


REMOTE CONTROL MC-3-SERIES  CAVOTEC® <small>We connect the future.</small> I/O Description		
Document:		ID20079-2104903L1A.doc
Customer Project no:		PO18-2100468
CMC Project no:		SO60-2104903
System Serial No:		20079
Base Unit Setup Rev:		20079N1A
Terminal Unit Setup Rev:		20079T1B
Terminal Unit (Spare) Setup Rev:		20080T1B
Frequency:		419.050MHz / 419.050MHz
Communication Protocol:		PROFINET
MAC-ID:		00-30-11-33-10-8A
Revision	Description	Date / Sign
A	ISSUED FOR CUSTOMER	15.09.2021 / EF
B	-S0 changed to std functions, mail 06.01.22	06.01.2022 / EF

General:

MC-MB2-PN interface is described in “SP-14-023 MC-MB2-PN Interface Specification”
Please refer to “MAN-14-001 Product manual MC-MB2” before use.

Profinet interface (SP-14-023, section 2.1)

The MC-MB2-PN connects directly to the PROFINET using the industry standard RJ45 interface.

Fitted with 2 physical ports and an internal switch, the MC-MB2-PN allows line or bus topologies without the need for external switches.

The MC-MB2-PN is a DAP v2.0 IO-Device fully compliant with the PROFINET standard as specified in IEC 61158 and IEC 61784. The MC-MB2-PN interface operates at 100Mbit, full duplex, as required by PROFINET.

The MC-MB2-PN is delivered with a GSDML-file used to configure the IO-Controller.

Refer SP-14-023, section 5.2 for appropriate GSDML-file.

Error handling (SP-14-023, section 2.4)

Errors in the MC-MB2-PN or in the remote controls are handled by the MC-MB2-PN unit, and cause the MC-MB2-PN to report an appropriate error status to the PLC. This error status should be trapped and handled in a proper way by the PLC.

Errors in the PROFINET communication is detected by using two «watchdog counters», one for uplink data and one for downlink data. For the downlink data, the procedure is:

- At regular intervals, the PLC increment the watchdog counter, at least every 500ms
- This watchdog counter is transferred via the Profinet network to the MC-MB2-PN.
- The MC-MB2-PN continuously monitors this counter. If the PLC fails to update this counter within a configurable timeout(default 2000ms), it means that the PLC has stopped, or communication is faulty. The MC-MB2-PN detects this error condition, brings the system to a safe state and indicates “E010”. (See MAN-14-001, section 3.3)

A similar error handling procedure should be implemented in the PLC for the uplink data transfer.

System communication specification.

This is one system with 1 terminal and 1 base unit, duplex.

System module mapping (SP-14-023, section 5.3)

MODULE	UPLINK	SIZE (BYTES)	TESTED
0	Uplink header Simplex/Duplex	2	
1	Uplink data – Terminal 1	20	
MODULE	DOWNLINK	SIZE (BYTES)	
5	Downlink header Simplex/Duplex/Polled	2	
6	Downlink module 1 – Terminal 1	20	

UPLINK:

The MC-MB2-PN generates totally 2 byte header +20 bytes of data pr. terminal like this:

HEADER	DATABYTES	TESTED
2	20	

System status information area	
Byte	Description
0	MC-MB2-PN status byte
1	Uplink watchdog counter
2	Digital function F01-F08, F01 is least significant bit.
3	Digital function F09-F16, F09 is least significant bit.
4	Digital function F17-F24, F17 is least significant bit.
5	Digital function F25-F32, F25 is least significant bit.
6	Digital function F33-F40, F33 is least significant bit.
7	Digital function F41-F48, F41 is least significant bit.
8	Prop. channel A01
9	Prop. channel A02
10	Prop. channel A03
11	Prop. channel A04
12	Prop. channel A05
13-21	Spare

Digital functions

BYTE	FUNCTION	DESCRIPTION	INPUT	TRANSF.	ACT. CHECK	TESTED
2	SR1, POS 0	10 POS.	F01	YES	NO	
	SR1, POS 1	10 POS.	F02	YES	YES	
	SR1, POS 2	10 POS.	F03	YES	YES	
	SR1, POS 3	10 POS.	F04	YES	YES	
	SR1, POS 4	10 POS.	F05	YES	YES	
	SR1, POS 5	10 POS.	F06	YES	YES	
	SR1, POS 6	10 POS.	F07	YES	YES	
	SR1, POS 7	10 POS.	F08	YES	YES	
3	SR1, POS 8	10 POS.	F09	YES	YES	
	SR1, POS 9	10 POS.	F10	YES	YES	
	SR2, DRIVE MODE POS "0"	6-POS.	F11	YES	NO	
	JOYSTICK SA3	ACTIVITY JOY.	F12	YES	YES	
	SR2, DRIVE MODE POS "1"	6-POS.	F13	YES	YES	
	SR2, DRIVE MODE POS "2"	6-POS.	F14	YES	YES	
	SR2, DRIVE MODE POS "3"	6-POS.	F15	YES	YES	
	JOYSTICK SA4	ACTIVITY JOY.	F16	YES	YES	

