SIPROTEC

Multifunction protection with control 7SJ68

Communication module

Redundant IEC 60870-5-103

Bus mapping

Edition: Feb.2012

C53000-L2540-A308-2

Siemens Aktiengesellschaft Buch-Nr. C53000-L2540-A308-2

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
Multifuction protection with control SIPROTEC 7SJ68	Function, operation, assembly and commissioning of the SIPROTEC® device 7SJ68	C53000-G115D-C171-2
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 7SJ68 version V4.70 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 enviroment (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”

Reference ref to chap. 3.2.8

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”,
- "Failure RTD-Box 1”, "Failure RTD-Box 2”.

"Reference ret. to chap. 3.2.8

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.

Reference ref. to chap. 3.2.8

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. 3.1.2

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 3.1.2 to the command for changing the setting group. The indication for a change of a setting group is shown in chapter 3.2.8

1.3 Measured values

Note

Depending on the device composition not all of the indicated analog inputs (and corresponding IEC 60870-5-103 mapping entrys) 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
- IEE real, IEE reactive: -4096 relates to IEE = -800 mA; +4096 relates to IEE = +800 mA

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

1.4 Metered measurands

Scaling

Metering values (e.g. kWh) are not defined in the IEC 60870-5-103 standard and there are no compatible data units available which are suitable for the transmission of metered values. Some SIPROTEC 4 relays offer the possibility to transmit metered values via the IEC 60870-5-103 interface. For this reason, the private data unit 205 has been defined for the transmission of metered values. This data unit 205 is sent spontaneously. Only one metering value per data unit is transmitted.

The scaling of the metered measurands, which are derived from measured values is defined as**:**

60000 impulses per hour for V = Vprim and I = Iprim

V_{prim} = **Full Scale Voltage**
(parameter address = 1101)

I_{prim} = **FULL SCALE CURRENT**
parameter address = 1102)

Example

In the parameter set is configured:

I_{prim} = 1000 A and V_{prim} = 400.0 kV,

60000 impulses correspond so that:

1 h * 1000 A * 400 kV * $\sqrt{3}$ = 692.82 MWh

Note

- The type of the update (cyclic, with or without deletion) and the update interval must be programmed for the metered measurands with the parametrization software DIGSI® 4. If the parameter was set to update with deletion, then the value will be deleted in the device after transmission.
- The scaling of the metered measurands at binary inputs ("Wp(puls)" and "Wq(puls)") is independent from the definition above and depends on the externally connected pulse generator.

Reference

Refer to chapter 3.3.5

IEC 60870-5-103 Interoperability 2

Redundant IEC 60870-5-103

DEVICE PROFILE DOCUMENT

Vendor Name: **SIEMENS AG**

Device Name: **7SJ68**

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 fibre
☐ Plastic fibre
☐ 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 Double Point Command

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	240	160	52Breaker	Trip / Close Breaker switch	-
20	240	161	Disconnect	Trip / Close Disconnect switch	-
20	240	164	Gnd switch	Trip / Close Ground switch	-
20	240	162	Switch 1	Trip / Close switch 1	-
20	240	163	Switch 2	Trip / Close switch 2	-
20	240	175	Switch 3	Trip / Close switch 3	-

3.1.2 Single Point Command

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	160	16	auto-recl.ac.	activation of Auto-reclosure function	-
20	160	18	Protection	Protection activation	-
20	160	19	Reset LEDs	Reset LEDs	-
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	-

3.2 Indications in monitor direction

3.2.1 Automatic reclosure status

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	40	1	>79 ON	>79 ON; Automatic reclosure ON; ON = 1, OFF = 0	2701
1	40	2	>79 OFF	>79 OFF; ON = 1, OFF = 0	2702
1	40	3	> BLOCK 79	>BLOCK 79; ON = 1, OFF = 0	2703
2	40	15	>Start 79 Gnd	>Start 79 Ground program	2715
2	40	16	>Start 79 Ph	>Start 79 Phase program	2716
1	40	30	>CB Ready	>Circuit breaker READY for reclosing; ON = 1, OFF = 0	2730
1	40	81	79 OFF	79 Auto recloser is switched OFF; ON = 1, OFF = 0	2781
2	40	85	79 DynBlock	79 – Auto-reclose is dynamically BLOCKED; ON = 1, OFF = 0	2785
1	40	101	79 in progress	79 – in progress; ON = 1, OFF = 0	2801
1	40	162	79 Successful	79 – cycle successful; ON = 1, OFF = 0	2862
2	40	163	79 Lockout	79 – Lockout; ON = 1, OFF = 0	2863
2	40	180	79 L_N Sequence	79-A/R single phase reclosing sequence; Program earthfault is running = 1, Program is deactivated = 0	2878
2	40	181	79 L-L Sequence	79-A/R multi-phase reclosing sequence; ON = 1, OFF = 0	2879
1	160	16	79 ON	79 Auto recloser is switched ON; ON = 1, OFF = 0	2782
1	160	128	79 Close	79 – Close command; ON = 1	2851

3.2.2 Time Overcurrent protection

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	60	1	>BLOCK I>>	>BLOCK I>>; ON = 1, OFF = 0	1721
1	60	2	>BLOCK I>	>BLOCK I>; ON = 1, OFF = 0	1722
1	60	3	>BLOCK 51	>BLOCK 51; ON = 1, OFF = 0	1723
1	60	4	>BLOCK 51N-2	>BLOCK IN>>; ON = 1, OFF = 0	1724
1	60	5	>BLOCK 50N-1	>BLOCK 50N-1; ON = 1, OFF = 0	1725
1	60	6	>BLOCK INp	>BLOCK INp; ON = 1, OFF = 0	1726
1	60	21	50/51 PH OFF	O/C switched OFF; ON = 1, OFF = 0	1751
1	60	22	50/51 PH BLK	O/C is BLOCKED; ON = 1, OFF = 0	1752
1	60	23	50/51 PH ACT	50/51 O/C is ACTIVE; ON = 1, OFF = 0	1753
1	60	26	50N/INp OFF	50N/INp is OFF; ON = 1, OFF = 0	1756

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	60	27	50N/INp BLK	50N/INp BLK; ON = 1, OFF = 0	1757
1	60	28	50N/INp ACT	50N/INp is ACTIVE; ON = 1, OFF = 0	1758
2	60	49	I>> Time Out	I>> Time Out; ON = 1	1804
2	60	53	I> Time Out	I> Time Out; ON = 1	1814
2	60	57	51 Time Out	51 Time Out; ON = 1	1824
2	60	58	51 TRIP	51 TRIP; ON = 1, OFF = 0	1825
2	60	59	IN>> picked up	IN>> picked up; ON = 1, OFF = 0	1831
2	60	60	IN>> TimeOut	IN>> Time Out; ON = 1	1832
2	60	62	IN>picked up	IN>picked up; ON = 1, OFF = 0	1834
2	60	63	IN>TimeOut	IN>Time Out; ON = 1	1835
2	60	64	INp picked up	INp picked up; ON = 1, OFF = 0	1837
2	60	65	INp TimeOut	INp Time Out; ON = 1	1838
2	60	66	INp TRIP	INp TRIP; ON = 1, OFF = 0	1839
2	60	75	I>> picked up	I>> picked up; ON = 1, OFF = 0	1800
2	60	76	I> picked up	I> picked up; ON = 1, OFF = 0	1810
2	60	77	51 picked up	51 picked up; ON = 1, OFF = 0	1820
1	60	243	>BLK CLP stpTim	>BLOCK Cold-Load-Pickup stop timer; ON = 1, OFF = 0	1731
1	60	244	CLP OFF	Cold-Load-Pickup switched OFF; ON = 1, OFF = 0	1994
1	60	245	CLP BLOCKED	Cold-Load-Pickup is BLOCKED; Blocked = 1, Unblocked = 0	1995
1	60	246	CLP running	Cold-Load-Pickup is RUNNING; ON = 1, OFF = 0	1996
1	60	247	Dyn set. ACTIVE	Dynamic settings are ACTIVE; ON = 1, OFF = 0	1997
2	160	64	50/51 Ph A PU	50/51 Phase A picked up; ON = 1, OFF = 0	1762
2	160	65	50/51 Ph B PU	50/51 Phase B picked up; ON = 1, OFF = 0	1763
2	160	66	50/51 Ph C PU	50/51 Phase C picked up; ON = 1, OFF = 0	1764
2	160	67	50N/INp Pickedup	50N/INp picked up; ON = 1, OFF = 0	1765
2	160	68	50 (N)/51(N)TRIP	50(N)/51(N) TRIP; ON = 1	1791
2	160	84	50 (N) / 51 (N) PU	50(N)/51(N) O/C PICKUP; ON = 1, OFF = 0	1761
2	160	90	I> TRIP	I> TRIP; ON = 1	1815
2	160	91	I>> TRIP	I>> TRIP; ON = 1	1805
2	160	92	IN>TRIP	IN>TRIP; ON = 1	1836
2	160	93	IN>> TRIP	IN>> TRIP; ON = 1	1833

