



**MRU4 – IEC60870-5-103
HighPROTEC**

Data point list

Manual MRU4 R3.6 (Build 41524)

Table of Contents

PHYSICAL LAYER.....	3
LINK LAYER.....	3
APPLICATION LAYER.....	4
DATA POINTS LIST.....	8
Signals.....	8
Measuring Values.....	25
Fault Values.....	26
Energy Values.....	27
Commands.....	29
Analog Traces.....	31

This manual applies to devices (version):

Version 3.6.b

Build: 41479

Physical layer

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
(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

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_N, V_{EN} |
| <input checked="" type="checkbox"/> 148 Measurands $I_{L1,2,3}, V_{L1,2,3}, P, Q, f$ | |

Generic functions in monitor 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 End of general interrogation of generic data | <input type="checkbox"/> 249 Write entry with confirmation |
| <input type="checkbox"/> 250 Write entry with execution | <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"/> 20 Blocking of Monitor Direction | <input checked="" type="checkbox"/> 21 Test mode |
| <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 | |

Basic application functions

- | | |
|--|---|
| <input checked="" type="checkbox"/> Test mode | <input checked="" type="checkbox"/> Blocking of monitor direction |
| <input checked="" type="checkbox"/> Disturbance data | <input type="checkbox"/> Generic services |
| <input checked="" type="checkbox"/> Private data | |

Miscellaneous

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

Data Points List

Signals

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Prot	active	1	163	18	GI	Signal: active
IEC103	Block MD active	1	163	20	GI	Signal: The blocking of IEC103 transmission in monitor direction has been activated.
IEC103	Test mode active	1	163	21	GI	Signal: IEC103 communication has been switched over into Test Mode.
PSet-Switch	min 1 param changed	1	163	22	GI	Signal: At least one parameter has been changed
DI Slot X1	DI 1	1	163	27	GI	Signal: Digital Input
DI Slot X1	DI 2	1	163	28	GI	Signal: Digital Input
DI Slot X1	DI 3	1	163	29	GI	Signal: Digital Input
DI Slot X1	DI 4	1	163	30	GI	Signal: Digital Input
VTS	Alarm	1	163	33	GI	Signal: Alarm Voltage Transformer Measuring Circuit Supervision
SSV	New warning	1	163	46	GI	Signal: A new warning message has been issued.
SSV	System Error	1	163	47	GI	Signal: Device Failure
Prot	Alarm L1	2	163	64	GI	Signal: General-Alarm L1
Prot	Alarm L2	2	163	65	GI	Signal: General-Alarm L2
Prot	Alarm L3	2	163	66	GI	Signal: General-Alarm L3
Prot	Alarm G	2	163	67	GI	Signal: General-Alarm - Earth fault

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Prot	Trip	2	163	68		Signal: General Trip
Prot	Trip L1	2	163	69		Signal: General Trip L1
Prot	Trip L2	2	163	70		Signal: General Trip L2
Prot	Trip L3	2	163	71		Signal: General Trip L3
Prot	Alarm	2	163	84	GI	Signal: General Alarm
CBF - 62BF	Alarm	2	163	85		Signal: Circuit Breaker Failure
ReCon[1]	Blo by Meas Circuit Superv	1	37	40	GI	Signal: Module blocked by measuring circuit supervision
ReCon[1]	active	1	37	50	GI	Signal: active
ReCon[1]	Release Energy Resource	1	37	111	GI	Signal: Release Energy Resource.
ReCon[1]	V Ext Release PCC-I	1	37	112	GI	Module input state: Release signal is being generated by the PCC (External Release)
ReCon[2]	Blo by Meas Circuit Superv	1	38	40	GI	Signal: Module blocked by measuring circuit supervision
ReCon[2]	active	1	38	50	GI	Signal: active
ReCon[2]	Release Energy Resource	1	38	111	GI	Signal: Release Energy Resource.
ReCon[2]	V Ext Release PCC-I	1	38	112	GI	Module input state: Release signal is being generated by the PCC (External Release)
IEC103	Failure Event lost	1	100	100		Failure event lost
V012[1] - 47	active	1	103	50	GI	Signal: active
V012[2] - 47	active	1	103	51	GI	Signal: active
V012[3] - 47	active	1	103	52	GI	Signal: active
V012[4] - 47	active	1	103	53	GI	Signal: active

