SIEMENS

Cerberus® MM7000
MUX/DMX Control Unit

Equipment Application
Project Sheets

Cerberus
Security
for People
and Assets

Siemens Building Technologies
Cerberus Division

1. MUX/DMX System in DMS7000

1.1. MUX/DMX Control Unit MM7033

Applications

The MUX/DMX-Control Unit **MM7033** is situated in the acquisition level of the network and may be used to perform the following tasks:

- supervision of technical equipment
- automatic control of fire protection equipment
  - dampers
  - fire doors
  - smoke vents
- supervision of sprinkler system stati (pumps and valves)
- perform logical combination of input signals
- interface for receiving and processing signals from foreign systems

Inputs and outputs may be configured as Sector Fire, Extinguishing, Gas, Intrusion or Building Services.

Functions

The MM7033 Control Unit receives signals to be monitored via digital inputs (contacts) and the resulting control signals activate digital outputs (relay and/or LED-drivers).

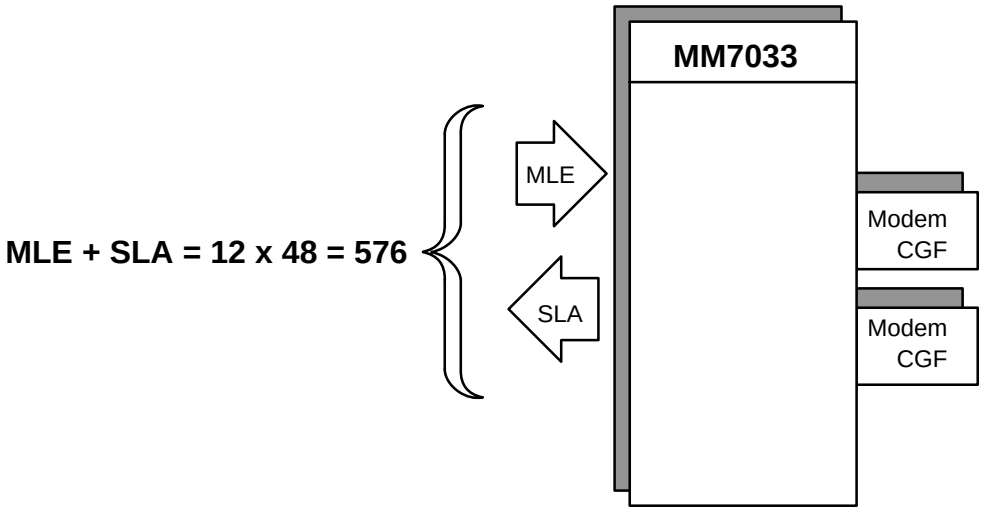
- transmits and receives information via DMS7000 Network CERBAN or CERLOOP.
- stores process image and system data
- monitors all interfaces and functions
- is micro-processor controlled with its own monitored power supply
- in addition to logic/time elementsa number of other security specific SPS-functions are available.

Basic design

The digital PLC-Unit comprises various modules in single and double Europa card format which are assembled into pre-wired 19”-Racks

- expansion may be achieved in steps of 48 inputs (or outputs) and is limited to a total of 12 modules.
- inputs and outputs are electrically isolated via opto-isolators
- options include a relay adapter (with 48 relays) and an LED test field
- rack, power supply and all external connections can be built into a 19”- cabinet
- connection to external installations is made via terminal strips or via pre-fabricated cable connectors.

