



MRMV4 – IEC60870-5-103
HighPROTEC

Data point list

Manual DOK-TD-MRMV4IDE

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This manual applies to devices (version):

Version 2.0.u

Build: 19933

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"/> 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 type="checkbox"/> Test mode | <input 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

<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

Data Points List

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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	STPC Blo-I	1	40	183	GI	State of the module input: With this setting a Digital Input keeps the Motor in the RUN mode, even when the motor current drops below STPC (motor stop current).

Data Points List

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
MStart	Blo-JamStart	1	41	173	GI	Signal: JAM Start Delay. JAM(Instantaneous Overcurrent) elements are blocked for the time programmed under this parameter
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-I2>Start	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
MStart	Blo-FrqStart	1	41	181	GI	Signal: Frequency Start Delay. Frequency elements are blocked for the time programmed under this parameter

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
MStart	Block-OverVStart	1	41	182	GI	Signal: Overvoltage Start Delay. Overvoltage elements are blocked for the time programmed under this parameter
MStart	Blo-PFacStart	1	41	183	GI	Signal: Power Factor Start Delay. Power Factor elements are blocked for the time programmed under this parameter
MStart	Blo-PowerStart	1	41	184	GI	Signal: Power Start Delay. Power elements are blocked for the time programmed under this parameter
MStart	Blo-UnderV Start	1	41	185	GI	Signal: Undervoltage Start Delay. Undervoltage elements are blocked for the time programmed under this parameter
MStart	Blo-U2>	1	41	186	GI	Signal: Motor start block voltage unbalance signal.
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
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

Data Points List

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

Data Points List

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
V 012[1]	active	1	103	50	GI	Signal: active
V 012[2]	active	1	103	51	GI	Signal: active
V 012[3]	active	1	103	52	GI	Signal: active
V 012[4]	active	1	103	53	GI	Signal: active
V 012[5]	active	1	103	54	GI	Signal: active
V 012[6]	active	1	103	55	GI	Signal: active
I2>[1]	active	1	103	56	GI	Signal: active
I2>[2]	active	1	103	57	GI	Signal: active
V 012[1]	Blo TripCmd	1	103	60	GI	Signal: Trip Command blocked
V 012[2]	Blo TripCmd	1	103	61	GI	Signal: Trip Command blocked
V 012[3]	Blo TripCmd	1	103	62	GI	Signal: Trip Command blocked
V 012[4]	Blo TripCmd	1	103	63	GI	Signal: Trip Command blocked
V 012[5]	Blo TripCmd	1	103	64	GI	Signal: Trip Command blocked
V 012[6]	Blo TripCmd	1	103	65	GI	Signal: Trip Command blocked
I2>[1]	Blo TripCmd	1	103	66	GI	Signal: Trip Command blocked

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
V 012[1]	TripCmd	2	103	92		Signal: Trip Command
V 012[2]	TripCmd	2	103	93		Signal: Trip Command
V 012[3]	TripCmd	2	103	94		Signal: Trip Command
V 012[4]	TripCmd	2	103	95		Signal: Trip Command
V 012[5]	TripCmd	2	103	96		Signal: Trip Command
V 012[6]	TripCmd	2	103	97		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
V 012[1]	Alarm	2	103	102	GI	Signal: Alarm voltage asymmetry
V 012[2]	Alarm	2	103	103	GI	Signal: Alarm voltage asymmetry
V 012[3]	Alarm	2	103	104	GI	Signal: Alarm voltage asymmetry
V 012[4]	Alarm	2	103	105	GI	Signal: Alarm voltage asymmetry
V 012[5]	Alarm	2	103	106	GI	Signal: Alarm voltage asymmetry
V 012[6]	Alarm	2	103	107	GI	Signal: Alarm voltage asymmetry
V[1]	active	1	104	50	GI	Signal: active
V[2]	active	1	104	51	GI	Signal: active
V[3]	active	1	104	52	GI	Signal: active
V[4]	active	1	104	53	GI	Signal: active
VG[1]	active	1	104	54	GI	Signal: active
VG[2]	active	1	104	55	GI	Signal: active

