SIPROTEC

Multifunctional protection with control 7SJ689

Communication module

Redundant IEC 60870-5-103

Bus mapping

Edition: Nov. 2010

C53000-L2540-A321-2

Siemens AG Book No. C53000-L2540-A321-2

Preface

Aim of This Manual

The manual is devided into the following topics:

- Notes to SIPROTEC® objects
- Redundant IEC 60870-5-103 Device Profile
- Bus mapping

General information about design, configuration, and operation of SIPROTEC® devices are laid down in the SIPROTEC® 4 system manual, order no. E50417-H1176-C151.

Target Audience

Protection engineers, commissioning engineers, persons who are involved in setting, testing and service of protection, automation, and control devices, as well as operation personnel in electrical plants and power stations.

Additional literature

This manual describes the redundant IEC 60870-5-103 Device Profile of the SIPROTEC® devices.

The following additional manuals inform you about the redundant IEC 60870-5-103 and the function, operation, assembly and commissioning of the SIPROTEC® devices:

Manual	Contents	Order number
Overvoltage and Remote Tripping Device SIPROTEC 7SJ689	Function, operation, assembly and commissioning of the SIPROTEC® device 7SJ689	C53000-G115D-C346-1
IEC 60870-5-103 Communication Database	redundant IEC 60870-5-103 communication database of the SIPROTEC® devices	C53000-L2540-A301-01

IEC 60870-5-103 Specification

The IEC 60870-5-103 specification and the structure of the IEC 60870-5-103 messages are defined in:

> International Standard IEC 60870-5-103
> Transmission protocols-
> Companion standard for the informative interface of protection equipment
> Edition 1997-12
> Reference number CEI/IEC 60870-5-103: 1997

Applicability of this Manual

This manual is valid for

- SIPROTEC® 4 devices 7SJ689 version V4.60 or higher
- Redundant IEC 60870-5-103 communication module version 01.00.01 or higher.

Note:

The redundant IEC 60870-5-103 module is not for all SIPROTEC® devices available. Check the manual of the device or contact your Siemens representative.

For device parameterization **DIGSI® 4 version 4.8 or higher** and IEC 60870-5-103 standard mappings 3-1 to 3-n (n = device type dependent number of standard mappings) have to be used.

Additional Support

Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, the matter should be referred to the local Siemens representative.

Instructions and Warnings

The warnings and notes contained in this manual serve for your own safety and for an appropriate lifetime of the device. Please observe them!

The following terms are used:

DANGER

indicates that death, severe personal injury or substantial property damage will result if proper precautions are not taken.

Warning

indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.

Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken. This particularly applies to damage on or in the device itself and consequential damage thereof.

Note

indicates information about the device or respective part of the instruction manual which is essential to highlight.

Warning!

Hazardous voltages are present in this electrical equipment during operation. Non–observance of the safety rules can result in severe personal injury or property damage.

Only qualified personnel shall work on and around this equipment after becoming thoroughly familiar with all warnings and safety notices of this manual as well as with the applicable safety regulations.

The successful and safe operation of this device is dependent on proper handling, installation, operation, and maintenance by qualified personnel under observance of all warnings and hints contained in this manual.

In particular the general erection and safety regulations (e.g. IEC, DIN, VDE, EN or other national and international standards) regarding the correct use of hoisting gear must be observed. Non–observance can result in death, personal injury or substantial property damage.

QUALIFIED PERSONNEL

For the purpose of this instruction manual and product labels, a qualified person is one who is familiar with the installation, construction and operation of the equipment and the hazards involved. In addition, he has the following qualifications:

- Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.
- Is trained in the proper care and use of protective equipment in accordance with established safety practices.
- Is trained in rendering first aid.

Typographic and Symbol Conventions

The following text formats are used when literal information from the device or to the device appear in the text flow:

`Parameter names`, i.e. designators of configuration or function parameters which may appear word-for-word in the display of the device or on the screen of a personal computer (with operation software DIGSI® 4), are marked in bold letters of a monospace type style.

