



POWERFACTORY

PowerFactory 2021

Technical Reference

Siemens 7SA6

PF2021

POWER SYSTEM SOLUTIONS
MADE IN GERMANY

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February 10, 2020
PowerFactory 2021
Revision 964

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Disclaimer

DlgSILENT protection device models are developed using publicly accessible information, such as user manuals, and are not validated or tested by the respective manufacturers.

1 Model information

Manufacturer Siemens

Model 7SA6

Variants The Siemens 7SA6 consists of two PowerFactory relay models, one for the 1A and one for the 5A version. The "DE-Region" models have additional circular characteristics and are limited to IEC characteristics and 50 Hz frequency protection. The "World-Region" models also have ANSI characteristics and 60 Hz frequency protection, but do not offer support of circular characteristics. Functions and model parameters are derived from information in [1].

Modelled Functionality

Functionality	7SA6
Distance Protection	X
Power Swing Detection	-
Teleprotection for Distance Protection	X ¹
Earth Fault Protection (Earthed Systems)	X ²
Teleprotection for Earth Fault Protection	-
Measures for Weak and Zero In-feed	-
External Direct and Remote Tripping	-
Overcurrent Protection	X
Switch-onto-Fault Protection	-
Earth Fault Protection (Non-Earthed Systems)	-
Automatic Reclosure	X
Synchronism and Voltage Check	-
Under- and Overvoltage Protection	X
Frequency Protection	X
Fault Locator	-
Circuit Breaker Failure Protection	-
Thermal Overload Protection	X

¹PUTT with Z1b, POTT and Pilot Wire Comp.

²Without logarithmic inverse characteristic

2 General description

Each model consists of a main relay with several sub-functions.

- Main relay : Measurement transformer slots, measurement processing, thermal overload, breaker logics
- Distance circular : (only DE-Region) Distance protection with circular characteristics
- Distance polygonal : Distance protection with polygonal characteristics
- Overcurrent : Backup overcurrent protection
- Earthfault : Dedicated earth fault protection
- Frequency (50 Hz) : Frequency protection for 50 Hz
- Frequency (60 Hz) : (only World-Region) Frequency protection for 60 Hz
- Voltage : Over-/Undervoltage protection

3 Main relay

Measurement transformers

The "CT" and "VT" slots hold the assigned 3-phase measurement transformers. The "CT I4" can be assigned to the CT of a parallel line for compensation. Please note, that the zero sequence current for the overcurrent elements will always be calculated from the phase CT. Similarly the zero sequence voltage will be calculated from the phase VT.

Measurement units

The "Measurement" slots process the transformer input and hold the nominal current and voltage values. Please note, that the current is fixed for each model (1A or 5A), but the nominal voltage (address 0204) of the relay should be entered in all measurement units

Thermal overload

The "Thermal overload" unit models the thermal overload protection. Please note, that the "Alarm Only" mode is not modelled.

Address	Relay Setting	Model Unit	Model Parameter	Note
4201	Ther. OVERLOAD	Thermal Overload	Out of Service	Input is in [min]
4202	K-FACTOR	Thermal Overload	Current Setting	
4203	TIME CONSTANT	Thermal Overload	Time Dial	

Breaker logics

The "Trip Logic" and the "Close Logic" hold the breaker and signal assignments for relay trips or reclosing attempts.

4 Distance Polygonal

This sub-function is used to model distance protection with polygonal characteristics. All model units are located in the "Distance Polygonal" sub-relay, unless stated otherwise. Please note that either polygonal or circular characteristics can be used at the same time.

Starting

The "Starting" unit holds the settings associated with distance fault detection and starts "T Non Directional" timer. Please note, that the visibility of the parameters in the dialogue may depend on the selected stating method.

