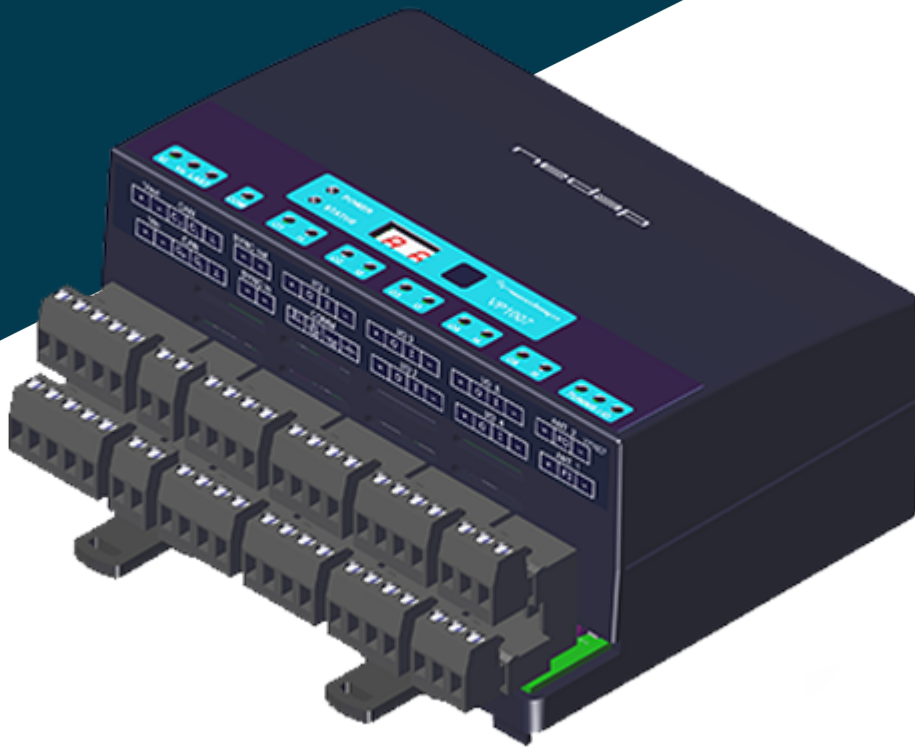


Instruction Manual

VP1007-B



Installation manual

Version 01.000 / November 2020 / EN

Original instructions



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Warranty and spare parts

Please consult the Nedap products dealer from whom you purchased this product, in regards to the applicable warranty conditions. This product cannot be used for any other purpose as described in this document. If the product is not installed according to this document; the warranty provided is not applicable. At the sole discretion of Nedap N.V., Nedap N.V. may decide to change the conditions of the warranty policy. You agree that Nedap N.V. is able to compensate you the pro-rata value of the warranty involved rather than replacing or repairing the product depending on the technical or economical value of the product. Prior to applying the warranty, please verify if you comply with the warranty conditions of the warranty policy, whether you can successfully apply for the replacement or repair of a defective part. Parts can only be replaced with original Nedap parts, otherwise the warranty policy will not be applicable on the product. If the warranty is applicable, please contact the dealer or send the defective parts to the dealer.

Additional information

For any information or questions regarding the product, please contact your own dealer.

VP1007-B



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1 Safety

Read this manual before using this product. Failure to follow the instructions and safety precautions in this manual may result in serious injury or death. Keep this manual in a safe location for future reference.

Symbols used in the manual

 Danger	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
 Warning	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 Caution	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	Indicates important information but not hazard related.
	Suggestions and advice to perform certain tasks more easily.

General safety instructions

-  **Warning**
Always turn off the mains power supply when working on the electrical installation.
-  **Warning**
Always wear proper protection when installing and maintaining the VP1007-B.
-  **Caution**
Use the VP1007-B only with a suitable power supply. The power supply or power adapter must comply with local regulations for a SELV, limited power (NEC class2, ps2) output (e.g. Nedap VP2001-B or Nedap power adapter (P/N 9223126)).
-  **Caution**
Installation and service should only be done by locally qualified personnel.
-  **Caution**
Install the system according to the local rules and regulations.

