SIPROTEC

Redundant T103 Bus mapping
7VU68x

Communication module

Redundant IEC 60870-5-103

Bus mapping

Edition: Apr. 2014

C53000-L2540-C558-1

Preface

Aim of This Manual The manual is devided into the following topics:

- Notes to SIPROTEC® objects

- Redundant IEC 60870-5-103 Device Profile

- Redundant T103 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
SIPROTEC Device 7VU68x	Function, operation, assembly and commissioning of the SIPROTEC® device 7VU68x	C53000-G1176-C349-2
IEC 60870-5-103 Communication Database	redundant IEC 60870-5-103 communication database of the SIPROTEC® devices	C53000-L2540-C558-1

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 7VU683 version V4.70 and 7VU681 version V4.60
- Redundant IEC 60870-5-103 communication module version 01.01.00 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 <u>will</u> result if proper precautions are not taken.

Warning

indicates that death, severe personal injury or substantial property damage <u>can</u> 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.

Table of Contents

Notes to SIPROTEC® objects

<div style="text-align: right; font-size: 3em;">1</div>

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

> *Note*
>
> The description of the standard mappings contains the pre-allocation of the mapping files at delivery or first assignment of a mapping in DIGSI® 4 to the SIPROTEC® device.
>
> Changes of the allocation and the scaling of the measured values are possible in adaptation to the concrete installation environment (ref. to page 3).

1.1 Annunciations

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

1.1.1 Error With A Summary Alarm

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

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

1.1.2 Alarm Summary Event

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

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

1.1.3 Stop Data Transmission

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

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

1.2 Commands

Note

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

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

1.2.1 Single Commands

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

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

Reference   ref. to chap. 3.1.1

1.2.2 Changing The Setting Group

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

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

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

1.3   Measured Values

Note

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

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

Note

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

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

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

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

Reference   Refer to chapter 3.3

IEC 60870-5-103 Interoperability

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Redundant IEC 60870-5-103

DEVICE PROFILE DOCUMENT

Vendor Name: **SIEMENS AG**

Device Name: **7VU683/7VU681**

2.1 Physical Layer

2.1.1 Electrical Interface

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

2.1.2 Optical Interface

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

2.1.3 Transmission Speed

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

2.2 Link Layer

There are no choices for the link layer.

2.3   Application Layer

2.3.1   Transmission Mode For Application Data

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

2.3.2   Common Address of ASDU

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

2.3.3   Selection of Standard Information Numbers In Monitor Direction

2.3.3.1   System Functions In Monitor Direction

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

2.3.3.2   Status Indications In Monitor Direction

	INF	Semantics
☐	<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

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3.1 General Command (Control Direction)

3.1.1 User defined double point command

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. -Adr.
20	240	175	Output 1	User defined double command 1	自定义双点遥控 1	-
20	240	176	Output 2	User defined double command 2	自定义双点遥控 2	-
20	240	177	Output 3	User defined double command 3	自定义双点遥控 3	-

3.1.2 Single Point Command

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. -Adr.
20	176	23	Setting Group A is active	Select parametergroup A and deactivate parameter-group B,C,D	A 组定制投入	
20	176	24	Setting Group B is active	Select parametergroup B and deactivate parameter-group A,C,D	B 组定制投入	-
20	176	25	Setting Group C is active	Select parametergroup C and deactivate parameter-group A,B,D	C 组定制投入	-
20	176	26	Setting Group D is active	Select parametergroup D and deactivate parameter-group A,B,C	D 组定制投入	-
20	176	27	HSBT ON/OFF	High speed busbar transfer ON/OFF (for 7VU683 only)	快切投退	17960
20	176	28	ATS ON/OFF	Automatic Transfer System ON/OFF (for 7VU681 only)	备自投投退	17961
20	176	29	Protections ON/OFF	Protection functions ON/OFF	保护功能投退	17962
20	176	30	Remote Op. CB2	Remote command open CB2 (for 7VU683 only)	远方分 CB2	
20	176	32	Remote Op. CB3	Remote command open CB3 (for 7VU683 only)	远方分 CB3	
20	176	33	Remote Op. CB1	Remote command open CB1 (for 7VU683 only)	远方分 CB1	

3.1.3   **User defined Single Point Command**

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. -Adr.
20	176	18	Output 1	User defined single command 1	自定义双点遥控 1	
20	176	19	Output 2	User defined single command 2	自定义双点遥控 2	
20	176	31	Output 3	User defined single command 3	自定义双点遥控 3	
20	176	34...49	Output 4 ...	User defined single command 4 ...	自定义双点遥控 4 ...	-
			Output 19	User defined single command 19	自定义双点遥控 19	-

