W-DMX OEM TRX interface description

Author: Niclas Norlén
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Document revision: K2
Confidential

This document describes the hardware interface of OEM TRX versions Pro, Micro and Pico. Valid revisions on the different versions of the TRX should be **revision F** The revision mark is found on the top long side as indicated in Figure 1.
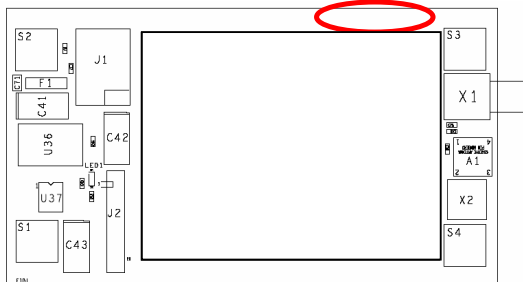

Figure 1 Location of TRX revision mark.

FCC Statment

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

CONFIDENTIALITY NOTICE

Any disclosure, copying, distribution or use of the contents of this information is without authorization and is prohibited.

Rvision K2
Author: Niclas Norlén R&D manager

Wireless Solution Sweden AB
Stureparksvägen 7 – 451 55 Uddevalla – Sweden
+46 522 511 511 Tel. +46 522 440 885 Fax.
Wirelessdmx.com   sales@wirelessdmx.com

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Author: Niclas Norlén R&D manager

Wireless Solution Sweden AB
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1 FCC Statement

DECLARATION OF CONFORMITY

We Wireless Solution,
Stureparksvägen 7
451 55 Uddevalla
Sweden
+46 522 511 511 Tel.
declare under our sole responsibility that the product(s)
OEM TRX (Model Designation)
W-DMX (Product Name)
complies with Part 15 of 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.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

NOTE: 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 in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
• Reorient or locate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

RF Exposure Warning for North America, and Australia

Warning! To meet FCC and other national safety guidelines for RF exposure, the antennas for this device must be installed to ensure a minimum separation distance of 20cm (7.9 in.) from persons.

2 Industry Canada Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference Causing Equipment Regulations ICES 003.
Cet appareil numerique de classe B respecte les exigences du reglement du Canada sur le materiel brouilleur NMB-003. The device is certified to the requirements of RSS-210 for 2.4 GHz spread spectrum devices. The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

3 Hardware interface

3.1 Connector J1

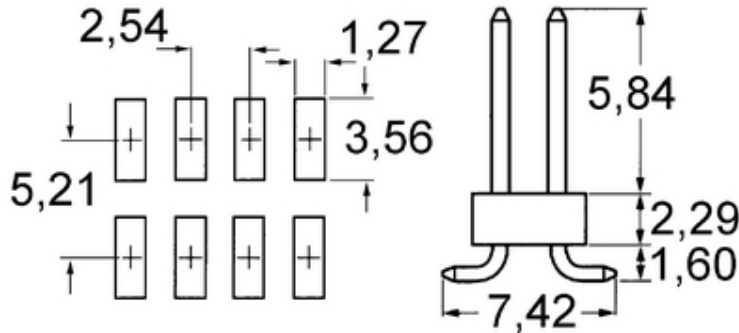DC-power and DMX is connected to a standard 2x5 2.54mm pin header (se Figure 2)

