



**MRM4 – IEC60870-5-103  
HighPROTEC**

Data point list

**Manual DOK-TD-MRM4IDE**

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This manual applies to devices (version):

Version 2.0.h

Build: 19747

# Physical layer

## Physical layer

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### Electrical interface

EIA RS-485

Number of loads for one equipment: 32

### Optical interface

Glass fibre

F-SMA type connector

Plastic fibre

BFOC/2,5 type connector

### Transmission speed

9600 bit/s

19200 bit/s

38400 bit/s

## Link Layer

There are no choices for the link layer

## Application layer

Transmission mode for application data Mode 1 (least significant octet first) as defined in 4.10 of IEC 60870-5-4

Common address of ADSU

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> One common address of ADSU<br>(identical with station address) | <input type="checkbox"/> More than one common address of ASDU |
|--|---|

Selection of standard information numbers in monitor direction

System functions in monitor direction

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> 0 = End of general interrogation | <input checked="" type="checkbox"/> 0 = Time synchronization |
| <input checked="" type="checkbox"/> 2 = Reset FCB                    | <input checked="" type="checkbox"/> 3 = Reset CU             |
| <input checked="" type="checkbox"/> 4 = Start/Restart                | <input checked="" type="checkbox"/> 5 = Power on             |

## Application layer

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### Measurands in monitor direction

- |  |   |
|--|---|
| <input type="checkbox"/> 144 Measurand I   | <input type="checkbox"/> 145 Measurands I,V                                 |
| <input type="checkbox"/> 146 Measurand I, V,P,Q  | <input type="checkbox"/> 147 Measurands I <sub>N</sub> ,<br>V <sub>EN</sub> |
| <input checked="" type="checkbox"/> 148 Measurands I <sub>L1,2,3</sub> , V <sub>L1,2,3</sub> , P, Q, f |   |

### Generic functions in monitor direction

- |                              |  |
|------------------------------|--|
| <input type="checkbox"/> 240 | <input type="checkbox"/> 241 Read values of all entries of one group |
| <input type="checkbox"/> 243 | <input type="checkbox"/> 244 Read value of a single entry            |
| <input type="checkbox"/> 245 | <input type="checkbox"/> 249 Write entry with confirmation           |
| <input type="checkbox"/> 250 | <input type="checkbox"/> 251 Write entry aborted                     |

### Selection of standard information numbers in control direction

#### System functions in control direction

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> 0 = Initiation of general interrogation | <input checked="" type="checkbox"/> 0 Time synchronization |
|---|--|

General commands in control direction

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> 16 Auto-recloser on/off      | <input checked="" type="checkbox"/> 17 Teleprotection on/off     |
| <input checked="" type="checkbox"/> 18 Protection on/off         | <input checked="" type="checkbox"/> 19 LED reset                 |
| <input checked="" type="checkbox"/> 23 Activate characteristic 1 | <input checked="" type="checkbox"/> 24 Activate characteristic 2 |
| <input checked="" type="checkbox"/> 25 Activate characteristic 3 | <input checked="" type="checkbox"/> 26 Activate characteristic 4 |

Generic functions in control direction

- |  |  |
|--|--|
| <input type="checkbox"/> 240 Read headings of all defined groups   | <input type="checkbox"/> 241 Read values of all entries of one group |
| <input type="checkbox"/> 243 Read directory of a single entry      | <input type="checkbox"/> 244 Read value of a single entry            |
| <input type="checkbox"/> 245 General interrogation of generic data | <input type="checkbox"/> 248 Write entry                             |
| <input type="checkbox"/> 249 Write entry with confirmation         | <input type="checkbox"/> 250 Write entry with execution              |
| <input type="checkbox"/> 251 Write entry abort                     |  |

## Application layer

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### Basic application functions

Test mode

Disturbance data

Private data

Blocking of monitor direction

Generic services



Miscellaneous

Measurand	max. value = rated value x	
	1.2	2.4
Current L <sub>1</sub>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Current L <sub>2</sub>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Current L <sub>3</sub>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Voltage L <sub>1-E</sub>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L <sub>2-E</sub>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L <sub>3-E</sub>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage L <sub>1</sub> – L <sub>2</sub>	<input type="checkbox"/>	<input type="checkbox"/>
Active power P	<input type="checkbox"/>	<input type="checkbox"/>
Reactive power Y	<input type="checkbox"/>	<input type="checkbox"/>
Frequency f	<input type="checkbox"/>	<input type="checkbox"/>