3.2.3 InRush Function

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
2	60	80	I> InRushPU	50-1 InRush picked up; ON = 1, OFF = 0	7551
2	60	81	IN>InRushPU	IN>InRush picked up; ON = 1, OFF = 0	7552
2	60	82	51 InRushPU	51 InRush picked up; ON = 1, OFF = 0	7553
2	60	83	INp InRushPU	INp InRush picked up; ON = 1, OFF = 0	7554
2	60	84	67-1 InRushPU	67-1 InRush picked up; ON = 1, OFF = 0	7559
2	60	85	67N-1 InRushPU	67N-1 InRush picked up; ON = 1, OFF = 0	7560
2	60	86	Ip InRushPU	Ip InRush picked up; ON = 1, OFF = 0	7561
2	60	87	67N-TOC InRushPU	67N-TOC InRush picked up; ON = 1, OFF = 0	7562
2	60	88	Gnd InRush PU	Ground InRush picked up; ON = 1, OFF = 0	7564
2	60	89	Ia InRush PU	Phase A InRush picked up; ON = 1, OFF = 0	7565
2	60	90	Ib InRush PU	Phase B InRush picked up; ON = 1, OFF = 0	7566
2	60	91	Ic InRush PU	Phase C InRush picked up; ON = 1, OFF = 0	7567
1	60	92	InRush OFF	InRush OFF; ON = 1, OFF = 0	7556
1	60	93	InRushPhBLOCKED	InRush Phase BLOCKED; ON = 1, OFF = 0	7557
2	60	94	InRush Gnd BLK	InRush Ground BLOCKED; ON = 1, OFF = 0	7558
2	60	101	PhA InrushBlk	Phase A trip blocked by inrush detection; ON = 1, OFF = 0	1840
2	60	102	PhB InrushBlk	Phase B trip blocked by inrush detection; ON = 1, OFF = 0	1841
2	60	103	PhC InrushBlk	Phase C trip blocked by inrush detection; ON = 1, OFF = 0	1842
2	60	104	INRUSH X-BLK	Cross blk: PhX blocked Phy; ON = 1, OFF = 0	1843

3.2.4 Directional time overcurrent protection

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	63	1	>BLOCK 67-1	>BLOCK 67-1; ON = 1, OFF = 0	2621
1	63	2	>BLOCK Ip	>BLOCK Ip; ON = 1, OFF = 0	2622
1	63	3	>BLOCK 67N-1	>BLOCK 67N-1; ON = 1, OFF = 0	2623
1	63	4	>BLOCK 67N-TOC	>BLOCK 67N-TOC; ON = 1, OFF = 0	2624
1	63	10	67/Ip OFF	67/Ip switched OFF; ON = 1, OFF = 0	2651
1	63	11	67 BLOCKED	67/Ip is BLOCKED; blocked = 1, unblocked = 0	2652
1	63	12	67 ACTIVE	67/Ip is ACTIVE; activate = 1, deactivate = 0	2653
1	63	13	67N OFF	67N/NIp switched OFF; ON = 1, OFF = 0	2656
1	63	14	67N BLOCKED	67N/67N-TOC is BLOCKED; blocked = 1, unblocked = 0	2657

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	63	15	67N ACTIVE	67N/67N-TOC is ACTIVE; activate = 1, deactivate = 0	2658
2	63	20	67-1 picked up	67-1 picked up; ON = 1, OFF = 0	2660
2	63	24	67-1 Time Out	67-1 Time Out; ON = 1, OFF = 0	2664
2	63	25	67-1 TRIP	67-1 TRIP; ON = 1, OFF = 0	2665
2	63	30	Ip pickedup	Ip picked up; ON = 1, OFF = 0	2670
2	63	34	Ip Time Out	Ip Time Out; ON = 1, OFF = 0	2674
2	63	35	Ip TRIP	Ip TRIP; ON = 1, OFF = 0	2675
2	63	41	67N-1 picked up	67N-1 picked up; ON = 1, OFF = 0	2681
2	63	42	67N-1 Time Out	67N-1 Time Out; ON = 1, OFF = 0	2682
2	63	43	67N-1 TRIP	67N-1 TRIP; ON = 1, OFF = 0	2863
2	63	44	67N-TOCPickedup	67N-TOC picked up; ON = 1, OFF = 0	2684
2	63	45	67N-TOC TimeOut	67N-TOC Time Out; ON = 1, OFF = 0	2685
2	63	46	67N-TOC TRIP	67N-TOC TRIP; ON = 1, OFF = 0	2686
2	63	50	67/67N pickedup	67/67N picked up; ON = 1, OFF = 0	2691
2	63	51	67 A picked up	67/Ip Phase A picked up; ON = 1, OFF = 0	2692
2	63	52	67 B picked up	67/Ip Phase B picked up; ON = 1, OFF = 0	2693
2	63	53	67 C picked up	67/Ip Phase C picked up; ON = 1, OFF = 0	2694
2	63	54	67N picked up	67N/67N-TOC picked up; ON = 1, OFF = 0	2695
2	63	55	67/67N TRIP	67/67N TRIP; ON = 1, OFF = 0	2696
2	63	62	67N-2 picked up	67N-2 picked up; ON = 1, OFF = 0	2646
2	63	63	67N-2 Time Out	67N-2 Time Out; ON = 1, OFF = 0	2648
2	63	64	67N-2 TRIP	67N-2 TRIP; ON = 1, OFF = 0	2679
2	63	67	67-2 picked up	67-2 picked up; ON = 1, OFF = 0	2642
2	63	71	67-2 Time Out	67-2 Time Out; ON = 1, OFF = 0	2647
2	63	72	67-2 TRIP	67-2 TRIP; ON = 1, OFF = 0	2649
1	63	73	>BLOCK 67-2	>BLOCK 67-2; ON = 1, OFF = 0	2615
1	63	74	>BLOCK 67N-2	>BLOCK 67N-2; ON = 1, OFF = 0	2616
1	63	81	Phase A forward	Phase A forward; ON = 1, OFF = 0	2628
1	63	82	Phase B forward	Phase B forward; ON = 1, OFF = 0	2629
1	63	83	Phase C forward	Phase C forward; ON = 1, OFF = 0	2630
1	63	84	Phase A reverse	Phase A reverse; ON = 1, OFF = 0	2632
1	63	85	Phase B reverse	Phase B reverse; ON = 1, OFF = 0	2633
1	63	86	Phase C reverse	Phase C reverse; ON = 1, OFF = 0	2634
1	63	87	Ground forward	Ground forward; ON = 1, OFF = 0	2635
1	63	88	Ground reverse	Ground reverse; ON = 1, OFF = 0	2636

3.2.5 Unbalanced load protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	70	126	>46 BLOCK	>BLOCK 46; ON = 1, OFF = 0	5143
1	70	131	46 OFF	46 switched OFF; ON = 1, OFF = 0	5151
1	70	132	46 BLOCKED	46 is BLOCKED; ON = 1, OFF = 0	5152
1	70	133	46 ACTIVE	46 is ACTIVE; ON = 1, OFF = 0	5153
1	70	138	46-2 picked up	46-2 picked up; ON = 1, OFF = 0	5159
1	70	141	46-TOC pickedup	46-TOC picked up; ON = 1, OFF = 0	5166
1	70	149	46 TRIP	46 TRIP picked up; ON = 1, OFF = 0	5170
1	70	150	46-1 picked up	46-1 picked up; ON = 1, OFF = 0	5165

3.2.6 Frequency protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	70	176	>BLOCK 81O/U	>BLOCK 81O/U; ON = 1, OFF = 0	5203
1	70	177	>BLOCK 81-1	>BLOCK 81-1; ON = 1, OFF = 0	5206
1	70	178	>BLOCK 81-2	>BLOCK 81-2; ON = 1, OFF = 0	5207
1	70	179	>BLOCK 81-3	>BLOCK 81-3; ON = 1, OFF = 0	5208
1	70	180	>BLOCK 81-4	>BLOCK 81-4; ON = 1, OFF = 0	5209
1	70	181	81 OFF	81 OFF; ON = 1, OFF = 0	5211
1	70	182	81 BLOCKED	81 BLOCKED; ON = 1, OFF = 0	5212
1	70	183	81 ACTIVE	81 ACTIVE; ON = 1, OFF = 0	5213
2	70	230	81-1 picked up	81-1 picked up; ON = 1, OFF = 0	5232
2	70	231	81-2 picked up	81-2 picked up; ON = 1, OFF = 0	5233
2	70	232	81-3 picked up	81-3 picked up; ON = 1, OFF = 0	5234
2	70	233	81-4 picked up	81-4 picked up; ON = 1, OFF = 0	5235
2	70	234	81-1 TRIP	81-1 TRIP; ON = 1, OFF = 0	5236
2	70	235	81-2 TRIP	81-2 TRIP; ON = 1, OFF = 0	5237
2	70	236	81-3 TRIP	81-3 TRIP; ON = 1, OFF = 0	5238
2	70	237	81-4 TRIP	81-4 TRIP; ON = 1, OFF = 0	5239

3.2.7 Voltage protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	74	3	>BLOCK 27	>BLOCK 27 undervoltage protection; ON = 1, OFF = 0	6503
1	74	5	>27 I SUPRVSN	>27-Switch current supervision ON; ON = 1, OFF = 0	6505
1	74	6	>BLOCK 27-1	>BLOCK 27-1 undervoltage protection; ON = 1, OFF = 0	6506
1	74	8	>BLOCK 27-2	>BLOCK 27-2 undervoltage protection; ON = 1, OFF = 0	6508
1	74	9	>FAIL: FEEDER VT	>Failure: Feeder VT; ON = 1, OFF = 0	6509
1	74	10	>FAIL: BUS VT	>Failure: Busbar VT; ON = 1, OFF = 0	6510
1	74	13	>BLCOK 59-1	>BLOCK 59-1 overvoltage protection; ON = 1, OFF = 0	6513
1	74	15	>59 I SUPRVSN	>59-Switch current supervision ON; ON = 1, OFF = 0	6515
1	74	30	27 OFF	27 Undervoltage protection switched OFF; ON = 1, OFF = 0	6530
1	74	31	27 BLOCKED	27 Undervoltage protection is BLOCKED; ON = 1, OFF = 0	6531
1	74	32	27 ACTIVE	27 Undervoltage protection is ACTIVE; ON = 1, OFF = 0	6532
2	74	33	27-1 picked up	27-1 Undervoltage picked up; ON = 1, OFF = 0	6533
2	74	34	27-1 PU CS	27-1 Undervoltage PICKUP w/curr. superv; ON = 1, OFF = 0	6534
2	74	37	27-2 picked up	27-2 Undervoltage picked up; ON = 1, OFF = 0	6537
2	74	38	27-2 PU CS	27-2 Undervoltage PICKUP w/curr. superv; ON = 1, OFF = 0	6538
2	74	39	27-1 TRIP	27-1 Undervoltage TRIP; ON = 1, OFF = 0	6539
2	74	40	27-2 TRIP	27-2 Undervoltage TRIP; ON = 1, OFF = 0	6540
1	74	65	59 OFF	59-Overvoltage protection switched OFF; ON = 1, OFF = 0	6565
1	74	66	59 BLOCKED	59-Overvoltage protection is BLOCKED; ON = 1, OFF = 0	6566
1	74	67	59 ACTIVE	59-Overvoltage protection is ACTIVE; ON = 1, OFF = 0	6567
2	74	68	59-1 picked up	59 picked up; ON = 1, OFF = 0	6568
1	74	70	59-1 TRIP	59 TRIP; ON = 1, OFF = 0	6570