1.1.1. Symbolic Representation in Site Configuration



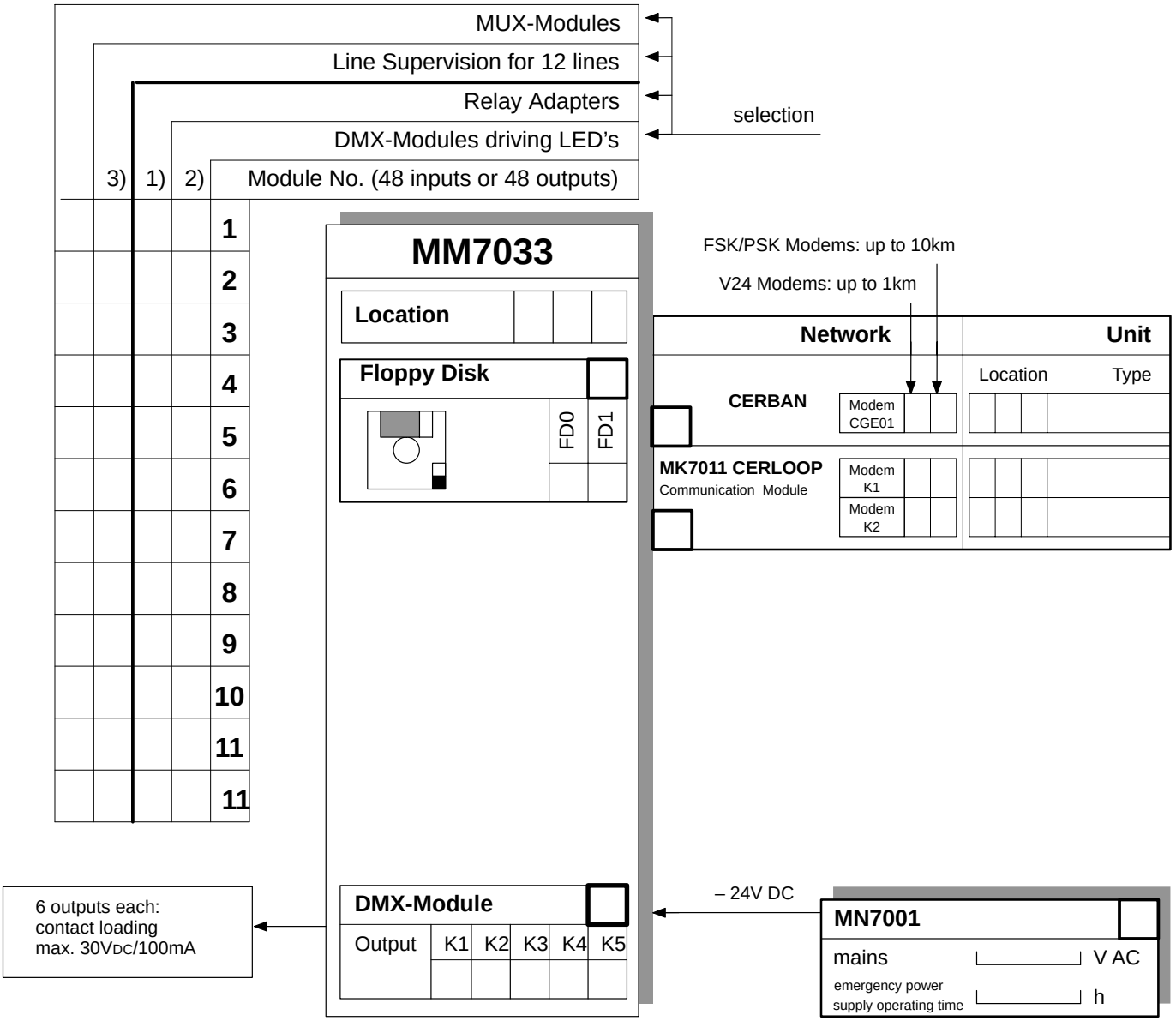
- MLE = digital multiplexer input (**M**elde–**L**inie **E**ingang)
- SLA = digital demultiplexer output (**S**teuer-**L**inie **A**usgang)
- input/outut electrically isolated via opto-isolators

