# Invexs 170 readers Nedap Mifare dual technology readers

General

The Invexs 170 reader series is capable of reading (simultaneously) Nedap, Mifare and DESFire credentials due to its dual reader technology. The Invexs 170 can read Mifare, DESFire and Nedap cards, and is equipped with keypad and/or a display. The Invexs 170 output can be set to either Wiegand, XS RF modulation or RS485 protocol (plain or encrypted). Functionality and output are determined by the configuration of the Invexs 170 reader.

The configuration is defined using the program AEreco, and deployed by the configuration card or via AEmon. More information about configurations can be found in the *Convexs Invexs Installation Manual*. Three LEDs (red, green, blue) and beeper are included (display version has no LED). Ciphers of the keypad versions light up after activation, so when not active the ciphers are not visible. Back panel colour: black.
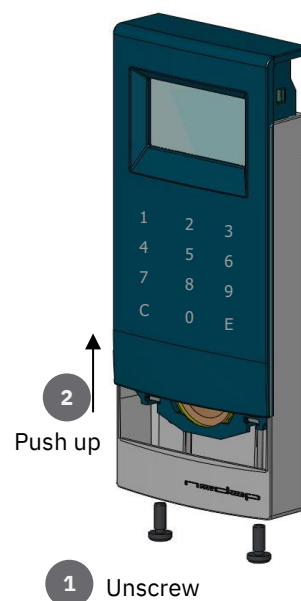
Dimensions
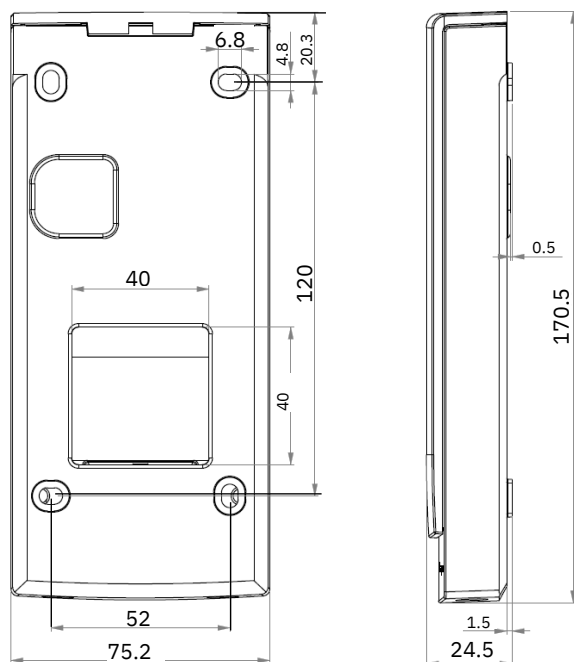
Dimensions: 171 x 75 x 25 mm.

4 mounting holes available at 52 x 120 mm.

Cable outlet: 40 x 40 mm.

Mounting procedure Invexs 170

For mounting the Invexs 170, the back plane must be placed on the wall first. To remove the back plane from the Invexs 170, unscrew the two screws **(1)** at the bottom of the Invexs 170 and push the front cover up **(2)**. Mount the back plane using the 4 holes.

Connections must be made on the connector on the backside of the front. After making the connections, replace the front and tighten up the two screws **(1)** at the bottom of the Invexs 170.

Connections

The Invexs 170 is not hot-swappable, so power must be switched **Off** when making/changing connections.

| Invexs 170		Function
1	Power / XSMOD	Power in (12-30VDC) / XS modulator (120kHz)
2	POWER GND/Shield	Power Ground
3	A (-)	RS485
4	B (+)	RS485
5	D0	Wiegand Data 0
6	D1	Wiegand Data 1
7	BEEP	Beep input
8	UL*	UL LED input
9	GND	LED Common Ground
10	NA*	NA LED input
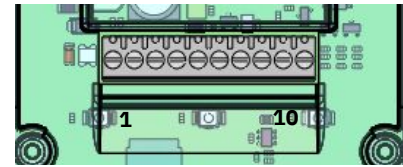
Invexs 170 without display