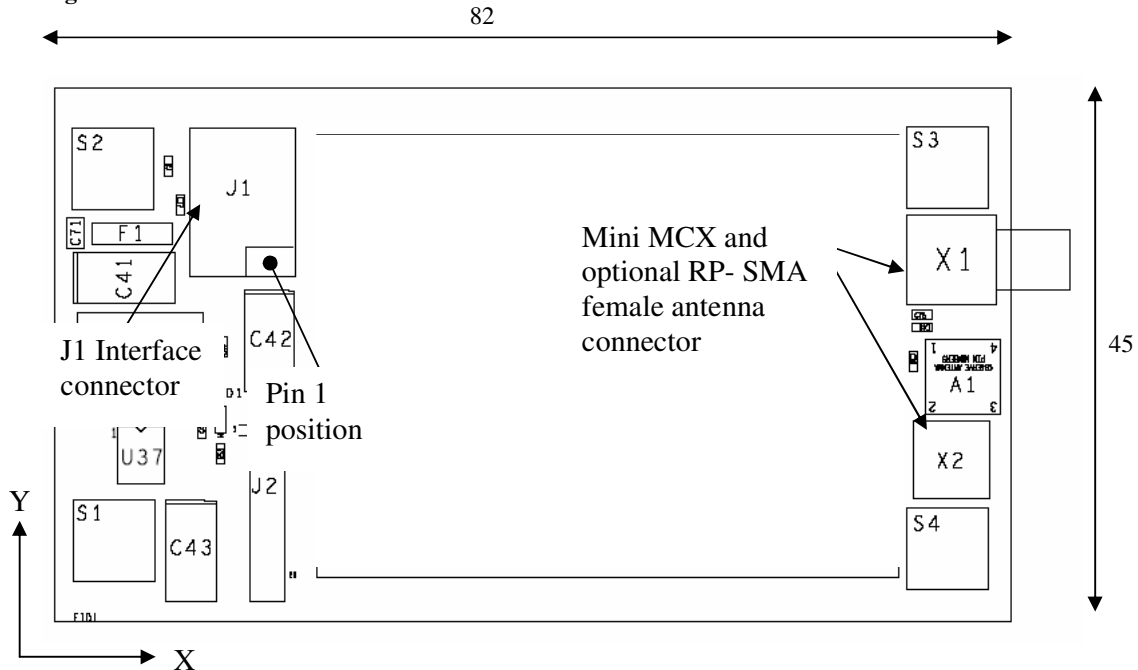**Figure 2 Connector on the W-DMX.**

Figure 3 W-DMX board layout and dimensions (units in mm).

The W-DMX OEM TRX has 4 3,2mm screw holes in every corner (S1-S4). These are located at coordinates according to Table 1.

Screw #	X (mm)	Y (mm)
S1	7,0	5,1
S2	5,0	39,0
S3	76,6	39,1
S4	76,7	6,3

Table 1 Screw hole positions

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J1 pin configuration is found below.

Do not supply DC 5V on pin 6 and DC to pin 8 simultaneously. The W-DMX may be permanently damaged.

Pin 9 and 10 should be left open and may not be connected.

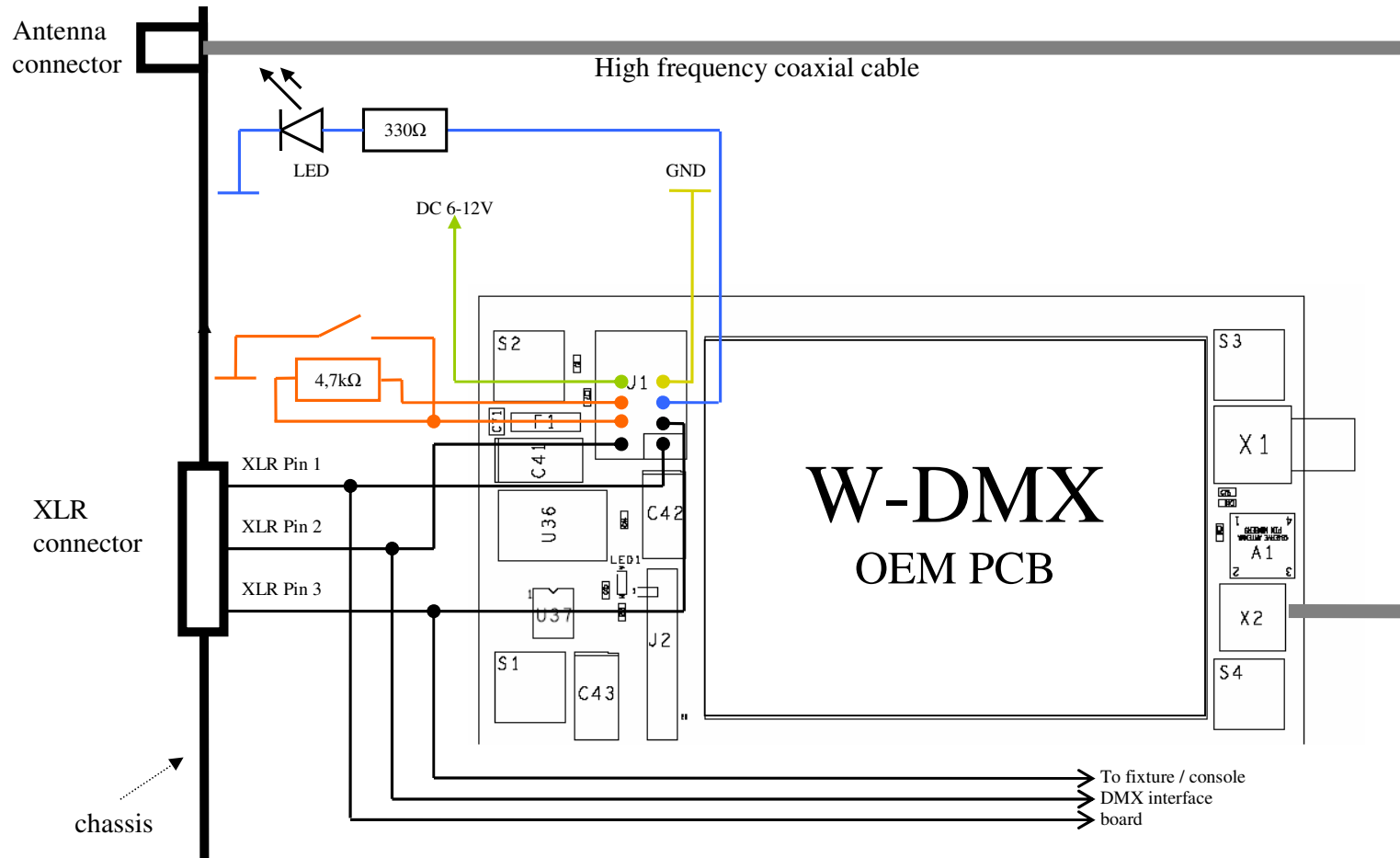| Pin no	Pin function
1	DMX link common (DMX GND)
2	DMX data – (primary complementary)
3	DMX data + (primary true)
4	Function switch
5	Signal LED pin
6	DC input 5±0,2V
7	GND
8	DC (+6↔+14V)
9	No Connect (reserved)
10	No Connect (reserved)