`Parameter options`, i.e. possible settings of text parameters, which may appear word-for-word in the display of the device or on the screen of a personal computer (with operation software DIGSI® 4), are written in italic style, additionally.

“`Annunciations`”, i.e. designators for information, which may be output by the relay or required from other devices or from the switch gear, are marked in a monospace type style in quotation marks.

Deviations may be permitted in drawings when the type of designator can be obviously derived from the illustration.

Table of Contents

Notes to SIPROTEC® objects

1

This chapter contains notes for the use and evaluation of certain SIPROTEC® objects which are available via IEC 60870-5-103 communication.

Note

The description of the standard mappings contains the pre-allocation of the mapping files at delivery or first assignment of a mapping in DIGSI® 4 to the SIPROTEC® device.

Changes of the allocation and the scaling of the measured values are possible in adaptation to the concrete installation environment (ref. to page 3).

1.1 Annunciations

Note

Depending on the device composition and the existing protection packages not all of the indicated binary inputs or protection annunciations (and corresponding IEC 60870-5-103 Information numbers) may be available in the SIPROTEC® device

1.1.1 Error With A Summary Alarm

The "Error with a summary alarm" (Obj.- Adr. 140) is ON if at least one of the following internal alarms assumes the value ON:

- "Error 5V", “Error 0V”, “Error -5V”, “Failure Battery empty”, “Error Power Supply”
- "Error I/O Board", “Error Board 1“, “Error Board 2“, "Error Board 3“, "Error Board 4“, "Error Board 5“, “Error Board 6“, "Error Board 7“
- “Error Offset”, “Calibration data fault”

1.1.2 Alarm Summary Event

The "Alarm summary event" (Obj.- Adr. 160) is indicated, if at least one of the following internal alarms assumes the ON status:

- "Failure Current Balance", "Failure Current Summation", "Voltage Balance"
- “Failure Phase Sequence Current”, “Failure Phase Sequence Voltage”

1.1.3 Stop Data Transmission

The functionality "Stop data transmission" is not supported via IEC 60870-5-103 communication. If "Stop data transmission" is active nevertheless data via IEC 60870-5-103 will be transmitted furthermore.

The annunciation "DataStop" (Obj.- Adr. 16) signals the activation of "Stop data transmission" however and can be evaluated correspondingly in the IEC 60870-5-103 master.

1.2 Commands

Note

The allocation of the output relays to the switching devices and to the binary outputs is defined during parametrization of the SIPROTEC® devices.

Depending on the device composition there may be less than the indicated output relays (and corresponding IEC 60870-5-103 Information numbers) available in the SIPROTEC® device.

1.2.1 Single Commands

The command output mode (*pulse output*, *continuous output*) is changeable for the single commands using parametrization software DIGSI® 4.

The switching direction OFF for single commands with *pulse output* is not permitted and is rejected in the SIPROTEC® device.

Reference ref. to chap. 3.1.1

1.2.2 Changing The Setting Group

Switching on one setting group automatically switches off the current active setting group. Transmission of the value OFF is insignificant for the change of the setting group and is refused by the device.

A change of the setting group is only possible via IEC 60870-5-103 if the parameter **CHANGE TO ANOTHER SETTING GROUP** (parameter address = 302) has the value "Protocol".

Reference Refer to chapter 3.1.1 to the command for changing the setting group. The indication for a change of a setting group is shown in chapter 3.2.3

1.3 Measured Values

Note

Depending on the device composition not all of the indicated analog inputs (and corresponding IEC 60870-5-103 mapping entries) may be available in the SIPROTEC® device.

For the transmission of measured values, the compatible range and the private range can be used. Are there several measurement telegrams parameterised then these are transferred cyclically after each other.

Note

If all parameterised measurement telegrams aren't transferred, the parameter Scanning period (in ms) for measurements must be put on a greater value.

The range of the values which can be transmitted is mostly +/-240% or +/-2.4 of the rated value. The value in data unit 9 has 13 bit (1 sign, 12 bit data). That means that +/- 4096 indicates +/- 240% of the measured value. Some following measured values use a different definition:

- cos Phi: -4096 relates to cos PHI = -1; +4096 relates to cos PHI = +1

Changes of the scaling of the measured values are possible in adaptation to the concrete installation environment (ref. to manual “IEC 60870-5-103 Communication database”).

