TRANSIT ENTRY*

installation guide

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1 INTRODUCTION

1.1 PRODUCT DESCRIPTION

Nedap's hands free access solution represents the latest in technology for secure hands free doors access and other RFID applications. TRANSIT Entry combines the convenience of traditional door automation with the security of restricted areas.

It makes a perfect fit to any door or vehicle gate environment where hands free access is required. The system reads at distances up to 4 meter (12 feet) reliable and consistently. This has great appeal to people, especially in situations where it is inconvenient to use their hands when presenting an ID badge when accessing a door, but where high security needs to be maintained.

Moreover it offers hands free vehicle access to gated areas. Vehicles are identified at a range up to 4 meters (12 feet), without the hassle of having to open the window to present a card.

The hands free access system is made up of a TRANSIT Entry reader and a transponder. TRANSIT Entry readers are installed next to a door or gate. A long range transponder visible in line of sight of the reader will be identified at distances up to 4 meter (12 feet).

1.2 OPTIONAL CARD TECHNOLOGY READER INTERFACE

The TRANSIT Entry reader also features an optional proximity and ISO compliant smartcard interface. This Multi-Technology Reader Module (MTR) enables the reader to read standard proximity cards and smartcard CSN. This also allows the reader to operate with existing credentials when presented to the face of the reader.

The MTR supports the following card technologies:

- 120-125 kHz: HID prox, Nedap and EM read-only.
- 13.56 MHz: HID iClass CSN, MIFARE, LEGIC Advant UID, ISO14443A and ISO15693.

2 INSTALLATION

2.1 SAFETY PRECAUTIONS

The following safety precautions should be observed during normal use, service and repair.

- All shields of the mandatory shielded cable shall be connected with safety ground.
- The TRANSIT Entry may only be installed and serviced by qualified service personnel.
- Disconnect the power supply before removing or installing any parts.
- To be sure of safety, do not modify or add anything to the TRANSIT Entry other than mentioned in this installation guide or indicated by NEDAP N.V.

2.2 MOUNTING INSTRUCTIONS

The TRANSIT Entry can be mounted to any surface, including directly to metal. Locate an appropriate position. Use the upper two keyholes (K) to mount the reader. Open the service cover to secure the reader using the two lower mounting positions (L).

See the picture below for details about the dimensions and the locations of the mounting positions.

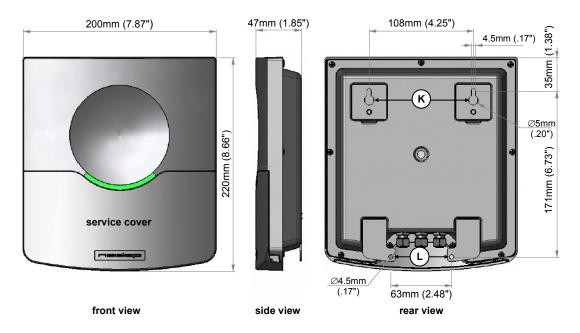


Figure 1: TRANSIT Entry reader dimensions

Installation

ADJUSTABLE MOUNTING BRACKET 2.3

With the adjustable mounting bracket, the TRANSIT Entry can be 'aimed' at the desired detection area. It can also be used for mounting the reader to round or square masts (see appendix B9B for part numbers).



Figure 2: Adjustable mounting bracket

Maximum diameter for round masts 125mm (4.9 inch)

Note

Maximum diameter for square masts 100mm (3.9 inch)

Once the adjustable mounting bracket is assembled, attach the bracket to the wall or mast. After that the TRANSIT Entry can be mounted onto the bracket. The ball and socket joint can be used to adjust the reader's orientation. Tighten the hex screw on top of the joint to fix the correct orientation.