Address	Relay Setting	Model Unit	Model Parameter	Note
0114	Dis. PICKUP	Starting	Type of Starting	Model unit is [%]
0207	SystemStarpoint	Starting	System Grounding	
1202	Minimum Iph>	Starting	Minimum Iph>	
1203	3I0> Threshold	Starting	Ie>	
1204	3U0> Threshold	Starting	Ue> grd.	
1205	3U0> COMP/ISOL	Starting	Ue> ungrd.	
1207A	3I0>/ Iphmax	Starting	Stabilisation Slope	
1209A	E/F recognition	Starting	Earth Fault detection	
1220	PHASE PREF.2phe	Starting	Phase preference for Ph-Ph-E Faults	
1221A	2Ph-E faults	Starting	Ph-Ph-Earth Faults	
1601	PROGAM U/I	Starting	Prog. U/I	
1610	Iph>>	Starting	Iph>>	
1611	Iph>	Starting	Iph>	
1612	Uph-e (I>>)	Starting	Uphe(I>>)	
1613	Uph-e (I>)	Starting	Uphe(I>)	
1614	Uph-ph (I>>)	Starting	Uphph(I>>)	
1615	Uph-ph (I>)	Starting	Uphph(I>)	
1616	Iphi>	Starting	Iphi>	
1617	Uph-e (Iphi>)	Starting	Uphe (Iphi>)	
1618	Uph-ph (Iphi>)	Starting	Uphph (Iphi>)	
1619A	EFFECT φ	Starting	Effect phi	
1620	φ >	Starting	phi>	
1621	φ <	Starting	phi<	

Determination of direction

The "Directional" unit controls the directional inputs of the associated zones and starts the "T Directional" timer. There are no settings associated with this unit. Please note, that while the "Tripping Direction" can be modified, it should remain at "Forward" to facilitate the correct behaviour of the directional backup trip.

Measurement value processing

The two "Polarizing" units process the input values (e.g. by applying zero sequence compensation), calculate the input impedances for the starting unit and the zones, and hold the settings associated with fault current compensation. Please note, that the visibility of some parameters is controlled by the selected "Z0/Z1" method. Both units are configured to use a 2-and-a-half cycle, delay-type voltage memory for the polarising signals.

Address	Relay Setting	Model Unit	Model Parameter	Note
0237	Format Z0/Z1	Polarizing Z1	Show as complex number	
1105	Line Angle	Polarizing Z1b-Z5	Line angle	
1116	RE/RL(Z1)	Polarizing Z1	Re / RI	
1117	XE/XL(Z1)	Polarizing Z1	Xe / XI	
1118	RE/RL(Z1B...Z5)	Polarizing Z1b-Z5	Re / RI	
1119	XE/XL(Z1B...Z5)	Polarizing Z1b-Z5	Xe / XI	
1120	K0 (Z1)	Polarizing Z1	k0	
1121	Angle K0(Z1)	Polarizing Z1	Angle	
1122	K0 (> Z1)	Polarizing Z1b-Z5	k0	
1123	Angle K0(> Z1)	Polarizing Z1b-Z5	Angle	
1126	RM/RL ParalLine	Polarizing Z1	Rm / RI	
1127	XM/XL ParalLine	Polarizing Z1	Xm / XI	

Zone settings

The units "Z1"- "Z5" model the polygonal distance characteristics and start / release their associated timers "TZ1"- "TZ5". For detailed information about the timer settings (including the setup of single-/multi-pole trips), please refer to the corresponding section.

Address	Relay Setting	Model Unit	Model Parameter	Note
1211	Distance Angle	Z1Z2Z3Z4Z5Z1b	Relay Angle	
1301	Op. mode Z1	Z1	Tripping Direction	see 1)
1302	R(Z1) Ø-Ø	Z1	+R Resistance	
1303	X(Z1)	Z1	+X Reach	
1304	RE(Z1) Ø-E	Z1	+R Resistance (PH-E)	
1307	Zone Reduction	Z1	+X Angle	
1311	Op. mode Z2	Z2	Tripping Direction	see 1)
1312	R(Z2) Ø-Ø	Z2	+R Resistance	
1313	X(Z2)	Z2	+X Reach	
1314	RE(Z2) Ø-E	Z2	+R Resistance (PH-E)	
1321	Op. mode Z3	Z3	Tripping Direction	see 1)
1322	R(Z3) Ø-Ø	Z3	+R Resistance	
1323	X(Z3)	Z3	+X Reach	
1324	RE(Z3) Ø-E	Z3	+R Resistance (PH-E)	
1331	Op. mode Z4	Z4	Tripping Direction	see 1)
1332	R(Z4) Ø-Ø	Z4	+R Resistance	

