

# Model Implementation Conformance Statement for the IEC 61850 Edition 2 server interface in MRZS-F

Version 1  
April 03, 2024

## 1. Introduction

This model implementation conformance statement is applicable for MRZS-F, with firmware : 14.13.2.0

## 2. Logical Nodes List

The following table contains the list of logical nodes implemented in the device:

|  |
|--|
| <b>L: System Logical Nodes</b>                           |
| LPHD (Physical device information)                       |
| LLNO (Logical node zero)                                 |
| <b>C: Logical Nodes for control</b>                      |
| CSWI (Switch controller)                                 |
| <b>P: Logical Nodes for protection functions</b>         |
| PTOC (Time overcurrent)                                  |
| PSDE (Sensitive directional earthfault)                  |
| PTOV (Overvoltage)                                       |
| PTUV (Undervoltage)                                      |
| PTUF (Underfrequency)                                    |
| <b>R: Logical nodes for protection related functions</b> |
| RADR (Disturbance recorder channel analogue)             |
| RBDR (Disturbance recorder channel binary)               |
| RBRF (Breaker failure)                                   |
| RREC (Autoreclosing)                                     |
| <b>G: Logical Nodes for generic references</b>           |
| GGIO (Generic process I/O)                               |
| GAPC (Generic automatic process control)                 |
| <b>M: Logical Nodes for metering and measurement</b>     |
| MMTR (Metering)  |
| MMXU (Measurement)                                       |

|   |
|---|
| <b>MSQI</b> (Sequence and imbalance)              |
| <b>S: Logical Nodes for</b>                       |
| <b>SARC</b> (Monitoring and diagnostics for arcs) |
| <b>X: Logical Nodes for switchgear</b>            |
| <b>XCBR</b> (Circuit breaker)                     |

### 3. New Logical Nodes

The following table use

- M: Data object is mandatory in the IEC 61850-7-4 ED.2.
- O: Data object is optional in the IEC 61850-7-4 ED.2 and is used in the device.
- E: Data object is an extension to the IEC 61850-7-4 ED.2.

#### LLNO

| LLNO class                      |                   |                   |       |         |
|---------------------------------|-------------------|-------------------|-------|---------|
| Data object name                | Common data class | Explanation       | M/O/E | Remarks |
| LLNO                            |                   | Logical node zero |       |         |
| Data objects                    |                   |                   |       |         |
| Common Logical Node Information |                   |                   |       |         |
| Mod                             | ENC_0             | Mode              | M     |         |
| Beh                             | ENS_1             | Behaviour         | M     |         |
| Health                          | ENS_0             | Health            | M     |         |
| NamPlt                          | LPL_1             | Name plate        | M     |         |

#### GNRCSWI1 (Switch controller)

| CSWI class                      |                   |                          |       |         |
|---------------------------------|-------------------|--------------------------|-------|---------|
| Data object name                | Common data class | Explanation              | M/O/E | Remarks |
| CSWI                            |                   | Switch controller        |       |         |
| Data objects                    |                   |                          |       |         |
| Common Logical Node Information |                   |                          |       |         |
| Mod                             | ENC_0             | Mode                     | M     |         |
| Beh                             | ENS_1             | Behaviour                | M     |         |
| Health                          | ENS_0             | Health                   | M     |         |
| NamPlt                          | LPL_0             | Name plate               | M     |         |
| Status Information              |                   |                          |       |         |
| OpCls                           | ACT_1             | Operation "Close switch" | O     |         |
| OpOpn                           | ACT_1             | Operation "Open switch"  | O     |         |
| Controls                        |                   |                          |       |         |
| Pos                             | DPC_1             | Switch, general          | M     |         |

#### CFGGIO1 (Communication function)

| GGIO class                      |                   |                        |       |         |
|---------------------------------|-------------------|------------------------|-------|---------|
| Data object name                | Common data class | Explanation            | M/O/E | Remarks |
| GGIO                            |                   | Communication function |       |         |
| Data objects                    |                   |                        |       |         |
| Common Logical Node Information |                   |                        |       |         |
| Mod                             | ENC_0             | Mode                   | M     |         |
| Beh                             | ENS_1             | Behaviour              | M     |         |
| Health                          | ENS_0             | Health                 | M     |         |
| NamPlt                          | LPL_0             | Name plate             | M     |         |
| Status Information              |                   |                        |       |         |
| Ind1 to Ind16                   | SPS_0             | CF output              | O     |         |

