

EMBEDDED HF RFID READER M890 SERIES

APPLICATIONS

- Handhelds | Terminals
- Vending Machines
- Ticketing Systems
- Payment Systems
- Access Control
- E-Charging
- Point-of-Care

FEATURES

- Adopts ARM MCU Solution
- TTL | USB VCP | USB HID | RS232 | RS485 | PC/SC
- SMD Assembly Possible
- 3.3 ~ 5 V Power Supply

RFID OPTIONS

- ISO 14443 A/B
- ISO 14443-4
- ISO 15693
- NXP MIFARE®
- ISO 18092 / ECMA-340 (NFC)
- ISO 18000-3

PRODUCT DESCRIPTION

The iDTRONIC embedded RFID reader M890 series is a high performance reader series. Thanks to its tiny size and single-face laying components layout, it allows for embedding in various applications and devices.

With its cutting edge microcontroller and latest HF transceiver technology, the reader series allows users to read and write almost any 13.56 MHz transponders. 5 different configurations are available which support the common RFID standards such as ISO 14443A/B (T=CL), ISO 14443-4, ISO 15693 and ISO 18092 / ECMA-340 (NFC), ISO 18000-3.

The embedded RFID reader M890 series features one external antenna port. iDTRONIC Professional RFID offers a wide choice of antennas suitable for any purpose. It achieves reading ranges of up to 8 cm (depending on type of transponder).

The Module M890 is available with TTL, USB VCP, USB HID, RS232/485 and PC/SC interface. In low power mode, the M890 consumes less than 1 mA.

iDTRONIC's hardware comes with a useful SDK for the development of controller, Linux or Windows based applications. Beside the documentation, command protocols and source codes, the SDK includes a Windows based demo application with full functionality over all supported HF RFID standards.

APPLICATION EXAMPLES

ACCESS CONTROL



Due to its small dimensions and its wide-range of interfaces, the M890 module can be installed in all kinds of existing systems, locks, locking systems or devices.

Applications for personal or hotel card identification require a system that can read DESFire or MIFARE cards. The embedded module M890 reads these cards reliably and securely. This increases security awareness against abusive and unauthorised access.

PAYMENT SYSTEMS



Payment systems are more and more to be found nowadays. In large company canteens, this type of payment processing is used for employees.

The M890 module can be optimally embedded in existing cashless readers oder devices.

The employee can identify himself by means of its DESFire chip card. With the PSAM function it is possible to pay by NFC directly.

This increases the effectiveness and efficiency of the procedures within the cash area of the canteen.

TECHNICAL DATA

ELECTRICAL SPECIFICATIONS

Power Supply	3.3 ~ 5 Vdc
Power Consumption	< 100 mA, standby current < 1 mA (low power mode)
Operating Frequency	13.56 MHz
Reading Distance	up to 8 cm*
Antenna	external*
Baudrate	9600 ... 115200 bit/s
Antenna Connector	U.FL
Interfaces	TTL, USB VCP, USB HID**, RS232/485, PC/SC
Connector	Molex PicoBlade 53261 (PCB) 51021 (cable)
PCB Connections	Soldering Pads (Suitable for SMD Production)

MECHANICAL SPECIFICATIONS

Material	FR-4, Blue
Mounting Options	Soldering

ENVIRONMENTAL CONDITIONS

Operating Temperature	-20 °C ... +80 °C
Storage Temperature	-40 °C ... +85 °C
Humidity	up to 95 %, non condensing
MTBF	200'000 h

SDK INFORMATION

Supported OS by Silabs USB VCP Driver	Windows 7/8/8.1/10 Windows Server 2003/7/8/8.1 Windows 2K WinCE (5.0, 6.0) Macintosh OSX Linux (4.x.x., 2.6.x) Android 4.2
Supported Languages	C++, Binary command protocol
Demo Software	Windows

