

Herstellererklärung Manufacturer`s Declaration of Conformity

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erklärt in alleiniger Verantwortung, dass das/die Produkt(e)
declares in sole responsibility, that the product(s)

IP67 ETHERNET Switch

(Bezeichnung / Product description)

**OCTOPUS 8M-Train-BP, 942 091-001,
OCTOPUS 24M-Train-BP, 942 093-001**

(Typ, Erzeugnisnummer / Type, reference number)

mit den folgenden Normen oder normativen Dokumenten übereinstimmt
has been designed and manufactured in accordance with the following standards

**EN 50155:2017 – Bahnanwendungen – Umweltaforderungen
– *Railway Applications – Environmental conditions***

| Prüfung <i>Test description</i> | EN 50155 Kapitel / Section | Prüfstandard <i>Test Reference</i> | Anforderungen <i>Requirement</i> |
|---|---|--|--|
| Umgebungstemperatur <i>Operating temperature</i> | 4.3.2 | EN 60068-2-1, Ad EN 60068-2-2, Bd | Class OT4 -40 °C to +70 °C in rack |
| Einschalttemperatur <i>Start-up temperature</i> | 4.3.3 | | Class ST1 OT over +15 K, 10 min. |
| Versorgungsspannung aus Batterie <i>Power supply from battery</i> | 5.1.1 | - | 24 V, 36 V, |
| Überspannungstest <i>Over voltage test</i> | 13.4.3.2 | - | 1.4 x UN during 1.0 s |
| Umschalten zwischen Spannungsversorgungen <i>Switching between power supplies</i> | 13.4.3.3 | - | Class C1 0.6 x UN during 100 ms |
| Spannungsunterbrechungen <i>Power supply interrupts</i> | 13.4.3.4 | - | Class S2 <= 10 ms |

| Prüfung <i>Test description</i> | EN 50155 <i>Kapitel / Section</i> | Prüfstandard <i>Test Reference</i> | Anforderungen <i>Requirement</i> |
|---|---|--|--|
| Kälteprüfung <i>Low air temperature</i> | 13.4.4 | EN 60068-2-1 | Test Ad, -40 °C |
| Trockene Wärme <i>High air temperature</i> | 13.4.5 | EN 60068-2-2 | Test Be, +70 °C in rack Cycle B: T start-up +15 K, 10 min. |
| Feuchte Wärme <i>Humidity</i> | 13.4.7 | EN 60068-2-30 | Test Db, 95 % |
| Low Temperature storage Low Temperature storage | 13.4.8 | EN 60068-2-1 | Test Ab, -40 °C |
| Elektromagnetische Verträglichkeit <i>Electromagnetic compatibility</i> | 13.4.8 | EN 50121-3-2:2016 | |
| Stehspannungsprüfung <i>Dielectric test</i> | 13.4.9 | - | U _{rated} < 72 VDC: 750 VDC U _{rated} ≥ 72 VDC ≤ 125 VDC: 1500 VDC |
| Isolationswiderstand Insulation test | 13.4.9 | - | Test voltage: 500 VDC Insulation resistance: > 20 MΩ *1) |
| Vibrationsprüfung <i>Vibration test</i> | 13.4.11 | IEC 61373 | Category 1, Class B broadband noise 5-150 Hz <i>vertical axis:</i> 1,0 m/s ² , life test: 5,72 m/s ² <i>longitudinal / transverse axis:</i> 0,7 m/s ² , life test: 3,96 m/s ² |
| Schock <i>Shock</i> | 13.4.11 | IEC 61373 | Category 1, Class B <i>vertical axis:</i> 30 m/s ² , 30 ms <i>longitudinal / transverse axis:</i> 50 m/s ² , 30 ms |

*1) Falls es hochohmige Ableitwiderstände zwischen den angrenzenden Äquipotenzialbereichen oder zwischen einem Äquipotenzialbereich und der Funktionserde gibt, muss die Wirkung dieser Widerstände herausgerechnet werden. (prEN50155:2019)

In case of high-impedance bleeder resistors between adjacent equipotential areas or between an equipotential area and functional earth, the effect of these resistors shall be deducted. (prEN50155:2019)

EN 50121-3-2: 2016 – Bahnanwendungen – EMV – Bahnfahrzeuge
– Railway Applications – EMC – Rolling stock