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
V[5]	active	1	104	56	GI	Signal: active
V[6]	active	1	104	57	GI	Signal: active
V[1]	Blo TripCmd	1	104	60	GI	Signal: Trip Command blocked
V[2]	Blo TripCmd	1	104	61	GI	Signal: Trip Command blocked
V[3]	Blo TripCmd	1	104	62	GI	Signal: Trip Command blocked
V[4]	Blo TripCmd	1	104	63	GI	Signal: Trip Command blocked
VG[1]	Blo TripCmd	1	104	64	GI	Signal: Trip Command blocked
VG[2]	Blo TripCmd	1	104	65	GI	Signal: Trip Command blocked
V[5]	Blo TripCmd	1	104	66	GI	Signal: Trip Command blocked
V[6]	Blo TripCmd	1	104	67	GI	Signal: Trip Command blocked
V[1]	TripCmd	2	104	90		Signal: Trip Command
V[2]	TripCmd	2	104	91		Signal: Trip Command
V[3]	TripCmd	2	104	92		Signal: Trip Command
V[4]	TripCmd	2	104	93		Signal: Trip Command
VG[1]	TripCmd	2	104	94		Signal: Trip Command
VG[2]	TripCmd	2	104	95		Signal: Trip Command
V[5]	TripCmd	2	104	96		Signal: Trip Command
V[6]	TripCmd	2	104	97		Signal: Trip Command
V[1]	Alarm	2	104	100	GI	Signal: Alarm voltage stage
V[2]	Alarm	2	104	101	GI	Signal: Alarm voltage stage
V[3]	Alarm	2	104	102	GI	Signal: Alarm voltage stage
V[4]	Alarm	2	104	103	GI	Signal: Alarm voltage stage

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
VG[1]	Alarm	2	104	104	GI	Signal: Alarm Residual Voltage Supervision-stage
VG[2]	Alarm	2	104	105	GI	Signal: Alarm Residual Voltage Supervision-stage
V[5]	Alarm	2	104	106	GI	Signal: Alarm voltage stage
V[6]	Alarm	2	104	107	GI	Signal: Alarm voltage stage
f[1]	active	1	105	50	GI	Signal: active
f[2]	active	1	105	51	GI	Signal: active
f[3]	active	1	105	52	GI	Signal: active
f[4]	active	1	105	53	GI	Signal: active
f[5]	active	1	105	54	GI	Signal: active
f[6]	active	1	105	55	GI	Signal: active
f[1]	Blo TripCmd	1	105	60	GI	Signal: Trip Command blocked
f[2]	Blo TripCmd	1	105	61	GI	Signal: Trip Command blocked
f[3]	Blo TripCmd	1	105	62	GI	Signal: Trip Command blocked
f[4]	Blo TripCmd	1	105	63	GI	Signal: Trip Command blocked
f[5]	Blo TripCmd	1	105	64	GI	Signal: Trip Command blocked
f[6]	Blo TripCmd	1	105	65	GI	Signal: Trip Command blocked
f[1]	TripCmd	2	105	90		Signal: Trip Command
f[2]	TripCmd	2	105	91		Signal: Trip Command
f[3]	TripCmd	2	105	92		Signal: Trip Command
f[4]	TripCmd	2	105	93		Signal: Trip Command
f[5]	TripCmd	2	105	94		Signal: Trip Command
f[6]	TripCmd	2	105	95		Signal: Trip Command

