IO_TRANSMITTER

USER MANUAL

This user manual refers to:
PCB (K1002) version 2.1
Firmware version 1.3
Output PCB version 2.0

TABLE OF CONTENTS

DOCUMENT VERSION HISTORY

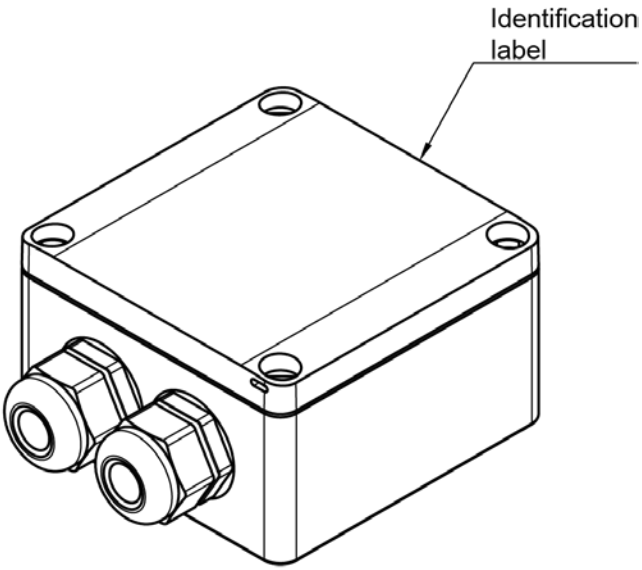
Date	Revision	Notes
18.10.2022	1.0	Initial release.
22.11.2022	1.1	Changed to A5 format. Added Appendix. Minor updates in content.
9.1.2022	1.2	Added Relay PCB
12.1.2022	1.3	Minor updates in content.
16.2.2023	1.4	EMC Tests and technical data updates.
23.3.2023	1.5	Changed to Output PCB. Major changes in Menu structure.

1 INTRODUCTION

The IO_Transmitter (IO_TX) is mainly designed to be used for transmitting signals from external sources to receivers within the IO_Series and Tele Radio Panther range.

High level digital sources, such as sensors (8-32V) and Low level (Gnd) such as push buttons, switches or other external sources, can be used.

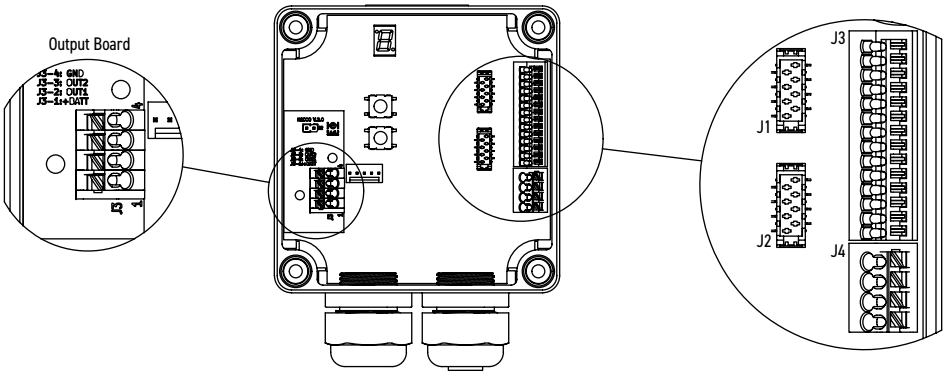
Please read this manual carefully before mounting, installing, configurating or operating this product.



2 TECHNICAL DATA

Input Voltage	8-32 VDC (or 5 VDC)
Current Consumption	~ 25 mA + (5V max 0,75 A)
Inputs (IN_1-12)	12 pcs (DIGITAL); configurable LOW (0V) or HIGH (8-32V)
Reference Voltage Outputs	1 pc; 5V (0,75 A)
Digital Outputs (Output PCB) (Optional)	2 pcs; 2A each or max 3,5A both simultanously (resistive or inductive load, activated by Inputs)
Ingress Protection	IP66
Dimensions (width x length x height)	100 x 100 x 60 mm
Connectors Dimensions	GND, POT, BATT, GND : max 1,5 m2 IN_1-12, GND: max 0,5 m2
Weight	~ 250g
Certifications	CE, FFC, IC, UKCA
Operating frequency	2,4 GHz (2,405 - 2,480 GHz as per IEEE 802.15.4)

3 ELECTRICAL CONNECTION



ATTENTION! Always GROUND both Output Board (J3-4) and Main Board (J4-5).