## IEC60870-5-103 – Data Points List

### Signals

<i>Module</i>	<i>Subgroups Names Functions</i>	<i>Function Type ASDU</i>	<i>Function (FUN)</i>	<i>Information Number (INF)</i>	<i>Device Interrogation</i>	<i>Description</i>
Prot	active	1	178	18	GI	Signal: active
PSet-Switch	min 1 param changed	1	178	22	GI	Signal: At least one parameter has been changed
DI Slot X1	DI 1	1	178	27	GI	Signal: Digital Input
DI Slot X1	DI 2	1	178	28	GI	Signal: Digital Input
DI Slot X1	DI 3	1	178	29	GI	Signal: Digital Input
DI Slot X1	DI 4	1	178	30	GI	Signal: Digital Input
CTS	Alarm	1	178	32	GI	Signal: Alarm Current Transformer Measuring Circuit Supervision
Prot	Alarm L1	2	178	64	GI	Signal: General-Alarm L1
Prot	Alarm L2	2	178	65	GI	Signal: General-Alarm L2
Prot	Alarm L3	2	178	66	GI	Signal: General-Alarm L3
Prot	Alarm G	2	178	67	GI	Signal: General-Alarm - Earth fault
Prot	Trip	2	178	68		Signal: General Trip
Prot	Trip L1	2	178	69		Signal: General Trip L1
Prot	Trip L2	2	178	70		Signal: General Trip L2
Prot	Trip L3	2	178	71		Signal: General Trip L3
Prot	Alarm	2	178	84	GI	Signal: General Alarm
CBF	Alarm	2	178	85		Signal: Circuit Breaker Failure

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
I[1]	TripCmd	2	178	90		Signal: Trip Command
I[2]	TripCmd	2	178	91		Signal: Trip Command
IG[1]	TripCmd	2	178	92		Signal: Trip Command
IG[2]	TripCmd	2	178	93		Signal: Trip Command
Ctrl	Local	1	178	160	GI	Switching Authority: Local
MStart	Blo	1	40	161	GI	Signal: Motor is blocked for starting or transition to Run mode
MStart	Stop	1	40	162	GI	Signal: Motor is in stop mode
MStart	Start	1	40	163	GI	Signal: Motor is in start mode
MStart	Run	1	40	164	GI	Signal: Motor is in run mode
MStart	LATBlock	1	40	165	GI	Signal: Long acceleration timer enforced
MStart	NOCSBlocked	1	40	166	GI	Signal: Motor is prohibited to start due to number of cold start limits
MStart	SPHBlocked	1	40	167	GI	Signal: Motor is prohibited to start due to starts per hour limits
MStart	TBSBlocked	1	40	168	GI	Signal: Motor is prohibited to start due to time between starts limits
MStart	ThermalBlo	1	40	169	GI	Signal: Thermal block
MStart	RemBlockStart	1	40	170	GI	Signal: Motor is prohibited to start due to external blocking through digital input DI
MStart	MotorStopBlo	1	40	171	GI	Signal: Motor stop block other protection functions

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
MStart	SPHBlockAlarm	1	40	172	GI	Signal: Motor is prohibited to start due to starts per hour limits, would come active in the next stop
MStart	INSQSt2RunFail	1	40	173	GI	Signal: Fail to transit from start to run based on reported back time
MStart	INSQSP2STFaill	1	40	174	GI	Signal: Fail to transit from stop to start based on reported back time
MStart	I_Transit	1	40	175	GI	Signal: Current transition signal
MStart	T_Transit	1	40	176	GI	Signal: Time transition signal
MStart	ABSActive	1	40	178	GI	Signal: Anti-backspin is active. For certain applications, such as pumping a fluid up a pipe, the motor may be driven backward for a period of time after it stops. The anti-backspin timer prevents starting the motor while it is spinning in the reverse direction.
MStart	ColdStartSeq	1	40	179	GI	Signal: Motor cold start sequence flag
MStart	EmergOverrideDI	1	40	180	GI	Signal: Emergency override start blocking through digital input DI
MStart	EmergOverrideUI	1	40	181	GI	Signal: Emergency override start blocking through front panel
MStart	ForcedStart	1	40	182	GI	Signal: Motor being forced to start
MStart	TripCmd	2	40	90		Signal: Trip Command
MStart	TransitionTrip	2	40	91		Signal: Start transition fail trip
MStart	ZSSTrip	2	40	92		Signal: Zero speed trip (possible locked rotor)