3.2.8 Internal Mode Status

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	101	1	>Door open	>Door open; ON = 1, OFF = 0	-
1	101	2	>CB wait	>Circuit breaker wait; ON = 1, OFF = 0	-
1	101	85	Control auth	Control authority; 0=Remote; 1=Local	-
1	101	86	ModeLOCAL	Mode Local; 0=lokal operation with interlocking; 1=lokal operation without interlocking;	-
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

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
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	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	182	Failure \19I	Failure: Current Summation; ON = 1, OFF = 0	162
1	135	183	Failure I balance	Failure: Current Balance; ON = 1, OFF = 0	163
1	135	186	Failure V balance	Failure: Voltage Balance; ON = 1, OFF = 0	167
1	135	191	Fail Ph. Seq. I	Failure: Phase Sequence Current; ON = 1, OFF = 0	175
1	135	192	Fail Ph. Seq. V	Failure: Phase Sequence Voltage; ON = 1, OFF = 0	176
1	135	197	Meas. Supervision OFF	Measurement Supervision is switched OFF	197
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	135	230	SP. I A dmd	Set Point Phase A dmd>; ON = 1, OFF = 0	273
1	135	234	SP. I B dmd	Set Point Phase B dmd>; ON = 1, OFF = 0	274
1	135	235	SP. I C dmd	Set Point Phase C dmd>; ON = 1, OFF = 0	275
1	135	236	SP. I1dmd>	Set Point positive sequence I1dmd>; ON = 1, OFF = 0	275
1	135	237	SP. |Pdmd|>	Set Point |Pdmd|>; ON = 1, OFF = 0	273
1	135	238	SP. |Qdmd|>	Set Point |Qdmd|>; ON = 1, OFF = 0	278
1	135	239	SP. |Sdmd|>	Set Point |Sdmd|>; ON = 1, OFF = 0	279
1	135	244	37 alarm	37 Undercurrent alarm; ON = 1, OFF = 0	284
1	135	245	SP. cos\1A alarm	Set point 55 Power factor alarm; ON = 1, OFF = 0	285
1	150	6	>Manual Close	>Manual close command; ON = 1, OFF = 0	356
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	16	protection act.	Protection activation	2782
1	160	20	DataStop	Data stop; ON = 1, OFF = 0; (ref to chap.)	16
1	160	21	Test mode	Test mode; ON = 1, OFF = 0	17
1	160	22	Running	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.	-

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
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	I Supervision	Failure: Current balance Supervision; ON = 1, OFF = 0	161
1	160	35	Fail Ph. Seq.	Failure: Phase Sequence; ON = 1, OFF = 0	171
1	160	38	>No volt	No Volt; ON = 1, OFF = 0	
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	160	130	CS is not ready	79 Auto recloser is NOT ready	2784

3.2.9 Highly sensitive earth fault protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	151	6	>Start Flt. Loc	>Start Fault Locator; ON = 1, OFF = 0	1106
1	151	101	>BLOCK 64	>BLOCK 64; ON = 1, OFF = 0	1201
1	151	102	>BLOCK 50Ns-2	>BLOCK 50Ns-2; ON = 1, OFF = 0	1202
1	151	103	>BLOCK 50Ns-1	>BLOCK 50Ns-1; ON = 1, OFF = 0	1203
1	151	104	>BLOCK 51Ns	>BLOCK 51Ns; ON = 1, OFF = 0	1204
1	151	107	>BLK 50Ns/67Ns	>BLOCK 50Ns/67Ns; ON = 1, OFF = 0	1207
1	151	111	50Ns/67Ns OFF	50Ns/67Ns is OFF; ON = 1, OFF = 0	1211
1	151	112	50Ns/67Ns ACT	50Ns/67Ns is ACTIVE; ON = 1, OFF = 0	1212
2	151	115	64 Pickup	64 displacement voltage pick up; ON = 1, OFF = 0	1215
2	151	117	64 Trip	64 displacement voltage element TRIP; ON = 1, OFF = 0	1217
2	151	121	50Ns-2 Pickup	50Ns-2 Pickup; ON = 1, OFF = 0	1221
2	151	123	50Ns-2 TRIP	50Ns-2 TRIP; ON = 1, OFF = 0	1223
1	151	124	50Ns-1 Pickup	50Ns-1 Pickup; ON = 1, OFF = 0	1224
1	151	126	50Ns-1 TRIP	50Ns-1 TRIP; ON = 1, OFF = 0	1226
1	151	127	51Ns Pickup	51Ns Pickup; ON = 1, OFF = 0	1227
1	151	129	51Ns TRIP	51Ns TRIP; ON = 1, OFF = 0	1229
1	151	130	Sens. Gnd block	Sensitive ground fault detection BLOCKED; ON = 1, OFF = 0	1230
1	151	171	Sens. Gnd Pickup	Sensitive ground fault pick up; ON = 1, OFF = 0	1271
1	151	178	SensGnd undef.	Sensitive Gnd fault direction undefined; ON = 1, OFF = 0	1278
1	160	48	Sens. Gnd Ph A	Sensitive Ground fault picked up in Ph A; ON = 1, OFF = 0	1272
1	160	49	Sens. Gnd Ph B	Sensitive Ground fault picked up in Ph B; ON = 1, OFF = 0	1273
1	160	50	Sens. Gnd Ph C	Sensitive Ground fault picked up in Ph C; ON = 1, OFF = 0	1274
1	160	51	SensGnd Forward	Sensitive Gnd fault in forward direction; ON = 1, OFF = 0	1276
1	160	52	SensGnd Reverse	Sensitive Gnd fault in reverse direction; ON = 1, OFF = 0	1277

3.2.10 Trip coil monitor

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	153	16	74TC BLOCKED	74TC Trip circuit supervision is BLOCKED; ON = 1, OFF = 0	6862
1	153	17	74TC ACTIVE	74TC Trip circuit supervision is ACTIVE; ON = 1, OFF = 0	6863
1	170	51	>74TC trip rel.	>74TC Trip circuit superv.: trip relay; ON = 1, OFF = 0	6852
1	170	52	>74TC brk rel.	>74TC Trip circuit superv.: bkr relay; ON = 1, OFF = 0	6853

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	170	53	74TC OFF	74TC Trip circuit supervision OFF; ON = 1, OFF = 0	6861
1	170	54	74 ProgFail	74TC blocked. Bin. input is not set; ON = 1, OFF = 0	6864
1	170	55	FAIL: Trip cir.	74TCFailure Trip Circuit; ON = 1, OFF = 0	6865

3.2.11 Circuit breaker failure protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	160	85	50BF TRIP	50BF TRIP; ON = 1	1471
1	166	103	>BLOCK 50BF	BLOCK 50BF; ON = 1, OFF = 0	1403
1	166	104	>50BF ext SRC	50BF initiated externally; ON = 1, OFF = 0	1431
1	166	151	50BF OFF	50BF is switched OFF; ON = 1, OFF = 0	1451
1	166	152	50BF BLOCK	50BF is BLOCKED; ON = 1, OFF = 0	1452
1	166	153	50BF ACTIVE	50BF is ACTIVE; ON = 1, OFF = 0	1453
2	166	156	50BF int Pickup	50BF (internal) PICKUP; ON = 1, OFF = 0	1456
2	166	157	50BF ext Pickup	50BF (external) PICKUP; ON = 1, OFF = 0	1457
2	166	180	50BF int TRIP	50BF (internal) TRIP; ON = 1, OFF = 0	1480
2	166	181	50BF ext TRIP	50BF (external) TRIP; ON = 1, OFF = 0	1481

3.2.12 Thermal overload protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	167	3	>49 O/L BLOCK	>BLOCK 49 Overload Protection; ON = 1, OFF = 0	1503
1	167	7	>EmergencyStart	>Emergency start of motors; ON = 1, OFF = 0	1507
1	167	11	49 O / L OFF	49 Overload Protection is OFF; ON = 1, OFF = 0	1511
1	167	12	49 O/L BLOCK	49 Overload Protection is BLOCKED; ON = 1, OFF = 0	1512
1	167	13	49 O/L ACTIVE	49 Overload Protection is ACTIVE; ON = 1, OFF = 0	1513
1	167	15	49 O/L I Alarm	Overload Current Alarm (I alarm); ON = 1, OFF = 0	1515
1	167	16	49 O/L \16 Alarm	49 Overload Alarm! Near Thermal Trip; ON = 1, OFF = 0	1516
1	167	17	49 Windings O/L	49 Winding Overload; ON = 1, OFF = 0	1517
2	167	21	49 Th O/L TRIP	49 Thermal Overload TRIP; ON = 1, OFF = 0	1521