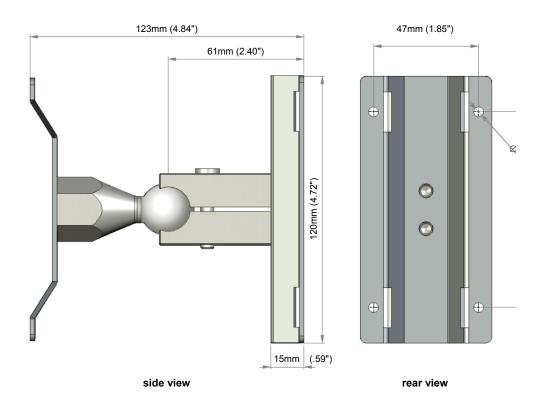


Figure 3: Adjustable mounting bracket dimensions (in mm)

Installation

2.4 OPENING THE SERVICE COVER

The service cover can be opened to access the connections, control the read range, setup the operating frequency and view the LED indicators.

Open the screws on the bottom of the device to unlock the service cover. Once the service cover is unlocked, lift it off.

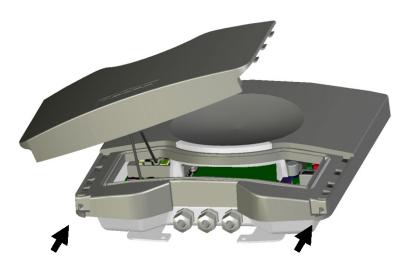


Figure 4: Opening the service cover

2.5 INSTALLING AN OPTIONAL INTERFACE BOARD

Make sure to follow all safety precautions outlined in chapter 2.1 and disconnect the power supply when installing or replacing an optional interface board.

2.6 AVAILABLE INTERFACE BOARDS

Various optional interface boards are also available for the TRANSIT Entry.

Ethernet (TCP/IP) interface board



Connects the TRANSIT Entry to an Ethernet network using the TCP/IP protocol.

See for detailed information about the Ethernet communication board its user's manual.

MTR Module (Multi Technology Reader Module)



The MTR Module enables proximity reading of many transponders types such as HID Prox, EM read-only, Mifare and HID iCLASS.

HIB (HID Interface Board)



Enables the reading of HID prox cards with an HID Prox Booster.

See appendix 9BB for part numbers.

Note

Make sure the screws are completely opened (and closed when placing the cover back on). Don't worry about losing the screws, they cannot fall out.

Installation

Installation Procedure

- Disconnect the power supply.
- 2 Remove the complete front cover from the TRANSIT Entry.
- Place the interface board on the 14-pin header K1. Make sure it's firmly positioned and makes good contact with connector K1.

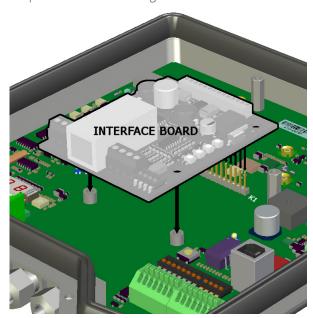


Figure 5: interface board installation

- 4 Tighten the two screws to fix the board into place.
- Read the board's installation guide for additional notes like address settings, jumper settings and wiring details.
- 6 Replace the front cover on the TRANSIT Entry.

3 CONNECTIONS

3.1 CABLE CONNECTIONS

Cable connections to the TRANSIT Entry are made using the EMC cable glands.

Shielded cable shall be used for all connections including the DC-supply connection.

Assembly instructions:

- 1 Push the cap nut (1), seal insert (2) and gland contact socket (3) onto the cable.
- 2 Cut back the outer sheath to desired length.
- Bend over the screen braiding (4) over the gland contact socket and cut back the screen braiding as shown in Figure 6.
- 4 Screw the cap nut onto reader part until the seal insert is pushed out of the gland. See Figure 7.

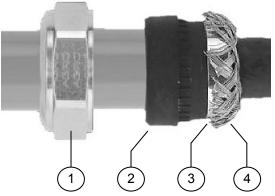


Figure 6: Cable shield

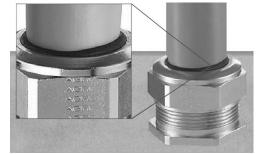


Figure 7: Gland tightening

Correct mounting and tightening the EMC cable glands is essential for water protection.

