SIPROTEC

Differential protection 7UT68x

Communication module

Redundant IEC 60870-5-103

Bus mapping

Edition: January 2009

C53000-L2540-A320-1

Siemens AG Order-No. C53000-L2540-A320-1

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
Differential protection SIPROTEC 7UT6x	Function, operation, assembly and commissioning of the SIPROTEC® devices 7UT6x	C53000-G115D-C230-1
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 7UT68x version V4.7 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 4.82 SP1 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 MeasurSys”, ” Fail: RTD-Box 1”, ”Fail: RTD-Box 2”, “Broken wire”, “Fail.Disconnect”.

Reference ref to chap. 3.2.10

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:

- “Fail I Superv.”, “Fail U Superv.”, “Fail Ph. Seq.”, “Alarm adjustm.”, “Fail Battery”, “Err. Module B”, “Err. Module C”, “Err. Module D”, “Clock SyncError”, “Incons.CBaux M1”, “Incons.CBaux M2”, “Incons.CBaux M3”, “Incons.CBaux M4”, “Incons.CBaux M5”, “Incons.CBaux S1”, “Incons.CBaux S2”, “Incons.CBaux S3”, “Incons.CBaux S4”, “Incons.CBaux S5”.

"Reference ret. to chap. 3.2.10

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. 3.2.10

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 3.2.10

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 3.3.3

IEC 60870-5-103 Interoperability 2

Redundant IEC 60870-5-103

DEVICE PROFILE DOCUMENT

Vendor Name: **SIEMENS AG**

Device Name: **7UT68x**

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>	Data Stop[1)]
☒	<21>	Test mode
☒	<22>	Local parameter setting
☒	<23>	Group A active
☒	<24>	Group B active
☒	<25>	Group C active
☒	<26>	Group D active
☐	<27>	Auxiliary input 1
☐	<28>	Auxiliary input 2
☐	<29>	Auxiliary input 3
☐	<30>	Auxiliary input 4

[1)] *Invalid in 7UT682*

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>	Group A active
☒	<24>	Group B active
☒	<25>	Group C active
☒	<26>	Group D active

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	175	Switch 1	Trip / Close switch 1	-
20	240	176	Switch 2	Trip / Close switch 2	-
20	240	177	Switch 3	Trip / Close switch 3	-

3.1.2 Single Point Command

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	176	18	Protection	Protection activation	-
20	176	23	Group A	Select parametergroup A and deactivate parametergroup B,C,D	-
20	176	24	Group B	Select parametergroup B and deactivate parametergroup A,C,D	-
20	176	25	Group C	Select parametergroup C and deactivate parametergroup A,B,D	-
20	176	26	Group D	Select parametergroup D and deactivate parametergroup A,B,C	-

3.1.3 Single Point Command without return position indication (invalid in 7UT682)

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	176	31	Switch 1	Trip / Close switch 1	-
20	176	32	Switch 2	Trip / Close switch 2	-
20	176	33	Switch 3	Trip / Close switch 3	-
20	176	34	Switch 4	Trip / Close switch 4	-

3.1.4 Single Point Command with return position indication (invalid in 7UT682)

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
20	240	181	Switch 1	Trip / Close switch 1	-
20	240	182	Switch 2	Trip / Close switch 2	-
20	240	183	Switch 3	Trip / Close switch 3	-
20	240	184	Switch 4	Trip / Close switch 4	-
20	240	185	Switch 5	Trip / Close switch 5	-

3.2 Indications in monitor direction

3.2.1 External Trips

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	51	137	Ext 1 Gen. TRIP	External trip 1: General TRIP	4537
2	51	157	Ext 2 Gen. TRIP	External trip 2: General TRIP	4557

3.2.2 Time Overcurrent protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	60	58	51 TRIP	51 TRIP; ON = 1, OFF = 0	1825
2	60	61	50G-2 TRIP	50G-2 TRIP; ON = 1, OFF = 0	1833
2	60	64	51G picked up	51G picked up; ON = 1, OFF = 0	1837
2	60	66	51G TRIP	51G TRIP; ON = 1, OFF = 0	1839
2	60	67	50G/51G pick.up	50G/51G pick.up; ON = 1, OFF = 0	1765
2	60	68	50/51(N,G) TRIP	50/51(N,G) TRIP; ON = 1, OFF = 0	1791
2	60	69	50(N,G) PU	50(N,G) PU; ON = 1, OFF = 0	1761
2	60	70	50-2 TRIP	50-2 TRIP; ON = 1, OFF = 0	1805
2	60	71	50-1 TRIP	50-1 TRIP; ON = 1, OFF = 0	1815
2	60	72	50G-1 TRIP	50G-1 TRIP; ON = 1, OFF = 0	1836
2	60	77	51 picked up	51 picked up; ON = 1, OFF = 0	1820
2	60	112	50/51 Ph A PU	50/51 Ph A PU; ON = 1, OFF = 0	1762
2	60	113	50/51 Ph B PU	50/51 Ph B PU; ON = 1, OFF = 0	1763
2	60	114	50/51 Ph C PU	50/51 Ph C PU; ON = 1, OFF = 0	1764
2	60	154	50N/51N pick.up	50N/51N pick.up; ON = 1, OFF = 0	1766
2	60	158	50N-2 TRIP	50N-2 TRIP; ON = 1, OFF = 0	1903
2	60	162	50N-1 TRIP	50N-1 TRIP; ON = 1, OFF = 0	1906
2	60	164	51N picked up	51N picked up; ON = 1, OFF = 0	1907
2	60	166	51N TRIP	51N TRIP; ON = 1, OFF = 0	1909
1	60	248	50/51 Dset.ACT	50/51 Dset.ACT; ON = 1, OFF = 0	1998
1	60	249	50N/51N Dset.ACT	50N/51N Dset.ACT; ON = 1, OFF = 0	1551
1	60	250	50G/51G Dset.ACT	50G/51G Dset.ACT; ON = 1, OFF = 0	1552

3.2.3 InRush Function

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	60	88	50G/51G InRushPU	50G/51G InRushPU; 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
2	60	95	50N/51N InRushPU	50N/51N InRushPU; ON = 1, OFF = 0	7568

3.2.4 Negative Sequence protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
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

3.2.5 Overexcit protection (Invalid in 7UT682)

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	71	86	24 warn	24 warn; ON = 1, OFF = 0	5367
2	71	89	24-1 picked up	24-1 picked up; ON = 1, OFF = 0	5370
2	71	90	24-2 TRIP	24-2 TRIP; ON = 1, OFF = 0	5371
2	71	91	24 th.TRIP	24 th.TRIP; ON = 1, OFF = 0	5372
2	71	92	24-2 picked up	24-2 picked up; ON = 1, OFF = 0	5373

