

RFID compendium

Table of Contents

1	CONTACTLESS IDENTIFICATION FOR 125 KHZ	3
1.1	TRANSPONDERS FOR 125 KHZ RFID.....	3
1.1.1	<i>Transponders for personal identification and access control.....</i>	3
1.1.2	<i>Transponders for food and animal identification.....</i>	5
1.1.3	<i>Transponders for industrial identification.....</i>	6
1.2	CHIPS FOR 125 KHZ TRANSPONDERS.....	9
1.2.1	<i>H4102 (UNIQUE).....</i>	9
1.2.2	<i>Q5.....</i>	9
1.2.3	<i>H4150 (Titan).....</i>	10
1.2.4	<i>HITAG 1.....</i>	10
1.2.5	<i>HITAG 2.....</i>	11
1.2.6	<i>HITAG S.....</i>	11
1.2.7	<i>H4105 – (Zodiac).....</i>	12
1.3	125 KHZ READERS.....	13
1.3.1	<i>Low cost Read Only Reader.....</i>	13
1.3.2	<i>Nano reader module (Multireader OEM module)</i>	14
1.3.3	<i>Nano reader module 3.3V (Multireader OEM module)</i>	14
1.3.4	<i>Multireader – plug & play R/W</i>	14
1.3.5	<i>Handheld reader</i>	15
1.3.6	<i>Desk reader.....</i>	16
1.3.7	<i>CF Card Reader 125 KHz.....</i>	17
1.3.8	<i>DSR100 – long range reader</i>	18
2	CONTACTLESS IDENTIFICATION FOR 13,56 MHZ.....	19
2.3	TRANSPONDERS FOR 13,56 MHZ RFID	19
2.3.1	<i>Cards.....</i>	19
2.4	<i>Chips for 13,56 MHz transponders.....</i>	19
2.4.1	<i>Mifare.....</i>	19
2.4.2	<i>I-Code</i>	20
2.5	<i>13,56 MHz Readers.....</i>	21
2.5.1	<i>Low Cost Plug & Play Read- and Writer Module.....</i>	21
2.5.2	<i>Desktop Reader 13,56 MHz</i>	22
2.5.3	<i>OEM Reader Modules (Mifare and others)</i>	23
2.5.4	<i>Plug&Play Reader Modules (Mifare and others)</i>	24
2.5.5	<i>HF Dual ISO OEM Module</i>	25
2.5.6	<i>HF Dual ISO Short Range USB Plug & Play Module</i>	26
2.5.7	<i>Access Control Door Reader</i>	27
2.5.8	<i>Mifare® All-in-One Stand-alone Access Control System</i>	29
2.5.9	<i>Mifare® Stand-alone Access Control System /Timexxx iiiTime iiiTime Attendance.....</i>	30
2.5.10	<i>CF Card Reader 13,56 MHz.....</i>	31
2.5.11	<i>High Speed Dual ISO Short Range USB Plug & Pay Module</i>	32
3	LONG RANGE UHF READER SYSTEM	33
3.3.1	<i>868 / 915MHz Reader UHF-R-01</i>	33
4	LONG RANGE ACTIVE READER SYSTEM TELIDES FOR 5,8 GHZ	33
4.3.1	<i>Telides.....</i>	33
5	RUGGED HANDHELD RECON	35
6	TYPICAL RFID APPLICATIONS	37

1 Contactless identification for 125 kHz

1.1 Transponders for 125 kHz RFID

1.1.1 Transponders for personal identification and access control

ISO Cards

The contactless Elatec ISO Cards are passive transponders in ISO Card shape that communicate with a reader via Radio Frequency. The dimensions and tolerances are in accordance with the ISO norm 7816- I, type ID- I. The power needed by the card is supplied by an electromagnetic field induced by the reader onto the card's internal coil. Inside the ISO Card the AC voltage is rectified in order to provide a DC internal supply voltage.

The contactless Elatec ISO Card is available with different ICs in an ISO Card shape that communicates with a reader via Radio Frequency.

Features:

- SRF : 125KHz +/- 6 KHz
- produced with different ICs (read only or read write)
- good reading distance : 15 to 150 cm (depending on the reader and antenna design)
- with or without different types of Mag.Stripe
- material used is PVC : both sides white/white finish
- perfect print with thermal transfer printers or offset printing technologies for personalization
- client specific contact chip module can be embedded



CLAMSHELL Cards

The Elatec Clamshell card is a lower cost RFID card solution compared to the more sophisticated ISO card. It is highly resistant against mechanical stress. Printing possibilities are limited. The Elatec Clamshell card provides an excellent reading distance compared to market standards. The Elatec Clamshell card is predominantly used in Access Control and some Ticket applications.



Features:

- length and width comparable to ISO card
- thickness : 1.5 mm = approx. 60 mil
- 50 mm round coil for excellent reading performance
- SRF : 125 KHz +/- 6 kHz

Tear Shape,

Elatec offers a wide variety of RFID key holder and wristband Tag. Different colors and chips are available for your application. Those RFID products can be used for access control, security identification or prepayment in recreation area for example.

Features:

- Width 31mm, length 40mm, thickness 4.8mm
- Polycarbonate material
- Colours: black, red and blue (upon request for HT1, HT2, Q5)
- IP 67
- Operating temperature -25°C to 50°C
- Other shapes and colours on request



Wristband

The Wrist Band is a portable transponder, which can be used for every kind of access control in recreation areas, swimming pools etc.

Features:

- Dimension: 32x42mm, thickness 5mm, band length 250mm
- Material: ABS and water resistant perlon band
- IP67
- Operating temperature: -25 to 50°C
- Standard colour: black
others (red, yellow, green, blue, white) on request



BLUEYE KEYFOB, BOBSLEIGH KEYFOB

The contactless Keyfobs are available with different ICs in a translucent blue polycarbonate housing that communicates with a reader via Radio Frequency. One is called Bobsleigh and the other is called Blueeye.

Features:

- SRF : 125KHz
- produced with different ICs (read only or read write)
- good reading distance : 5 to 30cm (depending on the reader design)
- material used is a blue polycarbonate
- perfect printability by pad printing
- IP 67



1.1.2 Transponders for food and animal identification

Glass TAG

We offer a wide range of glass tags from a very small tube of diameter 2.12 mm and of length 8 mm up to a diameter of 4 mm and length of 34 mm. This allows us to have a full spectrum of products so that everyone can find the suitable size and performance for his application.

Features:

- Outside diameter of 2.12 mm with a length of 8 mm or 12 mm
- ISO 11784 / 11785 compliant
- Outside diameter of 4 mm and a length of 34 mm for a reading range > 80cm
- Different chips available including the new read/write IC S5555



Button TAG

This product is developed for those system integrators who would be able to find the stud part (male part) and finally offer the complete system to the end users. This product is IDEA certified which guarantees a minimum performance level (80cm read range can easily be achieved).

Features:

- I.D.E.A. certificate No. JRC/082/IDEA/2000
- Reading range >80cm
- ISO 11784 / 11785 compliant
- Suitable for use with existing studs
- Available in different colours



Bolus

Thanks to Elatec's know how this product is a new packaging solution offered for animal tagging. The so called bolus is placed in the animal reticulum and therefore only works for ruminants. This product is IDEA certified which guarantees a minimum performance level (80cm read range can easily be achieved).

Features:

- Cattle size:
 - I.D.E.A. certificate No. JRC/071/IDEA/99
 - Ø 21mm, Length 58mm
- Sheep size available
- Reading range > 80 cm
- Al₂O₃ ceramic based



PET

Thanks to a very careful packaging process, a maximum thickness of as low as 0.7mm can be guaranteed for this product. The material used is PET and therefore is suitable for most pharmaceutical, medical and food application.

