TS-HRW38 Ethernet / USB HID / RS232

1. General:

The TS-HRW38 is a reader / programmer module with integrated antenna for communication with contactless integrated circuit cards.
It is designed for using ISO15693, ISO 14443-3, Mifare Ultralight, Mifare Classic 1K and Mifare Classic 4K Transponders, all operating at 13,56MHz.

Data transmission between the TS-HRW38 module and the host computer takes place according the commands of

"GiS Programming Interface (SDK) for TS-HRW devices".

2. Description:

The device is available in different variants. Depending on your needs it can be ordered as automatic reading device (TS-HR38), as programmer device (TS-HW38) to modify contents of transponders or as composite device (TS-HRW38) with both functions activated.
See also **Section 6. Starting up** for more information about the usage of the device and controlling software.

2.1. Power Supply

The power supply depends on the interface used at the device.
If the USB Interface is used, power can be supplied by the 5V provided by the USB Bus.
If Ethernet or RS232 Interface is used, power is supplied by external 5V power supply.

2.2. Interface

The device uses a USB full speed interface 12MBit with hot plug support respectively a Ethernet interface with 10/100 MBit or RS232 interface at 19200 Baud.

2.3. Contactless Transceiver

The MF RC632 handles the transceiver functionality for ISO15693 and ISO14443 communication at 13.56 MHz. Modulation is ASK with 0/100% (Type A).

2.4. Microcontroller

The microcontroller is a 8bit AT90USB1287. Is uses 128KB Flash, 8KB RAM and 4KB E²Prom. It controls the MF RC632 via External memory interface and contains the USB interface and the RS232 serial interface. When equipped with Ethernet interface, it controls the XPort via serial interface. In order to avoid malfunction an external reset circuit is used.

2.5. Ethernet controller

The XPort embedded device server handles the Ethernet connectivity and communicates through serial port with the AT90USB1287.

2.6. Oscillator

There are two oscillators on board. 8 MHz for AT90USB1287 and 13.56 MHz for MF RC632. Frequency stability is both better than 100ppm.

2.7. Antenna

The antenna is designed as film PCB magnetic antenna placed inside the housing. It is driven by the MF RC632 and matched to 50 Ohm using coils, resistors and capacitors.

2.8. Parts delivered

TS-HR38 reader module
This installation manual
5 V Power supply (only with Ethernet or RS232 interface)

2.9. FCC Statement

This device 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.

Section 15.21 Information to user

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

Section 15.105 (b)

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 interferences in a residential installation. This equipment generate, 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 ill 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 to correct the interference by one or more of the following measures:

- Reorient or relocate 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.

3. Technical data:

Size:	80 * 80 * 28 mm
Reading distance:	up to 100 mm (depending on the size of transponder)
Operating temperature:	-10°C to 55°C
Power supply:	through USB Port or 5 V DC at Ethernet or RS232
Interface:	Ethernet, USB HID, RS232
Types of transponder:	13,56MHz, ISO15693 compatible, ISO14443-3 compatible, Mifare Ultralight, Mifare Classic 1K und Mifare Classic 4K Transponder

4. Connector layout RS232:

9 pin Sub-D female connector

Pin 1: not connected	Pin 4: not connected	Pin 7: not connected
Pin 2: TxD Device	Pin 5: GND RS232	Pin 8: not connected
Pin 3: RxD Device	Pin 6: not connected	Pin 9: not connected

5. Buzzer operation (optional extension):

If there is a buzzer present, in mode of operation "MODE 0" the buzzer can be activated for 250ms by sending the "BELL" "07h" character through the interface to the device.

6. Starting up:

The actual software for these devices is available on our homepage at http://www.gis-net.de,
in the part RFID-Technique, menu Software.

When using as automatic reader (TS-HR38) the device can be configured using "GiS TS-HRW ReaderSetup":
Load the "GiS TS-HRW ReaderSetup" installation file and extract it to a folder of your choose. The installation of the software is started by double clicking the "GiS TS-HRW ReaderSetup".

As standard application to program and read tags (TS-HW38) the "GiS TS-HRW Programmer" is available.
Load the "GiS TS-HRW Programmer" installation file and extract it to a folder of your choose. The installation of the software is started by double clicking the "GiS TS-HRW Programmer.exe".

Hint:
For this device no additional driver from GiS has to be installed!

If the USB HID Interface is used, the standard driver from the windows operating system is used and this is normally preinstalled.

For the Configuration of the Ethernet interface, please see the user's manual (pdf file) of the used GiS Software.