelle 7 bis Tabelle 11 beschrieben. Die Statusdatenbytes sind in allen Kontrollformaten erforderlich. Die Bits sind wie folgt definiert: Bit 0 ist Bit 0 von Statusbyte 0; Bit 8 ist Bit 0 von Statusbyte 1. Die Definitionen werden aus den von der Auslöseeinheit übertragenen Primär/Sekundär/Statusursache-Daten ermittelt (siehe Tabelle 13, Tabelle 14 und Tabelle 15).

Die aus mehreren Bytes bestehenden Messwerte von Formaten 1 bis 4 werden, gemäß PROFIBUS-Protokoll, mit dem höchstwertigen Byte zuerst übertragen.
### Tabelle 6. Befehl Zyklischer Datenaustausch, Format 0

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Description</th>
<th>Umsetzung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1–0</td>
<td>Leistungsschalter:</td>
<td>Umsetzung</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = keine Änderung</td>
<td>LS öffnen (wenn Fernbedienung aktiv, s. Abschnitt 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = AUSschalten</td>
<td>LS schließen (wenn Fernbedienung aktiv, s. Abschnitt 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = EINSchalten</td>
<td>LS öffnen (wenn Fernbedienung aktiv, s. Abschnitt 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = keine Änderung</td>
<td>LS schließen (wenn Fernbedienung aktiv, s. Abschnitt 5)</td>
</tr>
<tr>
<td>2</td>
<td>Letzte Auslösung löschen</td>
<td>Befehl „Auslösung zurücksetzen“ an Auslöseeinheit</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ausgang 0</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ausgang 1</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ausgang 2</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ausgang 3</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Ausgang 4</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9–8</td>
<td>Testmodus:</td>
<td>Kein Phasenstromauslösungs-Selbsttest bei 3,0 je an Digitrip ausgegebene Einheit (nur bei Digitrip 1150)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = kein Test</td>
<td>Nicht implementiert</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = ohne Auslösung</td>
<td>Nicht implementiert</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = mit Auslösung</td>
<td>Nicht implementiert</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = mit Warnung</td>
<td>Nicht implementiert</td>
</tr>
<tr>
<td>10</td>
<td>Historienspeicher löschen</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Min./max. Speicher zurücksetzen</td>
<td>Signal „Alle Min.-/Max.-Werte zurücksetzen“ an Auslöseeinheit</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Temperatur zurücksetzen</td>
<td>Speicher Min./Max.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speicher Min./Max.</td>
<td>Nicht implementiert</td>
</tr>
<tr>
<td>13</td>
<td>Ausgang 5</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Angaben zu</td>
<td>Signal „Gesundheitspuffer Auslöseeinheit zurücksetzen“ an Auslöseeinheit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Instandhaltungsmaßnahmen zurücksetzen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Synchronisierung Uhrzeit</td>
<td>Nicht implementiert</td>
<td></td>
</tr>
</tbody>
</table>
### Tabelle 7. Kontrolle Zyklischer Datenaustausch, Format 0