Reference Refer to chapter 3.3

IEC 60870-5-103 Interoperability 2

Redundant IEC 60870-5-103

DEVICE PROFILE DOCUMENT

Vendor Name: **SIEMENS AG**

Device Name: **7SJ689**

2.1 Physical Layer

2.1.1 Electrical Interface

☒ EIA RS-485
☐ Number of loads _____ for one protection equipment

2.1.2 Optical Interface

☐ Glass fiber
☐ Plastic fiber
☐ F-SMA type connector
☐ BFOC/2,5 type connector

2.1.3 Transmission Speed

☒ 2 400 bit/s
☒ 4 800 bit/s
☒ 9 600 bit/s
☒ 19 200 bit/s
☒ 38 400 bit/s
☒ 57 600 bit/s

2.2 Link Layer

There are no choices for the link layer.

2.3 Application Layer

2.3.1 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.

2.3.2 Common Address of ASDU

☒ One Common Address of ASDU (identical with station address)
☐ More than one Common Address of ASDU

2.3.3 Selection of Standard Information Numbers In Monitor Direction

2.3.3.1 System Functions In Monitor Direction

	INF	Semantics
☒	<0>	End of general interrogation
☒	<0>	Time synchronization
☒	<2>	Reset FCB
☒	<3>	Reset CU
☒	<4>	Start/restart
☒	<5>	Power on

2.3.3.2 Status Indications In Monitor Direction

	INF	Semantics
☐	<16>	Auto-recloser active
☐	<17>	Teleprotection active
☒	<18>	Protection active
☐	<19>	LED reset
☒	<20>	Monitor direction blocked
☒	<21>	Test mode
☒	<22>	Local parameter setting
☒	<23>	Characteristic 1
☒	<24>	Characteristic 2
☒	<25>	Characteristic 3
☒	<26>	Characteristic 4
☐	<27>	Auxiliary input 1
☐	<28>	Auxiliary input 2
☐	<29>	Auxiliary input 3
☐	<30>	Auxiliary input 4

2.3.3.3 Supervision Indications In Monitor Direction

	INF	Semantics
☒	<32>	Measurand supervision I
☐	<33>	Measurand supervision V
☒	<35>	Phase sequence supervision
☐	<36>	Trip circuit supervision
☐	<37>	I>> back-up operation
☒	<38>	VT fuse failure
☐	<39>	Teleprotection disturbed
☒	<46>	Group warning
☒	<47>	Group alarm

2.3.3.4 Earth Fault Indications In Monitor Direction

	INF	Semantics
☐	<48>	Earth fault L_1
☐	<49>	Earth fault L_2
☐	<50>	Earth fault L_3
☐	<51>	Earth fault forward
☐	<52>	Earth fault reverse

2.3.3.5 Fault Indications In Monitor Direction

	INF	Semantics
☐	<64>	Start /pick-up L_1
☐	<65>	Start /pick-up L_2
☐	<66>	Start /pick-up L_3
☐	<67>	Start /pick-up N
☒	<68>	General trip
☐	<69>	Trip L_1
☐	<70>	Trip L_2
☐	<71>	Trip L_3
☐	<72>	Trip I>> (back-up operation)
☐	<73>	Fault location X in ohms
☐	<74>	Fault forward/line
☐	<75>	Fault reverse/busbar
☐	<76>	Teleprotection signal transmitted
☐	<77>	Teleprotection signal received
☐	<78>	Zone 1
☐	<79>	Zone 2
☐	<80>	Zone 3
☐	<81>	Zone 4
☐	<82>	Zone 5
☐	<83>	Zone 6
☒	<84>	General start/pick-up
☐	<85>	Breaker failure
☐	<86>	Trip measuring system L_1
☐	<87>	Trip measuring system L_2
☐	<88>	Trip measuring system L_3
☐	<89>	Trip measuring system E
☐	<90>	Trip I>
☐	<91>	Trip I>>
☐	<92>	Trip IN>
☐	<93>	Trip IN>>

