Manufacturer`s Declaration of Conformity

Hirschmann Automation and Control GmbH

Stuttgarter Straße 45-51
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declares in sole responsibility, that the product(s)

MACH 1000 Ruggedized Switch Family

(Product description)

MACH1020, MACH1030, MACH1022, MACH1032,MACH1120, MACH1130, MACH1122, MACH1132

with the following possible product codes:
[MAR1020-|MAR1030-|MAR1022-|MAR1032-|MAR1120-|MAR1130-|MAR1122-|MAR1132-]
[99|CC|4O|4T|OT] 12x[99|TT|MM|JJ|NN|VV|UU|LL|GG*|ZZ|FF|RR|BB]
[S*|C*|U|F] [C|G|L|M] [9|C|G|L|M] [H] [n] [H] [H] [nn.n.nn]
assembled with the transceivers M-Fast SFP-x, M-SFP-x.

(n = any letter or number, x = any suffix)

(Type, reference number)

has been designed and manufactured in accordance with the following standards

IEC/EN 61850-3:2014 – Communication networks and systems in substations

Test description	IEC 61850-3 Section	Test Reference	Requirement
Dry heat test operational	6.9.3.1	IEC 60068-2-2	+70 °C +60 °C *1)*
Cold test operational	6.9.3.2	IEC 60068-2-1	-40 °C 0 °C *1)*
Dry heat test storage	6.9.3.3	IEC 60068-2-1	+85 °C
Cold test storage	6.9.3.4	IEC 60068-2-2	-40 °C
Change of temperature test, operational	6.9.3.5	IEC 60068-2-14	-40 °C / 70 °C 0 °C / 60 °C *1)*
Damp heat cyclic test	6.9.3.7	IEC 60068-2-30	Test Db, 95 % (6 x 24h cycles)

Test description	IEC 61850-3 Section	Test Reference	Requirement
Vibration response and endurance (sinusoidal)	6.10.1	IEC 60255-21-1	Class 1 response: 10-59 Hz: 0,035 mm, 59-150 Hz: 0,5 g endurance: 59-150 Hz: 1,0 g
Shock response and shock withstand (half sine)	6.10.2	IEC 60255-21-2	Class 1 response: 5 g, 11 ms endurance: 15 g, 11 ms
Bumps	6.10.2	IEC 60255-21-2	Class 0
Seismic	6.10.3	IEC 60255-21-3	Class 1 1-8,5 Hz: 3,5 mm (x) / 1,5 mm (y) 8,5-35 Hz: 1 g (x) / 0,5 g (y)
IP protection class	6.11	IEC 60529	
Rated voltage, operating range	5.2		*AC power ports:* Urated: 110-230 V (M), -20 % to +10 % *DC power ports:* Urated: 24-48 V (L), 110-250 V (M), -20 % to +10 %
Product safety requirements	6.6.1	Clearances and creepage	Tests according to EN 60950-1 passed
	6.6.2	IP rating	EN 60950-1 passed
	6.6.3	Impulse voltage	±5 kV
	6.6.4	Dielectric voltage test	0,7 kV d.c. (L)
	6.6.5	Protective bonding resistance	0,1 Ω
	6.6.6	Flammability	EN 60950-1 passed
	6.6.7	Single-fault condition	EN 60950-1 passed
Electrostatic discharge	6.7.3	table 9.3 (Basic: IEC 61000-4-2)	Level 3, 6 kV contact / 8 kV air
Radiated electromagnetic field	6.7.3	table 9.2 (Basic: IEC 61000-4-3)	Level 3, 10 V/m 80 – 3000 MHz
Fast transient / burst	6.7.3	table 10.4, 11.5, 12.7 (Basic: IEC 61000-4-4)	*Signal ports, power ports:* CM Level 4, ±4 kV
Surges 1,2/50µs	6.7.3	table 10.2, 11.3, 12.5 (Basic: IEC 61000-4-5)	*Signal ports :* CM Level 4, ±4 kV *AC-power ports:* CM Level 4, ±4 kV DM Level 3, ±2 kV *DC-power ports:* CM Level 3, ±2 kV DM Level 2, ±1 kV