3.2 Indications In Monitor Direction

3.2.1 HSBT(For 7VU683 Only)

ASDU	Function type	informa- tion number	Name	Description	描述	Obj. - Adr.
1	200	15	L1 -> L2 Succeeded	Line1 -> Line2 Succeeded	进线 1-> 进线 2 切换成功	17871
1	200	21	L1 -> L2 Failed	Line1 -> Line2 Failed	进线 1-> 进线 2 切换失败	17916
1	200	16	L2 -> L1 Succeeded	Line2 -> Line1 Succeeded	进线 2-> 进线 1 切换成功	17872
1	200	22	L2 -> L1 Failed	Line2 -> Line1 Failed	进线 1-> 进线 2 切换失败	17917
1	200	17	B1 -> B2 Succeeded	Busbar1 -> Busbar2 Succeeded	母线 1-> 母线 2 切换成功	17873
1	200	23	B1 -> B2 Failed	Busbar1 -> Busbar2 Failed	母线 1-> 母线 2 切换失败	17918
1	200	18	B2 -> B1 Succeeded	Busbar2 -> Busbar1 Succeeded	母线 2-> 母线 1 切换成功	17874
1	200	24	B2 -> B1 Failed	Busbar2 -> Busbar1 Failed	母线 2-> 母线 1 切换失败	17919
1	200	19	B1 -> L1 Succeeded	Busbar1 -> Line1 Succeeded	母线 1-> 进线 1 切换成功	17875
1	200	25	B1 -> L1 Failed	Busbar1 -> Line1 Failed	母线 1-> 进线 1 切换失败	17920
1	200	20	B2 -> L2 Succeeded	Busbar2 -> Line2 Succeeded	母线 2-> 进线 2 切换成功	17876
1	200	26	B2 -> L2 Failed	Busbar2 -> Line2 Failed	母线 2-> 进线 2 切换失败	17921
1	200	93	HSBT is Ready	HSBT is Ready	快切充电完成	18012
1	200	91	HSBT Succeed	HSBT Succeed	切换成功	17948
1	200	92	HSBT Failed	HSBT Failed	切换失败	17949
1	200	66	L1 -> L2 ON/OFF	Line1 -> Line2 ON/OFF	进线 1-> 进线 2 投退	17963
1	200	67	L2 -> L1 ON/OFF	Line2 -> Line1 ON/OFF	进线 2-> 进线 1 投退	17964
1	200	68	B1 -> B2 ON/OFF	Busbar1 -> Busbar2 ON/OFF	母线 1-> 母线 2 投退	17965
1	200	69	B1 -> L1 ON/OFF	Busbar1 -> Line1 ON/OFF	母线 1-> 进线 1 投退	17966
1	200	70	B2 -> B1 ON/OFF	Busbar2 -> Busbar1 ON/OFF	母线 2-> 母线 1 投退	17967
1	200	71	B2 -> L2 ON/OFF	Busbar2 -> Line2 ON/OFF	母线 2-> 进线 2 投退	17968
1	200	129	LVLSH Trip	LVLSH Trip	母线低压减载跳闸	30410
1	200	130	B1 LVLSH Trip	B1 LVLSH Trip	一母低压减载跳闸	30412
1	200	131	B2 LVLSH Trip	B2 LVLSH Trip	二母低压减载跳闸	30414
1	200	132	L1->L3 Succeed	L1->L3 Succeed	进线 1-> 进线 3 切换成功	30419
1	200	133	L1->L3 Failed	L1->L3 Failed	进线 1-> 进线 3 切换失败	30421

ASDU	Function type	information number	Name	Description	描述	Obj.-Adr.
1	200	134	L2->L3 Succeed	L2->L3 Succeed	进线 2-> 进线 3 切换成功	30425
1	200	135	L2->L3 Failed	L2->L3 Failed	进线 2-> 进线 3 切换失败	30427
1	200	136	L3->L1 Succeed	L3->L1 Succeed	进线 3-> 进线 1 切换成功	30431
1	200	137	L3->L1 Failed	L3->L1 Failed	进线 3-> 进线 1 切换失败	30433
1	200	138	L3->L2 Succeed	L3->L2 Succeed	进线 3-> 进线 2 切换成功	30437
1	200	139	L3->L2 Failed	L3->L2 Failed	进线 3-> 进线 2 切换失败	30439
1	200	140	L1->L3 ON/OFF	L1->L3 ON/OFF	进线 1-> 母线 3 投退	30440
1	200	141	L2->L3 ON/OFF	L2->L3 ON/OFF	进线 2-> 进线 3 投退	30441
1	200	142	L3->L1 ON/OFF	L3->L1 ON/OFF	进线 3-> 母线 1 投退	30442
1	200	143	L3->L2 ON/OFF	L3->L2 ON/OFF	进线 3-> 进线 2 投退	30443