3.2.13 Monitor start protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	168	51	>66 emer. start	>Emergency start; ON = 1, OFF = 0	4823
1	168	52	66 OFF	66 Motor start protection OFF; ON = 1, OFF = 0	4824

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	168	53	66 BLOCKED	66 Motor start protection BLOCKED; ON = 1, OFF = 0	4825
1	168	54	66 ACTIVE	66 Motor start protection ACTIVE; ON = 1, OFF = 0	4826
1	168	55	66 TRIP	66 Motor start protection TRIP; ON = 1, OFF = 0	4827

3.2.14 Start-up supervision

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	169	51	START-SUP OFF	Startup supervision is OFF; ON = 1, OFF = 0	6811
1	169	52	START-SUP BLK	Startup supervision is BLOCKED; ON = 1, OFF = 0	6812
1	169	53	START-SUP ACT	Startup supervision is ACTIVE; ON = 1, OFF = 0	6813
2	169	54	START-SUP TRIP	Startup supervision TRIP; ON = 1, OFF = 0	6821
2	169	55	Rotor locked	Rotor locked; ON = 1, OFF = 0	6822
1	169	56	START-SUP pu	Startup supervision Pickup; ON = 1, OFF = 0	6823

3.2.15 Control switches return position indication(double point commands)

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	240	160	52 Breaker	input state of switch breaker; 1=open, 2=close	-
1	240	161	Disconnect switch	input state of disconnect switch; 1=open, 2=close	-
1	240	164	Gnd switch	input state of ground switch;1=open, 2=close	-
1	240	162	Switch 1	input state of switch 1; 1=open, 2=close	-
1	240	163	Switch 2	input state of switch 2; 1=open, 2=close	-
1	240	175	Switch 3	input state of switch 3; 1=open, 2=close	-

3.2.16 Output channels return position indication (Single point commands)

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	240	181	protection act.	Protection activation	-
1	240	182	>switch 1	0 = Open (off), 1= Close (on)	-
1	240	183	>switch 2	0 = Open (off), 1= Close (on)	-

3.2.17 free channelsr

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	160	110	>input channel 1	User input 1	-
1	160	111	>input channel 2	User input 2	-
1	160	112	>input channel 3	User input 3	-
1	160	113	>input channel 4	User input 4	-
1	166	110	>input channel 5	User input 5	-
1	166	111	>input channel 6	User input 6	-
1	166	112	>input channel 7	User input 7	-
1	166	113	>input channel 8	User input 8	-
1	166	114	>input channel 9	User input 9	-
1	166	115	>input channel 10	User input 10	-
1	166	116	>input channel 11	User input 11	-
1	166	117	>input channel 12	User input 12	-
1	166	118	>input channel 13	User input 13	-
1	166	119	>input channel 14	User input 14	-
1	167	30	>input channel 15	User input 15	-
1	167	31	>input channel 16	User input 16	-
1	167	32	>input channel 17	User input 17	-
1	167	33	>input channel 18	User input 18	-
1	167	34	>input channel 19	User input 19	-
1	167	35	>input channel 20	User input 20	-
1	167	36	>input channel 21	User input 21	-
1	167	37	>input channel 22	User input 22	-
1	167	38	>input channel 23	User input 23	-
1	167	39	>input channel 24	User input 24	-
1	168	60	>input channel 25	User input 25	-
1	168	61	>input channel 26	User input 26	-
1	168	62	>input channel 27	User input 27	-
1	168	63	>input channel 28	User input 28	-
1	168	64	>input channel 29	User input 29	-
1	168	65	>input channel 30	User input 30	-
1	168	66	>input channel 31	User input 31	-
1	168	67	>input channel 32	User input 32	-
1	168	68	>input channel 33	User input 33	-
1	168	69	>input channel 34	User input 34	-

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	169	60	>input channel 35	User input 35	-
1	169	61	>input channel 36	User input 36	-
1	169	62	>input channel 37	User input 37	-
1	169	63	>input channel 38	User input 38	-
1	169	64	>input channel 39	User input 39	-
1	169	65	>input channel 40	User input 40	-
1	169	66	>input channel 41	User input 41	-
1	169	67	>input channel 42	User input 42	-
1	169	68	>input channel 43	User input 43	-
1	169	69	>input channel 44	User input 44	-
1	169	70	>input channel 45	User input 45	-
1	170	60	>input channel 46	User input 46	-
1	170	61	>input channel 47	User input 47	-
1	170	62	>input channel 48	User input 48	-
1	170	63	>input channel 49	User input 49	-
1	170	64	>input channel 50	User input 50	-
1	170	65	>input channel 51	User input 51	-
1	170	66	>input channel 52	User input 52	-
1	170	67	>input channel 53	User input 53	-
1	170	68	>input channel 54	User input 54	-
1	170	69	>input channel 55	User input 55	-
1	170	70	>input channel 56	User input 56	-
1	240	114	>input channel 57	User input 57	-
1	240	115	>input channel 58	User input 58	-
1	240	116	>input channel 59	User input 59	-
1	240	117	>input channel 60	User input 60	-
1	240	118	>input channel 61	User input 61	-
1	240	181	>input channel 62	User input 62	-
1	240	182	>input channel 63	User input 63	-
1	240	183	>input channel 64	User input 64	-
1	240	184	>input channel 65	User input 65	-
1	240	185	>input channel 66	User input 66	-
1	240	186	>input channel 67	User input 67	-
1	240	187	>input channel 68	User input 68	-
1	240	188	>input channel 69	User input 69	-

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	240	189	>input channel 70	User input 70	-
1	240	190	>input channel 71	User input 71	-
1	240	191	>input channel 72	User input 72	-
1	240	192	>input channel 73	User input 73	-
1	240	193	>input channel 74	User input 74	-
1	240	194	>input channel 75	User input 75	-
1	240	195	>input channel 76	User input 76	-
1	240	196	>input channel 77	User input 77	-
1	240	197	>input channel 78	User input 78	-

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=	Current phase a	601
134	137	2	Ib=	Current phase b	602
134	137	3	Ic=	Current phase c	603
134	137	4	I0=	Current I0	604
134	137	5	Va=	Voltage phase a	621
134	137	6	Vb=	Voltage phase b	622
134	137	7	Vc=	Voltage phase c	623
134	137	8	Va-b=	Voltage phase a to phase b	624
134	137	9	Vb-c=	Voltage phase b to phase c	625
134	137	10	Vc-a=	Voltage phase c to phase a	626
134	137	11	P=	Active power	641
134	137	12	Q=	Reactive power	642
134	137	13	Freq=	frequency	644
134	137	14	cos ϕ=	power factor	901
134	137	15	IEE real=	earth fault current active	701
134	137	16	IEE reactive=	earth fault current reactive	702

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	-

3.3.4 Time Tagged Measurements

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
4	150	177	(0)Ia=	Trip Current phase a	533
4	150	178	(0)Ib=	Trip Current phase b	534
4	150	179	(0)Ic=	Trip Current phase c	535
4	151	18	(0)Xsec=	Fault impedance	1118
4	151	19	(0)dist=	Fault location	1119

3.3.5 Metering values

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
205	133	51	Wp+=	Wp Forward (metered measurand derived from measured value)	924
205	133	52	Wq+=	Wq Forward (metered measurand derived from measured value)	925
205	133	53	Wp-=	Wp Reverse (metered measurand derived from measured value)	928
205	133	54	Wq-=	Wq Reverse (metered measurand derived from measured value)	929
205	133	55	Wp(puls) =	Pulsed Energy Wp (active)(metering impulses at binary input)	888
205	133	56	Wq(puls) =	Pulsed Energy Wq (reactive)(metering impulses at binary input)	889