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
MStart	TripPhaseReverse	2	40	93		Signal: Relay tripped because of phase reverse detection
MStart	Rotating forward	1	40	94	GI	Signal: Rotation Direction forward
MStart	Rotating backward	1	40	95	GI	Signal: Rotation Direction reverse
MStart	INSQ-I	1	41	161	GI	State of the module input: INcomplete Sequence
MStart	RemStartBlock-I	1	41	167	GI	State of the module input: Remote Motor Start Blocking
MStart	ZSS-I	1	41	170	GI	State of the module input: Zero Speed Switch
MStart	Blo-IOCStart	1	41	171	GI	Signal: Phase Instantaneous Overcurrent Start Delay. IOC (Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
MStart	Blo-GOCStart	1	41	172	GI	Signal: Ground Instantaneous Overcurrent Start Delay. GOC (Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
MStart	Blo-JamStart	1	41	173	GI	Signal: JAM Start Delay. JAM(Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
MStart	Blo-I<Start	1	41	174	GI	Signal: Underload Start Delay. Underload(Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
MStart	Blo-UnbalStart	1	41	175	GI	Signal: Motor start block current unbalance signal
MStart	Blo-Generic1	1	41	176	GI	Generic Start Delay. This value can be used to block any protective element.1
MStart	Blo-Generic2	1	41	177	GI	Generic Start Delay. This value can be used to block any protective element.2
MStart	Blo-Generic3	1	41	178	GI	Generic Start Delay. This value can be used to block any protective element.3
MStart	Blo-Generic4	1	41	179	GI	Generic Start Delay. This value can be used to block any protective element.4
MStart	Blo-Generic5	1	41	180	GI	Generic Start Delay. This value can be used to block any protective element.5
ThR	Blo TripCmd	1	42	31	GI	Signal: Trip Command blocked
ThR	Load above SF	1	42	160	GI	Load above Service Factor
ThR	RTD effective	1	42	161	GI	RTD effective
ThR	Alarm	1	42	64	GI	Signal: Alarm
ThR	Alarm Pickup	1	42	65	GI	Signal: Alarm Pickup
ThR	Alarm Timeout	1	42	66	GI	Signal: Alarm Timeout

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
ThR	TripCmd	2	42	90		Signal: Trip Command
Jam[1]	ExBlo	1	43	30	GI	Signal: External Blocking
Jam[2]	ExBlo	1	43	31	GI	Signal: External Blocking
Jam[1]	TripCmd	2	43	90		Signal: Trip Command
Jam[2]	TripCmd	2	43	91		Signal: Trip Command
Jam[1]	Alarm	1	43	100	GI	Signal: Alarm
Jam[2]	Alarm	1	43	101	GI	Signal: Alarm
MLS	ExBlo	1	44	31	GI	Signal: External Blocking
MLS	Alarm	1	44	100	GI	Signal: Alarm
I<[1]	ExBlo	1	45	30	GI	Signal: External Blocking
I<[2]	ExBlo	1	45	31	GI	Signal: External Blocking
I<[3]	ExBlo	1	45	32	GI	Signal: External Blocking
I<[1]	TripCmd	2	45	90		Signal: Trip Command
I<[2]	TripCmd	2	45	91		Signal: Trip Command
I<[3]	TripCmd	2	45	92		Signal: Trip Command
I<[1]	Alarm	2	45	100	GI	Signal: Alarm
I<[2]	Alarm	2	45	101	GI	Signal: Alarm
I<[3]	Alarm	2	45	102	GI	Signal: Alarm
RTD	TripCmd	2	46	90		Signal: Trip Command
RTD	Alarm	2	46	100	GI	Alarm RTD Temperature Protection
IEC 103	Failure Event lost	1	100	100		Failure event lost
I[1]	active	1	101	50	GI	Signal: active

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
I[2]	active	1	101	51	GI	Signal: active
I[3]	active	1	101	52	GI	Signal: active
I[4]	active	1	101	53	GI	Signal: active
I[5]	active	1	101	54	GI	Signal: active
I[6]	active	1	101	55	GI	Signal: active
IG[1]	active	1	101	56	GI	Signal: active
IG[2]	active	1	101	57	GI	Signal: active
IG[3]	active	1	101	58	GI	Signal: active
IG[4]	active	1	101	59	GI	Signal: active
I[1]	Blo TripCmd	1	101	60	GI	Signal: Trip Command blocked
I[2]	Blo TripCmd	1	101	61	GI	Signal: Trip Command blocked
I[3]	Blo TripCmd	1	101	62	GI	Signal: Trip Command blocked
I[4]	Blo TripCmd	1	101	63	GI	Signal: Trip Command blocked
I[5]	Blo TripCmd	1	101	64	GI	Signal: Trip Command blocked
I[6]	Blo TripCmd	1	101	65	GI	Signal: Trip Command blocked
IG[1]	Blo TripCmd	1	101	66	GI	Signal: Trip Command blocked
IG[2]	Blo TripCmd	1	101	67	GI	Signal: Trip Command blocked
IG[3]	Blo TripCmd	1	101	68	GI	Signal: Trip Command blocked
IG[4]	Blo TripCmd	1	101	69	GI	Signal: Trip Command blocked
I[3]	TripCmd	2	101	92		Signal: Trip Command
I[4]	TripCmd	2	101	93		Signal: Trip Command
I[5]	TripCmd	2	101	94		Signal: Trip Command
I[6]	TripCmd	2	101	95		Signal: Trip Command