3.2.2   ATS(For 7VU681 Only)

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. - Adr.
1	200	94	ATS is Ready	ATS is Ready	备自投充电完成	18013
1	200	29	L1 -> L2 Succeeded	Line1 -> Line2 Succeeded	进线 1-> 进线 2 切换成功	17798
1	200	35	L1 -> L2 Failed	Line1 -> Line2 Failed	进线 1-> 进线 2 切换失败	17910
1	200	30	L2 -> L1 Succeeded	Line2 -> Line1 Succeeded	进线 2-> 进线 1 切换成功	17799
1	200	36	L2 -> L1 Failed	Line2 -> Line1 Failed	进线 2-> 进线 1 切换失败	17911
1	200	31	B1 -> B2 Succeeded	Busbar1 -> Busbar2 Succeeded	母线 1-> 母线 2 切换成功	17800
1	200	37	B1 -> B2 Failed	Busbar1 -> Busbar2 Failed	母线 1-> 母线 2 切换失败	17912
1	200	32	B2 -> B1 Succeeded	Busbar2 -> Busbar1 Succeeded	母线 2-> 母线 1 切换成功	17801
1	200	38	B2 -> B1 Failed	Busbar2 -> Busbar1 Failed	母线 2-> 母线 1 切换失败	17913
1	200	33	T1 -> T2 Succeeded	Transformer1 -> Transformer2 Succeeded	主变 1-> 主变 2 切换成功	17802
1	200	39	T1 -> T2 Failed	Transformer1 -> Transformer2 Failed	主变 1-> 主变 2 切换失败	17914
1	200	34	T2 -> T1 Succeeded	Transformer2 -> Transformer1 Succeeded	主变 2-> 主变 1 切换成功	17803
1	200	40	T2 -> T1 Failed	Transformer2 -> Transformer1 Failed	主变 2-> 主变 1 切换失败	17915
1	200	41	LSH Trip (T1)	Load-Shedding Trip (TimeDelay1)	第一轮过负荷联切动作	17734
1	200	42	LSH Trip (T2)	Load-Shedding Trip (TimeDelay2)	第二轮过负荷联切动作	17735
1	200	77	L1 -> L2 ON/OFF	Line1 -> Line2 ON/OFF	进线 1-> 进线 2 投退	17974
1	200	78	L2 -> L1 ON/OFF	Line2 -> Line1 ON/OFF	进线 2-> 进线 1 投退	17975
1	200	79	B1 -> B2 ON/OFF	Busbar1 -> Busbar2 ON/OFF	母线 1-> 母线 2 投退	17976
1	200	80	B2 -> B1 ON/OFF	Busbar2 -> Busbar1 ON/OFF	母线 2-> 母线 1 投退	17977
1	200	81	T1 -> T2 ON/OFF	Transformer1 -> Transformer2 ON/OFF	主变 1-> 主变 2 投退	17978
1	200	82	T2 -> T1 ON/OFF	Transformer2 -> Transformer1 ON/OFF	主变 2-> 主变 1 投退	17979
1	200	83	B1 -> B2 LSON/OFF	Busbar1 -> Busbar2 Load-Shifting ON/OFF	母线 1-> 母线 2 均衡负荷投退	17980
1	200	84	B2 -> B1 LSON/OFF	Busbar2 -> Busbar1 Load-Shifting ON/OFF	母线 2-> 母线 1 均衡负荷投退	18000

3.2.3 Protections

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. - Adr.
1	200	44	I> Trip	Phase Over-current I> Trip	相过流保护二段跳闸	17828
1	200	46	I>> Trip	Phase Over-current I>> Trip	相过流保护一段跳闸	17830
1	200	48	Ie> Trip	Earth Over-current I> Trip	零序过流保护二段跳闸	17837
1	200	50	Ie>> Trip	Earth Over-current I>> Trip	零序过流保护一段跳闸	17839
1	200	54	I> SOF Trip	Phase O/C I> Switch-Onto-Fault Trip	相电流充电保护二段跳闸	17929
1	200	56	I>> SOF Trip	Phase O/C I>> Switch-Onto-Fault Trip	相电流充电保护一段跳闸	17931
1	200	58	Ie> SOF Trip	Earth O/C I> Switch-Onto-Fault Trip	零序电流充电保护二段跳闸	17933
1	200	60	Ie>> SOF Trip	Earth O/C I>> Switch-Onto-Fault Trip	零序电流充电保护一段跳闸	17935
1	200	85	Phase O/C On/Off	Phase Over-current Protection ON/OFF	相过流保护投退	17981
1	200	86	Earth O/C On/Off	Earth Over-current Protection ON/OFF	零序过流保护投退	17982
1	200	87	PhO/C SOF On/Off	Phase O/C Switch-Onto-Fault ON/OFF	相电流充电保护投退	17983
1	200	88	EaO/C SOF On/Off	Earth O/C Switch-Onto-Fault ON/OFF	零序电流充电保护投退	17984