See appendix **Error! Reference source not found.**A for detailed information on the cable glands.

Connections

3.2 WIRE CONNECTIONS

Wire connections to the TRANSIT Entry are user friendly spring cage terminal connectors.

Connection procedure with spring cage terminal connectors.

- Strip wire lead for about 9 mm (0.35 inch).
- 2 Push the screwdriver straight down to release the spring cage. Use a slotted, narrow-head screwdriver.
- Insert the wire lead into the wire terminal.
- 4 Remove the screwdriver, this clamps the wire.
- 5 Gently pull on the installed wire to make sure the connection is reliable.

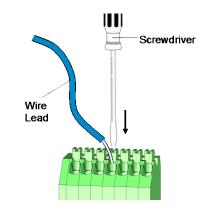


Figure 8: Wiring detail

See appendix Error! Reference source not found. A for recommended maximum and minimum conductor cross sections and for the recommended wire stripping length.

3.3 POWER SUPPLY

The TRANSIT Entry requires DC power supply in the range from 12-24V. Maximum current consumption is 1A @ 12VDC, 0.5A @ 24VDC.

Connections

DC-

Power supply OV.

DC+

Power supply 12 - 24VDC.

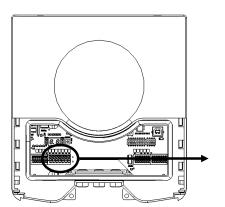
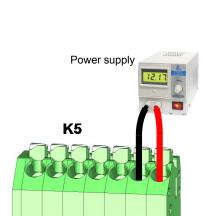


Figure 9: Power supply wiring



Note

Each connector terminal can accommodate only 1 solid or stranded wire.

Note

Wiring is normally done without ferrules. However, it is possible to use ferrules, provided that they are properly crimped.

Note

The power supply connection has an auto resetting fuse protection.

Connections

3.4 COMMUNICATION 3.4.1 RS232 CONNECTION

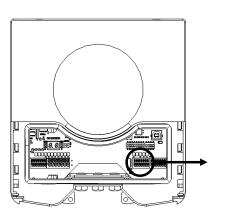
The TRANSIT Entry has an on-board RS232 interface. This interface does not support any hardware handshake signals. The communication protocol, baud rate, data format and flow control depend upon the reader firmware. See firmware manual for details.

Connections

RXD Receive data (input)

GND Ground

TXD Transmit data (output)



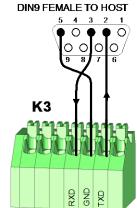


Figure 10: RS232 wiring

Note

Maximum cable length of 15 meters (50 feet) or the cable length equal to a capacitance of 2500pF.

Note

Enable the on-board RS232 interface by setting DIP-switch SW1-2 to ON. See chapter 0 for details.

Note

The RS232 interface is disabled while the USB interface is in use !!!

Connections

3.4.2 RS422 CONNECTION

The TRANSIT Entry has an on-board RS422 interface. The communication protocol, baud rate, data format and flow control depend upon the reader firmware. See firmware manual for details.

The RS422 interface is similar to the RS232 interface. The RS422 interface is commonly used where longer cable lengths are required.

Connections:

RX+ Receive line (positive)

RX- Receive line (negative)

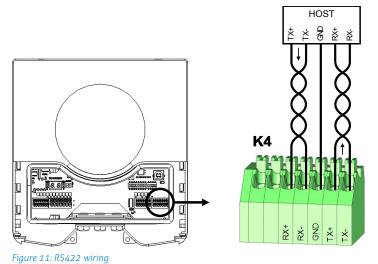
GND Ground

TX+ Transmission line (positive)

TX- Transmission line (negative)

RX+ and RX- inputs are terminated with a 120 Ω resistor.

