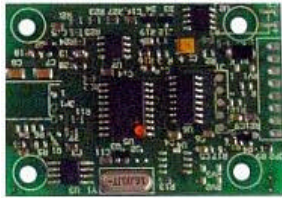
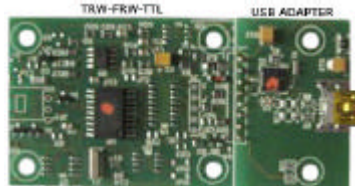




TR SERIAL TYPE TA ISO 11784/5 HDX



TR-PCB



TR-USB



TR-POCKET USB

1.0 DESCRIPTION

The TR is a Serial Tag Reader with **built-in Antenna**.

The frequency is set to 134,2Khz with **HDX** protocol.

INTERFACE OPTIONS:

TTL - RS485 - USB

This model permits to read:

Tag with the **STANDARD ISO 11784/5**.

The TR was developed for **TEXAS RI-TRP-RR3P-30** and **RI-TRP-WR3P-30** or other similar tags.

Can operate in Polling Mode (S) or Spontaneous mode (H).

TABLE 1

DESCRIPTION	N° BYTES	Usable BITS	MAX Value DECIMAL	MAX Value HEX
National Code	6	38	274.877.906.943	3FFFFFFFF
Country Code	2	10	999	3E7
Data Block	1	1	1	1
Reserved Code	2	14	16.383	0
Animal Flag	1	1	1	1
Extension	3	0	0	0

Example :

National Code	00-00-00-03-57-89 Dec	00-00-00-00-15-A8 Hex
Country Code	09-99 Dec	03-E7 Hex
Data Block	00 Dec	00 Hex
Reserved Code	00-00 Dec	00-00 Hex
Animal Flag	01 Dec	01 Hex
Extension	00-00-00 Dec	00-00-00 Hex

TRANSPONDERS SUPPORTED:

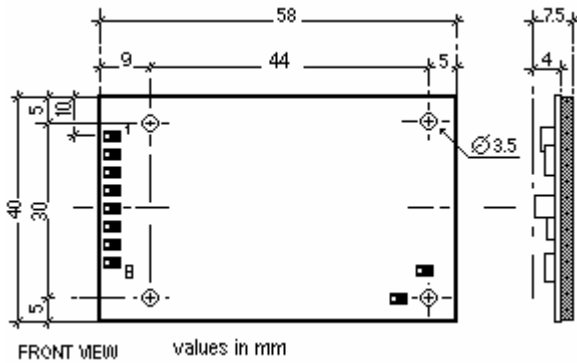
TEXAS Type RI-TRP-RR3P-30
TEXAS Type RI-TRP-WR3P-30

2.0 VERSIONS

TR-TTL-TAS-5	TTL interface. Polling mode.
TR-TTL-TAH-5	TTL interface. Spontaneous mode.
TR-485-TAS-12	RS485 interface. Polling mode.
TRW-USB-TAS-5	USB2.0 interface. Polling. Powered by USB connector.
TRW-USB-TAH-5	USB2.0 interface. Spontaneous. Powered by USB connector.

Glossary: **TA**= TAG Texas Animal HDX **S**= Polling mode **H**= Spontaneous mode **12/5**= Power supply

2.0 DIMENSION TR-TTL/485/



CONNECTION TR-TTL

The on-board connector is an 8 pin .1" soldering type.

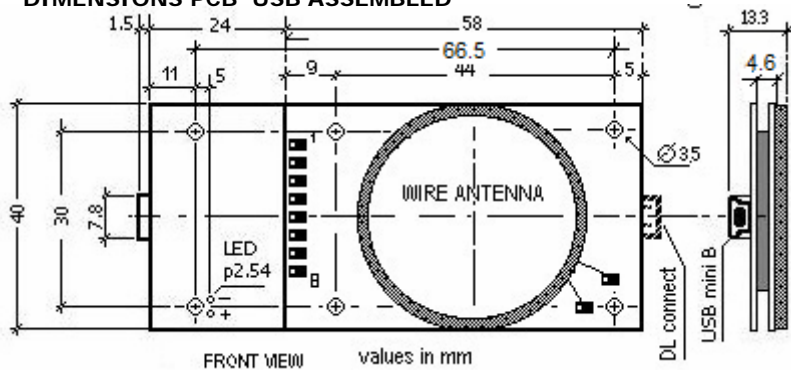
Pin Number	Description
1	+5VDC
2	GND
3	RX TTL input
4	TX TTL output
5	Spare TTL i/o
6	Spare TTL i/o
7	Out1 Open Collector output.
8	LED-OUT TTL output trough internal 1k?