Working environment

-  **Caution**
The installation area must be free from any obstacles, including animals.





Caution

Make sure all components are installed out of reach of animals.



Caution

Make sure all cables are properly concealed, and form no danger for stumbling.



Caution

Take into account the high concentrations of ammonia when installing and maintaining the VP1007-B in pig barns.

Animal welfare and safety

The automated actions of the Nedap Livestock Management systems do never discharge the installer and the user of the system from his/her responsibility to assure **and** to take care of the well-being of the animals.




2 VP1007-B introduction

The Nedap VP1007-B Transceiver is a reader and input/output controller that is used for feeding, weighing, milking, heat detection, sorting/routing, identification and so on.

Connectors:

- 2 Antenna connections, 1 active at the time
- FDX sync / HDX sync

 *HDX and other extra ID options are only available by license. If no license is purchased for the VP1007-B, these options can be tested for a 24-hour period.*

- 1 CAN channel with 2 connectors
- 5 Outputs (max 2A)
- 5 Inputs
- 1 RS485 / RS232 communication channel

Features:

- Identification of tags
- Activates and controls e.g. lights, motors, valves, relays
- Reads the input for e.g. sensors, switches
- Special serial interface (RS485 / RS232) for connecting sensors with serial interface

All currently available Nedap Livestock antennas can be used.


2.1 Extended functionality

The new generation V-packs (V-pack B types) are based on a new transmitter-receiver module with an improved way of animal identification based on Digital Signal Processing (DSP) technology.


The V-pack B types offer the following new features:

- Notch Filter (nF): This option suppresses the signals that are received from long wave transmitters near Berlin, Frankfurt and Budapest. Especially large antennas such as the Walk Through and Walk Past antennas are sensitive for this. Noise reduction antennas will not need this notch filter as they already suppress these long wave transmitter signals.

These new options and the HDX mode must be activated with a license on the VPU (VP8001/VP8002). If the V-pack is not connected to a VPU, a license for the V-pack must be purchased.

 *Nedap: If no license is purchased for the VPU or the V-pack, the HDX and/or Notch Filter options can be tested for a 24-hour period. For more information see the menu overview of the V-pack in the Appendix.*

 *To check if the VP1007 is a B version, a "b" will appear on the display shortly after the VP1007-B is booted.*

 *If a system uses HDX tags, and a VP1007 has to be replaced with a VP1007-B, there are two options:*

1. *Order a special VP1007-B with HDX license pre-installed on the VP1007-B, or:*
2. *Order a normal VP1007-B FDX only and add a separate HDX license to the VPU for this VP1007-B.*



3 Installation

Do not operate the product without first reading this chapter and the safety section at the beginning of this manual.



Warning

Failure to follow safety precautions in this chapter could result in serious injury or death.

3.1 Requirements for installation

3.1.1 Electrical requirements

Mains power

Make sure the mains power supply for the system is easily accessible and not too far away from the barn in which the units are placed. The power sockets shall be installed near the equipment and must be easily accessible.



Caution

Nedap power supplies must be connected to a power socket with protective earth (PE). Always use a 3-pole connector with a PE contact.



If there is no PE available, create a PE next to the power socket to be used for each power supply. The properties of a correct PE depend on local circumstances and legislation. Always comply with local rules and regulations when installing earth electrodes.

Cabling

Install the Velos CAN cable(s) inside a plastic (PVC) conduit.



Do NOT install cables directly to metal ceiling, trusses, feed lines and power lines.

Lightning protection

It is important to follow closely the guidelines that are described in this section, in order to minimize risk of damage on Velos systems in case of lightning. Nedap does, however, not accept any responsibility for damage caused by high voltage (such as lightning), as described in the Warranty Policy.

Protective Earth (PE)

PE is meant for safety related issues such as electric shocks to humans or animals. PE will not protect devices (sufficiently) when they are struck by lightning. Normally PE is situated next to the main power source only.

Grounding

Grounding is a connection to the ground, but not Protective Earth, for example a metal roof that is connected to different earth electrodes in order to lead high peak currents (such as lightning) to the earth.