Test description	IEC 61850-3 Section	Test Reference	Requirement
Conducted disturbances by RF fields	6.7.3	table 10.5, 11.6, 12.8, 13.2 (Basic: IEC 61000-4-6)	Level 3, 10 V 150 kHz – 80 MHz
Power Magnetic field	6.7.3	table 9.1 (Basic: IEC 61000-4-8)	Level 5, *100A/m cont., 1000A 1s*
Damped oscillatory wave 1MHz	6.7.3	table 10.3, 11.4, 12.6 (Basic: IEC 61000-4-18)	*Signal ports, power ports:* CM Level 3, 2,5 kV DM Level 3, 1,0 kV
Main frequency voltage	6.7.3	table 10.1, 12.4 (Basic: IEC 61000-4-16)	*Signal ports, DC power ports: Level 4, 30 V cont., 300 V 1s*
Voltage dips	6.7.3	table 11.1 (Basic: IEC 61000-4-11)	*AC Power Ports* (M) ΔU 30% for 1 period ΔU 60% for 50 periods **2)*
		table 12.1 (Basic: IEC 61000-4-29)	*DC Power Ports* (M/L) ΔU 30% for 0,1 s ΔU 60% for 0,1 s **2)*
Voltage interruptions	6.7.3	table 11.2 (Basic: IEC 61000-4-11)	*AC Power Ports* (L/M) ΔU 100% for 5 period **2)* ΔU 100% for 50 periods **2)*
		table 12.2 (Basic: IEC 61000-4-29)	*DC Power Ports* (L) ΔU 100% for 0,05 s **2)*
Ripple on DC power supply	6.7.3	table 12.3 (Basic: IEC 61000-4-17)	10 %
Radiated Emission	6.7.4	table 16.1, 17.1 CISPR22	30...230 MHz: 40 dBµV/m (10m) 230...1000 MHz: 47 dBµV/m (10m) 1...3 GHz: 56 dB(µV/m) av. 76 dB(µV)/m pk. (3m) 3...6 GHz: 60 dB(µV/m) av. 80 dB(µV)/m pk. (3m)
Conducted Emission	6.7.4	table 14.1, 15.1 CISPR22	*Power ports:* 150...500 kHz: 79 dBµV qp. 66 dBµV av. 500 kHz...30 MHz: 73 dBµV qp. 60 dBµV av. Telecommunication ports: 150...500 kHz: 97 to 87 dBµV qp. 84 to 74 dBµV av. 500 kHz...30 MHz: 87 dBµV qp. 74 dBµV av.

**1)* Standard temperature range – heated and/or cooled enclosed locations

**2)* For continuous operation according to 7.5.2c, a redundant power source or an UPS is recommended.

IEEE 1613:2009 – Devices in Electrical Power Substations

Test description	IEEE 1613 Section	Test Reference	Requirement
Operational temperature range	3.1.1	-	-40 °C to +70 °C 0 °C to +60 °C *1)*
Nonoperational temperature range	3.1.2	-	-40 °C to +85 °C
Relative humidity communication equipment	3.1.3	-	95 %, 96 hours
DC rated control power inputs	4.1	-	24 V rated, 32 V max. (L) 48 V rated, 60 V max. (L) 110 V rated, 123 V max. (M) 125 V rated, 140 V max. (M) 220 V rated, 246 V max. (M) 250 V rated, 280 V max. (M)
AC component in DC control voltage supply	4.2	-	5% peak
AC rated control power inputs	4.3	-	120V-240 V, 50-60 Hz (M)
Dielectric test	5.2	-	U_{rated} <= 48 V: 0,7 kV DC (L) U_{rated} > 48 V ≤ 250 V: 2,8 kV DC (M)
Impulse voltage test	5.3	-	±5 kV
Oscillatory wave test 1MHz	6	-	2,5 kV CM 2,5 kV DM
Fast transient / burst	6	-	±4 kV CM
Radiated electromagnetic field	7	-	20 V/m rms (35 V/m peak) 80 – 1000 MHz
Electrostatic Discharge	8	-	±8 kV contact discharge ±15 kV air discharge
Vibration	9	-	Class V.S.2 10 mm/s, 1-150 Hz
Device cooling	10	-	Convection cooled without fans

1) Standard temperature range – heated and/or cooled enclosed locations

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