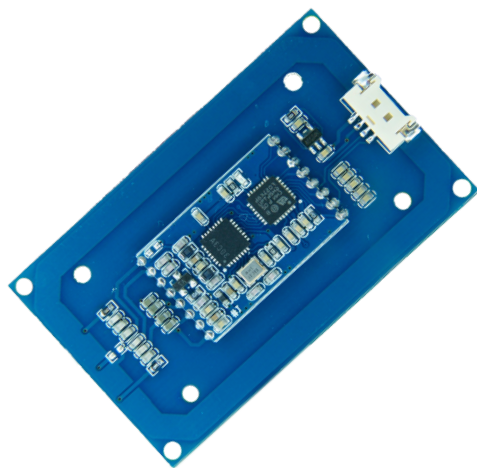


## HF | NFC EMBEDDED READER R835



### PRODUCT DESCRIPTION

The Soltronic HF | NFC Embedded Reader R835 series is a high performance and low-cost reader series for the integration into vending machines, healthcare, medicine or EV chargers. 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 ISO14443A/B (T=CL), ISO15693, ISO18092 / ECMA-340 (NFC) and ISO 18000-3.

Thanks to its integrated antenna, the HF | NFC Embedded Reader R835 achieves reading ranges of up to 8 cm (depending on type of transponder).

Its serial based interfaces TTL and RS485 allows an easy and fast integration into existing electronics or a fast paced new development of high end identification applications. In addition, the USB and USB HID is available with an PC/SC interface for payment solutions.

Soltronic'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.

#### ► APPLICATIONS

- Identification Products
- Vending Machines
- EV Chargers
- Healthcare
- Payment

#### ► FEATURES

- Reading Range up to 8 cm
- SDK and Windows based application are supplied
- Integrated Antenna
- TTL, RS485, USB, USB HID or PC/SC Connection

#### ► RFID OPTIONS

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

## APPLICATION EXAMPLES

### MEDICAL DEVICES



Inside the hospital room there are medical devices which are vital for the patient. These include ventilators, infusions or ECG devices. By integrating RFID readers, a wide variety of functionality may be implemented which help to increase patient safety and bring about a faster recovery.

These include, for example, automatic identification and authentication of consumables. On the other hand, it is possible to monitor which employee is operating the medical devices. Hierarchies may also be introduced for individual employees in order to avoid incorrect operation of the devices by medical personnel. The small embedded module may be easily and quickly integrated into a range of medical devices.

### EV CHARGERS



One of the essential technologies for public charging infrastructure is RFID. Operators can use it to control operators can use it to control charging approval and payment processes, and ensure that only authorized persons use the charging stations, and that charging processes are billed according to the defined conditions. For charging stations in rented or for charging stations in rented or company buildings, a charging release can be useful if the operator wants to ensure that only authorized persons use the charging facility. Furthermore, the question often arises as to whether and how the electricity is to be charged. With the integration of a suitable reader, such as the Embedded Reader R835 and the use of compatible RFID transponders transponders, such as charging cards or keyfobs, operators gain complete control and transparency over the use of their charging points.

## TECHNICAL DATA

### ELECTRICAL SPECIFICATIONS

|                     |                                                                                      |
|---------------------|--------------------------------------------------------------------------------------|
| Power Supply        | 3.3 ~ 5 Vdc                                                                          |
| Power Consumption   | < 150 mA, standby current<br>< 1 mA (low power mode)                                 |
| Operating Frequency | 13.56 MHz                                                                            |
| Reading Distance    | up to 8 cm*                                                                          |
| Antenna             | integrated, 55 × 30 mm                                                               |
| Baudrate            | 9600 ... 115200 bit/s                                                                |
| Antenna Connector   | U.FL                                                                                 |
| Interfaces          | TTL (3.3 V output levels, input is not 5 V tolerant)<br>RS485, USB, USB HID or PC/SC |
| Connector           | Molex PicoBlade 53261 (PCB) 51021 (cable)                                            |

### MECHANICAL SPECIFICATIONS

|                 |                    |
|-----------------|--------------------|
| Dimensions      | 58 × 34.5 × 4.5 mm |
| Weight          | 8 g                |
| Material        | FR-4, Blue         |
| Mounting Option | Screwing           |