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	1201	Phase Time Overcurrent	22 ON 23 OFF	
10	1	1217	I>>> Pickup		
10	2	1218	I>>> Time Delay		
10	3	1202	I>> Pickup		
10	4	1203	I>> Time Delay		
10	5	1204	I> Pickup		
10	6	1205	I> Time Delay		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	7	1207	Ip Pickup		
10	8	1208	Ip Time Delay		
10	9	1209	Ip Time Dial		
10	10	1210	Drop-out characteristic	12964 immediately 12965 Disk Emulation	
10	11	1211	IEC Curve	12559 - inverse, 12560 - strong inverse, 12561 - extremly inverse, 12837 - long time inverse	
10	12	1212	ANSI Curve	12808 - inverse, 12809 - short inverse, 12810 - long inverse, 12811 - moderately inverse, 12812 - very inverse, 12813 - extremly inverse, 12814 - definite inverse	
10	13	1223	51V V< Threshold for Release Ip	24 no, 30013 - voltage controlled, 30014 - voltage restraint	not available in V4.7 and the former version
10	14	1224	51V Voltage Influence		not available in V4.7 and the former version
10	15	1301	Ground Time Overcurrent	22 ON 23 OFF	
10	16	1317	IN>>> Pickup		
10	17	1318	IN>>> Time Delay		
10	18	1302	IN>> Pickup		
10	19	1303	IN>> Time Delay		
10	20	1304	IN>Pickup		
10	21	1305	IN>Time Delay		
10	22	1307	INp Pickup		
10	23	1308	INp Time Dial		
10	24	1309	INp Time Dial		
10	25	1310	Drop-Out Characteristic	12964 - immediately, 12965 - disk emulation	
10	26	1311	IEC Curve	12559 - inverse, 12560 - strong inverse, 12561 - extremly inverse, 12837 - long time inverse	
10	27	1312	ANSI Curve	12808 - inverse, 12809 - short inverse, 12810 - long inverse, 12811 - moderately inverse, 12812 - very inverse, 12813 - extremly inverse, 12814 - definite inverse	
10	28	1501	Directional Phase Time Overcurrent	22 ON 23 OFF	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	29	1502	Directional I>>pickup		
10	30	1503	Directional I>> Time Delay		
10	31	1504	Directional I> pickup		
10	32	1505	Directional I> Time Delay		
10	33	1507	Directional Ip Pickup		
10	34	1508	Directional Ip Time Dial		
10	35	1509	Directional Ip Time Dial		
10	36	1510	Drop-Out Characteristic	12964 - immediately, 12965 - disk emulation	
10	37	1511	IEC Curve	12559 - inverse, 12560 - strong inverse, 12561 - extremly inverse, 12837 - long time inverse	
10	38	1512	ANSI Curve	12808 - inverse, 12809 - short inverse, 12810 - long inverse, 12811 - moderately inverse, 12812 - very inverse, 12813 - extremly inverse, 12814 - definite inverse	
10	39	1516	Phase Direction	12514 - forward, 12515 - backward	
10	40	1523	Directional I>> Direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	41	1524	Directional I> direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	42	1525	Directional Ip Direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	43	1601	Directional Ground Time Overcurrent	22 ON 23 OFF	
10	44	1602	Directional IN>> Pickup		
10	45	1603	Directional IN>> Time Delay		
10	46	1604	Directional IN> Pickup		
10	47	1605	Directional IN> Time Delay		
10	48	1607	Directional INp Pickup		
10	49	1608	Directional INp Time Dial		
10	50	1609	Directional INp Time Dial		
10	51	1610	Drop-Out Characteristic	12964 - immediately, 12965 - disk emulation	
10	52	1611	IEC Curve	12559 - inverse, 12560 - strong inverse, 12561 - extremly inverse, 12837 - long time inverse	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	53	1612	ANSI Curve	12808 - inverse, 12809 - short inverse, 12810 - long inverse, 12811 - moderately inverse, 12812 - very inverse, 12813 - extremly inverse, 12814 - definite inverse	
10	54	1616	Ground Direction	12514 - forward, 12515 - backward	
10	55	1617	Ground Polarization	25128 - with Un and In, 25130 - with U2 and I2	
10	56	1623	Directional IN>> Direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	57	1624	Directional IN> Direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	58	1625	Directional INp Direction	12514 - forward, 12515 - backward	not available in 7SJ68
10	59	2701	1Ph overcurrent protection	22 ON 23 OFF	not available in V4.7 and the former version
10	60	2702	1Ph I>> pickup		not available in V4.7 and the former version
10	61	2703	1Ph I>> pickup		not available in V4.7 and the former version
10	62	2704	1Ph I>> DELAY		not available in V4.7 and the former version
10	63	2705	1Ph I> PICKUP		not available in V4.7 and the former version
10	64	2706	1Ph I> PICKUP		not available in V4.7 and the former version
10	65	2707	1Ph I> DELAY		not available in V4.7 and the former version
10	66	5101	undervoltage protection	22 - on, 23 - off, 12700 - annunciation only	
10	67	5102	U< Pickup		
10	68	5103	U< Pickup		
10	69	5106	U< Time Delay		
10	70	5110	U<< Pickup		
10	71	5111	U<< Pickup		
10	72	5112	U<< Time Delay		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	73	5115	Vph-n selection	25600 - one of Vph-n<, 25601 - all 3 Vph-n<	
10	74	5116	Vphph selection	25602 - one of Vphph<, 25603 - all 3 Vphph<	
10	75	5001	overvoltage protection	22 - on, 23 - off 12700 - annunciation only	
10	76	5002	U> Pickup		
10	77	5003	U> Pickup		
10	78	5019	U> Pickup V1		
10	79	5015	U> Pickup Overvoltage (neg. seq.)		
10	80	5004	U> Time Delay		
10	81	5005	U>> Pickup		
10	82	5006	U>> Pickup		
10	83	5020	U>> Pickup V1		
10	84	5016	U>> Pickup Overvoltage (neg. seq.)		
10	85	5007	U>> Time Delay		
10	86	4001	negative sequence protec	22 - on, 23 - off	
10	87	4002	I2> Pickup		
10	88	4003	I2> Time Delay		
10	89	4004	I2>> Pickup		
10	90	4005	I2>> Time Delay		
10	91	4006	I2 IEC Curve	12559 - inverse, 12560 - strong inverse, 12561 - extremly inverse	
10	92	4007	I2 ANSI Curve	12808 - inverse, 12811 - moderately inverse, 12812 - very inverse, 12813 - extremly inverse	
10	93	4008	I2p Pickup		
10	94	4009	I2p Time Dial		
10	95	4010	I2p Time Dial		
10	96	4011	I2p Drop Out	12964 - immediately, 12965 - disk emulation	
10	97	2201	Inrush Restraint	22 ON 23 OFF	
10	98	2202	2nd. harmonic in % of fundamental		
10	99	2203	Cross Block	24 NO 25 YES	
10	100	2204	Cross Block Time		
10	101	2205	Maximum Current for Inrush Restraint		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	102	1701	cold load pickup	22 ON 23 OFF	
10	103	1702	Start Condition		
10	104	1703	Circuit Breaker OPEN Time		
10	105	1704	Active Time		
10	106	1705	Stop Time		
10	107	1808	I>>> Cold Load Pickup		
10	108	1809	I>>> Cold Load Time Delay		
10	109	1801	I>> Cold Load Pickup		
10	110	1802	I>> Cold Load Time Delay		
10	111	1803	I> Cold Load Pickup		
10	112	1804	I> Cold Load Time Delay		
10	113	1805	Ip Cold Load Pickup		
10	114	1806	Ip Cold Load Time dial		
10	115	1807	Ip Cold Load Time dial		
10	116	1908	IN>>> Cold Load Pickup		
10	117	1909	IN>>> Cold Load Time Delay		
10	118	1901	IN>> Cold Load Pickup		
10	119	1902	IN>> Cold Load Time Delay		
10	120	1903	IN> Cold Load Pickup		
10	121	1904	IN> Cold Load Time Delay		
10	122	1905	INp Cold Load Pickup		
10	123	1906	INp Cold Load Time Dial		
10	124	1907	INp Cold Load Time Dial		
10	125	2001	Directional I>> Cold Load Pickup		
10	126	2002	Directional I>> Cold Load Time Delay		
10	127	2003	Directional I> Cold Load Pickup		
10	128	2004	Directional I> Cold Load Time Delay		
10	129	2005	Directional Ip Cold Load Pickup		
10	130	2006	Directional Ip Cold Load Time Dial		
10	131	2007	Directional Ip Cold Load Time Dial		
10	132	2101	Directional IN>> Cold Load Pickup		
10	133	2102	Directional IN>> Cold Load Time Delay		
10	134	2103	Directional IN> Cold Load Pickup		
10	135	2104	Directional IN> Cold Load Time Delay		
10	136	2105	Directional INp Cold Load Pickup		
10	137	2106	Directional INp Cold Load Time Dial		
10	138	2107	Directional INp Time Dial		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	139	4101	startup time supervision for motors	22 ON 23 OFF	
10	140	4102	Startup Current		
10	141	4103	Startup Time		
10	142	4104	Permissible Locked Rotor Time		
10	143	4105	Startup Time for warm motor		
10	144	4106	Temperature limit for cold motor		
10	145	5401	Over / Under Frequency Protection	22 ON 23 OFF	
10	146	5402	Minimum required voltage for operation		
10	147	5403	Over / Under Frequency Protection F1 Pickup		
10	148	5404	Over / Under Frequency Protection F1 Pickup		not available in 7SJ68
10	149	5405	Over / Under Frequency Protection F1 Time Delay		
10	150	5406	Over / Under Frequency Protection F2 Pickup		
10	151	5407	Over / Under Frequency Protection F2 Pickup		not available in 7SJ68
10	152	5408	Over / Under Frequency Protection F2 Time Delay		
10	153	5409	Over / Under Frequency Protection F3 Pickup		
10	154	5410	Over / Under Frequency Protection F3 Pickup		not available in 7SJ68
10	155	5411	Over / Under Frequency Protection F3 Time delay		
10	156	5412	Over / Under Frequency Protection F4 Pickup		
10	157	5413	Over / Under Frequency Protection F4 Pickup		not available in 7SJ68
10	158	5414	Over / Under Frequency Protection F4 Time delay		
10	159	5421	Over / Under Frequency Protection F1	23 - off, 30703 - on f<, 30704 - on f>	
10	160	5422	Over / Under Frequency Protection F2	23 - off, 30703 - on f<, 30704 - on f>	
10	161	5423	Over / Under Frequency Protection F3	23 - off, 30703 - on f<, 30704 - on f>	
10	162	5424	Over / Under Frequency Protection F4	23 - off, 30703 - on f<, 30704 - on f>	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	163	4201	thermal overload protection	22 ON 23 OFF 12700 Alarm Only	
10	164	4202	thermal overload protection K-Factor		
10	165	4203	Time Constant		
10	166	4204	Thermal Alarm Stage		
10	167	4205	Current Overload Alarm Setpoint		
10	168	4209	Temperature rise at rated sec. curr		
10	169	4210	Temperature rise at rated sec. curr		
10	170	4301	startup counter for motors	22 ON 23 OFF	
10	171	4302	I Start / I Motor nominal		
10	172	4303	Maximum Permissible Starting Time		
10	173	4304	Temperature Equalizaton Time		
10	174	4305	Rated Motor Current		
10	175	4306	Maximum Number of Warm Starts		
10	176	4307	Number of Cold Starts - Warm Starts		
10	177	4308	Extension of Time Constant at Stop		
10	178	4309	Extension of Time Constant at Running		
10	179	4310	Minimum Restart Inhibit Time		
10	180	4311	rotor overload protection	22 - on, 23 - off, 12700 - annunciation only	
10	181	8101	Measurement Supervision	22 ON 23 OFF	
10	182	8102	Voltage Threshold for Balance Monitoring		
10	183	8103	Balance Factor for Voltage Monitor		
10	184	8104	Current Threshold for Balance Monitoring		
10	185	8105	Balance Factor for Current Monitor		
10	186	8106	Summated Current Monitoring Threshold		
10	187	8107	Summated Current Monitoring Factor		
10	188	8109	Fast Summated Current Monitoring	22 ON 23 OFF	
10	189	5201	VT broken wire supervision	22 ON 23 OFF	
10	190	5202	Threshold voltage sum		
10	191	5203	Maximum phase to phase voltage		
10	192	5204	Minimum phase to phase voltage		
10	192	5205	Symmetry phase to phase voltages		
10	193	5206	Minimum line current		
10	194	5207	Threshold current blocking		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	195	5208	Alarm delay time		
10	196	5301	Fuse Fail Monitor	23 OFF 30730 Solid grounded 30731 Coil.gnd./isol.	
10	197	5310	Block protection by FFM	24 NO 25 YES	
10	198	5302	Zero Sequence Voltage		
10	199	5303	Residual Current		
10	200	5307	I> Pickup for block FFM		
10	201	3101	(Sensitive) Ground Fault	22 - on, 23 - off 12700 Alarm Only	
10	202	3102	Current I1 for CT Angle Error		
10	203	3102	Current I1 for CT Angle Error		
10	204	3103	CT Angle Error at I1		
10	205	3104	Current I2 for CT Angle Error		
10	206	3104	Current I2 for CT Angle Error		
10	207	3105	CT Angle Error at I2		
10	208	3106	L-Gnd Voltage of Faulted Phase Vph Min		
10	209	3107	L-Gnd Voltage of Unfaulted Phase Vph Max		
10	210	3108	Ground Displacement Voltage		
10	211	3109	Ground Displacement Voltage		not available in 7SJ68
10	212	3110	Ground Displacement Voltage		
10	213	3111	Time-DELAY Pickup		
10	214	3112	Time Delay		
10	215	3113	INs>> Pickup		
10	216	3113	INs>>Pickup		
10	217	3114	INs>> Time Delay		
10	218	3115	INs>> direction	12514 Forward 12515 Reverse 12516 Non-Directional	
10	219	3117	INs> Pickup		
10	220	3117	INs> Pickup		
10	221	3118	INs> Time delay		
10	222	3119	INsp Pickup		
10	223	3119	INsp Pickup		
10	224	3119	INsp Pickup		
10	225	3120	INsp Time Dial		not available in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	226	3127	INsp Current at const. Time Delay T min		not available in 7SJ68
10	227	3127	INsp Current at const. Time Delay T min		not available in 7SJ68
10	228	3128	INsp Current at Knee Point		not available in 7SJ68
10	229	3128	INsp Current at Knee Point		not available in 7SJ68
10	230	3129	INsp Time Delay at Knee Point		not available in 7SJ68
10	231	3140	INsp Minimum Time Delay		not available in 7SJ68
10	232	3140	INsp Minimum Time Delay		not available in 7SJ68
10	233	3141	INsp Maximum Time Delay		not available in 7SJ68
10	234	3141	INsp Maximum Time Delay (at 51Ns PU)		not available in 7SJ68
10	235	3142	INsp Time Dial		not available in 7SJ68
10	236	3132	INsp Time Dial		not available in 7SJ68
10	237	3143	INsp Start Point of Inverse Charac		
10	238	3122	INs> direction	12514 Forward 12515 Reverse 12516 Non-Directional	
10	239	3123	Release directional element		
10	240	3123	Release directional element		
10	241	3124	Correction Angle for Dir. Determination		
10	242	3125	Measurement method for Direction	12839 COS 12840 SIN	
10	243	3126	Reset Delay		
10	244	3130	Sensitive Ground Fault PICKUP criteria	12998 Vgnd OR INs 12999 Vgnd AND Ins	
10	245	3150	INs>> minimum voltage		not available in 7SJ68
10	246	3150	INs>> minimum voltage		not available in 7SJ68
10	247	3150	INs>> minimum voltage		not available in 7SJ68
10	248	3151	INs>> angle phi		not available in 7SJ68
10	249	3152	INs>> angle delta phi		not available in 7SJ68
10	250	3153	INs> minimum voltage		not available in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
10	251	3153	INs> minimum voltage		not available in 7SJ68
10	252	3153	INs> minimum voltage		not available in 7SJ68
10	253	3154	INs> angle phi		not available in 7SJ68
10	254	3155	INs> angle delta phi		not available in 7SJ68
10	255	3301	Intermittent earth fault protection	23 OFF 22 ON	
10	0	3302	Pick-up value of interm. E/F stage	5 … 3500 (0.05 - 35.00 A)	
10	1	3302	Pick-up value of interm. E/F stage	5 … 3500 (0.05 - 35.00 A)	
10	2	3302	Pick-up value of interm. E/F stage	5 … 1500 (0.005 - 1.500 A)	
11	3	3303	Detection extension time	0 … 1000 (0.00 - 10.00 s)	
11	4	3304	Sum of detection times	0 … 10000 (0.00 - 100.00 s)	
11	5	3305	Reset time	1 … 600 (1- 600 s)	
11	6	3306	No. of det. for start of int. E/F prot	2 … 10	
11	7	7101	Auto-reclose function	23 OFF 22 ON	
11	8	7103	AR blocking duration after manual close		
11	9	7105	Auto Reclosing reset time		
11	10	7108	Safety Time until 79 is ready		
11	11	7113	Check circuit breaker before AR?		
11	12	7114	AR start-signal monitoring time		not availabe in version V4.7
11	13	7115	Circuit Breaker (CB) Supervision Time		
11	14	7116	Maximum dead time extension		
11	15	7117	Action time		not availabe in version V4.7
11	16	7118	Maximum Time Delay of DeadTime Start		not availabe in version V4.7
11	17	7127	Dead Time 1: Phase Fault		
11	18	7128	Dead Time 1: Ground Fault		
11	19	7129	Dead Time 2: Phase Fault		
11	20	7130	Dead Time 2: Ground Fault		
11	21	7131	Dead Time 3: Phase Fault		
11	22	7132	Dead Time 3: Ground Fault		
11	23	7133	Dead Time 4: Phase Fault		
11	24	7134	Dead Time 4: Ground Fault		
11	25	7135	Number of Reclosing Cycles Ground		
11	26	7136	Number of Reclosing Cycles Phase		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	27	7139	External 25 synchronisation	24 NO 25 YES	
11	28	7140	ZSC - Zone sequence coordination	23 OFF 22 ON	not available in version V4.7
11	29	7150	I>	12886 No influence 12885 Starts 79 25011 Stops 79	
11	30	7151	IN> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	31	7152	I>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	32	7153	IN>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	33	7166	I>>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	34	7167	IN>>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	35	7154	Ip start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	36	7155	Inp start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	37	7156	Directional I> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	38	7157	Directional IN> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	39	7158	Directional I>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	40	7159	Directional IN>> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	41	7160	Directional Ip> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	42	7161	Directional INp> start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	43	7162	(Sensitive) Ground Fault start AR	12886 No influence 12885 Starts 79 25011 Stops 79	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	44	7163	I2 start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	45	7164	Binary Input start AR	12886 No influence 12885 Starts 79 25011 Stops 79	
11	46	7165	3 Pole Pickup blocks auto-recloser	24 NO 25 YES	
11	47	7200	before 1. Cycle: I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	48	7201	before 1. Cycle: IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	49	7202	before 1. Cycle: I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	50	7203	before 1. Cycle: IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	51	7248	before 1. Cycle: I>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	52	7249	before 1. Cycle: IN>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	53	7204	before 1. Cycle: Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	54	7205	before 1. Cycle: INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	55	7206	before 1. Cycle: INs>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	56	7207	Release directional element		not availabe in version V4.7
11	57	7208	Correction Angle for Dir. Determination		not availabe in version V4.7
11	58	7209	Measurement method for Direction		not availabe in version V4.7
11	59	7210	before 1. Cycle: Directional Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	60	7211	before 1. Cycle: Directional Inp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	61	7212	before 2. Cycle: I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	62	7213	before 2. Cycle: IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	63	7214	before 2. Cycle: I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	64	7215	before 2. Cycle: IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	65	7250	before 2. Cycle: I>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	66	7251	before 2. Cycle: IN>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	67	7216	before 2. Cycle: Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	68	7217	before 2. Cycle: INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	69	7218	before 2. Cycle: Directional I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	70	7219	before 2. Cycle: Directional IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	71	7220	before 2. Cycle: Directional I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	72	7221	before 2. Cycle: Directional IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	73	7222	before 2. Cycle: Directional Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	74	7223	before 2. Cycle: Directional INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	75	7224	before 3. Cycle: I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	76	7225	before 3. Cycle: IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	77	7226	before 3. Cycle: I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	78	7227	before 3. Cycle: IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	79	7252	before 3. Cycle: I>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	80	7253	before 3. Cycle: IN>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	81	7228	before 3. Cycle: Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	82	7229	before 3. Cycle: INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	83	7230	before 3. Cycle: Directional I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	84	7231	before 3. Cycle: Directional IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	85	7232	before 3. Cycle: Directional I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	86	7233	before 3. Cycle: Directional IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	87	7234	before 3. Cycle: Directional Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	88	7235	before 3. Cycle: Directional INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	89	7236	before 4. Cycle: I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	90	7237	before 4. Cycle: IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	91	7238	before 4. Cycle: I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	92	7239	before 4. Cycle: IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	93	7254	before 4. Cycle: I>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	94	7255	before 4. Cycle: IN>>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	95	7240	before 4. Cycle: Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	96	7241	before 4. Cycle: INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	97	7242	before 4. Cycle: Directional I>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	98	7243	before 4. Cycle: Directional IN>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	99	7244	before 4. Cycle: Directional I>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	100	7245	before 4. Cycle: Directional IN>>	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	101	7246	before 4. Cycle: Directional Ip	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	102	7247	before 4. Cycle: Directional INp	25345 Set value T=T 25344 instant. T=0 25343 blocked T=	not availabe in version V4.7
11	103	7480	Unreasonable CB open start AR	22 - on, 23 - off	
11	104	7482	Unreasonable CB open start AR dead time		
11	105	7400	1.Cycle: I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	106	7401	1.Cycle: I>> Speed up delay time		
11	107	7402	1.Cycle: IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	108	7403	1.Cycle: IN>> Speed up delay time		
11	109	7404	1.Cycle: I>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	110	7405	1.Cycle: I>>> Speed up delay time		
11	111	7406	1.Cycle: IN>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	112	7407	1.Cycle: IN>>> Speed up delay time		
11	113	7408	1.Cycle: Directional I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	114	7409	1.Cycle: Directional I>> Speed up delay time		
11	115	7410	1.Cycle: Directional IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	116	7411	1.Cycle: Directional IN>> Speed up delay time		
11	117	7420	2.Cycle: I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	118	7421	2.Cycle: I>> Speed up delay time		
11	119	7422	2.Cycle: IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	120	7423	2.Cycle: IN>> Speed up delay time		
11	121	7424	2.Cycle: I>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	122	7425	2.Cycle: I>>> Speed up delay time		
11	123	7426	2.Cycle: IN>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	124	7427	2.Cycle: IN>>> Speed up delay time		
11	125	7428	2.Cycle: Directional I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	126	7429	2.Cycle: Directional I>> Speed up delay time		
11	127	7430	2.Cycle: Directional IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	128	7431	2.Cycle: Directional IN>> Speed up delay time		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	129	7440	3.Cycle: I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	130	7441	3.Cycle: I>> Speed up delay time		
11	131	7442	3.Cycle: IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	132	7443	3.Cycle: IN>> Speed up delay time		
11	133	7444	3.Cycle: I>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	134	7445	3.Cycle: I>>> Speed up delay time		
11	135	7446	3.Cycle: IN>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	136	7447	3.Cycle: IN>>> Speed up delay time		
11	137	7448	3.Cycle: Directional I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	138	7449	3.Cycle: Directional I>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	139	7450	3.Cycle: Directional IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	140	7451	3.Cycle: Directional IN>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	141	7460	4.Cycle: I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	142	7461	4.Cycle: I>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	143	7462	4.Cycle: IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	144	7463	4.Cycle: IN>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	145	7464	4.Cycle: I>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	146	7465	4.Cycle: I>>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	147	7466	4.Cycle: IN>>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	148	7467	4.Cycle: IN>>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	149	7468	4.Cycle: Directional I>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	150	7469	4.Cycle: Directional I>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	151	7470	4.Cycle: Directional IN>> Speed up function	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	152	7471	4.Cycle: Directional IN>> Speed up delay time	12886 No influence 31000 SpeedUp before AR 31001 SpeedUp after AR	
11	153	8201	TC TRIP Circuit Supervision	22 - on, 23 - off	
11	154	8202	Delay Time for alarm		
11	155	8203	CC Close Circuit Supervision	22 - on, 23 - off	
11	156	8001	Start fault locator with	12552 - trip, 12553 - pick up	
11	157	7001	Breaker Failure Protection	22 - on, 23 - off	
11	158	7004	Check Breaker contacts	22 - on, 23 - off	
11	159	7005	TRIP-Timer		
11	160	7006	Pickup current threshold		
11	161	7007	Pickup earth current threshold		
11	162	7008	Delay of 2nd stage for busbar trip		
11	163	6101	Synchronizing Function	22 - on, 23 - off	
11	164	6103	Minimum voltage limit: Vmin		
11	165	6104	Maximum voltage limit: Vmax		
11	166	6105	Threshold V1, V2 without voltage		
11	167	6106	Threshold V1, V2 with voltage		
11	168	6107	ON-Command at V1< and V2>	24 NO 25 YES	
11	169	6108	ON-Command at V1> and V2<	24 NO 25 YES	
11	170	6109	ON-Command at V1< and V2<	24 NO 25 YES	
11	171	6112	Maximum duration of Synchronization		
11	172	6120	Closing (operating) time of CB		not available in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	173	6121	Balancing factor V1/V2		
11	174	6123	Connection of V2	25350 A-G 25351 B-G 25352 C-G 25353 A-B 25354 B-C 25355 C-A	
11	175	6125	VT nominal voltage V2, primary		
11	176	6130	Maximum voltage difference V2>V1		not available in 7SJ68
11	177	6131	Maximum voltage difference V2<V1		not available in 7SJ68
11	178	6132	Maximum frequency difference f2>f1		not available in 7SJ68
11	179	6133	Maximum frequency difference f2<f1		not available in 7SJ68
11	180	6140	Switching at synchronous conditions	24 NO 25 YES	not available in 7SJ68
11	181	6141	Frequency threshold ASYN <--> SYN		not available in 7SJ68
11	182	6142	Maximum voltage difference V2>V1		not available in 7SJ68
11	183	6143	Maximum voltage difference V2<V1		not available in 7SJ68
11	184	6144	Maximum angle difference alpha2>alpha1		not available in 7SJ68
11	185	6145	Maximum angle difference alpha2<alpha1		not available in 7SJ68
11	186	6166	Release delay at synchronous conditions		not available in 7SJ68
11	187	6150	Maximum voltage difference V2>V1		
11	188	6151	Maximum voltage difference V2<V1		
11	189	6152	Maximum frequency difference f2>f1		
11	190	6153	Maximum frequency difference f2<f1		
11	191	6154	Maximum angle difference alpha2>alpha1		
11	192	6155	Maximum angle difference alpha2<alpha1		
11	193	6201	Synchronizing Function	23 OFF 22 ON	not availabe in 7SJ68
11	194	6203	Minimum voltage limit: Vmin		not availabe in 7SJ68
11	195	6204	Maximum voltage limit: Vmax		not availabe in 7SJ68
11	196	6205	Threshold V1, V2 without voltage		not availabe in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	197	6206	Threshold V1, V2 with voltage		not availabe in 7SJ68
11	198	6207	ON-Command at V1< and V2>		not availabe in 7SJ68
11	199	6208	ON-Command at V1> and V2<		not availabe in 7SJ68
11	200	6209	ON-Command at V1< and V2<		not availabe in 7SJ68
11	201	6212	Maximum duration of Synchronization		not availabe in 7SJ68
11	202	6220	Closing (operating) time of CB		not availabe in 7SJ68
11	203	6221	Balancing factor V1/V2		not availabe in 7SJ68
11	204	6223	Connection of V2		not availabe in 7SJ68
11	205	6225	VT nominal voltage V2, primary		not availabe in 7SJ68
11	206	6230	Maximum voltage difference V2>V1		not availabe in 7SJ68
11	207	6231	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	208	6232	Maximum frequency difference f2>f1		not availabe in 7SJ68
11	209	6233	Maximum frequency difference f2<f1		not availabe in 7SJ68
11	210	6240	Switching at synchronous conditions		not availabe in 7SJ68
11	211	6241	Frequency threshold ASYN <--> SYN		not availabe in 7SJ68
11	212	6242	Maximum voltage difference V2>V1		not availabe in 7SJ68
11	213	6243	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	214	6244	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
11	215	6245	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
11	216	6246	Release delay at synchronous conditions		not availabe in 7SJ68
11	217	6250	Maximum voltage difference V2>V1		not availabe in 7SJ68
11	218	6251	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	219	6252	Maximum frequency difference f2>f1		not availabe in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	220	6253	Maximum frequency difference f2<f1		not availabe in 7SJ68
11	221	6254	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
11	222	6255	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
11	223	6301	Synchronizing Function	23 OFF 22 ON	not availabe in 7SJ68
11	224	6303	Minimum voltage limit: Vmin		not availabe in 7SJ68
11	225	6304	Maximum voltage limit: Vmax		not availabe in 7SJ68
11	226	6305	Threshold V1, V2 without voltage		not availabe in 7SJ68
11	227	6306	Threshold V1, V2 with voltage		not availabe in 7SJ68
11	228	6307	ON-Command at V1< and V2>		not availabe in 7SJ68
11	229	6308	ON-Command at V1> and V2<		not availabe in 7SJ68
11	230	6309	ON-Command at V1< and V2<		not availabe in 7SJ68
11	231	6312	Maximum duration of Synchronization		not availabe in 7SJ68
11	232	6320	Closing (operating) time of CB		not availabe in 7SJ68
11	233	6321	Balancing factor V1/V2		not availabe in 7SJ68
11	234	6323	Connection of V2		not availabe in 7SJ68
11	235	6325	VT nominal voltage V2, primary		not availabe in 7SJ68
11	236	6330	Maximum voltage difference V2>V1		not availabe in 7SJ68
11	237	6331	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	238	6332	Maximum frequency difference f2>f1		not availabe in 7SJ68
11	239	6333	Maximum frequency difference f2<f1		not availabe in 7SJ68
11	240	6340	Switching at synchronous conditions		not availabe in 7SJ68
11	241	6341	Frequency threshold ASYN <--> SYN		not availabe in 7SJ68
11	242	6342	Maximum voltage difference V2>V1		not availabe in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
11	243	6343	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	244	6344	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
11	245	6345	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
11	246	6346	Release delay at synchronous conditions		not availabe in 7SJ68
11	247	6350	Maximum voltage difference V2>V1		not availabe in 7SJ68
11	248	6351	Maximum voltage difference V2<V1		not availabe in 7SJ68
11	249	6352	Maximum frequency difference f2>f1		not availabe in 7SJ68
11	250	6353	Maximum frequency difference f2<f1		not availabe in 7SJ68
11	251	6354	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
11	252	6355	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
11	253	6401	Synchronizing Function	22 - on, 23 - off	not availabe in 7SJ68
11	254	6403	Minimum voltage limit: Vmin		not availabe in 7SJ68
11	255	6404	Maximum voltage limit: Vmax		not availabe in 7SJ68
12	0	6405	Threshold V1, V2 without voltage		not availabe in 7SJ68
12	1	6406	Threshold V1, V2 with voltage		not availabe in 7SJ68
12	2	6407	ON-Command at V1< and V2>		not availabe in 7SJ68
12	3	6408	ON-Command at V1> and V2<		not availabe in 7SJ68
12	4	6409	ON-Command at V1< and V2<		not availabe in 7SJ68
12	5	6412	Maximum duration of Synchronization		not availabe in 7SJ68
12	6	6420	Closing (operating) time of CB		not availabe in 7SJ68
12	7	6421	Balancing factor V1/V2		not availabe in 7SJ68
12	8	6423	Connection of V2		not availabe in 7SJ68
12	9	6425	VT nominal voltage V2, primary		not availabe in 7SJ68