CONNECTION TR-485

The on-board connector is an 8 pin .1" soldering type.

Pin Number	Description
1	+12VDC
2	GND
3	RS485-A
4	RS485-B
5	No Connect.
6	No Connect.
7	Out1 Open Collector output.
8	LED-OUT TTL output trough internal 1k?

DIMENSIONS PCB USB ASSEMBLED



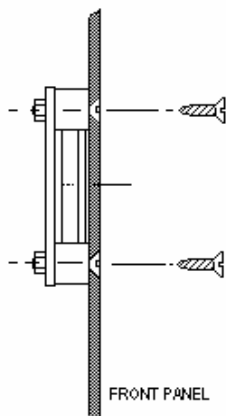
Pin Number	Description
1	+5VDC from PC
2	D+
3	D-
4	GND
LED	TTL out (internal 1k?)

2.2 INSTALL

Due to the Radio Frequency emissions of the Reader Antenna is important to avoid the usage of metal panels in front, rear and lateral sides of the Reader.

Although the TR provides an high resistance to EMC corruption, avoid to install it in high RF emission environments, the reading distance may result reduced.

Avoid to mount the external antenna on the TR board surface.



3.0 PROTOCOL

The standard protocols for the TR are:

- TAS** Polling Suitable for application where the Host continuously polls the TRW.
- TAH** Spontaneous Suitable for application point to point. The TR transmits data only when a TAG is really present.
The HOST normally works in receive mode and can operate on other task in absence of TAG.

The protocol FORMAT is described below.

STX Start of string synchronization code.
 DEVICE..... Is the Device Number. **For the TR-TTL is always 00H.**
 LENGTH..... Is the number of bytes following the LENGTH.
 Example: STX-DEVICE-LENGTH-FUNCTION-DATA0....DATA11-BCC
 The length is 14 DEC = 0D HEX.
 FUNCTION /STATUS..... Is the FUNCTION to be executed or the STATUS of an operation executed.
 DATA0 to DATA11..... Are the data exchanged.
 PASSW0 to PASSW3..... Is the Password code.
 BCC..... Is calculated as the XOR of all bytes from STX to last DATA included.
 Example: STX-DEVICE-LENGTH-STATUS-BCC ≠ 02H-00H-02H-01H-BCC
 where BCC= 01H.

3.1 PROTOCOL TAS (Polling)

3.1.1 COMMANDS from HOST to TRW

COMMAND #S : **SET DEVICE VALID ONLY FOR TR-485**

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	DATA0	BCC
HEX VALUE	02H	FFH	03H	See below	00H to 7CH	00H-FFH

FUNCTION **VALUE** **DESCRIPTION**
SET DEVICE **61H** The device number is set into the TR memory. Must be executed on any TR one-by-one before to install.
 In DATA0 insert the DEVICE NUMBER assigned to TR.

COMMAND#P : **POLL DATA**

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	FRB	N-BLOCKS	BCC
HEX VALUE	02H	00H	04H	See below	01H	06H	00H-FFH

FUNCTION **VALUE** **DESCRIPTION**
POLL DATA **04H** The Tag data are read in **HEX** format in **SHORT** or **LONG** as detected.
POLL DATA **06H** The Tag data are read in **DEC** format in **SHORT** or **LONG** as detected.

COMMAND #5: **TURN ON/TURN OFF** the OUT1 transistor.

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	BCC
HEX VALUE	02H	00H	02H	See below	00H-FFH

FUNCTION **VALUE** **DESCRIPTION**
TURN-ON **02H** The HOST send this Command to TURN-ON (closed) the OUT1 open collector.
TURN-OFF **01H** The HOST send this Command to TURN-OFF (open) the OUT1 open collector.

COMMAND#V : **READ VERSION**

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	BCC
HEX VALUE	02H	00-7CH	03H	See below	00H-FFH

FUNCTION **VALUE** **DESCRIPTION**
READ VERSION **76H** Read the actual firmware version of the module.

3.1.2 STRINGS from TRW to HOST

REPLY#0 : **READ**

DESCRIPTION	STX	DEVICE	LENGTH	STATUS	DATAn	BCC
HEX VALUE	02H	00H	11H	See below	00H to FFH	00H-FFH

FUNCTION **VALUE** **DESCRIPTION**
READ **04H** Data READ from the TAG are complete.
 In SHORT FRAME MODE DATAn is formed by 15 Data Bytes.