Connector Terminal Blocks J1 & J3

J1-1	J3-1	Ground
J1-2	J3-2	Input 12*
J1-3	J3-3	Input 11*
J1-4	J3-4	Input 10*
J1-5	J3-5	Input 9*
J1-6	J3-6	Input 8*
J1-7	J3-7	Input 7*

Connector Terminal Blocks J2 & J3

J2-1	J3-8	Ground
J2-2	J3-2	Input 6*
J2-3	J3-3	Input 5*
J2-4	J3-4	Input 4*
J2-5	J3-5	Input 3*
J2-6	J3-6	Input 2*
J2-7	J3-7	Input 1*

* All inputs are configurable **HI** or **LO** (see chapter 4.2.2)

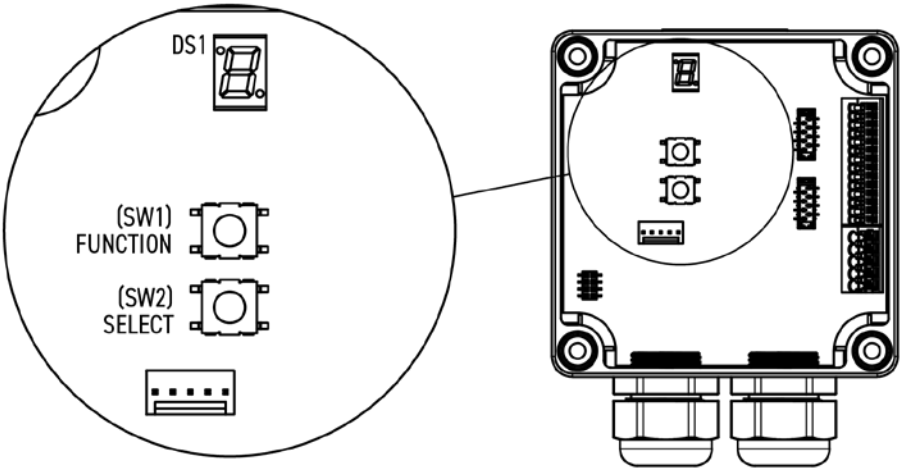
Connector Terminal Block J4

J4-1	GND	Ground
J4-2	POT/EXT_IN	5V out/in (0,75A)
J4-4	BATT+	Supply power (8-32VDC)
J4-5	GND	Supply ground

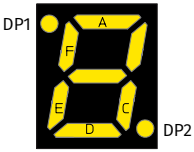
Output Board Connector Terminal Block (Optional)

J3-1	Supply power (8-32VDC)
J3-2	Output 1 (2A, activated by any input)
J3-3	Output 2 (2A, activated by any input)
J3-4	Ground

4 OPERATION



By default the Display shows the active input. 1...9, A=10, B=11, C=12.



The Dot (DP1) flashes when the transmitter is powered and also to indicate every new digit.

During restart, the firmware version is displayed.

4.1 REGISTERING

Registering means linking or joining a transmitter and a receiver. Make sure both are powered up before proceeding.

To enter Register Mode:
press the FUNCTION button - *the Dot (DP2) lits* - within 10 seconds, press the SELECT button - *the transmitter is now in register mode*.

In the receiver, also press the FUNCTION button and then the SELECT button.

When the registration is successful, all LEDs in the receiver flashes once.

(Depending on receiver-model, the registering procedure may differ *slightly.)*

To exit register mode, press any button, activate any input or power-cycle the transmitter.

4.2 MENU

To enter Menu Mode press and hold the FUNCTION button for 6 seconds.

ATTENTION! Changes in Menu structure since FW Version 1.3. (UM V_1.5). If earlier FW version, use UM V_1.4 or older.