Features :

- Disc shape made of PET-G, this product is available in different diameters
- Thickness down to 0.5 mm is possible
- Different chips can be integrated in this product



Pigeon Ring

Being the oldest supplier of RFID rings for pigeon contest, we are still at the front of the technology for this product type. Introducing a new chip in 1999 already and finalizing it in 2000 we have now one of the most modern ring at the most competitive price.

Features:

- Used for pigeon races by the German pigeon association (Verband Deutscher Brieftaubenzüchter E.V.)
- Available in black or dark blue
- Read only or read/write chips with fully configurable memory map are available
- Custom layout available



1.1.3 Transponders for industrial identification

Disc-TAG

Elatec's Disc-TAG is a product from our portfolio with a very good price / performance ratio that can fulfil most of the requirements found in industrial and logistics application. The Disc TAGs are available in 3 sizes and with all the different chips from our portfolio. The Disc TAGs have been world wide successfully implemented in applications such as waste management, pallets identification, warehouse, process control and a lot more.

Features:

- 3 diameters - 20, 30 and 50mm
- Centred hole for the 30 and 50mm disc
- Polycarbonate housing
- IP 67
- Operating temperature -25 to +70°C



Glass TAG

Elatec offers a wide range of small Industrial Glass TAGs with different sizes and chips. Glass TAGs are suitable for many applications where a small size, chemical or humidity resistance is required.

Features:

- 3 sizes:
 - 3.15 x 13.3mm
 - 2.12 x 12mm
 - 2.12 x 8mm
- Glass
- IP68
- Operating temperature: -40 to +85°C



Clear Disc

Elatec's Clear DISCs are a family of passive contactless transponders. Due to their design, material and easy handling the Clear DISCs are ideal for integrating into your individual package designs or can be used as a directly attached identification device.

This product can be used for example:

- As part of your individual package design
- For warehouse stock control and logistics
- In asset management
- For identification of pharmaceutical bottles...



Features:

- Diameters: 20mm, 30mm and 50mm
- Thickness: 0.6mm
- Polyethylen & Polyester (outside)
- Operating temperature: -20 to +60°C

Logi TAG 160/120

The Logi TAGs 160 and 120 are small transponders with high mechanical, chemical and temperature resistance. They are suitable for many logistics applications in harsh environment or if a good performance size / reading distance is requested.

Features Logi Tag 160:

- Diameter 16mm, thickness 3mm
- Material Epoxy overmolded
- IP68
- Peak temperature up to 220°C (time limitation)
- Specific version on request



Features Logi Tag 120:

- Diameter 12.4mm, thickness 2mm
- Material PPS and Epoxy
- IP68
- Peak temperature up to 160°C (time limitation)

Volcano TAG

Elatec's Volcano TAGs are passive transponders especially designed for applications and processes where high temperature is found. Volcano 370 is the strongest heat temperature shock resistance passive RFID TAG. Thanks to its special packaging made of LCP material, the Volcano 370 can withstands up to 300° few minutes and most of the solvents and acids used in the industry. Volcano 230 is a small epoxy disc that withstands up to 200°.

Features Volcano 370:

- Diameter 68mm, Thickness 11.5mm, centred hole 5.2mm
- Material LCP, ultrasonic welded
- IP 67
- Storage temperature -40°C up to 160°C
- Peak temperature up to 300°C (time limited)



Features Volcano 230:

- Diameter 26mm, thickness 4mm, centred hole 4.5mm
- Epoxy overmolded
- IP 68
- Storage temperature -25°C up to 150°
- Peak temperature up to 200°C (time limited)

Disc Epoxy

Disc Epoxy is a very thin transponder, which resists high axial and radial compression. The Disc Epoxy is available in 3 different sizes for a perfect fit within your applications such as : parcel identification, supply chain management, identification of containers, any area where traceability is required.

Features:

- 3 diameters: 20, 30 and 50mm, thickness 1mm
- Material: laminated epoxy, reinforced with glass fiber
- IP66
- Operating temperature: -20 to +85°C



Nail TAG

Nail TAGs are robust transponders, which can be nailed into any type of wood, such as trees, pallets...

Features:

- Length: 35mm, diameter 4mm
- Material: polyamid with glass fiber
- IP67
- Operating temperature: -25 to 85°C



1.2 Chips for 125 kHz transponders

1.2.1 H4102 (UNIQUE)

125kHz RFID IC - Read Only 64 bits

Features:

- 64 bits Read Only memory
- Typical operating frequency : 125kHz
- Contactless power supply, very low power
- Several options of data rate and coding type (during device manufacturing)
Data Rate : 2, 4 or 8kbaud
Modulation type : Manchester, Biphase or PSK
Standard Sokymat configuration : Manchester, 2kbaud
- Guaranty of the unicity of the codes
- Special Customer ID codes on request

1.2.2 Q5

125 kHz RFID IC - Read/Write 264 bits

Features:

- 256 bits EEPROM memory, 8 words of 32 bits (*224bits user memory*), OTP function
- Typical operating frequency : 125kHz
- Contactless power supply, very low power ($I_{read}=2\mu A$, $I_{write}=25\mu A$)
- Several options of data rate and coding type (*option selected by the user*)
Data Rate : 1 to 62kbaud
Modulation type : FSK (*2 different*), Manchester, Biphase, PSK (*3 different*) or NRZ
Standard Sokymat configuration : Manchester, 2kbaud (*Unique code like*)
- Operating Mode:
Max block feature : define the number of readable blocks
Password Mode : allows reading one word after password check
Direct Access Mode : allows reading one word without check of password

Answer On Request : modulation of transponder in the field on Request only
Modulation Defeat : command to stop modulation of transponder in the field
Inverse data output : inverse the data stream
Fast write method : allows division of the programming time by 2
Write protection : command to lock the words independently from one another

1.2.3 H4150 (Titan)

125 kHz RFID IC - Read/Write 1k bit

Features:

- 1k bit EEPROM memory organized in 32 words of 32 bits (*928bits of user memory*)
- 64 bits Laser Rom, guarantees unicity of the device
- Typical operating frequency : 125kHz
- Contactless power supply, very low power ($I_{read}=3\mu A$, $I_{write}=40\mu A$)
- Manchester encoding
- Data rate options : 2 or 4 kBd (*option selected during device manufacturing*)
- Standard Sokymat configuration : Manchester, 2kBd
- Security features :
 - Password of 32 bits
 - User defined Read Memory area at power On
 - User defined Write inhibited Memory area
 - User defined Read protected Memory area

1.2.4 HITAG 1

125kHz RFID IC - Read-Write 2k bits

Features:

- 2k bits EEPROM memory, 16 blocks of 4 pages each, 1 page include 32 bits
- 32 bits unique factory programmed serial number
- Typical operating frequency : 125kHz
- Contactless power supply, very low power ($I_{read}=9\mu A_{max}$, $I_{write}=25\mu A_{max}$)
- Manchester encoding type, data rate : 4 kBd
- Memory area write protection
- Anticollision protocol
- Mutual Authentication
- Encrypted data communication

1.2.5 HITAG 2

125kHz RFID IC - Read-Write 256 bytes

Features:

