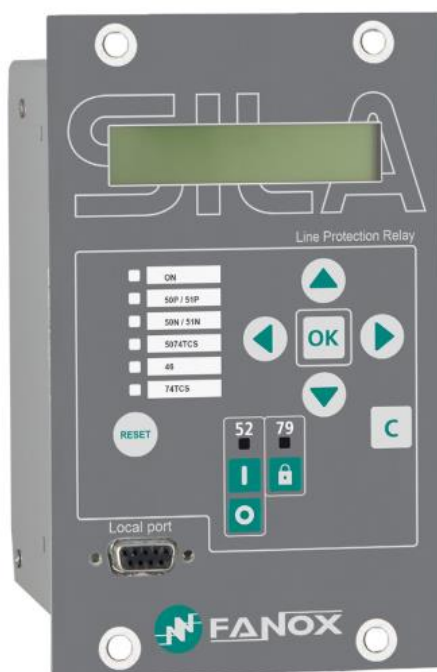


SIL-A

Overcurrent & Earth Fault Protection Relay



IEC 61870-5-130 PROTOCOL MANUAL

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2.	IEC 61850 PARAMETERS CONFIGURATION; ERROR! NO DEFINIDO.	MARCADOR

1. IEC 61870-5-103 PROTOCOL

This section describes the protocol IEC 60870-5-103 implemented in the unit.

1.1 Physical layer

Electrical interface

X	RS-485
32	Number of loads for one protection equipment

Transmission speed

X	4800 bits/s
X	9600 bits/s
X	19200 bits/s
X	38400 bits/s

Transmission parameters

Data size	8 bit
parity	EVEN
Stop bits	1

1.2 Application layer

Transmission mode for application data

Mode 1 (least significant octet first), as defined in 4.10 of IEC 60870-5-4, is used exclusively in this companion standard.

The following functions are supported:

- Initialization
- General Interrogation
- Synchronization
- Commands transmission

Information in monitor direction:

- <1>:= time-tagged message
- <2>:= time-tagged message with relative time
- <3>:= measurands I
- <5>:= identification
- <6>:= time synchronization
- <8>:= general interrogation termination

Information in control direction:

<6>:= time synchronization

<7>:= general interrogation

<20>:= general command

Common address of ASDU

X	One COMMON ADDRESS OF ASDU (identical with station address)
	More than one COMMON ADDRESS OF ASDU
255	GLOBAL ADDRESS

Selection of standard information numbers in monitor direction

SIL-A	FUN	INF	Description	TYP	COT
System functions in monitor direction					
X	160	<0>	End of general interrogation	8	End of GI
X	160	<0>	Time synchronization	6	TS
X	160	<2>	Reset FCB	5	Reset FCB
X	160	<3>	Reset CU	5	Reset CU
X	160	<4>	Start/restart	5	Start/restart
Status indications in monitor direction					
X	160	<16>	Auto-recloser active	1	SE,GI
X	160	<17>	Teleprotection active	1	SE,GI
X	160	<18>	Protection active	1	SE,GI
X	160	<22>	Local parameter setting	1	SE,GI
X	160	<27>	Auxiliary input 1	1	SE,GI
X	160	<28>	Auxiliary input 2	1	SE,GI
X	160	<29>	Auxiliary input 3	1	SE,GI
X	160	<30>	Auxiliary input 4	1	SE,GI
Supervision indications in monitor direction					
X	160	<36>	Trip circuit supervision	1	SE,GI
Fault indications in monitor direction					
X	160	<64>	Pickup L1	2	SE
X	160	<65>	Pickup L2	2	SE

X	160	<66>	Pickup L3	2	SE
X	160	<67>	Pickup N	2	SE
X	160	<68>	General trip	2	SE
X	160	<69>	Trip L1	2	SE
X	160	<70>	Trip L2	2	SE
X	160	<71>	Trip L3	2	SE
X	160	<84>	General Pickup	2	SE
X	160	<85>	Breaker failure	1	SE,GI
X	160	<90>	Trip I>	2	SE
X	160	<91>	Trip I>>	2	SE
X	160	<92>	Trip IN>	2	SE
X	160	<93>	Trip IN>>	2	SE
Auto-reclosure indications in monitor direction					
X	160	<128>	CB 'on' by AR	2	SE
X	160	<130>	AR blocked	1	SE,GI
Measurements in monitor direction					
X	160	<148>	Measurements IL123, VL123, P, Q, f (**)	9	CYC
Generic functions in monitor direction					
X	200	<1>	CB close / open	1	SE,GI
X	200	<4>	52 Status Open Failure	2	SE
X	200	<5>	52 Status Close Failure	2	SE
X	200	<6>	52 Status excessive openings	2	SE
X	200	<7>	52 Status excessive sum of switched amperes	1	SE,GI
X	200	<8>	52 Status excessive openings per minute	1	SE,GI
X	200	<9>	52 Status excessive openings per minute	1	SE,GI
X	200	<10>	52-A Status	1	SE,GI

X	200	<11>	52-B Status	1	SE,GI
X	200	<16>	79 Status Reclose Time	2	SE
X	200	<17>	79 Status Open	2	SE
X	200	<18>	79 Status Wait Time	2	SE
X	200	<19>	79 Status Reset Time	2	SE
X	200	<20>	79 Status Security Time	2	SE
X	200	<21>	79 Status final open Time	2	SE
X	200	<23>	Start	2	SE
X	200	<24>	GEN 50Hz	1	SE,GI
X	200	<26>	GEN Measurement Error	1	SE,GI
X	200	<28>	GEN synchronism	2	SE
X	200	<29>	GEN Eeprom with default values	1	SE,GI
X	200	<30>	GEN Eeprom Error	1	SE,GI
X	200	<31>	GEN Eeprom values changed	1	SE,GI
X	200	<48>	52 a Input	1	SE, GI
X	200	<49>	52 b Input	1	SE, GI
X	200	<50>	Phase lockout input	1	SE, GI
X	200	<51>	Ground lockout input	1	SE, GI
X	200	<52>	External trip input	1	SE, GI
X	200	<53>	Fault init input	1	SE, GI
X	200	<54>	79 init input	1	SE, GI
X	200	<55>	79 Enable input	1	SE, GI
X	200	<56>	79 Level lockout input	1	SE, GI

