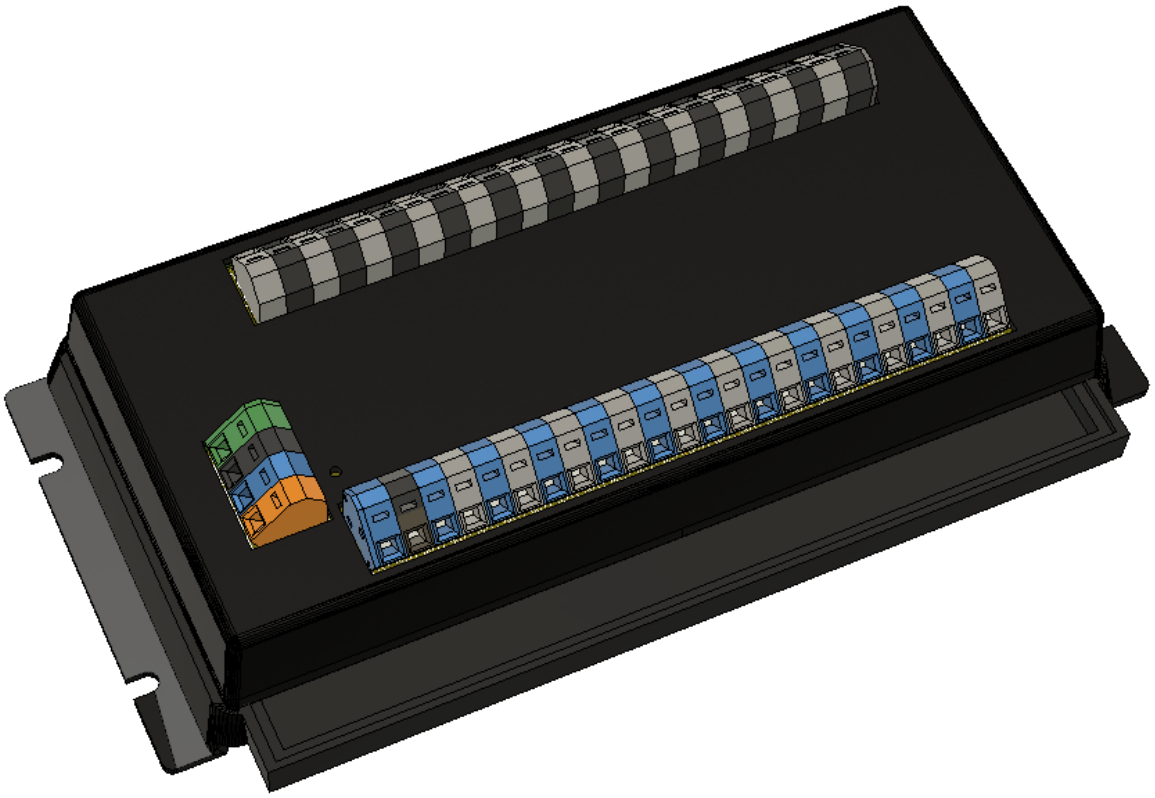
MULTIDIMMER

12-channel intermediate dimmer controlled with external positive PWM driver



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Device description:

The MULTIDIMMER device is intended to be used to regulate the brightness of the indicator LEDs connected externally to aircraft instruments, whose output does not have the possibility of dimming this indicator LED, but only the OFF and ON states. The MULTIDIMMER is inserted between the output of the indicating device and the LED indicator itself (hence the intermediate dimmer).

The MULTIDIMMER contains 12 separate channels with common PWM control (LED brightness at the outputs). Each channel has one input to connect to the indicating device and an output to which the original indicator LED including the resistor is connected.

The input for controlling each of the channels is galvanically isolated by an optical coupler with bipolar polarity (it does not matter polarity or DC signal level to GND). The output signal duty cycle is set using an external PWM source (for example DOUBLEDIMMER) in the range of 1 to 100%. The duty cycle of all outputs is controlled together. The device can be controlled by a positive or positive-negative switch level of the PWM signal. The PWM signal generator (device) with the GND switch output type is not supported. Channel number one differs from the others only in that the output is switched to GND (the others switch the VCC potential). Another functionality is completely preserved. The device also includes an EG input, which could be used to make all outputs activated independently of the inputs EN1, EN2…EN10, to check the functionality of the indicating elements (LEDs).

