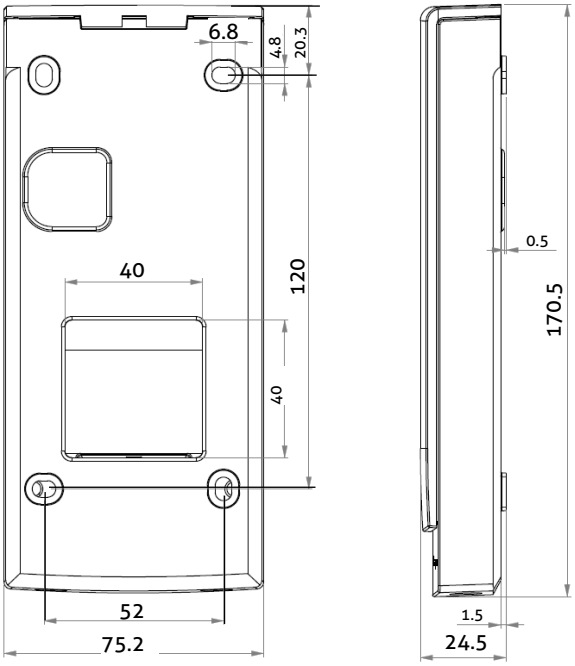
Invexs 170 Readers Mifare Nedap dual technology readers

1. General

The Invexs 170 reader series is capable of reading (simultaneously) Nedap, Mifare and DESFire credentials due to its dual reader technology. The Invexs can read Mifare, DESFire and Nedap cards, and is equipped with keypad and / or a display. The Invexs 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 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 is available only black (MNK170B).

2. Dimensions



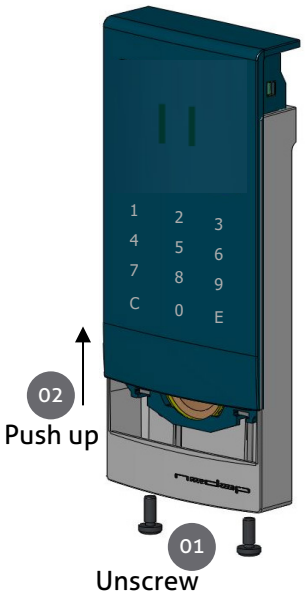
Dimensions: 171 x 75 x 25 mm.

4 mounting holes available at 52 x 120 mm

Cable outlet: 40 x 40 mm

3. Mounting Procedure Invexs

For mounting the Invexs, the back plane must be placed on the wall first. For removing the back plane from the Invexs, unscrew the two screws 01 at the bottom of the Invexs and push the front cover up 02. Mount the back plane using the 4 holes. Connections must be made on the connector on the



Date: 27-05-2019 Version 12.0 Document no.: 5265800

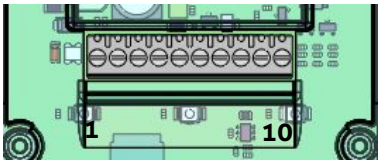
backside of the front. After making the connections, replace the front and tighten up the two screws at the bottom of the Invexs.

4. Connections

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

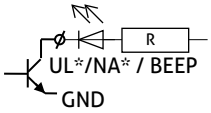
Invexs		Function
1	Power / XSMOD	Power in (12-30VDC) / XS modulator (120kHz)
2	POWER GND/Shield	Power Ground
3	A (-)	RS485
4	B (+)	RS485
5	D0	Wiegand Data 0
6	D1	Wiegand Data 1
7	BEEP	Beep input
8	UL*	UL LED input
9	GND	LED Common Ground
10	NA*	NA LED input

Invexs without display



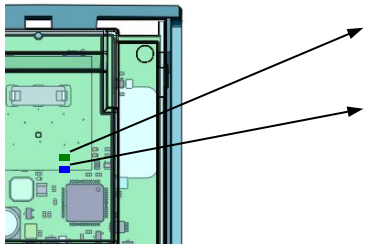
Invexs with display

- Cable shield **must** be connected to Power GND of Convexs (A2) and GND of external device (or metal case).
- If connected to a 120kHz RF device (AEOS Nedap reader AEpack or XS device) the power is supplied via the Convexs adapters (AX1014 for AEpacks, AB350 for XS devices). Existing antenna cabling can then be reused for connecting the ConveXS.
- UL*,NA* and BEEP are *Open Collector to GND*.
  If the Convexs adapters are used, the original UL and NA signals are converted to the UL* and NA*.



5. LED Indicators Inside

There are two LEDs available: Blue for Status (of application), Green for Identification (both 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

6. LED Indicators Front

At the front a three colour LED is positioned at the middle of the Invexs
Depending on the used configuration the function of these LEDs can differ:

- Green LED: Card is been authorised (UL LED)
- Red LED: Card is not authorised (NA LED), controller is stand-by
- Blue LED:
  - Blinks fast; No configuration is available at this Invexs (present *Configuration card* or load *Configuration* first).
  - Continuously ON; Determined by configuration: E.g. Reader stand-by.
    (Blue LED is activated if UL is OFF and NA is more than 1 sec OFF.)