- 256 bits EEPROM memory organized in 8 pages of 32 bits each
- 32 bits unique factory programmed serial number
- Typical operating frequency : 125kHz
- Contactless power supply, very low power ($I_{read}=7\mu A_{max}$, $I_{write}=20\mu A_{max}$)
- Manchester or Biphase encoding type, data rate : 2 or 4 kBd
- Different operating mode :
 Crypto Mode : encrypted data communication
 Password Mode : Password check before writing or reading data
 Public Mode A : Emulate Read Only 64 bit Manchester, 4kBd device
 Public Mode B : ISO compatible to the norm 11784/785
 Public Mode C : Emulate the Philips family PIT PCF7930/31

Selection Guide			
Features	HITAG S32	HITAG S256	HITAG S2048
Memory Size	32 Bit unique identification number	256 Bit	2048 Bit
Anticollision	Yes	Yes	Yes
Encrypted Authentication	No	Yes	Yes
Compatibility to HITAG 1	Yes	Yes	Yes
Compatibility to HITAG 2	Yes, with firmware upgrade	Yes, with firmware upgrade	Yes, with firmware upgrade
ISO Animal Standard	No	Yes	Yes
German Waste Management Standard	No	Yes	Yes
Pigeon Race Standard	No	Yes	Yes

1.2.6 HITAG S

The revolutionary HITAG-S ICs are targeted at the high volume livestock tracking and food safety market. Significantly reducing the cost of RFID tags, HITAG-S is offered with either 32 Bit, 256 Bit or 2048 Bit memory.

Features:

- Three memory options (32 Bit UID, 256 Bit, 2048 Bit)
- More than 100 000 erase/write cycles
- 10 years non-volatile data retention
- Frequency range 100-140 kHz
- CRC data integrity check
- Data Rates (Tag to Reader): 2.0kbits/s, 4.0kbits/s, 8.0kbits/s
- Data Rate (Reader to Tag): 5.2kbits/s
- Secure Memory Lock functionality
- 32 Bit Unique Identification Number (UID)
- 48 bit secret key based encrypted authentication

1.2.7 H4105 – (Zodiac)

134KHz, ISO 11'784 / 11'785 compliant read only contactless identification device. The H4005 is a CMOS integrated circuit intended for use in electronic Read Only RF Transponders. The circuit is powered by an external coil placed in an electromagnetic field, and gets its master clock from the same field via one of the coil terminals. The other coil terminal is affected by the modulator. By turning on and off the modulation current, the chip will send back the 128 bits of information contained in a factory pre-programmed memory array. Due to the low power consumption of the logic core, no supply buffer capacitor is required. Only an external coil is needed to obtain the chip function. A parallel resonance capacitor of 75 pF is also integrated.

Features:

1. 128 bit memory array laser programmable
2. Bit duration : 32 periods of RF field
3. Bit coding according to ISO FDX-B
4. On chip resonance capacitor
5. On chip supply buffer capacitor
6. Wide dynamic range
7. On chip voltage limiter
8. Full wave rectifier
9. Large modulation depth
10. Operating frequency 100 - 150 kHz
11. Very small chip size convenient for implantation
12. Very low power cons

1.3 125 kHz Readers

1.3.1 Low cost Read Only Reader

Elatec offers easy to integrate, low cost read only readers. They are available in three different sizes and read ranges. Both the AXA012 and AXA020 are equipped with internal antennas, and have read range of 12 cm and 15 cm, respectively. With an external antenna, the AXA002 can achieve read ranges of up to 15 cm. All three readers support ASCII and Wiegand 26 data format.

Features:

AXA002 (ID-2)

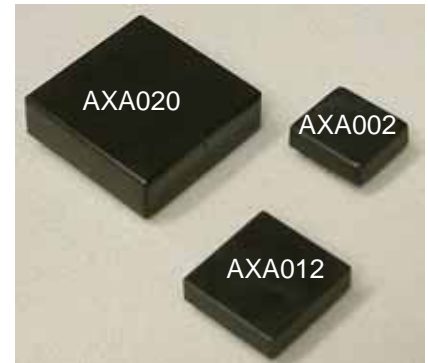
- Read range: N/A (depending on external antenna)
- Size : 21 mm x 19 mm x 6 mm
- Frequency : 125 kHz
- Card format: EM 4100 or compatible (Unique)
- Encoding: Manchester 64-bit, modules 64
- Output data format: ASCII, WIEGAND 26
- Power Requirement: +5V @ 13mA
- Voltage Supply Range: +4.5 to 5.5 V
- Tags supported: Read only

AXA012 (ID-12)

- Read range: 12 cm (depending on transponder size and type)
- Size : 26 mm x 25 mm x 7 mm
- Frequency : 125 kHz
- Card format: EM 4100 or compatible (Unique)
- Encoding: Manchester 64-bit, modules 64
- Output data format: ASCII, WIEGAND 26
- Power Requirement: +5V @ 30mA
- I/O Output Current: 75 mA
- Voltage Supply Range: +4.5 to 5.5 V
- Tags supported: Read only

AXA020 (ID-20)

- Read range: 15 cm (depending on transponder size and type)
- Size : 40 mm x 40 mm x 9 mm
- Frequency : 125 kHz
- Card format: EM 4100 or compatible (Unique)
- Encoding: Manchester 64-bit, modules 64
- Output data format: ASCII, WIEGAND 26
- Power Requirement: +5V @ 55mA
- Voltage Supply Range: +4.5 to 5.5 V
- Tags supported: Read only

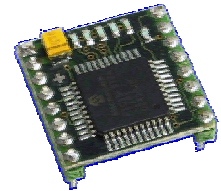


1.3.2 Nano reader module (Multireader OEM module)

Elatec's nano reader module is designed for integration into machines, handheld computer or any other device. Especially the focus is set on Size, price and flexibility. Thanks to it's compact dimensions a integration directly on a PC board is possible. Unique features are 5 (five) free configurable ports (to be configured as input or output), die possibility of external triggering and the quantity of different types of transponders that can be read with this reader.

Features:

- Frequency: 125 KHz +/- 0,5%
- Dimensions: 20,3 * 20,3 * 5,4 mm
- Power supply: +5V DC +/- 5%
- Temperature range: -20°....+60°C (-4 F....140 F)
- Antenna: to be connected externally (490µH)
- Transponders supported: EM4102, UNIQUE, EM4105, ZODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Ordering info: AXA050



1.3.3 Nano reader module 3.3V (Multireader OEM module)

Elatec's nano reader module is designed for integration into machines, handheld computer or any other device. Especially the focus is set on size, price and flexibility.

Thanks to it's compact dimensions a integration directly on a PC board is possible.

Unique features are 5 (five) free configurable ports (to be configured as input or output), die possibility of external triggering and the quantity of different types of transponders that can be read with this reader.

Features:

- Frequency: 125 KHz +/- 0,5%
- Dimensions: 20,3 * 20,3 * 5,4 mm
- Power supply: +3,3V DC +/- 5%
- Temperature range: -20°....+60°C (-4 F....140 F)
- Antenna: to be connected externally (490µH)
- Transponders supported: EM4102, UNIQUE, EM4105, ZODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Ordering info: AXA033

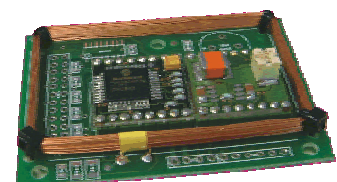


1.3.4 Multireader – plug & play R/W

The Multi-tag Reader module is ideal, if flexibility, size and price are important. Due to the modular concept, different sizes, antennas (air coil or stick) and interfaces are possible at relative low cost. The reader module is designed for integration into machines, terminals, handheld computers and others.