3.2.4 Internal Mode States

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. - Adr.
1	200	1	CommandOpenCB1	Command: Open CB1	跳断路器 1	17760
1	200	2	CommandOpenCB2	Command: Open CB2	跳断路器 2	17761
1	200	3	CommandOpenCB3	Command: Open CB3	跳断路器 3	17762
1	200	4	CommandOpenCB4	Command: Open CB4 (for 7VU681 only)	跳断路器 4	17763
1	200	5	CommandOpenCB5	Command: Open CB5 (for 7VU681 only)	跳断路器 5	17764
1	200	6	CommandOpenCB6	Command: Open CB6 (for 7VU681 only)	跳断路器 6	17765
1	200	7	CommandOpenCB7	Command: Open CB7 (for 7VU681 only)	跳断路器 7	17766
1	200	8	CommandCloseCB1	Command: Close CB1	合断路器 1	17767
1	200	9	CommandCloseCB2	Command: Close CB2	合断路器 2	17768
1	200	10	CommandCloseCB3	Command: Close CB3	合断路器 3	17769

ASDU	Function type	information number	Name	Description	描述	Obj.-Adr.
1	200	11	CommandCloseCB4	Command: Close CB4 (for 7VU681 only)	合断路器 4	17770
1	200	12	CommandCloseCB5	Command: Close CB5 (for 7VU681 only)	合断路器 5	17771
1	200	13	CommandCloseCB6	Command: Close CB6 (for 7VU681 only)	合断路器 6	17772
1	200	14	CommandCloseCB7	Command: Close CB7 (for 7VU681 only)	合断路器 7	17773
1	200	63	HSBT ON/OFF	HSBT ON/OFF	快切投退	17960
1	200	64	ATS ON/OFF	ATS ON/OFF	备自投投退	17961
1	200	65	Protections ON/OFF	Protections ON/OFF	保护功能投退	17962
2	150	151	Relay Pickup	Relay Pickup;	电源切换功能或保护功能启动	501
2	150	161	Relay TRIP	General TRIP of the relay;	保护功能总跳命令	511
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.	A 组定值投入	-
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.	B 组定值投入	-
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.	C 组定值投入	-
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.	D 组定值投入	-

3.2.5 User defined indication

ASDU	Function type	information number	Name	Description	描述	Obj.-Adr.
-	101	85	Input 1	User defined input 1	自定义信息 1	-
-	101	86	Input 2	User defined input 2	自定义信息 2	-
-	135	81	Input 3	User defined input 3	自定义信息 3	-
-	170	60	Input 4	User defined input 4	自定义信息 4	-
-	176	18	Input 5	User defined input 5	自定义信息 5	-
-	176	20	Input 6	User defined input 6	自定义信息 6	-

ASDU	Function type	informa-tion number	Name	Description	描述	Obj. -Adr.
-	176	21	Input 7	User defined input 7	自定义信息 7	-
-	176	22	Input 8	User defined input 8	自定义信息 8	-
-	176	46	Input 9	User defined input 9	自定义信息 9	-
-	176	47	Input 10	User defined input 10	自定义信息 10	-
-	200	43	Input 11	User defined input 11	自定义信息 11	-
-	200	45	Input 12	User defined input 12	自定义信息 12	-
-	200	47	Input 13	User defined input 13	自定义信息 13	-
-	200	49	Input 14	User defined input 14	自定义信息 14	-
-	200	51	Input 15	User defined input 15	自定义信息 15	-
-	200	53	Input 16	User defined input 16	自定义信息 16	-
-	200	55	Input 17	User defined input 17	自定义信息 17	-
-	200	57	Input 18	User defined input 18	自定义信息 18	-
-	200	59	Input 19	User defined input 19	自定义信息 19	-
-	200	61	Input 20	User defined input 20	自定义信息 20	-
-	200	72	Input 21	User defined input 21	自定义信息 21	-
-	200	73	Input 22	User defined input 22	自定义信息 22	-
-	200	74	Input 23	User defined input 23	自定义信息 23	-
-	200	75	Input 24	User defined input 24	自定义信息 24	-
-	200	76	Input 25	User defined input 25	自定义信息 25	-
-	200	95...128	Input 26...Input 59	User defined input 26 ... User defined input 59	自定义信息 26 ... 自定义信息 59	-
-	240	181...200	Input 60...Input 79	User defined input 60 ... User defined input 79	自定义信息 60 ... 自定义信息 79	-