Invexs 170 with display

- Cable shield must be connected to Power GND of the Invexs 170 (connector 2) and GND of the external device (or to the metal case).
  If connected to a 120kHz RF device (AEOS Nedap reader AEpack) the power is supplied via the AX1014 Convexs/Invexs adapters. Existing antenna cabling can then be reused for connecting the Invexs 170.
- UL*,NA* and BEEP are inputs for *Open Collector to GND*. If the AX1014 Convexs/Invexs adapters are used, the original UL and NA signals are converted to the UL* and NA*.
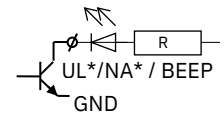
LED indicators inside

There are two LEDs available: blue for *Status* (of the reader application), green for *Identification.* Both LEDs are visible through two small holes at the back side.
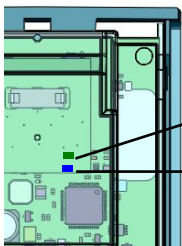
ID (green)	
Blinking	Card detected

ST: STATUS (blue)	
Slow blinking	Application running (operating)
Fast blinking	Downloading or error during loading
2 short flashes	Application present but not active
3 short flashes	No application present

LED indicators front side

At the front a three-colour LED is positioned at the middle of the Invexs 170 reader.
Depending of the configuration, the function of these LEDs can differ:

- Green LED: Card is authorised (UL LED)
- Red LED: Card is not authorised (NA LED), controller is stand-by
- Blue LED:
  Blinks fast: No configuration available at this Invexs 170.(Present configuration card or load configuration first).
  Continuously ON: Determined by configuration, for example, reader is stand-by.
                        (Blue LED is activated if UL is OFF and NA is more than 1 second OFF.)

> **!** Function of LEDs and Beeper is controlled by the application settings of the Invexs 170. Green and red LED can be controlled by hardware signals (connectors 8 and 10) or RS485NR, Blue LED indirectly by UL and NA, if this setting is activated in the configuration.
> Beeper can be controlled by a hardware signal (connector 7), RS485NR or software (configuration).

Firmware

Pay attention that the firmware loaded in the Invexs 170 together with the configuration determines functionality and protocols. By default the Invexs 170 handles the credentials in several simultaneous ways:

- XS cards as: RS485NR, RF badge
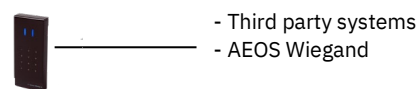- Mifare cards (CSN) as: RS485NR, RF data

System configurations (how to connect Invexs 170 readers)

AEOS RS485 interface
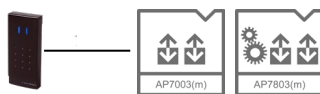
To APx003 reader interface with RS485 encrypted protocol. LEDs, keypad, beeper and display are controlled over RS485.

Wiegand interface

- Third party systems
- AEOS Wiegand

Wiegand output can be connected to third party systems (or to AEOS Wiegand interfaces). LEDs and beeper are controlled by hard wiring. PIN code possible.

For RF interface system configurations, see the *Convexs Invexs Installation manual*.

> **!** Configurations can be determined with AEreco (loaded by AEmon or with the configuration card).

> **!** Check https://portal.nedapsecurity.com for the compatibility of the readers and the latest available firmware.

Tamper Switch

The Invexs 170 reader is equipped with a tamper switch. This tamper switch can be monitored over the RS485NR protocol.

Beeper indications

The beeper is also used for indication of loading the configuration:

- High sound beep ('happy sound'): Configuration is loaded correctly, second high sound beep indicates that this configuration can be used at this Invexs 170.
- Low sound beep ('unhappy sound'): Configuration is not correctly loaded or no configuration available at start-up.

Certifications

CE and UKCA

Hereby NEDAP N.V. declares that the subject equipment is in compliance with:
For CE: Directives 2014/53/EU (Radio Equipment Directive) and 2011/65/EU (Restriction of the use of certain hazardous substances).
For UKCA: SI2017/1206 (UK Radio Equipment Regulations 2017) and SI2012/3032 (Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (RoHS)).
The full text of the declaration of conformity is available at www.nedapsecurity.com where, if applicable, also REACH information can be found.