3.2.6 Voltage protection (Invalid in 7UT682)

ASDU	Function type	information number	Name	Description	Obj. - Adr.
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	20	>BLOCK 59-1	>BLOCK 59-1; ON = 1, OFF = 0	6516
1	74	21	>BLOCK 59-2	>BLOCK 59-2; ON = 1, OFF = 0	6508

ASDU	Function type	information number	Name	Description	Obj. - Adr.
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	37	27-2 picked up	27-2 Undervoltage picked up; ON = 1, OFF = 0	6537
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
1	74	71	59-2 picked up	59-2 picked up; ON = 1, OFF = 0	6570
1	74	73	59-2 TRIP	59-2 TRIP; ON = 1, OFF = 0	6573

3.2.7 Differential Protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	75	31	87 picked up	87 picked up; ON = 1, OFF = 0	5631
2	75	91	87-1 TRIP	87-1 TRIP; ON = 1, OFF = 0	5691
2	75	92	87-2 TRIP	87-2 TRIP; ON = 1, OFF = 0	5692
2	176	68	87 TRIP	87 TRIP; ON = 1, OFF = 0	5671
2	176	86	87 TRIP Phase A	87 TRIP Phase A; ON = 1, OFF = 0	5672
2	176	87	87 TRIP Phase B	87 TRIP Phase B; ON = 1, OFF = 0	5673
2	176	88	87 TRIP Phase C	87 TRIP Phase C; ON = 1, OFF = 0	5674
2	176	89	87G Trip	87G Trip; ON = 1, OFF = 0	5821

3.2.8 Restricted Ground Fault Protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	76	17	87G picked up	87G picked up; ON = 1, OFF = 0	5817

3.2.9 50 1Ph protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
2	76	171	50 1Ph Pickup	50 1Ph Pickup; ON = 1, OFF = 0	5971
2	76	175	50 1Ph-1 TRIP	50 1Ph-1 TRIP; ON = 1, OFF = 0	5975
2	76	177	50 1Ph-2 TRIP	50 1Ph-2 TRIP; ON = 1, OFF = 0	5979

3.2.10 Internal Mode Status

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	101	85	Control auth[2)]	Control authority; 0=Remote; 1=Local	-
1	101	86	ModeLOCAL[2)]	Mode Local; 0=lokal operation with interlocking; 1=lokal operation without interlocking;	-
1	135	81	Device OK	Device is Operational and Protecting; ON = 1, OFF = 0	51
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	176	46	Alarm Sum Event	Alarm Summary Event; ON = 1, OFF = 0 (ref. to chap. 1.1.2))	160
1	176	47	Error Sum Alarm	Error with a summary alarm; ON = 1, OFF = 0 (ref. to chap. 1.1.1))	140
1	176	18	ProtActive	ProtActive; ON = 1, OFF = 0	52
1	176	20	DataStop[1)]	Stop data transmission; ON=1, OFF=0	16
1	176	21	Test mode[2)]	Test mode; ON = 1, OFF = 0	15
1	176	22	Settings Calc.[2)]	Setting calculation is running; ON = 1, OFF = 0	70
1	176	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	176	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	176	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	176	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) Invalid in 7UT682

2) Configured manually in 7UT682

3.2.11 Trip Circuit supervision

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	170	55	FAIL: Trip cir.	74TCFailure Trip Circuit; ON = 1, OFF = 0	6865

3.2.12 Circuit breaker failure protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
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	192	50BF-1 locTRIP	50BF-1 locTRIP; ON = 1, OFF = 0	1492
2	166	194	50BF-2 busTRIP[1)]	50BF-2 busTRIP; ON = 1, OFF = 0	1494

1) Invalid in 7UT682

3.2.13 Thermal overload protection

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	167	15	49 O/L I Alarm	Overload Current Alarm (I alarm); ON = 1, OFF = 0	1515
1	167	16	49 O/L (THETA) Alarm	49 Overload Alarm! Near Thermal Trip; ON = 1, OFF = 0	1516
2	167	21	49 Th O/L TRIP	49 Thermal Overload TRIP; ON = 1, OFF = 0	1521
1	167	41	49 ht. spot Al.	49 ht. spot Al.; ON = 1, OFF = 0	1541
2	167	42	49 ht.spot TRIP	49 ht.spot TRIP; ON = 1, OFF = 0	1542
1	167	43	49 ag.rate Al.	49 ag.rate Al.; ON = 1, OFF = 0	1543
1	167	44	49 ag.rt. TRIP	49 ag.rt. TRIP; ON = 1, OFF = 0	1544

3.2.14 Control switches return position indication(double point commands)

ASDU	Function type	information number	Name	Description	Obj. - Adr.
1	240	175	Switch 1	input state of switch 1; 1=open, 2=close	-
1	240	176	Switch 2	input state of switch 2; 1=open, 2=close	-
1	240	177	Switch 3	input state of switch 3; 1=open, 2=close	-

3.2.15 Output channels return position indication (single point commands)

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	240	181	>switch 1	0 = Open (off), 1= Close (on)	-
1	240	182	>switch 2	0 = Open (off), 1= Close (on)	-
1	240	183	>switch 3	0 = Open (off), 1= Close (on)	-
1	240	184	>switch 4[1)]	0 = Open (off), 1= Close (on)	-
1	240	185	>switch 5[1)]	0 = Open (off), 1= Close (on)	-

1) Invalid in 7UT682

3.2.16 Free channels

ASDU	Function type	informa-tion number	Name	Description	Obj. - Adr.
1	240	181	>input channel 1	User input 1	-
1	240	182	>input channel 2	User input 2	-
1	240	183	>input channel 3	User input 3	-
1	240	184	>input channel 4	User input 4	-
1	240	185	>input channel 5	User input 5	-
1	240	186	>input channel 6	User input 6	-
1	240	187	>input channel 7	User input 7	-
1	240	188	>input channel 8	User input 8	-
1	240	189	>input channel 9	User input 9	-
1	240	190	>input channel 10	User input 10	-
1	240	191	>input channel 11	User input 11	-
1	240	192	>input channel 12	User input 12	-
1	240	193	>input channel 13	User input 13	-
1	240	194	>input channel 14	User input 14	-
1	240	195	>input channel 15	User input 15	-
1	240	196	>input channel 16	User input 16	-
1	240	197	>input channel 17	User input 17	-
1	240	198	>input channel 18	User input 18	-
1	240	199	>input channel 19	User input 19	-
1	240	200	>input channel 20	User input 20	-
1	170	60	>input channel 21	User input 21	-