3.3 Measurements

3.3.1 Measurements

Function type	informa-tion number	Position	Name	Description	Obj. - Adr.
134	153	2	Uab_B =	Uab_Busbar =	17597
134	153	3	Ubc_B =	Ubc_Busbar =	17598
134	153	4	Uca_B =	Uca_Busbar =	17599
134	154	1	Uab_B1=	Uab_Busbar1 =	17581
134	154	2	Ubc_B1=	Ubc_Busbar1 =	17582
134	154	3	Uca_B1=	Uca_Busbar1 =	17583
134	155	1	Uab_B2=	Uab_Busbar2 =	17588
134	155	2	Ubc_B2=	Ubc_Busbar2 =	17589
134	155	3	Uca_B2=	Uca_Busbar2 =	17590
134	156	1	Ix_L1=	Ix_Line1 =	17605
134	156	2	Ix_L2=	Ix_Line2 =	17607
134	156	3	Ix_L3=	Ix_Line3 =	30449
134	157	1	Ux_L1 =	Ux_Line1 =	17592
134	157	2	Ux_L2 =	Ux_Line2 =	17593
134	157	3	Ia_B=	Ia_Busbar =	17601
134	157	4	Ib_B=	Ib_Busbar =	17602
134	157	5	Ic_B=	Ic_Busbar =	17603
134	157	6	Ie_B=	Ie_Busbar =	17604
134	157	7	Ux_L3 =	Ux_Line3 =	30448

3.3.2 User Defined Measurements

Function type	informa-tion number	Position	Name	Description	Obj. - Adr.
134	149	7 ... 9	Res1 ... Res3	User define 1 ... User define 3	-
130	149	1 ... 16	Res4 ... Res19	User define 4 ... User define 19	-
134	158	1 ... 16	Res20 ... Res35	User define 20 ... User define 35	-
134	151	1	Res36	User define 36	
134	151	2	Res37	User define 37	
130	152	1	Res38	User define 38	
130	152	2	Res39	User define 39	
130	153	1	Res40	User define 40	

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 Group	GIN Entry	Obj.-Adr.	Name	Generic identification data	描述
10	1	8801	CB1 Closing Time	20...150 ms	CB1 合闸时间
10	2	8802	CB2 Closing Time	20...150 ms	CB2 合闸时间
10	3	8803	CB3 Closing Time	20...150 ms	CB3 合闸时间
10	4	8804	Maximum Permitted HSBT Operating Time	10...60 sec	切换允许最长时间
10	5	8805	Transfer Mode Line1-> Line2	23-OFF; 22- ON	进线 1-> 进线 2 切换方式
10	6	8806	Transfer Mode Line2 -> Line1	23-OFF; 22- ON	进线 2-> 进线 1 切换方式
10	7	8807	Transfer Mode Busbar1 -> Busbar2	23-OFF; 22- ON	母线 1-> 母线 2 切换方式
10	8	8808	Transfer Mode Busbar1 -> Line1	23-OFF;22- ON	母线 1-> 进线 1 切换方式
10	9	8809	Transfer Mode Busbar2 -> Busbar1	23-OFF;22- ON	母线 2-> 母线 1 切换方式
10	10	8810	Transfer Mode Busbar2-> Line2	23-OFF;22- ON	母线 2-> 进线 2 切换方式
10	11	8811	Line1->Line2 LVLSH Permitted	25-Yes;24-No	进线 1-> 进线 2 低压减载
10	12	8812	Line2->Line1 LVLSH Permitted	25-Yes;24-No	进线 2-> 进线 1 低压减载
10	13	8813	Busbar1->Busbar2 LVLSH Permitted	25-Yes;24-No	母线 1-> 母线 2 低压减载
10	14	8814	Busbar2->Busbar1 LVLSH Permitted	25-Yes;24-No	母线 2-> 母线 1 低压减载
10	15	8815	Busbar1->Line1 LVLSH Permitted	25-Yes;24-No	母线 1-> 进线 1 低压减载
10	16	8816	Busbar2->Line2 LVLSH Permitted	25-Yes;24-No	母线 2-> 进线 2 低压减载
10	17	8817	Manual Restart HSBT	25-Yes;24-No	手动复归快切
10	18	8821	NORMAL Condition	23-OFF; 30917-PARALLELAuto; 30918-PARAL.Half-Auto; 30920-SIMULTANEOUS; 30919-SEQUENTIAL;	正常起动方式
10	19	8822	FAULT Start Type A	23-OFF; 30919-SEQUENTIAL; 30920-SIMULTANEOUS;	A 类事故起快切
10	20	8823	Under-voltage	23-OFF; 30919-SEQUENTIAL; 30920-SIMULTANEOUS;	低压起快切
10	21	8824	Under-frequency	23-OFF; 30919-SEQUENTIAL; 30920-SIMULTANEOUS;	低频起快切
10	22	8825	Inadvertent CB Ope	23-OFF;22- ON	开关偷跳起快切
10	23	8826	Undervoltage Threshold	0.700…0.950 U/Un	低压起动阀值
10	24	8827	Undervoltage Time Delay	0...1000 ms	低压起动时间
10	25	8829	Underfrequency Threshold	45.00...49.50 Hz	低频起动阀值
10	26	8830	Underfrequency Time Delay	0...1000 ms	低频起动时间