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Description</th>
<th>Umsetzung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1–0</td>
<td>Position des Leistungsschalters:</td>
<td>keine Kommunikation mit Auslöseeinheit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = getrennt</td>
<td>Kommunikation mit Auslöseeinheit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = betriebsbereit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = Test</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = nicht vorhanden</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td></td>
<td>Zustand des Leistungsschalters:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>00 = Init</td>
<td>Kommunikation zu Auslöseeinheit noch nicht aufgebaut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 = Zähler primär: offen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 = Ein</td>
<td>Zähler primär: geschlossen, Alarm, angesprochen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 = ausgelöst</td>
<td>Zähler primär: ausgelöst</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Bereit zum Einschalten</td>
<td>(nicht implementiert)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Unterspannungsauflöser</td>
<td>1 = Zustand primär: ausgelöst, Ursache: 12</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Feder angezogen</td>
<td>(nicht implementiert)</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Überlastwarnung</td>
<td>1 = Zustand primär: Alarm, Ursache: 61, ODER Zustand primär: angezogen</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Referenzwert aktiviert</td>
<td>1 = Zustand primär: Alarm, Ursache: 11, 12, 15, 16, 17, 18, 26, 27</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Warnung</td>
<td>1 = Zustand primär: Alarm, Ursache: alle außer 61</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Schreibschutz aktiviert</td>
<td>1 wenn Digitrip 1150 UND Fernbedienung aktiviert; s. Abschnitt 5</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Eingang 0</td>
<td>(nicht implementiert)</td>
</tr>
<tr>
<td>14–12</td>
<td></td>
<td>Grund für Auslösung:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>000 = nicht ausgelöst</td>
<td>000 = Zustand primär: NICHT ausgelöst</td>
</tr>
<tr>
<td></td>
<td></td>
<td>001 = überlänge-Auflöser</td>
<td>001 = Zustand primär: ausgelöst, Ursache: 61 (wenn $I_i &lt;$ alle anderen Stromwerte)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>010 = I1- (verzögerte) Auslösung</td>
<td>010 = Zustand primär: ausgelöst, Ursachen: 3, 66, 76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>011 = S- (verzögerte) Auslösung</td>
<td>011 = Zustand primär: ausgelöst, Ursachen: 62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 = Erdschlussfehler</td>
<td>100 = Zustand primär: ausgelöst, Ursachen: 84, 85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>101 = erweiterte Schutz</td>
<td>101 = Zustand primär: ausgelöst, Ursachen: alle weiteren</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110 = Überstrom in N-Leiter</td>
<td>110 = Zustand primär: ausgelöst, Ursachen: 80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>111 = keine Informationen über Gerät</td>
<td>111 = Kommunikation zu Auslöseeinheit noch nicht aufgebaut</td>
</tr>
</tbody>
</table>

### Tabelle 8. Kontrolle Zyklischer Datenaustausch, Format 1

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Datentyp</th>
<th>Description</th>
<th>Auflösung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>vorzeichenlos8</td>
<td>Zustand 0 (Byte 0 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>vorzeichenlos8</td>
<td>Zustand 1 (Byte 1 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>vorzeichenlos16</td>
<td>$I_i$ (Strom Phase A)</td>
<td>Ampere</td>
</tr>
<tr>
<td>5–4</td>
<td>vorzeichenlos16</td>
<td>$I_i$ (Strom Phase B)</td>
<td>Ampere</td>
</tr>
<tr>
<td>7–6</td>
<td>vorzeichenlos16</td>
<td>$I_i$ (Strom Phase C)</td>
<td>Ampere</td>
</tr>
<tr>
<td>9–8</td>
<td>vorzeichenlos16</td>
<td>$I_{max}$ (max.-Wert $I_i$, $I_j$, $I_k$)</td>
<td>Ampere</td>
</tr>
</tbody>
</table>
### Tabelle 9. Kontrolle Zyklischer Datenaustausch, Format 2

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Datentyp</th>
<th>Description</th>
<th>Auflösung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>vorzeichenlos8</td>
<td>Zustand 0 (Byte 0 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>vorzeichenlos8</td>
<td>Zustand 1 (Byte 1 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>vorzeichenlos16</td>
<td>$I_p$ (Strom Phase A)</td>
<td>Ampere</td>
</tr>
<tr>
<td>5–4</td>
<td>vorzeichenlos16</td>
<td>$I_q$ (Strom Phase B)</td>
<td>Ampere</td>
</tr>
<tr>
<td>7–6</td>
<td>vorzeichenlos16</td>
<td>$I_r$ (Strom Phase C)</td>
<td>Ampere</td>
</tr>
<tr>
<td>9–8</td>
<td>vorzeichenlos16</td>
<td>$I_{\text{max}}$ (max.-Wert $I_p$, $I_q$, $I_r$)</td>
<td>Ampere</td>
</tr>
<tr>
<td>11–10</td>
<td>vorzeichenlos16</td>
<td>$I_n$ (Strom Neutralleiter)</td>
<td>Ampere</td>
</tr>
<tr>
<td>13–12</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (durchschn. Außenleiterspannung)</td>
<td>Volt</td>
</tr>
<tr>
<td>15–14</td>
<td>Ganzzahl16</td>
<td>cos phi (durchschn. Leistungsfaktor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>17–16</td>
<td>vorzeichenlos16</td>
<td>Energie</td>
<td>MWh</td>
</tr>
</tbody>
</table>