Data Points List

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
f[6]	Alarm df/dt DF/DT	2	105	115	GI	Alarm instantaneous or average value of the rate-of-frequency-change
f[1]	Alarm delta phi	2	105	120	GI	Signal: Alarm Vector Surge
f[2]	Alarm delta phi	2	105	121	GI	Signal: Alarm Vector Surge
f[3]	Alarm delta phi	2	105	122	GI	Signal: Alarm Vector Surge
f[4]	Alarm delta phi	2	105	123	GI	Signal: Alarm Vector Surge
f[5]	Alarm delta phi	2	105	124	GI	Signal: Alarm Vector Surge
f[6]	Alarm delta phi	2	105	125	GI	Signal: Alarm Vector Surge
f[1]	Trip df/dt DF/DT	2	105	130		Signal: Trip df/dt or DF/DT
f[2]	Trip df/dt DF/DT	2	105	131		Signal: Trip df/dt or DF/DT
f[3]	Trip df/dt DF/DT	2	105	132		Signal: Trip df/dt or DF/DT
f[4]	Trip df/dt DF/DT	2	105	133		Signal: Trip df/dt or DF/DT
f[5]	Trip df/dt DF/DT	2	105	134		Signal: Trip df/dt or DF/DT
f[6]	Trip df/dt DF/DT	2	105	135		Signal: Trip df/dt or DF/DT
f[1]	Trip delta phi	2	105	140		Signal: Trip Vector Surge
f[2]	Trip delta phi	2	105	141		Signal: Trip Vector Surge
f[3]	Trip delta phi	2	105	142		Signal: Trip Vector Surge
f[4]	Trip delta phi	2	105	143		Signal: Trip Vector Surge

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
f[5]	Trip delta phi	2	105	144		Signal: Trip Vector Surge
f[6]	Trip delta phi	2	105	145		Signal: Trip Vector Surge
CBF	active	1	108	50	GI	Signal: active
CBF	running	1	108	60	GI	Signal: CBF-Module started
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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
PQS[1]	active	1	116	50	GI	Signal: active
PQS[2]	active	1	116	51	GI	Signal: active
PQS[3]	active	1	116	52	GI	Signal: active
PQS[4]	active	1	116	53	GI	Signal: active
PQS[5]	active	1	116	54	GI	Signal: active
PQS[6]	active	1	116	55	GI	Signal: active
PF[1]	active	1	116	56	GI	Signal: active
PF[2]	active	1	116	57	GI	Signal: active
PQS[1]	Blo TripCmd	1	116	60	GI	Signal: Trip Command blocked
PQS[2]	Blo TripCmd	1	116	61	GI	Signal: Trip Command blocked
PQS[3]	Blo TripCmd	1	116	62	GI	Signal: Trip Command blocked
PQS[4]	Blo TripCmd	1	116	63	GI	Signal: Trip Command blocked
PQS[5]	Blo TripCmd	1	116	64	GI	Signal: Trip Command blocked
PQS[6]	Blo TripCmd	1	116	65	GI	Signal: Trip Command blocked
PF[1]	Blo TripCmd	1	116	66	GI	Signal: Trip Command blocked
PF[2]	Blo TripCmd	1	116	67	GI	Signal: Trip Command blocked
PQS[1]	TripCmd	2	116	90		Signal: Trip Command
PQS[2]	TripCmd	2	116	91		Signal: Trip Command
PQS[3]	TripCmd	2	116	92		Signal: Trip Command