Address	Relay Setting	Model Unit	Model Parameter	Note
1333	X(Z4)	Z4	+X Reach	see 1)
1334	RE(Z4) Ø-E	Z4	+R Resistance (PH-E)	
1331	Op. mode Z5	Z5	Tripping Direction	
1342	R(Z5) Ø-Ø	Z5	+R Resistance	
1343	X(Z5)+	Z5	+X Reach	
1344	RE(Z5) Ø-E	Z5	+R Resistance (PH-E)	see 1)
1346	X(Z5)-	Z5	+X Reach	
1351	Op. mode Z1B	Z1b	Tripping Direction	
1352	R(Z1B) Ø-Ø	Z1b	+R Resistance	
1353	X(Z1B)	Z1b	+X Reach	
1354	RE(Z1B) Ø-E	Z1b	+R Resistance (PH-E)	

Notes:

- 1) Set "Inactive" zone to "Out of Service"

Timer settings

The timers "TZ1"- "TZ5", "T Directional" and "T Non Directional" generate the tripping signals. The zone timers "TZ1"- "TZ5" can be started by the starting unit or by the zones ("Timer Start" logic). Separate timers for single-pole tripping are available modelled with "TZ1", "TZ1B" and "TZ2". Whether or not single-pole tripping is available is controlled by the "Single Pole Trip" logic. Please note, that single-pole tripping only affects dynamic simulations (RMS/EMT).

Address	Relay Setting	Model Unit	Model Parameter	Note
0110	Trip mode	Single Pole Trip	DIP Setting: wSinglePole	"3pole only" = "off" "1-/3pole" = "on (high)"
1210	Start Timers	Timer Start	DIP Setting: wstart	"on Dis. Pickup" = "on" "on Zone Pickup" = "off"
1305	T1-1phase	TZ1 1Pol	Time Setting	"NO" = "off" "YES" = "on"
1306	T1-multi-phase	TZ1	Time Setting	
1315	T2-1phase	TZ2 1Pol	Time Setting	
1316	T2-multi-phase	TZ2	Time Setting	
1317A	Trip 1pole Z2	Z2 Trip	DIP Setting: wSinglePole	
1325	T3 DELAY	TZ3	Time Setting	
1335	T4 DELAY	TZ4	Time Setting	
1345	T5 DELAY	TZ5	Time Setting	
1355	T1B-1phase	TZ1b 1Pol	Time Setting	
1356	T1B-multi-phase	TZ1b	Time Setting	
1602	DELAY FORW. PU	T Directional	Time Setting	
1603	DEL. NON-DIR PU	T Non Directional	Time Setting	

Load encroachment

The "Load Area" unit can be used to prevent the relay model from tripping under load conditions by blocking all zones plus the direction and non directional backup trip.

Address	Relay Setting	Model Unit	Model Parameter	Note
1241	R load (Ø-E)	Load Area	R load (Ph-E)	
1242	φ load (Ø-E)	Load Area	PHI load (Ph-E)	
1243	R load (Ø-Ø)	Load Area	R load (Ph-Ph)	
1244	φ load (Ø-Ø)	Load Area	PHI load (Ph-Ph)	

Automatic reclosure

The "Reclosing" unit models the automatic reclosure by generating close commands after the respective delay times. The close commands are sent to the breaker associated with the 'Close Logic' in the main relay. The zones "Z1"- "Z3" can be blocked after a number of reclosing attempts (configurable via the "Logic" tab).