<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
IG[3]	TripCmd	2	101	98		Signal: Trip Command
IG[4]	TripCmd	2	101	99		Signal: Trip Command
I[1]	Alarm	2	101	100	GI	Signal: Alarm
I[2]	Alarm	2	101	101	GI	Signal: Alarm
I[3]	Alarm	2	101	102	GI	Signal: Alarm
I[4]	Alarm	2	101	103	GI	Signal: Alarm
I[5]	Alarm	2	101	104	GI	Signal: Alarm
I[6]	Alarm	2	101	105	GI	Signal: Alarm
IG[1]	Alarm	2	101	106	GI	Signal: Alarm IG
IG[2]	Alarm	2	101	107	GI	Signal: Alarm IG
IG[3]	Alarm	2	101	108	GI	Signal: Alarm IG
IG[4]	Alarm	2	101	109	GI	Signal: Alarm IG
I2>[1]	active	1	103	56	GI	Signal: active
I2>[2]	active	1	103	57	GI	Signal: active
I2>[1]	Blo TripCmd	1	103	66	GI	Signal: Trip Command blocked
I2>[2]	Blo TripCmd	1	103	67	GI	Signal: Trip Command blocked
I2>[1]	TripCmd	2	103	90		Signal: Trip Command
I2>[2]	TripCmd	2	103	91		Signal: Trip Command
I2>[1]	Alarm	2	103	100	GI	Signal: Alarm Negative Sequence
I2>[2]	Alarm	2	103	101	GI	Signal: Alarm Negative Sequence
CBF	active	1	108	50	GI	Signal: active
CBF	running	1	108	60	GI	Signal: CBF-Module started

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
CBF	Trigger1	1	108	100	GI	Module Input: Trigger that will start the CBF
CBF	Trigger2	1	108	101	GI	Module Input: Trigger that will start the CBF
CBF	Trigger3	1	108	102	GI	Module Input: Trigger that will start the CBF
CBF	Lockout	1	108	106	GI	Signal: Lockout
Exp[1]	active	1	114	50	GI	Signal: active
Exp[2]	active	1	114	51	GI	Signal: active
Exp[3]	active	1	114	52	GI	Signal: active
Exp[4]	active	1	114	53	GI	Signal: active
Exp[1]	Blo TripCmd	1	114	60	GI	Signal: Trip Command blocked
Exp[2]	Blo TripCmd	1	114	61	GI	Signal: Trip Command blocked
Exp[3]	Blo TripCmd	1	114	62	GI	Signal: Trip Command blocked
Exp[4]	Blo TripCmd	1	114	63	GI	Signal: Trip Command blocked
Exp[1]	TripCmd	2	114	90		Signal: Trip Command
Exp[2]	TripCmd	2	114	91		Signal: Trip Command
Exp[3]	TripCmd	2	114	92		Signal: Trip Command
Exp[4]	TripCmd	2	114	93		Signal: Trip Command
Exp[1]	Alarm	2	114	100	GI	Signal: Alarm
Exp[2]	Alarm	2	114	101	GI	Signal: Alarm
Exp[3]	Alarm	2	114	102	GI	Signal: Alarm
Exp[4]	Alarm	2	114	103	GI	Signal: Alarm
SOTF	active	1	115	50	GI	Signal: active

