



EC-TYPE EXAMINATION CERTIFICATE

- (1)
- (2) Directive 94/9/EC introduced into Polish law by Minister of Economy Decree of 22 December 2005 on the Essential Health and Safety Requirements relating to equipment and protective systems intended for use in potentially explosive atmospheres (O. J. No. 263, pos. 2203).
- (3) EC-Type Examination Certificate No. **TEST 13 ATEX 0070U**
- (4) Product name: **Module of audio and interlocks control MAB-1**
- (5) Manufacturer name: **ROOTTEL Sp. z o.o.**
- (6) Manufacturer address: **40-189 Katowice, Leopolda 29, Poland**
- (7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate; the schedule may also include possible supplements to this certificate and documents referred to.
- (8) Jednostka Opiniująca, Atestująca i Certyfikująca Wyroby TEST Sp. z o.o. (“TEST” Product Assessment, Approval and Certification Body Ltd.), notified body number 2057 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The assessment and test results are recorded in confidential report No. TEST/RW/51/13/AP.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with standards:
PN-EN 60079-0:2009 **PN-EN 60079-11:2012** **PN-EN 50303:2004**
(EN 60079-0:2009) (EN 60079-11:2012) (EN 50303:2000)
- (10) The sign “U” placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.
- (11) This EC-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system, according to the Directive 94/9/EC. The certificate does not cover the Directive requirements relating to the process of manufacture and placing the equipment or protective system on the market.
- (12) The marking of the equipment or protective system shall include the following:
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- (13) This certificate is valid in its entirety, schedule(s) included.



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(14)

SCHEDULE

(15)

EC-TYPE EXAMINATION CERTIFICATE TEST 13 ATEX 0070U

(16)

Description of Ex equipment or protective system:

Module of audio and interlocks control MAB-1 is intended to work with a central unit of the controller. The device is able to detect and identify enabled interlock. All information and messages of MAB-1 can be sent to the central unit within CAN or RS485 interface. Electronic parts of the module are placed in a plastic enclosure. The module consists of circuits located on two PCB boards. On the first one there are two connectors and processor. This board is responsible for communication with the CPU, the audio signal generation and identification of the active interlock. The second board is responsible for detection of the interlock signal and for control.

Technical characteristics:

Power supply voltage	12 V DC
Current consumption	max. 190 mA
Ambient temperature	-20°C ≤ Tamb ≤ +40°C
Permissible humidity	0+95% (without condensation)
Enclosure protection level	IP 20
Dimensions	90x45.5x81 mm
Mass	approx. 80 g

Intrinsically safe parameters:

Power supply (12V, GND_IN)

Maximum input voltage

Ui = 14 V

Negligible parameters

Li, Ci

Input/output CTRL_IO

Maximum input voltage

Ui = 15 V

Maximum output voltage

Uo = 15 V

Maximum output current

Io = 3,4 mA

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [µF]	2,4	2,5	2,9	3,2	3,6	4,3	5,1	6,1	8,1	9,2	16

Input/output CALL_IO

Maximum input voltage

Ui = 15 V

Maximum output voltage

Uo = 15 V

Maximum output current

Io = 3,4 mA

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [µF]	2,4	2,5	2,9	3,2	3,6	4,3	5,1	6,1	8,1	9,2	16



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Input L/O_IN

Maximum input voltage

$U_i = 15 \text{ V}$

Output PULSE_OUT

Maximum output voltage

$U_o = 15 \text{ V}$

Maximum output current

$I_o = 3,4 \text{ mA}$

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [μF]	2,4	2,5	2,9	3,2	3,6	4,3	5,1	6,1	8,1	9,2	16

Output L/O_OUT

Maximum output voltage

$U_o = 15 \text{ V}$

Maximum output current

$I_o = 79 \text{ mA}$

Maximum external inductance and capacitance:

Lo [mH]	59	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [μF]	1,2	1,4	2,1	2,6	3,2	4,0	4,9	5,9	8,1	9,1	16

Input/output AUDIO_EX

Maximum input voltage

$U_i = 15 \text{ V}$

Maximum output voltage

$U_o = 15 \text{ V}$

Maximum output current

$I_o = 79 \text{ mA}$

Maximum external inductance and capacitance:

Lo [mH]	59	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [μF]	1,2	1,4	2,1	2,6	3,2	4,0	4,9	5,9	8,1	9,1	16

Input/output AUDIO_IO

Maximum input voltage

$U_i = 15 \text{ V}$

Maximum output voltage

$U_o = 15 \text{ V}$

Maximum output current

$I_o = 79 \text{ mA}$

Maximum external inductance and capacitance:

Lo [mH]	59	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [μF]	1,2	1,4	2,1	2,6	3,2	4,0	4,9	5,9	8,1	9,1	16

Digital output RELAY

Maximum input voltage

$U_i = 30 \text{ V}$

Maximum input current

$I_i = 2,5 \text{ A}$

Maximum input power

$P_i = 3,3 \text{ W}$

Digital input REL_IN

Maximum output voltage

$U_o = 15 \text{ V}$

Maximum output current

$I_o = 52,7 \text{ mA}$

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [μF]	1,4	1,9	2,4	2,8	3,3	4,2	4,9	5,9	8,1	9,1	16



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Digital output REL_OUT

Maximum input voltage

Ui = 30 V

Maximum input current

Ii = 2,5 A

Maximum input power

Pi = 3,3 W

Transmission (CAN_H, CAN_L)

Maximum input voltage

Ui = 8 V

Maximum output voltage

Uo = 4,935 V

Maximum output current

Io = 43,3 mA

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [µF]	14	17	21	23	27	32	37	45	76	420	1000

Transmission (RS_H, RS_L)

Maximum input voltage

Ui = 8 V

Maximum output voltage

Uo = 4,935 V

Maximum output current

Io = 43,3 mA

Maximum external inductance and capacitance:

Lo [mH]	100	50	20	10	5	2	1	0,5	0,1	0,01	0,001
Co [µF]	14	17	21	23	27	32	37	45	76	420	1000

(17) Test reports:

–Jednostka Opiniująca, Atestująca i Certyfikująca Wyroby TEST Sp. z o.o. Laboratorium Badawcze. Sprawozdanie z badań nr LT/141/2013. Badanie modułu audio i sterowania blokadami MAB-1, Siemianowice Śl., 20.09.2013r.

(18) Conditions of use:

- in the hazardous areas, the module shall be installed in an enclosure with a degree of protection of at least IP54

(19) Compliance with Essential Health and Safety Requirements has been assured by conformity with standards specified in item 9 of this certificate.



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