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
12	10	6430	Maximum voltage difference V2>V1		not availabe in 7SJ68
12	11	6431	Maximum voltage difference V2<V1		not availabe in 7SJ68
12	12	6432	Maximum frequency difference f2>f1		not availabe in 7SJ68
12	13	6433	Maximum frequency difference f2<f1		not availabe in 7SJ68
12	14	6440	Switching at synchronous conditions		not availabe in 7SJ68
12	15	6441	Frequency threshold ASYN <--> SYN		not availabe in 7SJ68
12	16	6442	Maximum voltage difference V2>V1		not availabe in 7SJ68
12	17	6443	Maximum voltage difference V2<V1		not availabe in 7SJ68
12	18	6444	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
12	19	6445	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
12	20	6446	Release delay at synchronous conditions		not availabe in 7SJ68
12	21	6450	Maximum voltage difference V2>V1		not availabe in 7SJ68
12	22	6451	Maximum voltage difference V2<V1		not availabe in 7SJ68
12	23	6452	Maximum frequency difference f2>f1		not availabe in 7SJ68
12	24	6453	Maximum frequency difference f2<f1		not availabe in 7SJ68
12	25	6454	Maximum angle difference alpha2>alpha1		not availabe in 7SJ68
12	26	6455	Maximum angle difference alpha2<alpha1		not availabe in 7SJ68
12	27	4401	Load Jam Protection	23 OFF 22 ON	
12	28	4406	Load Jam Blocking after motor start		
12	29	4402	Load Jam Tripping Threshold		
12	30	4403	Load Jam Trip Delay		
12	31	4404	Load Jam Alarm Threshold		
12	32	4405	Load Jam Alarm Delay		
12	33	2203	I2>> Cold Load PICKUP		
12	34	2204	I2>> Cold Load Time Delay		
12	35	2201	I2> Cold Load PICKUP		