Table 2 W-DMX connector J1

W-DMX is easily controlled by a single function switch and the status of the radio link can be indicated by a LED connected to J1 pin5.

0V is the same as "red LED" and 5V the same as "green LED".

The function switch is connected to J1 pin4 and ground. For proper operation pin 4 should have a pull up resistor, recommended value 4,7kΩ.

Function	
Transmitter "node scan"	toggle pin to 100mS<0V<3s "short push"
Transmitter "node(s) log off"	toggle pin to 0V>3s "long push"
Receiver "log off"	toggle pin to 0V>3s "long push"
Idle	5V pull up 4,7kΩ

wireless solution

3.2 Typical Operating Circuit

Antenna connector

High frequency coaxial cable

LED

330Ω

GND

DC 6-12V

4,7kΩ

S 2

J 1

C 1   F 1

C 4 1

XLR connector

XLR Pin 1

XLR Pin 2

XLR Pin 3

U 36

C 4 2

LED1

U 37

J 2

S 1

C 4 3

S 3

X 1

A 1

X 2

S 4

W-DMX
OEM PCB

To fixture / console
DMX interface
board

chassis

4 Integrating W-DMX TRX to an existing menu system

The function switch is mandatory for proper operation of the TRX. Below is a description how to integrate the function switch into an existing menu system as an alternative to an electro mechanical switch.
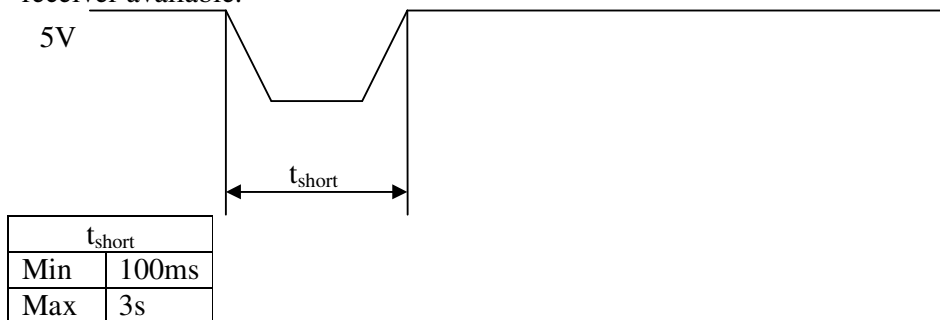
4.1 Hardware and electrical requirements

The function switch may be replaced by a software switch. J1 pin 4 (MMI-input) and may be interfaced directly with an MCU or similar. Timing requirements for the MMI-input are listed below. The MMI-input accepts standard TTL levels.