**MMSRECGGIO1, MMSRECGGIO2 (MMS blocks single point)**

| GGIO class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks |
| GGIO                            |                   | MMS blocks   |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour  | M     |         |
| Health                          | ENS_0             | Health   | M     |         |
| NamPlt                          | LPL_0             | Name plate   | M     |         |
| Status Information              |                   |  |       |         |
| Blk                             | SPS_0             | Blocking signal  | O     |         |
| Controls                        |                   |  |       |         |
| SPCSO1 to SPCS08                | SPC_0             | Information inputs for receiving incoming MMS messages | O     |         |

**MMSRECGGIO3, MMSRECGGIO4 (MMS blocks double point)**

| GGIO class                      |                   |             |       |         |
|---------------------------------|-------------------|-------------|-------|---------|
| Data object name                | Common data class | Explanation | M/O/E | Remarks |
| GGIO                            |                   | MMS blocks  |       |         |
| Data objects                    |                   |             |       |         |
| Common Logical Node Information |                   |             |       |         |
| Mod                             | ENC_0             | Mode        | M     |         |
| Beh                             | ENS_1             | Behaviour   | M     |         |

|   |       |  |   |  |
|---|-------|--|---|--|
| Health                                  | ENS_0 | Health   | M |  |
| NamPlt                                  | LPL_0 | Name plate   | M |  |
| <b>Status Information</b>               |       |  |   |  |
| Blk                                     | SPS_0 | Blocking signal  | O |  |
| <b>Controls</b>                         |       |  |   |  |
| DPCSO1,<br>DPCSO3,<br>DPCSO5,<br>DPCSO7 | DPC_0 | Information inputs for receiving incoming MMS messages | O |  |

#### GSBIGGIO1 ... GSBIGGIO16 (GOOSE blocks)

| GGIO class                      |                   |                                |       |         |
|---------------------------------|-------------------|--------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                    | M/O/E | Remarks |
| GGIO                            |                   | GOOSE blocks                   |       |         |
| Data objects                    |                   |                                |       |         |
| Common Logical Node Information |                   |                                |       |         |
| Mod                             | ENC_0             | Mode                           | M     |         |
| Beh                             | ENS_1             | Behaviour                      | M     |         |
| Health                          | ENS_0             | Health                         | M     |         |
| NamPlt                          | LPL_0             | Name plate                     | M     |         |
| Status Information              |                   |                                |       |         |
| Blk                             | SPS_0             | Blocking signal                | O     |         |
| Ind1 to Ind8                    | SPS_1             | data inputs for GOOSE messages | O     |         |

#### BIGGIO1 (Digital inputs)

| GGIO class                      |                   |   |       |         |
|---------------------------------|-------------------|---|-------|---------|
| Data object name                | Common data class | Explanation                                 | M/O/E | Remarks |
| GGIO                            |                   | Digital inputs                              |       |         |
| Data objects                    |                   |   |       |         |
| Common Logical Node Information |                   |   |       |         |
| Mod                             | ENC_0             | Mode  | M     |         |
| Beh                             | ENS_1             | Behaviour                                   | M     |         |
| Health                          | ENS_0             | Health                                      | M     |         |
| NamPlt                          | LPL_0             | Name plate                                  | M     |         |
| Status Information              |                   |   |       |         |
| Ind1 to Ind16                   | SPS_0             | General indication: Digital inputs DI1-DI16 | O     |         |

#### BOGGIO1 (Relay outputs)

| GGIO class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation                                  | M/O/E | Remarks |
| GGIO                            |                   | Relay outputs                                |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour                                    | M     |         |
| Health                          | ENS_0             | Health                                       | M     |         |
| NamPlt                          | LPL_0             | Name plate                                   | M     |         |
| Status Information              |                   |  |       |         |
| Ind1 to Ind16                   | SPS_0             | General indication: Digital outputs DO1-DO16 | O     |         |

#### LEDGGIO1 (LED status)

| GGIO class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks |
| GGIO                            |                   | LED status   |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour  | M     |         |
| Health                          | ENS_0             | Health   | M     |         |
| NamPlt                          | LPL_0             | Name plate   | M     |         |
| Status Information              |                   |  |       |         |
| Ind1 to Ind17                   | SPS_0             | General indication: LEDs status from 1 to 15 and "Trip", "Start" | O     |         |

#### DFGGIO1 (User defined function)

| GGIO class                      |                   |                       |       |         |
|---------------------------------|-------------------|-----------------------|-------|---------|
| Data object name                | Common data class | Explanation           | M/O/E | Remarks |
| GGIO                            |                   | User defined function |       |         |
| Data objects                    |                   |                       |       |         |
| Common Logical Node Information |                   |                       |       |         |
| Mod                             | ENC_0             | Mode                  | M     |         |
| Beh                             | ENS_1             | Behaviour             | M     |         |
| Health                          | ENS_0             | Health                | M     |         |
| NamPlt                          | LPL_0             | Name plate            | M     |         |

| Status Information |       |   |   |  |
|--------------------|-------|---|---|--|
| Ind1 to Ind8       | SPS_0 | General indication: UD-Functions outputs status from 1 to 8 | O |  |

