SIEMENS

ACP 1703 • Ax 1703

SM-x551/TG8SA0

LANDIS & GYR TELEGYR 800 MPT-S
(Unbalanced Multipoint Slave)

System Element Manual

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Literature

DC0-058-2.03

Hint

Please observe Notes and Warnings for your own safety in the Preface.

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Preface

This document is applicable to the following product:

- AK 1703 ACP, TM 1703 ACP, BC 1703 ACP, AK 1703 und AMC 1703

Purpose

This manual describes the functioning of the system elements

- SM-2551/TG8SA0 – LANDIS & GYR TELEGYR 800-Slave
- SM-0551/TG8SA0 – LANDIS & GYR TELEGYR 800-Slave

and essentially contains

- Functional descriptions
- Technical specifications
- Descriptions of interfaces to the process and other system elements
- Possible configurations

Target Group and Safety Instructions

The document you are reading right now is addressed to users, who are in charge of the following engineering tasks:

- Conceptual activities, as for example design and configuration
- Creation of the assembly technical documentation using the designated engineering tools
- System parameterization and system diagnostic, using the designated engineering tools
- Technical system maintenance

Manipulating the hardware itself, as for example "unplugging" and "plugging" printed circuit boards and modules, or working on terminals and/or connectors – for instance when applying changes to the wiring – **are** – also if they are an issue in the context of configuration, parameterization and diagnostic – **not subject of this document**.

For activities, which comprise hardware manipulations, it is essential to pay attention to the appropriate safety instructions and to strictly adhere to the appropriate safety regulations.

Instructions and regulations are also stated in installation manuals or manuals which deal with hardware installation and other hardware manipulations.

Notes on Safety

This manual does not constitute a complete catalog of all safety measures required for operating the equipment (module, device) in question because special operating conditions might require additional measures. However, it does contain notes that must be adhered to for your own personal safety and to avoid damage to property. These notes are highlighted with a warning triangle and different keywords indicating different degrees of danger.

Danger

means that death, serious bodily injury or considerable property damage **will** occur, if the appropriate precautionary measures are not carried out.

Warning

means that death, serious bodily injury or considerable property damage **can** occur, if the appropriate precautionary measures are not carried out.

Caution

means that minor bodily injury or property damage could occur, if the appropriate precautionary measures are not carried out.

Hint

Please observe Notes and Warnings for your own safety in the Preface.

Qualified Personnel

Commissioning and operation of the equipment (module, device) described in this manual must be performed by qualified personnel only. As used in the safety notes contained in this manual, qualified personnel are those persons who are authorized to commission, release, ground, and tag devices, systems, and electrical circuits in accordance with safety standards.

Use as Prescribed

The equipment (device, module) must not be used for any other purposes than those described in the Catalog and the Technical Description. If it is used together with third-party devices and components, these must be recommended or approved by Siemens.

Correct and safe operation of the product requires adequate transportation, storage, installation, and mounting as well as appropriate use and maintenance.

During operation of electrical equipment, it is unavoidable that certain parts of this equipment will carry dangerous voltages. Severe injury or damage to property can occur if the appropriate measures are not taken:

- Before making any connections at all, ground the equipment at the PE terminal.
- Hazardous voltages can be present on all switching components connected to the power supply.
- Even after the supply voltage has been disconnected, hazardous voltages can still be present in the equipment (capacitor storage).
- Equipment with current transformer circuits must not be operated while open.
- The limit values indicated in the manual or the operating instructions must not be exceeded; that also applies to testing and commissioning.

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1. Introduction

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1.1. Application

The protocol element SM-x551/TG8SA0 is used in automation units of the systems AK 1703 ACP, TM 1703 ACP, BC 1703 ACP, AK 1703 and AMC 1703. It is deployed in the field of telecontrol and automation.

A protocol element is used for the exchange of data - and thereby for the transmission of messages - over a communication interface to other automation units or devices of 3rd party manufacturers using TELEGYR 800 protocol.