Nedap can never be kept responsible for incorrect functioning of networks or any damage arising from the recommendations mentioned in this document.

3.1.2 Electromagnetic requirements

Nedap Animal Identification uses radio waves in compliance with ISO 11784/11785 standard and local regulations.



Notwithstanding all due precaution by Nedap, Nedap Animal Identification may not function optimally due to devices that emit radio waves, such as (but not limited to) variable frequency drives, electronic ballasts of lighting systems, power supplies, electronic converters of solar panels/windmills and (long) wave radio stations, which may cause interference with Nedap Animal Identification.

No claims, representations or warranties, whether expressed or implied, are made by Nedap as to the performance, reliability, durability and safety of Nedap Animal Identification used in conjunction with abovementioned or other devices.

In order to achieve optimal performance of Nedap Animal Identification, the electrical installation on the farm needs to meet the conditions that are shown below.

- Maximum allowed environmental noise level: 10 dB μ A/m quasi peak, according to CISPR 16-1-1.
- Maximum allowed conducted noise: according to EN55032: 2015.

3.1.3 Tools requirements

- Screwdriver size 0.4 x 2.5 mm (0.016 x 0.098 in.) for the LAN connector of the V-pack.

3.2 Mount the VP1007-B

Mount the VP1007-B in a dust and splash proof housing, preferably a Nedap V-box:



If the VP1007-B is installed as a part of a complete Nedap system, use the installation manual of this system. The installation manual can be obtained from your dealer or on our Business portal: <http://www.nedap.com/livestockmanagement-portal>.

1. Mount the V-box according to the installation instructions of the V-box, which can be obtained from your dealer or on our Business portal: <http://www.nedap.com/livestockmanagement-portal>.
2. Mount the VP1007-B in the V-box:
 - a. Pull down the 2 lips on the back side of the VP1007-B.
 - b. Place the VP1007-B on the top of the DIN rail inside the V-box.
 - c. Hinge down the VP1007-B until it clicks in.
 - d. Push up the 2 lips to secure the VP1007-B to the DIN rail.
3. Close the V-box.

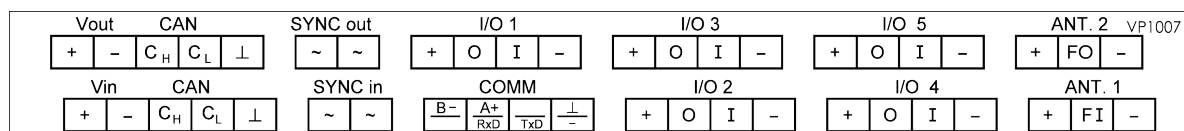


Caution

Make sure to always close the V-box with the V-box cover and check the correct position of the cover seal.

3.3 Wiring

Connectors



Connector	Symbol	Description
Vout	+	Output voltage 25 VDC, ± 20%
-	Minus	
Vin	+	Input voltage 25 VDC, ± 20%
	-	Minus
CAN	C_H	CAN high (cable twisted pair with C _L)
	C_L	CAN low (cable twisted pair with C _H)
	⊥	CAN bus cable shielding
SYNC in	~	Antenna synchronization, AC (no plus or minus, cable must be twisted pair)
	~	Antenna synchronization, AC (no plus or minus, cable must be twisted pair)
SYNC out	~	Antenna synchronization, AC (no plus or minus, cable must be twisted pair)
	~	Antenna synchronization, AC (no plus or minus, cable must be twisted pair)
I/O 1/2/3/4/5	+	Output max. 2 A (total of all outputs 4 A)
	O	Output max. 2 A (total of all outputs 4 A)
	I	Input
	-	Minus for output (O) and minus input (I)
COMM	B-	Receive data (RS-485)
	A+ / RxD	A+ = Send data (RS-485) / RxD = Receive data (RS-232)
	TxD	Send data (RS-232)
	⊥ / -	Shield (RS-485) / minus (RS-232)
ANT. 1	+	Plus (core of coax cable or plus of antenna cable)
	FI	Frequency synchronization (of the antenna signal) in (must be connected to the FSYNC-O connector of the other V-pack)
	-	Minus (shield of coax cable or minus of antenna cable)
ANT. 2	+	Plus (core of coax cable or antenna cable)
	FO	Frequency synchronization (of the antenna signal) out (must be connected to the FSYNC-I connector of the other V-pack)
	-	Minus (shield of coax cable or antenna cable)