APPLICABLE STANDARDS

EMC	EN 301489-1:2012-04 (v1.9.21) EN 301489-3:2013-12 (V1.6.1)
Radio Regulation	EN 300330-1:2015-08 (V1.8.1) EN 300330-2:2015-08 (V1.6.1)
Safety	EN 60950-1:2014-08 EN 62369-1:2010-03 EN 50364:2010-11
RED	2014/53/EU
RoHS 2	2011/65/EU
REACH	1907/2006
Certificates	FCC, CE, IC***

*READING DISTANCE DEPENDS ON TAG, ANTENNA AND ENVIRONMENTAL CONDITIONS

** HUMAN INTERFACE DEVICE

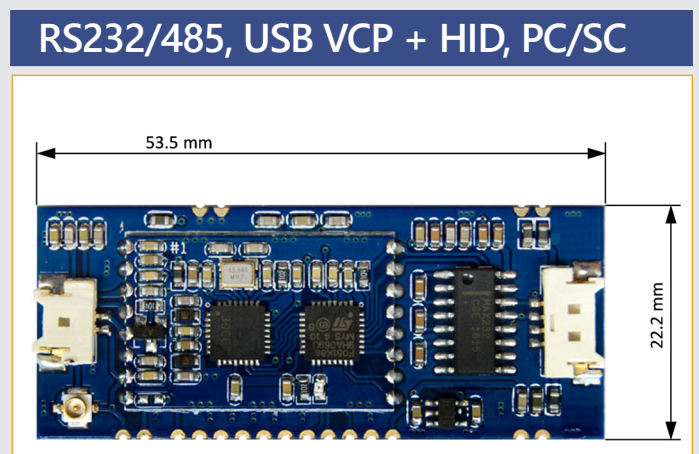
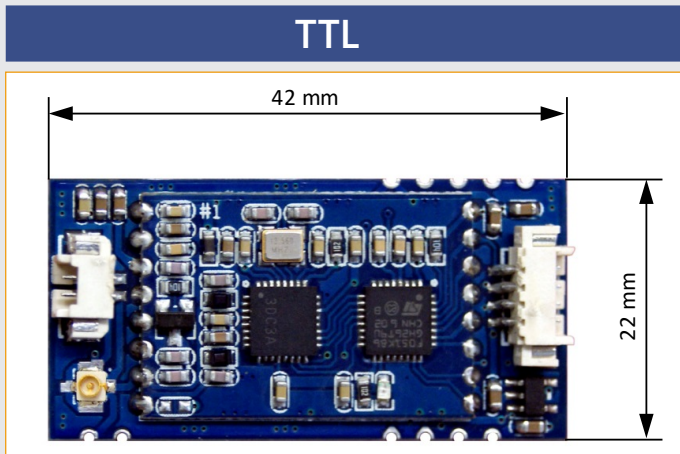
***ONLY AVAILABLE FOR SOME VERSIONS.

AVAILABLE VERSIONS

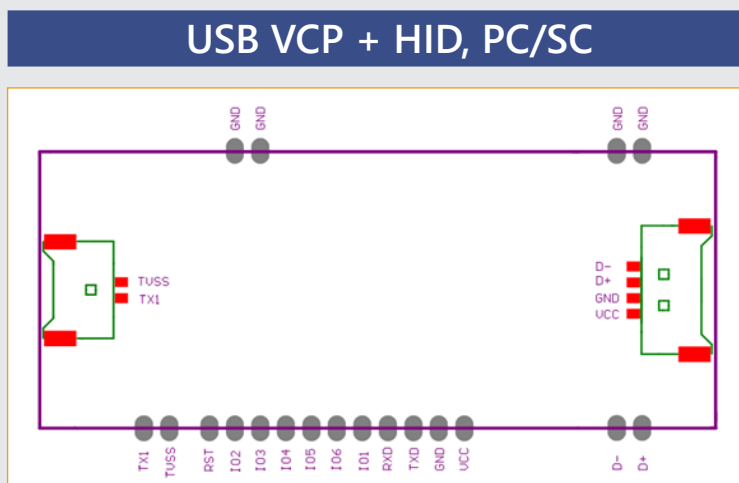
*READING DISTANCE DEPENDS ON TAG, ANTENNA AND ENVIRONMENTAL CONDITIONS
** HUMAN INTERFACE DEVICE