The protocol element SM-x551/TG8SA0 is part of a remote station and Slave of the TELEGYR 800 protocol.

The hardware of a protocol element is a communication interface which - dependent on system and interface - can be available in different ways:

- on a serial interface module (SIM), which is installed - directly or cascaded (SIM on SIM) - on the basic system element

Products	AK 1703 ACP, TM 1703 ACP, BC 1703 ACP, AK 1703 and AMC 1703
System element type	Protocol Element
consists of	Module SM-2551 or SM-0551 with firmware TG8SA0 HW-Typ: 0551 / FW-Typ: 1551 HW-Typ: 2551 / FW-Typ: 1551
can be used in	AK 1703 ACP, TM 1703 ACP, BC 1703 ACP, AK 1703 and AMC 1703
Engineering	TOOLBOX II with OPM II

1.2. Overview

Protocol elements based on a Serial Interface Module (SIM) with serial interfaces

- SM-2551: two interfaces
- SM-0551: one interface

Protocol element (serial)

- LANDIS & GYR TELEGYR 800 (DIN 19244) for
  - multi-point traffic Slave
- with byte-asynchronous puls code modulation
- in "leased line" mode or dial-up mode (from TG8A0.05)
- all interface signals (RS-232) and all interfaces are galvanically insulated from each other

SM-2551 can be attached to master control and communication elements of ACP 1703 and Ax 1703 platforms.

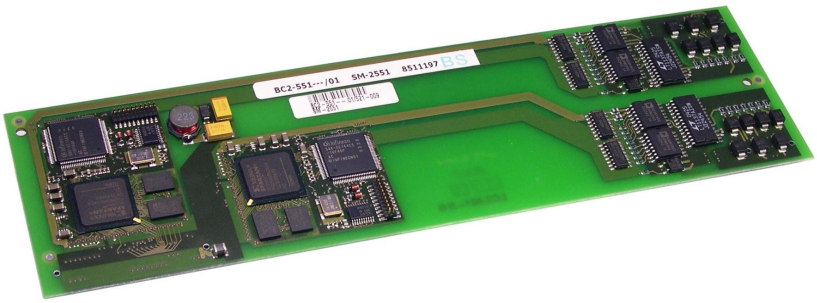
SM-0551 can be attached to selected SIM's SM-25xx.

1.3. Mechanics

1.3.1. SM-2551

SIM SM-2551 can be attached to master control and communication elements of ACP 1703 and Ax 1703 platforms.

View



1.3.2. SM-0551

SIM SM-0551 can be attached to SIM SM-2556 and SIM SM-2546.

SIM SM-2556 can be attached to master control and communication elements of ACP 1703 and Ax 1703 platforms.

SIM SM-2546 can only be attached to the BC 1703 ACP master control element.

View

For further information see also chapter **2.3.2 Hardware.**

2. Protocol Element SM-x551/TG8SA0

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2.1. Features and Functions

General Functions

- Unbalanced multi-point (multi-point traffic) according to TELEGYR 800 specification (DIN 19244) in "leased line" mode or dial-up mode.
  Firmware is remote terminal unit (secondary station)
- Data acquisition by polling
- General interrogation, interrogation of integrated totals (counter values)
- spontaneous transmission of commands and set points in command direction
- spontaneous transmission of indications, measured values and integrated totals (counter values) in monitoring direction
- multi-hierarchical TG800 configurations possible
- time synchronization via TG800 communication
- subset of TG800 "system indications"
- Radio spontaneous mode

Hint

The above mentioned functions are described in detail in the ducument Common functions Landis & Gyr TELEGYR 800 MPT-S.
This protocol element for interfacing 3rd party systems supports only restricted functionality and only a sub set of the possible data formats.
For using this protocol element in your project you have to verify if the supported functionality and supported data formats of the protocol element will be compatible to the required functionality and data formats for interfacing a specific 3rd party system.