### ENVIRONMENTAL CONDITIONS

|                     |                            |
|---------------------|----------------------------|
| Operat. 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        | Windows 7, 8, 8.1, 10        |
| Supported Languages | C++, Binary command protocol |
| Demo Software       | Windows                      |

### APPLICABLE STANDARDS

|                  |                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------|
| EMC              | EN 301489-1:2012-04 (v1.9.21)<br>EN 301489-3:2013-12 (V1.6.1)                                               |
| Radio Regulation | EN 300330-1:2015-08 (V1.8.1)<br>EN 300330-2:2015-08 (V1.6.1)                                                |
| Safety           | EN 62369-1:2010-03<br>EN 50364:2010-11                                                                      |
| RED              | 2014/53/EU                                                                                                  |
| RoHS 2           | EC Guideline 2011/65/EU<br>and amendment 2015/863<br>EN 50581:2012 (valid till 2024-07-07)<br>EN 63000:2018 |
| REACH            | EU Guideline 1907/2006,<br>updated by 2020/171/EU                                                           |
| Certificates     | FCC, CE, IC**                                                                                               |

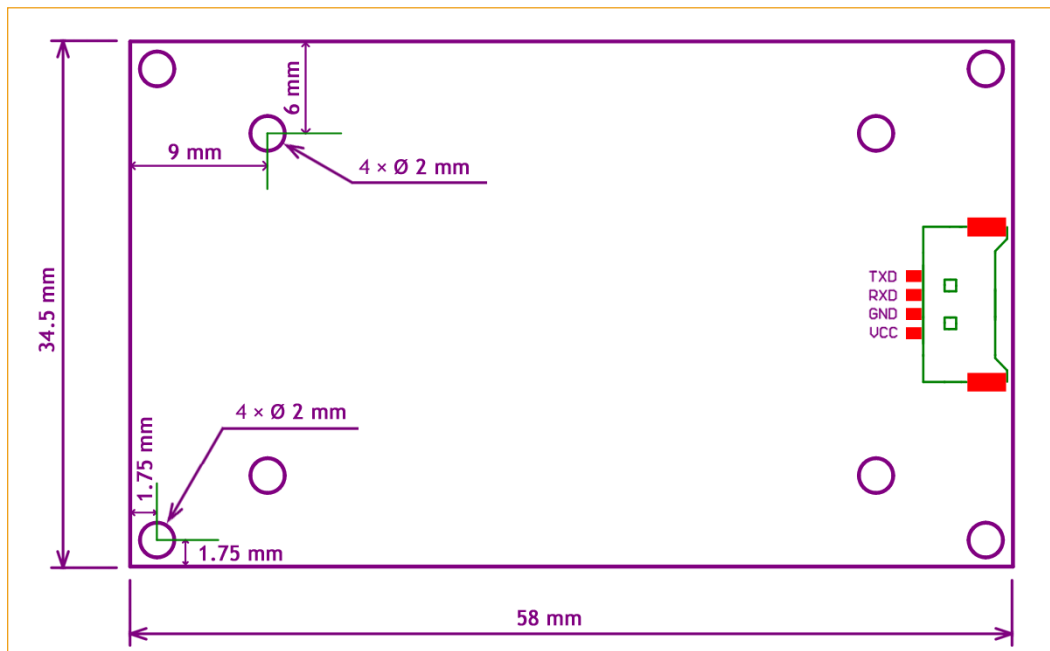
\*READING DISTANCE DEPENDS ON TAG, ANTENNA AND ENVIRONMENTAL CONDITIONS.

