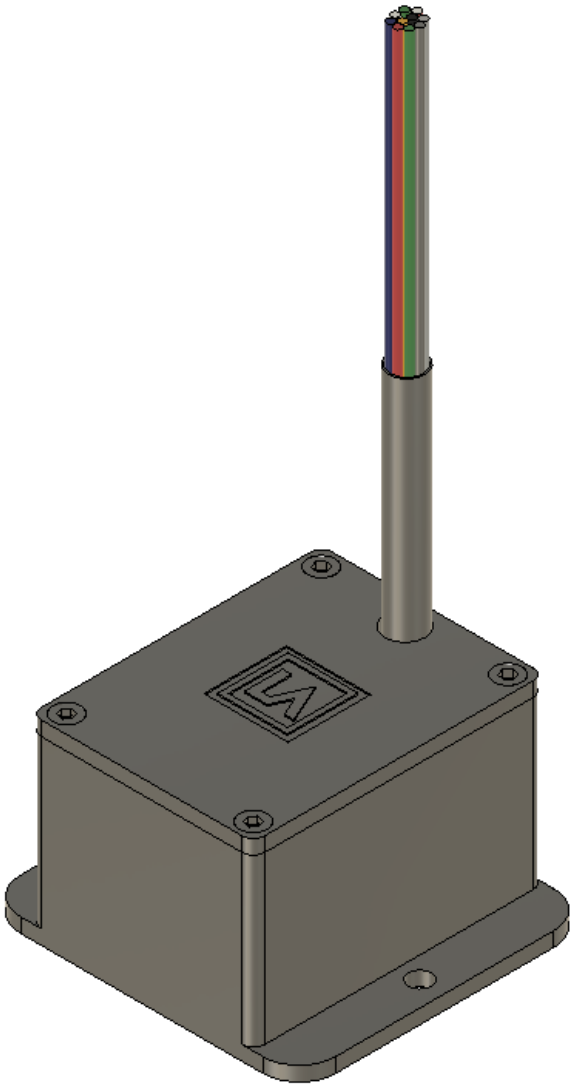
CT Relay Deck

1 (CTRD2) or 2 (CTRD4) channel drivers for trimming systems (servo) on UL aircraft (Aileron trim / Pitch trim)



LAMBERT AERODEVICES s.r.o.
Sokolovská 573
686 01 Uherské Hradiště
CZECH REPUBLIC, EU

Phone: +420 572 522 166
E-mail: info@lambert-aerodevices.cz
www.lambert-aerodevices.cz

VAT:CZ07712758

Description of the device:

CT Relay Deck is a device needed to convert the signal from the stick grips buttons to the signal for Ray Allen T2 or T3 servos. These are useful for trimming tab systems on UL airplanes. With this equipment, we achieve easier control of the aircraft, because after the using this device, it is no longer necessary to exert such a force on the steering. The device processes the signal from the electric buttons on the stick grip of the aircraft and according to the evaluation of the signal turns on, off and change the way rotation of the appropriate servo. The servo runs as long as the button is pressed. There is a 1 or 2-channel version (for 2 or 4 buttons on the stick grip, depending on the type of trimming system application considered. The device may also be called a Single Pole Single Throw (SPST) to Double Pole Double Throw (DPDT) signal converter. Simply put, a simple button on input changing the state polarity on output. To check the status of ailerons and pitch trim, it is possible to use a trim (position) indicator, which is connected to the potentiometer output of the controlled servo. CTRD units are available in 12V and 24V versions.

When installing, follow the wiring diagram, see. fig. 1 and 2 and test properly after installation. If the servo reacts in the opposite direction to the intended direction, reverse the polarity of the motor of the respective servo. If the trim indicator shows a deviation in the opposite direction to that intended, change the polarity of end measuring wires on the trim indicator. If is not used servo speed control unit, connect yellow wire to red wire. The +VCC_SERVO signal (yellow wire) can also be connected to another source (5..30V) that has a common GND.