2.2. Modes of Operation

Operating mode	Patch Plug	Extras [1)]	Note
Unbalanced interchange circuit V.24/V.28 V.28 asynchronous	CM-2860 [a)] CM-5860 [b)]	---	• 50 .. 64,000 bps • Signals and levels according to V.24, V.28, RS-232 • RJ45 connector RXD, TXD, CTS, RTS, DCD, DTR, DSR/+5V, GND • *RJ45 connector pin assignment corresponds with SM-2541 operating mode 1a, V.28 asynchronous*
Unbalanced interchange circuit V.24/V.28 V.23 Dedicated line	CM-2860 [a)]	CE-0700	• 300 / 1,200 Bit/s • Signals and levels according to V.24, V.28, RS-232 • RJ45 connector to CE-0700 • 4-pin screw terminals on CE-0700
Unbalanced interchange circuit V.24/V.28 VFT channel	CM-2860 [a)]	CE-0701	• 50 .. 2,400 bps • Signals and levels according to V.24, V.28, RS-232 • RJ45 connector to CE-0701 • 4-pin screw terminals on CE-0701

1) Extras is optional equipment

a) Patch Plug for AK 1703 ACP, TM 1703 ACP; AK 1703, AMC 1703, AM 1703, BC 1703

b) Patch Module for BC 1703 ACP

2.3. Configuration

2.3.1. Communication

For the stations to communicate with each other, suitable transmission facilities and/or network components may be needed in addition.

Own station (= remote Terminal Unit, Slave-Station)

System	System Element	Protocol Element	Note
AK 1703 ACP	CP-2010/MC25 CP-2012/PCCE25 CP-2017/PCCX25 CP-2014/CPCX25	SM-2551/TG8SA0 SM-0551/TG8SA0	
BC 1703 ACP	CP-5000/CPC55 CP-5014/CPCX55	SM-2551/TG8SA0 SM-0551/TG8SA0	
TM 1703 ACP	CP-6003/CPC65 CP-6014/CPCX65	SM-2551/TG8SA0 SM-0551/TG8SA0	
AK 1703	CP-2000/MC00 CP-2002/PCCE00 CP-2002/CE00 CP-2012/CE20	SM-2551/TG8SA0 SM-0551/TG8SA0	
AMC 1703	CP-4000/CPC4x CP-4003/CCP4x	SM-2551/TG8SA0 SM-0551/TG8SA0	

Remote station (= Master-Station)

System	System Element	Protocol Element	Note
Third-party system	---	---	

2.3.2. Hardware

2.3.2.1. SM-2551

The following table lists supported configurations. In addition to one (SI0/SI1 or SI2/SI3) or two (SI0/SI1 and SI2/SI3) SM-2551, all parts (carrier module, connection board, patch plug, etc.) listed for the choosen configuration are needed:

Configuration			Interfaces			
Carrier Module	**Connection Board** [1]	**Patch Plug** [1]	**SI0**	**SI1**	**SI2**	**SI3**
CP-2010; CP-2014	CM-2837	[2]	✓	✓		
CP-2012, CP-2017	CM-2838	[2]	✓	✓	✓	✓
CP-5000, CP-5014	one integrated patch module per SIx [3]		✓	✓		
CP-6003, CP-6014	---	[2]	✓	✓	✓	✓
CP-2000	CM-2857	[2]	✓	✓		
CP-2002	CM-2858	[2]	✓	✓	✓	✓
CP-4000	---	[2]		✓	✓	
CP-4003	---	[2]	✓	✓	✓	✓

[1] One connection board for each carrier module, one patch plug for each interface

[2] For patch plugs for standard protocols in standard configurations as desribed above see these standard protocols; for patch plugs in other than standard configurations see ACP 1703 Platforms Configuration Automation Units and Automation Networks (DC0-021-1)

[3] Each variant of the BC 1703 ACP (Bay Controller) which can be ordered comes with a determined patch module for each interface

