

File E203960  
Project 06CA10376

Issued: 2006-06-28  
Revised: 2012-12-03

REPORT

on

PROGRAMMABLE CONTROLLERS  
**FOR USE IN HAZARDOUS LOCATIONS**

\*

Hirschmann **Automation & Control** GmbH  
Neckartenzlingen, Germany

Copyright © 2006 Underwriters Laboratories Inc.

Underwriters Laboratories Inc. authorizes the above named company to reproduce this Report provided it is reproduced in its entirety.

## DESCRIPTION

## PRODUCT COVERED:

\* USL, CNL - Listed programmable controllers, open type, modular switch, cat. no. MS20- or MS30- followed by 4 numbers, followed by S or T or E, followed by A or C, followed by **a letter**, followed by E or P, may be followed by additional suffixes;

\* Backplane module MB- or MB20-, may be followed by additional suffixes **for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations.**

## GENERAL:

These devices (MS20 / MS30-Family) are industrial control Ethernet LAN components for rail mounting and intended for use in industrial automation applications. They are to be supplied by a Class 2 source only and communicate via interfaces through wire or fiber optics. MS30 modules additional have a slot for one gigabit media module on the left of the backplane. The backplane modules MB- may be followed by suffixes are intended to extend the Backplane slots on the right and are also used for interconnection and supply.

## ELECTRICAL RATINGS:

MS20, MS30 modular switch

Main supply voltage: 18 - 32 Vdc, Class 2 or optional  
18 - 60 Vdc, Class 2  
For the relevant currents see Table 1 below.

\*Remark: No external Power Supply for MB backplane modules.

Max. surrounding air temperature:

MS modules

type S: 0°C up to 60°C max.

types T or E: -40°C up to 70°C max.

Note: types see item IV of nomenclature breakdown for MS modules.

MB modules

type S: 0°C up to 60°C max.

types T or E: -40°C up to 70°C max.

Note: types see item III of nomenclature breakdown for MB modules.

\*

**Entity Parameters for relay Outputs (signal contact for indicating Fault Condition):****Vmax: 30 Vdc****Imax: 0.09 A****Ci: 2.0 nF****Li: 1.0 uH**

Table 1: Power supply indication on MS module labels

Module Type							Power supply current (A)		
							$U_{in} = 18 \text{ Vdc}$	$U_{in} = 32.0 \text{ Vdc}$	$U_{in} = 60.0 \text{ Vdc}$
MS20-	08	00	x	A	x	x	1.1	0.7	-
MS30-	08	02	x	A	x	x	1.6	0.9	-
MS20-	16 24	00	x	A	x	x	3.2	1.8	-
MS30-	16 24	02	x	A	x	x	3.6	2.1	-
MS20-	08	00	x	C	x	x	1.3	-	0.4
MS30-	08	02	x	C	x	x	1.8	-	0.6
MS20-	16 24	00	x	C	x	x	3.5	-	1.1
MS30-	16 24	02	x	C	x	x	3.9	-	1.2

**ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE'S USE):**

\* CNL - Indicates investigation to Canadian National Standard(s) C22.2 No. 142-M1987 and **CSA C22.2 No. 213-M1987, Non-incendive Control Equipment for Use in Class I, Division 2 Hazardous Locations.**

\* USL - Indicates investigation to United States Standard UL 508, 17<sup>th</sup> edition (Industrial Control Equipment) and (E203960) **ANSI/ISA 12.12.01-2012, Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations, Approved 9 July 2012.**

Note: CNL = Canadian National Standards - Listed.

USL = United States Standards - Listed.

CONSTRUCTION DETAILS:

General - The details of construction are covered in the following photographs and accompanying descriptive pages and illustrations.

Corrosion Protection - All parts of corrosion resistant materials are painted or plated as corrosion protection.

Class 2 circuit - The investigation has been conducted under consideration of the Class 2 requirements. The investigation of spacings and components has been waived due to the connection to a Class 2 power supply.

\*

## MARKINGS:

The following information is provided on an adhesive backed label or ink stamped to the unit.