TX+ and TX- must be terminated at the host side.



rigure 11. N3422 Wiring

Note

Maximum cable length 1200 meters (4000 feet).

Note

Enable the on-board RS422 interface by setting DIP-switch SW1-2 to OFF. See chapter 0 for details.

Note

The RS422 interface is disabled while the USB interface is in use !!!

Connections

3.4.3 WIEGAND, MAGSTRIPE, BARCODE CONNECTION

The synchronous communication interface wiring depends upon the selected communication protocol and the reader firmware. Please refer to the firmware manual for more details.

In Figure 12 the wiring for the Wiegand protocol is outlined.

Connections

	WIEGAND	MAGSTRIPE	BARCODE
OUT1	-	Card Loaded	-
OUT2	Data-0 (green)	Clock	-
OUT3	Data-1 (white)	Data	Data
GND	Ground (black)	Ground	Ground

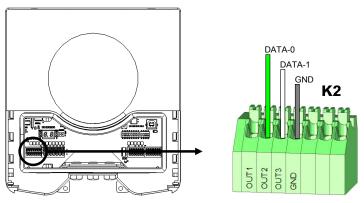


Figure 12: Wiegand wiring

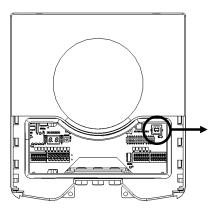
Note

Maximum cable length 150 meters (500 feet)

Connections

3.4.4 USB CONNECTION

The TRANSIT Entry features an USB interface for service and installation purposes. The USB connector (Type B) is accessible behind the service cover.



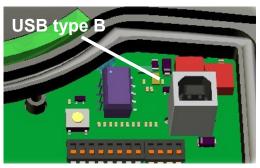


Figure 13: USB interface

USB Driver installation

Make sure your computer is connected to the internet. The driver should install automatically via Windows update when the TRANSIT Entry is connected to your PC via the USB cable. Follow the driver installation wizard. If you do not see the Windows update pop-up, you can manually install the driver. To manually install, you need to go to FTDI's website at www.ftdichip.com/Drivers/VCP.htm and download the VCP (Virtual Com Port) drivers for your operating system. Drivers for MacOS and Linux are available as well.

Note

While the USB interface is in use, the on-board RS232 and RS422 interfaces are disabled. Also when an optional interface board is placed (e.g. TCP/IP) the board will be disabled as long as the USB interface is in use.

Connections

3.5 DIGITAL I/O 3.5.1 RELAY OUTPUT

The relay output is automatically activated upon identification of a transponder. This behavior can be changed and configured by means of the firmware. Please refer to the firmware manual for more details.



The 'smile' on the front cover lights-up simultaneously with the relay output.

Connections:

NC

Relay contact normally closed

COM

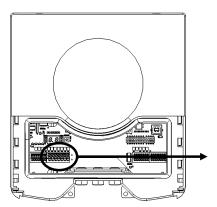
Relay contact common

NO

Relay contact normally open

Contact ratings:

Max. switching current: 2A
Max. switching voltage: 24VDC
Max. switching power: 50W



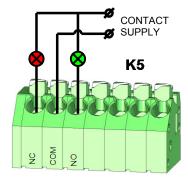


Figure 14: Relay output

Connections

3.5.2 READ DISABLE INPUT

The reading of the TRANSIT Entry can be completely disabled with the RDIS input. This input is commonly used in combination with a sensor (e.g. inductive loop) that detects the presence of a person or vehicle. Use always a relay contact to connect the internal 5V to the RDIS input. When the RDIS input is unused the reader is enabled.

Connections

RDIS

Read disable input

5V

Internal 5V source for read disable input

Warning: Using an external 5V supply can damage the unit.