2.3.2.2. SM-0551

The following table lists supported configurations. In addition SM-0551, all parts (SIM, carrier module, connection board, patch plug, etc.) listed for the choosen configuration are needed:

Configuration				Interfaces			
Carrier Module	**SIM**	**Connection Board** [1]	**Patch Plug** [2]	**SI0**	**SI1**	**SI2**	**SI3**
CP-2010; CP-2014	4)	CM-2837	2)	✓	6)		
CP-2012, CP-2017	4)	CM-2838	2)	✓	6)	✓	6)
CP-5000, CP-5014	5)	one integrated patch module per Six [3]		✓	6)		
CP-6003, CP-6014	4)	---	2)	✓	6)	✓	6)
CP-2000	4)	CM-2857	2)	✓	6)		
CP-2002	4)	CM-2858	2)	✓	6)	✓	6)
CP-4000	4)	---	2)		✓	6)	
CP-4003	4)	---	2)	✓	6)	✓	6)

1) One connection board for each carrier module, one patch plug for each interface

2) see chapter Modes of Operation

3) Each variant of the BC 1703 ACP (Bay Controller) which can be ordered comes with a determined patch module for each interface

4) SM-2556 required, on which SM-0551 can be installed

5) SM-2546 or SM-2556 required, on which SM-0551 can be installed

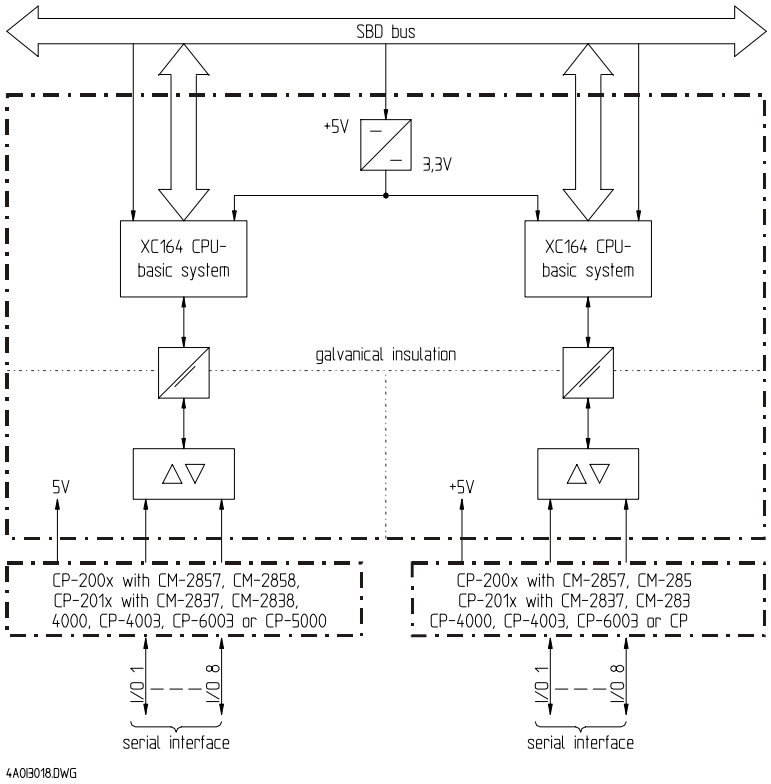
6) Interface is not operated by SM-0551 but directly by SM-2546 / SM-2556

2.4. Engineering

For diagnosis, testing, parameter setting or documentation, the system element is supported by the engineering tools of TOOLBOX II. OPM II is required.

