

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 1st Edition, 2007-10-31 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Listing
CCN:	NWGQ, NWGQ7 (Information Technology Equipment Including Electrical Business Equipment)
Product:	Modular Ethernet Switch
Model:	Power Rack M4-Power Can be provided with: Power Module M4-P-AC/DC 300W and/or Power Module M4-P-AC/DC 300W-CC and/or Power Module M4-P-48VDC 300W and/or Power Module M4-P-48VDC 300W-CC and/or Power Module M4-P-24VDC 300W. Power Module M4-P-24VDC 300W-CC and/or Switch Rack MACH4002 48+4G-XXX or Switch Rack MACH4002 48+4G-XXX-CC. Switch Rack MACH4002-24G-xxx or Switch Rack MACH4002-24G-xxx-CC. Switch Rack MACH4002-24G+3X-xxx or Switch Rack MACH4002-24G+3X-xxx-CC. Switch Rack MACH4002-48G-xxx or Switch Rack MACH4002-48G-xxx-CC. Switch Rack MACH4002-48G+3X-xxx or Switch Rack MACH4002-48G+3X-xxx-CC. Mandatory sub components for Switch Rack Types MACH4002: One of the following Switch Boards MACH4002 48+4G or MACH4002 48G + 3X or MACH4002 48+4G or MACH4002 48G + 3X -CC or MACH4002 48G or MACH4002 24G + 3X or MACH4002 48G or MACH4002 24G + 3X-CC or MACH4002 24G or MACH4002 24G-CC. Fan Unit M4-AIR or Unit M4-AIR-CC (with max. surrounding temperature of 60°C) or M4-AIR-L or M4-AIR-L-CC (with max. surrounding temperature of 40°C)

Optional sub components for
Switch Rack Types MACH4002:
Power Module M4-S-AC/DC 300W or
Power Module M4-S-AC/DC 300W- CC

Power Module M4-S-48VDC 300W or
Power Module M4-S-48VDC 300W-CC

Power Module M4-S-24VDC 300W or
Power Module M4-S-24VDC 300W-CC

Media Module M4-8TP-RJ45 or
Media Module M4-8TP-RJ45-CC,

Media Module M4-FAST 8-SFP or
Media Module M4-FAST 8-SFP-CC.

Media Module M4-GIGA 8-SFP or
Media Module M4-GIGA 8-SFP-CC.

Media Module M4-FAST 8TP-RJ45-PoE or
Media Module M4-FAST 8TP-RJ45-PoE-CC,
(Supplied with any kind of (NWGQ2 or DUXR2) fiberoptic module SFP
or XFP).

The XXX in the model designation of Switch Rack MACH4002 can be
numbers from 0 until 9 or characters from A until Z and indicate non-
safety differences like e.g. software.

MODELS:
HS8002, HS8002-CC, HS8006, HS8006-CC, HS8008, HS8008-CC,
HS8026, HS8026-CC, HS8028, HS8028-CC, HS8046, HS8046-CC,
HS8048 and HS8048-CC.

Rating:

Power Rack or Switch Rack provided with
Power Modul M4-P(S)-AC/DC 300W:
110- 230V, 50Hz/60Hz, 1.8- 4.2A
Power Rack or Switch Rack provided with
Power Modul M4-P(S)-48VDC 300W:
24V, 16.0A
Power Rack or Switch Rack provided with
Power Modul M4-P(S)-24VDC 300W:
48V, 8.0A

Applicant Name and Address:

HIRSCHMANN AUTOMATION AND CONTROL GMBH
STUTTGARTER STR. 45-51
72654 NECKARTENZLINGEN GERMANY

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Page 3 of 28

Report Reference #

E168643-A1-UL

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

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Reviewed by: Oliver Frohberg

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The EUT is a Ethernet- Switch or Router which receives data may be changes it and sends it out again. The EUT can be configurated with a Power Rack and a Switch Rack or a Switch Rack alone. The below power supplies (P- types and S- types) can be used variable in type and amounts.

The Power Rack M4-Power can be equipped with the three max. possible P- type power supplies:

Power Modul M4-P-AC/DC 300W and/or,
Power Modul M4-P-48VDC 300W and/or,
Power Modul M4-P-24VDC 300W
and supplies the Switch Rack via cable.

The Switch Racks MACH4002 48+4G-XXX can be equipped with a S- type power supply:

Power Modul M4-S-AC/DC 300W or,
Power Modul M4-S-48VDC 300W or,
Power Modul M4-S-24VDC 300W.