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
12	36	2202	I2> Cold Load Time Delay		
12	37	2205	I2p Cold Load Pickup		
12	38	2206	I2p Cold Load Time Dial		
12	39	2207	I2p Cold Load Time Dial		
12	40	5501	Low Frequency Load shedding Protection	22 - on, 23 - off	
12	41	5521	LFLSH-1 Load shedding Protection	22 - on, 23 - off	
12	42	5522	LFLSH-2 Load shedding Protection	22 - on, 23 - off	
12	43	5523	LFLSH-3 Load shedding Protection	22 - on, 23 - off	
12	44	5524	LFLSH-4 Load shedding Protection	22 - on, 23 - off	
12	45	5502	Minimum required voltage for operation		
12	46	5519	Dropout differential		
12	47	5503	LFLSH-1 load shedding frequency		
12	48	5504	LFLSH-1 safe frequency		
12	49	5505	LFLSH-1 Time Delay		
12	50	5506	LFLSH-1 blocked by -df/dt		
12	51	5507	LFLSH-2 load shedding frequency		
12	52	5508	LFLSH-2 safe frequency		
12	53	5509	LFLSH-2 Time Delay		
12	54	5510	LFLSH-2 blocked by -df/dt		
12	55	5511	LFLSH-3 load shedding frequency		
12	56	5512	LFLSH-3 safe frequency		
12	57	5513	LFLSH-3 Time Delay		
12	58	5514	LFLSH-3 blocked by -df/dt		
12	59	5515	LFLSH-4 load shedding frequency		
12	60	5516	LFLSH-4 safe frequency		
12	61	5517	LFLSH-4 Time Delay		
12	62	5518	LFLSH-4 blocked by -df/dt		
12	63	5525	Frequency rising block LFLSH-1	22 - on, 23 - off	
12	64	5526	Frequency rising block LFLSH-2	22 - on, 23 - off	
12	65	5527	Frequency rising block LFLSH-3	22 - on, 23 - off	
12	66	5528	Frequency rising block LFLSH-4	22 - on, 23 - off	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
12	67	5601	Low Voltage Load Shedding Protection	22 - on, 23 - off	
12	68	5602	LVLSH-1 Load shedding Protection	22 - on, 23 - off	
12	69	5603	LVLSH-2 Load shedding Protection	22 - on, 23 - off	
12	70	5604	LVLSH-3 Load shedding Protection	22 - on, 23 - off	
12	71	5605	LVLSH-4 Load shedding Protection	22 - on, 23 - off	
12	72	5612	LVLSH Drop out Ratio		
12	73	5606	Current Supervision	22 - on, 23 - off	
12	74	5608	Delay Time of Current Supervision		
12	75	5609	LVLSH-1 load shedding voltage		
12	76	5610	LVLSH-1 load shedding voltage		
12	77	5611	LVLSH-1 Time Delay		
12	78	5613	LVLSH-1 blocked by -du/dt		
12	79	5614	Voltage rising block LVLSH-1	22 - on, 23 - off	
12	80	5615	LVLSH-2 load shedding voltage		
12	81	5616	LVLSH-2 load shedding voltage		
12	82	5617	LVLSH-2 Time Delay		
12	83	5619	LVLSH-2 blocked by -du/dt		
12	84	5620	Voltage rising block LVLSH-2	22 - on, 23 - off	
12	85	5621	LVLSH-3 load shedding voltage		
12	86	5622	LVLSH-3 load shedding voltage		
12	87	5623	LVLSH-3 Time Delay		
12	88	5625	LVLSH-3 blocked by -du/dt		
12	89	5626	Voltage rising block LVLSH-3	22 - on, 23 - off	
12	90	5627	LVLSH-4 load shedding voltage		
12	91	5628	LVLSH-4 load shedding voltage		
12	92	5629	LVLSH-4 Time Delay		
12	93	5631	LVLSH-4 blocked by -du/dt		
12	94	5632	Voltage rising block LVLSH-4	22 - on, 23 - off	
12	95	5633	du/dt cancel LVLSH-1 after LSH pickup	24 - NO, 25 - YES	
12	96	5634	du/dt cancel LVLSH-2 after LSH pickup	24 - NO, 25 - YES	