Data are send in this order:

Data 0	National Code	00-00-00-03-57-89 Dec	00-00-00-00-15-A8 Hex
Data 6	Country Code	09-99 Dec	03-E7 Hex
Data 8	Data Block	00 Dec	00 Hex
Data 9	Reserved Code	00-00 Dec	00-00 Hex
Data 11	Animal Flag	01 Dec	01 Hex
Data 12	Extension	00-00-00 Dec	00-00-00 Hex

REPLY#V : VERSION

DESCRIPTION	STX	DEVICE	LENGTH	VERSION (2 bytes)	BCC
HEX VALUE	02H	00-7CH	03H	MMH-RRH	00H-FFH

FUNCTION**DESCRIPTION****VERSION**

Show the actual version (MM=Model RR=Firmware release).

For this model the value **MM** is: TTL/RS232-XS=**2AH** TTL/RS232-XH=**2BH** RS485-XS=**2CH****REPLY#1 : STATUS**

DESCRIPTION	STX	DEVICE	LENGTH	STATUS	BCC
HEX VALUE	02H	00H	02H	See below	00H-FFH

FUNCTION**VALUE****DESCRIPTION****READ DATA ERR****01H**

The data detected on the TAG are corrupted or incomplete. RF noise environment detected.

NO TAG**02H**

The TRW has detected a no tag present during a COMMAND or POLLING sequence.

COMMAND OK**04H**

The command sent to TRW has been correctly executed.

COMMAND ERR**20H**

The command sent to TRW was not executed because a parameter out of limit on the string or a data error was detected on the TAG during a command execution

In the case the TRW detects a BCC error on the received string, don't exec the Command and don't transmit any Reply.

3.1.3 DATA FLOW TRW-TAS

The exchange of strings in a typical operation is described below. The HOST is considered as Master, the TRW as Slave.

HOST**NORMAL OPERATING MODE****TRW-TAS****READ SEQUENCE****POLL DATA**

====>

(poll time min 400ms)

<===

if OK

READ**POLL DATA**

====>

<===

if ERROR

STATUS**3.2 PROTOCOL TAH (Spontaneous)**

The TR operates in spontaneous mode; when the TAG enters the RF field and is correctly read, directly transmits readable data to the host.

3.2.1 STRINGS from SRW to HOST**REPLY#0 : READ**

DESCRIPTION	STX	DEVICE	LENGTH	STATUS	DATAn	BCC
HEX VALUE	02H	00H	11H	See below	00H to FFH	00H-FFH

FUNCTION**VALUE****DESCRIPTION****READ****04H**

Data READ from the TAG are complete.

In SHORT FRAME MODE DATAn is formed by 15 Data Bytes .

Data are send in this order:

Data 0 National Code**00-00-00-00-15-A8 Hex****Data 6 Country Code****03-E7 Hex****Data 8 Data Block****00 Hex****Data 9 Reserved Code****00-00 Hex****Data 11 Animal Flag****01 Hex****Data 12 Extension****00-00-00 Hex****REPLY#V : VERSION**

DESCRIPTION	STX	DEVICE	LENGTH	VERSION (2 bytes)	BCC
HEX VALUE	02H	00-7CH	03H	MMH-RRH	00H-FFH

FUNCTION**DESCRIPTION****VERSION**

Show the actual version (MM=Model RR=Firmware release).

For this model the value **MM** is: TTL/RS232-XS=**2AH** TTL/RS232-XH=**2BH** RS485-XS=**2CH****REPLY#1 : STATUS**

DESCRIPTION	STX	DEVICE	LENGTH	STATUS	BCC
HEX VALUE	02H	00H	02H	See below	00H-FFH

FUNCTION**VALUE****DESCRIPTION****READ DATA ERR****01H**

The data detected on the TAG are corrupted or incomplete. RF noise environment detected.

NO TAG**02H**

The TR has detected a no tag present during a COMMAND.

COMMAND OK**04H**

The command sent to TR has been correctly executed.

COMMAND ERR**20H**

The command sent to TR was not executed because a parameter out of limit on the string or a data error was detected on the TAG during a command execution

3.2.2 STRINGS from HOST to TRW

COMMAND#4 : ACK

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	BCC
HEX VALUE	02H	00H	02H	See below	00H-FFH

FUNCTION VALUE DESCRIPTION

ACK **10H** The HOST send this Command to the TRW to close any sequence. After the TR wait for a TAG extraction.

COMMAND #5: TURN ON/TURN OFF the OUT1 transistor.