#### DTGGIO1 (User defined trigger)

| GGIO class                      |                   |   |       |         |
|---------------------------------|-------------------|---|-------|---------|
| Data object name                | Common data class | Explanation   | M/O/E | Remarks |
| GGIO                            |                   | User defined trigger                                      |       |         |
| Data objects                    |                   |   |       |         |
| Common Logical Node Information |                   |   |       |         |
| Mod                             | ENC_0             | Mode  | M     |         |
| Beh                             | ENS_1             | Behaviour   | M     |         |
| Health                          | ENS_0             | Health  | M     |         |
| NamPlt                          | LPL_0             | Name plate  | M     |         |
| Status Information              |                   |   |       |         |
| SPCSO1 to SPCSO4                | SPC_2             | General indication: UD-triggers inputs status from 1 to 4 | O     |         |

#### MFPGAPC1 ... MFPGAPC8 (Multi-function protection)

| GAPC class                      |                   |                                       |       |         |
|---------------------------------|-------------------|---------------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                           | M/O/E | Remarks |
| GAPC                            |                   | Multi-function protection             |       |         |
| Data objects                    |                   |                                       |       |         |
| Common Logical Node Information |                   |                                       |       |         |
| Mod                             | ENC_0             | Mode                                  | M     |         |
| Beh                             | ENS_1             | Behaviour                             | M     |         |
| Health                          | ENS_0             | Health                                | M     |         |
| NamPlt                          | LPL_0             | Name plate                            | M     |         |
| Status Information              |                   |                                       |       |         |
| Str                             | ACD_0             | MFP starting element operation signal | O     |         |
| Op                              | ACT_1             | MFP operation signal                  | O     |         |
| Blk                             | SPS_0             | Dynamic blocking of function          | O     |         |

#### CMSQI1 (Sequence and imbalance)

| MSQI class       |                   |                        |       |         |
|------------------|-------------------|------------------------|-------|---------|
| Data object name | Common data class | Explanation            | M/O/E | Remarks |
| MSQI             |                   | Sequence and imbalance |       |         |
| Data objects     |                   |                        |       |         |

| Common Logical Node Information |       |                  |   |  |
|---------------------------------|-------|------------------|---|--|
| Mod                             | ENC_0 | Mode             | M |  |
| Beh                             | ENS_1 | Behaviour        | M |  |
| Health                          | ENS_0 | Health           | M |  |
| NamPlt                          | LPL_0 | Name plate       | M |  |
| Measured values                 |       |                  |   |  |
| Seq_A                           | SEQ_0 | sequence current | C |  |
| Seq_V                           | SEQ_0 | voltage sequence | C |  |

#### IPTOC1 (Inrush protection)

| PTOC class                      |                   |                                       |       |         |
|---------------------------------|-------------------|---------------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                           | M/O/E | Remarks |
| PTOC                            |                   | Inrush protection                     |       |         |
| Data objects                    |                   |                                       |       |         |
| Common Logical Node Information |                   |                                       |       |         |
| Mod                             | ENC_0             | Mode                                  | M     |         |
| Beh                             | ENS_1             | Behaviour                             | M     |         |
| Health                          | ENS_0             | Health                                | M     |         |
| NamPlt                          | LPL_0             | Name plate                            | M     |         |
| Status Information              |                   |                                       |       |         |
| Str                             | ACD_0             | Start                                 | M     |         |
| Op                              | ACT_1             | Operate                               | M     |         |
| Blk                             | SPS_0             | Blocking for the signal presence time | O     |         |

#### NSPTOC1 (Negative sequence overcurrent protection)

| PTOC class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation                              | M/O/E | Remarks |
| PTOC                            |                   | Negative sequence overcurrent protection |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode                                     | M     |         |
| Beh                             | ENS_1             | Behaviour                                | M     |         |
| Health                          | ENS_0             | Health                                   | M     |         |
| NamPlt                          | LPL_0             | Name plate                               | M     |         |
| Status Information              |                   |  |       |         |
| Str                             | ACD_0             | Start                                    | M     |         |
| Op                              | ACT_1             | Operate                                  | M     |         |

|     |       |                                       |   |  |
|-----|-------|---------------------------------------|---|--|
| Blk | SPS_0 | Blocking for the signal presence time | O |  |
|-----|-------|---------------------------------------|---|--|