Address	Relay Setting	Model Unit	Model Parameter	Note
0133	Auto Reclose	Reclosing	Operations to lockout	
3401	AUTO RECLOSE	Reclosing	Out of Service	
3403	T-RECLAIM	Reclosing	Reset Time	
3456	1.AR Tdead1Trip	Reclosing	Reclosing int 1 1Ph-Gnd faults	
3457	1.AR Tdead3Trip	Reclosing	Reclosing interval 1	
3468	2.AR Tdead3Trip	Reclosing	Reclosing interval 2	
3479	3.AR Tdead3Trip	Reclosing	Reclosing interval 3	
3490	4.AR Tdead3Trip	Reclosing	Reclosing interval 4	

Teleprotection

In order for the teleprotection to function correctly, both 7SA6 models have to be linked via the "7SA6 Communication" model. Depending on the selected mode (currently supported: *"PUTT with Z1b"*, *"POTT"* and *"Pilot Wire Comparison"*) each model will send the appropriate signals to the receiving side. The received signals are combined with the overreach zone tripping signals to generate a trip signal.

Address	Relay Setting	Model Unit	Model Parameter	Note
0121	Teleprot. Dist.	Signal Send Signal Receive	Logic Out of Service	See 1)
2101	FCT Telep. Dis.	Signal Send Signal Receive	Logic Out of Service	See 1)
2103A	Send Prolong.	T Send T Send 1Pol	Time Setting	See 2)

Notes:

- 1) – "PUTT with Z1b" : Set *"PUTT=TRIP"* in the "Signal Send" logic tab and enable the "Signal Send" and "Signal Receive" units

- "POTT" : Set "*POTT=TRIP*" in the "Signal Send" logic tab and enable the "Signal Send" and "Signal Receive" units
- "Pilot Wire Comp" : Set "*COMP=TRIP*" in the "Signal Send" logic tab and enable the "Signal Send" and "Signal Receive" units
- Any other setting : Disable the "Signal Send" and "Signal Receive" units

2) When "Pilot Wire Comp" is used, the setting should be set to zero.

Trip signal

The trip signals are generated by the "Distance Trip" logic. Depending on the single-pole setting and the detected fault, these can either be "per phase" (yout_A, yout_B, yout_C) or a general 3-pole trip (yout) signal. Please note, that the overreach zone "Z1B" is connected to the logic, but is not considered for the trip signal generation. It was incorporated in the scheme to facilitate the addition of teleprotection schemes.

5 Distance Circular

This sub-function is used to model distance protection with circular characteristics. All model units are located in the "Distance Circular" sub-relay, unless stated otherwise. All functions, except the zone settings, behave like described in the corresponding section of the "Distance Polygonal" sub-function. Please note that either polygonal or circular characteristics can be used at the same time and that the circular characteristics are only available in "DE-Region" models.

Zone settings

The units "Z1"- "Z5" model the circular distance characteristics and start / release their associated timers "TZ1"- "TZ5". For detailed information about the timer settings (including the setup of single-/multi-pole trips), please refer to the corresponding section.

Address	Relay Setting	Model Unit	Model Parameter	Note
1301	Op. mode Z1	Z1	Tripping Direction	see 1)
1502	ZR(Z1)	Z1	Replica Impedance	
1503	ALPHA(Z1)	Z1	Alpha	see 2)
1311	Op. mode Z2	Z2	Tripping Direction	see 1)
1512	ZR(Z2)	Z2	Replica Impedance	
1513	ALPHA(Z2)	Z2	Alpha	see 2)
1321	Op. mode Z3	Z3	Tripping Direction	see 1)
1522	ZR(Z3)	Z3	Replica Impedance	
1523	ALPHA(Z3)	Z3	Alpha	see 2)
1331	Op. mode Z4	Z4	Tripping Direction	see 1)
1532	ZR(Z4)	Z4	Replica Impedance	
1533	ALPHA(Z4)	Z4	Alpha	see 2)
1331	Op. mode Z5	Z5	Tripping Direction	see 1)
1542	ZR(Z5)	Z5	Replica Impedance	
1543	ALPHA(Z5)	Z5	Alpha	see 2)
1351	Op. mode Z1B	Z1b	Tripping Direction	see 1)

Address	Relay Setting	Model Unit	Model Parameter	Note
1552	ZR(Z1B)	Z1b	Replica Impedance	
1553	ALPHA(Z1B)	Z1b	Alpha	see 2)

Notes:

- 1) Set "Inactive" zone to "Out of Service"; "Non-Directional" is not supported due to modelling restrictions.
- 2) Use "Enable" flag on the "Arc Compensation" tab to enable/disable the arc compensation.