Features Multireader Aircoil:

- Frequency: 125 KHz +/- 0,5%
- Dimensions: 65 x 47 x 6 mm (with air coil)
- Power supply: +8....12V DC (RS232 version)
+5V +/- 5% (USB version)



- Current consumption: Standby:15mA
Operating: 50mA
- Temperature range: -20°....+60°C (-4 F....140 F)
- Read / write distance: Proximity
- Antenna: Aircoil approx. 58 * 37mm
- Transponders supported: EM4102, UNIQUE, EM4105, ZOODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Ordering info: AXA200 (RS232 – version)
AXA500 (USB – version)

Features Multireader Ferrit Coil

- Frequency: 125 KHz +/- 0,5%
- Dimensions: 56 x 25 x 29 mm
- Power supply: +8....12V DC (RS232 version)
+5V +/- 5% (USB version)
- Current consumption: Standby:15mA
Operating: 50mA
- Temperature range: -20°....+60°C (-4 F....140 F)
- Read / write distance: Proximity
- Antenna: Ferrit stick approx. 21 * 9 mm
- Transponders supported: EM4102, UNIQUE, EM4105, ZOODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5
- Ordering info: AXA250 (RS232 – version)
AXA550 (USB – version)



1.3.5 Handheld reader

The hand reader is designed for connection to any terminal. It comes in a compact housing is easy to connect and provides an easy to implement protocol.
Possible applications are: tool ID, data acquisitions, time attendance, access control...

Features:

- Housing: Polystyrol (UL 94 HB)
- Color: Gray-white or black
- dimensions (L x W x H): 96 x 47 x 24 mm
- Protection: Up to IP 65
(with optional seal kit)
- Power supply: +8-12V DC (RS232 version)
+5V +/- 5% (USB version)
- Current consumption: approx. 60mA max
- Temperature range: -20°C to +50°C (-4 F to 122 F)
- Antenna: Integrated ferrite stick
- Read-/Write distance: Proximity
- Transponders supported: EM4102, UNIQUE, EM4105, ZOODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Options: Wall holder
- Ordering info: AHL330 (RS232 version)
AHL410 (USB version)



1.3.6 Desk reader

The Desk reader is designed for connection to PCs. Possible applications are: tool ID, data acquisitions, time attendance, access control...

Features:

- Housing ABS
- Color Gray-white
- dimensions (L x W x H) 127 x 115 x 44 mm
- Power supply USB
- Current consumption approx. 60mA max
- Temperature range -20°C to +60°C
- Antenna: Aircoil
- Read-/Write distance Proximity
- Transponders supported: EM4102, EM4105, EM4150, TITAN, Q5, HITAG1, HITAG2 HITAG-S
- Ordering info: AHL575



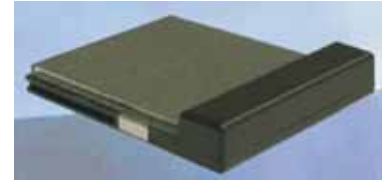
1.3.7 CF Card Reader 125 KHz

Elatec's CF Card Reader is a integrated reader for 125KHz transponders. It combines state of the art technology in a small housing. Antenna is completely integrated. Rapid application development drivers for Windows and Windows CE are provided with the module.

Reading distance depending on size, type and orientation of transponder. Many types of transponders are supported at the same time within the same module.

Features:

- Housing: CF card Type II
- Frequency: 125 KHz
- Dimensions (L x W x H) 52 * 42,5 * 9 mm
- Current input
HF field off: 15mA
HF field on: max 75mA
- Temperature range -20°....+60°C (-4 F....140 F)
- Antenna: Integrated air coil
- Read- / write distance Proximity, up to 10cm
- Transponders supported: EM4102, UNIQUE, EM4105, ZOODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Technical certificates: CE
- Weight: approx. 25g
- Ordering info: AHL810



1.3.8 DSR100 – long range reader

Long range read/write 125 kHz with Digital Signal Processing

Features:

- Housing: Aluminum
- Dimension (LxWxH): 222 * 145 * 78 mm
- Frequency: 125 kHz, frequency by digital tuning changeable
- Antenna field: Auto tuning after power up and auto tune cycle during power
- Power Supply: 24V +/- 5%
- Operating mode: Standalone (500 ID's) or connected to server
- Temperature range: -20°....+60°C (-4 F....140 F)
- Tightness: IP65
- Interface: RS 232, USB available
RS 422, RS 485 in preparation
- Tags supported: EM4102, UNIQUE, EM4105, ZODIAC, HITAG1, HITAG2, HITAG-S, EM4150, TITAN, Q5.
- Ordering info: DSR101 (RS232 interface)
DSR106 (USB interface)
DSR111 (StarterKit with 40*40cm antenna, Test Software and drivers).



DSR100 application example with external antenna

2 Contactless identification for 13,56 MHz

2.3 Transponders for 13,56 MHz RFID

2.3.1 Cards

The contactless MIFARE 1 S50 smart card IC has been especially tailored to meet the requirements of a payment card which can be used for ticketing systems in public transport and comparable applications. MIFARE 1 S50 IC is a true multi-application smart card IC with the functionality of a processor realized with hardwired logic.

Multi-application memory

- 8 KBit EEPROM memory, no battery,
- Organized in securely separated 16 sectors supporting multi-application use.
- Each sector consists of 4 blocks.
- A block is the smallest part to be addressed and consists of 16 bytes.
- Each sector has its own secret file for a set of keys for systems using key hierarchies.
- Access to memory zones are flexible user definable by a variety of access conditions.
- Arithmetic capability: increase and decrease
- Data retention of 10 years.
- write endurance 100.000 cycles



2.4 Chips for 13,56 MHz transponders

2.4.1 Mifare

The contactless MIFARE®1 S50 smart card IC has been especially tailored to meet the requirements of a payment card which can be used for ticketing systems in public transport and comparable applications. MIFARE® 1 S50 IC is a true multi-application smart card IC with the functionality of a processor realized with hardwired logic. Special emphasis has been placed on user convenience, speed, reliability, security against fraud and cost effectiveness.

Features:

- Operating frequency: 13.56MHz
- High speed: Baud rate 106 kBaud
- Anti-collision: The ability to handle more than one card in the field at the same time.
- Operating distance: up to 100mm (depending on antenna geometry) to allow convenient and fast transaction
- Half duplex communication protocol using handshake
- Data integrity via contactless communication link by
 - Anti-collision
 - 16 Bit CRC per block
 - 16 Bit Parity per block (one per Byte)
 - Bit count checking

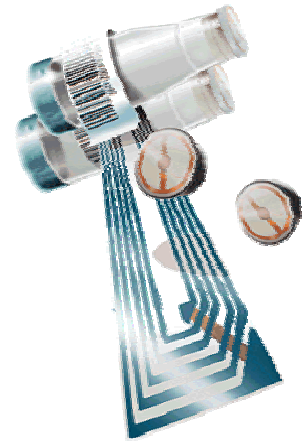
- Bit coding to distinguish between “1”, “0”, and no information
 - Channel monitoring (Protocol sequence and bit stream analysis)
- Multi-Card-operation supporting:
 - Anti-collision: allows the handling of more than one card in the field at the same time; inhibits accidental read or write and data corruption due to more than one card in the field
 - Dynamic read + write: during communication with one card other cards may enter or leave the RF field
 - Fast anti-collision protocol: an increase of only 1.0 ms of the total transaction time for each additional card

2.4.2 I-Code

Smart labeling is the latest RFID technology, combining the advantages of barcode, Electronic Article Surveillance (EAS) and traditional RFID solutions. Philips Semiconductors' I-CODE ICs represent the state-of-the-art in smart label technology, offering a low-cost, re-programmable and disposable solution for source tagging, automatic data capture, theft protection and data storage on a product or its packaging. I-CODE smart labels allow almost any item to be tagged for efficient handling.