In the Menu, press the FUNCTION button to navigate to next Menu Section.

To save and Exit Menu Mode, navigate to Menu Section 8 (4.2.8) and press SELECT button or leave the transmitter without pressing anything for 60 seconds - *the transimtter saves all changes and restarts.*

Menu Sections:

1 CHANNEL
2 INPUT MODE
3 OFF DELAY I
4 OFF DELAY II
5 ON MASK I
6 ON MASK II
7 REGION
8 END

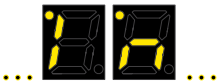
4.3 CHANNEL (Menu Section 1)

The transmitter can send on 16 different (11-26) channels.

To change channel press the SELECT button.

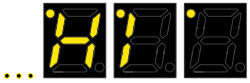
If used in a dense wi-fi environments it's recommended to use channels 15, 20, 25. Heavy traffic on wi-fi (802.11) channels 1, 6 and 11 may othervise cause some interference.

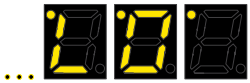
4.4 INPUT MODE (Menu Section 2)



(Factory default: LO)

To change Input Mode press the SELECT button.

 HI = Activated when pulled HIGH (8-32V)

 LO = Activated when pulled LOW (Ground)

4.5 OFF DELAY I (Menu Section 3)

(Factory default: 0.0)

The time **Output 1** remains active after deactivating an input can be set from 0-1,5 seconds in steps of 0,1 seconds.

To change Delay time press the SELECT button.

4.6 OFF DELAY II (Menu Section 4)

(Factory default: 0.0)

The time **Output 2** remains active after deactivating an input. Procedure as in 4.2.3.

4.7 ON MASK I (Menu Section 5)

(Factory default: All Inputs)

Choose which Input(s) will activate **Output 1**. The menu will loop thru every Input (1...9, A=10, B=11, C=12) with a 2 sec intervall. Active Input is indicated with lower display Dot (DP2).

To activate or deactivate Input press the SELECT button when respective Input number is shown in the display.

4.8 ON MASK II (Menu Section 6)

(Factory default: None)

Choose which Input(s) will activate **Output 2.** Procedure as in 4.2.5.

4.9 REGION (Menu Section 7)

(Factory default: EU)

To change region press the SELECT button.

EU = For use in Europe. This setting ensures compliance with ETSI EN 300 328 clause 4.3.2.2 Maximum Power Spectral Density.

US = For use in USA or Canada. This setting ensures FCC and IC compliance.

4.10 END (Menu Section 8)

To Save and Exit press the SELECT button.

5 APPROVALS AND SAFETY

5.1 EMC TESTS

Emission tests according to the test specification EN 61000-6-3: residential, commersial and light industry.

Emission test	**Test method**	**Conclusion**
Radiated disturbance	CISPR 16-2-3 (2016+AMD1:2019)	Pass
Conducted disturbance at mains ports	CISPR 16-2-1 (2017-06 ed. 3.1)	Pass

Immunity tests according to the test specification EN 61000-6-2: industrial environment.

Immunity test	**Test method**	**Performance Criterion**	**Conclusion**
Electrostatic Discharge (ESD)	EN 61000-4-2 (2008-12)	B	Pass
Radiated RF Electromagnetic Field	EN 61000-4-3 (2020-09)	A	Pass
Fast Transient (EFT/B)	EN 61000-4-4 (2012-04)	B	Pass
Conducted RF Common Mode	EN 61000-4-6 (2013-03)	A	Pass

Emission tests according to the E/ECE Regulation No. 10, Revision 6 (2019)

Emission test	**Test method**	**Conclusion**
Measurement of radiated interference field strength in the frequency range 30 – 1000 MHz	E/ECE Reg. No. 10, Annexes 7 and 8	Pass
Measurement of conducted disturbances	E/ECE Reg. No. 10, Annex 10	Pass

Immunity tests according to the E/ECE Regulation No. 10, Revision 6 (2019), (immunity related functions).
Immunity test procedures and acceptance criteria to comply with:
Agricultural and forestry machinery, ISO 14982:1998 and
Earth-moving and building construction machinery — (EMC), ISO 13766-1:2018