#### GNRPTOV1, GNRPTOV2 (Overvoltage protection)

| PTOV class                      |                   |                                       |       |         |
|---------------------------------|-------------------|---------------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                           | M/O/E | Remarks |
| PTOV                            |                   | Overvoltage                           |       |         |
| Data objects                    |                   |                                       |       |         |
| Common Logical Node Information |                   |                                       |       |         |
| Mod                             | ENC_0             | Mode                                  | M     |         |
| Beh                             | ENS_1             | Behaviour                             | M     |         |
| Health                          | ENS_0             | Health                                | M     |         |
| NamPlt                          | LPL_0             | Name plate                            | M     |         |
| Status Information              |                   |                                       |       |         |
| Str                             | ACD_0             | Start                                 | M     |         |
| Op                              | ACT_1             | Operate                               | O     |         |
| Blk                             | SPS_0             | Blocking for the signal presence time | O     |         |

#### GNNRRADR1 (Disturbance recorder channel analogue)

| RADR class                      |                   |                                       |       |         |
|---------------------------------|-------------------|---------------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                           | M/O/E | Remarks |
| RADR                            |                   | Disturbance recorder channel analogue |       |         |
| Data objects                    |                   |                                       |       |         |
| Common Logical Node Information |                   |                                       |       |         |
| Mod                             | ENC_0             | Mode                                  | M     |         |
| Beh                             | ENS_1             | Behaviour                             | M     |         |
| Health                          | ENS_0             | Health                                | M     |         |
| NamPlt                          | LPL_0             | Name plate                            | M     |         |
| Status Information              |                   |                                       |       |         |
| ChTrg                           | SPS_0             | Channel triggered                     | M     |         |

#### GNNRBDR1 (Disturbance recorder channel binary)

| RBDR class                      |                   |                                     |       |         |
|---------------------------------|-------------------|-------------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                         | M/O/E | Remarks |
| RBDR                            |                   | Disturbance recorder channel binary |       |         |
| Data objects                    |                   |                                     |       |         |
| Common Logical Node Information |                   |                                     |       |         |
| Mod                             | ENC_0             | Mode                                | M     |         |
| Beh                             | ENS_1             | Behaviour                           | M     |         |

|                           |       |                   |   |  |
|---------------------------|-------|-------------------|---|--|
| Health                    | ENS_0 | Health            | M |  |
| NamPlt                    | LPL_0 | Name plate        | M |  |
| <b>Status Information</b> |       |                   |   |  |
| ChTrg                     | SPS_0 | Channel triggered | M |  |

#### 4. Extended Logical Nodes

##### LPHD1 (Physical devise information)

| LPHD class                |                   |  |       |                    |
|---------------------------|-------------------|--|-------|--------------------|
| Data object name          | Common data class | Explanation  | M/O/E | Remarks            |
| LPHD                      |                   | Physical devise information  |       |                    |
| <b>Data objects</b>       |                   |  |       |                    |
| PhyNam                    | DPL_0             | Physical device name plate   | M     |                    |
| <b>Status Information</b> |                   |  |       |                    |
| PhyHealth                 | ENS_0             | Physical device health   | M     |                    |
| Proxy                     | SPS_0             | Indicates if this LN is a proxy  | M     | Defaulted to FALSE |
| Flt                       | SPS_2             | General fault  | E     |                    |
| FltAlm                    | SPS_2             | Emergence Fault  | E     |                    |
| ChgCfg                    | SPS_2             | Settings change  | E     |                    |
| ExtProtOff                | SPS_2             | External protections disabling signal  | E     |                    |
| ErrEL                     | SPS_2             | UD-Logic error   | E     |                    |
| RestrGrSG                 | SPS_2             | The presence of the signal means that a setpoints group is not set via BI              | E     |                    |
| RemReady                  | SPS_2             | Device remote control readiness signal (Rem Ctl Ena)                                   | E     |                    |
| ClrRemReady               | SPS_2             | Signal: reset the "Rem Ctl Ena" signal blocking set when the protections are triggered | E     |                    |
| <b>Controls</b>           |                   |  |       |                    |
| ClrInd                    | SPC_1             | LED Reset  | E     |                    |
| ClrRele                   | SPC_1             | Relay reset  | E     |                    |

##### DLGGIO1 (User defined logic)

| GGIO class                             |                   |                    |       |         |
|--|-------------------|--------------------|-------|---------|
| Data object name                       | Common data class | Explanation        | M/O/E | Remarks |
| GGIO                                   |                   | User defined logic |       |         |
| <b>Data objects</b>                    |                   |                    |       |         |
| <b>Common Logical Node Information</b> |                   |                    |       |         |
| Mod                                    | ENC_0             | Mode               | M     |         |
| Beh                                    | ENS_1             | Behaviour          | M     |         |

|                           |       |  |   |  |
|---------------------------|-------|--|---|--|
| Health                    | ENS_0 | Health   | M |  |
| NamPlt                    | LPL_0 | Name plate                                     | M |  |
| <b>Status Information</b> |       |  |   |  |
| And1 to And8              | SPS_2 | General indication: Logic element "AND" status | E |  |
| Or1 to Or8                | SPS_2 | General indication: Logic element "OR" status  | E |  |
| Not1 to Not16             | SPS_2 | General indication: Logic element "NOT" status | E |  |
| Xor1 to Xor8              | SPS_2 | General indication: Logic element "XOR" status | E |  |