### Tabelle 10. Kontrolle Zyklischer Datenaustausch, Format 3

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Datentyp</th>
<th>Description</th>
<th>Auflösung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>vorzeichenlos8</td>
<td>Zustand 0 (Byte 0 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>vorzeichenlos8</td>
<td>Zustand 1 (Byte 1 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>vorzeichenlos16</td>
<td>$I_p$ (Strom Phase A)</td>
<td>Ampere</td>
</tr>
<tr>
<td>5–4</td>
<td>vorzeichenlos16</td>
<td>$I_q$ (Strom Phase B)</td>
<td>Ampere</td>
</tr>
<tr>
<td>7–6</td>
<td>vorzeichenlos16</td>
<td>$I_r$ (Strom Phase C)</td>
<td>Ampere</td>
</tr>
<tr>
<td>9–8</td>
<td>vorzeichenlos16</td>
<td>$I_{\text{max}}$ (max.-Wert $I_p$, $I_q$, $I_r$)</td>
<td>Ampere</td>
</tr>
<tr>
<td>11–10</td>
<td>vorzeichenlos16</td>
<td>$I_n$ (Strom Neutralleiter)</td>
<td>Ampere</td>
</tr>
<tr>
<td>13–12</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Außenleiterspannung $V_{L1}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>15–14</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Außenleiterspannung $V_{L2}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>17–16</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Außenleiterspannung $V_{L3}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>19–18</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Sternspannung $V_{AN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>21–20</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Sternspannung $V_{BN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>23–22</td>
<td>vorzeichenlos16</td>
<td>$V_{\text{Lin}}$ (Sternspannung $V_{CN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>25–24</td>
<td>Ganzzahl16</td>
<td>cos phi (durchschn. Leistungsfaktor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>27–26</td>
<td>vorzeichenlos16</td>
<td>Energie</td>
<td>MWh</td>
</tr>
<tr>
<td>29–28</td>
<td>vorzeichenlos16</td>
<td>$S_{\text{max}}$ (Scheinleistung gesamt)</td>
<td>kVA</td>
</tr>
</tbody>
</table>
### Tabelle 11. Kontrolle Zyklischer Datenaustausch, Format 4

<table>
<thead>
<tr>
<th>Byte(s)</th>
<th>Datentyp</th>
<th>Beschreibung</th>
<th>Auflösung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>vorzeichenlos8</td>
<td>Zustand 0 (Byte 0 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>vorzeichenlos8</td>
<td>Zustand 1 (Byte 1 von Kontrolle Format 0, Tabelle 7)</td>
<td></td>
</tr>
<tr>
<td>3–2</td>
<td>vorzeichenlos16</td>
<td>$I_p$ (Strom Phase A)</td>
<td>Ampere</td>
</tr>
<tr>
<td>5–4</td>
<td>vorzeichenlos16</td>
<td>$I_q$ (Strom Phase B)</td>
<td>Ampere</td>
</tr>
<tr>
<td>7–6</td>
<td>vorzeichenlos16</td>
<td>$I_r$ (Strom Phase C)</td>
<td>Ampere</td>
</tr>
<tr>
<td>9–8</td>
<td>vorzeichenlos16</td>
<td>$I_{max}$ (max.-Wert $I_p$, $I_q$, $I_r$)</td>
<td>Ampere</td>
</tr>
<tr>
<td>11–10</td>
<td>vorzeichenlos16</td>
<td>$I_n$ (Strom Neutralleiter)</td>
<td>Ampere</td>
</tr>
<tr>
<td>13–12</td>
<td>vorzeichenlos16</td>
<td>$V_{L1-L2}$ (Außenleiterspannung $V_{AB}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>15–14</td>
<td>vorzeichenlos16</td>
<td>$V_{L2-L3}$ (Außenleiterspannung $V_{BC}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>17–16</td>
<td>vorzeichenlos16</td>
<td>$V_{L3-L1}$ (Außenleiterspannung $V_{CA}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>19–18</td>
<td>vorzeichenlos16</td>
<td>$V_{AN}$ (Sternspannung $V_{AN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>21–20</td>
<td>vorzeichenlos16</td>
<td>$V_{BN}$ (Sternspannung $V_{BN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>23–22</td>
<td>vorzeichenlos16</td>
<td>$V_{CN}$ (Sternspannung $V_{CN}$)</td>
<td>Volt</td>
</tr>
<tr>
<td>25–24</td>
<td>Ganzzahl16</td>
<td>$\cos \phi_{avg}$ (durchschn. Leistungsfaktor)</td>
<td>0–1000</td>
</tr>
<tr>
<td>29–26</td>
<td>vorzeichenlos32</td>
<td>$S_{total}$ (Scheinleistung gesamt)</td>
<td>kW</td>
</tr>
<tr>
<td>31–30</td>
<td>vorzeichenlos16</td>
<td>$S_{max}$ (Scheinleistung gesamt)</td>
<td>kW</td>
</tr>
</tbody>
</table>