## AVAILABLE VERSIONS

\*READING DISTANCE DEPENDS ON TAG, ANTENNA AND ENVIRONMENTAL CONDITIONS.

|                                   | DESIRE                                                                                                                                                                                                                                                                                                                                                   | ISO 18000-3                                                                                                                                                                                                                                                         | PSAM                                                                                                                                                                                                                                                                         | HF                                                                                                                                                                           | MIFARE                                                                                                                                                                        |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GENERAL SPECIFICATIONS</b>     |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                              |                                                                                                                                                                              |                                                                                                                                                                               |
| Dimensions                        | 58 × 34.5 × 4.5 mm                                                                                                                                                                                                                                                                                                                                       | 58 × 34.5 × 4.5 mm                                                                                                                                                                                                                                                  | 58 × 34.5 × 4.5 mm                                                                                                                                                                                                                                                           | 58 × 34.5 × 4.5 mm                                                                                                                                                           | 58 × 34.5 × 4.5 mm                                                                                                                                                            |
| Weight                            | 8 g                                                                                                                                                                                                                                                                                                                                                      | 8 g                                                                                                                                                                                                                                                                 | 8 g                                                                                                                                                                                                                                                                          | 8 g                                                                                                                                                                          | 8 g                                                                                                                                                                           |
| Power Supply                      | 3.3 ~ 5 Vdc                                                                                                                                                                                                                                                                                                                                              | 3.3 ~ 5 Vdc                                                                                                                                                                                                                                                         | 3.3 V ~ 5 Vdc                                                                                                                                                                                                                                                                | 3.3 V ~ 5 Vdc                                                                                                                                                                | 3.3 ~ 5 Vdc                                                                                                                                                                   |
| Power Consumption                 | < 150 mA,<br>standby current<br>< 1 mA (low power<br>mode)                                                                                                                                                                                                                                                                                               | < 150 mA,<br>standby current<br>< 1 mA (low power<br>mode)                                                                                                                                                                                                          | < 150 mA,<br>standby current<br>< 1 mA (low power<br>mode)                                                                                                                                                                                                                   | < 150 mA,<br>standby current<br>< 1 mA (low power<br>mode)                                                                                                                   | < 150 mA,<br>standby current<br>< 1 mA (low power<br>mode)                                                                                                                    |
| Operating Frequency               | 13.56 MHz                                                                                                                                                                                                                                                                                                                                                | 13.56 MHz                                                                                                                                                                                                                                                           | 13.56 MHz                                                                                                                                                                                                                                                                    | 13.56 MHz                                                                                                                                                                    | 13.56 MHz                                                                                                                                                                     |
| Reading Distance                  | up to 8 cm*                                                                                                                                                                                                                                                                                                                                              | up to 8 cm*                                                                                                                                                                                                                                                         | up to 8 cm*                                                                                                                                                                                                                                                                  | up to 8 cm*                                                                                                                                                                  | up to 8 cm*                                                                                                                                                                   |
| 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                                                                                                                                                                     |
| Interfaces                        | TTL, RS485,<br>USB, PC/SC                                                                                                                                                                                                                                                                                                                                | TTL                                                                                                                                                                                                                                                                 | TTL                                                                                                                                                                                                                                                                          | TTL                                                                                                                                                                          | TTL                                                                                                                                                                           |
| Antenna                           | integrated, nominal<br>size: 55 × 30 mm                                                                                                                                                                                                                                                                                                                  | integrated, nominal<br>size: 55 × 30 mm                                                                                                                                                                                                                             | integrated, nominal<br>size: 55 × 30 mm                                                                                                                                                                                                                                      | integrated, nominal<br>size: 55 × 30 mm                                                                                                                                      | integrated, nominal<br>size: 55 × 30 mm                                                                                                                                       |
| 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<br>(PCB) 51021 (cable)                                                                                                                                                                                                                                                                                                             | Molex PicoBlade 53261<br>(PCB) 51021 (cable)                                                                                                                                                                                                                        | Molex PicoBlade 53261<br>(PCB) 51021 (cable)                                                                                                                                                                                                                                 | Molex PicoBlade 53261<br>(PCB) 51021 (cable)                                                                                                                                 | Molex PicoBlade 53261<br>(PCB) 51021 (cable)                                                                                                                                  |
| <b>SUPPORTED STANDARDS   TAGS</b> |                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                              |                                                                                                                                                                              |                                                                                                                                                                               |
| ISO 14443A<br>and compatible      | Read/Write:<br>MIFARE® Classic<br>Mini /1K /4K, MIFARE<br>Ultralight®, MIFARE<br>Ultralight® C, MIFA-<br>RE Ultralight® Nano,<br>MIFARE® DESFi-<br>re® EV1, MIFARE®<br>DESFire® Light,<br>MIFARE® Smart MX,<br>MIFARE® Plus S /<br>X, MIFARE® Pro X,<br>NTAG 21x, NTAG 424<br><br>Read UID only:<br>Read UID only of all<br>other ISO14443A<br>RFID tags | Read/Write:<br>MIFARE® Clas-<br>sic Mini / 1K /4K,<br>MIFARE Ultralight®,<br>MIFARE Ultralight®<br>C, MIFARE® DESFi-<br>re® EV1, MIFARE®<br>Smart MX, MIFARE®<br>Plus S / X, MIFARE®<br>Pro X, NTAG 21x<br><br>Read UID only of all<br>other ISO14443A<br>RFID tags | Read/Write:<br>MIFARE® Classic<br>1K /4K, MIFARE<br>Ultralight®, MIFARE<br>Ultralight® C, MIFA-<br>RE® DESFire® EV1,<br>MIFARE® Smart MX,<br>MIFARE® Plus S /<br>X, MIFARE® Pro X,<br>NTAG 21x<br><br>Read UID only:<br>Read UID only of all<br>other ISO14443A<br>RFID tags | Read/Write:<br>MIFARE® Classic<br>1K /4K, MIFARE<br>Ultralight®,<br>Ultralight® C,<br>NTAG 21x<br><br>Read UID only:<br>Read UID only of all<br>other ISO14443A<br>RFID tags | Read/Write:<br>MIFARE® Classic<br>1K /4K, MIFARE®<br>Ultralight®,<br>Ultralight® C,<br>NTAG 21x<br><br>Read UID only:<br>Read UID only of all<br>other ISO14443A<br>RFID tags |
| ISO 14443 B<br>and compatible     | SRI4K, SRIX4K, AT88RF020, 66CL160S, SR176                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                              |                                                                                                                                                                              | —                                                                                                                                                                             |
| ISO 15693<br>and compatible       | EM4135, EM4043, EM4x33, EM4x35, I-Code SLI/SLIX/DNA,<br>M24LR16/64, TI Tag-it HF-I, SRF55Vxx (my-d vicinity)                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                              |                                                                                                                                                                              | —                                                                                                                                                                             |
| ISO 7816                          | —                                                                                                                                                                                                                                                                                                                                                        | —                                                                                                                                                                                                                                                                   | PSAM T=1                                                                                                                                                                                                                                                                     | —                                                                                                                                                                            | —                                                                                                                                                                             |
| ISO 18000-3M3<br>and compatible   | —                                                                                                                                                                                                                                                                                                                                                        | I-Code ILT-M                                                                                                                                                                                                                                                        | —                                                                                                                                                                                                                                                                            | —                                                                                                                                                                            | —                                                                                                                                                                             |