Electrical parameters:

Parameter	*min*	*typ*	*max*	*unit*	*note*
Supply voltage 12V/24V version	9,5/19	12/24	15/28	VDC	trademark CTRD2-12, CTRD4-12, CTRD2-24, CTRD4-24 (+VCC – red wire)
Power consumption 12V/24V for 1 channel	0	150/200	500/650	mW	dependent of actual using's of channel and supply voltage
Separate servo power supply		YES		-	Common GND. Normally, the power supply for the servo and the control electronics is common. +VCC_SERVO – yellow wire
Switched output voltage 12V/24V version	5	12/24	30	VDC	+VCC_SERVO – yellow wire
Switched output current	0,01 m	1	2	A	
Switched output power	0,0001		30	W	
Mechanical live of switch	10^8			-	
Electrical live of switch	$5x10^5$			-	1A/24VDC
Recommended fuse protection		6		A	
Number of channels		1/2		-	CTRD2/ CTRD4
Fail polarity protection		YES		-	
Rele controll protection		YES		-	(peaks voltage protection on primary side of the relay)

Device mechanical parameters:

Parameter	*value*	*unit*	*note*
Long	41	mm	*see. fig. 3, 4 and 6 - box dimension
Depth	44,5	mm	
High	27,5	mm	
Installations holes (diametral)	M3	mm	
Weight CTRD2 / CTRD4	39/61	g	CTRD2/CTRD4
Cable cross section	22	AWG	$0,34mm^2$
Cable lenght	50	cm	

LAMBERT AERODEVICES s.r.o.
Sokolovská 573
686 01 Uherské Hradiště
CZECH REPUBLIC, EU

Phone: +420 572 522 166
E-mail: info@lambert-aerodevices.cz
www.lambert-aerodevices.cz

VAT:CZ07712758

Color marking of wires on CT Relay Deck:

Signal	recommended connector	Wire Color
GND*	male	black
SERVO_AILERON_2*	female	green
SERVO_AILERON_1*	female	brown
STICK_GRIP_AILERON_2*	male	blue
STICK_GRIP_AILERON_1*	male	pink / orange
STICK_GRIP_PITCH_2	male	grey
STICK_GRIP_PITCH_1	male	white
SERVO_PITCH_2	female	dark green
SERVO_PITCH_1	female	violet
+VCC*	male	red
+VCC_SERVO*	male	yellow
Note:	** outputs of 1CH version CTRD2 (usable for aileron or pitch trim)* The circuit is activated after connected controll signal (STICK) to ground.	

INPUT/OUTPUT truth table

		Channel 1	INPUT			OUTPUT		
CTRD4	CTRD2	Name input/output Wire color	STICK_GRIP_1 (pitch)	STICK_GRIP_2 (pitch)	VCC (control electronics power supply)	VCC_SERVO (servo power supply)	SERVO_1 (pitch)	SERVO_2 (pitch)
		State	NC	NC	VCC	VCC_SERVO	GND	GND
			GND	NC	VCC	VCC_SERVO	VCC_SERVO	GND
			NC	GND	VCC	VCC_SERVO	GND	VCC_SERVO
			GND	GND	VCC	VCC_SERVO	VCC_SERVO	VCC_SERVO
			X	X	NC	X	GND	GND
			Y	Y	Y	Y	Y	Y
		Channel 2	**INPUT**			**OUTPUT**		
		Name input/output Wire color	STICK_GRIP_1 (aileron)	STICK_GRIP_2 (aileron)	VCC (control electronics power supply)	VCC_SERVO (servo power supply)	SERVO_1 (aileron)	SERVO_2 (aileron)
		State	NC	NC	VCC	VCC_SERVO	GND	GND
			GND	NC	VCC	VCC_SERVO	VCC_SERVO	GND
			NC	GND	VCC	VCC_SERVO	GND	VCC_SERVO
			GND	GND	VCC	VCC_SERVO	VCC_SERVO	VCC_SERVO
			X	X	NC	X	GND	GND
			Y	Y	Y	Y	Y	Y
Note		NC – not connected VCC – connected to supply voltage + GND – grounded (connected to supply voltage -) X – no matter the status Y – there are other options (not important for our use) The table is valid only if the GND input is connected to the negative pole of the battery						