Velos CAN cable

Velos CAN cable	Wiring	Wire color
	1. Power +25 Vdc	1. Red
	2. Power -	2. Black
	3. CAN _{High}	3. Blue
	4. CAN _{Low}	4. Blue/white
	5. HF synchronization	5. Orange
	6. HF synchronization	6. Orange/white
	7. Shield communication wires	7. Blank
	8. Shield synchronization wires	8. Blank





Caution

- The maximum number of V-packs that can be installed per CAN channel of the VPU depends on the power consumption.
- The maximum CAN cable length between the VPU and the last V-pack is 80 m (262 ft) with 1.5 mm² (0.0023 in.²) cable and 100 m (328 ft) with 2.0 mm² (0.0031 in.²) cable.

3.3.1 Wiring diagram VP1007-B

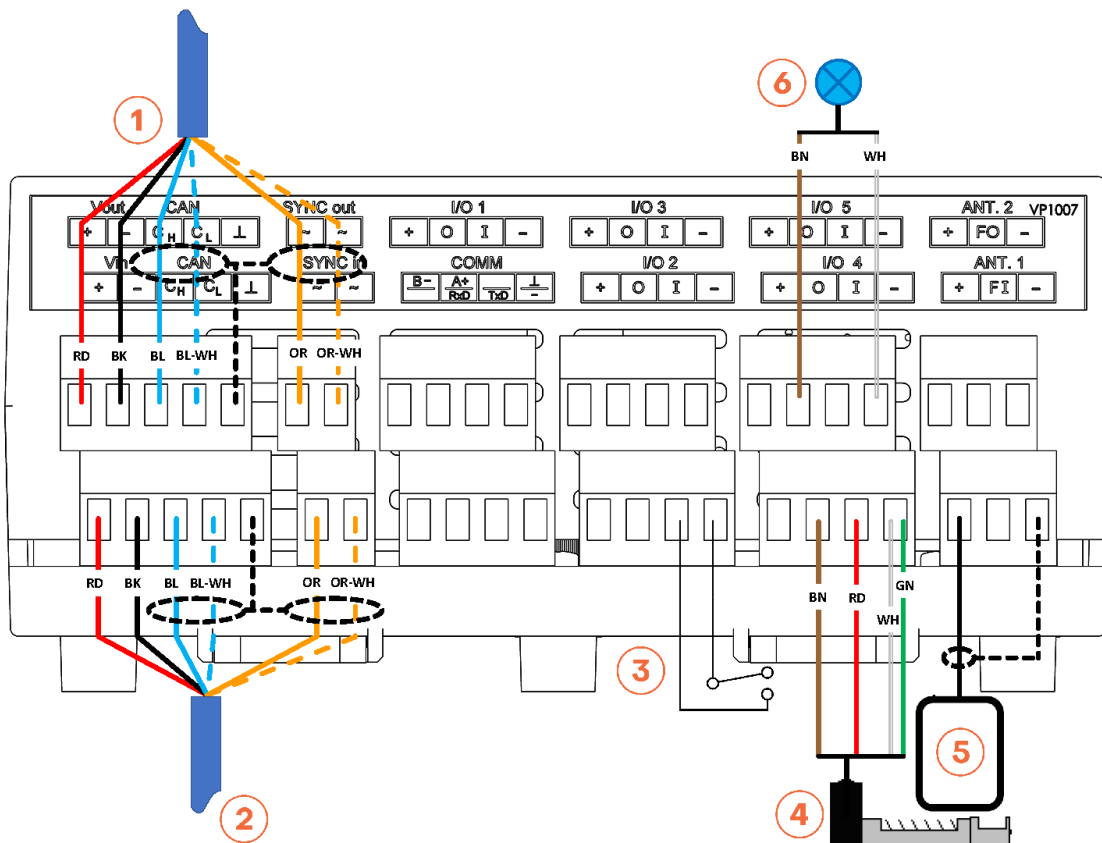


Figure 1: Wiring diagram VP1007-B example

1. Velos CAN cable OUT (to next V-pack)
 2. Velos CAN cable IN (from VPU or previous V-pack)
 3. Switch
 4. Feed motor
 5. Antenna
 6. Signal light
- Wiring colors: see [Wiring color coding \(page 28\)](#)

1. Install all wiring according to the VP1007-B wiring diagram. An example of a VP1007-B wiring diagram is shown in Figure 1 (page 9).