I-CODE's highly automated item scanning process does not require line-of-sight and can scan multiple labels at the same time. I-CODE ICs can also store a digital signature, enabling proof of genuineness and preventing goods from being counterfeited.

I-CODE is the most advanced technology for smart labels. Developed in close cooperation with end users and system integration experts, it delivers the best price/performance ratio, making it ideal for mass markets with many millions of labels per application per year. With I-CODE, RFID technology is available for the first time at prices which can challenge bar-code in its key strongholds where bar code information is a limiting factor to the application.



2.5 13,56 MHz Readers

2.5.1 Low Cost Plug & Play Read- and Writer Module

Advantages

- The modules are designed for developers and integrators who need a small-sized reader module to fit in the existing products. The firmware can be changed to meet the customer's need.
- Two LED Indication Status, one Buzzer
- Auto answer mode: permanent reading and sending the ID number
- TCP/IP network version is available as option.
- Compact size, low cost, fast and easy system integration
- Hardware Watchdog and voltage monitoring enhance the system reliability



Application

- Access control
- Hand-held terminals, parking meters
- Public telephones, prepaid gas, electric meters and on-board units
- Non-stop road toll, electronic ticketing for public transportation

Software Package

- High-level commands implement the READ, WRITE, INCREMENT, DECREMENT, INITVAL and LOAD_KEY functions. This enables developing card operations without understanding the technical details
- Demonstration software and .DLL are available under Windows98, Windows2000 and Windows NT. Users can develop the communication program between Host and module easily
- Firmware program can be updated by in-system programming

Specifications

	Multitag ISO 15693, ISO 14443 A/B read and write	ISO 14443 A/B read and write	Mifare® read and write
Order code:	CV3100AT-x	CV3531AT-x	CV3600AT-x
Supported transponders:	TagIt, I-Code, Mifare® Standard, Mifare® Ultralight, Mifare® 4k, DesFire, Mifare® Pro/Prox, SLE 55Rxx, SLE66CL160S, other ISO14443 compatible transponders.	Mifare® Standard, Mifare® Ultralight, Mifare® 4k, Mifare® DesFire, Mifare® Pro/Prox, SLE 55Rxx, SLE66CL160S, other ISO14443 compatible transponders.	Mifare® classic, Mifare® Ultralight, Mifare® Pro (X), Mifare® DesFire, other ISO14443A transponders.
Operating distance:	Depend on antenna and type of transponder	Typical 70 mm for ISO 14443A cards; 40 mm for ISO 14443B cards (depend on antenna and transponder)	70 mm (depend on antenna and transponder)
Size with antenna:	100 x 50 x 16 mm (breakable antenna integrated)		

Size without antenna:	46 x 50 x 16 mm
Baudrate:	9600 – 115200 Kbit/s (default 115200)
Supply Voltage:	DC 5V ($\pm 5\%$), DC 9V (optional)
Consumption Current:	< 120 mA
Interface:	RS232 / RS485 / TTL, Wiegand 26, TCP/IP network version is available as option.
Extended I/O port:	2 I/O ports (TTL level), the I/O ports provide TTL level interface for general-purpose use. No current driving or input protecting circuits is associated with these I/O ports.
Indication:	Two LEDs, one buzzer
Operating temperature:	-10° ... +70°
Storage temperature:	-20° ... +80°
Humidity:	0 - 95% relative humidity non-condensing
Order information:	x = Interface (TTL, Wiegand default) 2 for RS232 4 for RS485 T for TCP/IP (optional)

2.5.2 Desktop Reader 13,56 MHz

Advantages

- Proximity desktop reader for smart card issuing and application development.
- USB interface and RS232 interface.
- TCP/IP network version is available as option.
- Auto answer mode: permanent reading and sending the ID number.
- Multicolor LED
- Excellent and compact design



	Desktop-Reader with multicolor LED		
Order code:	CV6100-xB	CV6200-xB	CV6600-xB
	Multitag ISO 15693, ISO 14443 A/B read and write	ISO 14443 A/B read and write	Mifare® read and write
Supported transponders:	TagIt, I-Code, Mifare® standard, Mifare® Ultralight, Mifare® Pro/Prox, Mifare® 4k, DesFire, SLE 55Rxx, SLE66CL160S, other ISO 14443 compatible card transponders	all ISO 14443 A/B-cards	Mifare® standard, Mifare® Ultralight, Mifare® Pro/Prox, Mifare® DesFire and other ISO 14443A
Interface:	USB 1.1 / RS232 / TCP/IP available as option		
Comm. speed RS232:	9600 – 115200 baud rate (default 115200)		
Communication rate:	106 kbit/s		
Power- and	1,2 meter long for USB,		

communication cable:	1,5 meter long for RS232 (communication cable with splitter for the PS/2 keyboard connector)
Current consumption:	< 120 mA
Temperature range:	0° C...+ 65° C
Size:	129 x 68 x 33 mm
Auto answer mode:	Permanent reading and sending the ID-number
Order information:	x = U for USB = 2 for RS232 = T for TCP/IP (optional)

2.5.3 OEM Reader Modules (Mifare and others)

The 13.56MHz OEM read/write engine is a very compact device designed for fast integration into portable or stationary readers. The typical reading range of the module is up to 90 mm depending on the antenna and TAG. Also printed circuit board antennas are supported. Because of the small size the module can be integrated easily into existing data collection applications such as portable terminals, ticketing, machines vending or access control.



	OEM Reader Modules		
	ISO 14443A Mifare standard Mifare Pro ISO 14443A-Tags	ISO 14443A/B (see next sites)	ISO 15693 Tag-It I-Code SLI My-D SR176 KSW temp LRI512
Order no.:	AXB010 H102014xx		AXB210 H102022xx
Interface: according order info	Wiegand CMOS-TTL		CMOS-TTL
Reading range:	up to 85 mm		up to 120 mm
Antenna:	No		No
Power supply:	5 V / 90 mA		5 V / 50 mA
Module size (mm):	30,5 x 25,5 x 9,5		30,5 x 25,5 x 9,5
Temperature range:	-20° C...+80° C		-20° C...+80° C
Applications:	Access control, Ticketing, POS, vending machines, Data storage, Logistic, Retail, Tracking, Web-linking		
Order information:	OEM H1020xx xx BB – Wiegand BC – CMOS-TTL		

2.5.4 Plug&Play Reader Modules (Mifare and others)

The 13.56MHz MIFARE ® plug and play reader module is based on the OEM reader module. It includes an etched/-PCB antenna on the back side. The reading range is up to 5 - 9 cm depending on the TAG. A regulated supply voltage of 5 Volts is needed. The RS232 serial interface can be connected to COM1/COM2 connector of PC station, laptop or notebook using a cable.