3.3 Measurements

3.3.1 ASDU9 (Measurements II)

Function type	informa-tion number	Position	Name	Description	Obj. - Adr.
134	139	1	IA S1=	IA S1=	721
134	139	2	IA S2=	IA S2=	724
134	139	3	IC S1=	IC S1=	723
134	139	4	IC S2=	IC S2=	726
134	139	5	IB S1=	IB S1=	722
134	139	6	IB S2=	IB S2=	725
134	139	7	IA S3= [1)]	IA S3=	1861
134	139	8	IC S3=[1)]	IC S3=	1862
134	139	9	IB S3=[1)]	IB S3=	1863
134	146	1	(Theta) RTD 1 =[1)]	(Theta) RTD 1 =	1068
134	146	2	(Theta) RTD 2 =[1)]	(Theta) RTD 2 =	1069
134	146	3	(Theta) RTD 3=[1)]	(Theta) RTD 3=	1070
134	146	4	(Theta) RTD 4=[1)]	(Theta) RTD 4=	1071
134	146	5	(Theta) RTD 5=[1)]	(Theta) RTD 5=	1072
134	146	6	(Theta) RTD 6=[1)]	(Theta) RTD 6=	1073
134	146	7	(Theta) RTD 7=[1)]	(Theta) RTD 7=	1074
134	146	8	(Theta) RTD 8=[1)]	(Theta) RTD 8=	1075
134	146	9	(Theta) RTD 9=[1)]	(Theta) RTD 9=	1076
134	146	10	(Theta) RTD 10=[1)]	(Theta) RTD 10=	1077
134	146	11	(Theta) RTD 11=[1)]	(Theta) RTD 11=	1078
134	146	12	(Theta) RTD 12=[1)]	(Theta) RTD 12=	1079
134	149	1	IB M1=[1)]	IB M1=	30662
134	149	2	IA M1=[1)]	IA M1=	30661
134	149	3	IC M1=[1)]	IC M1=	30663
134	149	4	IB M2=[1)]	IB M2=	30668
134	149	5	IA M2=[1)]	IA M2=	30667
134	149	6	IC M2=[1)]	IC M2=	30669
134	149	7	IB M3=[1)]	IB M3=	30674
134	149	8	IA M3=[1)]	IA M3=	30673
134	149	9	IC M3=[1)]	IC M3=	30675
134	149	10	IB M4=[1)]	IB M4=	30680
134	149	11	IA M4=[1)]	IA M4=	30679
134	149	12	IC M4=[1)]	IC M4=	30681

Function type	information number	Position	Name	Description	Obj. - Adr.
134	149	13	IB M5=[1)]	IB M5=	30686
134	149	14	IA M5=[1)]	IA M5=	30685
134	149	15	IC M5=[1)]	IC M5=	30687

[1)] *Invalid in 7UT682*

3.3.2 User defined ASDU9 (Measurements II)

Function type	information number	Position	Name	Description	Obj. - Adr.
130	149	1	Res1	User define 1	-
130	149	2	Res2	User define 2	-
130	149	3	Res3	User define 3	-
130	149	4	Res4	User define 4	-
130	149	5	Res5	User define 5	-
130	149	6	Res6	User define 6	-
130	149	7	Res7	User define 7	-
130	149	8	Res8	User define 8	-
130	149	9	Res9	User define 9	-
130	149	10	Res10[1)]	User define 10	-
130	149	11	Res11[1)]	User define 11	-
130	149	12	Res12[1)]	User define 12	-
130	149	13	Res13[1)]	User define 13	-
130	149	14	Res14[1)]	User define 14	-
130	149	15	Res15[1)]	User define 15	-
130	149	16	Res16[1)]	User define 16	-

[1)] *Invalid in 7UT682*

3.3.3 Metering values (Invalid in 7UT682)

ASDU	Function type	information 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

ASDU	Function type	information number	Name	Description	Obj. - Adr.
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 = Generic Identification Number

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	6	1201	FCT 87	Differential Protection	1)	
10	7	1205	INC.CHAR.START	Increase of Trip Char. During Start	2)	
10	8	1206	INRUSH 2.HARM.	Inrush with 2. Harmonic Restraint	2)	
10	9	1207	RESTR. n.HARM.	n-th Harmonic Restraint	OFF=23 3.Harmonic=30219 5.Harmonic=30220	
10	10	1208	I-DIFF> MON.	Differential Current monitoring	2)	
10	11	1210	I> CURR. GUARD	I> for Current Guard		
10	12	1221	87-1	Pickup Value of Differential Curr.		
10	13	1231	87-2	Pickup Value of High Set Trip		
10	14	1253	T START MAX	Maximum Permissible Starting Time		
10	15	1271	87 2. HARMONIC	2nd Harmonic Content in I-DIFF		
10	16	1276	87 n. HARMONIC	n-th Harmonic Content in I-DIFF		
10	17	1281	I-DIFF> MON.	Pickup Value of diff. Current Monitoring		
10	18	1282	T I-DIFF> MON.	T I-DIFF> Monitoring Time Delay		
10	19	1301	RGF PROT.	Restricted Earth Fault Protection	1)	
10	20	1311	87G-1	Pick up value I REF>		
10	21	1401	RGF PROT.	Restricted Earth Fault Protection	1)	12)
10	22	1411	87G-1	Pick up value I REF>		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	23	1701	COLDLOAD PICKUP	Cold-Load-Pickup Function	No Current=12968 Breaker Contact=12969	
10	24	1702	StartCLP 50/51	Start Condition CLP for O/C Phase		
10	25	1703	StartCLP 50/51N	Start Condition CLP for O/C 3I0		
10	26	1704	StartCLP 50/51G	Start Condition CLP for O/C Earth		
10	27	1705	StartCLP50/51#2	Start Condition CLP for O/C Phase 2		
10	28	1706	StartCLP50/51#3	Start Condition CLP for O/C Phase 3		
10	29	1707	StrtCLP50/51N#2	Start Condition CLP for O/C 3I0 2		
10	30	1708	StrtCLP50/51N#3	Start Condition CLP for O/C 3I0 3		
10	31	1709	StrtCLP50/51G#2	Start Condition CLP for O/C Earth 2		
10	32	1711	CB Open Time	Circuit Breaker OPEN Time		
10	33	1712	Active Time	Active Time		
10	34	1713	Stop Time	Stop Time		
10	35	2001	FCT 50/51	Phase Time Overcurrent	1)	
10	36	2002	50/51 Inr.Rest	InRush Restrained O/C Phase	2)	
10	37	2011	50-2 PICKUP	I>> Pickup		
10	38	2012	50-2 PICKUP	I>> Pickup		
10	39	2013	50-2 DELAY	T I>> Time Delay		
10	40	2014	50-1 PICKUP	I> Pickup		
10	41	2015	50-1 PICKUP	I> Pickup		
10	42	2016	50-1 DELAY	T I> Time Delay		
10	43	2021	51 PICKUP	Ip Pickup		
10	44	2022	51 PICKUP	Ip Pickup		
10	45	2023	51 TIME DIAL	T Ip Time Dial		
10	46	2024	51 TIME DIAL	D Ip Time Dial		
10	47	2025	51 DROP-OUT	TOC Drop-out characteristic	4)	
10	48	2026	51 IEC CURVE	IEC Curve	5)	
10	49	2027	51 ANSI CURVE	ANSI Curve	6)	
10	50	2031	51 PU T/Tp	Pickup Curve I/Ip - TI/TIp		
10	51	2032	51 Res T/Tp	Multiple of Pickup <-> TI/TIp		
10	52	2041	50/51 2.HARM.	2nd harmonic O/C Ph. in % of fundamental		
10	53	2042	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		
10	54	2043	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		
10	55	2044	50/51 CROSS BLK	CROSS BLOCK O/C Phase	3)	
10	56	2045	50/51 T CRS BLK	CROSS BLOCK Time O/C Phase		
10	57	2111	50c-2 PICKUP	I>> Pickup		
10	58	2112	50c-2 PICKUP	I>> Pickup		
10	59	2113	50c-2 DELAY	T I>> Time Delay		
10	60	2114	50c-1 PICKUP	I> Pickup		
10	61	2115	50c-1 PICKUP	I> Pickup		
10	62	2116	50c-1 DELAY	T I> Time Delay		