If the VP1007-B is part of a complete Nedap system, use the installation manual of this system. The installation manual can be obtained from your dealer or on our Business portal: <http://www.nedap.com/livestockmanagement-portal>.

2. The **SYNC** connector is used for the synchronization of the ISO identification between more than one ISO transceiver, such as the VP1007-B:



- The **SYNC** connection is mandatory when using the ISO mode of the VP1007-B
- When using FDX only it is not necessary to connect the synchronization cable.



- Use a 2-conductor cable to connect the **SYNC** connectors of two or more VP1007-B transceivers together.

The cable type is not critical, a twin lead or coaxial cable can be used. Also the connection is not sensitive for polarization (+ and - are interchangeable).

3. Preferably, use ferrules to connect the wires. These ferrules are not supplied.



4 Configuration

4.1 Configure the VP1007-B



Caution

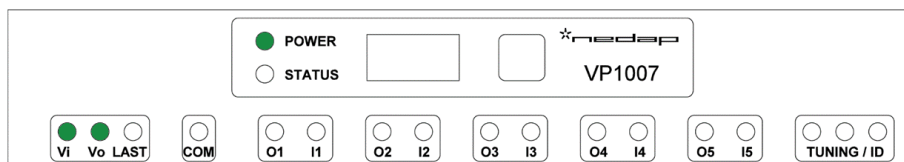
Before configuring the VP1007-B, the system must be fully mounted and all cabling must be installed and checked.

Some settings of the VP1007-B must be set prior to use.

1. Power up and check the LED indicators (see Power up check).
2. Set the required address (see Address setting).

Power up check

1. Power up the VPU.
2. Check if the VP1007-B has power after power up. The "Power", "Vi" and "Vo" LEDs must light up green.



3. Check if the LED "LAST" is green at the last V-pack on the CAN bus
4. When the LEDs are green, continue with address setting.



Caution

If the output LEDs are red (flashing), there is an output error. Go to **It > dE** in the display menu to reset all errors.



The LED indicators are explained in VP1007-B reader LED indicators (page 25).

Address setting



The parameters and use of the VP1007-B are described in VP1007-B reader menu overview (page 26).

Each V-pack connected to the same VPU requires a unique logic address. Set the logic address of the VP1007-B either **manually** or in **Velos**:

1. Set the logic address of the VP1007-B **manually**:
 - a. Go to parameter **Ad > dA** in the VP1007-B menu to read the logic address of the VP1007-B. The default logic address of the VP1007-B is 01.



Caution

When the logic address is not a unique number, the logic address will blink in the display.

- b. Go to parameter **Ad > SA** to set the logic address of the VP1007-B reader to a unique number when multiple V-packs are connected to the same VPU.



- The available address range is 01 – 99.
- c. To leave the menu, push and hold down the button until the display goes blank.
2. Set the logic address of the VP1007-B in **Velos**:
 - a. In Velos, go to **Settings > Devices - V-packs**.
 - b. Select the correct VPU in the drop-down list.
A list with all V-packs connected to the VPU is shown. The **Address** column shows the logic addresses of the V-packs.
 - c. Find the VP1007-B in the list and check the logic address.
The default logic address of the VP1007-B is 01.
 - d. If necessary, click on the logic address and change it to a unique number. Click **Ok** to save the change.



Caution

V-packs with the same logic address are indicated with a red exclamation mark icon.

- e. Click on **Submit** to save all changes.

4.2 Check for firmware updates



Caution

The VPU and V-packs are never updated automatically by the VPU.