6 Overcurrent

The "Overcurrent" sub-function models the backup overcurrent functions for phase and zero sequence currents. Please note, that the operation mode "ON:with VT loss" can only be modelled indirectly by blocking the overcurrent units from generating trip signals (via the "Operation Mode" logic) and can not be simulated directly.

Address	Relay Setting	Model Unit	Model Parameter	Note
2601	Operating Mode	Various	Various	see 1)
2610	Iph>>	Iph>>	Pickup Current	
2611	T Iph>>	Iph>>	Time Setting	
2612	3I0>> PICKUP	3I0>>	Pickup Current	
2613	T 3I0>>	3I0>>	Time Setting	
2620	Iph>	Iph>	Pickup Current	
2621	T Iph>	Iph>	Time Setting	
2622	3I0>	3I0>	Pickup Current	
2623	T 3I0>	3I0>	Time Setting	
2640	Ip>	Ip>	Current Setting	
2642	T Ip Time Dial	Ip>	Time Dial	see 2)
2643	Time Dial TD Ip	Ip>	Time Dial	see 3)
2646	T Ip Add	Ip>	Time Adder	
2650	3I0p PICKUP	3I0p	Current Setting	
2652	T 3I0p TimeDial	3I0p	Time Dial	see 2)
2653	TimeDial TD3I0p	3I0p	Time Dial	see 3)
2656	T 3I0p Add	3I0p	Time Adder	
2660	IEC Curve	Ip> 3I0p	Characteristic	see 2)
2661	ANSI Curve	Ip> 3I0p	Characteristic	see 3)

Notes:

- 1)
 - "ON:with VT loss" : set the "DIP Setting : wEmergencyOnly" of the "Operation Mode" logic to "on (high)"
 - "ON:always activ" : set the "DIP Setting : wEmergencyOnly" of the "Operation Mode" logic to "off"
 - "OFF" : set the units "Iph>>", "Iph>", "Ip>", "3I0>>", "3I0>" and "3I0p" to "Out of Service"

- 2) Setting only applies when address 0126 indicates IEC-Curves
- 3) Setting only applies when address 0126 indicates ANSI-Curves (please note, that ANSI curves are only available for "World-Region" models)

7 Earthfault

The "Earthfault" sub-function models separate earthfault detection and tripping functions.

Address	Relay Setting	Model Unit	Model Parameter	Note
3110	Op. mode 3I0>>>	3I0>>>	Tripping Direction	see 1)
3111	3I0>>>	3I0>>>	Pickup Current	
3112	T 3I0>>>	3I0>>>	Time Setting	
3121	Op. mode 3I0>>	3I0>>	Tripping Direction	see 1)
3121	3I0>>	3I0>>	Pickup Current	
3122	T 3I0>>	3I0>>	Time Setting	
3130	Op. mode 3I0>	3I0>	Tripping Direction	see 1)
3131	3I0>	3I0>	Pickup Current	
3132	T 3I0>	3I0>	Time Setting	
3140	Op. mode 3I0p	3I0p	Tripping Direction	see 1), 4), 7)
3141	3I0p PICKUP	3I0p 3I0p (U0inv)	Current Setting Pickup Current	see 4) see 6)
3143	3I0p Time Dial	3I0p	Time Dial	see 2)
3144	3I0p Time Dial	3I0p	Time Dial	see 3)
3147	Add.T-DELAY	3I0p	Time Adder	see 4)
3151	IEC Curve	3I0p	Characteristic	see 2)
3152	ANSI Curve	3I0p	Characteristic	see 3)
3160	POLARIZATION	Directional (I0-U0) Directional (I2-U2) Directional (S)	Out of Service	see 5)
3164	3U0>	Directional (I0-U0)	Polarizing Voltage	
3165	IY>	Directional (I0-U0)	Operating Current	
3166	3U2>	Directional (I2-U2)	Polarizing Voltage	
3167	3I2>	Directional (I2-U2)	Operating Current	
3169	S forward	Directional (S)	Product	
3182	3U0>(U0 inv)	3U0> (U0inv)	Pickup Voltage	see 6)
3183	U0inv. minimum	3I0p (U0inv)	Input Setting	see 6)
3184	T forw. (U0inv)	3I0p (U0inv)	Time Adder	see 6)
3185	T rev. (U0inv)	T rev (U0 inv)	Tdelay	see 6)

