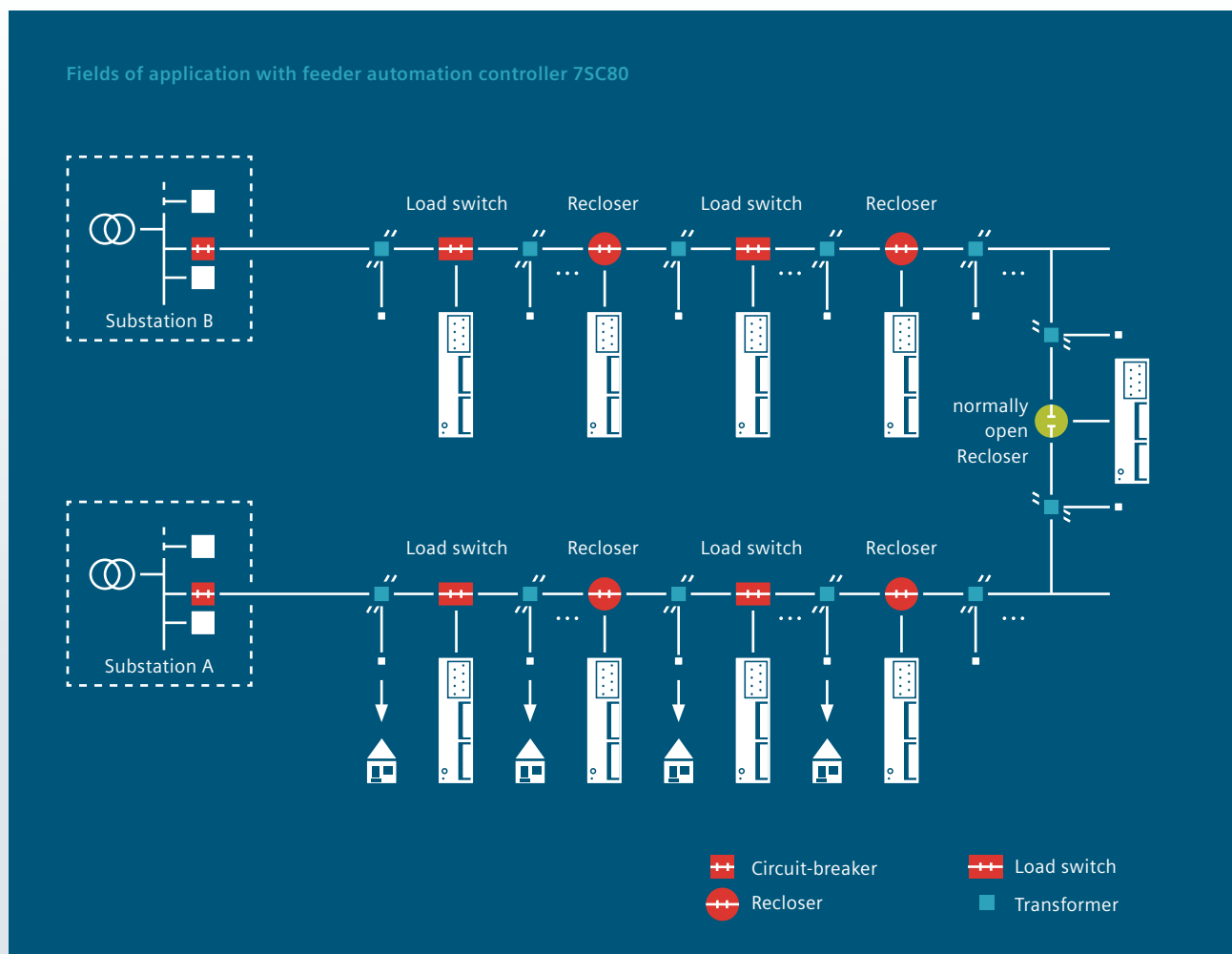# SIEMENS

SIPROTEC 7SC80

Feeder Protection and Automation

Answers for infrastructure and cities.

SIPROTEC 7SC80: designed for feeder automation applications

This solution allows very fast fault detection and isolation in distribution networks.