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
DI Slot X1	DI 5	1	121	27	GI	Signal: Digital Input
DI Slot X1	DI 6	1	121	28	GI	Signal: Digital Input
DI Slot X1	DI 7	1	121	29	GI	Signal: Digital Input
DI Slot X1	DI 8	1	121	30	GI	Signal: Digital Input
DI Slot X1	DI 1	1	121	35	GI	Signal: Digital Input
DI Slot X1	DI 2	1	121	36	GI	Signal: Digital Input
DI Slot X1	DI 3	1	121	37	GI	Signal: Digital Input
DI Slot X1	DI 4	1	121	38	GI	Signal: Digital Input
BO-5 X2	BO 1	1	123	160	GI	Signal: Binary Output Relay
BO-5 X2	BO 2	1	123	161	GI	Signal: Binary Output Relay
BO-5 X2	BO 3	1	123	162	GI	Signal: Binary Output Relay
BO-5 X2	BO 4	1	123	163	GI	Signal: Binary Output Relay
BO-5 X2	BO 5	1	123	164	GI	Signal: Binary Output Relay
BO-3 X2	BO 1	1	123	168	GI	Signal: Binary Output Relay
BO-3 X2	BO 2	1	123	169	GI	Signal: Binary Output Relay
BO-3 X2	BO 3	1	123	170	GI	Signal: Binary Output Relay
Logics	LE1.Gate Out	1	162	160	GI	Signal: Output of the logic gate
Logics	LE1.Timer Out	1	162	161	GI	Signal: Timer Output
Logics	LE1.Out	1	162	162	GI	Signal: Latched Output (Q)
Logics	LE1.Gate In1-I	1	162	163	GI	State of the module input: Assignment of the Input Signal
Logics	LE1.Gate In2-I	1	162	164	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE1.Gate In3-I	1	162	165	GI	State of the module input: Assignment of the Input Signal
Logics	LE1.Gate In4-I	1	162	166	GI	State of the module input: Assignment of the Input Signal
Logics	LE2.Gate Out	1	162	167	GI	Signal: Output of the logic gate
Logics	LE2.Timer Out	1	162	168	GI	Signal: Timer Output
Logics	LE2.Out	1	162	169	GI	Signal: Latched Output (Q)
Logics	LE2.Gate In1-I	1	162	170	GI	State of the module input: Assignment of the Input Signal
Logics	LE2.Gate In2-I	1	162	171	GI	State of the module input: Assignment of the Input Signal
Logics	LE2.Gate In3-I	1	162	172	GI	State of the module input: Assignment of the Input Signal
Logics	LE2.Gate In4-I	1	162	173	GI	State of the module input: Assignment of the Input Signal
Logics	LE3.Gate Out	1	162	174	GI	Signal: Output of the logic gate
Logics	LE3.Timer Out	1	162	175	GI	Signal: Timer Output
Logics	LE3.Out	1	162	176	GI	Signal: Latched Output (Q)
Logics	LE3.Gate In1-I	1	162	177	GI	State of the module input: Assignment of the Input Signal
Logics	LE3.Gate In2-I	1	162	178	GI	State of the module input: Assignment of the Input Signal
Logics	LE3.Gate In3-I	1	162	179	GI	State of the module input: Assignment of the Input Signal
Logics	LE3.Gate In4-I	1	162	180	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE4.Gate Out	1	162	181	GI	Signal: Output of the logic gate
Logics	LE4.Timer Out	1	162	182	GI	Signal: Timer Output
Logics	LE4.Out	1	162	183	GI	Signal: Latched Output (Q)
Logics	LE4.Gate In1-I	1	162	184	GI	State of the module input: Assignment of the Input Signal
Logics	LE4.Gate In2-I	1	162	185	GI	State of the module input: Assignment of the Input Signal
Logics	LE4.Gate In3-I	1	162	186	GI	State of the module input: Assignment of the Input Signal
Logics	LE4.Gate In4-I	1	162	187	GI	State of the module input: Assignment of the Input Signal
Logics	LE5.Gate Out	1	162	188	GI	Signal: Output of the logic gate
Logics	LE5.Timer Out	1	162	189	GI	Signal: Timer Output
Logics	LE5.Out	1	162	190	GI	Signal: Latched Output (Q)
Logics	LE5.Gate In1-I	1	162	191	GI	State of the module input: Assignment of the Input Signal
Logics	LE5.Gate In2-I	1	162	192	GI	State of the module input: Assignment of the Input Signal
Logics	LE5.Gate In3-I	1	162	193	GI	State of the module input: Assignment of the Input Signal
Logics	LE5.Gate In4-I	1	162	194	GI	State of the module input: Assignment of the Input Signal
Logics	LE6.Gate Out	1	162	195	GI	Signal: Output of the logic gate
Logics	LE6.Timer Out	1	162	196	GI	Signal: Timer Output
Logics	LE6.Out	1	162	197	GI	Signal: Latched Output (Q)