2.3.3.6 Auto-reclosure Indications In Monitor Direction

	INF	Semantics
☐	<128>	CB ‘on’ by AR
☐	<129>	CB ‘on’ by long-time AR
☐	<130>	AR blocked

2.3.3.7 Measurands In Monitor Direction

	INF	Semantics
☐	<144>	Measurand I
☒	<145>	Measurands I, V
☐	<146>	Measurands I, V, P, Q
☐	<147>	Measurands I_N, V_{EN}
☐	<148>	Measurands $I_{L1,2,3}$, $V_{L1,2,3}$, P, Q, f

2.3.3.8 Generic Functions In Monitor Direction

	INF	Semantics
☐	<240>	Read headings of all defined groups
☐	<241>	Read values or attributes of all entries of one group
☐	<243>	Read directory of a single entry
☒	<244>	Read value or attribute of a single entry
☒	<245>	End of general interrogation of generic data
☐	<249>	Write entry with confirmation
☒	<250>	Write entry with execution
☐	<251>	Write entry aborted

2.3.4 Selection of Standard Information Numbers In Control Direction

2.3.4.1 System Functions In Control Direction

	INF	Semantics
☒	<0>	Initiation of general interrogation
☒	<0>	Time synchronization

2.3.4.2 General Commands In Control Direction

	INF	Semantics
☐	<16>	Auto-recloser on/off
☐	<17>	Teleprotection on/off
☒	<18>	Protection on/off
☒	<19>	LED reset
☒	<23>	Activate characteristic 1
☒	<24>	Activate characteristic 2
☒	<25>	Activate characteristic 3
☒	<26>	Activate characteristic 4

2.3.4.3 Generic Functions In Control Direction

	INF	Semantics
☐	<240>	Read headings of all defined groups
☐	<241>	Read values or attributes of all entries of one group
☐	<243>	Read directory of a single entry
☒	<244>	Read value or attribute of a single entry
☒	<245>	General interrogation of generic data
☐	<248>	Write entry
☐	<249>	Write entry with confirmation
☒	<250>	Write entry with execution
☐	<251>	Write entry abort

2.3.5 Basic Application Functions

- ☒ Test mode
- ☒ Blocking of monitor direction
- ☒ Disturbance data
- ☒ Generic services

2.3.6 Miscellaneous

Measurand	Max. MVAL = rated value times 1,2	or	2,4
Current L_1	☐		☒
Current L_2	☐		☒
Current L_3	☐		☒
Voltage L_{1-E}	☐		☒
Voltage L_{2-E}	☐		☒
Voltage L_{3-E}	☐		☒
Active power P	☐		☒
Reactive power Q	☐		☒
Frequency f	☐		☒
Voltage L_1 - L_2	☐		☒

Point List

3

3.1 General Command (Control Direction)

3.1.1 Single Point Command

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	160	18	ProActive	At Least 1 Protection Funct. is Active	52
20	160	23	Group A	Select parametergroup A and deactivate parametergroup B,C,D	-
20	160	24	Group B	Select parametergroup B and deactivate parametergroup A,C,D	-
20	160	25	Group C	Select parametergroup C and deactivate parametergroup A,B,D	-
20	160	26	Group D	Select parametergroup D and deactivate parametergroup A,B,C	-
20	160	101	RT ON/OFF	Remote Trip ON/OFF	17440
20	160	102	wtLC ON/OFF	Without local criterion ON/OFF	17442
20	160	103	FltIU ON/OFF	Fault cur/vol ON/OFF	17444
20	160	104	LowCurP ON/OFF	Low current/P ON/OFF	17446
20	160	105	LowPF ON/OFF	Low Power factor ON/OFF	17448
20	160	131	59 ON/OFF	59 overvoltage ON/OFF	17496
20	160	132	59 Trip ON/OFF	59 Trip Local CB ON/OFF	17497
20	160	133	59RT ON/OFF	Send Remote Trip CMD. ON/OFF	17498
20	160	134	CB BLK. ON/OFF	Local CB Block Remote TRIP CMD. ON/OFF	17499
20	160	106	PTwtLC ON/OFF	PT switched off LC ON/OFF	17488
20	160	135	1pOV ON/OFF	One phase over voltage ON/OFF	17435

