SIEMENS

SIPROTEC® 7ST6 V4.10

Numerical Overhead Contact Line Protection

AC Traction Power Supply

Supplement to the Manual **Status: 01/2006**

Siemens AG
Transportation Systems
Electrification

This supplement to the manual contains **information on the changes to and additional features** of the **SIPROTEC 7ST61/63 V4.10** device for overhead contact line protection.

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1 Scope of Supply

This delivery is accompanied by the following product:

SIPROTEC 7ST61/63 V4.10 firmware

Attention:
If you wish to carry out a firmware update, please comply with the installation instructions for the firmware (Document Number: C53000-A1000-X072-2N) supplied with this supplement to the manual.

2 Fault Locator

The function is optional, i.e. not included in all variants.

☐ Fault locator reverse direction

Previously, it was only possible to define the maximum of 5 line sections common for forward and reverse direction.

From V4.10 onwards, there are two separate sets of function parameters for the definition of line sections in a forward and in a reverse direction available:

Previously		New			
Addr.	**Parameter**	**Addr.**	**Parameter**	**Default setting**	**Setting range**
234	SECTIONS	235	SECTIONS reverse	None	1 section
					2 sections
					3 sections
					4 sections
					5 sections
					None
	Only for Addr. 236 UNIT OF LENGTH=km				
1110	X1	1130	X1 reverse	0.20 Ω/km	0.05 … 50.00
1111	d1	1131	d1 reverse	20.00 km	1.00 … 200.00; 0
1112	X2	1132	X2 reverse	0.20 Ω/km	0.05 … 50.00
1113	d2	1133	d2 reverse	20.00 km	1.00 … 200.00; 0
1114	X3	1134	X3 reverse	0.20 Ω/km	0.05 … 50.00
1115	d3	1135	d3 reverse	20.00 km	1.00 … 200.00; 0
1116	X4	1136	X4 reverse	0.20 Ω/km	0.05 … 50.00
1117	d4	1137	d4 reverse	20.00 km	1.00 … 200.00; 0
1118	X5	1138	X5 reverse	0.20 Ω/km	0.05 … 50.00
1119	d5	1139	d5 reverse	20.00 km	1.00 … 200.00; 0
	Only for Addr. 236 Unit of length=Miles				
1160	X1	1180	X1 reverse	0.32 Ω/mi	0.05 … 80.00
1161	d1	1181	d1 reverse	12.50 MILES	0.60 … 124.00; 0
1162	X2	1182	X2 reverse	0.32 Ω/mi	0.05 … 80.00
1163	d2	1183	d2 reverse	12.50 MILES	0.60 … 124.00; 0
1164	X3	1184	X3 reverse	0.32 Ω/mi	0.05 … 80.00
1165	d3	1185	d3 reverse	12.50 MILES	0.60 … 124.00; 0
1166	X4	1186	X4 reverse	0.32 Ω/mi	0.05 … 80.00
1167	d4	1187	d4 reverse	12.50 MILES	0.60 … 124.00; 0
1168	X5	1188	X5 reverse	0.32 Ω/mi	0.05 … 80.00
1169	d5	1189	d5 reverse	12.50 MILES	0.60 … 124.00; 0

☐ Indications of the fault locator

Previously, the indications of the fault locator were dispatched as transient information only when they were coming (ON).

From V4.10 onwards, indications 1129, 1130, 2640 and 2641 are signaled as coming/going (ON/OFF) and can thus be assigned to fault records or relays.

∇ Type of indication changed

	No.	Name	InfType	Oper	Flt	M	CE	CA	b	r	l	Type	Inf	DU	GaT
X	**02640**	**Dir. forw.**	**SIIO**	**b:***	**s:k**	*	*			**r**	**l**	**128**	**74**	**2**	
X	**02641**	**Dir. rev.**	**SIIO**	**b:***	**s:k**	*	*			**r**	**l**	**128**	**75**	**2**	
	01106	>FaultLocStart	SIIO	b:kg	s:kg	*	*	*	b	r	l				
	01110	FOR block	SIIO	b:kg	s:*	*	*			r	l	138	11	1	GaT
X	**01129**	**X neg,no FO**	**SIIO**	**b:k**	**s:***	*	*			**r**	**l**	**138**	**6**	**1**	
X	**01130**	**d>proj.sect**	**SIIO**	**b:k**	**s:***	*	*			**r**	**l**	**138**	**7**	**1**	
	01132	FO invalid	SI_F	b:*	s:k		*				l				
	01114	Rpri =	Vi	b:*	s:kg							138	1	4	
	01115	Xpri =	Vi	b:*	s:kg							128	73	4	
	01117	Rsec =	Vi	b:*	s:kg							138	2	4	
	01118	Xsec =	Vi	b:*	s:kg							138	8	4	
	01119	d =	Vi	b:*	s:kg							138	3	4	
	01120	d[%] =	Vi	b:*	s:kg							138	4	4	
	01121	Section=	Vi	b:*	s:kg							138	5	4	
	01122	d =	Vi	b:*	s:kg							138	10	4	