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	63	2121	51c PICKUP	Ip Pickup		
10	64	2122	51c PICKUP	Ip Pickup		
10	65	2123	51c TIME DIAL	T Ip Time Dial		
10	66	2124	51c TIME DIAL	D Ip Time Dial		
10	67	3001	FCT 50/51	Phase Time Overcurrent	1)	12)
10	68	3002	50/51 Inr.Rest	InRush Restrained O/C Phase	2)	12)
10	69	3011	50-2 PICKUP	I>> Pickup		12)
10	70	3012	50-2 PICKUP	I>> Pickup		12)
10	71	3013	50-2 DELAY	T I>> Time Delay		12)
10	72	3014	50-1 PICKUP	I> Pickup		12)
10	73	3015	50-1 PICKUP	I> Pickup		12)
10	74	3016	50-1 DELAY	T I> Time Delay		12)
10	75	3021	51 PICKUP	Ip Pickup		12)
10	76	3022	51 PICKUP	Ip Pickup		12)
10	77	3023	51 TIME DIAL	T Ip Time Dial		12)
10	78	3024	51 TIME DIAL	D Ip Time Dial		12)
10	79	3025	51 DROP-OUT	TOC Drop-out characteristic	4)	12)
10	80	3026	51 IEC CURVE	IEC Curve	5)	12)
10	81	3027	51 ANSI CURVE	ANSI Curve	6)	12)
10	82	3031	51 PU T/Tp	Pickup Curve I/Ip - TI/TIp		12)
10	83	3032	51 Res T/Tp	Multiple of Pickup <-> TI/TIp		12)
10	84	3041	50/51 2.HARM.	2nd harmonic O/C Ph. in % of fundamental		12)
10	85	3042	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		12)
10	86	3043	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		12)
10	87	3044	50/51 CROSS BLK	CROSS BLOCK O/C Phase	3)	12)
10	88	3045	50/51 T CRS BLK	CROSS BLOCK Time O/C Phase		12)
10	89	3111	50c-2 PICKUP	I>> Pickup		12)
10	90	3112	50c-2 PICKUP	I>> Pickup		12)
10	91	3113	50c-2 DELAY	T I>> Time Delay		12)
10	92	3114	50c-1 PICKUP	I> Pickup		12)
10	93	3115	50c-1 PICKUP	I> Pickup		12)
10	94	3116	50c-1 DELAY	T I> Time Delay		12)
10	95	3121	51c PICKUP	Ip Pickup		12)
10	96	3122	51c PICKUP	Ip Pickup		12)
10	97	3123	51c TIME DIAL	T Ip Time Dial		12)
10	98	3124	51c TIME DIAL	D Ip Time Dial		12)
10	99	3201	FCT 50/51	Phase Time Overcurrent	1)	12)
10	100	3202	50/51 Inr.Rest	InRush Restrained O/C Phase	2)	12)
10	101	3211	50-2 PICKUP	I>> Pickup		12)
10	102	3212	50-2 PICKUP	I>> Pickup		12)
10	103	3213	50-2 DELAY	T I>> Time Delay		12)
10	104	3214	50-1 PICKUP	I> Pickup		12)
10	105	3215	50-1 PICKUP	I> Pickup		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	106	3216	50-1 DELAY	T I> Time Delay		12)
10	107	3221	51 PICKUP	Ip Pickup		12)
10	108	3222	51 PICKUP	Ip Pickup		12)
10	109	3223	51 TIME DIAL	T Ip Time Dial		12)
10	110	3224	51 TIME DIAL	D Ip Time Dial		12)
10	111	3225	51 DROP-OUT	TOC Drop-out characteristic	4)	12)
10	112	3226	51 IEC CURVE	IEC Curve	5)	12)
10	113	3227	51 ANSI CURVE	ANSI Curve	6)	12)
10	114	3231	51 PU T/Tp	Pickup Curve I/Ip - TI/TIp		12)
10	115	3232	51 Res T/Tp	Multiple of Pickup <-> TI/TIp		12)
10	116	3241	50/51 2.HARM.	2nd harmonic O/C Ph. in % of fundamental		12)
10	117	3242	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		12)
10	118	3243	50/51 Max Inr.	Maximum Current for Inr. Rest. O/C Phase		12)
10	119	3244	50/51 CROSS BLK	CROSS BLOCK O/C Phase	3)	12)
10	120	3245	50/51 T CRS BLK	CROSS BLOCK Time O/C Phase		12)
10	121	3311	50c-2 PICKUP	I>> Pickup		12)
10	122	3312	50c-2 PICKUP	I>> Pickup		12)
10	123	3313	50c-2 DELAY	T I>> Time Delay		12)
10	124	3314	50c-1 PICKUP	I> Pickup		12)
10	125	3315	50c-1 PICKUP	I> Pickup		12)
10	126	3316	50c-1 DELAY	T I> Time Delay		12)
10	127	3321	51c PICKUP	Ip Pickup		12)
10	128	3322	51c PICKUP	Ip Pickup		12)
10	129	3323	51c TIME DIAL	T Ip Time Dial		12)
10	130	3324	51c TIME DIAL	D Ip Time Dial		12)
10	131	2201	FCT 50N/51N	3I0 Time Overcurrent	1)	12)
10	132	2202	50/51N Inr.Rest	InRush Restrained O/C 3I0	2)	12)
10	133	2211	50N-2 PICKUP	3I0>> Pickup		12)
10	134	2212	50N-2 PICKUP	3I0>> Pickup		12)
10	135	2213	50N-2 DELAY	T 3I0>> Time Delay		12)
10	136	2214	50N-1 PICKUP	3I0> Pickup		12)
10	137	2215	50N-1 PICKUP	3I0> Pickup		12)
10	138	2216	50N-1 DELAY	T 3I0> Time Delay		12)
10	139	2221	51N PICKUP	3I0p Pickup		12)
10	140	2222	51N PICKUP	3I0p Pickup		12)
10	141	2223	51N TIME DIAL	T 3I0p Time Dial		12)
10	142	2224	51N TIME DIAL	D 3I0p Time Dial		12)
10	143	2225	51N DROP-OUT	TOC Drop-out Characteristic	4)	12)
10	144	2226	51N IEC CURVE	IEC Curve	5)	12)
10	145	2227	51N ANSI CURVE	ANSI Curve	6)	12)
10	146	2231	51N PU T/TI0p	Pickup Curve 3I0/3I0p - T3I0/T3I0p		12)
10	147	2232	51N Res T/TI0p	Multiple of Pickup <-> T3I0/T3I0p		12)
10	148	2241	50/51N 2.HARM.	2nd harmonic O/C 3I0 in % of fundamental		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	149	2242	50/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	150	2243	50/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	151	2311	50Nc-2 PICKUP	3I0>> Pickup		
10	152	2312	50Nc-2 PICKUP	3I0>> Pickup		
10	153	2313	50Nc-2 DELAY	T 3I0>> Time Delay		
10	154	2314	50Nc-1 PICKUP	3I0> Pickup		
10	155	2315	50Nc-1 PICKUP	3I0> Pickup		
10	156	2316	50Nc-1 DELAY	T 3I0> Time Delay		
10	157	2321	51Nc PICKUP	3I0p Pickup		
10	158	2322	51Nc PICKUP	3I0p Pickup		
10	159	2323	51Nc TIME DIAL	T 3I0p Time Dial		
10	160	2324	51Nc TIME DIAL	D 3I0p Time Dial		
10	161	3401	FCT 50N/51N	3I0 Time Overcurrent	1)	12)
10	162	3402	50/51N Inr.Rest	InRush Restrained O/C 3I0	2)	12)
10	163	3411	50N-2 PICKUP	3I0>> Pickup		12)
10	164	3412	50N-2 PICKUP	3I0>> Pickup		12)
10	165	3413	50N-2 DELAY	T 3I0>> Time Delay		12)
10	166	3414	50N-1 PICKUP	3I0> Pickup		12)
10	167	3415	50N-1 PICKUP	3I0> Pickup		12)
10	168	3416	50N-1 DELAY	T 3I0> Time Delay		12)
10	169	3421	51N PICKUP	3I0p Pickup		12)
10	170	3422	51N PICKUP	3I0p Pickup		12)
10	171	3423	51N TIME DIAL	T 3I0p Time Dial		12)
10	172	3424	51N TIME DIAL	D 3I0p Time Dial		12)
10	173	3425	51N DROP-OUT	TOC Drop-out Characteristic	4)	12)
10	174	3426	51N IEC CURVE	IEC Curve	5)	12)
10	175	3427	51N ANSI CURVE	ANSI Curve	6)	12)
10	176	3431	51N PU T/TI0p	Pickup Curve 3I0/3I0p - T3I0/T3I0p		12)
10	177	3432	51N Res T/TI0p	Multiple of Pickup <-> T3I0/T3I0p		12)
10	178	3441	50N/51N 2.HARM.	2nd harmonic O/C 3I0 in % of fundamental		12)
10	179	3442	50N/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	180	3443	50N/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	181	3511	50Nc-2 PICKUP	3I0>> Pickup		12)
10	182	3512	50Nc-2 PICKUP	3I0>> Pickup		12)
10	183	3513	50Nc-2 DELAY	T 3I0>> Time Delay		12)
10	184	3514	50Nc-1 PICKUP	3I0> Pickup		12)
10	186	3516	50Nc-1 DELAY	T 3I0> Time Delay		12)
10	187	3521	51Nc PICKUP	3I0p Pickup		12)
10	188	3522	51Nc PICKUP	3I0p Pickup		12)
10	189	3523	51Nc TIME DIAL	T 3I0p Time Dial		12)
10	190	3524	51Nc TIME DIAL	D 3I0p Time Dial		12)
10	191	3601	FCT 50N/51N	3I0 Time Overcurrent	1)	12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	192	3602	50N/51N Inr.Rest	InRush Restrained O/C 3I0	2)	12)
10	193	3611	50N-2 PICKUP	3I0>> Pickup		12)
10	194	3612	50N-2 PICKUP	3I0>> Pickup		12)
10	195	3613	50N-2 DELAY	T 3I0>> Time Delay		12)
10	196	3614	50N-1 PICKUP	3I0> Pickup		12)
10	197	3615	50N-1 PICKUP	3I0> Pickup		12)
10	198	3616	50N-1 DELAY	T 3I0> Time Delay		12)
10	199	3621	51N PICKUP	3I0p Pickup		12)
10	200	3622	51N PICKUP	3I0p Pickup		12)
10	201	3623	51N TIME DIAL	T 3I0p Time Dial		12)
10	202	3624	51N TIME DIAL	D 3I0p Time Dial		12)
10	203	3625	51N DROP-OUT	TOC Drop-out Characteristic	4)	12)
10	204	3626	51N IEC CURVE	IEC Curve	5)	12)
10	205	3627	51N ANSI CURVE	ANSI Curve	6)	12)
10	206	3631	51N PU T/TI0p	Pickup Curve 3I0/3I0p - T3I0/T3I0p		12)
10	207	3632	51N Res T/TI0p	Multiple of Pickup <-> T3I0/T3I0p		12)
10	208	3641	50/51N 2.HARM.	2nd harmonic O/C 3I0 in % of fundamental		12)
10	209	3642	50N/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	210	3643	50N/51N Max Inr.	Maximum Current for Inr. Rest. O/C 3I0		12)
10	211	3711	50Nc-2 PICKUP	3I0>> Pickup		12)
10	212	3712	50Nc-2 PICKUP	3I0>> Pickup		12)
10	213	3713	50Nc-2 DELAY	T 3I0>> Time Delay		12)
10	214	3714	50Nc-1 PICKUP	3I0> Pickup		12)
10	215	3715	50Nc-1 PICKUP	3I0> Pickup		12)
10	216	3716	50Nc-1 DELAY	T 3I0> Time Delay		12)
10	217	3721	51Nc PICKUP	3I0p Pickup		12)
10	218	3722	51Nc PICKUP	3I0p Pickup		12)
10	219	3723	51Nc TIME DIAL	T 3I0p Time Dial		12)
10	220	3724	51Nc TIME DIAL	D 3I0p Time Dial		12)
10	221	2401	FCT 50G/51G	Earth Time Overcurrent	1)	
10	222	2402	50/51G Inr.Rest	InRush Restrained O/C Earth	2)	
10	223	2411	50G-2 PICKUP	IE>> Pickup		
10	224	2412	50G-2 DELAY	T IE>> Time Delay		
10	225	2413	50G-1 PICKUP	IE> Pickup		
10	226	2414	50G-1 DELAY	T IE> Time Delay		
10	227	2421	51G PICKUP	IEp Pickup		
10	228	2422	51G TIME DIAL	T IEp Time Dial		
10	229	2423	51G TIME DIAL	D IEp Time Dial		
10	230	2424	51G DROP-OUT	TOC Drop-out Characteristic	4)	
10	231	2425	51G IEC CURVE	IEC Curve	5)	
10	232	2426	51G ANSI CURVE	ANSI Curve	6)	
10	233	2431	51G PU T/TEp	Pickup Curve IE/IEp - TIE/TIEp		
10	234	2432	51G Res T/TEp	Multiple of Pickup <-> TI/TIEp		