① **FLISR (Fault Location, Isolation, and Service Restoration)**

② **Fast Source Transfer**

③ **Load Balancing**

Fields of application with feeder automation controller 7SC80

	Circuit-breaker	Load switch
	Recloser	Transformer

SIPROTEC 7SC80: overview of the benefits

- Selective and fast detection via current jump detector
- Determine the fault location
- Isolate the faulted section of the feeder
- Restore service to "healthy" portions of the feeder
- Support of feeder automation applications
- Designed for harsh environment
- Extended CFC (PLC – Programmable Logic Controller)
- Extended temperature range $-50\,°C$ up to $+85\,°C$
- Singlemode module for distances up to 24 km available, multimode for up to 4 km

- Open for all different communication technologies, e.g. radio, which are used for feeder automation
- Integrated GPS module for time synchronization and localization
- Full remote access supported for firmware and parameter updates and upgrades
- A web-based HMI provides complete remote control of the device
- Low power consumption
- Battery Monitoring / Management

Basic features

USB front interface, Status LEDs, labeled ports

Remote control & Upgrade web-based HMI

Compact design

Detachable HMI

IEC 61850, DNP TCP, IEC 60870-5-104, Profinet

Pluggable current and voltage terminal blocks

SIPROTEC 7SC80:
flexible application for
medium-voltage power system

We offer you considerably more than just a simple time-over current protection.
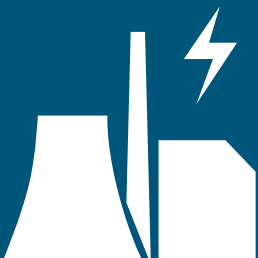
Description

The SIPROTEC 7SC80 feeder automation protection device controller can be used for protection and automation of medium-voltage distribution networks with grounded, low-resistance grounded, isolated or a compensated neutral point.

The SIPROTEC Compact 7SC80 features "flexible protection functions". Up to 20 additional protection functions can be created by the user. Please find the available protection functions in configuration table on page 7.

The relay provides circuit-breaker control, further switching devices and automation functions. The integrated programmable logic (CFC) allows the user to add own functions, e.g. for the automation of switch gear (including: interlocking, transfer and load shedding schemes). The user is also allowed to generate user-defined messages.

SIPROTEC 7SC80: has everything you need for remote operation and control

Comprehensive physical and interactive web-based HMI

The relay has a physical respectively web-based HMI with 32 LEDs and 9 programmable pushbuttons to configure shortcuts for menu or various applications:

- Large and well organized display
- 14 push buttons plus arrow keys
- 32 configurable LEDs plus operating LEDs
- Automatic LED and push button labeling
- Button for LED acknowledgement
- "Open" and "Close" buttons for direct control of equipment
- Lock push buttons preventing accidental actions

With DIGSI 4 and SIGRA 4, you have everything under control

- Easy configuration of flexible protection functions
- A matrix instead of nested dialogs means less time-consumption and errors
- With DIGSI 4, you read all process data from a device and store it centrally
- With SIGRA 4, you can analyze every network fault
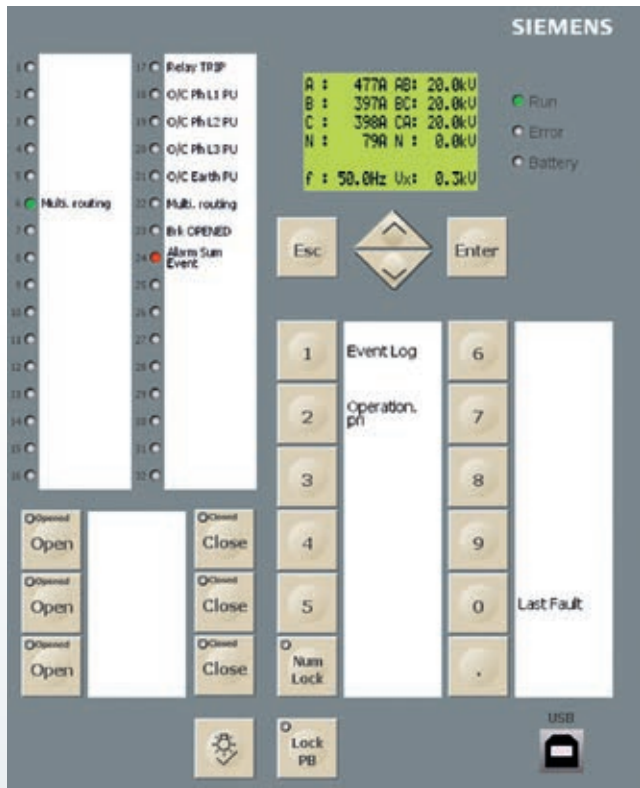
SIPROTEC 7SC80: function overview