2. Project Documention of HW-Configuration

2.1. Equipment Configuration

	the following data is required for project engineering
Network	CERLOOP or CERBAN max. distance between modems
Location	equipment address
Floppy Disk	quantity dependent on number of input elements, output elements and logic elements 720kB: FD0 ca. 3000 elements FD1 ca. 7500 elements 1,44MB: FD0 ca. 7500 elements FD1 ca. 15000 elements
	note load factors, see Doc. e999 PLC-Functions!
	wiring may be considerably simplified by grouping together DMX outputs with LED's (eg. DMX-Addr1 SLA 01 ... 30 etc.)
Power supply	with or without emergency power supply mains voltage min. emergency power time
MUX/DMX I/O's	number of MUX / DMX-Modules (48 outputs or 48 inputs per module) number of monitored lines number of outputs with relay adapter
LED-test	available for MF7033 only
DMX-Module	number of modules (max. 6 outputs per board)

2.2. MUX/DMX Control Unit MM7033

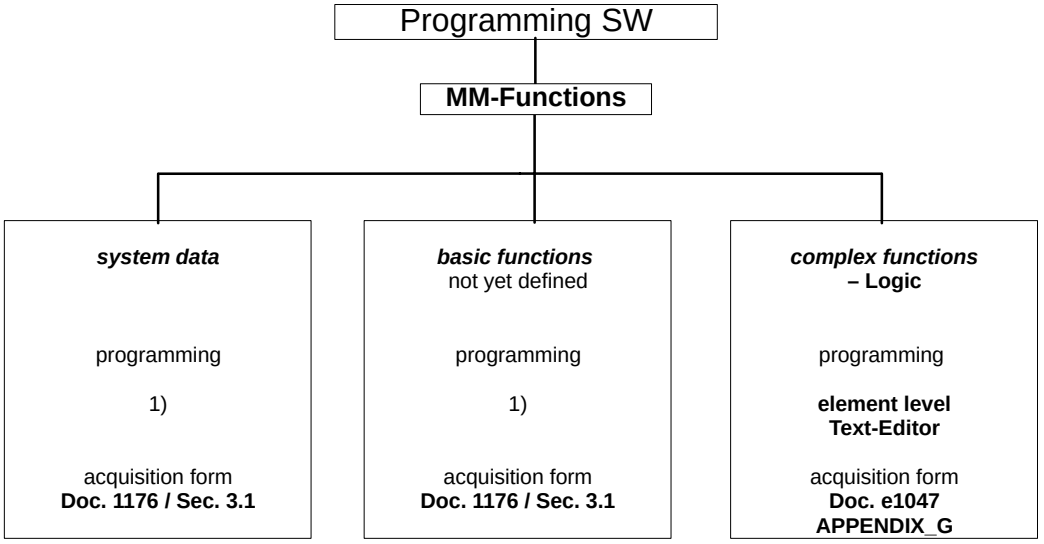


1) Operating principle used in output circuits is described in Section 2 "Power Supply/Control Principle".

2) Relay-Adapter control voltage = –24VDC; max. contact loading = 24VDC/100mA (ohmic load).

3) Supply voltage 24VDC : Line Supervision I_L = 320mA per MUX-Adapter.
2 line monitoring adapters are required per MUX-module

3. Control Unit Programming



1) No equvalent SW–Tools are available for the MM7000.
Programming must be performed using a text editor.

3.1. System Data for MUX/DMX Control Unit MM7033

project (max. 8 characters)	
title (max. 35 characters)	

	default	entry		valid entries
location address	**111**			111 ... 118 / 121 ... 128 130 ... 138 / 141 ... 148 211 ... 218 / 221 ... 228 230 ... 238 / 241 ... 248
protocol	CERLOOP	**CERLOOP**		CERBAN / CERLOOP
		CERBAN		
transmit presence telegrams	**yes**	**yes**		yes / no
		no		
presence monitoring interval	**50**			50 ... 99s
time synchronisation	**via time tg.**	**via time tg.**		via time-tg **/** via int. clock
		via int. clock		
power supply monitoring	**batteries**	**with batt.**		with batteries without batteries no monitoring
		without batt.		
		no monitoring		
MPU hardware E2H 080 should not be used in new installations	**E2H 081**	E2H 080		E2H 080 / E2H 081
		E2H 081		