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE6.Gate In1-I	1	162	198	GI	State of the module input: Assignment of the Input Signal
Logics	LE6.Gate In2-I	1	162	199	GI	State of the module input: Assignment of the Input Signal
Logics	LE6.Gate In3-I	1	162	200	GI	State of the module input: Assignment of the Input Signal
Logics	LE6.Gate In4-I	1	162	201	GI	State of the module input: Assignment of the Input Signal
Logics	LE7.Gate Out	1	162	202	GI	Signal: Output of the logic gate
Logics	LE7.Timer Out	1	162	203	GI	Signal: Timer Output
Logics	LE7.Out	1	162	204	GI	Signal: Latched Output (Q)
Logics	LE7.Gate In1-I	1	162	205	GI	State of the module input: Assignment of the Input Signal
Logics	LE7.Gate In2-I	1	162	206	GI	State of the module input: Assignment of the Input Signal
Logics	LE7.Gate In3-I	1	162	207	GI	State of the module input: Assignment of the Input Signal
Logics	LE7.Gate In4-I	1	162	208	GI	State of the module input: Assignment of the Input Signal
Logics	LE8.Gate Out	1	162	209	GI	Signal: Output of the logic gate
Logics	LE8.Timer Out	1	162	210	GI	Signal: Timer Output
Logics	LE8.Out	1	162	211	GI	Signal: Latched Output (Q)
Logics	LE8.Gate In1-I	1	162	212	GI	State of the module input: Assignment of the Input Signal
Logics	LE8.Gate In2-I	1	162	213	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE8.Gate In3-I	1	162	214	GI	State of the module input: Assignment of the Input Signal
Logics	LE8.Gate In4-I	1	162	215	GI	State of the module input: Assignment of the Input Signal
Logics	LE9.Gate Out	1	162	216	GI	Signal: Output of the logic gate
Logics	LE9.Timer Out	1	162	217	GI	Signal: Timer Output
Logics	LE9.Out	1	162	218	GI	Signal: Latched Output (Q)
Logics	LE9.Gate In1-I	1	162	219	GI	State of the module input: Assignment of the Input Signal
Logics	LE9.Gate In2-I	1	162	220	GI	State of the module input: Assignment of the Input Signal
Logics	LE9.Gate In3-I	1	162	221	GI	State of the module input: Assignment of the Input Signal
Logics	LE9.Gate In4-I	1	162	222	GI	State of the module input: Assignment of the Input Signal
Logics	LE10.Gate Out	1	162	223	GI	Signal: Output of the logic gate
Logics	LE10.Timer Out	1	162	224	GI	Signal: Timer Output
Logics	LE10.Out	1	162	225	GI	Signal: Latched Output (Q)
Logics	LE10.Gate In1-I	1	162	226	GI	State of the module input: Assignment of the Input Signal
Logics	LE10.Gate In2-I	1	162	227	GI	State of the module input: Assignment of the Input Signal
Logics	LE10.Gate In3-I	1	162	228	GI	State of the module input: Assignment of the Input Signal
Logics	LE10.Gate In4-I	1	162	229	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE11.Gate Out	1	163	160	GI	Signal: Output of the logic gate
Logics	LE11.Timer Out	1	163	161	GI	Signal: Timer Output
Logics	LE11.Out	1	163	162	GI	Signal: Latched Output (Q)
Logics	LE11.Gate In1-I	1	163	163	GI	State of the module input: Assignment of the Input Signal
Logics	LE11.Gate In2-I	1	163	164	GI	State of the module input: Assignment of the Input Signal
Logics	LE11.Gate In3-I	1	163	165	GI	State of the module input: Assignment of the Input Signal
Logics	LE11.Gate In4-I	1	163	166	GI	State of the module input: Assignment of the Input Signal
Logics	LE12.Gate Out	1	163	167	GI	Signal: Output of the logic gate
Logics	LE12.Timer Out	1	163	168	GI	Signal: Timer Output
Logics	LE12.Out	1	163	169	GI	Signal: Latched Output (Q)
Logics	LE12.Gate In1-I	1	163	170	GI	State of the module input: Assignment of the Input Signal
Logics	LE12.Gate In2-I	1	163	171	GI	State of the module input: Assignment of the Input Signal
Logics	LE12.Gate In3-I	1	163	172	GI	State of the module input: Assignment of the Input Signal
Logics	LE12.Gate In4-I	1	163	173	GI	State of the module input: Assignment of the Input Signal
Logics	LE13.Gate Out	1	163	174	GI	Signal: Output of the logic gate
Logics	LE13.Timer Out	1	163	175	GI	Signal: Timer Output
Logics	LE13.Out	1	163	176	GI	Signal: Latched Output (Q)