Control functions / programmable logic

- Commands for the control of CB, reclosers, disconnect switches (isolators / isolating switches)
- Control through keyboard, binary inputs, DIGSI 4 or SCADA system
- User-defined PLC logic with CFC (e.g. interlocking)

Monitoring functions

- Operational measured values V, I, f
- Energy metering values W_p, W_q
- Minimum and maximum values
- Circuit-breaker wear monitoring
- Fuse failure monitor
- 8 oscillographic fault records
- Trip circuit supervision (74TC)

Communication interfaces

- Ethernet electrical RJ45
- Ethernet optical LC multimode up to 4 km
- Ethernet optical LC singlemode up to 24 km

## Integrated switch functionality included with protocol options:

- IEC 61850 Edition 1 and 2
- DNP3 TCP
- IEC 60870-5-104
- Profinet
- Ethernet redundancy protocols RSTP, PRP and HSR
- USB front interface for DIGSI 4

Hardware

- 4 current transformers
- 1 / 4 voltage transformers
- 12 binary inputs
- 8 binary outputs
- 1 live-status contact
- Pluggable terminals
- Detachable HMI
- LPS CTs

FASE and FAST: Convenient engineering and test tool for Feeder Automation Applications

- Simplified workflow based on device templates
- Easy & time saving creation and testing of FA apps
- Automatic configuration of all Feeder Automation related settings
- No deep CFC and IEC 61850 knowledge necessary
- Automatic and detailed creation of documentation as PDF
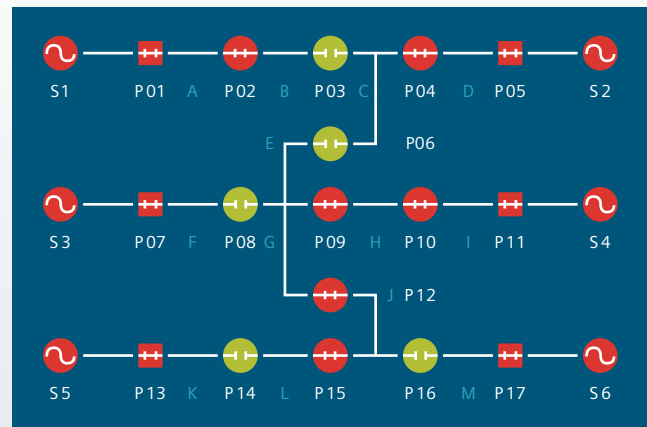
Product and Order No.

FASE Trial	7XS5500-1AA50
FASE Scientific	7XS5500-1AB00
FASE Package 1	7XS5500-0AA01
FASE Package 5	7XS5500-0AA05
FASE Package 10	7XS5500-0AA10
FASE Package 50	7XS5500-0AA50
FASE Recorder multi-user license keys	7XS5500-0AA00

1) only with 100 Mbit Ethernet electrical and multimode
2) in preparation
3) only with position 7 = 3, 4 or 6
4) only with position 16 = 0
5) 87N (REF) only with sensitive ground current input (position 7 = 5 or 6)
6) depending on the ground current input, the function will be either sensitive (IEE) or non-sensitive (IE)
7) only with position 12 = 7