3.1.1. Hardware Configuration

MPU E2H 081		**default**	**entry**	**MPU E2H 080**		**default**	**entry**	valid entries
PIA E2H 081	**Port 1**	**S(N)** 1)		no PIA's present				S = PS monitoring L = LEDtest I = Input O = Output N = not used Note: L = LEDtest via Port 4 of E1H 040 only!
	Port 2	**N**						
PIA E1H 040	**Port 1**	**N**		**PIA E1H 040**	**Port 1**	**S(N)** 1)		
	Port 2	**N**			**Port 2**	**N**		
	Port 3	**N**			**Port 3**	**N**		
	Port 4	**N**			**Port 4**	**N**		

1) according to power supply monitoring: S = with/without batteries; N = no power supply monitoring

disks	**default**	**entry**	valid entries
1 floppy disk 1,4 MB	**X**		X indicates relevant configuration only ONE entry possible!
2 floppy disks 1,4 MB			
1 floppy disk 720KB			
2 floppy disks 720KB			
Hard disk	**–**	**–**	not foreseen

digital I/O modules	**default**	**entry**	valid entries 2)
MUX	**0**		1 ... 16
DMX	**0**		1 ... 16

2) sum of MUX/DMX-modules ≤ 12

3.2. Configuration using List Editor SWE700MT

in preparation

4. Summary of MM-Elements

4.1. Telegram Input Elements

Elements	Zone ON/OFF	Monitoring	Zone Test	Doc. e1047 APPENDIX_G Formular
MM_IA1	x	x	x	7.1.4
MM_IA2	x		x	7.1.4
MM_IB1	x	x		7.1.4
MM_IC1	x	x	x	7.1.5
MM_IC2	x		x	7.1.6
MM_ID1	x	x		7.1.7
MM_IE1				7.1.8
MM_IE2	x	x	x	7.1.8
MM_IE3	x		x	7.1.9
MM_IE4				7.1.10

4.2. Logic Elements

Element	Application	Function	Doc. e1047 APPENDIX_G Form	Segment allocation in PLC-File (.QMC)
F_EQUAL	signal distributor	1 input signal 1 ... n output signals	7.2.1	Post_Logic_FL
F_NOT	inverter	1 input signal 1 output signal	7.2.1	Pre_Logic_FL or Post_Logic_FL
F_AND	AND	2 ... n input signals 1 output signal	7.2.1	Pre_Logic_FL or Post_Logic_FL
F_OR	OR	2 ... n input signals 1 output signal	7.2.1	Pre_Logic_FL or Post_Logic_FL
F_EXOR	exclusive OR	2 input signals 1 output signal	7.2.1	Pre_Logic_FL or Post_Logic_FL
F_LATCH	latch	set/reset input 2 output signals	7.2.1	Pre_Logic_FL or Post_Logic_FL
F_COUNT	counter	creates impulse after n events	7.2.2	Pre_Logic_FL or Post_Logic_FL
F_WAIT	delay (0..16000000s)	creates a 250ms impulse after t seconds	7.2.2	Pre_Logic_FL or Post_Logic_FL
F_DELAY	delay	as F_WAIT but with programmable impulse length	7.2.2	Pre_Logic_FL or Post_Logic_FL
F_TOUT	monitoring timer	SET input starts timer CLR input resets timer to zero STOP input resets timer and creates impulse at STOPPED output timer elapsed creates impulse at EXPIRED output	7.2.2	Pre_Logic_FL or Post_Logic_FL

4.3. Telegram Output Elements

Element	Isolate output	Doc. e1047 APPENDIX_G Formular
MM_OE1	x	7.3.3
MM_OE2	x	7.3.3

5. Environmental Specifications

	max. values	id letter
operating temperature (Z depends on the housing dimensions)	0°C ... +30°C	KZ
storage temperature: Exceptions: for battery for disk	–40°C ... +60°C –10°C ... +35°C	GU JZ
Humidity Specification NO CONDENSATION annual average maximum	 < 75% < 95%	F
mechanical specification: in a vibration-free system	10 ... 55 Hz 2 g 20 m/S	W
Dust Conditions: ambient air	dust free	
direct sunlight	not permitted	
housing requirement according to DIN 40050	IP20	