No.: Indication number
Name: Name
InfType: Type of information: SIIO - Single-point indication, ON/OFF
SI_F - Single-point indication, fleeting Vi - Value indication

Default setting / ability to be assigned

Fixed preset, cannot be assigned: UPPER CASE
Preset, can be assigned: lower case
Not preset, can be assigned: *
Neither preset nor can be assigned: <empty>

K or k: coming (ON)
G or g: going (OFF)
OPER: assignment as operational indication
FLT.: assignment as fault indication
M: assignment as oscillographic record
CE: enabled at CFC input
b: can be assigned to binary input
r: can be assigned to relays
l: can be assigned to LED

Type: Function type for T103
Inf: Information number for T103
DU: Data unit for T103
GaT: generally has to be interrogated for T103

Note

If the Fault Locator function is not available, the direction indication is generated by the distance protection function. The indication is sent coming (ON) and going (OFF).

☐ Fault direction indication of the distance protection function with pick-up

If the Fault Locator function is not available, the direction indication is generated by the distance protection function. Previously, this direction indication was generated with the OFF command.

From V4.10 onwards, the direction in this case is indicated along with the pick-up.

3 Distance Protection

☐ Characteristic parameter "ALPHA Zx"

The value range of the characteristic parameter "ALPHA Zx" was previously -70° … +45°.

Addr.	Parameter	Default setting	Setting range
1311	ALPHA Z1	20 °	- 70° … + 75°
1351	ALPHA Z2	20 °	- 70° … + 75°
1371	ALPHA Z3	20 °	- 70° … + 75°
1385	ALPHA ZUE	20 °	- 70° … + 75°

From V4.10 onwards, this value range has been increased to -70° … +75°.

☐ Startup stages with account taken of the size of the current/voltage change

For the reserve zones Z2 and Z3, there are 2 grading margins TxK and TxL. TxK is activated on detection of a short-circuit and TxL is activated in the event of an overload. The difference of the current phasor and the voltage phasor compared to the values measured 2 cycles before is used as the criterion. If the phasor difference is above the value defined by 1343/1363 - depending on parameters 1210/1220 - AND/OR above the value defined by 1344/1364, ZxK is activated.

From V4.10 onwards, the change in the size of the current and the voltage is taken into consideration in the decision. For release of the TxK grading margins, the current must be greater and the voltage must be smaller.

Addr.	Parameter	Default setting	Setting range
1210	Release T2K	di OR du	di OR du
			di AND du
1343	di/dt Z2	0.5 A	0.0 ... 1.0; ∞
1344	du/dt Z2	20 V	0 ... 100; ∞
1220	Release T3K	di OR du	di OR du
			di AND du
1363	di/dt Z3	0.5 A	0.0 … 1.0; ∞
1364	du/dt Z3	20 V	0 ... 100; ∞

☐ Setting range of the restraint factor for di/dt

From V4.10 onwards, the set value "∞" is no longer permissible in the case of restraint factor 1211/1221 Rest. di/dt Zx. The Restraint function itself can be deactivated by means of the set value "0“.

Addr.	Parameter	Default setting	Setting range
1211	Rest. di/dt Z2	0.0	0.0 ... 0.5
1221	Rest. di/dt Z3	0.0	0.0 ... 0.5

4 System Interface

☐ Type and information number (IEC 60870-5-103 protocol)

From V4.10 onwards, the type and information number of each indication can be changed by the user. A distinction is no longer made between compatible and manufacturer-specific ranges.

☐ Time synchronization via system interface (IEC 60870-5-103 protocol)

After re-starting and external synchronization, the IV-bit is not immediately set.

From V4.10 onwards, there is a new (advanced) parameter in the "Device" parameter group. It prescribes the time after the IV-bit is set if synchronization has not been carried out before. If the selected setting is "0", the device behaves in the same way as before.

Addr.	Parameter	Default setting	Setting range
699	TO IV-Bit T103	1380 min	0; 1 ... 1500

5 Commissioning

☐ Hardware test mode

If the device had been switched to the hardware test mode, this was previously not visible from the appearance of the device.

From V4.10, onwards, the GOK relay is de-energized and the ERROR LED is triggered.

Note

If DIGSI is used to change to the test mode, the GOK relay and the ERROR LED are activated immediately.
However, relay output isolation does not occur until a relay output has been set/deleted. Protection remains active as long as only the binary input or LED is tested.
Before this, the high-speed overcurrent protection function should always be deactivated.

6 Other Information

Internet:

In order to keep up-to-date in the future, please use our download platform in the Internet at the following address:

http://www.siprotec.de

If you have any problems using SIPROTEC 4, please use our hotline

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We wish you success in your work with SIPROTEC 4.

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Subject to change!