### CMMXU1 (Measurement)

| MMXU class                             |                   |   |       |         |
|--|-------------------|---|-------|---------|
| Data object name                       | Common data class | Explanation   | M/O/E | Remarks |
| MMXU                                   |                   | Measurement   |       |         |
| <b>Data objects</b>                    |                   |   |       |         |
| <b>Common Logical Node Information</b> |                   |   |       |         |
| Mod                                    | ENC_0             | Mode  | M     |         |
| Beh                                    | ENS_1             | Behaviour   | M     |         |
| Health                                 | ENS_0             | Health  | M     |         |
| NamPlt                                 | LPL_0             | Name plate  | M     |         |
| <b>Measured values</b>                 |                   |   |       |         |
| TotW                                   | MV_0              | Total active power (total P)                                | O     |         |
| TotVAr                                 | MV_0              | Total reactive power (total Q)                              | O     |         |
| TotVA                                  | MV_0              | Total apparent power (total S)                              | O     |         |
| TotPF                                  | MV_0              | Average power factor (total PF)                             | O     |         |
| Hz                                     | MV_0              | Frequency   | O     |         |
| PhV                                    | WYE_3             | Phase to ground voltages (VL1ER, ...)                       | O     |         |
| A                                      | WYE_2             | Phase currents (IL1, IL2, IL3)                              | O     |         |
| PPV                                    | DEL_1             | Phase to phase voltages(VL1, VL2, VL3)                      | O     |         |
| ALV                                    | CMV_0             | Current of one of the LV connection phases                  | E     |         |
| PPRis                                  | DEL_0             | Active impedances Rab                                       | E     |         |
| PPX                                    | DEL_0             | Reactive impedances Xab                                     | E     |         |
| HAh                                    | WYE_1             | Sum of higher 3IO current harmonics (without the first one) | E     |         |
| Ah2                                    | WYE_0             | Phase currents (IL1, IL2, IL3) h2                           | E     |         |

### CMMTR1 (Metering)

| MMTR class                      |                   |                         |       |         |
|---------------------------------|-------------------|-------------------------|-------|---------|
| Data object name                | Common data class | Explanation             | M/O/E | Remarks |
| MMTR                            |                   | Metering                |       |         |
| Data objects                    |                   |                         |       |         |
| Common Logical Node Information |                   |                         |       |         |
| Mod                             | ENC_0             | Mode                    | M     |         |
| Beh                             | ENS_1             | Behaviour               | M     |         |
| Health                          | ENS_0             | Health                  | M     |         |
| NamPlt                          | LPL_0             | Name plate              | M     |         |
| Measured values                 |                   |                         |       |         |
| TotWhh                          | BCR_0             | Net real energy Ea+     | E     |         |
| TotWhl                          | BCR_0             | Net real energy Ea-     | E     |         |
| TotVArhA                        | BCR_0             | Net reactive energy Eq1 | E     |         |
| TotVArhB                        | BCR_0             | Net reactive energy Eq2 | E     |         |
| TotVArhC                        | BCR_0             | Net reactive energy Eq3 | E     |         |
| TotVArhD                        | BCR_0             | Net reactive energy Eq4 | E     |         |

**GNRPTOC1, GNRPTOC2, GNRPTOC3, GNRPTOC4 (Overcurrent protection)**

| PTOC class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks |
| PTOC                            |                   | Overcurrent protection   |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour  | M     |         |
| Health                          | ENS_0             | Health   | M     |         |
| NamPlt                          | LPL_0             | Name plate   | M     |         |
| Status Information              |                   |  |       |         |
| Str                             | ACD_0             | Start  | M     |         |
| Op                              | ACT_1             | Operate  | M     |         |
| Blk                             | SPS_0             | OCP blocking for the signal presence time                              | O     |         |
| StrU                            | ACD_1             | OCP starting element signal with voltage start                         | E     |         |
| StrF                            | ACD_1             | Direct OCP starting element operation signal in the forward direction  | E     |         |
| StrB                            | ACD_1             | Direct OCP starting element operation signal in the backward direction | E     |         |
| SecF                            | SPS_2             | One of the current vectors of direct OCP is in the "forward" sector    | E     |         |

|        |       |   |   |                               |
|--------|-------|---|---|-------------------------------|
| SecB   | SPS_2 | One of the current vectors of direct OP is in the "backward" sector | E |                               |
| StrUu  | ACD_1 | OCp voltage starting element operation signal with voltage start    | E |                               |
| BlkAcc | SPS_2 | OCp acceleration blocking   | E | used only for <b>GNRPTOC2</b> |