Plug & Play (P+P) Reader Modules				
	ISO 14443A Mifare standard Mifare Pro ISO 14443A-Tags		ISO 14443A/B (see next sites)	ISO 15693 Tag-It I-Code SLI My-D SR176 KSW temp LRI512
Order no.:	AXB020 H6152xx	AXB021 H6154xx		AXB220 H6160xx
Interface: according order info	RS232 RS422 RS485	RS232 RS422 RS485		RS232 RS422 RS485
Reading range:	50 mm	85 mm		up to 120 mm
Module size:	70 x 45,5 x 15 mm	110 x 67 x 15 mm		70 x 45,5 x 15 mm
Antenna:	on board			on board
Operating system:	Windows Linux UNIX			Windows Linux UNIX
Utility:	Windows only			Windows only
Power supply:	5 V / 110 mA			5 V / 100 mA
Temperature range:	-20° C...+80° C			-20° C...+80° C
Applications:	Access control, Ticketing, POS, vending machines, Data storage, Logistic, Retail, Tracking, Web-linking			
Order information:	P+P H61xx xx BA – RS232 BE – RS422 / RS485			

2.5.5 HF Dual ISO OEM Module

The HF Dual ISO OEM Module is a contact less proximity read / write device that, with its interoperability capability, supports various ISO14443A and ISO14443B RFID-devices, including the whole MIFARE® family. The module needs an external application specific antenna to operate. By using the serial interface the device can be connected to a controller or any host system easily. An integrated SAM interface enables a state of the art security level. This RFID read / write unit is optimized for maximum data throughput rates on both, the air interface as well as the serial interface. The built in boot-loader enables firmware field upgrades via the serial interface.



Technical Data

Part Number			
RF Transmit Frequency	13.56MHz		
Standards Supported	ISO14443A, ISO14443B		
Supported Tag-ICs	MIFARE® Standard MIFARE® 4k MIFARE® Pro MIFARE® Ultralight MIFARE® DESFIRE SmartMX	SLE 55Rxx SLE 66CL160S SLE 66CLX320P SR176 SRIX4K	ISO14443A Tags ISO14443B Tags Juwel Tag (IRT0302B11 KSW DIY Eng. Sample) Sharp B ASK GTML2ISO
Host Communication	Point-to-Point		
Communications Interface	CMOS-TTL		
Communications Protocol	Specific ASCII or Binary Protocol		
Communications Parameter	9600 Bit/s to 460 kBit/s, 8,N,1		
Firmware Bootloader	Supported via Serial Interface		
S/W Driver	DLL and API available (VC++), PC/SC Driver for MS Windows 2000/XP		
Power Supply	5 VDC regulated		
Current Consumption	90 – 200 mA depending on antenna, < 10µA at power down mode		
Reading distance	up to 95 mm, depending on tag and antenna		
RF Transmission Speed	up to 848 kBit/s		
Antenna	External		
Input/Output Connector	Read indicator LED, 1 I/O Port, SAM Interface		
Size (LxWxH)	25,5 x 30 x 4,8 mm ± (L/W) 0,5 (H) 1,0 1,00 x 1,18 x 0,19 Inch ± (L/W) 0,02 (H) 0,04		
Weight	5g ± 5% / 0,01 lb ± 5%		
Operating Temperature	-20°C to +80°C / - 4F to + 176F		
Storage Temperature	-40°C to +85°C / - 40F to + 185F		

2.5.6 HF Dual ISO Short Range USB Plug & Play Module

The HF Dual ISO Short Range USB Plug & Play Module is a contact less proximity read / write device that, with its interoperability capability, supports various ISO14443A and ISO14443B RFID-devices, including the whole MIFARE® family. The module has a built in antenna. By using the USB 2.0 interface the device can be connected to a PC or any other host system easily. An integrated SAM Socket enables a state of the art security level. This RFID read / write unit is optimized for maximum data throughput rates on both, the air interface as well as the serial interface. The built in boot-loader enables firmware field upgrades via the USB interface.



Technical Data

Part Number			
RF Transmit Frequency	13.56MHz		
Standards Supported	ISO14443A, ISO14443B		
Tags Supported	MIFARE® Standard MIFARE® 4k MIFARE® Pro MIFARE® Ultralight MIFARE® DESFIRE MIFARE® SmartMX	SLE 55Rxx SLE 66CL160S SLE 66CLX320P SR176 SRIX4K	ISO14443A Tags ISO14443B Tags Juwel Tag (IRT0302B11 KSW DIY Eng. Sample) Sharp B ASK GTML2ISO
Host Communication	Point-to-Point		
Communications Interface	USB 2.0		
Communications Protocol	Specific ASCII or Binary Protocol		
Communications Parameter	9600 Bit/s to 460 kBit/s, 8,N,1		
S/W Driver	Virtual COM port Driver, DLL (VC++), PC/SC Driver for Windows 2000/XP		
Firmware Bootloader	Supported via USB Interface		
Power Supply	Via USB Interface		
Current Consumption	Approx. 200 mA, < 1mA at power down mode		
Reading distance	up to 95 mm, depending on tag and antenna		
RF Transmission Speed	up to 848 kBit/s		
Antenna	Integrated		
Input/Output Connector	Read indicator LED, 1 I/O Port, SAM Interface		
Size (LxWxH)	117 x 67 x 15 mm ± 1,0mm / 4,60 x 2,64 x 0,59 Inch ± 0,04 Inch		
Weight	32g ± 10% / 0,07 lb ± 10%		
Operating Temperature	0°C to +70°C / 32F to + 158F		
Storage Temperature	-40°C to +85°C / - 40F to + 185F		
Approvals	ETS 300-330, CE		

2.5.7 Access Control Door Reader

		
CV5100-X-0A / CV5600-X-0A CV5600S-X-0A	CV5100-X-0B / CV5600-X-0B CV5600S-X-0B	CV5100-X-1A / CV5600-X-1A CV5600S-X-1A
120 x 85 x 22 mm	126 x 68 x 19 mm	120 x 90 x 25 mm

	
CV5100-X-1B / CV5600-X-1B CV5600S-X-1B	CV5100-X-2A / CV5600-X-2A
126 x 68 x 19 mm	120 x 90 x 25 mm

Access Control Door Reader, ISO15693, ISO14443A/B

CV5100-X-XX is a proximity door reader family for access control which is designed to read and write ISO15693, ISO14443A/B contactless smart cards. CV5100-X-XX provides much higher security solution thanks to its **SECURE SECTOR** version that is designed to read data from an individual sector. Wiegand interface allows to read the unique factory programmed ID number.

Access Control Door Reader, Mifare® Serial Number Only

CV5600S-X-XX is a proximity door reader family for access control which is designed to support Mifare® contactless smart card. CV5600S-X-XX provides the low cost solution thanks to its serial number version that reads the unique factory programmed 32bit ID of any Mifare transponder. Beeper and multicolor LED can be host and/or locally controlled.

Access Control Door Reader, Mifare® Secure Sector

CV5600-X-XX is a proximity door reader-and writer family for access control which is designed to support Mifare® contactless smart card. CV5600-X-XX provides much higher security solution thanks to its **SECURE SECTOR** version that is designed to read data from an individual sector. Beeper and multicolor LED can be host and/or locally controlled.