	DESFIRE	ISO 18000-3	PSAM	HF	MIFARE
GENERAL SPECIFICATIONS					
Dimensions	22 × 42 × 3 mm (TTL) 22 × 53 × 5 mm (USB, RS232)	22 × 42 × 3 mm (TTL) 22 × 53 × 5 mm (USB, RS232)	22 × 42 × 3 mm	22 × 42 × 3 mm (TTL) 22 × 53 × 5 mm (USB, RS232)	22 × 42 × 3 mm (TTL) 22 × 53 × 5 mm (USB, RS232)
Weight	6 g (TTL) 7 g (USB, RS232)	6 g (TTL) 7 g (USB, RS232)	6 g	6 g (TTL) 7 g (USB, RS232/485)	6 g (TTL) 7 g (USB, RS232)
Power Supply	3.3 V ~ 5 Vdc	3.3 V ~ 5 Vdc	3.3 V ~ 5 Vdc	3.3 V ~ 5 Vdc	3.3 ~ 5 Vdc
Power Consumption	< 100 mA, standby current < 1 mA (low power mode)	< 100 mA, standby current < 1 mA (low power mode)	< 100 mA, standby current < 1 mA (low power mode)	< 100 mA, standby current < 1 mA (low power mode)	< 100 mA, standby current < 1 mA (low power mode)
Operating Frequency	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz	13.56 MHz
Reading Distance	depending on external antenna*	depending on external antenna*	depending on external antenna*	depending on external antenna*	depending on external antenna*
RT FX Speed	up to 848 kBd	up to 848 kBd	up to 848 kBd	up to 848 kBd	up to 848 kBd
Reader IC	NXP CLRC663	NXP CLRC663	NXP CLRC663	NXP CLRC663	NXP CV520
Interface	TTL, USB VCP, USB HID**, RS232, PC/SC	TTL, USB VCP, USB HID**, RS232	TTL	TTL, USB VCP, RS232/485	TTL, USB VCP, RS232
Antenna	external*	external*	external*	external*	external*
Baudrate	9600 ... 115200 bit/s	9600 ... 115200 bit/s	9600 ... 115200 bit/s	9600 ... 115200 bit/s	9600 ... 115200 bit/s
Connector	Molex PicoBlade 53261 (PCB) 51021 (cable)	Molex PicoBlade 53261 (PCB) 51021 (cable)	Molex PicoBlade 53261 (PCB) 51021 (cable)	Molex PicoBlade 53261 (PCB) 51021 (cable)	Molex PicoBlade 53261 (PCB) 51021 (cable)
SUPPORTED STANDARDS TAGS					
ISO 14443A and compatible	Read/Write: MIFARE® Classic Mini / 1K /4K, MIFARE Ultralight®, MIFARE Ultralight® C, MIFARE Ultralight® Nano, MIFARE® DESFire® EV1, MIFARE® DESFire® Light, MIFARE® Smart MX, MIFARE® Plus S / X, MIFARE® Pro X, NTAG 21x, NTAG 424 Read UID only: Read UID only of all other ISO14443A RFID tags	Read/Write: MIFARE® Classic Mini / 1K /4K, MIFARE Ultralight®, MIFARE Ultralight® C, MIFARE® DESFire® EV1, MIFARE® Smart MX, MIFARE® Plus S / X, MIFARE® Pro X, NTAG 21x Read UID only of all other ISO14443A RFID tags	Read/Write: MIFARE® Classic 1K / 4K, MIFARE Ultralight®, MIFARE Ultralight® C, MIFARE® DESFire® EV1, MIFARE® Smart MX, MIFARE® Plus S / X, MIFARE® Pro X, NTAG 21x Read UID only: Read UID only of all other ISO14443A RFID tags	Read/Write: MIFARE® Classic 1K / 4K, MIFARE Ultralight®, MIFARE Ultralight® C, NTAG 21x Read UID only: Read UID only of all other ISO14443A RFID tags	Read/Write: MIFARE® Classic 1K / 4K, MIFARE Ultralight®, MIFARE Ultralight® C, NTAG 21x Read UID only: Read UID only of all other ISO14443A RFID tags
ISO 14443 B and compatible	SRI4K, SRIX4K, AT- 88RF020, 66CL160S, SR176	SRI4K, SRIX4K, AT- 88RF020, 66CL160S, SR176	SRI4K, SRIX4K, AT- 88RF020, 66CL160S, SR176	SRI4K, SRIX4K, AT- 88RF020, 66CL160S, SR176	–
ISO 15693 and compatible	EM4135, EM4043, EM4x33, EM4x35, I-Code SLI/SLIX/DNA, M24LR16/64, TI Tag-it HF-I, SRF55Vxx (my-d vicinity)	EM4135, EM4043, EM4x33, EM4x35, I-Code SLI / SLIX, M24LR16/64, TI Tag-it HF-I, SRF55Vxx (my-d vicinity)	EM4135, EM4043, EM4x33, EM4x35, I-Code SLI / SLIX, M24LR16/64, TI Tag-it HF-I, SRF55Vxx (my-d vicinity)	EM4135, EM4043, EM4x33, EM4x35, I-Code SLI / SLIX, M24LR16/64, TI Tag-it HF-I, SRF55Vxx (my-d vicinity)	–
ISO 7816	PSAM T = 1 (optional)	–	PSAM T = 1 (optional)	–	–
ISO 18000-3M3 and compatible	–	I-Code ILT-M	–	–	–