4	SR2, DRIVE MODE POS "4"	6-POS.	F17	YES	YES	
	SR2, DRIVE MODE POS "5"	6-POS.	F18	YES	YES	
	SR3, "SETTINGS" POS "0"	6-POS.	F19	YES	NO	
	SR3, "SETTINGS" POS "1"	6-POS.	F20	YES	NO	
	SR3, "SETTINGS" POS "2"	6-POS.	F21	YES	NO	
	SR3, "SETTINGS" POS "3"	6-POS.	F22	YES	NO	
	SR3, "SETTINGS" POS "4"	6-POS.	F23	YES	NO	
	SR3, "SETTINGS" POS "5"	6-POS.	F24	YES	NO	
5	SO, NC STOP	STOP SWITCH	F25	YES	NO	
	SO, NO STOP	STOP SWITCH	F26	YES	NO	
	JOYSTICK SA5	ACTIVITY JOY.	F27	YES	YES	
	JOYSTICK SA1	ACTIVITY JOY.	F28	YES	YES	
	TPB, LEFT JOYSTICK	SWITCH 0-(1)	F29	YES	YES	
	TPB, RIGHT JOYSTICK	SWITCH 0-(1)	F30	YES	YES	
	TPB, JOYSTICK SA5	SWITCH 0-(1)	F31	YES	YES	
	JOYSTICK SA2	ACTIVITY JOY.	F32	YES	YES	
6	HST, LOW BAT	ACT. WHEN BAT IS LOW	F33	YES	NO	
	N/A		F34	YES	NO	
	N/A		F35	YES	NO	
	N/A		F36	YES	NO	
	N/A		F37	YES	NO	
	N/A		F38	YES	NO	
	N/A		F39	YES	NO	
	N/A		F40	YES	NO	
7	N/A		F41	YES	NO	
	N/A		F42	YES	NO	
	N/A		F43	YES	NO	
	N/A		F44	YES	NO	
	N/A		F45	YES	NO	
	N/A		F46	YES	NO	
	N/A		F47	YES	NO	
	N/A		F48	YES	NO	

*Downlink OK bit is an internal function between radio receiver and terminal. Not to be used in the PLC. (Not used on polled systems)

Proportional functions

BYTE	FUNCTION	DESCRIPTION	CHA.	127 '7F' HEX	0 '00' HEX	-128 '80' HEX	TRANSF.	ACT. CHECK	TESTED
8	SA1, LEFT JOYSTICK	JOYSTICK	A01	IN	CENTER	OUT	YES	YES	
9	SA2, LEFT JOYSTICK	JOYSTICK	A02	LEFT	CENTER	RIGHT	YES	YES	
10	SA3, RIGHT JOYSTICK	JOYSTICK	A03	IN	CENTER	OUT	YES	YES	
11	SA4, RIGHT JOYSTICK	JOYSTICK	A02	LEFT	CENTER	RIGHT	YES	YES	
12	SA5, JOYSTICK	JOYSTICK	A03	RIGHT	CENTER	LEFT	YES	YES	













DOWNLINK:

The MC-MB2-PN consumes 2 byte header + 20 bytes of data pr. terminal like this:

HEADER	DATABYTES	TESTED
2	20	

System status information area	
Byte	Description
0	Base unit number (Not used. Reserved for future use)
1	Downlink watchdog counter
Byte	Description
2	LED Downlink, O01 is least significant bit.
3	LED Downlink, O09 is least significant bit.
4	LED Downlink, O17 is least significant bit.
5	LED Downlink, O25 is least significant bit.
6-21	Spare

Led downlink

BYTE	FUNCTION	DESCRIPTION	INPUT	COLOUR	TESTED
2	HO1, ARM 1	CONTROLLED FROM PLC	O01	RED	
	HO2, ARM 2	CONTROLLED FROM PLC	O02	RED	
	HO3, ARM 3	CONTROLLED FROM PLC	O03	RED	
	HO4, ARM 4	CONTROLLED FROM PLC	O04	RED	
	HO5, ARM 5	CONTROLLED FROM PLC	O05	RED	
	HO6, ARM 6	CONTROLLED FROM PLC	O06	RED	
	HO7, ARM 7	CONTROLLED FROM PLC	O07	RED	
	HO8, ARM 8	CONTROLLED FROM PLC	O08	RED	
3	HO9, ARM 9	CONTROLLED FROM PLC	O09	RED	
	HO10,  1 RUNNING	CONTROLLED FROM PLC	O10	GREEN	
	HO11,  0	CONTROLLED FROM PLC	O11	YELLOW	
	HO12, 	CONTROLLED FROM PLC	O12	YELLOW	
	HO13,  STORAGE LOCKED	CONTROLLED FROM PLC	O13	RED	
	HO14, 	CONTROLLED FROM PLC	O14	YELLOW	
	HO15, 	CONTROLLED FROM PLC	O15	YELLOW	
	HO16, 	CONTROLLED FROM PLC	O16	YELLOW	
4	HO17, 	CONTROLLED FROM PLC	O17	YELLOW	
	HO18, 	CONTROLLED FROM PLC	O18	YELLOW	
	HO19, 	CONTROLLED FROM PLC	O19	YELLOW	
	HO20, 	CONTROLLED FROM PLC	O20	GREEN	
	HO21, 	CONTROLLED FROM PLC	O21	BLUE	
	SU1, BUZZER	CONTROLLED FROM PLC	O22	BUZZER	
	SPARE	CONTROLLED FROM PLC	O23		
	SPARE	CONTROLLED FROM PLC	O24		

5	SPARE	CONTROLLED FROM PLC	O25		
	SPARE	CONTROLLED FROM PLC	O26		
	SPARE	CONTROLLED FROM PLC	O27		
	SPARE	CONTROLLED FROM PLC	O28		
	SPARE	CONTROLLED FROM PLC	O29		
	SPARE	CONTROLLED FROM PLC	O30		
	SPARE	CONTROLLED FROM PLC	O31		
	SPARE	CONTROLLED FROM PLC	O32		

Timeout on data from PLC is 2000mS. If new data not is received within this time, default value will be used, and an error message will be indicated in display.

DATE	TESTED BY