Update via the VPU

When the VPU or V-pack is connected with a computer, the firmware can be updated using the Nedap Velos software:

1. In Velos, go to **Maintenance > Devices - V-packs**.
2. Select the correct VPU in the drop-down list.
A list with all V-packs connected to the VPU is shown. The **Firmware** column shows if an update is available.
3. Select the V-pack(s) that must be updated.
4. Click on **Actions > Update**.
5. Click on **I agree** to confirm.



5 Commissioning



Caution

Before commissioning and handing over the system to the user, the installer must perform several checks and tests to verify that the system functions flawlessly. Encountered issues and problems must be solved first.

5.1 Testing inputs and outputs

The inputs and outputs of the VP1007-B can be tested with three tests:

1. Input/output test for Nedap feed motors.
2. Output test to check connected equipment like lights, valves or relays.
3. Input test to check connected equipment like switches and sensors.

The tests are performed using the menu options described in VP1007-B reader menu overview (page 26)

Feed motor test

The feed motor test is a combination of an input and output test.

1. Go to **It > o1** to test the feed motor on the connector I/O 1.
When the test is finished, the test results are shown as a code on the display (blinking).

Code on the display	Description motor test results
00	Motor run ok
01	Output already in use
02	No motor current measured
03	No input signal seen
06	Motor current too high for too long
08	Current still measured after test has stopped
09	Output voltage is stopped due to motor safeguard function
10	Output already in use
12	Motor current too low while running
13	Previous motor command finished, output still active

- a. When the test result is not OK (higher than 00): Fix the problem and go to **It > dE** to reset the error.
2. If applicable, repeat step 1 for option **o2, o3, o4** or **o5** to test feed motors on connector I/O 2, I/O 3, I/O 4 or I/O 5.

Output test

The output test is used to test connected equipment like light, valves or relay on the output connectors.

1. Go to **It > L1** to test the connected equipment on output 1.
The output is switched on.
2. Check if the green LED of the output is on.
A red blinking LED indicates an output error.
3. Go to **It > dE** to reset the output errors.
4. Check if the connected equipment is activated.



- If not, check the wiring.
- Press the button on the display to stop the test.
The output is switched off.
 - Repeat step 1 for parameter **L2** to **L5** to test equipment on output 2 to 5.

Input test

The input test is used to test connected equipment like switches and sensors on the input connectors.

- Go to **It > i1** to test the connected equipment on input (I) 1.
The input is read.
- Check if the green LED of the input is on or off.
- Switch the connected equipment on and off and check the values in the display.
The on and off setting must show a unique value (0 or 1).











 *When the VP1007-B is part of a complete Nedap system, the meaning of the input values (open or closed) depends on the settings of the behavior component of the Nedap system.*

- Press the button on the display to stop the test.
- Repeat step 1 for parameter **i2** to **i5** to test equipment on input (I) 2 to 5.

5.2 Antenna tuning

After the first time power up, the antenna tuning must be checked.

- Check the TUNING LED and follow the instructions in the table (see also VP1007-B reader LED indicators (page 25)):

Tuning LEDs		Description	Action
Green		On	Antenna 1 tuned correctly.
		Blinking	Antenna 1 identified tag.
		On	Antenna 2 tuned correctly.
		Blinking	Antenna 2 identified tag.
Various		Red on	Antenna 1 not tuned correctly (turn left).
		Red on	Antenna 1 not tuned correctly (turn right).
		Red on	Antenna 2 not tuned correctly (turn right).
		Red on	Antenna 2 not tuned correctly (turn left).
Red		Red blinking	Antenna 1 not connected or low antenna signal.
		Red blinking	Antenna 2 not connected or low antenna signal.

5.3 Antenna adjustment

The Antenna Power (AP) and Antenna Squelch (AS) can be adjusted manually to optimize the detection of the animal tags. The Adjust Antenna (AA) option can be used to manually tune the antenna.

The tests described in this section can be activated using the menu options described in VP1007-B reader menu overview (page 26).



Antenna power (AP)

1. Go to **HF > H1 or H2 > AP** in the menu to check the antenna power setting.
The default antenna power level is 99 (maximum value).
2. If necessary, adjust the setting of the antenna power **AP**.
Decreasing the antenna power level will reduce the reading distance of the antenna.
Increasing the antenna power level will increase the reading distance of the antenna, but the reading distance is also dependent on conditions like external noise, tag quality and antenna configuration.