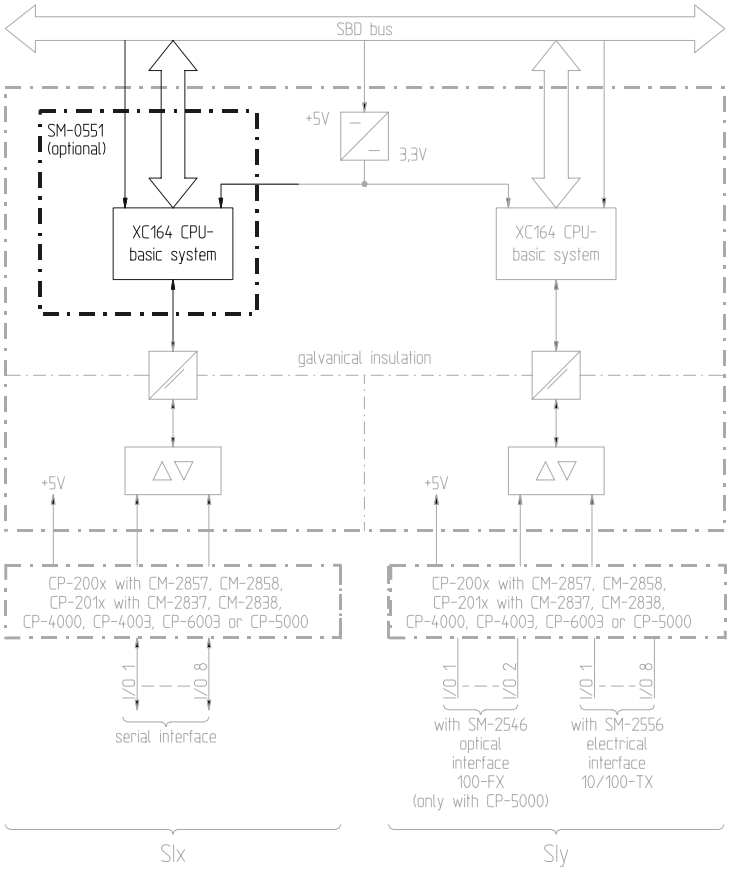
2.5. Block Diagrams

2.5.1. SM-2551



2.5.2. SM-0551

Example: SIM SM-0551 on SIM-25x6



2.6. Technical Specifications

2.6.1. SM-2551

Communication Circuits	
2 serial interfaces	• Interface characteristics, interface signals, modes of operation, transmission rates – see description of the respective protocol, "Modes of operation" • Instead of the interface signal DSR the gate circuit voltage (+5VDC) can be provided (settable) • Ability to be connected in parallel – outgoing interface signals in tristate technology – up to 2 interfaces can be connected in parallel – circuits for incoming interface signals always active • The signals are galvanically insulated from logic circuits • Line lengths V.28 – 50 bps up to 25m – 115,200 bps up to 5m
Power supply	
Operating voltage	4.75 .. 5.25 VDC, typ. 300 mA, max. 540 mA @5V The voltage is supplied by the carrier module.
Gate circuit voltage +5VDC instead of DSR	• Voltage 4.7 .. 5.6 VDC • Max. output current 150 mA at U > 4.75V • Max. output power 750 mW • Max. idle voltage ≤ 5.6V DC • Not short-circuit proof • Not overload proof • Galvanically insulated from logic voltage • The voltage (data circuit voltage) is supplied by the carrier module (galvanically insulated).
Mechanics	
Dimensions	227.3 x 63.5 mm
Weight	Approx. 200 g