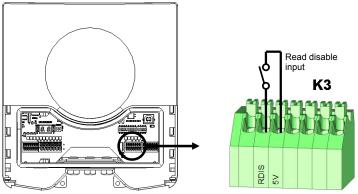


Figure 15: Read disable input

Connections

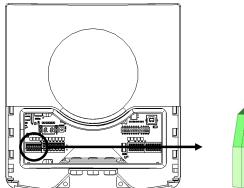
3.5.3 GENERAL PURPOSE INPUTS

Three general purpose inputs are available on the TRANSIT Entry reader. The inputs are active low.

Connections

IN1 General purpose input 1
IN2 General purpose input 2
IN3 General purpose input 3

GND Ground



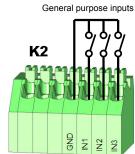


Figure 16: GPIO inputs

Connections

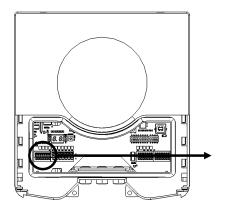
3.5.4 GENERAL PURPOSE OUTPUTS

Three general purpose inputs are available on the TRANSIT Entry reader. The installed firmware may use these outputs for synchronous communication interfaces such as Wiegand, Barcode and Magstripe. See chapter 3.4.3 for more details.

Connections

OUT1 General purpose output 1
OUT2 General purpose output 2
OUT3 General purpose output 3

GRD Ground



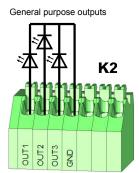


Figure 17: GPIO inputs

Connections

3.5.5 TAMPER SWITCH

An internal magnet provides tamper indication when the service cover is opened. This contact may be connected to an external alarm system. The contacts are normally closed when the cover is in place.

Tamper switches of multiple TRANSIT Entry reader may be connected in series.

Connections

NC

Tamper switch (normally closed)

COM

Tamper switch (common)

Contact ratings:

Max. current 50 mA (0.5 Volt voltage drop)

Max. switching voltage +24 VDC

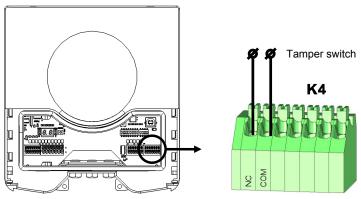


Figure 18: Tamper switch

Connections

3.6 SPECIAL CONNECTIONS

Nedap Antenna Interface

The Nedap antenna interface is used to connect the TRANSIT Entry to NEDAP EAOS access control hardware such as the AP1001. Instead of proximity antenna the TRANSIT Entry can be connected.

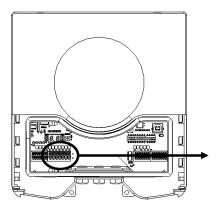
Connections



Nedap antenna interface (modulation output, connect to ANT)



Nedap antenna interface (ground shield, connect to ANT GND)



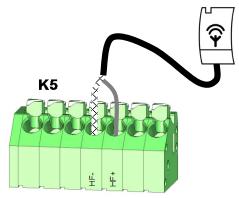


Figure 19: Nedap antenna interface

Note

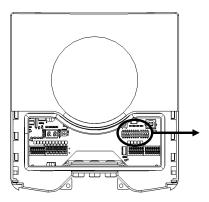
Use coax RG58U, maximum cable length 100 meters (330 feet)

DIP Switch Settings

4 DIP SWITCH SETTINGS

The DIP-switches are located behind the service cover. The function of the switches SW2-1 through SW2-8 is dependent upon the installed firmware. Please refer to the firmware manual for details.

The switches SW1-1 through SW1-4 are described below.



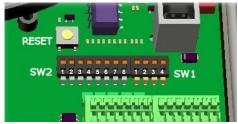


Figure 20: DIP-switches

Range Beeper On / Off

Enable or disable the internal range beeper. The beeper indicates transponder identification. The signal strength of the identified transponder determines the beeping frequency. When the transponder is near to the reader the range beeper will beep fast.



Range beeper ON



Range beeper OFF

RS232 / RS422 Selection

On-board RS232 or RS422 interface selection.