#### LVPTOC1, LVPTOC2 (Low voltage overcurrent protection)

| PTOC class                      |                   |                                       |       |                              |
|---------------------------------|-------------------|---------------------------------------|-------|------------------------------|
| Data object name                | Common data class | Explanation                           | M/O/E | Remarks                      |
| PTOC                            |                   | Low voltage overcurrent protection    |       |                              |
| Data objects                    |                   |                                       |       |                              |
| Common Logical Node Information |                   |                                       |       |                              |
| Mod                             | ENC_0             | Mode                                  | M     |                              |
| Beh                             | ENS_1             | Behaviour                             | M     |                              |
| Health                          | ENS_0             | Health                                | M     |                              |
| NamPlt                          | LPL_0             | Name plate                            | M     |                              |
| Status Information              |                   |                                       |       |                              |
| Str                             | ACD_0             | Start                                 | M     |                              |
| Op                              | ACT_1             | Operate                               | M     |                              |
| Blk                             | SPS_0             | Blocking for the signal presence time | O     |                              |
| BlkAcc                          | SPS_2             | OCp acceleration blocking             | E     | used only for <b>LVPTOC2</b> |

#### GNRUPTOC1 (General signals for 4 stages of overcurrent protection)

| PTOC class                      |                   |  |       |                               |
|---------------------------------|-------------------|--|-------|-------------------------------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks                       |
| PTOC                            |                   | General signals for 4 stages of overcurrent protection                       |       |                               |
| Data objects                    |                   |  |       |                               |
| Common Logical Node Information |                   |  |       |                               |
| Mod                             | ENC_0             | Mode   | M     |                               |
| Beh                             | ENS_1             | Behaviour  | M     |                               |
| Health                          | ENS_0             | Health   | M     |                               |
| NamPlt                          | LPL_0             | Name plate   | M     |                               |
| Status Information              |                   |  |       |                               |
| Str                             | ACD_0             | Start  | M     | not defined                   |
| Op                              | ACT_1             | Operate  | M     | not defined                   |
| BlkU                            | SPS_2             | Signal of OCp direction blocking starting element according to voltage level | E     | one signal for all OCp levels |

|       |       |                              |   |                               |
|-------|-------|------------------------------|---|-------------------------------|
| CtrlU | ACT_0 | Voltage circuit fault signal | E | one signal for all OCP levels |
|-------|-------|------------------------------|---|-------------------------------|

### DEFPTOC1, DEFPTOC2, DEFPTOC3 (Three-stage directional earth fault protection)

| PTOC class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks |
| PTOC                            |                   | Three-stage directional earth fault protection                   |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour  | M     |         |
| Health                          | ENS_0             | Health   | M     |         |
| NamPlt                          | LPL_0             | Name plate   | M     |         |
| Status Information              |                   |  |       |         |
| Str                             | ACD_0             | Start  | M     |         |
| Op                              | ACT_1             | Operate  | M     |         |
| Blk                             | SPS_0             | Blocking for the signal presence time                            | O     |         |
| StrF                            | ACD_1             | Starting element operation signal in the forward direction       | E     |         |
| StrB                            | ACD_1             | Starting element operation signal in the backward direction      | E     |         |
| SecF                            | SPS_2             | 3I0 current vector is in the forward direction operation sector  | E     |         |
| SecB                            | SPS_2             | 3I0 current vector is in the backward direction operation sector | E     |         |
| StrIF                           | ACD_1             | Forward direction current starting element operation signal      | E     |         |
| StrIB                           | ACD_1             | Backward direction current starting element operation signal     | E     |         |
| StrUF                           | ACD_1             | Forward direction voltage starting element operation signal      | E     |         |
| StrUB                           | ACD_1             | Backward direction voltage starting element operation signal     | E     |         |