Antenna squelch (AS)

With Antenna squelch you can set a threshold for the ID level of an EID tag. There is a relation between ID strength (RSSI) of a tag and the squelch level, and both values range from 0 to 99. Tags read with an RSSI value lower than the squelch level will not be identified.

RSSI: The Received Signal Strength Indication is an indication of the signal strength received by the receiver. The higher the RSSI value, the stronger the signal.

Squelch: The traditional squelch circuit is an audio switch controlled by the radio signal level using a fixed or manually adjustable threshold (level). When the received signal strength falls below this, the receiver is muted. When the VP1007-B reads the tag with an RSSI level below this threshold, the tag will not be read.

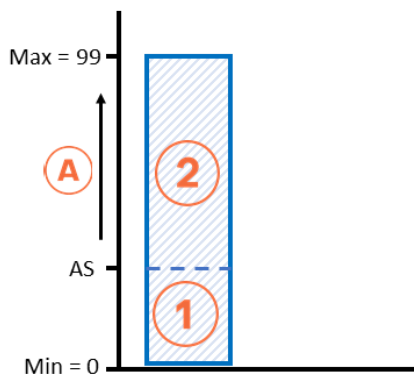


Figure 2: Antenna squelch (AS) diagram

1. Received tag numbers are not transferred.
 2. Received tag numbers are transferred.
- A. Antenna Squelch (0 to 99%)
AS. Antenna Squelch setting (between 0% and 99%)

1. Go to **HF > H1 or H2 > AS** in the menu to check the antenna squelch setting.
The default antenna squelch value is 0% (most sensitive setting). At the lowest value there is no threshold and all received tag data will be identified.
2. If necessary, adjust the antenna squelch value **AS** to set the correct threshold.
The maximum value is 99%. At this value no received tag data will be identified.

Antenna tuning with option "AA"

With the option Adjust Antenna (AA), you can follow the antenna tuning on the display of the VP1007-B.

 The antenna can also be tuned using the TUNING LED on the display (see Tune the antenna).

1. Go to **HF > H1 or H2 > AA** in the menu to check the antenna tuning setting.
A value will appear on the display. The highest display value is the optimum adjustment.
2. Turn the antenna trimmer slowly.
The display value will change.
3. If the value decreases, turn the antenna trimmer the other way.




4. Turn the antenna trimmer until the highest value is found.

Antenna reading distance

The antenna squelch and antenna power settings can be used to adjust the reading distance of the antenna for an optimal detection of the animal tags:

1. Check if the antenna is set up correctly:
 - a. Check that the antenna is tuned correctly: see Antenna tuning with option "AA".
 - b. Check that the antenna power (AP) is set to the desired level (usually 99): see Antenna power (AP) (page 15).

 *Increase the antenna squelch when the antenna field interferes with other transmitting fields or metal frameworks in the barn. If this is not sufficient, reduce the antenna power.*

2. Check the maximum reading distance of the antenna with an EID tag (e.g. 120 cm for a neck tag in a walk through antenna).
 - a. Move the tag to and from the antenna and use one of the following options to determine the maximum distance for tag identification:
 1. Check the TUNING/ID LED on the VP1007-B (see VP1007-B reader LED indicators (page 25)).
 2. Go to **HF > H1 or H2 > AS > id** and check if the last two digits of the tag ID appear in the display.