On-board RS422 interface enabled.

Unused SW1-3 And SW1-4

The switches SW1-3 and SW1-4 are reserved for future use. It is recommended to leave these switches in the ON position.

Note

The on-board RS232 and RS422 interfaces are both disabled when the USB connector is in use or when the TCP/IP interface board is installed.

5 LED INDICATIONS

A number of LED's indicate the current status of the TRANSIT Entry reader.

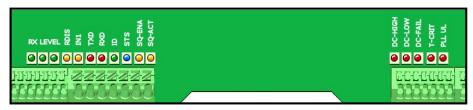


Figure 21: LED locations

Table 1 below describes the function of each LED.

Led	Description		
RX LEVEL	LED bar indicating the received tag signal strength. This LED bar may also indicate the presence of radio interference. In case of interference, try switching to a different frequency. See chapter 6.		
RDIS	Read Disable LED. On while reading disabled. See chapter 3.5.2.		
Input 1 status. On when input 1 contact is closed. See chap: 3.5.3.			
TXD	Transmit serial data (RS232, RS422, USB, I/F-board).		
RXD	Receive serial data (RS232, RS422, USB, I/F-board).		
● ID	Identification. Blinks fast when a valid transponder is identified.		
• STS	Status LED. Slow blinking: System's heartbeat (0.8 sec on / 0.8 sec off). Indicates that the power is on and the processor is running. Fast blinking: Bootloader says hello. Indicated after a restart. Twice blinking: Configuration menu active. Off: Abnormal situation.		
SQ-ENA	Squelch enabled. See chapter 7.		
SQ-ACT	Squelch active. See chapter 7.		
OC-HI	Power supply voltage too high. See chapter 3.3.		
OC-LO	Power supply voltage too low. See chapter 3.3.		
OC-FAIL	Internal supply voltage failure. See chapter 3.3.		
T-CRIT	Temperature critically high.		
PLL UL PLL unlocked. Try switching to a different frequency. See cl 6.			

Table 1: LED indicators

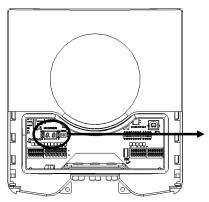
6 FREQUENCY SELECTION

The TRANSIT Entry reader operates in the 2.45GHz frequency band. When two or more readers are within a range of 15 meters (50 feet), these readers should be set on a different operating frequency. The selected frequency has to comply with local radio regulations.

Press the UP or DOWN switch once and the display will show a value indicating the currently selected frequency. Lookup the display value in the table below to find out what the actual operating frequency is.

When the display is on, press the UP switch to select a higher frequency. Similarly, press the DOWN switch to select a lower frequency.

The display will automatically switch off after 5 seconds.



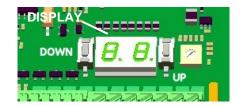


Figure 22: frequency setting

Display value	Frequency (GHz)	Wifi
50	2.4384	
51	2.4390	
52	2.4396	
53	2.4402	
54	2.4408	
55	2.4414	
56	2.4420	CH7
57	2.4426	
58	2.4432	
59	2.4438	
5A	2.4444	
5B	2.4450	
5C	2.4456	
5D	2.4462	
5E	2.4468	
5F	2.4474	CH8

J1	2.4
Table 2: Frequency	values

Display value	Frequency (GHz)	Wifi
60	2.4480	
61	2.4486	
62	2.4492	
63	2.4498	
64	2.4504	
65	2.4510	
66	2.4516	
67	2.4522	CH9
68	2.4528	
69	2.4534	
6A	2.4540	
6B	2.4546	
6C	2.4652	
6D	2.4558	
6E	2.4564	
6F	2.4570	CH10

Read Range Control (Squelch)

7 READ RANGE CONTROL (SQUELCH)

7.1 PRINCIPLE

The read range of the TRANSIT Entry can be controlled with the embedded squelch function. The squelch references the received signal strength against the squelch level setting. When the received signal strength is below the squelch level no identification is possible. The received signal strength becomes higher when the transponder approaches the reader. When the received signal strength exceeds the squelch level the transponder will be identified.