Advantages

CV5100-X-XX	CV5600S-X-XX	CV5600-X-XX
ISO15693, ISO14443A/B Read and Write Secure Sector	Mifare® Serial Number Only	Reader and writer device for Mifare Secure Sector Application
High security solution for access control system	Low cost solution for access control system	High security solution for access control system
Indoor and Outdoor version for selection	Indoor and Outdoor (IP65, Epoxy potted) version for selection	Indoor and Outdoor (IP65, Epoxy potted) version for selection
Card or Card + Pin or Card + Pin + LCD function	Card or Card + Pin function	Card or Card + Pin or Card + Pin + LCD function
Compatible with the most controller on the market		
Wiegand, RS232, RS485 or others on request		
TCP/IP network version available as option		
Auto answer mode: permanent reading and sending the ID number		
45cm pigtail		
Unique design for easy installation using light switcher base		
Multicolor LED		
Custom-designed housing, color on request		

Specifications

	CV5100-X-XX	CV5600S-X-XX	CV5600-X-XX
Host interface:	Wiegand / RS232 / RS485 interface; TCP/IP available as option, others on request		
Contactless interface:	ISO15693, ISO14443 Type A and B	ISO14443 Type A Mifare	ISO14443 Type A Mifare
Operating frequency:	13.56 MHz		
Communication rate:	106Kbit/s		
Readable cards:	ISO15693, TagIt, I-Code, Mifare® Standard, Mifare® Ultralight, Mifare® 4k, Mifare® Pro/Prox, DesFire, SLE 55Rxx, SLE66CL160S, other ISO14443 compatible card transponders	Mifare® classic	Mifare® classic
Data type:	Read data from card's secure sector, authentication with the security keys is needed	Card Serial Number only. Compatible with all Standard Type A cards with Level 1 Card Serial Number (4 bytes)	Read data from Mifare® card's secure sector, authentication with the security keys is needed
Indicators (programmable):	LED: Two Status s (Red and Green).(A housing) ; Multicolor LED (B housing) One Buzzer		
Power supply:	DC 9V ~ 16V		
Current consumption:	< 120 mA		
Reading distance:	7cm (depending on transponders)		
Operating temperature:	-20°C ~ +65°C		
Operating humidity	0 ~ 95% relative humidity, non-condensing		

2.5.8 Mifare® All-in-One Stand-alone Access Control System

- Proximity contactless access control system
- All-in-one Stand-alone System
- Functional card/password set entry method
- Entry Mode: Card / Pin / Card+Pin
- Up to 500 user, expandable up to 2000 user
- High security: Lost card and system alarm
- Water-/dust proof, suitable for outdoor use
- Applicable to all different types of doors
- Easy installation and simple maintenance



Application

Office building, apartment, store, lab, garage, parking lots.

Specifications

Power supply	9V DC, 12V DC
Current consumption	< 0.5A
Memory	1) EEPROM 2) RAM 2k (expandable to 8k)
Technology	Mifare standard, ISO14443A
Reading range	Up to 70 mm, depending on transponders
Readable card	Mifare® S50, Mifare® S70
Card holder	Up to 500 user, expandable up to 2000
Entry Mode	Card / Pin / Card+Pin
Indicator	LED (green: door open; red: standby) / Beeper
Keypad	1) 10 number keys 2) 2 function keys
Operation Features	<ul style="list-style-type: none"> • Functional password / card set entry method • Time door remains open can be programmed from 1-99 seconds from keypad • Lost cards can be voided to prevent unauthorized access • System alarm: alarm will be activated and temporarily stop the system from function for one minute when the pin is incorrectly entered and/or access with an unauthorized card is attempted four consecutive times-system is impaired or destroyed • Programming: simply programming cards and entry methods by functional card or password access
Output	<ul style="list-style-type: none"> • Lock relay 1 Amp, 24Vdc / 0.5Amp, 110-120Vac • Auxiliary relay 1 Amp, 24Vdc / 0.5Amp, 110-120Vac • Alarm output 1 Amp, 24Vdc / 0.5Amp, 110-120Vac
Outdoor use	Water and dust proof
Installation	1) Applicable to all different types of doors 2) Simple maintenance
Housing	ABS
Operating Temperature	0 ~ +60°C
Humidity	20% ~ 95%
Size	120 x 90 x 25 mm
Order Code	CV9600 - X - 1 - X A = Indoor B = In- / Outdoor, IP65 1 = Card reader + keypad 2 = Card reader + keypad + LCD 2 = RS232 4 = RS485 W = Wiegand

2.5.9 Mifare® Stand-alone Access Control System / Time Attendance

CV9600-X-2-X is a stand-alone access control system which can function as a single door access control solution and can easily be connected in a RS485 network (up to 256 units). CV9600-X-2-X utilizes Mifare smart card technology and support Mifare S50 and S70 cards. CV9600-X-2-X supports to read and write Mifare Secure Sector.

CV9600-X-2-X can work as a Time Attendance System with a local customized application management software thanks to his excellent platform with all technical documentation, API and programmer tools.

Advantages

- All in one Stand-alone for single door access control
- ISO14443 A Mifare, Serial Number and Secure Sector
- Up to 5000 user
- 10000 entries memory
- Off-line and on-line mode (network up to 256 units)
- LCD-Display (backlighted), night time visible
- LED and buzzer
- Built-in keyboard
- Function Mode: CARD / PIN / CARD+PIN or host controlled
- Timer divided
- Door open, Door sensor, Alarm output
- Alarm activated in case of sabotage
- RS232 and RS485 Interface
- Indoor and Outdoor (IP65) version available
- Easy to install, simple setup



Application

Office building, apartment, store, lab, garage, parking lots.

Specifications

Power supply	9-16V DC
Current consumption	< 200 mA
Technology	13.56 MHz ISO14443 A Mifare
Reading range	Typical up to 70mm, depending on transponders
Readable card	Mifare® S50, Mifare® S70
Card holder	Up to 5000 user
Date / Time	MM/DD/YYYY; / HH.MM.SS
Entry Mode	CARD / PIN / CARD+PIN/host controlled Door open Time divided
Output	Electric Door lock (12V DC 3A) Alarm (12V DC 3A)
Antenna	Integrated Antenna mounted inside (Front)
Log-Function	10000 entries (User ID; Date & Time)
Outdoor use	Water and dust proof
Installation	1) Applicable to all different types of doors 2) Simple maintenance
Housing	ABS
Operating Temperature	0 ~ +60°C
Humidity	20% ~ 95%
Administration	Administrator password initialization
Size	120 x 90 x 25 mm
Order Code	CV9600-X-2-X

2.5.10 CF Card Reader 13,56 MHz

Elatec's CF Card Reader is a integrated reader for 13,56MHz transponders. It combines state of the art technology in a small housing. Antenna is completely integrated. Rapid application development drivers for Windows and Windows CE are provided with the module.

Reading distance depending on size, type and orientation of transponder.

Many types of transponders are supported at the same time within the same module.

Applications are Logistics, Transport, Ticketing, Identification, Asset Tracking and many more

Features plug & play module:

- | | |
|---------------------------|--|
| ○ Housing / Interface | CF card Type II |
| ○ Frequency: | 13,56 MHz |
| ○ Dimensions (L x W x H) | 45,0 * 91,6 * 12,25 mm |
| ○ Power supply | 3,3 – 5V |
| ○ Current input | HF field off: 15mA |
| | HF field on: max 75mA |
| ○ Temperature range | -20° - +80°C (-4 F – 176 F) |
| ○ Antenna: | Integrated aircoil |
| ○ Read- / write distance | Proximity, up to 7 cm |
| ○ Transponders supported: | ISO15693 (Tag-IT, I-Code, My-D, SLI, LRI512) |
| | Mifare Standard and Ultralight (serial No. only) |
| | SLE 66CL160S (serial No. only) |
| ○ Technical certificates: | CE |
| ○ Signaling | Reading LED |
| ○ Ordering info: | AXB810 |



2.5.11 High Speed Dual ISO Short Range USB Plug & Pay Module

The HF Dual ISO Short Range USB Plug & Play Module is a contactless short range read / write device that, with its interoperability capability, supports ISO14443A and ISO14443B RFID-devices, including the whole MIFARE® family. The module has a built in antenna. By using the USB 2.0 interface the device can be connected to a PC or any other host system easily. An integrated SAM Socket enables a state of the art security level. The integrated boot loader enables firmware upgrades and uploads of customer specific applications via the USB interface.