### Abschnitt 8: PROFIBUS DP-V0 Diagnose

Bevor das PCAM-Modul durch den PROFIBUS-Master parametriert und konfiguriert wurde, liefert das PCAM-Modul als Antwort auf eine Diagnoseanforderung vom Master nur die obligatorischen 6-Byte-PROFIBUS-Diagnosedaten.


### Anmerkungen:
### Tabelle 12. Diagnosebits der DP-V0-Einheit

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit(s)</th>
<th>Wert</th>
<th>Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>08H</td>
<td>Header: gerätespezifische Diagnose, Länge (8 Byte)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>7–0</td>
<td>81H</td>
<td>Typ (Statusmeldung)</td>
</tr>
<tr>
<td>9</td>
<td>15–8</td>
<td>00H</td>
<td>Steckplatz</td>
</tr>
<tr>
<td>10</td>
<td>23–16</td>
<td>00H</td>
<td>Spezifikator</td>
</tr>
<tr>
<td>11</td>
<td>24</td>
<td>1</td>
<td>keine Kommunikation mit Auslöseeinheit</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>Datanobjekt 1 ungültig (Kontrollformate 1–4: ( I_L ))</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>1</td>
<td>Datanobjekt 2 ungültig (Kontrollformate 1–4: ( I_L ))</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>Datanobjekt 3 ungültig (Kontrollformate 1–4: ( I_L ))</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>1</td>
<td>Datanobjekt 4 ungültig (Kontrollformate 1–4: ( I_L ))</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>1</td>
<td>Datanobjekt 5 ungültig (Kontrollformate 2–4: ( I_L ))</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1</td>
<td>Datanobjekt 6 ungültig (Kontrollformate 2: ( V_{avg} )) (Kontrollformate 3–4: ( V_{avg} ))</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>1</td>
<td>Datanobjekt 7 ungültig (Kontrollformate 2: ( \cos \phi )) (Kontrollformate 3–4: ( V_{avg} ))</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>32</td>
<td>1</td>
<td>Datanobjekt 8 ungültig (Kontrollformate 2: Energie) (Kontrollformate 3–4: ( V_{avg} ))</td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td>Datanobjekt 9 ungültig (Kontrollformate 3–4: ( V_{im} ))</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>Datanobjekt 10 ungültig (Kontrollformate 3–4: ( V_{im} ))</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>Datanobjekt 11 ungültig (Kontrollformate 3–4: ( V_{im} ))</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>Datanobjekt 12 ungültig (Kontrollformate 3–4: ( \cos \phi ))</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>Datanobjekt 13 ungültig (Kontrollformate 3–4: Energie)</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>1</td>
<td>Datanobjekt 14 ungültig (Kontrollformate 3–4: ( S_{avg} ))</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>Dezentrales Öffnen/Schließen nicht aktiv (d.h. Fernbedienungsschalter deaktiviert, siehe Abschnitt 5)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>40</td>
<td>1</td>
<td>Alarm EEROM-Fehler (Status primär: Alarm, Ursache: 43)</td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>Alarm RAM-Fehler (Status primär: Alarm, Ursache: 39)</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>1</td>
<td>Alarm Sollwertfehler (Status primär: Alarm, Ursache: 77)</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>1</td>
<td>Alarm Watchdog (Status primär: Alarm, Ursache: 46)</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>1</td>
<td>Alarm Hilfsschalter prüfen (Status primär: Alarm, Ursache: 148)</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>1</td>
<td>Fehler LS-Mechanismus (Status primär: Alarm, Ursache: 154)</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>1</td>
<td>Problem LS-Spannungsauslöser (Status primär: Alarm, Ursache: 157)</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>1</td>
<td>Alarm Schaltspielzählzähler (Status primär: Alarm, Ursache: 31)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>48</td>
<td>1</td>
<td>Erdschlussalarm (Status primär: Alarm, Ursache: 84, 85)</td>
</tr>
<tr>
<td>49</td>
<td>1</td>
<td>Alarm niedriger Leistungsfaktor (Status primär: Alarm, Ursache: 19)</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>1</td>
<td>Alarm Klirrfaktor (Status primär: Alarm, Ursache: 30)</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>1</td>
<td>Alarm Frequenzüber-/-unterschreitung (Status primär: Alarm, Ursache: 146)</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>1</td>
<td>Auslösung durch Historie stattgefunden (Status primär: geschlossen, Ursache: 82)</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>1</td>
<td>LS in Instandhaltungsmodus (Ursache: 153)</td>
<td></td>
</tr>
</tbody>
</table>