The schematic diagram (for a quick idea of how the device works) is shown in Figure 1. The electrical diagram is shown in Figure 2. The mounting holes are shown in Figure 3. When installing with the DOUBLEDIMMER or FLAPS, also pay attention to their operating instructions. The DOUBLEDIMMER allows you to control 2 channels simultaneously and independently. This allows independent change of the brightness of the indicator LEDs and setting cabin lights. The device is designed for installation in **NON-CERTIFIED** aircraft.

Electrical parameters:

parameter	*min.*	*Typ.*	*max.*	*units*	*note*
Operating voltage (VCC)	9,5	12	15	VDC	Reverse polarity protected
Current consumption	-	8	185	mA	Max. consumption – all output activated (without ballast)
input range frequency of external PWM signal	0		500	Hz	
Input voltage PWM	6	12	VCC	V	PWM source
Input current PWM	-	8	-	mA	
PWM duty	1		100	%	Power OFF and PWM 1...100%
PWM type	Switching positive or positive-negative				Negative PWM is not supported
Input voltage on pin EN1...EN12	6		15	V	Safe output activation level
Input current EN1...EN12	2		10	mA	Bidirectional input, the input resistance of about 1500Ω
Output voltage EG			VCC-0,5	V	
Output current EG			200	mA	
Type of OUT channels	OUT1: switch negative and OUT2...12: switch positive (VCC)				
Output current on to OUT pin			200	mA	For channel OUT1 input current. Permissible current load at the maximum voltage occurring in the system.
Output short current on OUT pin		650		mA	Output current is limited with poly fuses. For channel OUT1 input current.
Recommended fuse on VCC		5		A	F_{MD} fuse

Mechanical parameters:

parameter	*value*	*unit*	*note*
Width	198,2	mm	More information in chapter DEVICE dimension.
Depth	97,4	mm	
Height	41	mm	
Weight	220	g	

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Wiring terminals colors:

signal	*color*	*note*
VIN	orange	Supply voltage source +
GND	blue	Supply voltage source -
PWM	dark gray	Input for external positive PWM
EG	green	Input for activating all outputs – test of output function (activated level on GND)
EN1, EN2…EN12	pair light gray and dark gray	Input for channel control. Bidirectional polarity.
OUT1	pair blue and dark gray	Output for connecting FLAPS device (output is switching to GND)
OUT2…OUT12	pair blue and light gray	Output for LED indicators (output is switching to VCC)

The schematic diagram for the quick idea:

Original situation (without dimming):