LAMBERT AERODEVICES s.r.o.
Sokolovská 573
686 01 Uherské Hradiště
CZECH REPUBLIC, EU

Phone: +420 572 522 166
E-mail: info@lambert-aerodevices.cz
www.lambert-aerodevices.cz

VAT:CZ07712758

Installation schema:

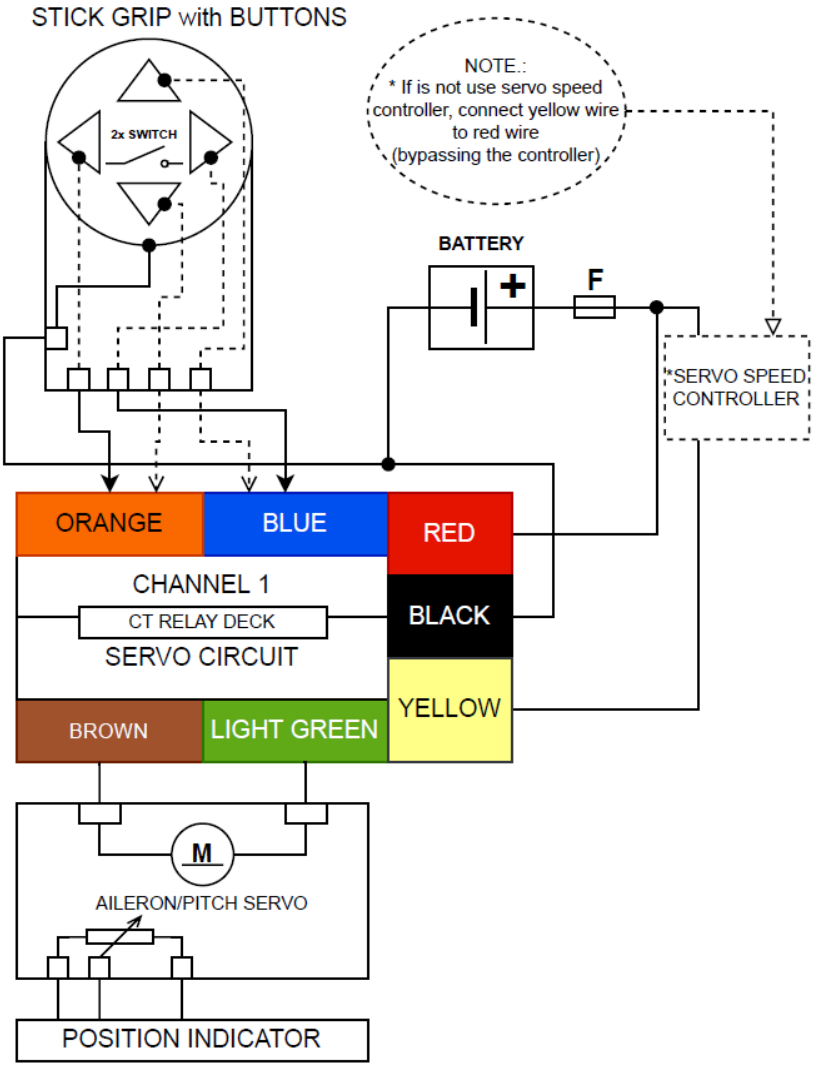


Fig. 1 Wiring diagram CTRD2

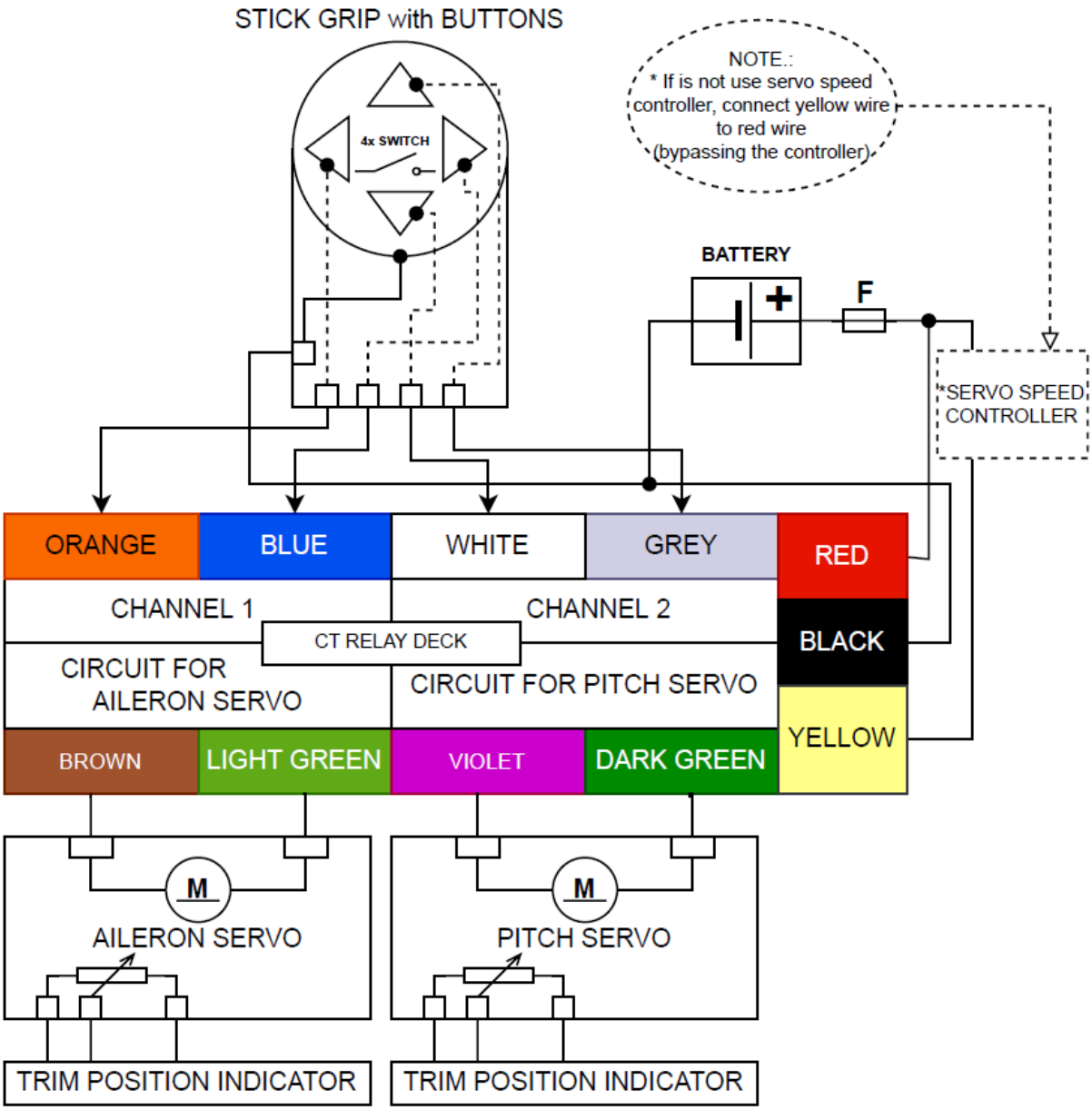


Fig. 2 Wiring diagram CTRD4

Operating conditions:

parameter	*value*	*unit*	*note*
Operating temperature	-30 ÷ 60	°C	
Operating Humidity	20 ÷ 85 %	RH	
Atm. Pressure	900 ÷ 1100	hPa	
Protection	IP30	-	
Mounting type	by screwing to the surface / into the hole	-	screw type M3
Working position	any	-	

Device dimension:

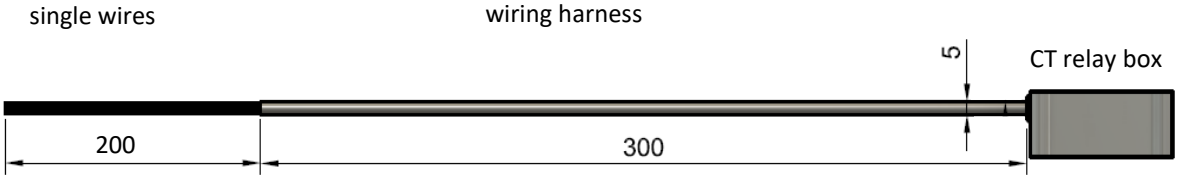


Fig. 3 Length of output cables [mm]

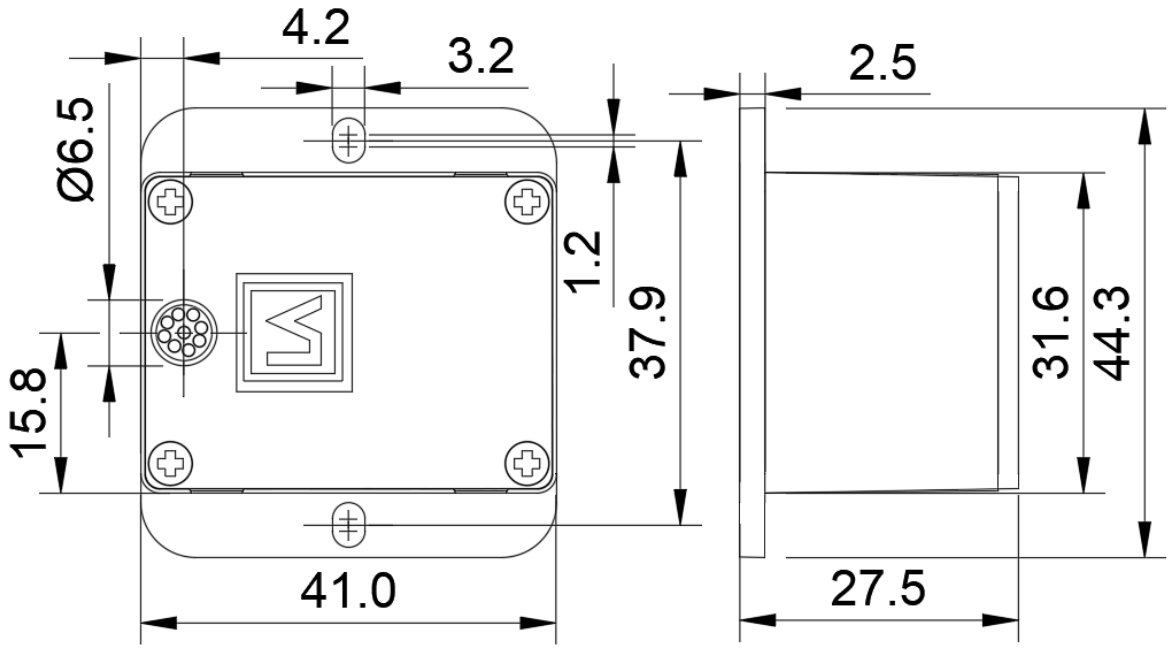


Fig. 4 Box dimension [mm]