### Abschnitt 9: Störungssuche


**Beobachtung 1—Status-LED blinkt nicht**

**Maßnahme**—Überprüfen Sie, ob die Moduladresse korrekt ist.

**Maßnahme**—Überprüfen Sie, ob das Kommunikationskabel, korrekt am Master und am Modul angeschlossen ist.

*Beobachtung 2—Status-LED blinkt grün, das Modul ändert jedoch bei einer Antwort auf eine Befehlsanfrage des Masters nicht den Zustand.*

**Maßnahme**—Überprüfen Sie, ob die Moduladresse korrekt ist.

**Maßnahme**—Überprüfen Sie, ob das Kommunikationskabel, korrekt am Master und am Modul angeschlossen ist.
Anhang A

PROFIBUS DP-V0—GSD-Profildatei

;======================================
;GSD-Datei für Niederspannungs-Leistungsschalter von Eaton
;English Version 1.0
;Date: 2009-02-03
;revised by CC-TDH/P.Thiessmeier
;
;Changes:
;support of mandatory profile 1 (F0)
;changed to modular slave for better support of intel-based plcs
;Date: 2009-02-17
;revised by A.A. Anderson
;
;Changes:
;User_Prm_Data_Len = 3, to eventually support DP-V1
;Added Unit_Diag_Bit(0024-0052)
;Date: 2009-06-04
;revised by A.A. Anderson
;
;Changes:
;Added Module = “Add. Data of profile type 4” 0xDE
;Date: 2009-06-29
;revised by A.A. Anderson
;
;Changes:
;Comments (Slave related Key Words)
;Only
;======================================

#PROFIBUS_DP
;
;======================================

;General parameters
;======================================

GSD_Revision = 3
Vendor_Name = “Eaton Corporation”
Model_Name = “Magnum,IZM,NRX” ;“Low Voltage Circuit Breaker”
Revision = “V1.0” ;Revision version of device
;Revision_Number = ;Must agree with RevNum in slave-specific diag

Ident_Number = 0x0BF4
Protocol_Ident = 0 ;0=PROFIBUS DP
Station_Type = 0 ;0=DP Slave
FMS_supp = 0 ;0=Not FMS/DP mixed device
Hardware_Release = “V1,0” ;Hardware release of device
Software_Release = “V1,0” ;Software release of device
9,6_supp = 1
19,2_supp = 1
31,25_supp = 0
45,45_supp = 1
93,75_supp = 1
187,5_supp = 1
500_supp = 1
1,5M_supp = 1
3M_supp = 1
6M_supp = 1
12M_supp = 1
MaxTsdr_9,6 = 60 ; Bit Time
MaxTsdr_19,2 = 60 ; Bit Time
MaxTsdr_31,25 = 60 ; Bit Time
MaxTsdr_45,45 = 60 ; Bit Time
MaxTsdr_93,75 = 60 ; Bit Time
MaxTsdr_187,5 = 60 ; Bit Time
MaxTsdr_500 = 100 ; Bit Time
MaxTsdr_1,5M = 150 ; Bit Time
MaxTsdr_3M = 250 ; Bit Time
MaxTsdr_6M = 450 ; Bit Time
MaxTsdr_12M = 800 ; Bit Time
Redundancy = 0 ;0=Redundant Xmission NotSupported
Repeater_Ctrl_Sig = 2 ;CNTR-P bus signal:
; 0=NotConnected, 1=RS485 2=TTL
24V_Pins = 0 ;M24V & P24V bus signals:
; 0=NotConnected, 1=Input, 2=Output
Implementation_Type = “SPC3” ;Optional
; Bitmap_Device = “DIB_????” ;Optional
; Bitmap_Diag = “DIB_????” ;Optional
; Bitmap_SF = “DIB_????” ;Optional