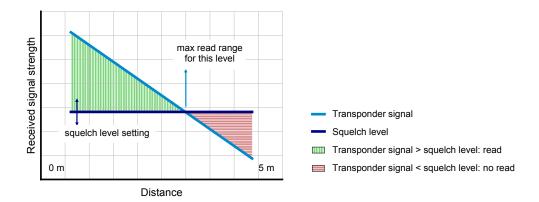


Figure 23: Squelch principle

7.2 READ RANGE ADJUSTING



SQ-LVL potentiometer completely clockwise: Maximum read range (squelch disabled).



SQ-LVL potentiometer completely counter-clockwise: Minimum read range.

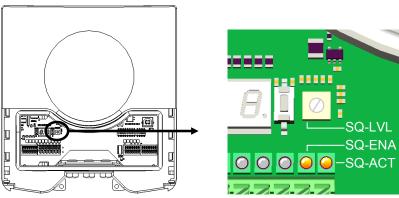


Figure 24: Squelch level setting

Two LEDs indicate the status of the squelch. When the squelch is enabled (potentiometer SQ-LVL not completely clockwise) LED SQ-ENA will be on. LED SQ-ACT is on when the transponder signal is below the squelch level (red area in Figure 23). In chapter 5 all LED indicators are described.

8 IDENTIFICATION

The TRANSIT Entry reader is always reading (except when disabled with the read disable input, see chapter 3.5.2). Automatically upon identification of a transponder the relay will be activated, the 'smile' lights-up and an event message is generated on the communication interface(s).

8.1 STANDARD OPERATING PROCEDURE



The TRANSIT Entry was designed to implement secure handsfree access. The system reads at distances up to 4 meters (12 feet). This has great appeal, especially in situations where people cannot use their hands to present their ID badge. Moreover it offers handsfree vehicle access to gated areas. Vehicles are identified at range,

without having to open the window to present a card. Only line-of-sight between transponder and reader is required.

On-site adjustable read-range in case of cross over reading (see chapter 7). On-site adjustment of the frequency channel to avoid radio interference (see chapter 6).

8.2 USING THE MTR MODULE



The TRANSIT Entry reader can be featured with an optional proximity and ISO compliant smartcard interface, called Multi-Technology Reader Module (MTR). This MTR interface will enable the reader to read standard proximity cards and smartcard CSN, allowing it to operate with existing credentials at short range, when presented to the face of the

reader. See chapter 2.4 for more information about installing the MTR board.

The MTR eliminates the need for multiple readers mounted next to a door or gate. Please refer to the MTR manual for more details. The following card types are supported with the MTR:

- 120-125 kHz: HID prox, Nedap and EM read-only.
- 13.56 MHz: HID iClass CSN, MIFARE, ISO14443A and ISO15693.

Proximity cards must be presented to the circle on the front cover of the TRANSIT Entry reader. The MTR reads from all supported transponder types their card serial number. For Mifare Classic and Ultralight cards optionally the MTR can be configured to read data from a (secured) sector. Configuration is done with a configuration card, which can be programmed with the 'Smartcard-Booster Config' software. This software can be downloaded from our website www.nedapidentification.com.

Note

It is not possible to install the MTR module together with an additional interface board, such as the TCP/IP interface board.

Firmware Upgrade

9 FIRMWARE UPGRADE

The firmware in the TRANSIT Entry's processor can be upgraded by means of the serial interface (RS232, RS422 or USB). The upgrade is performed by the 'PIC downloader' application. The upgrade procedure is described below.