### SEFPSDE1 (Sensitive directional earth fault protection)

| PSDE class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation                                  | M/O/E | Remarks |
| PSDE                            |                   | Sensitive directional earth fault protection |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |

|                           |       |   |   |  |
|---------------------------|-------|---|---|--|
| Mod                       | ENC_0 | Mode  | M |  |
| ModI                      | ENC_1 | Mode I  | E |  |
| ModU                      | ENC_1 | Mode U  | E |  |
| Beh                       | ENS_1 | Behaviour   | M |  |
| Health                    | ENS_0 | Health  | M |  |
| NamPlt                    | LPL_0 | Name plate  | M |  |
| <b>Status Information</b> |       |   |   |  |
| Str                       | ACD_0 | Start   | M |  |
| Op                        | ACT_1 | Operate   | O |  |
| Blk                       | SPS_0 | Blocking for the signal presence time                           | O |  |
| StrI                      | ACD_1 | Current protection starting element operation signal            | E |  |
| Opl                       | ACT_0 | Earth fault current protection trip signal                      | E |  |
| StrU                      | ACD_1 | Signal of the triggering of the earth fault protection trigger  | E |  |
| OpU                       | ACT_0 | Voltage earth fault protection trip signal                      | E |  |
| Sec                       | SPS_2 | The current vector 3Io is in the sector of operation of the NZZ | E |  |

#### GNRPTUV1, GNRPTUV2 (Time undervoltage)

| PTUV class                             |                   |  |       |         |
|--|-------------------|--|-------|---------|
| Data object name                       | Common data class | Explanation  | M/O/E | Remarks |
| PTUV                                   |                   | Time undervoltage                                  |       |         |
| <b>Data objects</b>                    |                   |  |       |         |
| <b>Common Logical Node Information</b> |                   |  |       |         |
| Mod                                    | ENC_0             | Mode   | M     |         |
| Beh                                    | ENS_1             | Behaviour  | M     |         |
| Health                                 | ENS_0             | Health   | M     |         |
| NamPlt                                 | LPL_0             | Name plate   | M     |         |
| <b>Status Information</b>              |                   |  |       |         |
| Str                                    | ACD_0             | Start  | M     |         |
| Op                                     | ACT_1             | Operate  | M     |         |
| Blk                                    | SPS_0             | Blocking for the signal presence time              | O     |         |
| StrIBlk                                | ACD_1             | Current blocking starting element operation signal | E     |         |
| StrUBlk                                | ACD_1             | Voltage blocking starting element operation signal | E     |         |
| Lnch                                   | ACD_1             | External start signal                              | E     |         |

**AFSLPTUF1, AFSLPTUF2 (Load-frequency control and frequency auto reclosing)**

| PTUF class                      |                   |   |       |         |
|---------------------------------|-------------------|---|-------|---------|
| Data object name                | Common data class | Explanation   | M/O/E | Remarks |
| PTUF                            |                   | Load-frequency control and frequency auto reclosing |       |         |
| Data objects                    |                   |   |       |         |
| Common Logical Node Information |                   |   |       |         |
| Mod                             | ENC_0             | Mode  | M     |         |
| ModFAR                          | ENC_1             | FAR 1   | E     |         |
| Beh                             | ENS_1             | Behaviour   | M     |         |
| Health                          | ENS_0             | Health  | M     |         |
| NamPlt                          | LPL_0             | Name plate  | M     |         |
| Status Information              |                   |   |       |         |
| Str                             | ACD_0             | LFC starting element operation signal               | M     |         |
| Op                              | ACT_1             | LFC/FAR operation signal                            | M     |         |
| Blk                             | SPS_0             | LFC static blocking signal                          | O     |         |
| OpBl                            | ACT_0             | Signal of LFC/FAR start via the binary input        | E     |         |
| BlkFAR                          | SPS_2             | Locked FAR at voltages control                      | E     |         |
| FARena                          | SPS_2             | FAR enable signal                                   | E     |         |
| StrFAR                          | ACD_1             | First FAR stage starting element operation signal   | E     |         |

**GNRRBRF1 (Circuit Breaker Failure Protection Device)**

| RBRF class                      |                   |   |       |         |
|---------------------------------|-------------------|---|-------|---------|
| Data object name                | Common data class | Explanation                               | M/O/E | Remarks |
| RBRF                            |                   | Circuit Breaker Failure Protection Device |       |         |
| Data objects                    |                   |   |       |         |
| Common Logical Node Information |                   |   |       |         |
| Mod                             | ENC_0             | Mode                                      | M     |         |
| Beh                             | ENS_1             | Behaviour                                 | M     |         |
| Health                          | ENS_0             | Health                                    | M     |         |
| NamPlt                          | LPL_0             | Name plate                                | M     |         |
| Status Information              |                   |   |       |         |
| Str                             | ACD_0             | CBFP starting element operation signal    | O     |         |
| OpEx                            | ACT_1             | Second CBFP stage operation signal        | C     |         |
| OpIn                            | ACT_1             | First CBFP stage operation signal         | C     |         |
| Blk                             | SPS_0             | CBFP blocking signal                      | O     |         |

|       |       |   |   |  |
|-------|-------|---|---|--|
| StrBI | ACD_1 | Signal of CBFP diagram operation start via BI | E |  |
|-------|-------|---|---|--|