;======================================

;Physical Interface parameters (optional)
;======================================
Montageanweisung für PROFIBUS-DP-Kommunikationsbaugruppe NRX

Montageanweisung IL01301035E

 gültig ab Maerz 2011

; Physical_Interface = 0 ;Optional RS485-intrinsic
; Transmission_Delay_9.6 = 0 ; Bit Time
; Transmission_Delay_19.2 = 0 ; Bit Time
; Transmission_Delay_31.25 = 0 ; Bit Time
; Transmission_Delay_45.45 = 0 ; Bit Time
; Transmission_Delay_187.5 = 0 ; Bit Time
; Transmission_Delay_500 = 0 ; Bit Time
; Transmission_Delay_1.5M = 0 ; Bit Time
; Transmission_Delay_3M = 0 ; Bit Time
; Transmission_Delay_6M = 0 ; Bit Time
; Transmission_Delay_12M = 0 ; Bit Time
; Reaction_Delay_9.6 = 0 ; Bit Time
; Reaction_Delay_19.2 = 0 ; Bit Time
; Reaction_Delay_31.25 = 0 ; Bit Time
; Reaction_Delay_45.45 = 0 ; Bit Time
; Reaction_Delay_93.75 = 0 ; Bit Time
; Reaction_Delay_187.5 = 0 ; Bit Time
; Reaction_Delay_500 = 0 ; Bit Time
; Reaction_Delay_1.5M = 0 ; Bit Time
; Reaction_Delay_3M = 0 ; Bit Time
; Reaction_Delay_6M = 0 ; Bit Time
; Reaction_Delay_12M = 0 ; Bit Time
; End_Physical_Interface

; ===========================
; Slave-Specification
; ===========================
Freeze_Mode_supp = 1 ;1=Supported
Sync_Mode_supp = 1 ;1=Supported
Auto_Baud_supp = 1 ;1=Supported
Set_Slave_Add_supp = 0
0=NotSupported (INCOM address setting)
User_Prm_Data_Len = 2
User_Prm_Data = 0x00,0x00,0x00,0x00
Max_User_Prm_Data_Len = 3
Ext_User_Prm_Data_Cons(0) = 0x00,0x00,0x00,0x00
Min_Slave_Intervall = 1 ;Min interval between two slave list cycles
; Time base: 100us
Modular_Station = 1 ;0=Compact, 1=Modular device
Max_Module = 2 ;
Max_Input_Len = 32 ;Circuit Breaker Profile input, format 4
Max_Output_Len = 2 ;Circuit Breaker Profile output
Max_Data_Len = 34
Fail_Safe = 0 ;0=DataMsg with data=0 in CLEAR mode
Modul_Offset = 0 ;Slot number to appear in Cfg tool
Slave_Family = 2@CircuitBreaker@Digitrip
Diag_Update_Delay = 0
Fail_Safe_required = 0
;Info_Text = " " ;Optional additional info about device
Max_Diag_Data_Len = 14 ;6 Bytes Mandatory by PROFIBUS