Note:
Conditions to which equipment modules may be subjected are in accordance with application classes listed in DIN 40040

6. Power Supply

6.1. Basis

Battery capacity Q [Ah] for emergency power duration t [h]

$Q = t \times 1{,}3 \times I_{24}$ [Ah] 1,3 safety factor

I_{24} battery charging current < 5A

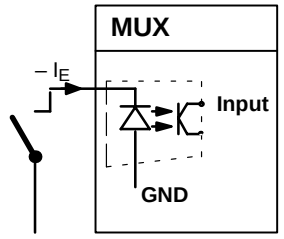
Note:

Emergency power capacity has a major influence on mechanical design.

6.1.1. Control Principle of MUX/DMX Modules

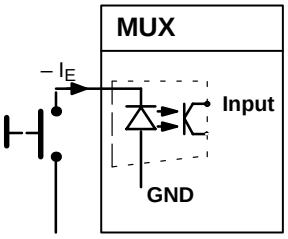
Signal line MLE

Input signal ”static” (switch) 1)



– U_E = 17... 29V DC
– I_E = 1mA

Input signal ”dynamic” (Button) 1)

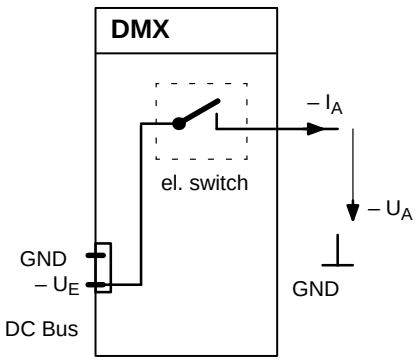


– U_E = 17... 29V DC
– I_E = 1mA

1) specified in configuration form MF7033/SWE700FT MUX-Macro (edge)

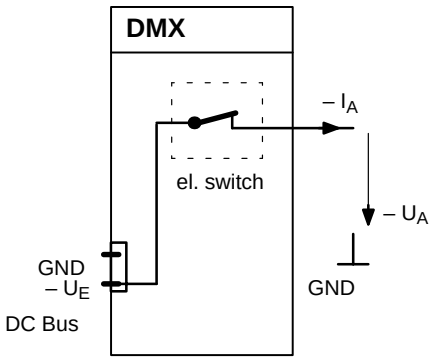
Controle line SLA

open circuit principle 2)



output active: negative potential to GND

closed circuit principle 2)



output inactive: negative potential to GND

2) specified in configuration form MF7033/SWE700FT DEMUX-Macro (log)

Module E2A 032 : $-U_A = -U_E$ = 5 ... 29V DC ; I_{Amax} = 40mA
Module E2A 031 : $-U_A = -U_E$ = 17...29V DC ; I_{Amax} = 40mA

6.2. Nominal Current Consumption

6.2.1. Nominal Values, battery capacity

Emergency power duration	[h]	4	12	24
Load current (CERBAN oder CERLOOP)	[A]		1,8 1)	
Battery capacity	[Ah]	24	48	72

1) Load current with 1 MUX and 2 DMX cards, and 20 LED's or relays activated

6.2.2. Table

Components	Current consumption I_{24}		Power dissipation P_V	
	per number 1)	total 2)	per numbe 3)	total 4)
Base load		1,3		37
CERBAN / CERTER V24	_____ x 0,07		_____ x 1	
CERBAN FSK/PSK	_____ x 0,12		_____ x 7	
MK7011 (CERLOOP V24/PSK)	_____ x 0,12		_____ x 7	
MD7002 (CERBAN V24/FSK/PSK)	_____ x 0,12		_____ x 7	
MUX-Module	_____ x 0,03		_____ x 1	
Line Monitoring Adapter	_____ x 0,32		_____ x 9	
DMX-Module 5) Open-current principle 5) Closed-current principle per LED Closed-current principle per relay	_____ x 0,03 _____ x ____ _____ x 0,02 _____ x 0,02		_____ x 1 _____ x ____ _____ x 0,6 _____ x 0,6	
DMX-Module (per p.c.b.)	_____ x 0,03		_____ x 1	
Total				