3.2 Indications In Monitor Direction

3.2.1 Remote Trip

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	166	101	>Block RT	>Block remote trip	17430
1	166	102	>RT signal	>Remote trip signal	17431
1	166	103	RT OFF	Remote trip is switched OFF	17432

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	166	104	RT blocked	Remote trip is blocked	17433
1	166	105	RT active	Remote trip is active	17434
1	160	101	RT ON/OFF	Remote trip ON/OFF	17440
1	160	102	wtLC ON/OFF	Without local criterion ON/OFF	17442
1	160	103	FltIU ON/OFF	Fault cur/vol ON/OFF	17444
1	160	104	LowCurP ON/OFF	Low current/P ON/OFF	17446
1	160	105	Low PF ON/OFF	Low power factor ON/OFF	17448
1	160	106	PTwtLC ON/OFF	PT switched off LC ON/OFF	17488
1	166	154	RT Signal	Remote trip signal	17483
1	166	158	RT Sig. N. Cfg.	RT signal not configured	17487
1	166	167	Remote trip PU	Remote trip picked up	17436
1	166	168	Remote trip	Remote trip	17437
1	166	169	FltCurVol PU	Fault current/voltage picked up	17438
1	166	170	LowCurP PU	Low current/active power picked up	17439
1	166	171	LowPF PU	Low power factor picked up	17441
1	167	36	>FAIL:RMT.Sig	>Failure: remote signal trip,	17504
1	167	35	Error RMT.Sig	Error: remote signal command	17503

3.2.2 Over Voltage

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	74	13	>BLOCK 59	>BLOCK 59 overvoltage protection	6513
1	74	101	>CB P(52-b)	>CB P(52-b)(OPEN, if bkr is closed)	17495
1	74	65	59 OFF	59-Overvoltage protection switched OFF	6565
1	74	66	59 BLOCKED	59-Overvoltage protection is BLOCKED	6566
1	74	67	59 ACTIVE	59-Overvoltage protection is ACTIVE	6567
1	74	102	59 PICKED UP	59 PICKED UP	17491
1	74	103	59 TRIP	59 TRIP	17492
1	74	104	59 ALARM	59 Alarm	17493
1	74	105	59 Remote Trip	59 Remote Trip	17494
1	160	131	59 ON/OFF	59 overvoltage ON/OFF	17496
1	160	132	59 Trip ON/OFF	59 Trip Local CB ON/OFF	17497
1	160	133	59RT ON/OFF	Send Remote Trip CMD. ON/OFF	17498
1	160	134	CB BLK. ON/OFF	Local CB Block Remote TRIP CMD. ON/OFF	17499
1	160	135	1pOV ON/OFF	One phase over voltage ON/OFF	17435

3.2.3 Internal Mode States

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	135	48	>Time Synch	>Synchronize Internal Real Time Clock; ON = 1,	3
1	135	49	>Trig. Wave.Cap.	>Trigger Waveform Capture; ON = 1, OFF = 0	4
1	135	50	>Reset LED's	>Reset LED's; ON = 1	5
1	135	51	>Set Group Bit0	>Setting Group Select Bit 0	7
1	135	52	>Set Group Bit1	>Setting Group Select Bit 1	8
1	135	53	>Test mode	>Test mode	15
1	135	54	>DataStop	>Stop data transmission	16
1	135	81	Relay OK	Relay OK; ON = 1, OFF = 0	51
1	135	130	Event Lost	Event lost; ON = 1	110
1	135	136	Flag Lost	Flag lost; ON = 1, OFF = 0	113
1	135	145	Chatter ON	Chatter ON	125
1	135	203	Wave. deleted	Waveform data deleted; ON = 1	203
1	135	229	SP. Op Hours>	Setpoint Operation Hours; ON = 1, OFF = 0	272
1	150	6	>Manual Close	>Manual close command; ON = 1, OFF = 0	356

