DOC. 114-R7

TR 485 MIDRANGE-HF

TYPE H

1.0 DESCRIPTION

- **Suitable for multipoint High Speed readings on Conveyor Belt .**

The TR is a Front Side Tag Reader with **built-in Antenna** :

- Continuous Tag reading and Code memorization.
- RS485 interface at 19200 baud
- Communication and RF TAG detection operate in multitask.

TRANSPONDERS SUPPORTED:

- UNIQUE
- Q5 (formatted UNIQUE)
- T5577 (formatted UNIQUE)

VERSION AVAILABLE
TR-485-SS-12-HF RS485 interface. Polling mode with FIFO. 32 device addressable.

Glossary: **TR**=Transponder reader **485**=RS485 interface **S**= UNIQUE format
S=Poll-Select mode **12**= Power Supply **H**= Midrange antenna **F**=FIFO version

2.0 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.
In this model the RF field is always on, therefore using more than one antenna make attention to mount them at a distance of at least 2mt one another to avoid mutual noise.

3.0 PROTOCOL

The standard protocols for the TR are:

S Polling-Selecting Suitable for application where the Host continuously polls the TR.

The protocol FORMAT is described below.

STX Start of string synchronization code.

DEVICE..... Is the Device Number

LENGTH..... Is the number of bytes following the LENGTH itself.

FUNCTION /STATUS..... Is the FUNCTION to be executed or the STATUS of an operation executed.

DATA0 to DATA4..... Are the data exchanged.

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 S

3.1.1 COMMANDS from HOST to TR

COMMAND #S : SET DEVICE

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 befor 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-7CH	04H	04H	01H	01H	02H

FUNCTION	VALUE	DESCRIPTION
POLL FIFO	04H	If the FIFO FLAG is set. The TR has detected a new TAG. The FIFO data are read and the FIFO FLAG reset.
POLL DATA	05H	Read immediate the Tag actually present in the RF field.
POLL R-FIFO	06H	If the FIFO FLAG is reset, read the actual value in FIFO.
POLL N-FIFO	07H	If the FIFO FLAG is set. The FIFO data are read and the FIFO FLAG remain set.
POLL ACK	10H	Only reset the FIFO FLAG.

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

3.1.2 STRINGS from TR to HOST

IN RS485 MODE THE DEVICE BIT7 IS ALWAYS SET TO 1. So the address 00H is 80H and the 7CH is FCH.

REPLY#0 : READ COMPLETE

DESCRIPTION	STX	DEVICE	LENGTH	STATUS	DATA0	..	DATA4	BCC
HEX VALUE	02H	00H-7CH	07H	See below	00H to FFH		00H to FFH	00H-FFH

FUNCTION	VALUE	DESCRIPTION
READ COMPLETE	04H	The data READ on **Antenna#1** from the TAG is complete.

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: RS485-XS-HF/MF=**0AH**

REPLY#1 : STATUS

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

FUNCTION	VALUE	DESCRIPTION
READ DATA ERR	41H	The data detected on Antenna#1 from the TAG are corrupted or incomplete. RF noise environment detected.
READ DATA ERR	81H	The data detected on Antenna#2 from the TAG are corrupted or incomplete. RF noise environment detected.
NO TAG	02H	The TR has detected a no tag present during a COMMAND or POLLING sequence.
COMMAND OK	04H	The command sent to TR has been correctly executed.
COMMAND ERR	20H	The command sent to TR was not executed.

3.1.3 DATA FLOW TR

This Version support a FIFO to permit the continuous read of the RF Field also if the device is not addressed.
When the reader detect a TAG Code **different** from the previous memorized:
1)Set the internal FIFO FLAG.
2)Write the new value in the FIFO memory.
3)Set the LED ON.
4)Set the OUT1 ON. This signal can be used by PLC digital input to immediate POLL the asking device. Saving time to read.

Different Poll Command are available:

POLL FIFO **04H** If the FIFO FLAG is **set**, the TR send a REPLY#0 containing the actual FIFO value. The FIFO FLAG is reset.
If the FIFO FLAG is **reset**, the TR send a REPLY#1 status NO TAG.

POLL R-FIFO **06H** If the FIFO FLAG is **reset**, the TR send a REPLY#0 containing the actual FIFO value.

POLL DATA **05H** Read immediate the Tag actually present in the RF field.

POLL N-FIFO **07H** If the FIFO FLAG is **set**, the TR send a REPLY#0 containing the actual FIFO value. The FIFO FLAG remain set.

POLL ACK **10H** Reset the FIFO FLAG.

HOST		TR
	NORMAL READ FIFO SEQUENCE	
POLL FIFO	===> Poll command	<=== If FIFO FLAG is SET, send REPLY#0 and Reset the FIFO.
POLL FIFO	===> Poll command	<=== If FIFO FLAG is RESET, send REPLY#1 (NO-TAG).
	If the HOST don't recognize the REPLY#0, send a recovery command :	
POLL R-FIFO	===> Poll Command	<=== REPLY#0 if FIFO FLAG is Reset.
	READ IMMEDIATE SEQUENCE	
POLL DATA	===> Poll immediate	<=== REPLY#0 if a TAG is actually detected.
POLL DATA	===> Poll immediate	<=== REPLY#1 NO-TAG if no TAG detected.

4.0 OUT1

The Out1 is an Open Collector output driving a max. load of 80 ma at 12VDC.
It will goes ON when a TAG code has been detected and memorized.

4.1 LED-OUT

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 TR-485-SS-12-HF

The TR module is a Medium Range serial reader inserted into a plastic housing.
It has the same electrical functions of the standard TR-485 and is particularly hardened for use in high noise environments.
A 6 wire 0,25mm cable connect all the signals. The cable length is 50cm.
The cable is positioned in the geometrical center of antenna.
The TR is protected against polarity inversion.
The antenna and the circuit are fully moulded to obtain a waterproof feature.
Led inserted in the plastic front.

TYPE H	**MECHANICAL**
Dimensions	178 x 70 x 15 mm
Weight	Tip 400g
Material	PVC GREY COLOR CLASS V0

OPERATING

Power Requirements	**12VDC +- 2% Stabilized current max. 85ma**
Serial interface **Data = 8bit Parity = none Stop = 1bit**	BINARY asynchronous half duplex
Speed	19200 bits per second
Reading Distance (with TAG in center of RF field)	UNIQUE disk 5cm : typ 215 mm

ENVIRONMENTAL

Temperature	Operating Storage	-15°C to 60°C -30°C to 70°C
Protection	Operating	Fully waterproof IP66

TR-232-H

CABLE PIN FUNCTION

COLOR	**485**
WHITE	+12VDC
BROWN	GND
YELLOW	RS485-A
GREEN	RS485-B
GREY	GND
PINK	OUT1

INOUT RFID srl Via Milano,14/H 20064-Gorgonzola (Italy)
Phone:+39 02.95138.139 **Fax:**+39 02.95.158.694
Email: info@inoutsrl.it Web: www.inoutsrl.it