Unit_Diag_Bit(0024) = “No Communications with DigiTrip”
Unit_Diag_Bit(0025) = “Data Object 1 invalid”
Unit_Diag_Bit(0026) = “Data Object 2 invalid”
Unit_Diag_Bit(0027) = “Data Object 3 invalid”
Unit_Diag_Bit(0028) = “Data Object 4 invalid”
Unit_Diag_Bit(0029) = “Data Object 5 invalid”
Unit_Diag_Bit(0030) = “Data Object 6 invalid”
Unit_Diag_Bit(0031) = “Data Object 7 invalid”
Unit_Diag_Bit(0032) = “Data Object 8 invalid”
Unit_Diag_Bit(0033) = “Data Object 9 invalid”
Unit_Diag_Bit(0034) = “Data Object 10 invalid”
Unit_Diag_Bit(0035) = “Data Object 11 invalid”
Unit_Diag_Bit(0036) = “Data Object 12 invalid”
Unit_Diag_Bit(0037) = “Data Object 13 invalid”
Unit_Diag_Bit(0038) = “Data Object 14 invalid”
Unit_Diag_Bit(0039) = “Remote Open/Closed Not Enabled”
Unit_Diag_Bit(0040) = “EEROM Error Alarm”
Unit_Diag_Bit(0041) = “RAM Error Alarm”
Unit_Diag_Bit(0042) = “Setpoints Error Alarm”
Unit_Diag_Bit(0043) = “Watchdog Alarm”
Unit_Diag_Bit(0044) = “Check Aux Switch Alarm”
Unit_Diag_Bit(0045) = “Breaker Mechanism Fault”
Unit_Diag_Bit(0046) = “Breaker Shunt Trip Problem”
Unit_Diag_Bit(0047) = “Operations Count Alarm”
Unit_Diag_Bit(0048) = “Earth Fault Alarm”
Unit_Diag_Bit(0049) = “Low Power Factor Alarm”
Unit_Diag_Bit(0050) = “Total Harmonic Distortion Alarm”
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Unit_Diag_Bit(0051) = "Frequency Out Of Bounds Alarm"
Unit_Diag_Bit(0052) = "Historic Trip Occurred"
Unit_Diag_Bit(0053) = "Breaker In Maintenance Mode"
Unit_Diag_Bit(0053) = "Breaker In Maintenance Mode"

; ******************************************************
; ** Slave related Key Words for DP
extensions **
; ******************************************************
DPV1_Slave = 0
; C1_Read_Write_supp = 1
; C2_Read_Write_supp = 1
; C1_Max_Data_Len = 22
; C2_Max_Data_Len = 48
; C1_Response_Timeout = 50 ;in units of
10ms, optional
; C2_Response_Timeout = 50 ;in units of
10ms, optional
; C1_Read_Write_required = 0
; C2_Read_Write_required = 0
; C2_Max_Count_Channels = 1
; Max_Initiate_PDU_Length = 52
; Diagnostic_Alarm_supp = 0
; Process_Alarm_supp = 0
; Pull_Plug_Alarm_supp = 0
; Status_Alarm_supp = 0
; Update_Alarm_supp = 0
; Manufacturer_Specific_Alarm_supp = 0
; Extra_Alarm_SAP_supp = 0
; Alarm_Sequence_Mode_Count = 0
; Alarm_Type_Mode_supp = 0
; Diagnostic_Alarm_required = 0
; Process_Alarm_required = 0
; Pull_Plug_Alarm_required = 0
; Status_Alarm_required = 0
; Update_Alarm_required = 0
; Manufacturer_Specific_Alarm_required = 0
; DPV1_Data_Types = 0
; WD_Base_1ms_supp = 1
; Check_Cfg_Mode = 0

; Publisher_supp = 0

; ******************************************************
; Module Definition List
; ******************************************************
Module = "Profile type 1" 0x31
1
EndModule
Module = "Add. data of profile type 2" 0xD3
2
Ext_Module_Prm_Data_Len = 0
EndModule
Module = "Add. Data of profile type 3" 0xD7
3
Ext_Module_Prm_Data_Len = 0
EndModule
Module = "Add. Data of profile type 4" 0xDD
4
Ext_Module_Prm_Data_Len = 0
EndModule
Module = "Add. Data of profile type 5" 0xDE
5
Ext_Module_Prm_Data_Len = 0
EndModule
Module = "No additional data" 0x00
6
EndModule

SlotDefinition
Slot (1) = "Profile type 1" 1 1-1
Slot (2) = "Additional data" 2 2-6
EndSlotDefinition
Anhang B

Primär/Sekundär/Ursache


Tabelle 13. Definition der primärseitigen Statuscodes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unbekannt</td>
</tr>
<tr>
<td>1</td>
<td>Öffnen</td>
</tr>
<tr>
<td>2</td>
<td>geschlossen</td>
</tr>
<tr>
<td>3</td>
<td>Tripped</td>
</tr>
<tr>
<td>4</td>
<td>Alarm ausgelöst</td>
</tr>
<tr>
<td>13</td>
<td>Angezogen</td>
</tr>
</tbody>
</table>

Tabelle 14. Definition der sekundärseitigen Statuscodes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unbekannt</td>
</tr>
<tr>
<td>3</td>
<td>Testmodus</td>
</tr>
<tr>
<td>7</td>
<td>Eingeschaltet</td>
</tr>
<tr>
<td>8</td>
<td>Alarm</td>
</tr>
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Tabelle 15. Ursache der Statusänderung