GIN		Obj.-Adr.	Name	Generic identification data	Remark
Group	Entry				
12	97	5635	du/dt cancel LVLSH-3 after LSH pickup	24 - NO, 25 - YES	
12	98	5636	du/dt cancel LVLSH-4 after LSH pickup	24 - NO, 25 - YES	
12	99	7301	20 mA (B1) correspond to		
12	100	7302	Output value (B1) valid from		
12	101	7310	Minimum Percentage Output Value (B1)		
12	102	7311	Minimum Current Output Value (B1)		
12	103	7312	Maximum Percentage Output Value (B1)		
12	104	7313	Maximum Current Output Value (B1)		
12	105	7303	20 mA (B2) correspond to		
12	106	7304	Output value (B2) valid from		
12	107	7320	Minimum Percentage Output Value (B2)		
12	108	7321	Minimum Current Output Value (B2)		
12	109	7322	Maximum Percentage Output Value (B2)		
12	110	7323	Maximum Current Output Value (B2)		
12	111	7330	Minimum Percentage Output Value (D1)		Only Available in 7SJ683
12	112	7331	Minimum Current Output Value (D1)		Only Available in 7SJ683
12	113	7332	Maximum Percentage Output Value (D1)		Only Available in 7SJ683
12	114	7333	Maximum Current Output Value (D1)		Only Available in 7SJ683
12	115	7340	Minimum Percentage Output Value (D2)		Only Available in 7SJ683
12	116	7341	Minimum Current Output Value (D2)		Only Available in 7SJ683
12	117	7342	Maximum Percentage Output Value (D2)		Only Available in 7SJ683
12	118	7343	Maximum Current Output Value (D2)		Only Available in 7SJ683
12	119	5531	LFSH-1 load shedding frequency		
12	120	5532	LFSH-1 pickup frequency		
12	121	5533	LFSH-2 load shedding frequency		
12	122	5534	LFSH-2 pickup frequency		
12	123	5535	LFSH-3 load shedding frequency		
12	124	5536	LFSH-3 pickup frequency		
12	125	5537	LFSH-4 load shedding frequency		
12	126	5538	LFSH-4 pickup frequency		

Index

S

T

V

W

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