- 1 Start the 'PIC downloader' application.
- 2 Select the serial port to which the reader is connected.
- 3 Select the firmware file (*.hex, *.ehx).
- Disable 'download customer codes' to prevent your customer codes inside the reader to be overwritten. Enable 'download customer codes' when you want to load the customer codes from the hex-file into the reader. Hex-files on www.nedapidentification.com contain DEMO customer codes.
- 5 Click 'Download' to start downloading the firmware.
- Once the downloading has completed 'PIC downloader' displays the message 'Download successfully completed' and the reader starts the upgraded firmware.

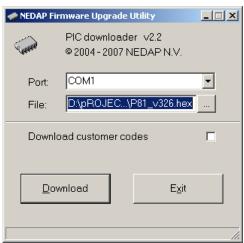


Figure 25: PIC downloader

Note

Aborted downloads may cause the reader to stop functioning. In such cases repeat the upgrade procedure until it succeeds.

Note

If the message 'Searching for bootloader' does not disappear check the cables and the com-port settings. Sometimes it may be required to restart the reader before the bootloader can be found. Before restarting the reader make sure that the message 'Searching for bootloader' is still shown in the statusbar. The restart is easily performed by pressing the reset-switch.

A TECHNICAL SPECIFICATIONS

Item	Specification	Remark
Dimensions	200x220x46.5mm (7.87 x 8.66	
	x 1.83 inch)	
Weight	0.75 kg (1.65 lbs)	
Enclosure color	RAL7017 (dark gray)	
Enclosure material	Polycarbonate	
Chassis material	Aluminum	
Cable entry fittings	AGRO Progress MS EMC IP68	4-6mm cable diameter
Recommended wire stripping length	8 10mm (0.3 0.4 inch)	l∢ →l L
Connector K5	0.5mm² 1.5mm² (AWG20 16)	Springcage type PTSA 1.5
Connector K2,3,4	0.14mm ² 0.5mm ² (AWG24 20)	Springcage type PTSA 0.5
Protection class	IP65	
Operational temperature	-30°C +60°C (-22°F +140°F)	
Relative humidity	10 93% non-condensing	
Identification range	Typical 4 meters (12 feet)	Line-of-sight required
Power supply	12VDC 24VDC	
Current consumption	1A @ 12VDC, 0.5A @ 24VDC	
Operating frequency	2.4384GHz 2.4570GHz	
Polarisation	Circular	
EIRP	18.7 dBm linear	
Immunity	EN 301 489-1 V1.6.1 EN 301 489-3 V1.4.1	ERM and EMC Part 1 and Part 3 common technical requirements
	EN 501130-4: 1995	Alarm systems – Part 4
Safety	EN 60 950-1: 2001 / UL 50	
Emission	EN 300 440-2 (SRD > 1GHz) EN 300 330-2 V1.3.1 (SRD < 30 MHz) FCC part 15.245 (2.4 GHz) FCC part 15C (120 kHz) FCC part 15C (13.56 MHz) Industry Canada RSS210	
Shock	IEC 68-2-27 Ea	50 G, 6 ms, 10x3 dir
Bump	IEC 68-2-29 Eb	25 G, 6 ms, 1000x3 dir
Random vibration	EN 50155	5 – 150Hz, 5 G, 20 sweeps x 3 dir

B PART NUMBERS

Readers		
9	TRANSIT Entry	9876200

Accessories		
	Ethernet (TCP/IP) board	7817940
	MTR Module	7816650
	HID interface board	7819102
	Adjustable mounting bracket	9875840

Transponders		
	Compact Tag	9891900
	Window Button Window Button Switch	9882650 9882480

FCC / IC Statement

C FCC / IC STATEMENT

FCC ID: CGD-TRANSITENTRY IC: 1444A-TRANSITE

This device complies with part 15 of the FCC Rules and to RSS210 of Industry Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Disclaimer

D DISCLAIMER

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Document revision

E DOCUMENT REVISION

Version	Date	Comment
4.1	2015-08-24	Document number on front page
4.0	2014-02-11	Layout adjusted to new corporate style