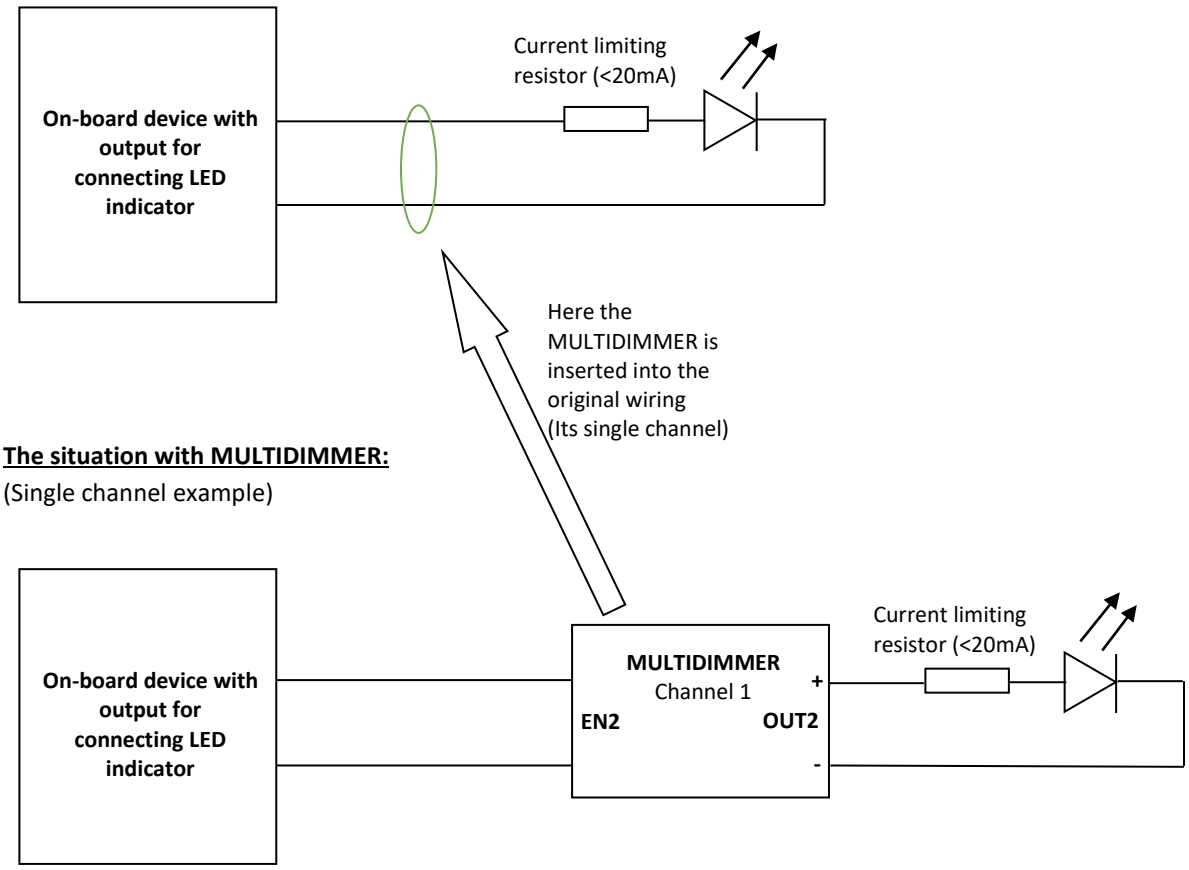

Fig. 1 Principe of MULTIDIMMER installation

Electrical wiring diagram:

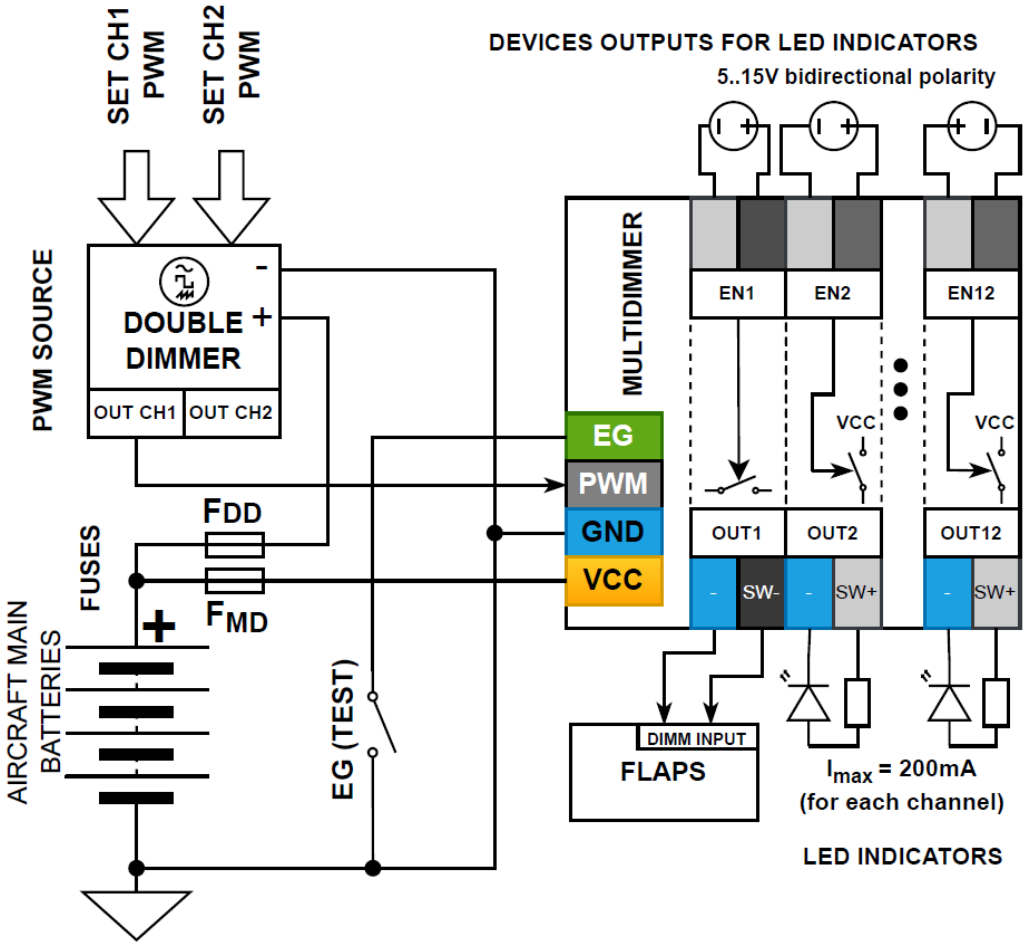

Fig. 2 Connection scheme for MULTIDIMMER with DOUBLEDIMMER and FLAPS devices

Mounting holes:

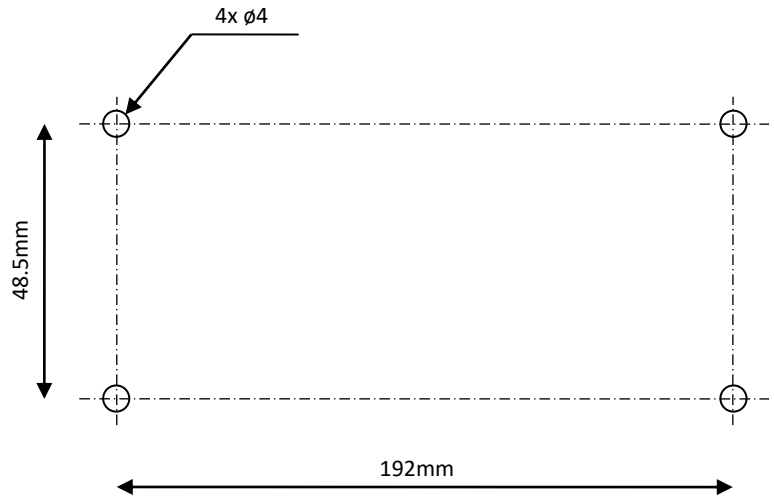

Fig. 3 Mounting holes dimension

Device dimension:

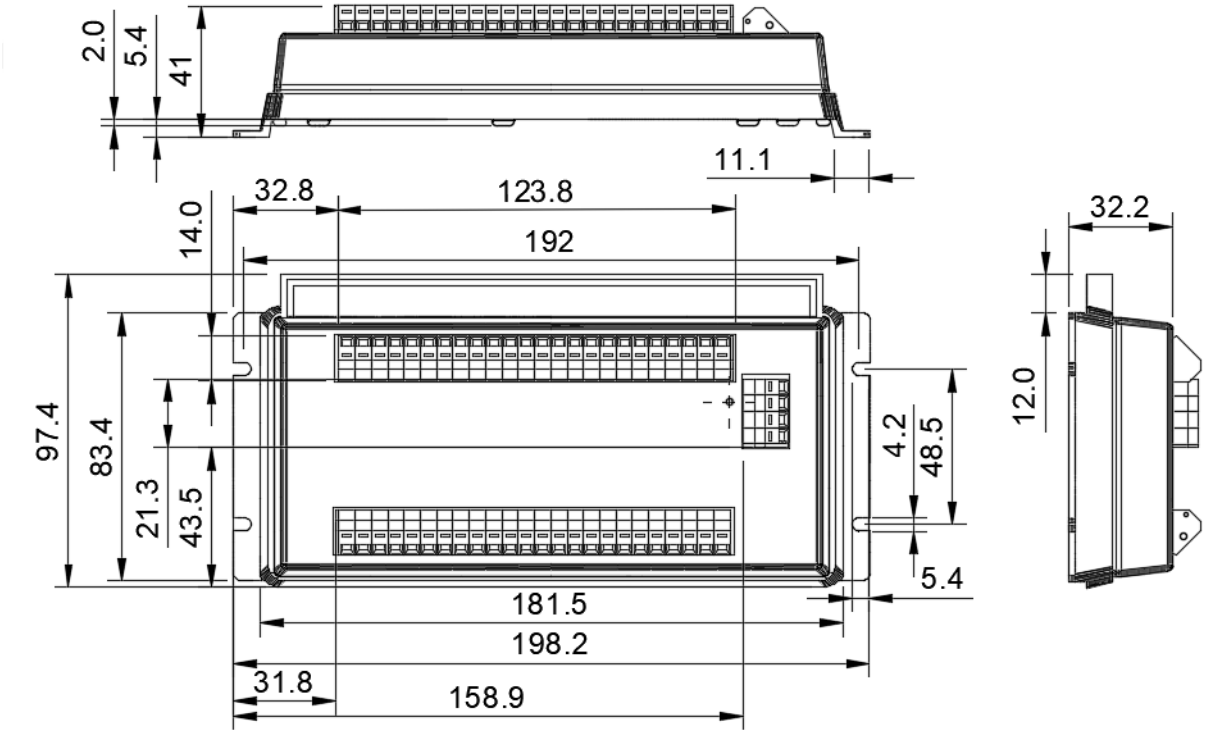

Fig. 4 Device dimension

Device design view:

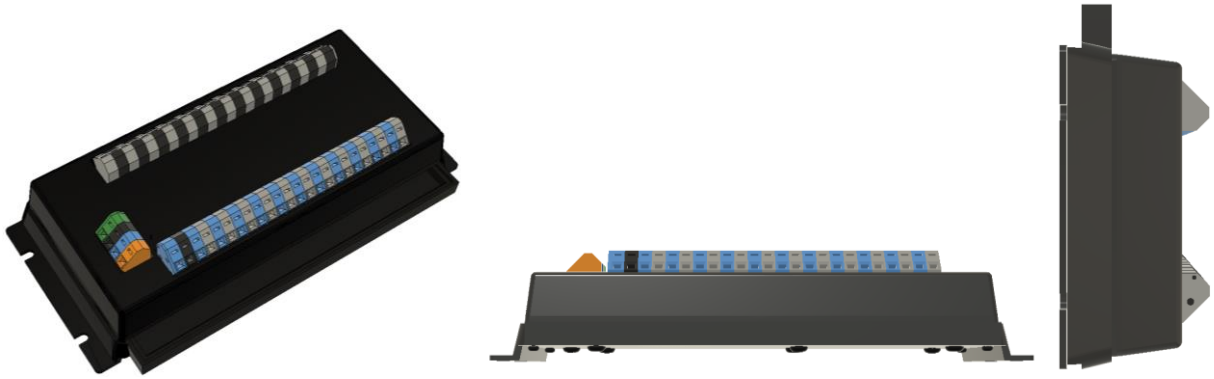

Fig. 5 Device design view

Operating conditions:

parameter	***value***	***unit***	***note***
Working temperature	-30 ÷ 60	°C	
Humidity	10 ÷ 90 %	RH	
Atmospheric pressure	900 ÷ 1100	hPa	
IP	IP20	-	
Type of installation	On the surface	-	Screw M4
Working position	any	-	

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Important notice and warnings:

Thank you for purchasing MULTIDIMMER - 12-channel intermediate dimmer for external positive PWM driver. For a comfortable and safe use of this product, please pay attention to THE ENTIRE MANUAL, especially the notes and warnings below.

- Although the MULTIDIMMER device has been thoroughly tested to ensure maximum safety in all conceivable situations, THE RIGHT FUNCTIONALITY DEPENDS ON THE RIGHT INSTALLATION AND SETTINGS.
- Therefore, it is **NECESSARY to READ CAREFULLY and UNDERSTAND THIS MANUAL COMPLETELY**.
- Keep this manual printed in an airplane for cases of emergency or change of ownership.
- THIS PRODUCT IS NOT APPROVED FOR INSTALLATION IN CERTIFIED AIRPLANES.
- The pilot MUST UNDERSTAND the control of this product before the first flight. DO NOT use the product unless you are sure how it works!
- Do not allow unauthorized persons to handle the installed product.
- After installing the product, before the first flight, turn on ALL possible sources of electromagnetic interference on board the aircraft and ensure that the instrument is functioning properly.
- Use of the device in conflict with this manual, with bad wiring, outside the allowed operating conditions, etc., may cause the device to malfunction or damage and endanger flight safety.
- If the product repeatedly indicates an error, do not use it and turn off the power!
- AVOID contact with liquids and chemicals
- Before installation, check the mechanical integrity of the device and its accessories
- DO NOT disassemble the device!
- After installation, carefully check the functionality of the device and its installation
- The responsibility for the installation is entire with the installer.
- Responsibility for performing control actions based on information indicated by the product is complete with the operator (pilot). The operator must be able to evaluate an incorrect indication even if the product does not indicate an error.
- Ensure regular maintenance of the aircraft's main battery
- If you do not agree to the notes and warnings above, do not use this product.

Company LAMBERT AERODEVICES s.r.o reserves the right to change or improve the product or manual without prior or subsequent notice.

Document history:

Date	*Version*	*Change description*	*Author*
17.1.2020	1	Initial edition	Stanislav Dulina
12.3.2020	2	Text corrections, further information, additional information, and diagrams	ATAMAN
13.6.2022	3	Total redesign of the MULTIDIMMER device (12-channel).	NEPOR
8.8.2022	4	Parameters update, LA	NEPOR
1.12.2022	5	Parameters update	NEPOR

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