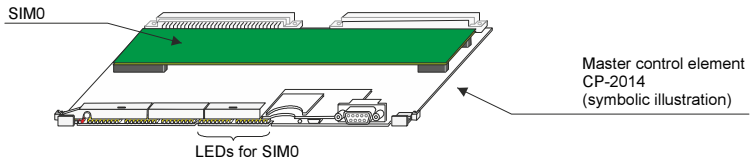
2.6.2. SM-0551

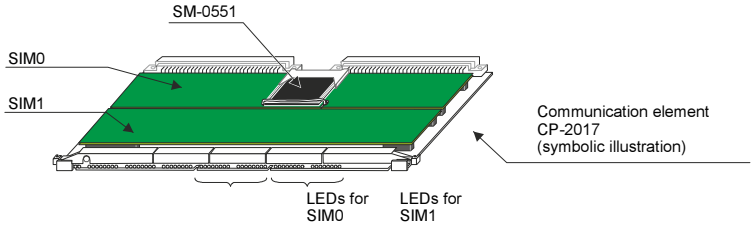
Communication Circuits	
1 serial interface	• Interface characteristics, interface signals, modes of operation, transmission rates – see description of the respective protocol, "Modes of operation" • Instead of the interface signal DSR the gate circuit voltage (+5VDC) can be provided (settable) • Ability to be connected in parallel – outgoing interface signals in tristate technology – up to 2 interfaces can be connected in parallel – circuits for incoming interface signals always active • The signals are galvanically insulated from logic circuits • Line lengths V.28 – 50 bps up to 25m – 115,200 bps up to 5m
Power supply	
Operating voltage	4.75 .. 5.25 VDC, typ. 25 mA, max. 50 mA @5V 3.14 .. 3.47 VDC, typ. 150 mA, max. 330 mA @3.3V The voltage is supplied by the carrier module.
Gate circuit voltage +5VDC instead of DSR	• Voltage 4.7 .. 5.6 VDC • Max. output current 150 mA at U > 4.75V • Max. output power 750 mW • Max. idle voltage ≤ 5.6V DC • Not short-circuit proof • Not overload proof • Galvanically insulated from logic voltage • The voltage (data circuit voltage) is supplied by the carrier module (galvanically insulated).
Mechanics	
Dimensions	56 x 43 x 5,5 mm
Weight	Approx. 15 g

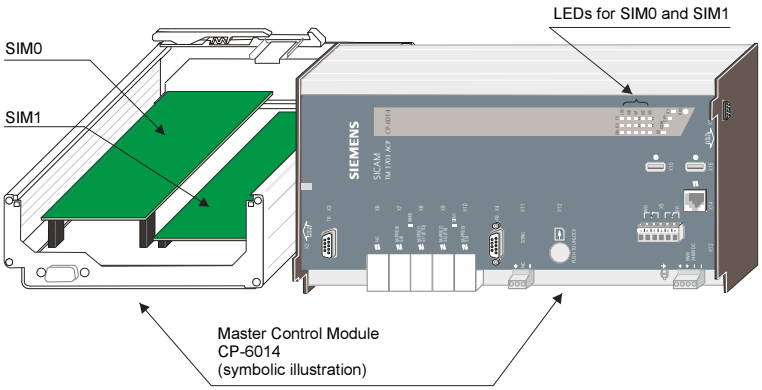
2.7. Front Panel

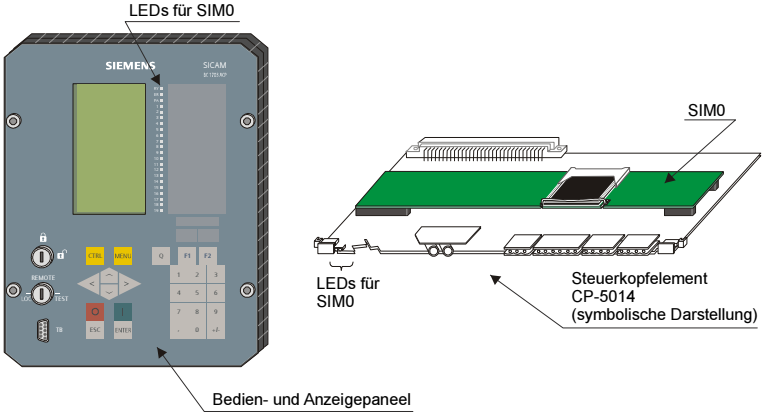
The protocol elements SM-2551/TG8SA0 and SM-0551/TG8SA0 itself have neither a front panel nor LED displays.

They use the LED displays on the master control- or communication elements, or, in case of BC 1703 ACP, additional the displays on the operating panel. The meaning of these LED displays is described in the manual of the concerning system element.