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
PQS[4]	TripCmd	2	116	93		Signal: Trip Command
PQS[5]	TripCmd	2	116	94		Signal: Trip Command
PQS[6]	TripCmd	2	116	95		Signal: Trip Command
PF[1]	TripCmd	2	116	96		Signal: Trip Command
PF[2]	TripCmd	2	116	97		Signal: Trip Command
PQS[1]	Alarm	2	116	100	GI	Signal: Alarm Power Protection
PQS[2]	Alarm	2	116	101	GI	Signal: Alarm Power Protection
PQS[3]	Alarm	2	116	102	GI	Signal: Alarm Power Protection
PQS[4]	Alarm	2	116	103	GI	Signal: Alarm Power Protection
PQS[5]	Alarm	2	116	104	GI	Signal: Alarm Power Protection
PQS[6]	Alarm	2	116	105	GI	Signal: Alarm Power Protection
PF[1]	Alarm	2	116	106	GI	Signal: Alarm Power Factor
PF[2]	Alarm	2	116	107	GI	Signal: Alarm Power Factor
PF[1]	Compensator	2	116	110	GI	Signal: Compensation Signal
PF[2]	Compensator	2	116	111	GI	Signal: Compensation Signal
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
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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
BO Slot X2	BO 5	1	123	164	GI	Signal: Binary Output Relay
BO Slot X2	BO 6	1	123	165	GI	Signal: Binary Output Relay
BO Slot X6	BO 1	1	123	166	GI	Signal: Binary Output Relay
BO Slot X6	BO 2	1	123	167	GI	Signal: Binary Output Relay
BO Slot X6	BO 3	1	123	168	GI	Signal: Binary Output Relay
BO Slot X6	BO 4	1	123	169	GI	Signal: Binary Output Relay
BO Slot X6	BO 5	1	123	170	GI	Signal: Binary Output Relay
BO Slot X6	BO 6	1	123	171	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
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

Data Points List

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

Data Points List

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

Data Points List

Module	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	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
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

Data Points List

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

Data Points List

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

Data Points List

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

Data Points List

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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)
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	active	1	241	50	GI	Signal: active
TCS	ExBlo	1	241	80		Signal: External Blocking

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
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
LOP	active	1	243	50	GI	Signal: active
LOP	ExBlo	1	243	80	GI	Signal: External Blocking
LOP	Alarm	1	243	100	GI	Signal: Alarm Loss of Potential
LOP	LOP Blo	1	243	110	GI	Signal: Loss of Potential blocks other elements.
LOP	Ex FF EVT	1	243	111	GI	Signal: Alarm Fuse Failure Earth Voltage Transformers
LOP	Ex FF VT	1	243	112	GI	Signal: Ex FF VT
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

Data Points List

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

Module	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
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	VL1 [%]	9	178	148	2.4	3	Measured value: Phase-to-neutral voltage (fundamental)
Measured values	VL2 [%]	9	178	148	2.4	4	Measured value: Phase-to-neutral voltage (fundamental)
Measured values	VL3 [%]	9	178	148	2.4	5	Measured value: Phase-to-neutral voltage (fundamental)
Measured values	P [%]	9	178	148	2.4	6	Measured value (calculated): Active power (P- = Fed Active Power, P+ = Consumed Active Power) (fundamental)

Data Points List

Module	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
Measured values	Q [%]	9	178	148	2.4	7	Measured value (calculated): Reactive power (Q- = Fed Reactive Power, Q+ = Consumpted Reactive Power) (fundamental)
Measured values	f [%]	9	178	148	1.2	8	Measured value: Frequency
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)
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)

Data Points List

Module	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
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)
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	P [%]	9	150	148	2.4	13	Measured value (calculated): Active power (P- = Fed Active Power, P+ = Consumed Active Power) (fundamental)
Measured values	Q [%]	9	150	148	2.4	14	Measured value (calculated): Reactive power (Q- = Fed Reactive Power, Q+ = Consumed Reactive Power) (fundamental)

Data Points List

Module	Subgroup Names Functions	Function type ASDU	Function code (FUN)	Information Number (INF)	Factor	Position	Description
Measured values	cos phi [%]	9	150	148	1.0	15	Measured value (calculated): Power factor
Measured values	f [%]	9	150	148	1.2	16	Measured value: Frequency

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

Data Points List

Module	Subgroups Names Functions	Function Type ASDU	Function (FUN)	Information Number (INF)	Device Interrogation	Description
Fault measurement	VL3	4	92	195		Measured value: Phase-to-neutral voltage (fundamental)
Fault measurement	VX meas	4	92	196		Measured value (measured): VX measured (fundamental)

Commands

<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>
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

Module	IEC60870-5-103 Channel Number	Desc
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
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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