Immunity test	**Test method**	**Conclusion**
Radiated radio-frequency electromagnetic field	E/ECE Reg. No. 10, Annex 9	Pass
Immunity to transient disturbances conducted along supply lines	E/ECE Reg. No. 10, Annex 10, ISO 7637-2: 2004	Pass

	Pulse 24 V, Test Method	**Pulse 12 V, Test Method**	**Perf. Criterion**
1	-450V, 500 pulses	-112V, 500 pulses	C
2a	+55V, 500 pulses	+55V, 500 pulses	B
2b	+20V, 10 pulses	+10V, 10 pulses	C
3a	-220V, 1 h	-165V, 1 h	A
3b	220V, 1 h	112V, 1 h	A
Starting Profile	-16V, 8V, 10 pulses	-9V, -6V, 10 pulses	B
Load Dump, unclamped	123V, 10 pulses	56V, 5 pulses	C

ISO 10605 Electrostatic Discharge (ESD) 330pF

Air Discharge	**Contact Discharge**	**Indirect Discharge**
±8.0kV	±6.0kV	±6.0kV

(For more detailed reports, please contact Tele Radio Finland)

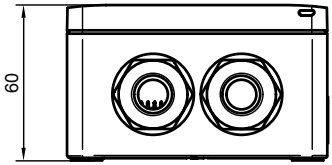
5.2 ENVIRONMENTAL TESTS

The enclosure is certified according to EN 62208:2011:2011

Degree of protection (EN 60529)	IP66 / IP67
Mechanical strength (EN 62262)	IK08 +35 oC / -40 oC
Material	Polycarbonate

6 DIMENSIONS AND MOUNTING

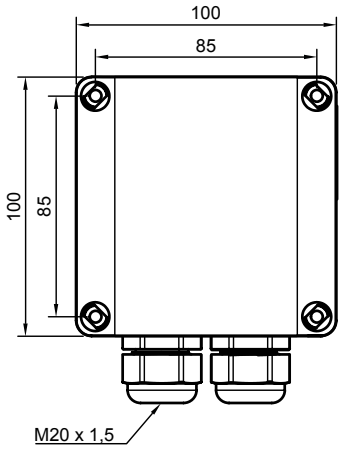
When mounting the transmitter in moist or otherwise harch environments, make sure that the cable glands are pointing downwards.



7 WARRANTY AND SERVICE

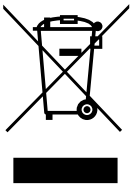
The enclosure is rated IP66, however cable glands may be a subject of leakage and should be mounted pointing downwards. Warranty does not cover failure or damage caused by water or moist, incorrect installation or normal wear and tear. High pressure water cleaning is NOT recommended.

For further instructions on service or repair, please contact Tele Radio Finland.



8 REGULATORY INFORMATION

This product is subject to THE EUROPEAN PARLIAMENT AND OF THE COUNCIL DIRECTIVE 2012/19/EU on waste electrical and electronic equipment (WEEE). For proper treatment, recovery and recycling, please take this product to a designated collection point.



This product is in compliance with the Radio Equipment Directive 2014/53/EU. The latest version of the complete EU Declaration of Conformity is available on request from Tele Radio Finland Oy.

CE

This product conforms with the regulatory requirements for the UKCA (UK Conformity Assessed) marking. The latest version of the complete UK Declaration of Conformity is available on request from Tele Radio Finland Oy or from the website www.radio-remote.com

UK CA

IMPORTANT: Contains FCC ID: VW4A091729. This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation (FCC 15.19).

IMPORTANT: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense (FCC section 15.105).

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with radio frequency exposure limits set forth by Industry Canada for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the device and the user or bystanders.

Cet équipement est conforme aux limites d'exposition aux radiofréquences définies par Industrie Canada pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre le dispositif et l'utilisateur ou des tiers.

