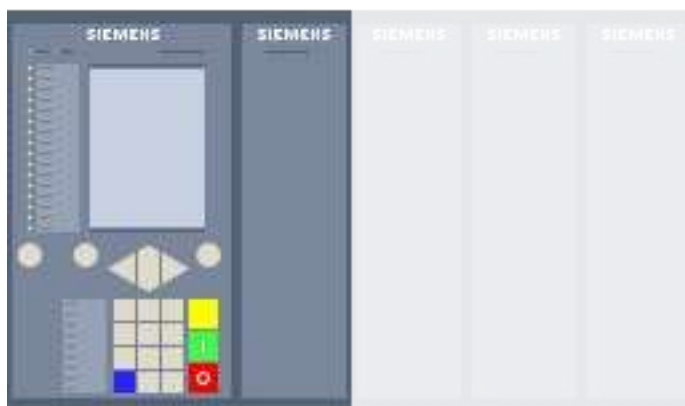


Device: 7SJ85 Overcurrent Protection**Product code**

Short: P1J2036915

Long: 7SJ85DAAAAA00AAAA0AP011113113BBBA000000AC0CB1BA1CG0

IO202 PS201 IO207

**Technical Data:**

Firmware:	Current version
Binary inputs:	27
Binary outputs:	17 Relays (11 Standard, 6 Fast, 0 High-Speed, 0 Power)
Current transformers:	4 for protection
Voltage transformers:	4 standard
Measuring-transducer inputs:	0 (20 mA or 10 V, fast) 0 (20 mA, standard) 0 (DC 300 V) 0 (20 mA, fast) 0 (temperature)
Housing width:	1/2 x 19"
Housing type:	Flush mounting
Modules in 19" row 1:	IO202, PS201, IO207
LEDs/Push-buttons:	16 LEDs
Operation Panel:	Integrated
Key switch:	Without
Display type:	Large display
Front Design:	Standard
Power Supply:	DC 60 V-250 V, AC 100 V-230 V

Redundant Power Supply: No

Note on module selection

Devices ordered with the latest firmware will be delivered with ETH-BA-2EL/ETH-BB-2FO Rev2 module and can't be downgraded to a firmware version less than V09.6x. To order devices with ETH-BA-2EL/ETH-BB-2FO Rev1 modules, select a specific firmware version less than V09.6x.

Communication/Plug-in modules:

Communications encryption: Normal

Integrated Ethernet port J: DIGSI 5 and IEC 61850/Goose

Plug-in module position E: ETH-BB-2FO: 2x optical Ethernet 100 Mbit/s, 1300 nm, duplex LC connector, 2 km over 50/125 um or 62.5/125 um multimode optical fiber
Communication Protocols: applicable for DIGSI 5, IEC 61850-8-1 MMS and GOOSE, IEC 60870-5-104, DNP3 TCP, Modbus TCP, Synchrophasor (IEEE C37.118 - IP), Profinet IO, SUP, DHCP, SNTP, SNMP, etc.
Redundancy protocols: Line Mode, RSTP, HSR, PRP

Plug-in module position F: ETH-BA-2EL: 2x electric Ethernet 100 Mbit/s, RJ45
Communication Protocols: applicable for DIGSI 5, IEC 61850-8-1 MMS and GOOSE, IEC 60870-5-104, DNP3 TCP, Modbus TCP, Synchrophasor (IEEE C37.118 - IP), Profinet IO, SUP, DHCP, SNTP, SNMP, etc.
Redundancy protocols: Line Mode, RSTP, HSR, PRP

Functions:

Function points class: Base + 250 function points

Note on function-points class

The function-points class results from the sum of the function points of the selected functions. You can apply these functions according to the selected function-points class. The device also allows each other selection of functions if the sum of the required function points is within the selected function-points class.

From Version V9.3 on the function-points class "1400+" is withdrawn. With this class function-points exceeding the limit of 1400 were free of charge. The maximum function-points class is now 1400. If a function-points budget of more than 1400 points is required for a device the application Function-Point-Manager need to be applied. All function points are liable to cost.

In the engineering phase DIGSI 5 checks that the selected configuration is suitable (capable of running in the device) before loading it to the device.