Notes:

- 1) Set "Inactive" units to "Out of Service"
- 2) Only applies, when address 0131 indicates IEC-Curves
- 3) Only applies, when address 0131 indicates ANSI-Curves
- 4) Only applies, when address 0131 indicates IEC- or ANSI-Curves

- 5)
 - "U0 + IY or U2" : enable "Directional (I0-U0)"
 - "U0 + IY" : enable "Directional (I0-U0)"
 - "with IY only" : not modelled
 - "with U2 and I2" : enable "Directional (I2-U2)"
 - "zero seq. power" : enable "Directional (S)"
- 6) Only applies, when address 0131 indicates U0-Characteristic
- 7) To set the "Operating Mode" for U0 Characteristics :
 - "Inactive" : Set the "U0 Trip" unit "Out of Service"
 - "Forward" : Set the "DIP Setting" of the "Direction (U0inv)" logic to: "DirFwd" = "on", "DirRev" = "off"
 - "Reverse" : Set the "DIP Setting" of the "Direction (U0inv)" logic to: "DirFwd" = "off", "DirRev" = "on"
 - "Non-Directional" : Set the "DIP Setting" of the "Direction (U0inv)" logic to: "DirFwd" = "on", "DirRev" = "on"

8 Voltage

The "Voltage" sub-function models over-/undervoltage related functionality.

Address	Relay Setting	Model Unit	Model Parameter	Note
3701	Uph-e>(>)	Uph-e>(>)	Various	see 1)
3702	Uph-e>	Uph-e>	Pickup Voltage	$U_{PF} = U/\sqrt{3}$
3703	T Uph-e>	Uph-e>	Time Delay	
3704	Uph-e>>	Uph-e>>	Pickup Voltage	$U_{PF} = U/\sqrt{3}$
3705	T Uph-e>>	Uph-e>>	Time Delay	
3711	Uph-ph>(>)	Uph-ph>(>)	Various	see 1)
3712	Uph-ph>	Uph-ph>	Pickup Voltage	
3713	T Uph-ph>	Uph-ph>	Time Delay	
3714	Uph-ph>>	Uph-ph>>	Pickup Voltage	
3715	T Uph-ph>>	Uph-ph>>	Time Delay	
3721	U0>(>)	U0>(>)	Various	see 1)
3722	U0>	U0>	Pickup Voltage	
3723	T U0>	U0>	Time Delay	
3724	U0>>	U0>>	Pickup Voltage	
3725	T U0>>	U0>>	Time Delay	
3731	U1>(>)	U1>(>)	Various	see 1)
3732	U1>	U1>	Pickup Voltage	
3733	T U1>	U1>	Time Delay	
3734	U1>>	U1>>	Pickup Voltage	
3735	T U1>>	U1>>	Time Delay	
3741	U2>(>)	U2>(>)	Various	see 1)
3742	U2>	U2>	Pickup Voltage	
3743	T U2>	U2>	Time Delay	
3744	U2>>	U2>>	Pickup Voltage	
3745	T U2>>	U2>>	Time Delay	