Function of LEDs and Beeper is controlled by used application settings of Invexs. Green and Red LED can be controlled by hardware signals (Connector 8 and 10) or RS485NR, Blue LED indirectly by UL and NA, if this setting is activated (configuration). Beeper can be controlled by hardware signal (Connector 7), RS485NR or software (configuration).

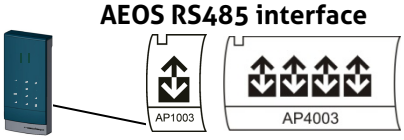
7. Firmware

Pay attention that the firmware loaded in the Invexs together with the Invexs type and configuration determines functionality and protocols. For the Invexs with screen contact Nedap. Default (from factory) the Invexs handles the credentials on several ways simultaneously:

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

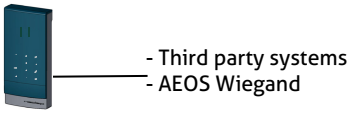
8. System Configurations (how to connect Invexs readers)

AEOS RS485 interface



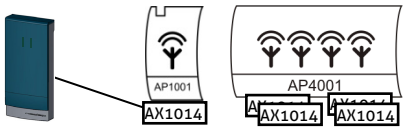
To APx003 readers with RS485 special encrypted protocol. (LEDs, Beeper, Keys and Display are controlled over the RS485 communication)

Wiegand interface



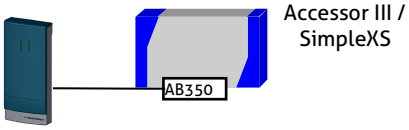
Wiegand output connected to Third party systems (or to AEOS Wiegand interfaces). LEDs andBeeper are controlled by hard wiring. (PINcode possible)

RF interface AEpacks



Invexs uses existing antenna cabling (Coax + 3*0,25qmm for LEDs).
On each AEpack-RF interface an AX1014 must be added. Connections: see AX1014

RF interface XS systems



Invexs uses existing antenna cabling (Coax + 3*0,25qmm for LEDs).
On each XS reader-RF interface an AB350 must be added. Connections: see AB350

Configurations can be determined by using the configuration card.

Check the *Convexs Invexs Installation Manual* chapter 8 (Available reader Firmware) for the compatibility for the used readers.

9. Tamper Switch

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

10. Beeper Indications

Beeper is also used for indication of loading the configuration:

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

SPECIFICATIONS Invexs 170: MD170B (article no.9834400), MND170B (article no.9899570), MDK170B (article no.9834680), MNDK170B (article no.9938761), MDNKS170B (article no.9938796)

Discontinued products: M170B (article no. 9833900), M170W (article no. 9832750), MD170W (article no. 9834370), MN170B (article no. 9834060), MN170W (article no. 9832890), MND170W (article no. 9899570), MK170B (article no. 9834230), MK170W (article no. 9832920), MDK170W (article no. 9834540), MNK170B (article no. 9833730), MNK170W (article no. 9833080), MNDK170W (article no. 9938753), MKS170B (article no. 9939822), MKS170W (article no. 9833390), MDKS170B (article no. 9939849), MDKS170W (article no. 9891820), MNKS170B (article no. 9833870), MNKS170W (article no. 9833420), MNDKS170W (article no. 9938788)

Dimensions:	171 x 75 x 25 mm	Weight:	± 200 gr
Protection:	IP40		
Power Supply:	M(N)(D)170 12 – 30VDC, 70 - 28mA SELV	Power Consumption:	70mA@12VDC, 35mA@24VDC
	M(N)(D)K170 12 – 30VDC, 125 - 50mA SELV		125mA@12VDC, 60mA@24VDC
	MNDKS: 12 – 30VDC, 130 - 52mA SELV		130mA@12VDC, 65mA@24VDC
Environment:	Temperature: Operating:0-55°C, Storage:-30-65°C	Relative humidity:	10 – 93% non-condensing
Tamper switch:	Yes		
Communication	RS485 (Encrypted AEOS protocol to APx003, (firmware APx003rs485NR). RS485 plain Wiegand Data 0 and Data 1 (protocol depending on configuration) RF Modulator (120 kHz for AX1014 or AB350)		
Inputs:	Beeper (Beep ON / OFF, controlled by application) Open collector to GND, max 20mA UL* LED Open collector to GND, max 20mA 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). Antenna 2: 13,56 MHz, Mifare compatible	Detection distance UniXS card: 15 cm Detection distance Mifare card: 5 cm Mifare EV1 card: 1 cm	

CABLE SPECIFICATIONS

RS485:	2 x 2 x 0,25mm² shielded, max cable length: 1000 meter, cable capacity <= 100pF/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