Miscellaneous:

Warranty: 5 years

Special Approvals: Without

Firmware:

Current version

7SJ85 Overcurrent-Time Protection - Overview Function points calculation

(P1J2036915)

Functions Free of Charge

ANSI	Function	Abbr.	Included
	Protection functions for 3-pole tripping	3-pole	✓
	Hardware quantity structure expandable	I/O	✓
37	Undercurrent	I<	✓
38	Temperature supervision	θ>	✓
46	Negative-sequence overcurrent protection	I2>	✓
46	Unbalanced-load protection (thermal)	I2 ² t>	✓
49	Thermal overload protection	θ, I ² t	✓
49	Thermal overload protection, user-defined characteristic	θ, I ² t	✓
	Instantaneous tripping at switch onto fault	SOTF	✓
50HS	Instantaneous high-current tripping	I>>>	✓
50/51 TD	Overcurrent protection with positive-sequence current I1 (from V7.9)	I1>	20 X ✓
50N/ 51N TD	Overcurrent protection, ground	IN>	✓
50N/ 51N TD	Overcurrent protection, 1-phase	IN>	✓
50Ns/ 51Ns	Sensitive ground-current detection for systems with resonant or isolated neutral systems incl. a) 3I0>, b) admittance Y0>, c) 3I0-harm> (from V7.8)	INs>	✓
74TC	Trip-circuit supervision	TCS	✓
74CC	Closed-circuit supervision (from V7.9)	CCS	✓
86	Lockout		✓
AFD	Arc-protection (only with plug-in module ARC-CD-3FO)		5 X ✓
	Measured values - standard		✓
	Switching statistic counters		✓

	PQ-Basic measured values: THD (Total Harmonic Distortion) and harmonics (from V8.01) THD voltage aggregation values (from V8.40)		✓
	CFC (Standard, control)		✓
	Inrush current detection		✓
	External trip initiation		✓
	Control		✓
	Protection interface, serial		✓
	Monitoring and supervision		✓
	Fault recording of analog and binary signals		✓
	Frequency-tracking groups (from V7.8)		6 X ✓
	Temperature acquisition via communication protocol		✓

Functions with Costs

ANSI	Function	Abbr.	Included	Quantity	Value	Points
	IEC 61850-9-2 Merging Unit function (Note: Max. 2 streams per MU function, each MU function requires a ETH-BD-2FO plug-in module)	MU		0	200	0
	Process Bus Client function (Note: This function requires a ETH-BD-2FO plug-in module)	PB client		0	100	0
	Subscription of redundant IEC 61850-9-2 Sampled Value streams, with automatic and manual switching capabilities between Main and Redundant measuring point (Note: Requires PB Client functionality, not applicable for 7SS85 CU) (from V9.90)	Redundant SV		0	25	0
	IEC 61850-9-2 Merging Unit function for 7SS85 CU (Note: Only for communication with a 7SS85 with Significant properties: "CU: ...". This function requires a ETH-BD-2FO plug-in module)	MU (7SS85 CU)		0	295	0

	IEEE 1588v2/PTP Grandmaster Clock (Note: This function requires a ETH-BD-2FO, with V9.20)	GMC		0	200	0
24	Overexcitation protection	V/f		0	25	0
25	Synchrocheck, synchronization function	Sync		0	50	0
25	Synchronization function with balancing commands, 1 channel for each sync. location	Sync		0	80	0
27	Undervoltage protection: "3-phase" or "positive-sequence system V1" or "universal Vx"	V<		0	5	0
27R, 59R	Rate-of-voltage-change protection (from V8.30)	dV/dt		0	5	0
	Undervoltage-controlled reactive power protection	Q>/V<		0	15	0
32, 37	Power protection active/reactive power	P<>, Q<>		0	10	0
32R	Reverse-power protection	- P<		0	5	0
46	Negative-sequence overcurrent protection with direction			0	10	0
47	Overvoltage protection, negative-sequence system	V2>		0	5	0
49	Thermal overload protection for RLC filter elements of a capacitor bank	θ, I^2t		0	10	0
50/51 TD	Overcurrent protection, phases	I>	2 X ✓	0	30	0
50/51 TD	Overcurrent protection for RLC filter elements of a capacitor bank	I>		0	10	0
	Ground-fault detection via pulse pattern detection; Note: this stage additionally requires the function 50Ns/51Ns or 67Ns "Sensitive ground-fault detection for systems with resonant or isolated neutral"	IN-pulse		0	15	0
	Intermittent ground-fault protection	lie>		0	20	0
50BF	Circuit-breaker failure protection, 3-pole	CBFP		0	5	0
50RS	Circuit-breaker restrike protection	CBRS		0	20	0