1. Manufacturer's name, or trademark.
2. Electrical ratings.
3. Catalog number.
4. Hazardous Locations Class, Groups and Division as found under "Product Covered".\*
5. \* **Maximum Surrounding Air Temperature** rating as described under "Ratings" and **Operating temperature code - "T4"**.
6. WARNING - EXPLOSION HAZARD - SUBSTITUTION OF **ANY** COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
7. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
8. Date of manufacture, indicating week and year, or Serial number for controllers Listed for use in Canada.
9. **USB port to be marked with the Tri-Ex symbol - may be marked on the side label of the Ethernet switch.**
  
10. **Relay terminals are marked with the Tri-Ex symbol - may be marked on the side label of the Ethernet switch and "See Control Drawing 000160011DNR"**.

\*

## INSTALLATION AND OPERATING INSTRUCTIONS:

An installation manual shall be provided with each unit to direct the user on proper installation and operation of the device.

1. SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.
2. WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
3. WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
4. The following markings are also provided on the device or as part of the installation instructions:
5. The statement, "To be supplied by a Class 2 power supply or isolated Low Voltage Limited Energy (LVLE)"
6. "Use 60/75 or 75°C copper (CU) wire only"
7. "The USB connector is for temporary connection, for maintenance only. Do not use, connect or disconnect the equipment unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion."
8. The terminal tightening torque of lbs-in (NM)". Note: Wire binding screws do not need to have the tightening torque marking.

## NOMENCLATURE BREAKDOWN:

## MS modules

MS30-	24	02	S	C	B	P	H	H	01.0
I	II	III	IV	V	VI	VII	VIII	IX	X

- I: Switch type  
MS20- Modular Switch, Fast-ETHERNET uplinks  
MS30- Modular Switch, Gigabit-ETHERNET uplinks
- II: Number of Fast-ETHERNET ports  
08 8x100 Mbit  
16 16x100 Mbit  
24 24x100 Mbit
- III: Number of Gigabit-ETHERNET ports  
00 none  
02 2x1000 Mbit
- IV: Surrounding air temperature range & coating  
S 0°C up to +60°C  
T -40°C up to +70°C  
E -40°C up to +70°C inclusive conformal coating of PCB's
- V: Power supply rating  
A 18 - 32 Vdc (**mounted in a small housing**)  
C 18 - 60 Vdc (**mounted in a large housing**)
- VI: Approvals / Qualification  
A cUL 508, cUL ISA 12.12.01 Class 1 Div. 2  
\* B cUL 508, cUL ISA 12.12.01 Class 1 Div. 2, ATEX 100a Zone 2  
\* H cUL 508, cUL ISA 12.12.01 Class 1 Div. 2, German Lloyd, IEC 61850  
+ **IEEE1613** Substations, Railway standard EN 50121-4  
**X cUL 508, cUL ISA 12.12.01 Class 1 Div. 2, and additional approvals - customer specific (X = any other letter)**
- VII: Software version  
E enhanced  
P professional
- VIII: optional: configuration  
H Standard  
X Customer specific (**X - any other letter**)
- IX: optional: OEM type  
H Standard  
X Customer specific (**X - any other letter**)
- X: optional: Software release  
01.0 Software release 1.0 or other release numbers.

MB modules (Backplane extension modules)

MB20-	2	T	A	H	H
I	II	III	IV	V	VI

- I: Backplane type  
 MB20- Fast Ethernet 10/100  
 MB- Fast Ethernet 10/100
- II: Number of mountable Media Modules  
 2
- III: Surrounding air temperature range & coating  
 S 0°C up to +60°C  
 T -40°C up to +70°C  
 E -40°C up to +70°C inclusive conformal coating of PCB's
- IV: Approvals / Qualification  
 A cUL508, cUL ISA 12.12.01 Class 1 Div. 2  
 B cUL508, cUL ISA 12.12.01 Class 1 Div. 2, German Lloyd, IEC61850  
 Substations, Railway standards EN 50121-4 / EN 50155 /  
 IEEE 1613, ATEX 100a Zone 2  
 H cUL508, cUL ISA 12.12.01 Class 1 Div. 2, German Lloyd, IEC61850  
 Substations, Railway standard EN 50121-4 / IEEE 1613  
 X **cUL 508, cUL ISA 12.12.01 Class 1 Div. 2, and additional  
 approvals - customer specific (X = any other letter)**
- V: optional: OEM type  
 H Standard  
 x Customer specific
- VI: optional: OEM type  
 H Standard  
 x Customer specific

\*