2.8. Pin Assignment

Operating Mode	Pin Assignment (RJ45)
Unbalanced interchange circuit V.24/V.28 – V.28 asynchronous	

pin	alias	signal
1	I/O 1	CTS
2	I/O 2	RTS
3	I/O 3	DSR/+5V
4	I/O 4	TxD
5	I/O 5	RxD
6	I/O 6	GND
7	I/O 7	DCD
8	I/O 8	DTR

Balanced interface RS-485
– V.11 asynchronous

pin	alias	signal
1	I/O 1	
2	I/O 2	RTS
3	I/O 3	+5V
4	I/O 4	TxD
5	I/O 5	RxD
6	I/O 6	GND
7	I/O 7	
8	I/O 8	

Optical interface (multimode fibre optic)
– Star / Tree

pin	alias	signal
1	I/O 1	
2	I/O 2	TxD
3	I/O 3	+5V
4	I/O 4	
5	I/O 5	RxD
6	I/O 6	GND
7	I/O 7	
8	I/O 8	MODE

Die Abkürzungen haben folgende Bedeutung:

CTS . . . . serielle Schnittstelle (V.28) - Clear To Send
RTS . . . . serielle Schnittstelle (V.28) - Request To Send
DSR . . . . serielle Schnittstelle (V.28) - Data Set Ready
DCD . . . . serielle Schnittstelle (V.28) - Data Carrier Detect
DTR . . . . serielle Schnittstelle (V.28) - Data Terminal Ready
TxD . . . . serielle Schnittstelle (V.28) - Transmit Data
RxD . . . . serielle Schnittstelle (V.28) - Receive Data
GND . . . . serielle Schnittstelle (V.28) - Signal Ground
+5V . . . . serielle Schnittstelle - +5V-Versorgung
TxC . . . . serielle Schnittstelle (V.28) - Takt wird gesendet
RxC . . . . serielle Schnittstelle (V.28) - Takt wird empfangen
RNGERR . .Signalisierung Ringbruch (nur in Verbindung mit CM-0821)
MODE . . . Betriebsart V.28 am CM-0827

4A013018.DWG

3. System Components

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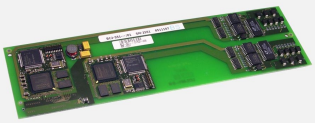
3.1. System Element SM-2551

	Designation	Item Number/MLFB
	SM-2551 Serial Interface Processor 2 SI	BC2-551 6MF10130CF510A00

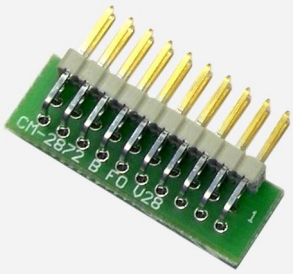
3.2. Systemelement SM-0551

	Designation	Item Number/MLFB
	Serial Interface Processor 1 SI	BC0-551 6MF10130AF510A00

3.2.1. SM-0551 attachable on

	Designation	Item Number/MLFB
	SM-2556 Ethernet 10/100TX + 1 SI (optional)	BC2-556 6MF10130CF560A00
	SM-2546 Ethernet 100FX + 1 SI (optional)	BC2-546 6MF10130CF460A00

3.3. Accessories

	Designation	Item Number/MLFB
	CM-2860 Patch Plug standard V28,ET,TR	CA2-860 6MF12110CJ600A00
	CM-2872 Patch Plug CM-0821/27 FO	CA2-872 6MF12110CJ720A00

Literature

ACP 1703 Common Functions System and Basic System Elements	DC0-015-2
ACP 1703 Platforms Configuration Automation Units and Automation Networks	DC0-021-2
ACP 1703 • Ax 1703 Gemeinsame Funktionen Protokollelemente	DC0-023-2
ACP 1703 • Ax 1703 Common Functions Landis & Gyr TG800 MPT - S	DC0-103-2
TM 1703 emic Protocol Elements System Elements Manual	DC6-049-2

Documents for Interoperability

TG800 Interoperability	DC0-041-2