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
V012[5] - 47	active	1	103	54	GI	Signal: active
V012[6] - 47	active	1	103	55	GI	Signal: active
V012[1] - 47	Blo TripCmd	1	103	60	GI	Signal: Trip Command blocked
V012[2] - 47	Blo TripCmd	1	103	61	GI	Signal: Trip Command blocked
V012[3] - 47	Blo TripCmd	1	103	62	GI	Signal: Trip Command blocked
V012[4] - 47	Blo TripCmd	1	103	63	GI	Signal: Trip Command blocked
V012[5] - 47	Blo TripCmd	1	103	64	GI	Signal: Trip Command blocked
V012[6] - 47	Blo TripCmd	1	103	65	GI	Signal: Trip Command blocked
V012[1] - 47	TripCmd	2	103	92		Signal: Trip Command
V012[2] - 47	TripCmd	2	103	93		Signal: Trip Command
V012[3] - 47	TripCmd	2	103	94		Signal: Trip Command
V012[4] - 47	TripCmd	2	103	95		Signal: Trip Command
V012[5] - 47	TripCmd	2	103	96		Signal: Trip Command
V012[6] - 47	TripCmd	2	103	97		Signal: Trip Command
V012[1] - 47	Alarm	2	103	102	GI	Signal: Alarm voltage asymmetry
V012[2] - 47	Alarm	2	103	103	GI	Signal: Alarm voltage asymmetry
V012[3] - 47	Alarm	2	103	104	GI	Signal: Alarm voltage asymmetry
V012[4] - 47	Alarm	2	103	105	GI	Signal: Alarm voltage asymmetry
V012[5] - 47	Alarm	2	103	106	GI	Signal: Alarm voltage asymmetry
V012[6] - 47	Alarm	2	103	107	GI	Signal: Alarm voltage asymmetry
V[1] - 27, 59	active	1	104	50	GI	Signal: active
V[2] - 27, 59	active	1	104	51	GI	Signal: active
V[3] - 27, 59	active	1	104	52	GI	Signal: active

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
V[4] - 27, 59	active	1	104	53	GI	Signal: active
VG[1] - 27A, 59N,A	active	1	104	54	GI	Signal: active
VG[2] - 27A, 59N,A	active	1	104	55	GI	Signal: active
V[5] - 27, 59	active	1	104	56	GI	Signal: active
V[6] - 27, 59	active	1	104	57	GI	Signal: active
V[1] - 27, 59	Blo TripCmd	1	104	60	GI	Signal: Trip Command blocked
V[2] - 27, 59	Blo TripCmd	1	104	61	GI	Signal: Trip Command blocked
V[3] - 27, 59	Blo TripCmd	1	104	62	GI	Signal: Trip Command blocked
V[4] - 27, 59	Blo TripCmd	1	104	63	GI	Signal: Trip Command blocked
VG[1] - 27A, 59N,A	Blo TripCmd	1	104	64	GI	Signal: Trip Command blocked
VG[2] - 27A, 59N,A	Blo TripCmd	1	104	65	GI	Signal: Trip Command blocked
V[5] - 27, 59	Blo TripCmd	1	104	66	GI	Signal: Trip Command blocked
V[6] - 27, 59	Blo TripCmd	1	104	67	GI	Signal: Trip Command blocked
V[1] - 27, 59	TripCmd	2	104	90		Signal: Trip Command
V[2] - 27, 59	TripCmd	2	104	91		Signal: Trip Command
V[3] - 27, 59	TripCmd	2	104	92		Signal: Trip Command
V[4] - 27, 59	TripCmd	2	104	93		Signal: Trip Command
VG[1] - 27A, 59N,A	TripCmd	2	104	94		Signal: Trip Command
VG[2] - 27A, 59N,A	TripCmd	2	104	95		Signal: Trip Command
V[5] - 27, 59	TripCmd	2	104	96		Signal: Trip Command
V[6] - 27, 59	TripCmd	2	104	97		Signal: Trip Command
V[1] - 27, 59	Alarm	2	104	100	GI	Signal: Alarm voltage stage
V[2] - 27, 59	Alarm	2	104	101	GI	Signal: Alarm voltage stage