50EF	End-fault protection (Note: Only useable for distributed busbar protection with 7SS85 CU with V8.40)			0	5	0
51V	Overcurrent protection, voltage dependent	$t=f(I,V)$		0	10	0
59, 59N	Overvoltage protection: "3-phase" or "zero-sequence system V0" or "universal Vx"	$V>$		0	5	0
59C	Peak overvoltage protection, 3-phase, for capacitors	$V> \text{ cap.}$		0	30	0
59NU	Neutral-point Voltage-Unbalance Protection (from V8.6)	$UNU>$		0	30	0
60	Voltage-comparison supervision	$\Delta U>$		0	5	0
60C	Current-unbalance protection for capacitor banks	$I_{unbal}>$		0	50	0
67	Directional overcurrent protection, phases			0	15	0
67N	Directional overcurrent protection, ground			0	15	0
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral incl. a) $3I0>$, b) $V0>$, c) Cos-/SinPhi , d) Transient ground-fault fct., e) $\text{Phi}(V,I)$, f) admittance			0	30	0
	Directional stage with a harmonic; Note: this stage additionally requires the function "67Ns Dir. sensitive ground-fault detection for systems with resonant or isolated neutral"			0	10	0
	Directional intermittent ground-fault protection	$I_{ie \text{ dir}}>$		0	20	0
79	Automatic reclosing, 3-pole	AR		0	35	0
81	Frequency protection: "f>" or "f<" or "df/dt"	$f<>$; $df/dt<>$		0	5	0
81U	Underfrequency load-shedding	$f<(UFLS)$		0	15	0
	Vector-jump protection	$\Delta\varphi>$		0	20	0
	Subsynchronous Resonance Detection (from V9.90)	SSR		0	1000	0
87N	Restricted ground-fault protection	ΔI_N		0	15	0

87C	Differential protection, capacitor bank	ΔI		0	95	0
87V	Voltage differential protection, capacitor bank	ΔV		0	50	0
90ASC	Arc Suppression Coil Controller (from V9.90)	ASC		0	250	0
90ASC	Resistor Control (Note: only together with the function Arc Suppression Coil Control) (from V9.90)	ASC		0	10	0
90V	Automatic voltage controller for two-winding transformer			0	150	0
90V	Automatic voltage controller for two-winding transformer with parallel operation			0	180	0
	Number of two-winding transformers with parallel operation (Note: only together with the function "Automatic voltage controller for two-winding transformer with parallel operation")		2 X ✓	0	5	0
90V	Automatic voltage controller for three-winding transformer			0	200	0
90V	Automatic voltage controller for grid coupling transformer			0	175	0
FL	Fault locator, single-sided	FL-one		0	25	0
FL	Fault locator plus (from V7.9)	FL plus		0	45	0
PMU	Synchrophasor measurement	PMU		0	40	0
	Measured values - extended: Min, Max, Avg			0	3	0
	PQ-Basic measured values: Voltage unbalance (from V8.40)			0	20	0
	PQ-Basic measured values: Voltage variations - voltage dips, swells and interruptions (from V8.40)			0	30	0
	PQ-Basic measured values: TDD - Total Demand Distortion (from V8.40)			0	10	0
	CFC arithmetic			0	40	0
	Circuit-breaker monitoring (from V9.20)	ΣI_x , I^2t , 2P, tO, tC, pole scatter, discrepancy		0	10	0

	Disconnecter monitoring (from V9.50)	tO, tC		0	5	0
	Switching sequences function			0	5	0
	Point-on-wave with residual flux estimation (from V9.80)	PoW		0	465	0
	Circuit-breaker		4 X ✓	0	3	0
	Disconnecter/Grounding switch		4 X ✓	0	3	0
PoW	Point-on-wave switching (from V7.90)	PoW		0	425	0
	Multiplexing of protection interface			0	50	0
SSR	Slow-scan recorder (Mod.: from V8.80, Non-Mod.: from V9.40)	SSR	1 X ✓	0	40	0
CR	Continuous recorder (Mod.: from V9.20, Non-Mod.: from V9.40)	CR	1 X ✓	0	25	0
	PQ-10/12 cycle values for continuous recorder (from V9.20)	CR		0	25	0
TR	Trend recorder (Mod.: from V9.30, Non-Mod.: from V9.40)	TR	1 X ✓	0	25	0
	PQ-Trend value for Trend Recorder (from V9.30)	TR		0	25	0
	PQ-Flicker values for Trend Recorder (from V9.30)	TR		0	25	0
	Cyber Security: Role-Based Access Control (from V7.8)			0	25	0
	Cyber Security: IEEE 802.1x based network authentication (from V8.3)			0	10	0
27-CEI	Region Italy: undervoltage protection according to the CEI 0-16 standard (from V9.50)	V<		0	5	0
59-CEI	Region Italy: overvoltage protection according to the CEI 0-16 standard (from V9.50)	V>		0	5	0
81-CEI	Region Italy: frequency protection according to the CEI 0-16 standard (from V9.50)	f<>		0	10	0
Total:						0