<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE13.Gate In1-I	1	163	177	GI	State of the module input: Assignment of the Input Signal
Logics	LE13.Gate In2-I	1	163	178	GI	State of the module input: Assignment of the Input Signal
Logics	LE13.Gate In3-I	1	163	179	GI	State of the module input: Assignment of the Input Signal
Logics	LE13.Gate In4-I	1	163	180	GI	State of the module input: Assignment of the Input Signal
Logics	LE14.Gate Out	1	163	181	GI	Signal: Output of the logic gate
Logics	LE14.Timer Out	1	163	182	GI	Signal: Timer Output
Logics	LE14.Out	1	163	183	GI	Signal: Latched Output (Q)
Logics	LE14.Gate In1-I	1	163	184	GI	State of the module input: Assignment of the Input Signal
Logics	LE14.Gate In2-I	1	163	185	GI	State of the module input: Assignment of the Input Signal
Logics	LE14.Gate In3-I	1	163	186	GI	State of the module input: Assignment of the Input Signal
Logics	LE14.Gate In4-I	1	163	187	GI	State of the module input: Assignment of the Input Signal
Logics	LE15.Gate Out	1	163	188	GI	Signal: Output of the logic gate
Logics	LE15.Timer Out	1	163	189	GI	Signal: Timer Output
Logics	LE15.Out	1	163	190	GI	Signal: Latched Output (Q)
Logics	LE15.Gate In1-I	1	163	191	GI	State of the module input: Assignment of the Input Signal
Logics	LE15.Gate In2-I	1	163	192	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE15.Gate In3-I	1	163	193	GI	State of the module input: Assignment of the Input Signal
Logics	LE15.Gate In4-I	1	163	194	GI	State of the module input: Assignment of the Input Signal
Logics	LE16.Gate Out	1	163	195	GI	Signal: Output of the logic gate
Logics	LE16.Timer Out	1	163	196	GI	Signal: Timer Output
Logics	LE16.Out	1	163	197	GI	Signal: Latched Output (Q)
Logics	LE16.Gate In1-I	1	163	198	GI	State of the module input: Assignment of the Input Signal
Logics	LE16.Gate In2-I	1	163	199	GI	State of the module input: Assignment of the Input Signal
Logics	LE16.Gate In3-I	1	163	200	GI	State of the module input: Assignment of the Input Signal
Logics	LE16.Gate In4-I	1	163	201	GI	State of the module input: Assignment of the Input Signal
Logics	LE17.Gate Out	1	163	202	GI	Signal: Output of the logic gate
Logics	LE17.Timer Out	1	163	203	GI	Signal: Timer Output
Logics	LE17.Out	1	163	204	GI	Signal: Latched Output (Q)
Logics	LE17.Gate In1-I	1	163	205	GI	State of the module input: Assignment of the Input Signal
Logics	LE17.Gate In2-I	1	163	206	GI	State of the module input: Assignment of the Input Signal
Logics	LE17.Gate In3-I	1	163	207	GI	State of the module input: Assignment of the Input Signal
Logics	LE17.Gate In4-I	1	163	208	GI	State of the module input: Assignment of the Input Signal

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE18.Gate Out	1	163	209	GI	Signal: Output of the logic gate
Logics	LE18.Timer Out	1	163	210	GI	Signal: Timer Output
Logics	LE18.Out	1	163	211	GI	Signal: Latched Output (Q)
Logics	LE18.Gate In1-I	1	163	212	GI	State of the module input: Assignment of the Input Signal
Logics	LE18.Gate In2-I	1	163	213	GI	State of the module input: Assignment of the Input Signal
Logics	LE18.Gate In3-I	1	163	214	GI	State of the module input: Assignment of the Input Signal
Logics	LE18.Gate In4-I	1	163	215	GI	State of the module input: Assignment of the Input Signal
Logics	LE19.Gate Out	1	163	216	GI	Signal: Output of the logic gate
Logics	LE19.Timer Out	1	163	217	GI	Signal: Timer Output
Logics	LE19.Out	1	163	218	GI	Signal: Latched Output (Q)
Logics	LE19.Gate In1-I	1	163	219	GI	State of the module input: Assignment of the Input Signal
Logics	LE19.Gate In2-I	1	163	220	GI	State of the module input: Assignment of the Input Signal
Logics	LE19.Gate In3-I	1	163	221	GI	State of the module input: Assignment of the Input Signal
Logics	LE19.Gate In4-I	1	163	222	GI	State of the module input: Assignment of the Input Signal
Logics	LE20.Gate Out	1	163	223	GI	Signal: Output of the logic gate
Logics	LE20.Timer Out	1	163	224	GI	Signal: Timer Output
Logics	LE20.Out	1	163	225	GI	Signal: Latched Output (Q)

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Logics	LE20.Gate In1-I	1	163	226	GI	State of the module input: Assignment of the Input Signal
Logics	LE20.Gate In2-I	1	163	227	GI	State of the module input: Assignment of the Input Signal
Logics	LE20.Gate In3-I	1	163	228	GI	State of the module input: Assignment of the Input Signal
Logics	LE20.Gate In4-I	1	163	229	GI	State of the module input: Assignment of the Input Signal
TCS	Alarm	1	241	100	GI	Signal: Alarm Trip Circuit Supervision
TCS	Not Possible	1	241	110	GI	Not possible because no state indicator assigned to the breaker.
SG	Operations Alarm	1	242	104	GI	Signal: Service Alarm, too many Operations
SG	WearLevel Alarm	1	242	130	GI	Signal: Threshold for the Alarm
SG	WearLevel Lockout	1	242	131	GI	Signal: Threshold for the Lockout Level
Sgen	Ex ForcePost-I	1	245	110	GI	State of the module input:Force Post state. Abort simulation.
Sgen	Running	1	245	111	GI	Signal; Measuring value simulation is running
SG	SCmd OFF-I	1	246	110	GI	State of the module input: Switching OFF Command, e.g. the state of the Logics or the state of the digital input

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
SG	SCmd ON-I	1	246	111	GI	State of the module input: Switching ON Command, e.g. the state of the Logics or the state of the digital input
SG	TripCmd	2	246	114		Signal: Trip Command
SG	OFF Cmd	1	246	115		Signal: OFF Command issued to the switchgear. Depending on the setting the signal may include the OFF command of the Prot module.
SG	ON Cmd	1	246	116		Signal: ON Command issued to the switchgear. Depending on the setting the signal may include the ON command of the Prot module.
SG	CES succesf	1	246	117	GI	Command Execution Supervision: Switching command executed successfully.
SG	Interl OFF	1	246	118	GI	Signal: One or more IL_Off inputs are active.
SG	Interl ON	1	246	119	GI	Signal: One or more IL_On inputs are active.
SG	Ready	1	246	120	GI	Signal: Circuit breaker is ready for operation.