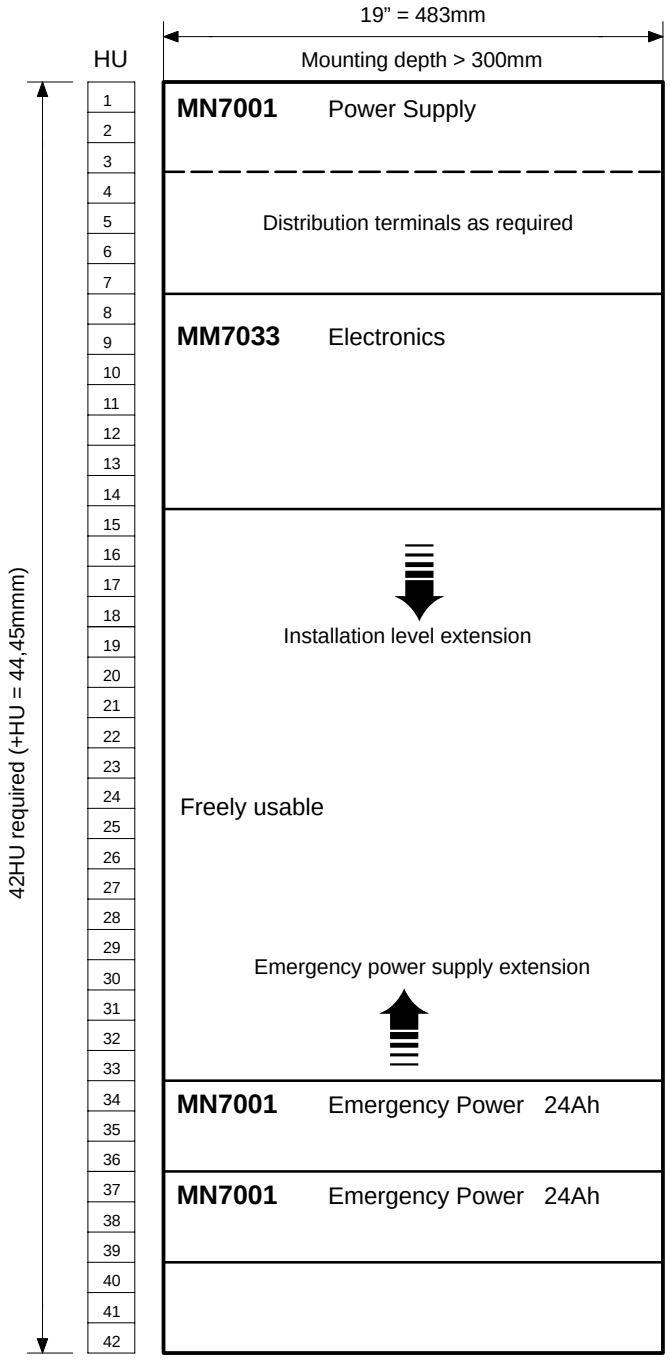
1) Current consumption as a fuction of the number of components to be used.
2) Given load current from the battery (+/– 24V DC)
3) Given power dissipation as a function of the number of components to be used.
4) Power dissipation in housing (+/– 28V DC = system voltage)
5) The sum of LED's or relays simultaneously activated

Notes:

– For details of the space requirement for the emergency power supply and size of housing as a function of power dissipation, see User Manual MN7000.

7. Space Requirement and Basic Design

See product data sheets (x185/x195/x381) for housings and 19" standard cabinets.
Number of cabinets depends on the required emergency power supply.
See User Manual MN7000-... for power supply details .



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