The products will be disposed of by the end-user and discharge Nedap for any liability or responsibility thereof.

FCC and ISED

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
Les changements ou modifications n'ayant pas été expressément approuvés par la partie responsable de la conformité peuvent faire perdre à l'utilisateur l'autorisation de faire fonctionner le matériel
This device complies with part 15 of the FCC Rules and with RSS-210 of Innovation, Science and Economic Development 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.
Cet appareil se conforme aux normes CNR-210 exemptés de license d'Innovation, Sciences et Développement économique Canada. L'opération est soumis aux deux conditions suivantes: (1) cet appareil ne doit causer aucune interférence, et (2) cet appareil doit accepter n'importe quelle interférence, y inclus interférence qui peut causer une opération non pas voulu de cet appareil. Les changements ou modifications n'ayant pas été expressément approuvés par la partie responsable de la conformité peuvent faire perdre à l'utilisateur l'autorisation de faire fonctionner le matériel.

Check our website www.nedapsecurity.com for a full overview of all certified models, certificates and other certifications.

Article numbers

Invexs 170 reader		Invexs 170 reader + keypad		Invexs 170 reader + screen		Credentials
Invexs MD170B	9834400	Invexs MDK170B	9834680	-	-	Mifare – DESFire
Invexs MND170B	9899570	Invexs MNDK170B	9938761	Invexs MNDKS170B	9938796	Mifare – Nedap– DESFire

Specifications

Dimensions:	171 x 75 x 25 mm		Weight:	± 200 g	
Protection:	IP40		Tamper switch:	Yes	
Environment:	Temperature: Operating: -0 – 55°C, Storage: -30 – 65°C		Relative humidity:	10 – 93% non-condensing	
Power supply:	M(N)D170B:	12 – 30VDC, 70 – 28mA SELV	Power consumption:	70mA@12VDC, 35mA@24VDC	
	M(N)DK170B:	12 – 30VDC, 125 – 50mA SELV		125mA@12VDC, 60mA@24VDC	
	MNDKS170B:	12 – 30VDC, 130 – 52mA SELV		130mA@12VDC, 65mA@24VDC	
	The power supply or power adapter must comply with local regulations for a SELV (ES1), limited power (NEC class2, ps2) output.				
Communication:	RS485 (Encrypted AEOS protocol to APx003, (firmware APx003rs485NR) / RS485 plain. Wiegand Data 0 and Data 1 (depending on configuration). RF Modulator (120 kHz for AX1014).				
Inputs:	Beeper	Open collector to GND, max 20mA (Beep ON / OFF, controlled by application)			
	UL* LED, NA* LED	Open collector to GND, max 20mA			
Indicators:	UL (green), NA (red), MD (blue) if available				
Antennas (internal):	Antenna 1:	120 kHz, Nedap XS compatible (PM and AM cards). Detection distance UniXS card: 15 cm			
	Antenna 2:	13,56 MHz, Mifare compatible. Detection distance Mifare card: 5 cm, Mifare EV1 card: 1 cm			
Cable specifications					
RS485:	Excl. power: 1 x 2 x 0.22 mm² shielded (characteristic impedance 100-120 Ohm), max cable length: 300 meter				
	Incl. power: 2 x 2 x 0.22 mm² shielded (characteristic impedance 100-120 Ohm), max cable length: 150 meter				
UL/GND/NA:	3 x 0,25mm², max cable length: 50 meter				
XS MOD/ GND:	Coax RG58U, max cable length: 50 meter				
	Or 5 x 0,25mm² shielded, max cable length: 50 meter, cable capacity <= 100pF/meter				
Wiegand:	4 x 0,25mm² shielded (excl. LEDs), max cable length: 150 meter, depending on receiving device				
	MORE INFORMATION: Contact your local Nedap supplier or check our website www.nedapsecurity.com				