GIN		Obj.-Adr.	Name	Generic identification data	描述
Group	Entry				
10	27	8841	FAST Transfer Mode	23-OFF;22- ON	快速切换
10	28	8842	REAL-TIME FAST Transfer Mode	23-OFF;22- ON	实时快速切换
10	29	8843	IN-PHASE Transfer Mode	23-OFF; 22- ON	同相捕捉切换
10	30	8844	RES-VOLT Transfer Mode	23-OFF;22- ON	残压切换
10	31	8845	LONG-TIME Transfer Mode	23-OFF; 22- ON	长延时切换
10	32	8851	PARALLEL Sequence: Delta Frequency	0.02...2.00 Hz	并联切换允许频差
10	33	8852	PARALLEL Sequence: Delta U	1.0...40.0 V, 0	并联切换允许压差
10	34	8853	PARALLEL Sequence: Delta Phase Angle	2.0...80.0 °	并联切换允许角差
10	35	8854	PARALLEL Auto: CB Open Time Delay	0.00...2.00 sec	并联全自动跳工作电源时间
10	38	8857	SIMULTANEOUS Sequence: CB Close T-Delay	0...40 ms	同时切换合闸时间
10	39	8858	FAST Transfer: Delta Frequency	0.50...2.50 Hz	快速切换允许频差
10	40	8859	FAST Transfer: Delta Phase Angle	10.0...50.0 °	快速切换允许角差
10	41	8860	FAST Transfer: Undervoltage Block	0.500...0.900 U/Un	快速切换低压闭锁值
10	42	8861	REAL-TIME FAST Transfer: Delta Frequency	1.00...15.00 Hz	实时快速切换允许频差
10	43	8862	REAL-TIME FAST Transfer: V/Hz	1.00...1.33 p.u.	实时快速切换允许 V/Hz
10	44	8863	REAL-TIME FAST Transfer: Delta Phase	70.0...90.0 °	实时快速切换允许角差
10	45	8864	REAL-TIME FAST Transfer: Undervolt.Block	0.500...0.900 U/Un	实时快速切换低压闭锁值
10	46	8868	IN-PHASE Transfer: Delta Frequency	1.00...15.00 Hz	同相捕捉切换允许频差
10	47	8869	IN-PHASE Transfer: Delta Phase	0.5...20.0 °	同相捕捉切换允许角差
10	48	8870	IN-PHASE Transfer: Undervoltage Block	0.200...0.800 U/Un	同相捕捉切换低压闭锁值
10	49	8871	RES-VOLT Transfer: Threshold	0.200...0.600 U/Un	残压切换定值
10	50	8872	LONG-TIME Transfer: Threshold	0.50...10.00 sec	长延时切换定值
10	51	8881	Low Voltage Load-Shedding1 Pickup	10.0...80.0 V	低压减载二段定值
10	52	8882	Low Voltage Load-Shedding1 Time Delay	0...60.00 sec, ∞	低压减载二段时间
10	53	8883	Low Voltage Load-Shedding2 Pickup	10.0...80.0 V	低压减载一段定值
10	54	8884	Low Voltage Load-Shedding2 Time Delay	0...60.00 sec, ∞	低压减载一段时间
10	55	8819	Time Delay to Un-ready Status	0.05...600.00 sec	延时放电时间
10	56	8818	Time Delay to Ready Status	0.05...600.00 sec	充电时间
10	57	8831	Mono-direction Against NORMAL	25-Yes; 24-No	异常起动只允许单向切换
10	58	8820	HSBT Test Mode	23-OFF; 22- ON	调试模式
10	59	8938	Time Delay to Ready Status	0.05...600.00 sec	充电时间
10	60	223	Transfer Mode Line1 -> Line2	23-OFF; 22- ON	进线 1-> 进线 2 备投方式
10	61	224	Transfer Mode Line2 -> Line1	23-OFF; 22- ON	进线 2-> 进线 1 备投方式
10	62	225	Transfer Mode Busbar1 -> Busbar2	23-OFF; 22- ON	母线 1-> 母线 2 备投方式
10	63	226	Transfer Mode Busbar2 -> Busbar1	23-OFF; 22- ON	母线 2-> 母线 1 备投方式
10	64	227	Transfer Mode Transformer1->Transformer2	23-OFF; 22- ON	主变 1-> 主变 2 备投方式
10	65	228	Transfer Mode Transformer2->Transformer1	23-OFF; 22- ON	主变 2-> 主变 1 备投方式