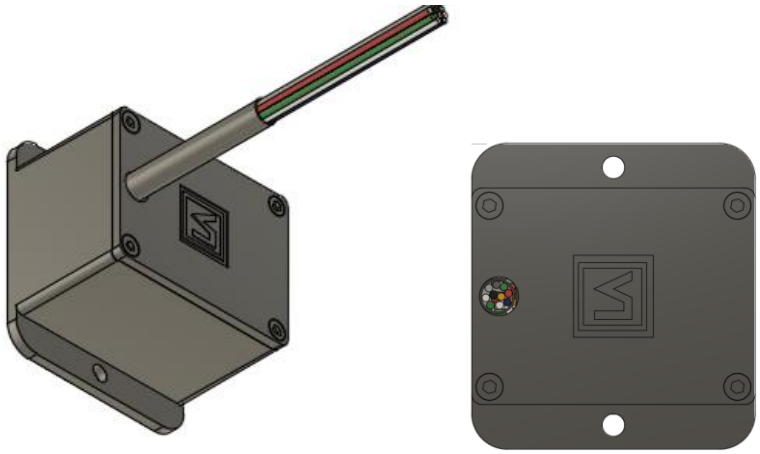


Fig. 5 Box view

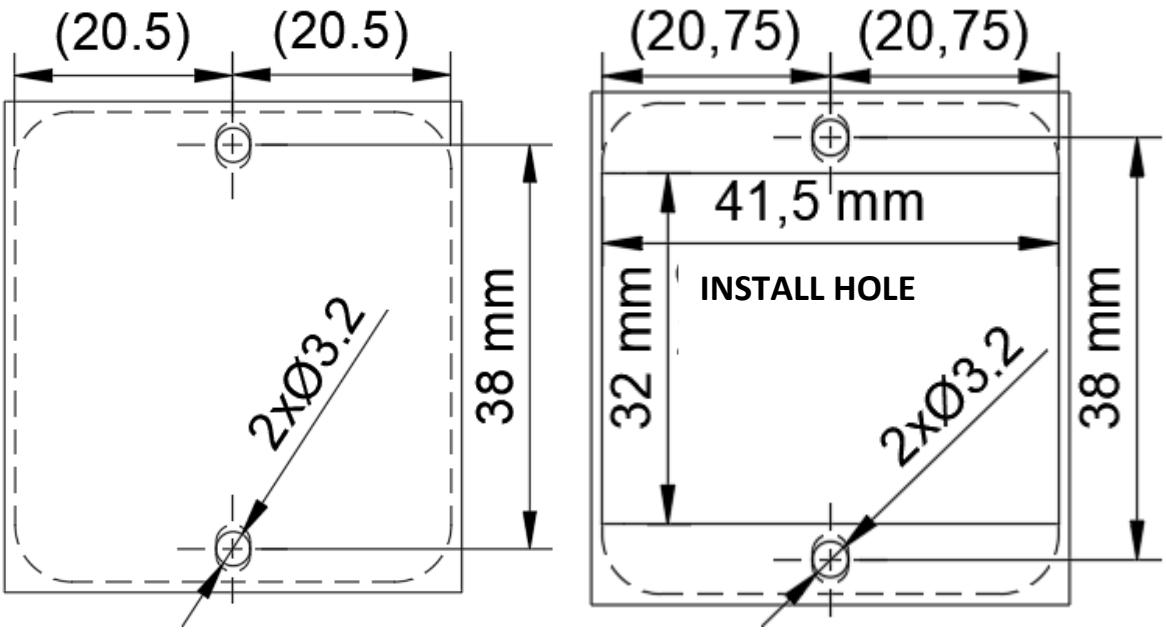


Fig. 6 Installation holes a) on the surface b) recessed into the hole

Important notes and warnings

Thank you for purchasing **CT Relay Deck**. For a comfortable and safe use of this product, please pay attention to THE ENTIRE MANUAL, especially the notes and warnings below.

- Although the **CT Relay Deck** 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 INSTALLING 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 entirely with the installer.
- Responsibility for performed control actions based on information indicated by the product is fully 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 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, improve the product or manual without prior or subsequent notice.

Document history:

date	*version*	*change description*	*author*
27.10.2021	0	Create the document	NEPOR
16.11.2021	1	update box view and dimension, wire color	NEPOR
04.03.2022	2	Update box	NEPOR
26.04.2022	3	Update parameters	NEPOR
1.06.2022	4	Change color marking of signal, data correction	NEPOR
19.08.2022	5	LA, graphical correction	NEPOR
1.09.2022	6	parameter update, input/output truth table	NEPOR
2.12.2022	7	Update box dimension	NEPOR

www.lambert-aerodevices.cz

LAMBERT AERODEVICES s.r.o.
Sokolovská 573
686 01 Uherské Hradiště
CZECH REPUBLIC, EU

Phone: +420 572 522 166
E-mail: info@lambert-aerodevices.cz
www.lambert-aerodevices.cz

VAT:CZ07712758