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
V[3] - 27, 59	Alarm	2	104	102	GI	Signal: Alarm voltage stage
V[4] - 27, 59	Alarm	2	104	103	GI	Signal: Alarm voltage stage
VG[1] - 27A, 59N,A	Alarm	2	104	104	GI	Signal: Alarm Residual Voltage Supervision-stage
VG[2] - 27A, 59N,A	Alarm	2	104	105	GI	Signal: Alarm Residual Voltage Supervision-stage
V[5] - 27, 59	Alarm	2	104	106	GI	Signal: Alarm voltage stage
V[6] - 27, 59	Alarm	2	104	107	GI	Signal: Alarm voltage stage
f[1] - 81	active	1	105	50	GI	Signal: active
f[2] - 81	active	1	105	51	GI	Signal: active
f[3] - 81	active	1	105	52	GI	Signal: active
f[4] - 81	active	1	105	53	GI	Signal: active
f[5] - 81	active	1	105	54	GI	Signal: active
f[6] - 81	active	1	105	55	GI	Signal: active
f[1] - 81	Blo TripCmd	1	105	60	GI	Signal: Trip Command blocked
f[2] - 81	Blo TripCmd	1	105	61	GI	Signal: Trip Command blocked
f[3] - 81	Blo TripCmd	1	105	62	GI	Signal: Trip Command blocked
f[4] - 81	Blo TripCmd	1	105	63	GI	Signal: Trip Command blocked
f[5] - 81	Blo TripCmd	1	105	64	GI	Signal: Trip Command blocked
f[6] - 81	Blo TripCmd	1	105	65	GI	Signal: Trip Command blocked
f[1] - 81	TripCmd	2	105	90		Signal: Trip Command
f[2] - 81	TripCmd	2	105	91		Signal: Trip Command
f[3] - 81	TripCmd	2	105	92		Signal: Trip Command
f[4] - 81	TripCmd	2	105	93		Signal: Trip Command

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
f[5] - 81	TripCmd	2	105	94		Signal: Trip Command
f[6] - 81	TripCmd	2	105	95		Signal: Trip Command
f[1] - 81	Alarm	2	105	100	GI	Signal: Alarm Frequency Protection (collective signal)
f[2] - 81	Alarm	2	105	101	GI	Signal: Alarm Frequency Protection (collective signal)
f[3] - 81	Alarm	2	105	102	GI	Signal: Alarm Frequency Protection (collective signal)
f[4] - 81	Alarm	2	105	103	GI	Signal: Alarm Frequency Protection (collective signal)
f[5] - 81	Alarm	2	105	104	GI	Signal: Alarm Frequency Protection (collective signal)
f[6] - 81	Alarm	2	105	105	GI	Signal: Alarm Frequency Protection (collective signal)
f[1] - 81	Alarm df/dt DF/DT	2	105	110	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[2] - 81	Alarm df/dt DF/DT	2	105	111	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[3] - 81	Alarm df/dt DF/DT	2	105	112	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[4] - 81	Alarm df/dt DF/DT	2	105	113	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[5] - 81	Alarm df/dt DF/DT	2	105	114	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[6] - 81	Alarm df/dt DF/DT	2	105	115	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[1] - 81	Alarm delta phi	2	105	120	GI	Signal: Alarm Vector Surge