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	BCC
HEX VALUE	02H	00H	02H	See below	00H-FFH

FUNCTION VALUE DESCRIPTION

TURN-ON **02H** The HOST send this Command to TURN-ON (closed) the OUT1 open collector.
TURN-OFF **01H** The HOST send this Command to TURN-OFF (open) the OUT1 open collector.

COMMAND#V : READ VERSION

DESCRIPTION	STX	DEVICE	LENGTH	FUNCTION	BCC
HEX VALUE	02H	00-7CH	03H	See below	00H-FFH

FUNCTION VALUE DESCRIPTION

READ VERSION **76H** Read the actual firmware version of the module.

In the case the TRW detects a BCC error on the received string, don't exec the Command and don't transmit any Reply.

3.2.3 DATA FLOW TR-TAH

The REPLY#0 function as a **trigger** to start a COMMAND sequence.

When a REPLY#0 is fully received, the HOST can send a COMMAND in a **time window** of 500 ms.

Over this time, if no command has been sent, the TR automatically repeat a READ DATA sequence till TAG extraction or a COMMAND receive, except for COMMAND#4.

If receive COMMAND#4 the TR close the sequence and wait for a TAG extraction.

The **time window** on TRW is **reloaded** at any reply during a COMMAND sequence, except for critical errors.

A typical data flow, in spontaneous mode, is described below.

HOST

READ DATA sequence

TR

Example: in case of bad reading

Exit.... wait new reply.....

<=== READ DATA-ERROR and/or NO-TAG
Repeat READ DATA sequence....

Example: a TAG placed into RF field is correctly read

<=== READ COMPLETE

Time window.....500ms.....

COMMAND sequence in time window

NO COMMAND ===>

Repeat READ DATA sequence

ACK ===>

Exit....wait new reply.....

Wait for TAG extraction....
Return to READ DATA sequence

TURN-ON/OFF ===> (max response time 150ms)

Exit.....or continue with commands.....

<=== COMMAND-OK
Time window reload.

ACK ===>

Exit....wait new reply.....

Wait for TAG extraction....
Repeat READ DATA sequence

4.0 OUT1

The Out1 is an Open Collector output driving a max. load of 80 ma at 12VDC.

It will goes ON/OFF with the COMMAND#5.

4.1 LED-OUT

The LED-OUT is a TTL output, active high, with a 1 k Ω internal series resistor suitable to drive an external LED connected to GND.

It will turn ON when a KEY/CARD is moved in the RF-Field and is correctly read.

It will turn OFF when the KEY/CARD is removed by the RF-Field.

5.0 TRW-USB-TAS/TAH-5 USB2.0 modules

Before any operation need to INSTALL the drivers.

1)Unzip the package "MCP2200 Windows Driver.zip"

2)Open the folder "Driver Installation Tool"

3)Open the folder "x64" for 64bit platforms or "x86" for 32bit platforms.

4)Launch the application "MCP2200DriverInstallationTool.exe".

5)Connect the TRW-USB device and follows the Microsoft instructions to complete the INSTALL on your platform.

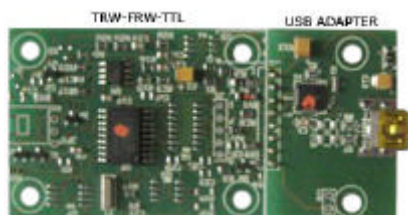
6)The install assign a COM PORT to your device. Now you can communicate on this PORT.

To connect the TRW-USB module use a cable of the desired length mounting the connectors:

USB 2.0 TYPE A PLUG (side HOST) and USB2.0 MINI TYPE B PLUG (side FRW)

The available models for order are:

TRW-USB-TAS/TAH-5 (PCB version) and TRW-USB-TAS/TAH-5-POCKET



TRW-USB-Version PCB



TRW-USB- Version POCKET

6.0 SPECIFICATIONS

OPERATING

Power Requirements	12 VDC ? 10% at max 55mA . 5 VDC ? 5% at max 50mA max ripple 10mV
Serial interface Data = 8bit Parity = none Stop = 1bit	TSA: BINARY asynchronous half duplex, polling-selecting protocol . THA: BINARY asynchronous half duplex, spontaneous protocol .
Baud Rate	9600 bits per second
Reading Distance (with TAG in center of RF field)	Depends on Tag Form

MECHANICAL

Dimensions	40mm x 58mm x 10 mm
Weight	Max 60g

ENVIRONMENTAL

Temperature	Operating Storage	-10°C to 60°C -30°C to 70°C
Humidity	Operating Storage	10% to 90% non condensing 0% to 95% non condensing

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