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
10	235	2441	50/51G 2.HARM.	2nd harmonic O/C E in % of fundamental		
10	236	2442	50/51G Max Inr.	Maximum Current for Inr. Rest. O/C Earth		
10	237	2511	50Gc-2 PICKUP	IE>> Pickup		
10	238	2512	50Gc-2 DELAY	T IE>> Time Delay		
10	239	2513	50Gc-1 PICKUP	IE> Pickup		
10	240	2514	50Gc-1 DELAY	T IE> Time Delay		
10	241	2521	51Gc PICKUP	IEp Pickup		
10	242	2522	51Gc TIME DIAL	T IEp Time Dial		
10	243	2523	51Gc TIME DIAL	D IEp Time Dial		
10	244	3801	FCT 50G/51G	Earth Time Overcurrent	1)	12)
10	245	3802	50/51G Inr.Rest	InRush Restrained O/C Earth	2)	12)
10	246	3811	50G-2 PICKUP	IE>> Pickup		12)
10	247	3812	50G-2 DELAY	T IE>> Time Delay		12)
10	248	3813	50G-1 PICKUP	IE> Pickup		12)
10	249	3814	50G-1 DELAY	T IE> Time Delay		12)
10	250	3821	51G PICKUP	IEp Pickup		12)
10	251	3822	51G TIME DIAL	T IEp Time Dial		12)
10	252	3823	51G TIME DIAL	D IEp Time Dial		12)
10	253	3824	51G DROP-OUT	TOC Drop-out Characteristic	4)	12)
10	254	3825	51G IEC CURVE	IEC Curve	5)	12)
10	255	3826	51G ANSI CURVE	ANSI Curve	6)	12)
11	0	3831	51G PU T/TEp	Pickup Curve IE/IEp - TIE/TIEp		12)
11	1	3832	51G Res T/TEp	Multiple of Pickup <-> TI/TIEp		12)
11	2	3841	50/51G 2.HARM.	2nd harmonic O/C E in % of fundamental		12)
11	3	3842	50/51G Max Inr.	Maximum Current for Inr. Rest. O/C Earth		12)
11	4	3911	50Gc-2 PICKUP	IE>> Pickup		12)
11	5	3912	50Gc-2 DELAY	T IE>> Time Delay		12)
11	6	3913	50Gc-1 PICKUP	IE> Pickup		12)
11	7	3914	50Gc-1 DELAY	T IE> Time Delay		12)
11	8	3921	51Gc PICKUP	IEp Pickup		12)
11	9	3922	51Gc TIME DIAL	T IEp Time Dial		12)
11	10	3923	51Gc TIME DIAL	D IEp Time Dial		12)
11	11	2701	FCT 50 1Ph	1Phase Time Overcurrent	1)	
11	12	2702	50 1Ph-2 PICKUP	1Phase O/C I>> Pickup		
11	13	2703	50 1Ph-2 PICKUP	1Phase O/C I>> Pickup		
11	14	2704	50 1Ph-2 DELAY	T 1Phase O/C I>> Time Delay		
11	15	2705	50 1Ph-1 PICKUP	1Phase O/C I> Pickup		
11	16	2706	50 1Ph-1 PICKUP	1Phase O/C I> Pickup		
11	17	2707	50 1Ph-1 DELAY	T 1Phase O/C I> Time Delay		
11	18	4001	FCT 46	Unbalance Load (Negative Sequence)	1)	
11	19	4011	46-2 PICKUP	I2>> Pickup		
11	20	4012	46-2 PICKUP	I2>> Pickup		