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
f[2] - 81	Alarm delta phi	2	105	121	GI	Signal: Alarm Vector Surge
f[3] - 81	Alarm delta phi	2	105	122	GI	Signal: Alarm Vector Surge
f[4] - 81	Alarm delta phi	2	105	123	GI	Signal: Alarm Vector Surge
f[5] - 81	Alarm delta phi	2	105	124	GI	Signal: Alarm Vector Surge
f[6] - 81	Alarm delta phi	2	105	125	GI	Signal: Alarm Vector Surge
f[1] - 81	Trip df/dt DF/DT	2	105	130		Signal: Trip df/dt or DF/DT
f[2] - 81	Trip df/dt DF/DT	2	105	131		Signal: Trip df/dt or DF/DT
f[3] - 81	Trip df/dt DF/DT	2	105	132		Signal: Trip df/dt or DF/DT
f[4] - 81	Trip df/dt DF/DT	2	105	133		Signal: Trip df/dt or DF/DT
f[5] - 81	Trip df/dt DF/DT	2	105	134		Signal: Trip df/dt or DF/DT
f[6] - 81	Trip df/dt DF/DT	2	105	135		Signal: Trip df/dt or DF/DT
f[1] - 81	Trip delta phi	2	105	140		Signal: Trip Vector Surge
f[2] - 81	Trip delta phi	2	105	141		Signal: Trip Vector Surge
f[3] - 81	Trip delta phi	2	105	142		Signal: Trip Vector Surge
f[4] - 81	Trip delta phi	2	105	143		Signal: Trip Vector Surge
f[5] - 81	Trip delta phi	2	105	144		Signal: Trip Vector Surge
f[6] - 81	Trip delta phi	2	105	145		Signal: Trip Vector Surge
CBF - 62BF	active	1	108	50	GI	Signal: active
CBF - 62BF	running	1	108	60	GI	Signal: CBF-Module started
CBF - 62BF	Trigger1-I	1	108	100	GI	Module Input: Trigger that will start the CBF
CBF - 62BF	Trigger2-I	1	108	101	GI	Module Input: Trigger that will start the CBF
CBF - 62BF	Trigger3-I	1	108	102	GI	Module Input: Trigger that will start the CBF
CBF - 62BF	Lockout	1	108	106	GI	Signal: Lockout

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
CBF - 62BF	Waiting for Trigger	1	108	107	GI	Waiting for Trigger
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
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
BO Slot X2	BO 1	1	123	160	GI	Signal: Binary Output Relay
BO Slot X2	BO 2	1	123	161	GI	Signal: Binary Output Relay

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
BO Slot X2	BO 3	1	123	162	GI	Signal: Binary Output Relay
BO Slot X2	BO 4	1	123	163	GI	Signal: Binary Output Relay
BO Slot X2	BO 5	1	123	164	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	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	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	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	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	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)
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

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Logics	LE7.Out	1	162	204	GI	Signal: Latched Output (Q)
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	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	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	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)

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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)
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

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
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

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
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)

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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)
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
Intertripping	active	1	166	50	GI	Signal: active
Intertripping	TripCmd	2	166	90		Signal: Trip Command
Intertripping	Alarm	2	166	100	GI	Signal: Alarm
delta phi - 78V	active	1	169	50	GI	Signal: active
delta phi - 78V	TripCmd	2	169	90		Signal: Trip Command
delta phi - 78V	Alarm	2	169	100	GI	Signal: Alarm Frequency Protection (collective signal)