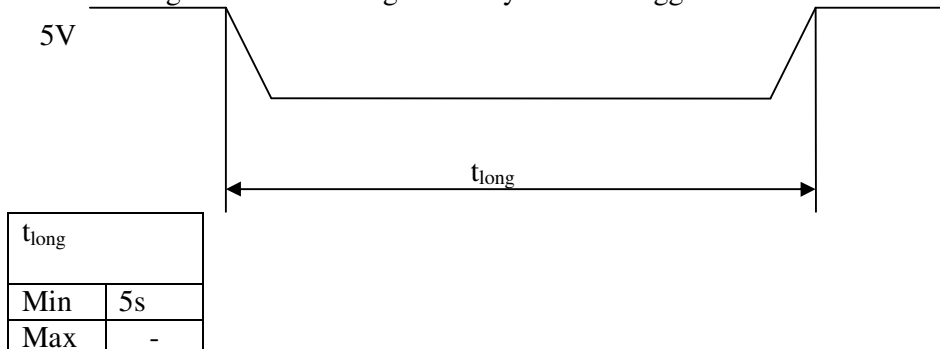| J1 pin 4 input digital input levels		
	Min	Max
High	2.0V	5.0V
Low	0V	0.8V

4.1.1 TRX TX node scan timing requirements

When the node scan function is enabled, the transmitter (TX) will try to synchronize any free receiver available.
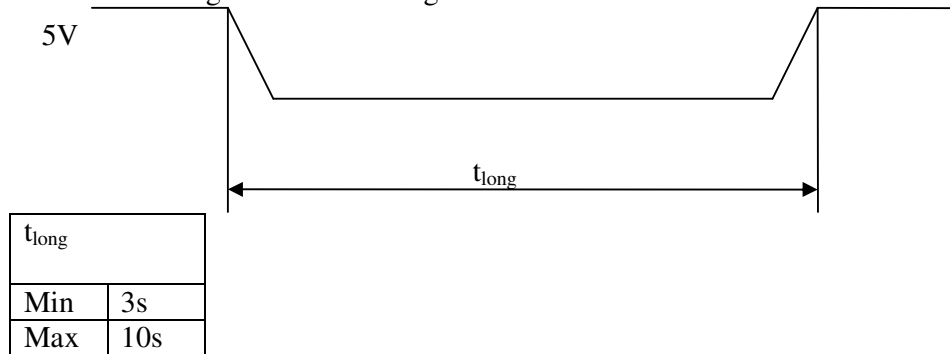

t_{short}	
Min	100ms
Max	3s

4.1.2 TRX TX node log of timing requirements

The node log off mode will log out every receiver logged into the transmitter.

t_{long}	
Min	5s
Max	-

4.1.3 TRX RX log of timing requirements

The receiver log off mode will log out the actual receiver from the transmitter.

5V

t_{long}

t_{long}	
Min	3s
Max	10s

5 Electrical specification

Parameter	Min.	Typ.	Max.	Unit
Operating conditions,				
5V DC (pin 6) and DC input (pin 8) must not be connected simultaneously.				
DC input voltage[1]	6		14	V
5V DC input[2]	4.9	5.0	5.1	V
Average current consumption		300	400	mA
Operating Temperature	-20		50	°C
DMX interface				
Maximum number of units on the DMX bus		32		
Maximum datarate[3]	250			kbps
ESD protection, human body model		±15		kV
RF characteristics				
Output Power	20		27	dBm
	100		500	mW
Frequency Range of operation	2405		2479	MHz
Channel bandwidth		1		MHz
Sensitivity at 0.1%BER		97		dBm
FSPL Link range with 5dBi external antenna[4]		3232		m
Range with standard 2dBi antenna (measured)[5]		500		m

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[1] When DC voltage applied the 5V DC input, pin 6, must not be connected.

[2] When 5V DC voltage applied the DC input, pin 8, must not be connected.

[3] Slewrate limited for minimum of EMI in unterminated networks.

[4] Standard external indoor antenna provided by Wireless Solutions AB.

[5] Measured in a typical city environment.

Appendix 1 Revision History

K1
Revision K1 is hardware compatible with revision F of the TRX. Revision K1 is based on revision K of this document.

- Introduction added
- Revision history added
- Table of contents added
- Minor changes in the text on page 4.

K2
Revision K2 is hardware compatible with revision F of the TRX. Revision K2 is based on revision K1 of this document.

- FCC statement added
- Industry Canada Compliance Statement added