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REPORT

on

PROGRAMMABLE CONTROLLERS

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## 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 or B or H, followed by E or P, may be followed by additional suffixes;  
Backplane module MB- or MB20-, may be followed by additional suffixes.

## 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.

Table 1: Power supply indication on MS module labels

Module Type							Power supply current (A)		
							$U_{in} =$ 18 Vdc	$U_{in} =$ 32.0 Vdc	$U_{in} =$ 60.0 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.

USL - Indicates investigation to United States Standard UL 508,  
17<sup>th</sup> edition (Industrial Control Equipment).

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.

Installation Instructions - Shall be provided and include a wiring diagram. It must include a statement "Only for connection to a Class 2 power supply" or equivalent.

Warning Markings - See Section General for details.

Markings - Listed company name or trademark, model number, electrical ratings, and wiring diagram is required. Terminal identifications shall be provided on the device.

"Class 2" or equivalent statement next to the voltage rating. This may be provided in the installation instructions separately instead of marked on the device. This Marking shall be visible when the device is mounted singularly. The Marking may be provided on the side of the device, and is not required to be visible when the device is mounted next to other devices.

The following markings are also be provided on the device or as part of the installation instructions:

"Use 60/75 or 75°C copper (CU) wire only"

"max. surrounding temperature 60°C/70°C" or equivalent as appropriate for the S, T or E types.

Canadian Marking (CNL) - The month and year of manufacturer shall also be marked on the device. Bar coding, date coding, serial numbers, or equivalent means may be used.

## 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  
 C 18 - 60 Vdc
- VI: Approvals / Qualification  
 A cUL 508, cUL 1604 Class 1 Div. 2  
 B cUL 508, cUL 1604 Class 1 Div. 2, German Lloyd, IEC 61850  
 Substations Railway standards EN 50121-4 / EN 50155, IEC 61850,  
 ATEX 100a Zone 2  
 H cUL 508, cUL 1604 Class 1 Div. 2, German Lloyd, IEC 61850  
 Substations, Railway standard EN 50121-4 / IEC 61850
- VII: Software version  
 E enhanced  
 P professional
- VIII: optional: configuration  
 H Standard  
 X Customer specific
- IX: optional: OEM type  
 H Standard  
 X Customer specific
- 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, cUL1604 Class 1 Div. 2

B cUL508, cUL1604 Class 1 Div. 2, German Lloyd, IEC61850  
Substations, Railway standards EN 50121-4 / EN 50155 /  
IEEE 1613, ATEX 100a Zone 2

H cUL508, cUL1604 Class 1 Div. 2, German Lloyd, IEC61850  
Substations, Railway standard EN 50121-4 / IEEE 1613

V: optional: OEM type

H Standard

x Customer specific

VI: optional: OEM type

H Standard

x Customer specific

Modular switch,  
MS20 or MS30 family

Fig.1, 2  
Fig.3, 4  
Fig.5, 6

General - Figure 1 shows the MS20 and Figure 2 shows the MS30 module. Figure 3 and 4 show the view of the terminal block (field wiring connection) of the modules. Figure 5 shows the power supply PCB for 18 to 60 V range. Figure 6 shows the power supply PCB for 18 to 30 V range. These six figures are for reference use only. The interior of a module housing may have a metallized surface. Due to the use of Class 2 Source only, no evaluation of components was considered necessary except of the following:

1. Terminal Block - R/C (XCFR2), any kind of manufacturer, min. rated 250 V, 3 A, suitable for field wiring and Use Group C or D.
2. Any kind of R/C (NWGQ2 or DUXR2) fiber-optic module (SFP-stick).

Backplane extension modules  
MB and MB20 modules

Fig.7

General - Figure 7 shows the MB extension module and is for reference use only. Models MB20 may have PCB's with conformal coating. The interior of a module housing may have a metallized surface. Due to the use of Class 2 Source only, no evaluation of components was considered necessary.