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
11	21	4013	46-2 DELAY	T I2>> Time Delay		
11	22	4014	46-1 PICKUP	I2> Pickup		
11	23	4015	46-1 PICKUP	I2> Pickup		
11	24	4016	46-1 DELAY	T I2> Time Delay		
11	25	4021	46-TOC PICKUP	I2p Pickup		
11	26	4022	46-TOC PICKUP	I2p Pickup		
11	27	4023	46-TOC TIMEDIAL	T I2p Time Dial		
11	28	4024	46-TOC TIMEDIAL	D I2p Time Dial		
11	29	4025	46-TOC DROP-OUT	I2p Drop-out Characteristic	4)	
11	30	4026	46 IEC CURVE	IEC Curve	5)	
11	31	4027	46 ANSI CURVE	ANSI Curve	6)	
11	32	4031	46 I2>	Continously Permissible Current I2		
11	33	4032	I2 tolerance	Permissable quiescent unbalanced load		
11	34	4033	46 T WARN	Warning Stage Time Delay		
11	35	4034	46 PERM.TIME K	Negativ Sequence Factor K		
11	36	4035	46 T COOL DOWN	Time for Cooling Down		
11	37	4201	FCT 49	Thermal Overload Protection	8)	
11	38	4202	49 K-FACTOR	K-Factor		
11	39	4203	TIME CONSTANT	Thermal Time Constant		
11	40	4204	49 \16 ALARM	Thermal Alarm Stage		
11	41	4205	I ALARM	Current Overload Alarm Setpoint		
11	42	4210	TEMPSENSOR RTD	Temperature sensor connected to RTD		
11	43	4211	TEMPSENSOR RTD	Temperature sensor connected to RTD		
11	44	4212	49 TEMP. RISE I	Temperature Rise at Rated Sec. Curr.		
11	45	4213	49 TEMP. RISE I	Temperature Rise at Rated Sec. Curr.		
11	46	4220	OIL-DET. RTD	Oil-Detector conected at RTD		
11	47	4221	OIL Sensor RTD	Oil sensor connected to RTD		
11	48	4222	HOT SPOT ST. 1	Hot Spot Temperature Stage 1 Pickup		
11	49	4223	HOT SPOT ST. 1	Hot Spot Temperature Stage 1 Pickup		
11	50	4224	HOT SPOT ST. 2	Hot Spot Temperature Stage 2 Pickup		
11	51	4225	HOT SPOT ST. 2	Hot Spot Temperature Stage 2 Pickup		
11	52	4226	AG. RATE ST. 1	Aging Rate STAGE 1 Pickup		
11	53	4227	AG. RATE ST. 2	Aging Rate STAGE 2 Pickup		
11	54	4231	METH. COOLING	Method of Cooling		
11	55	4232	Y-WIND.EXPONENT	Y-Winding Exponent		
11	56	4233	HOT-SPOT GR	Hot-spot to top-oil gradient		
11	57	4401	FCT 49	Thermal Overload Protection	8)	12)
11	58	4402	49 K-FACTOR	K-Factor		12)
11	59	4403	TIME CONSTANT	Thermal Time Constant		12)
11	60	4404	49 \16 ALARM	Thermal Alarm Stage		12)
11	61	4405	I ALARM	Current Overload Alarm Setpoint		12)
11	62	4410	TEMPSENSOR RTD	Temperature sensor connected to RTD		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
11	63	4411	TEMPSENSOR RTD	Temperature sensor connected to RTD		12)
11	64	4412	49 TEMP. RISE I	Temperature Rise at Rated Sec. Curr.		12)
11	65	4413	49 TEMP. RISE I	Temperature Rise at Rated Sec. Curr.		12)
11	66	4420	OIL-DET. RTD	Oil-Detector conected at RTD		12)
11	67	4421	OIL Sensor RTD	Oil sensor connected to RTD		12)
11	68	4422	HOT SPOT ST. 1	Hot Spot Temperature Stage 1 Pickup		12)
11	69	4423	HOT SPOT ST. 1	Hot Spot Temperature Stage 1 Pickup		12)
11	70	4424	HOT SPOT ST. 2	Hot Spot Temperature Stage 2 Pickup		12)
11	71	4425	HOT SPOT ST. 2	Hot Spot Temperature Stage 2 Pickup		12)
11	72	4426	AG. RATE ST. 1	Aging Rate STAGE 1 Pickup		12)
11	73	4427	AG. RATE ST. 2	Aging Rate STAGE 2 Pickup		12)
11	74	4431	METH. COOLING	Method of Cooling	7)	12)
11	75	4432	Y-WIND.EXPONENT	Y-Winding Exponent		12)
11	76	4433	HOT-SPOT GR	Hot-spot to top-oil gradient		12)
11	77	4301	FCT 24 V/f	Overexcitation Protection (U/f)	1)	12)
11	78	4302	24-1 PICKUP	U/f > Pickup		12)
11	79	4303	24-1 DELAY	T U/f > Time Delay		12)
11	80	4304	24-2 PICKUP	U/f >> Pickup		12)
11	81	4305	24-2 DELAY	T U/f >> Time Delay		12)
11	82	4306	24-t(V/f=1.05)	U/f = 1.05 Time Delay		12)
11	83	4307	24-t(V/f=1.10)	U/f = 1.10 Time Delay		12)
11	84	4308	24-t(V/f=1.15)	U/f = 1.15 Time Delay		12)
11	85	4309	24-t(V/f=1.20)	U/f = 1.20 Time Delay		12)
11	86	4310	24-t(V/f=1.25)	U/f = 1.25 Time Delay		12)
11	87	4311	24-t(V/f=1.30)	U/f = 1.30 Time Delay		12)
11	88	4312	24-t(V/f=1.35)	U/f = 1.35 Time Delay		12)
11	89	4313	24-t(V/f=1.40)	U/f = 1.40 Time Delay		12)
11	90	4314	24 T COOL DOWN	Time for cool down		12)
11	91	5001	FCT 32R	Reverse Power Protection	1)	12)
11	92	5011	32R PICKUP	P> Reverse Pickup		12)
11	93	5012	32R PICKUP	Pick-up threshold reverse power		12)
11	94	5013	32R T-SV-OPEN	Time Delay Long (without Stop Valve)		12)
11	95	5014	32R T-SV-CLOSED	Time Delay Short (with Stop Valve)		12)
11	96	5101	FCT 32 F	Forward Power Supervision	1)	12)
11	97	5111	32F PICKUP P<	P-forw.< Supervision Pickup		12)
11	98	5112	32F PICKUP P<	Pick-up threshold P<		12)
11	99	5113	32F DELAY P<	T-P-forw.< Time Delay		12)
11	100	5114	32F PICKUP P>	P-forw.> Supervision Pickup		12)
11	101	5115	32F PICKUP P>	Pick-up threshold P>		12)
11	102	5116	32F DELAY P>	T-P-forw.> Time Delay		12)
11	103	5201	FCT 27	Undervoltage Protection	1)	12)
11	104	5211	27-1 PICKUP	U< Pickup		12)
11	105	5212	27-1 PICKUP	Pick-up voltage U<		12)
11	106	5213	27-1 DELAY	T U< Time Delay		12)
11	107	5214	27-2 PICKUP	U<< Pickup		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
11	108	5215	27-2 PICKUP	Pick-up voltage U<<		12)
11	109	5216	27-2 DELAY	T U<< Time Delay		12)
11	110	5301	FCT 59	Overvoltage Protection	1)	12)
11	111	5311	59-1 PICKUP	U> Pickup		12)
11	112	5312	59-1 PICKUP	Pick-up voltage U>		12)
11	113	5313	59-1 DELAY	T U> Time Delay		12)
11	114	5314	59-2 PICKUP	U>> Pickup		12)
11	115	5315	59-2 PICKUP	Pick-up voltage U>>		12)
11	116	5316	59-2 DELAY	T U>> Time Delay		12)
11	117	5601	FCT 81 O/U	Over / Under Frequency Protection	1)	12)
11	118	5611	81-1UF PICKUP	Pick-up frequency f<		12)
11	119	5612	81-2UF PICKUP	Pick-up frequency f<<		12)
11	120	5613	81-3UF PICKUP	Pick-up frequency f<<<		12)
11	121	5614	81-4OF PICKUP	Pick-up frequency f>		12)
11	122	5621	81-1UF PICKUP	Pick-up frequency f<		12)
11	123	5622	81-2UF PICKUP	Pick-up frequency f<<		12)
11	124	5623	81-3UF PICKUP	Pick-up frequency f<<<		12)
11	125	5624	81-4OF PICKUP	Pick-up frequency f>		12)
11	126	5631	81-1UF PICKUP	Pick-up frequency f<		12)
11	127	5632	81-2UF PICKUP	Pick-up frequency f<<		12)
11	128	5633	81-3UF PICKUP	Pick-up frequency f<<<		12)
11	129	5634	81-4OF PICKUP	Pick-up frequency f>		12)
11	130	5641	81-1UF DELAY	Delay time T f<		12)
11	131	5642	81-2UF DELAY	Delay time T f<<		12)
11	132	5643	81-3UF DELAY	Delay time T f<<<		12)
11	133	5644	81-4OF DELAY	Delay time T f>		12)
11	134	5651	81 V MIN	Minimum Required Voltage for Operation		12)
11	135	5652	81 V MIN	Minimum voltage		12)
11	136	7001	FCT 50BF	Breaker Failure Protection	1)	
11	137	7011	START WITH REL.	Start with Relay (intern)		
11	138	7012	START WITH REL.	Start with Relay (intern)		
11	139	7015	50BF-1 DELAY	T1, Delay of 1st stage (local trip)		
11	140	7016	50BF-2 DELAY	T2, Delay of 2nd stage (busbar trip)		
11	141	7101	FCT 50BF	Breaker Failure Protection	1)	12)
11	142	7111	START WITH REL.	Start with Relay (intern)		12)
11	143	7112	START WITH REL.	Start with Relay (intern)		12)
11	144	7115	50BF-1 DELAY	T1, Delay of 1st stage (local trip)		12)
11	145	7116	50BF-2 DELAY	T2, Delay of 2nd stage (busbar trip)		12)
11	146	7601	POWER CALCUL.	Calculation of Power	9)	12)
11	147	7611	DMD Interval	Demand Calculation Intervals	10)	
11	148	7612	DMD Sync.Time	Demand Synchronization Time	11)	
11	149	7621	MinMax cycRESET	Automatic Cyclic Reset Function	3)	
11	150	7622	MiMa RESET TIME	MinMax Reset Timer		
11	151	7623	MiMa RESETCYCLE	MinMax Reset Cycle Period		
11	152	7624	MinMaxRES.START	MinMax Start Reset Cycle in		