MECHANICAL VIEW



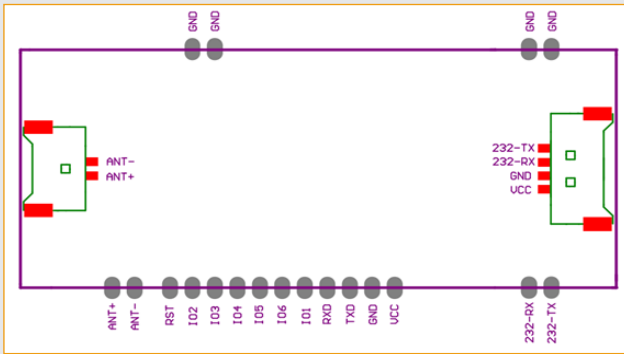
PIN LAYOUT



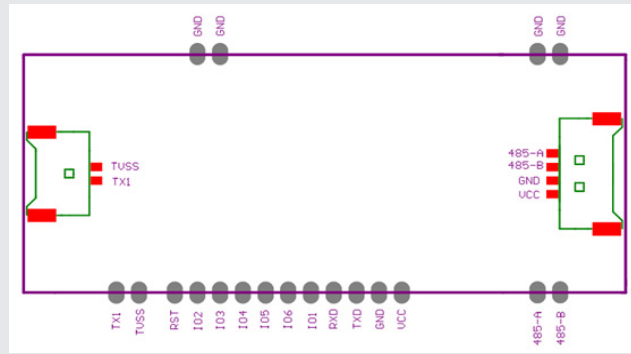
MOLEX CONNECTOR

SIGNAL	IO TYPE	DESCRIPTION
D-	Output	USB D-
D+	Input	USB D+
VCC	Power	DC 3.3 V ~ 5 V
GND	GND/Power	GND
TVSS	Output	External antenna
TX1	Output	External antenna