## Measuring Values

<b>Module</b>	<b>Subgroup Names Functions</b>	<b>Function type ASDU</b>	<b>Function code (FUN)</b>	<b>Information Number (INF)</b>	<b>Factor</b>	<b>Position</b>	<b>Description</b>
Measured values	IL1 [%]	9	178	148	2.4	0	Measured value: Phase current (fundamental)
Measured values	IL2 [%]	9	178	148	2.4	1	Measured value: Phase current (fundamental)
Measured values	IL3 [%]	9	178	148	2.4	2	Measured value: Phase current (fundamental)
Measured values	IL1 [%]	9	150	148	2.4	0	Measured value: Phase current (fundamental)
Measured values	IL2 [%]	9	150	148	2.4	1	Measured value: Phase current (fundamental)
Measured values	IL3 [%]	9	150	148	2.4	2	Measured value: Phase current (fundamental)
Measured values	IG meas [%]	9	150	148	2.4	3	Measured value (measured): IG (fundamental)
Measured values	IG calc [%]	9	150	148	2.4	4	Measured value (calculated): IG (fundamental)

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Fault measurement	IL1	4	92	150		Measured value: Phase current (fundamental)
Fault measurement	IL2	4	92	151		Measured value: Phase current (fundamental)
Fault measurement	IL3	4	92	152		Measured value: Phase current (fundamental)
Fault measurement	IG meas	4	92	186		Measured value (measured): IG (fundamental)

## Commands

<b>Module</b>	<b>Subgroups Names Functions</b>	<b>Function Type ASDU</b>	<b>Function (FUN)</b>	<b>Information Number (INF)</b>	<b>Device Interrogation</b>	<b>Description</b>
Scada Cmd	Ack LED	20	178	19		Signal: LEDs acknowledgement
Scada Cmd	PS 1	20	178	23	GI	Signal: Parameter Set 1
Scada Cmd	PS 2	20	178	24	GI	Signal: Parameter Set 2
Scada Cmd	PS 3	20	178	25	GI	Signal: Parameter Set 3
Scada Cmd	PS 4	20	178	26	GI	Signal: Parameter Set 4
Scada Cmd	Scada Cmd 1	20	130	15		Scada Command
Scada Cmd	Scada Cmd 2	20	130	16		Scada Command
Scada Cmd	Scada Cmd 3	20	130	17		Scada Command
Scada Cmd	Scada Cmd 4	20	130	18		Scada Command
Scada Cmd	Scada Cmd 5	20	130	19		Scada Command
Scada Cmd	Scada Cmd 6	20	130	20		Scada Command
Scada Cmd	Scada Cmd 7	20	130	21		Scada Command
Scada Cmd	Scada Cmd 8	20	130	22		Scada Command
Scada Cmd	Scada Cmd 9	20	130	23		Scada Command
Scada Cmd	Scada Cmd 10	20	130	24		Scada Command
Scada Cmd	Ack BO	20	130	40		Signal: Acknowledgement of the Binary Outputs
Scada Cmd	Ack TripCmd	20	130	41		Signal: Reset Trip Command
SG	Control/Position of circuit breaker	20	131	32	GI	Control respectively Position of circuit breaker (1 = OFF, 2 = On).



## Analog Traces

<i>Module</i>	<i>IEC60870-5-103 Channel Number</i>	<i>Desc</i>
I L1	1	Analog trace I L1
I L2	2	Analog trace I L2
I L3	3	Analog trace I L3
IG	4	Analog trace IG



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**Woodward Kempen GmbH**

Krefelder Weg 47 · D – 47906 Kempen (Germany)  
Postfach 10 07 55 (P.O.Box) · D – 47884 Kempen (Germany)  
Phone: +49 (0) 21 52 145 1

**Internet**

[www.woodward.com](http://www.woodward.com)

**Sales**

Phone: +49 (0) 21 52 145 216 or 342  
Fax: +49 (0) 21 52 145 354  
e-mail: [salesEMEA\\_PGD@woodward.com](mailto:salesEMEA_PGD@woodward.com)

**Service**

Phone: +49 (0) 21 52 145 614  
Fax: +49 (0) 21 52 145 455  
e-mail: [supportEMEA\\_PGD@woodward.com](mailto:supportEMEA_PGD@woodward.com)