| Prüfung Test description | EN 50121-3-2 Kapitel / Section | Prüfstandard Test Reference | Anforderungen Requirement |
|---|-----------------------------------|--------------------------------|--|
| Elektromagnetisches HF-Feld <i>Radiated electromagnetic field</i> | table 5.1 table 5.2 | IEC 61000-4-3 IEC 61000-4-3 | 80...1000 MHz, 20 V/m 1400...2000 MHz, 10 V/m 2000...2700 MHz, 5 V/m 5100...6000 MHz, 3 V/m |
| Statische Entladung <i>Electrostatic discharge</i> | table 5.3 | IEC 61000-4-2 | ±6 kV contact discharge ±8 kV air discharge |
| Leitungsgeführte HF-Störgrößen <i>Conducted disturbances</i> | table 3.1/ 4.1 | IEC 61000-4-6 | Signal ports, power ports: 10 V |
| Schnelle Transienten <i>Fast transient / burst</i> | table 3.2/ 4.2 | IEC 61000-4-4 | Signal ports, power ports: ±2 kV |
| Stoßspannungen <i>Surges</i> 1,2/50µs | table 3.3 | IEC 61000-4-5 | Signal ports, power ports: CM ±2 kV DM ±1 kV |
| Gestrahlte HF-Störaussendungen <i>Radiated Emission</i> | 7 | EN 61000-6-4 | 30...230 MHz: 40 dBµV/m (10m) 230...1000 MHz: 47 dBµV/m (10m) 1...3 GHz: 76 dBµV/m peak (3m) 56 dBµV/m av. (3m) 3...6 GHz: 80 dBµV/m peak (3m) 60 dBµV/m av. (3m) |
| Leitungsgebundene HF-Störaussendungen <i>Conducted Emission</i> | table 2.1 | EN 55016-2-1 | AC or DC power ports: 150...500 kHz: 99 dBµV qp. 500 kHz...30 MHz: 93 dBµV qp. |

EN 50121-4:2016 – Bahnanwendungen / Railway Applications
– EMV – Signal und Telekommunikationseinrichtungen
– EMC – Signalling and telecommunication apparatus

| Prüfung Test description | EN 50121-4 Kapitel / Section | Prüfstandard Test Reference | Anforderungen Requirement |
|---|---------------------------------|--------------------------------|---|
| Elektromagnetisches HF-Feld <i>Radiated electromagnetic field</i> | table 2.1 table 2.2 | IEC 61000-4-3 IEC 61000-4-3 | 80...800 MHz, 10 V/m 800...1000 MHz, 20 V/m 1400...2000 MHz, 10 V/m 2000...2700 MHz, 5 V/m 5100...6000 MHz, 3 V/m |
| Magnetfelder mit energietechnischen Frequenzen <i>Power frequency magnetic field</i> | table 2.3 | IEC 61000-4-8 | 16,7 Hz, 100 A/m 50 Hz, 100 A/m 0 Hz, 100 A/m No test required |
| Statische Entladung <i>Electrostatic Discharge</i> | table 2.4 | IEC 61000-4-2 | ±6 kV contact discharge ±8 kV air discharge |
| Leitungsgeführte HF-Störgrößen <i>Conducted disturbances</i> | table 3.1/ 4.1/ 5.1/ 6.1 | IEC 61000-4-6 | Signal ports, power ports: 10 V |
| Schnelle Transiente <i>Burst</i> | table 3.2/ 4.2/ 5.2/ 6.2 | IEC 61000-4-4 | Signal ports, power ports: ±2kV |

| Prüfung Test description | EN 50121-4 Kapitel / Section | Prüfstandard Test Reference | Anforderungen Requirement |
|---|---------------------------------|--------------------------------|--|
| Stoßspannungen <i>Surges</i> 1,2/50µs | table 3.3/ 4.3/ 5.3 | IEC 61000-4-5 | Signal ports, power ports: CM ±2kV DM ±1kV |
| Gestrahlte HF-Störaussendungen <i>Radiated Emission</i> | 5 | EN 61000-6-4 | 30...230 MHz: 40 dBµV/m (10m) 230...1000 MHz: 47 dBµV/m (10m) 1...3 GHz: 76 dBµV/m peak (3m) 56 dBµV/m av. (3m) 3...6 GHz: 80 dBµV/m peak (3m) 60 dBµV/m av. (3m) |
| Leitungsgebundene HF-Störaussendungen <i>Conducted Emission on AC or DC power ports</i> | table 1.1 | EN 55016-2-1 | Power ports: 150...500 kHz: 79 dBµV qp. 66 dBµV av. 500 kHz...30 MHz: 73 dBµV qp. 60 dBµV av. |

DB Regelung Nr. EMV 06, Rev. 2.0 / DB Regulation EMV 06, Rev. 2.0
– Technische Regeln zur Elektromagnetischen Verträglichkeit
– Radio compatibility of railway vehicles with train radio services

| Prüfung Test description | EMV 06 Kapitel / Section | Prüfstandard Test Reference | Anforderungen Requirement |
|--|-------------------------------|--|------------------------------|
| Nachweisverfahren <i>Verification procedure</i> | 6.1, method 1 | | |
| Schutzklasse <i>Protection class:</i> | Annex E | | S1 |
| Gestrahlte Störaussendung <i>Radiated Emission</i> | Annex E | EN 61000-6-4:2011 - Semi anechoic chamber - Measuring distance: 10 m - Detector: Average - Bandwidth: 9 kHz or 10 kHz | |
| | 0,7 m band | | Limits (S1) |
| | 419,72 – 419,80 MHz: | | 9 dBµV |
| | 429,72 – 429,80 MHz: | | 9 dBµV |
| | 457,4125 – 458,3125 MHz: | | 9 dBµV |
| | 467,4125 – 468,3125 MHz: | | 9 dBµV |
| | 0,3 m band | | Limits (S1) |
| | 873 – 880 MHz (GSM uplink): | | 28 dBµV |
| | 918 – 925 MHz (GSM downlink): | | 12 dBµV |



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