Contains Transmitter Module IC:11019A-091729

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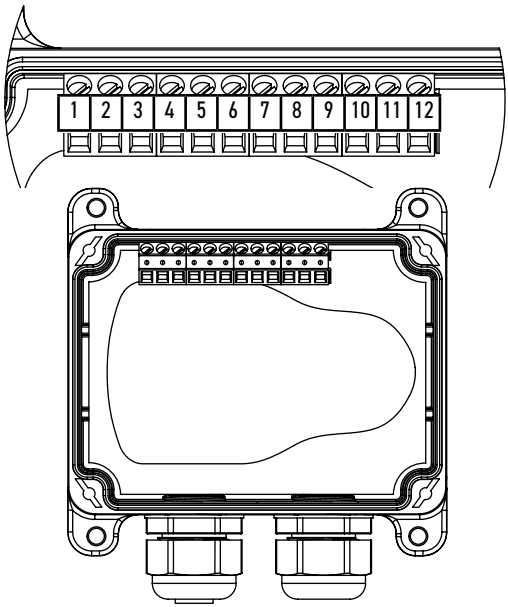
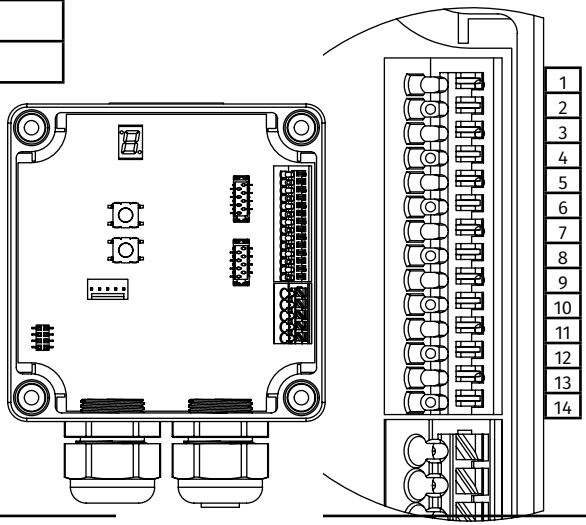
APPENDIX A: REPLACING THE T2182 (WALL TRANSMITTER)

T2182 connector corresponding to IO_TX connector J3:

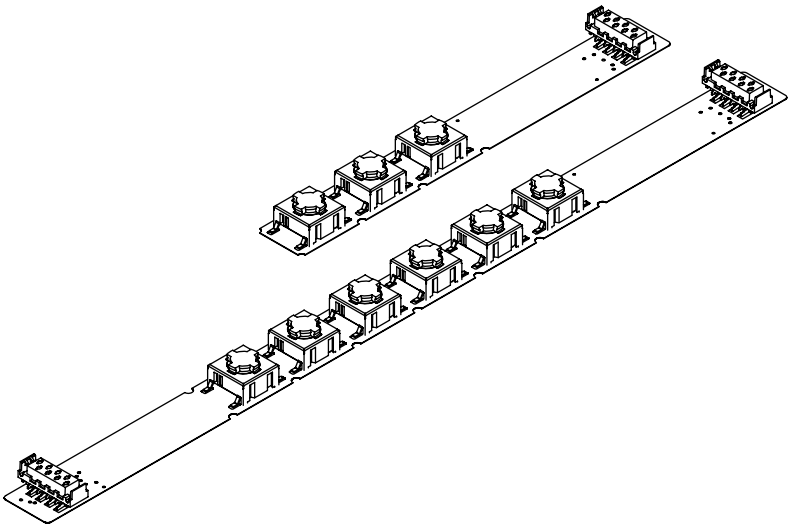
T2182	Function	IO_TX
1	Ground	J3-14
2	Input 1	J3-13
3	Input 2	J3-12
4	Input 3	J3-11
5	Input 3	J3-10
6	Input 5	J3-9
7	Ground	J3-1
8	Input 6	J3-8
9	Input 7	J3-7
10	Input 8	J3-6
11	Input 9	J3-5
12	Input 10	J3-4
	(Input 11)	J3-3
	(Input 12)	J3-2





APPENDIX B: BUTTON_FLEX

The Button_Flex is an easy way to add extra push-button functions to a joystick or any other similiar controlling unit.
Available in 3- or 6-button versions with a 1,5m cable and connector that fits directly into the IO_Transmitter's connector J1 or J2.



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