X	200	<57>	1 Setting group input	1	SE, GI
X	200	<58>	2 Setting group input	1	SE, GI
X	200	<59>	79 pulse lockout input	1	SE, GI
X	200	<60>	79 pulse unlock input	1	SE, GI
X	200	<61>	50BF init input	1	SE, GI
X	200	<63>	Continuity A	1	SE, GI
X	200	<64>	Continuity B	1	SE, GI
X	200	<76>	Auxiliary input 5	1	SE, GI
X	200	<77>	Auxiliary input 6	1	SE, GI
X	200	<92>	Auxiliary output 1	1	SE, GI
X	200	<93>	Auxiliary output 2	1	SE, GI
X	200	<94>	Auxiliary output 3	1	SE, GI
X	200	<95>	Auxiliary output 4	1	SE, GI
X	200	<133>	CB Open	2	SE
X	200	<134>	CB Close	2	SE
X	200	<135>	79 Lockout	2	SE
X	200	<136>	79 Unlock	2	SE
X	200	<137>	Remote control into Local	2	SE
X	200	<138>	Telecontrol into Remote	2	SE
X	200	<141>	Open CB	2	SE
X	200	<142>	Close CB	2	SE
X	200	<143>	Lockout 79	2	SE
X	200	<144>	Unlock 79	2	SE

X	200	<149>	Open CB	2	SE
X	200	<150>	Close CB	2	SE
X	200	<151>	Lockout 79	2	SE
X	200	<152>	Unlock 79	2	SE
X	200	<153>	49 Reset	1	SE, GI
X	200	<160>	CLP Activation	1	SE, GI
X	201	<1>	46 Start	2	SE
X	201	<2>	46 Trip	2	SE
X	201	<8>	49 Alarm	2	SE
X	201	<9>	49 Trip	2	SE
X	201	<24>	37 Start A	2	SE
X	201	<25>	37 Start B	2	SE
X	201	<26>	37 Start C	2	SE
X	201	<27>	37 Start P	2	SE
X	201	<28>	37 Trip A	2	SE
X	201	<29>	37 Trip B	2	SE
X	201	<30>	37 Trip C	2	SE
X	201	<31>	37 Trip P	2	SE
X	201	<40>	50BF Start	2	SE
X	201	<41>	50BF Activation	2	SE
X	201	<48>	50 Start N	2	SE
X	201	<49>	50 Trip N	2	SE
X	201	<50>	50 Start N	2	SE

X	201	<51>	50 Trip N	2	SE
X	201	<52>	50 Start A	2	SE
X	201	<53>	50 Start B	2	SE
X	201	<54>	50 Start C	2	SE
X	201	<55>	50 Start P	2	SE
X	201	<56>	50 Trip A	2	SE
X	201	<57>	50 Trip B	2	SE
X	201	<58>	50 Trip C	2	SE
X	201	<59>	50 Trip P	2	SE
X	201	<60>	50 Start A	2	SE
X	201	<61>	50 Start B	2	SE
X	201	<62>	50 Start C	2	SE
X	201	<63>	50 Start P	2	SE
X	201	<64>	50 Trip A	2	SE
X	201	<65>	50 Trip B	2	SE
X	201	<66>	50 Trip C	2	SE
X	201	<67>	50 Trip P	2	SE
X	201	<72>	51 Start N	2	SE
X	201	<76>	51 Start A	2	SE
X	201	<77>	51 Start B	2	SE
X	201	<78>	51 Start C	2	SE
X	201	<79>	51 Start P	2	SE
X	201	<80>	51 Trip A	2	SE

X	201	<81>	51 Trip B	2	SE
X	201	<82>	51 Trip C	2	SE
X	203	<1>	46BC Start	2	SE
X	203	<2>	46BC Trip	2	SE
X	203	<3>	74TC Trip	1	SE,GI
X	203	<4>	74TC Start	2	SE
X	203	<5>	Trip Block	1	SE,GI

Type Identification 9: Measurands II (Measurements IL123, VL123, P, Q, f).

SIL-A relay uses this type to send the value of the currents IL1, IL2 and IL3, the other measures remain with value 0.

- I_{L1}, I_{L2} and I_{L3} current values are in the range 0 – 4095 where 4095 corresponds to $1, 2 * I_n$.
- For values higher than $1, 2 * I_n$ an overflow situation is indicated.

e.g : A received value of 806 with nominal value $I_n = 5 A$ corresponds to 1,18 A.

Selection of standard information numbers in control direction

SIL-A	FUN	INF	Description	TYP	COT
System functions in control direction					
X	160	<0>	Initiation of general interrogation	7	Init of GI
X	160	<0>	Time synchronization	6	TS
General commands in control direction					
X	160	<16>	Auto-recloser on (1) / off (0)	20	ACK,NACK
X	160	<19>	LED reset (0)	20	ACK,NACK
Particular commands in control direction					
X	200	<1>	CB close (1) / open (0)	20	ACK,NACK
X	200	<153>	49 Reset (0)	20	ACK,NACK



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