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
LVRT[1] - 27	active	1	170	50	GI	Signal: active
LVRT[2] - 27	active	1	170	51	GI	Signal: active
LVRT[1] - 27	TripCmd	2	170	90		Signal: Trip Command
LVRT[2] - 27	TripCmd	2	170	91		Signal: Trip Command
LVRT[1] - 27	Alarm	2	170	100	GI	Signal: Alarm voltage stage
LVRT[2] - 27	Alarm	2	170	101	GI	Signal: Alarm voltage stage
df/dt - 81R	active	1	175	50	GI	Signal: active
df/dt - 81R	TripCmd	2	175	90		Signal: Trip Command
df/dt - 81R	Alarm	2	175	100	GI	Signal: Alarm Frequency Protection (collective signal)
SysA	active	1	182	50	GI	Signal: active
SysA	Alarm V THD	2	182	108	GI	Signal: Alarm Total Harmonic Distortion Voltage
SysA	Trip V THD	2	182	98		Signal: Trip Total Harmonic Distortion Voltage
TCS - 74TC	active	1	241	50	GI	Signal: active
TCS - 74TC	ExBlo	1	241	80		Signal: External Blocking
TCS - 74TC	Alarm	1	241	100	GI	Signal: Alarm Trip Circuit Supervision
TCS - 74TC	Not Possible	1	241	110	GI	Not possible because no state indicator assigned to the breaker.
SG[1]	Operations Alarm	1	242	104	GI	Signal: Too many Operations. (The operations counter »TripCmd Cr« has exceeded the limit set at »Operations Alarm«.)
Sync - 25	active	1	244	50	GI	Signal: active

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Sync - 25	ExBlo	1	244	80		Signal: External Blocking
Sync - 25	AngleDiffTooHigh	1	244	110	GI	Signal: Phase Angle difference between bus and line voltages too high.
Sync - 25	Sys-in-Sync	1	244	111	GI	Signal: Bus and line voltages are in synchronism according to the system synchronism criteria.
Sync - 25	LiveBus	1	244	112	GI	Signal: Live-Bus flag: 1=Live-Bus, 0=Voltage is below the LiveBus threshold
Sync - 25	LiveLine	1	244	113	GI	Signal: Live Line flag: 1=Live-Line, 0=Voltage is below the LiveLine threshold
Sync - 25	SlipTooHigh	1	244	114	GI	Signal: Frequency difference (slip frequency) between bus and line voltages too high.
Sync - 25	Ready to Close	1	244	115	GI	Signal: Ready to Close
Sync - 25	SynchronFailed	1	244	116	GI	Signal: This signal indicates a failed synchronization. It is set for 5s when the circuit breaker is still open after the Synchron-Run-timer has timed out.
Sync - 25	VDiffTooHigh	1	244	117	GI	Signal: Voltage difference between bus and line too high.
Ctrl	SG Disturb	1	246	32	GI	(At least one) Switchgear is disturbed.
Ctrl	SG Indeterm	1	246	33	GI	(At least one) Switchgear is moving (Position cannot be determined).
SG[1]	Prot ON	1	246	113		Signal: ON Command issued by the Prot module
SG[1]	TripCmd	2	246	114		Signal: Trip Command
SG[1]	Ready	1	246	120	GI	Signal: Circuit breaker is ready for operation.

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Scada Cmd	PS 1	1	163	23	GI	Signal: The currently active Parameter Set is PS 1
Scada Cmd	PS 2	1	163	24	GI	Signal: The currently active Parameter Set is PS 2
Scada Cmd	PS 3	1	163	25	GI	Signal: The currently active Parameter Set is PS 3
Scada Cmd	PS 4	1	163	26	GI	Signal: The currently active Parameter Set is PS 4
SG[1]	Pos	1	131	32	GI	Signal: Circuit Breaker Position (0 = Indeterminate, 1 = OFF, 2 = ON, 3 = Disturbed)