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
11	153	8101	BALANCE I	Current Balance Supervision	2)	
11	154	8102	BALANCE V	Voltage Balance Supervision		12)
11	155	8104	SUMMATION V	Voltage Summation Supervision		12)
11	156	8105	PHASE ROTAT. I	Current Phase Rotation Supervision		
11	157	8106	PHASE ROTAT. V	Voltage Phase Rotation Supervision		12)
11	158	8111	BAL. I LIMIT M1	Current Balance Monitor Meas. Loc. 1		
11	159	8112	BAL. FACT. I M1	Bal. Factor for Curr. Monitor Meas.Loc.1		
11	160	8121	BAL. I LIMIT M2	Current Balance Monitor Meas. Loc. 2		
11	161	8122	BAL. FACT. I M2	Bal. Factor for Curr. Monitor Meas.Loc.2		
11	162	8131	BAL. I LIMIT M3	Current Balance Monitor Meas. Loc. 3		12)
11	163	8132	BAL. FACT. I M3	Bal. Factor for Curr. Monitor Meas.Loc.3		12)
11	164	8141	BAL. I LIMIT M4	Current Balance Monitor Meas. Loc. 4		12)
11	165	8142	BAL. FACT. I M4	Bal. Factor for Curr. Monitor Meas.Loc.4		12)
11	166	8151	BAL. I LIMIT M5	Current Balance Monitor Meas. Loc. 5		12)
11	167	8152	BAL. FACT. I M5	Bal. Factor for Curr. Monitor Meas.Loc.5		12)
11	168	8161	BALANCE V-LIMIT	Voltage Threshold for Balance Monitoring		12)
11	169	8162	BAL. FACTOR V	Balance Factor for Voltage Monitor		12)
11	170	8201	FCT 74TC	TRIP Circuit Supervision	2)	
11	171	8401	BROKEN WIRE	Fast broken current-wire supervision		
11	172	8403	FUSE FAIL MON.	Fuse Failure Monitor		
11	173	8601	EXTERN TRIP 1	External Trip Function 1	1)	
11	174	8602	T DELAY	Ext. Trip 1 Time Delay		
11	175	8701	EXTERN TRIP 2	External Trip Function 2	1)	
11	176	8702	T DELAY	Ext. Trip 2 Time Delay		
11	177	5321	59-1 Pickup	U> Pickup		
11	178	5322	59-1 Pickup	U> Pickup		
11	179	5324	59-2 Pickup	U>> Pickup		
11	180	5325	59-2 Pickup	U>> Pickup		
11	181	5701	FCT 59	Overvoltage Protection	1)	12)
11	182	5714	59N-1 PICKUP	Ue> Pickup		12)
11	183	5704	59N-1 PICKUP	Ue> Pickup		12)
11	184	5704	59N-1 PICKUP	Ue> Pickup		12)
11	185	5710	59N-1 PICKUP	Ue> Pickup		12)
11	186	5712	59N-1 PICKUP	Ue> Pickup		12)
11	187	5718	59N-1 PICKUP	Ue> Pickup		12)
11	188	5705	59N-1 DELAY	T Ue> Time Delay		12)
11	189	5702	59N-2 PICKUP	Ue>> Pickup		12)