Product description	Order No.
	6 7 8 9 10 11 12 13 14 15 16
Feeder Protection Controller 7SC80	7SC80☐☐-☐☐☐☐☐-3F☐☐-L☐☐
Basic functions Housing, 12 BI, 8 BO, 1 live status contact	2
Specification of CT and VT measuring inputs	
3 x I LPS / LoPo, 1 x V	1
4 x I 1 A / 5 A, 1 x V	2
3 x I LPS / LoPo, 4 x V	3
4 x I 1 A / 5 A, 4 x V	4
3 x I 1 A / 5 A, 1 x I_{ee} (sensitive) = 0.001 to 1.6 A / 0.005 to 8 A, 1 x V	5
3 x I 1 A / 5 A, 1 x I_{ee} (sensitive) = 0.001 to 1.6 A / 0.005 to 8 A, 4 x V	6
Rated auxiliary voltage	
DC 60 V to 250 V, AC 115 V, AC 230 V	1
DC 24 V / 48 V	2
DC 24 V / 48 V, Battery Monitoring 2)	3
Unit version	
Surface mounting housing	A
Surface / Flush mounting housing with HMI	B
Surface mounting housing with detached HMI	C
Region-specific default- and language settings	
Region DE, IEC, language German (language selectable)	A
Region World, IEC / ANSI, language English (language selectable)	B
Region US, ANSI, language US English (language selectable)	C
Region World, IEC / ANSI, language Spanish (language selectable)	E
Region World, IEC / ANSI, language Russian (language selectable)	G
System interface	
100 Mbit Ethernet, electrical, 2 x RJ45 connector	9 ... R
100 Mbit Ethernet, with integrated switch, optical, 2 x LC connector multimode	9 ... S
100 Mbit Ethernet, with integrated switch, optical, 2 x LC connector singlemode 24 km	9 ... T
Protocol for system interface	
IEC 61850	0
IEC 61850 + DNP3 TCP	2
IEC 61850 + Profinet 1)	3
IEC 61850 + IE C60870-5-104	4
Additional interfaces	
No module	0
GPS module	7

Functionality

Software packages

ANSI No.	Base Package A	
50 / 51	Time-overcurrent protection phase I>, I>>, I>>>, I_p	
50N / 51N	Time overcurrent protection ground IE >, IE >>, IE >>>, IE_p	
50N(s) / 51N(s)	Sensitive ground fault protection IEE >, IEE >>, IEE_p 6)	
50BF	Circuit-breaker failure protection	
46	Negative sequence / unbalanced load protection	
49	Thermal overload protection	
87N	High impedance REF 5)	
74TC	Trip circuit supervision	
37	Undercurrent	
51c	Cold load pickup	
86	Lockout	
60CTS	CT supervision	
	Jump detector with Delta measurement, Parameter changeover, Monitoring functions, Control of circuit-breaker, Flexible protection functions (current parameters), Under- / overfrequency, Inrush restraint, Fault recording, average values, min / max values	A
	Base Package B (containing A) 3)	
67	Directional overcurrent protection phase, I>, I>>, IE_p	
67N	Directional overcurrent protection ground, IE>, IE >>, IE_p	
67N(s)	Directional sensitive ground fault protection, IEE>, IEE >>, IEE_p 6)	
27 / 59	Under- / overvoltage	
81 U/O	Under- / overfrequency, f<, f>	
25	Sync check	
47	Phase rotation	
64 / 59N	Displacement voltage	
60VTS	VT supervision	
32 / 55 / 81R	Flexible protection functions (current and voltage parameters)	
	Protective function for voltage, power, power factor, frequency change	B
	Base Package N 4) 7) SNTP server functionality, no protection	N
	Base Package R 4) Pure RTU functionality, no protection	R

Additional functions		
	without	0
79	with autoreclose	1
21FL	with fault locator 3)	2
79 / 21FL	with autoreclose and fault locator 3)	3
79 / TS	with single / triple pole autoreclose	4
79 / TS / 21FL	with single / triple pole autoreclose and fault locator 3)	5

For all products using security features of OpenSSL,
the following shall apply:

This product includes software developed by the
OpenSSL Project for use in the OpenSSL Toolkit.
(www.openssl.org)

This product includes cryptographic software written
by Eric Young. (eay@cryptsoft.com)