GIN		Obj.-Adr.	Name	Generic identification data	描述
Group	Entry				
10	66	229	Busbar1 -> Busbar2 Load-Shifting	23-OFF; 22- ON	母线 1-> 母线 2 均衡负荷
10	67	230	Busbar2 -> Busbar1 Load-Shifting	23-OFF; 22- ON	母线 2-> 母线 1 均衡负荷
10	68	231	Manually Restart ATS	25-Yes; 24-No	手动复归备自投
10	69	8909	Line1 -> Line2 Load-Shedding	25-Yes; 24-No	进线 1->2 备投过负荷联切
10	70	8910	Line2 -> Line1 Load-Shedding	25-Yes; 24-No	进线 2->1 备投过负荷联切
10	71	8911	Busbar1 -> Busbar2 Load-Shedding	25-Yes; 24-No	母线 1->2 备投过负荷联切
10	72	8912	Busbar2 -> Busbar1 Load-Shedding	25-Yes; 24-No	母线 2->1 备投过负荷联切
10	73	8913	Transformer1->Transformer2 Load-Shedding	25-Yes; 24-No	主变1->主变2备投过负荷联切
10	74	8914	Transformer2->Transformer1 Load-Shedding	25-Yes; 24-No	主变2->主变1备投过负荷联切
10	75	8919	Transfer Line1->Line2 Time Delay	0.05...600.00 sec	进线 1-> 进线 2 备投动作时间
10	76	8920	Transfer Line2->Line1 Time Delay	0.05...600.00 sec	进线 2-> 进线 1 投动作时间
10	77	8921	Transfer Busbar1->Busbar2 Time Delay	0.05...600.00 sec	母线 1-> 母线 2 投动作时间
10	78	8922	Transfer Busbar2->Busbar1 Time Delay	0.05...600.00 sec	母线 2-> 母线 1 投动作时间
10	79	8923	Transfer TFR1->TFR2 Time Delay	0.05...600.00 sec	主变 1-> 主变 2 备投动作时间
10	80	8924	Transfer TFR2->TFR1 Time Delay	0.05...600.00 sec	主变 2-> 主变 1 备投动作时间
10	81	8925	Busbar Load-Shifting Time Delay	0.01...600.00 sec	母线均衡符合启动时间
10	82	8939	Time Delay to Un-Ready Status	0.05...600.00 sec	延时放电时间
10	83	8929	Time Delay to Switch CB	0.01...600.00 sec	断路器操作延时
10	84	8940	Load-Shedding Active Time	0.1...6000.0 sec	过负荷联切有效时间
10	85	8941	Load-Shedding Current Threshold	0.02...5.00 I/In, ∞	过负荷定值
10	86	8942	Load-Shedding Time Delay 1	0.01...600.00 sec	第一轮过负荷时间
10	87	8943	Load-Shedding Time Delay 2	0.01...600.00 sec	第二轮过负荷时间
10	88	8926	Transformer Energization Time	0.05...600.00 sec	变压器充电时间
10	89	9000	Phase Over-current Protection	23-OFF; 22- ON	相过流保护
10	90	9001	Compound Voltage Control	25-Yes; 24-No	复压闭锁
10	91	9002	Ph-Ph Undervoltage Threshold	1.0...125.0 V, 0	线电压低定值
10	92	9003	U2 Overvoltage Threshold	1.0...125.0 V, ∞	负序过压定值
10	93	9004	Phase Over-current I> Threshold	0.10...35.00 A	相过流保护二段定值
10	94	9005	Phase Over-current I> Time Delay	0...60.00 sec, ∞	相过流保护二段时间
10	95	9006	Phase Over-current I>> Threshold	0.10...35.00 A	相过流保护一段定值
10	96	9007	Phase Over-current I> >Time Delay	0...60.00 sec, ∞	相过流保护一段时间
10	97	9010	Earth Over-current Protection	23-OFF; 22- ON	零序过流保护
10	98	9011	3U0 Control	25-Yes; 24-No	零压闭锁
10	99	9012	3U0 Overvoltage Threshold	1.0...200.0 V	零序过压定值
10	100	9013	Earth Over-current I> Threshold	0.10...35.00 A	零序过流保护二段定值
10	101	9014	Earth Over-current I> Time Delay	0...60.00 sec, ∞	零序过流保护二段时间
10	102	9015	Earth Over-current I>> Threshold	0.10...35.00 A	零序过流保护一段定值