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
2	150	151	Relay Pickup	Relay Pickup; ON = 1, OFF = 0	501
2	150	161	Relay TRIP	General TRIP of the relay; ON = 1	511
1	160	5	Initial Start	Initial Start of the Relay; ON = 1	56
1	160	18	ProtActive	At Least 1 Protection Func. is Active	52
1	160	20	DataStop	Data stop; ON = 1, OFF = 0; (ref to chap.)	
1	160	21	Test mode	Test mode; ON = 1, OFF = 0	
1	160	22	Setting Calc.	Setting calculation is running; ON = 1, OFF = 0	70
1	160	23	Group A	Protection Parameter Group A; 0 = Group A is deactivated, 1= Group A is activated and Group B,C,D are deactivated.	-
1	160	24	Group B	Protection Parameter Group B; 0 = Group B is deactivated, 1= Group B is activated and Group A,C,D are deactivated.	-
1	160	25	Group C	Protection Parameter Group C; 0 = Group C is deactivated, 1= Group C is activated and Group A,B,D are deactivated.	-
1	160	26	Group D	Protection Parameter Group D; 0 = Group D is deactivated, 1= Group D is activated and Group A,B,C are deactivated.	-
1	160	32	Fail I Superv.	Failure: General Current Supervision; ON = 1, OFF = 0	161
1	160	46	Alarm Sum Event	Alarm Summary Event; ON = 1, OFF = 0 (ref. to chap. 1.1.2)	160
1	160	47	Error Sum Alarm	Error with a summary alarm; ON = 1, OFF = 0 (ref. to chap. 1.1.1)	140
1	167	38	CT Broken>12s	CT Broken alarm>12s	17501
1	167	37	Fail VT circuit	Failure VT circuit	255

3.3 Measurements

3.3.1 ASDU3 (Measurements I)

Function type	information number	Position	Name	Description	Obj. - Adr.
160	145	1	Ib=	Current phase b	602
160	145	2	Va-b=	Voltage phase a to phase b	624

3.3.2 ASDU9 (Measurements II)

Function type	information number	Position	Name	Description	Obj. - Adr.
134	137	1	Ia =	Ia	601
134	137	2	Ib =	Ib	602
134	137	3	Ic =	Ic	603
134	137	4	In =	In	604
134	137	5	I1 =	I1 (positive sequence)	605
134	137	6	I2 =	I2 (negative sequence)	606
134	137	7	3I0 =	3I0 (zero sequence)	831
134	137	8	Va =	Va	621
134	137	9	Vb =	Vb	622
134	137	10	Vc =	Vc	623
134	137	11	Va-b =	Va-b	624
134	153	1	Vb-c =	Vb-c	625
134	153	2	Vc-a =	Vc-a	626
134	153	3	VN =	VN	627
134	153	5	V1 =	V1 (positive sequence)	629
134	153	6	V2 =	V2 (negative sequence)	630
134	153	7	P =	P (active power)	641
134	153	8	Q =	Q (reactive power)	642
134	153	9	S =	S (apparent power)	645
134	153	10	Freq=	Frequency	644
134	153	11	3V0 =	3V0 (zero sequence)	832
134	169	1	PF =	Power Factor	901

3.3.3 User Defined ASDU9 (Measurements II)

Function type	informa-tion number	Position	Name	Description	Obj. - Adr.
130	135	1	Res1	User define 1	-
130	135	2	Res2	User define 2	-
130	135	3	Res3	User define 3	-
130	135	4	Res4	User define 4	-
130	135	5	Res5	User define 5	-
130	135	6	Res6	User define 6	-
130	135	7	Res7	User define 7	-
130	135	8	Res8	User define 8	-
130	135	9	Res9	User define 9	-
130	135	10	Res10	User define 10	-
130	135	11	Res11	User define 11	-
130	135	12	Res12	User define 12	-
130	135	13	Res13	User define 13	-
130	135	14	Res14	User define 14	-
130	135	15	Res15	User define 15	-
130	135	16	Res16	User define 16	-

3.4 Settings

Note

The settings which can be read and written are given in the following table. The setting options are indicated in column "Generic identification data". If no values are indicated the setting is a number. For the vaild setting range please refer to the user manual of the device.