RS-232



RS-485



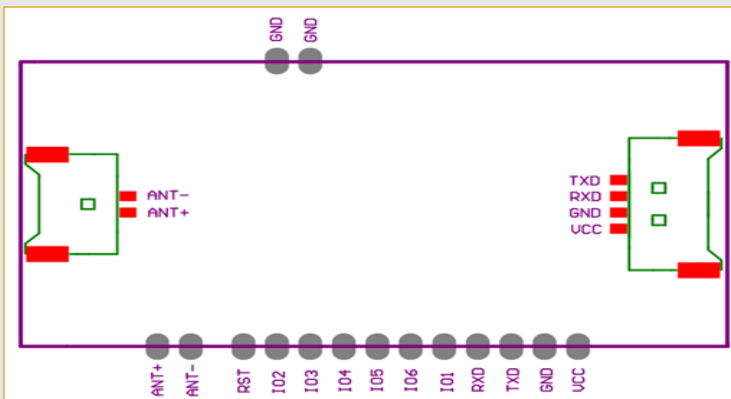
MOLEX CONNECTOR

SIGNAL	IO TYPE	DESCRIPTION
RS232-TX	Output	UART TX (RS232 Level)
RS232-RX	Input	UART RX (RS232 Level)
VCC	Power	DC 3.3 V ~ 5 V
GND	GND/Power	GND
ANT -	Output	External antenna
ANT +	Output	External antenna

MOLEX CONNECTOR

SIGNAL	IO TYPE	DESCRIPTION
RS485-A	Bus	UART A (RS485 Level)
RS485-B	Bus	UART B (RS485 Level)
VCC	Power	DC 3.3 V ~ 5 V
GND	GND/Power	GND
ANT -	Output	External antenna
ANT +	Output	External antenna

TTL



MOLEX CONNECTOR

SIGNAL	IO TYPE	DESCRIPTION
TXD	Output	UART TX (TTL Level)
RXD	Input	UART RX (TTL Level)
VCC	Power	DC 3.3 V ~ 5 V
GND	GND/Power	GND
ANT -	/	External antenna
ANT +	/	External antenna

CONNECTIONS

STAMP-HOLES			
SIGNAL	IO TYPE	DESCRIPTION	
ANT +	/	External antenna	
ANT -	/	External antenna	
RST	Input	Lower power reset	
IO2	Output	A group of IO used for control full color RGB Light	
IO3	Output		
IO4	Output		
IO5	Output	External LED	
IO6	Output	External LED	
IO1	Output	External Buzzer	
RXD	Input	UART RX (TTL Level)	
TXD	Output	UART TX (TTL Level)	
GND	GND/Power	GND	
VCC	Power	DC 3.3 V ~ 5 V	
USB	D-	Input	USB D-
	D+	Output	USB D+
RS232	RS232-RX	Input	UART RX (RS232 Level)
	RS232-TX	Output	UART TX (RS232 Level)
RS485	RS485-A	Bus	RS485 A
	RS485-B	Bus	RS485 B

ORDER CODES

VERSION	ORDER CODE
DESFIRE	
OEM DESFire Module TTL	OEM-DES-M890-TTL
OEM DESFire Module USB VCP	OEM-DES-M890-USB
OEM DESFire Module USB-HID	OEM-DES-M890-HID
OEM DESFire Module RS-232	OEM-DES-M890-RS232
OEM DESFire Module PC/SC	OEM-DES-M890-PCSC
PSAM	
OEM PSAM Module TTL	OEM-PSAM-M890-TTL
ISO 18000-3	
OEM ISO 18000-3 Module TTL	OEM-DES-M890-TTL-18/3
OEM ISO 18000-3 Module USB VCP	OEM-DES-M890-USB-18/3
OEM ISO 18000-3 Module USB HID	OEM-DES-M890-USB-HID-18/3
OEM ISO 18000-3 Module RS-232	OEM-DES-M890-RS232-18/3
HF	
OEM HF Module TTL	OEM-HF-M890-TTL

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