## PIN LAYOUT



| PIN | SIGNAL      | IO TYPE | DESCRIPTION                          |
|-----|-------------|---------|--------------------------------------|
| 1   | Data        | Output  | UART TxD (yellow) up to 3.3 V, USB - |
| 2   | Data        | Input   | UART RxD (green) up to 3.3 V, USB +  |
| 3   | GND         | PWR     | Power supply GND (black)             |
| 4   | +5 V/+3.3 V | PWR     | Power supply +5 or 3.3 VDC (red)     |

## ORDER CODES

| VERSIONS                                                | ORDER CODES          |
|---------------------------------------------------------|----------------------|
| <b>DESFire</b>                                          |                      |
| HF   NFC Embedded Reader R835 - DESFire TTL             | OEM-DES-R835-TTL     |
| HF   NFC Embedded Reader R835 - DESFire RS485           | OEM-DES-R835-RS485   |
| HF   NFC Embedded Reader R835 - DESFire USB             | OEM-DES-R835-USB     |
| HF   NFC Embedded Reader R835 - DESFire USB HID         | OEM-DES-R835-USB-HID |
| HF   NFC Embedded Reader R835 - DESFire PC/SC           | OEM-DES-R835-PCSC    |
| <b>ACCESSORIES</b>                                      |                      |
| HF   NFC Embedded Reader R835 - Connecting Cable M8     | OEM-HF-M8-CC         |
| HF   NFC Embedded Reader R835 - Converter TTL   USB 5 V | OEM-HF-M8-CONV-5V    |