Technical Data

RF Transmit Frequency	13.56MHz
Standards Supported	ISO14443A, ISO14443B
Tags Supported	MIFARE® Standard, MIFARE® 4k, MIFARE® Pro, MIFARE® Ultralight, MIFARE® DESFIRE SmartMX SLE 55Rxx, SLE 66CL160S, SLE 66CLX320P SR176, SRIX4K ISO14443A Tags, ISO14443B Tags Sharp B ASK GTML2ISO
Typical Read Time	Depending on chip type, for Serial Number only
Host Communication	Point-to-Point
Communications Interface	USB 2.0
Communications Protocol	Specific ASCII or Binary Protocol
Communications Parameter	9600 Bit/s to 460 kBit/s, 8,N,1
S/W Driver	Virtual COM port Driver, DLL
Firmware Bootloader	Supported Via USB Interface
Power Supply	Via USB Interface
Current Consumption	Approx. 150 mA
Reading distance	up to 95 mm, depending on tag
RF Transmission Speed	up to 848 kBit/s
Antenna	Integrated
Input/Output Connector	Read indicator LED, 1 I/O Port, SAM Interface
Size (LxWxH)	117 x 67 x 15 mm ± 1,0mm / 4,60 x 2,64 x 0,59 Inch ± 0,04 Inch
Weight	32g ± 10%
Operating Temperature	-20°C to +80°C / - 4F to + 176F
Storage Temperature	-40°C to +85°C / - 40F to + 185F
Relative Humidity	t.b.d.
Approvals	ETS 300-330, CE, FCC, pending

3 Long Range UHF Reader System

3.3.1 868 / 915MHz Reader UHF-R-01

Elatec's UHF Reader is designed for long reading distance of RFID labels. Especially for logistic application in combination with high volume of low cost transponders. It combines state of the art technology in a small housing. Antenna is separated and can be customized.

Reading distance depends on size, type and orientation of transponder and is up to 4m.

Features and Benefits

Long range passive applications

Easy to use

Compact and low cost

Quick customization for commercial implementation

Main Applications

Supply chain management

Access control

Road toll collections

Starterkit available:

5 x UHF-T-01 tags

Each tag is 86 by 54 by 0.1mm

1 x UHF-R-01 reader

Frequency hopping

Power output of 28.5 dBm

1 x UHF-A-01 reader antenna

Gain of 7.5 dBi, circular polarized

1 x demo software

for Win 2000 & Win XP

Accessories

Universal Power supply

Documentation

Set-up instructions & application notes



4 Long Range Active Reader System Telides for 5,8 GHz

4.3.1 Telides



TELIDES® stands for Tele-Identification-System and serves for the contactless identification of persons and objects.

TELIDES® consists of two components: a reading unit and a tag. The reading unit offers a serial interface (RS232 or RS422) for a connection to an external computer and an output for a switching contact to control units like barriers or gates. Thanks to an internal memory the TELIDES® reading unit can also work without a connection to a computer. If used offline 4000 readings of tags can be stored together with the date and time of the reading. The compact design of the reading unit, with integrated antenna and power pack, facilitates installation. Due to its rugged

and watertight casing, the TELIDES® tag is protected from exterior influences like humidity, pressure variations or vibrations and can even be treated with steam jets. Battery power supply lasts for at least 7 years (guaranteed).

For a permanent fixing of the tag to the windshield of a car, a special fixing device is available.

TELIDES® offers a unique concept for many applications: control of parking areas and test ranges for cars, time registration on cart tracks, automation of production or logistic processes.

Features:

- Frequency: 5,8 GHz
- Transmitting power: <25 mW
- Reading distance: Up to 10m
- Temperature range: -25 °C to + 80 °C
- Relative humidity: 5% to 95%
- Power supply reading unit: 230 V / 50 Hz
- Service life battery tag: At least 7 years
- Serial interface: RS 232 or RS 422
- Output for switching contact: 230 V AC / 5 A constant current
24 V DC / 1 A constant current
- Dimensions: Reading unit: 240 * 160 * 90 mm
Tag: 76 * 63 * 17 mm
- Approvals: VDE 0805 / EN60950
ETS 300440 / 300683,
EN 55022

5 Rugged Handheld RECON



Recon delivers maximum performance and reliability in a lightweight and extremely rugged design. The waterproof Recon weighs just 450 gram, and it exceeds military specifications for drop, vibration and both high and low temperature operation. The Recon works wherever and whenever you need it.

You can count on Recon when portability, data security and maximum operating time are crucial. The innovative modular design saves time and money on long-term service and provides customization options to suit your different applications. The PowerBoot Module™ integrates a 3800 mAh battery pack with industry-standard 9-pin serial and USB ports into a single component you can easily replace even in the field. The standard CF-Cap™ O-ring seal protects its two Compact Flash® slots from rain, wind and dust, and it supports qualified memory and Bluetooth® cards.

The Recon features the high-performance 200 MHz or 400 MHz XScale™ processor, a colour display with front light, 64 MB of RAM and 64 or 128 MB of non-volatile Flash storage to protect data from resets or even complete power loss. The operating systems Windows CE.NET or Pocket PC 2003 is easily upgradeable and gives unmatched performance.

Size	16,5 cm x 9,5 cm x 4,5 cm
Weight	453 g including rechargeable powerboot module
Environment	<p>Water: MIL-STD-810F, Method 512.4, Procedure IP67. Sealed against accidental immersion (1M for 30 min)</p> <p>Drop: MIL-STD-810F, Method 516.5, Procedure IV 26 drops from 1.22 m 6 additional drops at -20°C 6 additional drops at 60°C</p> <p>Operating: -30°C to 65° Storage: -40°C to 70°C Humidity: MIL-STD-810F, Method 507.4 Sand & Dust: IP67, MIL-STD-810F, Method 510.4, Procedures I & II</p>
Disk	<p>Onboard non-volatile NAND Flash</p> <p>64 MB (Recon 200) 128 MB (Recon 400)</p>
Screen	<p>240x320 pixel (1/4 VGA) color</p> <p>TFT with LED front light</p>
Battery	3800mAh NiMH rechargeable pack, allowing for 12-30h operating time depending on usage.
Operating system	<p>Microsoft Windows CE.Net 4.1</p> <p>Microsoft Mobile 2003</p>
Connections	<p>1 x Standard 9-pin (male) D-shell</p> <p>RS-232 serial, 1 x USB 1.1 port slave</p> <p>1 x 5V Charging, 2 x CF-Card slots</p> <p>one type I and one type II slot</p>
Communication	<p>WAN: Audiovox GPRS CF-Card</p> <p>WLAN: Socket 802.11b CF-Card</p> <p>PAN: Socket Bluetooth CF-Card</p>
Keyboard	<p>10 Keys</p> <p>Onscreen qwerty softkeyboard</p>
Options	<p>12V Vehicle charger</p> <p>Socket Bt CF-Card Socket 802.11b</p> <p>Wlan CF-Card</p> <p>Audiovox RTM8000 GPRS CF-Card</p> <p>Extended Cap</p> <p>PowerBoot module for alkaline batteries</p> <p>Carrying cases</p>
Processor / memory	<p>Intel PXA 255 Xscale CPU, 64 MB</p> <p>High-speed SDRAM</p> <p>Recon 200: 200Mhz, Recon 400: 400Mhz</p>

6 Typical RFID Applications

Animal Identification

ID of Kegs / barrels / bins

Automotive production

Spare parts / tool ID

Production control

Container ID, Tree ID

Medicine / laboratory

Ticketing

Reusable containers / pallets

Vehicle ID (Truck, Bus, ...)

Waste management

Access control / time & attendance

Logistics

Car immobilizer

Laundry

Marathon

Recycling Systems

Events

Casino (gaming chips)

Train Identification

Trailer ID