Measuring Values

Module (- ANSI / IEEE Device Number)	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
VT	VL1 [%]	9	163	148	2.4	3	Measured value: Phase-to-neutral voltage (fundamental)
VT	VL2 [%]	9	163	148	2.4	4	Measured value: Phase-to-neutral voltage (fundamental)
VT	VL3 [%]	9	163	148	2.4	5	Measured value: Phase-to-neutral voltage (fundamental)
VT	f [%]	9	163	148	1.2	8	Measured value: Frequency
Measured Values	VL1 [%]	9	150	148	2.4	5	Measured value: Phase-to-neutral voltage (fundamental)
Measured Values	VL2 [%]	9	150	148	2.4	6	Measured value: Phase-to-neutral voltage (fundamental)
Measured Values	VL3 [%]	9	150	148	2.4	7	Measured value: Phase-to-neutral voltage (fundamental)
Measured Values	VX meas [%]	9	150	148	2.4	8	Measured value (measured): VX measured (fundamental)
Measured Values	VG calc [%]	9	150	148	2.4	9	Measured value (calculated): VG (fundamental)
Measured Values	VL12 [%]	9	150	148	2.4	10	Measured value: Phase-to-phase voltage (fundamental)

Module (- ANSI / IEEE Device Number)	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
Measured Values	VL23 [%]	9	150	148	2.4	11	Measured value: Phase-to-phase voltage (fundamental)
Measured Values	VL31 [%]	9	150	148	2.4	12	Measured value: Phase-to-phase voltage (fundamental)
Measured Values	f [%]	9	150	148	1.2	16	Measured value: Frequency

Fault Values

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
VT	VL12	4	92	190		Measured value: Phase-to-phase voltage (fundamental)
VT	VL23	4	92	191		Measured value: Phase-to-phase voltage (fundamental)
VT	VL31	4	92	192		Measured value: Phase-to-phase voltage (fundamental)
VT	VL1	4	92	193		Measured value: Phase-to-neutral voltage (fundamental)
VT	VL2	4	92	194		Measured value: Phase-to-neutral voltage (fundamental)
VT	VL3	4	92	195		Measured value: Phase-to-neutral voltage (fundamental)

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
VT	VX meas	4	92	196		Measured value (measured): VX measured (fundamental)

Energy Values

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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The unit of measurement for the energy values is always kWh, independent of the setting "Energy Units" [Device Para / Measurem Display / General settings]. Therefore we recommend to adapt this setting, i. e. change the "Energy Units" setting to kWh. Otherwise the precision of the measurement value might decrease.

Function type ASDU 195:

Type identification	195
Variable structure qualifier	129
Cause of transmission	1 or 7
Device address	
Function type	See Data point table
Information number	See Data point table
Data byte 1.1	Counter value1 (currently not used)
Data byte 1.2	
Data byte 1.3	
Data byte 1.4	
Data byte 2.1	Counter value 2
Data byte 2.2	
Data byte 2.3	
Data byte 2.4	
ms	Timestamp
min	
h	

Commands

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Scada Cmd	Ack LED	20	163	19		Signal: LEDs acknowledgement
Scada Cmd	PS 1	20	163	23	GI	Signal: The currently active Parameter Set is PS 1
Scada Cmd	PS 2	20	163	24	GI	Signal: The currently active Parameter Set is PS 2
Scada Cmd	PS 3	20	163	25	GI	Signal: The currently active Parameter Set is PS 3
Scada Cmd	PS 4	20	163	26	GI	Signal: The currently active Parameter Set is PS 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

Data Points List

Module (- ANSI / IEEE Device Number)	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
SG[1]	Pos	20	131	32	GI	Signal: Circuit Breaker Position (0 = Indeterminate, 1 = OFF, 2 = ON, 3 = Disturbed)

Analog Traces

Module	IEC60870-5-103 Channel Number	Desc
V L1 / V L12	5	Analog trace V L1 / V L12
V L2 / V L23	6	Analog trace V L2 / V L23
V L3 / V L31	7	Analog trace V L3 / V L31
VX	8	Analog trace VX

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