### GNRRREC1 (Quadruple Auto Reclosing)

| RBRF class                      |                   |                              |       |         |
|---------------------------------|-------------------|------------------------------|-------|---------|
| Data object name                | Common data class | Explanation                  | M/O/E | Remarks |
| RREC                            |                   | Quadruple Auto Reclosing     |       |         |
| Data objects                    |                   |                              |       |         |
| Common Logical Node Information |                   |                              |       |         |
| Mod                             | ENC_0             | Mode AR1                     | M     |         |
| Beh                             | ENS_1             | Behaviour                    | M     |         |
| Health                          | ENS_0             | Health                       | M     |         |
| NamPlt                          | LPL_0             | Name plate                   | M     |         |
| Status Information              |                   |                              |       |         |
| AutoRecSt                       | ENS_2             | Auto reclosing status        | M     |         |
| OpCls                           | ACT_1             | Signal: Enabled AR           | M     |         |
| Blk                             | SPS_0             | Dynamic blocking of function | O     |         |
| EnaAR1                          | SPS_2             | AR1                          | E     |         |
| EnaAR2                          | SPS_2             | AR2                          | E     |         |
| EnaAR3                          | SPS_2             | AR3                          | E     |         |
| EnaAR4                          | SPS_2             | AR4                          | E     |         |
| OpCyc1 to OpCyc4                | ACT_0             | AR cycle operation signal    | E     |         |

### AFDSARC1 (Arc fault detector)

| SARC class                      |                   |   |       |         |
|---------------------------------|-------------------|---|-------|---------|
| Data object name                | Common data class | Explanation   | M/O/E | Remarks |
| SARC                            |                   | Arc fault detector  |       |         |
| Data objects                    |                   |   |       |         |
| Common Logical Node Information |                   |   |       |         |
| Mod                             | ENC_0             | Mode  | M     |         |
| Beh                             | ENS_1             | Behaviour   | M     |         |
| Health                          | ENS_0             | Health  | M     |         |
| NamPlt                          | LPL_0             | Name plate  | M     |         |
| Status Information              |                   |   |       |         |
| FADet                           | SPS_0             | Fault arc detected (signal: the presence of arc light is determined by a discrete signal from the BI) | M     |         |
| Blk                             | SPS_0             | AFD stage static blocking signal  | O     |         |
| FADetF1 ...<br>FADetF3          | SPS_2             | Fault arc detected (fiber)  | E     |         |

|                 |       |  |   |  |
|-----------------|-------|--|---|--|
| FAStr           | ACD_1 | AFD stage starting element operation signal            | E |  |
| FAOp            | ACT_0 | AFD stage operation signal                             | E |  |
| FAStrBl         | ACD_1 | AFD trigger signal from external arc protection sensor | E |  |
| <b>Controls</b> |       |  |   |  |
| FACntRs         | INC_0 | Fault arc counter                                      | M |  |

### GNRXCBR1 (Circuit breaker)

| XCBR class                      |                   |  |       |         |
|---------------------------------|-------------------|--|-------|---------|
| Data object name                | Common data class | Explanation  | M/O/E | Remarks |
| XCBR                            |                   | Circuit breaker  |       |         |
| Data objects                    |                   |  |       |         |
| Common Logical Node Information |                   |  |       |         |
| Mod                             | ENC_0             | Mode   | M     |         |
| Beh                             | ENS_1             | Behaviour  | M     |         |
| Health                          | ENS_0             | Health   | M     |         |
| NamPlt                          | LPL_0             | Name plate   | M     |         |
| Status Information              |                   |  |       |         |
| Loc                             | SPS_0             | Local control behavior   | M     |         |
| OpCnt                           | INS_0             | Operation counter  | M     |         |
| OpCls                           | ACT_0             | Trip device operation signal   | E     |         |
| OpOpn                           | ACT_0             | Switching device operation signal  | E     |         |
| CBAct                           | SPS_2             | Triggering signal of CB Monitoring block   | E     |         |
| CBClCtrl                        | SPS_2             | Close command circuit control  | E     |         |
| CBOpnCtrl                       | SPS_2             | Open command circuit control   | E     |         |
| AExc                            | SPS_2             | Maximum fault current exceedance of the circuit breaker disabling nominal current value signal | E     |         |
| CBCritRes                       | SPS_2             | Circuit breaker critical resource  | E     |         |
| CBResExh                        | SPS_2             | Circuit breaker exceeded signal  | E     |         |
| Controls                        |                   |  |       |         |
| Pos                             | DPC_0             | Switch position  | M     |         |
| BlkOpn                          | SPC_2             | Block opening  | M     |         |
| BlkCls                          | SPC_2             | Block closing  | M     |         |