GIN		Obj.-Adr.	Name	Generic identification data	描述
Group	Entry				
10	103	9016	Earth Over-current I> >Time Delay	0...60.00 sec, ∞	零序过流保护一段时间
10	104	9018	3I0/IE Assignment	30924-IE; 30923-3I0	零序电流选择
10	105	9020	Phase O/C Switch-Onto-Fault Protection	23-OFF; 22- ON	相电流充电保护
10	106	9021	Compound Voltage Control	25-Yes; 24-No	充电保护复压闭锁
10	107	9024	Phase O/C I> Switch-Onto-Fault Thresh.	0.10...35.00 A	相电流充电保护二段定值
10	108	9025	Phase O/C I> Switch-Onto-Fault Time Delay	0...60.00 sec, ∞	相电流充电保护二段时间
10	109	9026	Phase O/C I>> Switch-Onto-Fault Thresh.	0.10...35.00 A	相电流充电保护一段定值
10	110	9027	Phase O/C I>> Switch-Onto-Fault Time Delay	0...60.00 sec, ∞	相电流充电保护一段时间
10	111	9031	3U0 Control	25-Yes; 24-No	充电保护零压闭锁
10	112	9033	Earth O/C I> Switch-Onto-Fault Thresh.	0.10...35.00 A	零序电流充电保护二段定值
10	113	9034	Earth O/C I> Switch-Onto-Fault Time Delay	0...60.00 sec, ∞	零序电流充电保护二段时间
10	114	9035	Earth O/C I>> Switch-Onto-Fault Thresh.	0.10...35.00 A	零序电流充电保护一段定值
10	115	9036	Earth O/C I>> Switch-Onto-Fault Time Delay	0...60.00 sec, ∞	零序电流充电保护一段时间
10	116	9019	Active Time for Busbar Energization	0.01...600.00 sec	充电保护投入时间
10	117	9030	Earth O/C Switch-Onto-Fault Protection	23-OFF; 22- ON	零序电流充电保护
10	118	8898	FAULT Start Type B	23-OFF; 30920-SIMULTANEOUS; 30919-SEQUENTIAL;	B 类事故起快切
10	133	8873	SIMULTANEOUS Sequence: CB Open T-Delay	0…40 ms	同时切换跳闸时间
10	137	8832	Reverse Power	23-OFF; 30920-SIMULTANEOUS; 30919-SEQUENTIAL;	逆功率起快切
10	138	8833	Reverse Power Time Delay	0…1000 ms	逆功率起动时间
10	139	8890	Switching direction Line1->Line3	23-OFF; 22- ON	进线 1-> 进线 3 切换方式
10	140	8891	Switching direction Line3->Line1	23-OFF; 22- ON	进线 3-> 进线 1 切换方式
10	141	8892	Switching direction Line2->Line3	23-OFF; 22- ON	进线 2-> 进线 3 切换方式
10	142	8893	Switching direction Line3->Line2	23-OFF; 22- ON	进线 3-> 进线 2 切换方式
10	143	8894	Line1->Line3 LVLSH Permitted	25-Yes;24-No	进线 1-> 进线 3 低压减载
10	144	8895	Line3->Line1 LVLSH Permitted	25-Yes;24-No	进线 3-> 进线 1 低压减载
10	145	8896	Line2->Line3 LVLSH Permitted	25-Yes;24-No	进线 2-> 进线 3 低压减载
10	146	8897	Line3->Line2 LVLSH Permitted	25-Yes;24-No	进线 3-> 进线 2 低压减载
10	147	8834	Change Rate of Frequency	23-OFF; 30920-SIMULTANEOUS; 30919-SEQUENTIAL;	滑差起快切
10	148	8835	Change Rate of Frequency Threshold	-10.0…-0.5 Hz/s	滑差起动阀值
10	150	8836	Change Rate of Frequency Time Delay	0…1000 ms	滑差起动时间

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

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