Address	Relay Setting	Model Unit	Model Parameter	Note
3751	Uph-e(<)	Uph-e(<)	Various	see 2)
3752	Uph-e>	Uph-e<	Pickup Voltage	$U_{PF} = U/\sqrt{3}$
3753	T Uph-e>	Uph-e<	Time Delay	
3754	Uph-e<<	Uph-e<<	Pickup Voltage	$U_{PF} = U/\sqrt{3}$
3755	T Uph-e<<	Uph-e<<	Time Delay	
3761	Uph-ph(<)	Uph-ph(<)	Various	see 2)
3762	Uph-ph<	Uph-ph<	Pickup Voltage	
3763	T Uph-ph<	Uph-ph<	Time Delay	
3764	Uph-ph<<	Uph-ph<<	Pickup Voltage	
3765	T Uph-ph<<	Uph-ph<<	Time Delay	
3771	U1<(<)	U1<(<)	Various	see 2)
3772	U1<	U1<	Pickup Voltage	
3773	T U1<	U1<	Time Delay	
3774	U1<<	U1<<	Pickup Voltage	
3775	T U1<<	U1<<	Time Delay	

Notes:

- 1) – "OFF" : Set the logic "Out of Service"
- "Alarm Only" : Set the "DIP Setting" to "Tripgg" = "off", "Tripg" = "off"
- "ON" : Set the "DIP Setting" to "Tripgg" = "on (high)", "Tripg" = "on (high)"
- "U> Alarm U>> Trip" : Set the "DIP Setting" to "Tripgg" = "on (high)", "Tripg" = "off"
- 2) – "OFF" : Set the logic "Out of Service"
- "Alarm Only" : Set the "DIP Setting" to "Tripll" = "off", "Tripl" = "off"
- "ON" : Set the "DIP Setting" to "Tripll" = "on (high)", "Tripl" = "on (high)"
- "U> Alarm U>> Trip" : Set the "DIP Setting" to "Tripll" = "on (high)", "Tripl" = "off"

9 Frequency

The two "Frequency" sub-functions model the over-/underfrequency related functionality. The 50Hz version has the dedicated ranges for $f_N = 50\text{Hz}$, the 60Hz version the ranges for $F_N = 60\text{Hz}$. Please note, that only one of the two can be active at the same time and that the "DE-Region" models only have the 50Hz version.

Address	Relay Setting	Model Unit	Model Parameter	Note
3601	O/U FREQ. f1	Various	Various	see 1)
3602	f1 PICKUP	f1	Frequency	see 2)
3603	f1 PICKUP	f1	Frequency	see 3)
3604	T f1	f1	Time Delay	
3611	O/U FREQ. f2	Various	Various	see 1)
3612	f2 PICKUP	f2	Frequency	see 2)
3613	f2 PICKUP	f2	Frequency	see 3)
3614	T f2	f2	Time Delay	
3621	O/U FREQ. f3	Various	Various	see 1)
3622	f3 PICKUP	f3	Frequency	see 2)

Address	Relay Setting	Model Unit	Model Parameter	Note
3623	f3 PICKUP	f3	Frequency	see 3)
3624	T f3	f3	Time Delay	
3631	O/U FREQ. f4	Various	Various	see 1)
3632	f4 PICKUP	f4	Frequency	see 2)
3633	f4 PICKUP	f4	Frequency	see 3)
3634	T f4	f4	Time Delay	

Notes:

- 1)
 - "ON: Alarm only" : Set the "DIP Setting" of the "Frequency Trip" to "TripfX" = "off"
 - "ON: with Trip" : Set the "DIP Setting" of the "Frequency Trip" to "TripfX" = "on"
 - "OFF" : Set the corresponding frequency unit "Out of service"
- 2) Only applies for $f_N = 50Hz$
- 3) Only applies for $f_N = 60Hz$

10 Available Mapping Files

Hardware Version	Firmware Version	Language	Multiple Setting Groups	Model
7SA6xxx-xxAxx	4.6	de		7SA6 1A 7SA6 5A
			X	7SA6 1A 7SA6 5A

11 References

- [1] Siemens AG. *SIPROTEC Distance Protection 7SA6*. C53000-G1176-C156-4.