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Unbekannt</td>
</tr>
<tr>
<td>1</td>
<td>Normaler Betriebsmodus</td>
</tr>
<tr>
<td>3</td>
<td>unverzögerter Überstrom in Phase</td>
</tr>
<tr>
<td>11</td>
<td>Überspannung</td>
</tr>
<tr>
<td>12</td>
<td>Unterspannung</td>
</tr>
<tr>
<td>15</td>
<td>Unterfrequenz</td>
</tr>
<tr>
<td>16</td>
<td>Überfrequenz</td>
</tr>
<tr>
<td>17</td>
<td>Unsymmetrischer Strom</td>
</tr>
<tr>
<td>18</td>
<td>Unsymmetrische Spannung</td>
</tr>
<tr>
<td>19</td>
<td>Scheinleistungsfaktor</td>
</tr>
<tr>
<td>26</td>
<td>Energiebedarf</td>
</tr>
<tr>
<td>27</td>
<td>VA-Bedarf</td>
</tr>
<tr>
<td>30</td>
<td>Klirrfaktor</td>
</tr>
<tr>
<td>31</td>
<td>Anzahl Schaltspiele</td>
</tr>
<tr>
<td>33</td>
<td>Steuerung über Kommunikation</td>
</tr>
<tr>
<td>37</td>
<td>Überwachung Spule</td>
</tr>
<tr>
<td>39</td>
<td>RAM Fehler</td>
</tr>
<tr>
<td>43</td>
<td>EEROM Fehler</td>
</tr>
<tr>
<td>46</td>
<td>Watchdog</td>
</tr>
<tr>
<td>61</td>
<td>lange Verzögerung bei Überstrom in Phase</td>
</tr>
<tr>
<td>62</td>
<td>kurze Verzögerung bei Überstrom in Phase</td>
</tr>
<tr>
<td>63</td>
<td>fest unverzögert bei Überstrom in Phase, 1</td>
</tr>
<tr>
<td>64</td>
<td>fehlerhaftes/fehlendes Bemessungsstrommodul</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>rückwärts, Energie</td>
</tr>
<tr>
<td>66</td>
<td>fest unverzögert bei Überstrom in Phase, 2</td>
</tr>
<tr>
<td>67</td>
<td>rückwärts Phase</td>
</tr>
<tr>
<td>68</td>
<td>rückwärts Sequenz</td>
</tr>
<tr>
<td>69</td>
<td>Stromverlust Phase</td>
</tr>
<tr>
<td>71</td>
<td>Alarm aktiv</td>
</tr>
<tr>
<td>72</td>
<td>schlechter Rahmen</td>
</tr>
<tr>
<td>73</td>
<td>Phasenstromwerte bei Ansprechen</td>
</tr>
<tr>
<td>75</td>
<td>Einschaltstromlaufseheinheit</td>
</tr>
<tr>
<td>76</td>
<td>fest unverzögert bei Überstrom in Phase, 3</td>
</tr>
<tr>
<td>77</td>
<td>Sollwertfehler</td>
</tr>
<tr>
<td>78</td>
<td>Übertemperatur</td>
</tr>
<tr>
<td>80</td>
<td>Lange Verzögerung neutral Überstrom</td>
</tr>
<tr>
<td>82</td>
<td>Historiedaten</td>
</tr>
<tr>
<td>84</td>
<td>Erdschluss (unverzögert oder verzögert)</td>
</tr>
<tr>
<td>85</td>
<td>Erdschluss (unverzögert oder verzögert)</td>
</tr>
<tr>
<td>146</td>
<td>Frequenz außerhalb Bereich</td>
</tr>
<tr>
<td>148</td>
<td>Hilfsschalter überprüfen</td>
</tr>
<tr>
<td>149</td>
<td>Überstrom</td>
</tr>
<tr>
<td>153</td>
<td>Instandhaltungsmodus</td>
</tr>
<tr>
<td>154</td>
<td>Mechanischer Fehler des Leistungsschalters</td>
</tr>
<tr>
<td>156</td>
<td>Getrennt-Stellung</td>
</tr>
<tr>
<td>157</td>
<td>Auslösung durch Netzkurzschluß</td>
</tr>
</tbody>
</table>
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gültig ab Maerz 2011