GIN = Generic Identification Number

For the position and format of the GIN within the telegram please refer to the official IEC 60870-5-103 standard.

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	0	50	59 Overvoltage Protection	on 22 - on, 23 - off	59 ON/OFF (Function type=160, Inf. No=131)
10	2	5118	Send Remote TRIP CMD.	on 22 - on, 23 - off	59RTON/OFF (Function type=160, Inf. No=133)
10	3	5119	Local CB Closed Position Block Remote TRIP CMD.	on 22 - on, 23 - off	CB BLK ON/OFF (Function type=160, Inf. No=134)
10	4	5021	Overvoltage TRIP Local CB	on 22 - on, 23 - off	59 Trip ON/OFF (Function type=160, Inf. No=132)
10	5	5022	59 Pickup	60 V, 57.7 ~ 100.0 V	
10	6	5023	59 Time Delay	0.50 sec, 0.01 ~ 10.00 sec	
10	1	45	Remote transfer trip function	on 22 - on, 23 - off	RT ON/OFF (Function type=160, Inf. No=101)
10	7	4500	Remote trip without local criterion	on 22 - on, 23 - off	wtLC ON/OFF (Function type=160, Inf. No=102)
10	8	4501	PT switch off LC with voltage	off 22 - on, 23 - off	PTwtLC ON/OFF (Function type=160, Inf. No=106)
10	9	4510	Fault current and voltage criterion	off 22 - on, 23 - off	FltIU ON/OFF (Function type=160, Inf. No=103)
10	10	4530	Low currrent/low active power criterion	off 22 - on, 23 - off	LowCurP ON/OFF (Function type=160, Inf. No=104)
10	11	4540	Low power factor criterion	off 22 - on, 23 - off	LowPF ON/OFF (Function type=160, Inf. No=105)
10	12	4502	Remote trip with criterion time delay	0.10s 0.01 .. 10.00s	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	13	4503	Remote trip without criterion time delay	0.20s 0.01 .. 10.00s	
10	14	4511	Delta I pickup	0.20A 0.05 .. 0.50A, ∞	
10	15	4512	3I0 pickup	1.00A 0.05 .. 20.00A, ∞	
10	16	4513	I2 pickup	1.00A 0.05 .. 20.00A, ∞	
10	17	4514	3U0 pickup	10.0V 2.0 .. 57.7V, ∞	
10	18	4515	U2 pickup	10.0V 2.0.. 57.7V, ∞	
10	19	4531	Low current pickup	0.05A 0, 0.05 .. 0.50A	
10	20	4532	Low active power pickup	8.0W 0, 2.0 .. 200.0W	
10	21	4541	Low power factor pickup	45° 30° .. 90°	
10	22	5117	One phase over voltage	on 22 - on, 23 - off	1pOV ON/OF(Function type 160, Inf.No=135)

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Glossary

AR	**A**utomatic **R**ecloser
CFC	**C**ontinuous **F**unction **C**hart
DC	**D**ouble **C**ommand
DIGSI® 4	Parameterization system for SIPROTEC® devices
DP	**D**ouble-**p**oint Indication
IEC	**I**nternational **E**lectrotechnical **C**ommission
GID	**G**eneric **i**dentification **d**ata
GIN	**G**eneric **i**dentification **n**umber
Input data/ input direction	Data from the IEC 60870-5-103 **slave to the** IEC 60870-5-103 **master**.
Mapping	Allocation of the SIPROTEC® data objects to the IEC 60870-5-103 protocol.
Output data/ output direction	Data from the IEC 60870-5-103 **master to the** IEC 60870-5-103 **slave**.
RTU	**R**emote **T**erminal **U**nit
SC	**S**ingle **C**ommand
SP	**S**ingle-**p**oint Indication