GIN		Obj-Adr.	Name	Description	Generic Identification data	Remark
Group	Entry					
11	190	5713	59N-2 PICKUP	Ue>> Pickup		12)
11	191	5702	59N-2 PICKUP	Ue>> Pickup		12)
11	192	5709	59N-2 PICKUP	Ue>> Pickup		12)
11	193	5711	59N-2 PICKUP	Ue>> Pickup		12)
11	194	5717	59N-2 PICKUP	Ue>> Pickup		12)
11	195	5703	59N-2 DELAY	T Ue>> Time Delay		12)

1) *ON = 22; OFF= 23; Block relay = 30008*

2) *ON = 22; OFF= 23*

3) *NO = 24; YES = 25*

4) *Instantaneous = 12964; Disk Emulation = 12965*

5) *Normal Inverse =12559; Very Inverse = 12560; Extremely Inv. = 12561;Long Inverse = 12837*

6) *Very Inverse = 12812; Inverse = 12808; Short Inverse = 12809; Long Inverse = 12810; Moderately Inv. = 1281; Extremely Inv. = 12813; Definite Inv. = 12814*

7) *ON = 30231; OFF = 30232; OD = 30233*

8) *ON = 22; OFF = 23; Block relay = 30008; Alarm Only = 12700*

9) *With V setting = 30242; with V measur. = 30243*

10) *15 Min., 1 Sub = 12978; 15 Min., 3 Subs = 12979; 15 Min., 15 Subs = 12980; 30 Min., 1 Sub = 12981; 60 Min., 1 Sub = 12982; 60 Min., 10Subs = 12983; 5 Min., 5 Subs = 12984*

11) *On The Hour = 12972; 15 After Hour = 12973; 30 After Hour = 12974; 45 After Hour = 12975*

12) *Invalid in 7UT682*

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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