Mandatory sub components for

Switch Rack Types MACH4002:

One of the following Switch Boards

MACH4002 48+4G or MACH4002 48G + 3X

Or MACH4002 48G or MACH4002 24G + 3X

Or MACH4002 24G,

Fan Unit M4-AIR (with max. surrounding temperature of 60°C)

Or M4-AIR-L (with max. surrounding temperature of 40°C)

Optional sub components for

Switch Rack Types MACH4002:

Power Module M4-S-AC/DC 300W

Power Module M4-S-48VDC 300W

Power Module M4-S-24VDC 300W

Media Module M4-8TP-RJ45,

Media Module M4-FAST 8-SFP.

Media Module M4-GIGA 8-SFP

Media Module M4-FAST 8TP-RJ45-PoE,

(Supplied with any kind of (NWGQ2 or DUXR2) fiberoptic module SFP or XFP).

The XXX in the model designation of Switch Rack MACH4002 can be numbers from 0 until 9 or characters

from A until Z and indicate non-safety differences like e.g. software.

Model Differences

The X in the model designation MACH4002 48+4G-XXX can be numbers from 0 until 9 or characters from A until Z and indicate non safety differences like e. g. software,.....

Media Module M4-GIGA 8-SFP (this module type is not supported by Switch Rack Types MACH4002 48+4G-XXX).

By the SFP module various model of SFPs fiberoptic module with the CCN (NWGQ2 or DUXR2) can be used.

The unit is to be operated with the following ambient temperature according to the used fan unit:

Fan Unit M4-AIR: 60°C .
Fan Unit M4-AIR-L: 40°C

The following models are technical identical to the listed models as indicated below, except in model designations:

HS8002 = ACH4002 48+4G-L2P
HS8006 = MACH4002 48+4G-L3E
HS8008 = MACH4002 48+4G-L3P
HS8026 = MACH4002-24G-L3E
HS8028 = MACH4002-24G-L3P
HS8046 = MACH4002-48G-L3E
HS8048 = MACH4002-48G-L3P

All models with "-CC" are technical identical to basic models without "-CC". the only differences is that models with "-CC" the printed circuit boards are protected with conformal coating.

Technical Considerations

- Equipment mobility : stationary
- Operating condition : continuous
- Mains supply tolerance (%) : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed) with AC/DC- power supply and Class III with DC/DC-converters
- Mass of equipment (kg) : Power Rack M4-Power : 13.1kg, Switch Racks MACH4002 48+4G-XXX: 11.8 kg
- Protection against ingress of water : IP X0
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: Fan Unit M4-AIR: 60°C . Fan Unit M4-AIR-L: 40°C
- The means of connection to the mains supply is: Pluggable A or , Permanently connected (field wired)
- The product is intended for use on the following power systems: TN or , DC mains supply
- The equipment disconnect device is considered to be: Appliance inlet for AC/DC- power supply
- The class of laser product is: Incorporates previously certified Class I laser source(optional)

- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): USB

Additional Information

All tests were conducted under maximum possible load configuration with the most power consumption for representing the worst case.

History:

Amendment:

The following model designations were added with the addition of the following alternate modules:

Switch Rack MACH4002-24G-xxx

Switch Rack MACH4002-24G+3X-xxx

Switch Rack MACH4002-48G-xxx

Switch Rack MACH4002-48G+3X-xxx

With the addition of the new mandatory sub components:

M4-AIR-L (with max. surrounding temperature of 40°C and with the additional optional sub components for Switch Rack Types MACH4002:

Media Module M4-GIGA 8-SFP

Media Module M4-FAST 8TP-RJ45-PoE,

All tests were conducted under maximum possible load configuration with the most power consumption for representing the worst case.

Correction 1:

Correction of the model designations.

CB Report Amendment 2/UL Report Amendment 3:

Add of new model designations HS8002; HS8006, HS8008, HS8026, HS8028, HS8046 and HS8048 .

-Project # 4788799777-Revision UL only (January2018)- The original report was modified to include the following additions:

- New model variants based in previous certified models. the only differences is that models with "-CC" the printed circuit boards are protected with conformal coating, e.g. :

Power Module M4-P-48VDC 300W ----->Power Module M4-P-48VDC 300W-CC

Power Module M4-P-24VDC 300W -----> Power Module M4-P-24VDC 300W-CC.

Additional Standards

The product fulfills the requirements of: -

Markings and instructions

Clause Title	Marking or Instruction Details
Safety Instructions - Rack Mount	<p>"Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions:</p> <p>A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.</p> <p>B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not</p>