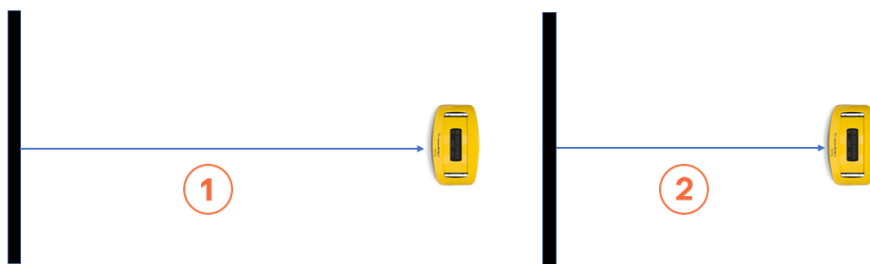


Figure 3: Antenna reading distance adjustment

1. Maximum before adjustment (e.g. 120 cm)

2. Maximum after adjustment (e.g. 80 cm)

3. Put the tag in the antenna field at the desired maximum reading distance (e.g. 80 cm) and read the RSSI value:
 - a. **FDX**: Go to **HF > H1 or H2 > AS > dF** and note down the value (e.g. 60).
 - b. **HDX**: Go to **HF > H1 or H2 > AS > dH** and note down the value (e.g. 60).
4. Set the squelch value:
 - a. **FDX**: Go to **HF > H1 or H2 > AS > SF** and set the value noted in step 3a.
 - b. **HDX**: Go to **HF > H1 or H2 > AS > SH** and set the value noted in step 3b.
5. Repeat step 2. The maximum reading distance of the antenna should now be found at the desired distance of step 3 (e.g. 80 cm).

5.4 Identification tests

The tests are performed using the parameters described in VP1007-B reader menu overview (page 26).

Tag identification

When a tag is detected by the antenna of the VP1007-B, the green TUNING/ID LED will automatically blink. The identification (**id**) test can be used to identify the tag number.

1. When the green TUNING/ID LED blinks, go to **It > id** on the display.
The last two digits of the tag number are shown.



FDX/HDX signal strength indication

The signal strength received by the reader of the VP1007-B can be tested. The FDX (dF) and HDX (dH) signals are tested separately.

1. **FDX** test:

- a. Go to **HF > AS > dF** on the display.
- b. Press the button until the display starts to blink.
A value (0 - 99) will appear on the display.
- c. Move an FDX tag slowly into the antenna field.
The display value will normally increase when getting closer to the antenna. If there is already a high value when the tag is not in the antenna field, this is an indication that an external source is causing noise (see Troubleshooting).

2. **HDX** test:

- a. Go to **HF > AS > dH** on the display.
- b. Press the button until the display starts to blink.
A value (0 - 99) will appear on the display.
- c. Move an HDX tag slowly into the antenna field.
The display value will normally increase when getting closer to the antenna. If there is already a high value when the tag is not in the antenna field, this is an indication that an external source is causing noise (see Troubleshooting).



For the VPU or V-pack with an ethernet connection, the RSSI values are shown on the Overview page of the web interface.



6 Troubleshooting


Errors and malfunctioning of the VP1007-B are indicated by the indicator LEDs or codes on the display.

Indicator LED

Indicator LEDs are normally green (except the blue Status LED) or switched off. A red or orange indicator LED usually means there is something not functioning correctly. See VP1007-B reader LED indicators (page 25) for the explanation of the various colors.

Display code

Codes on the display are normally controlled by the VPU. The error will be indicated in the Velos web interface.

 *If the VP1007-B is part of a complete Nedap system, see the Troubleshooting section in the installation manual of this system. The installation manual can be obtained from your dealer or on our Business portal: <http://www.nedap.com/livestockmanagement-portal>.*

Error codes shown with menu option "dE"

Actual error codes can be displayed with menu option **dE**:

1. Select option **dE** on the display (see VP1007-B reader menu overview (page 26)).
The error code will be displayed.

 *Multiple error codes will be displayed one after another with a short gap between each code.*

2. Press the button to clear the error.
3. If the error code is not cleared, the error could not be solved automatically. Try to solve the error.

Error code	Description	Possible solution(s)
00	No errors	No action
03	Power to outputs turned off (high side)	Test outputs one by one via it menu option
04	Power to outputs turned off (low side)	Test outputs one by one via it menu option
09	Output 1: output error. Possibly caused by error 01 to 08.	Check connected device on output 1
10	Output 2: output error. Possibly caused by error 01 to 08.	Check connected device on output 2
11	Output 3: output error. Possibly caused by error 01 to 08.	Check connected device on output 3
12	Output 4: output error. Possibly caused by error 01 to 08.	Check connected device on output 4
13	Current too high (> 8 A) to next V-packs: Power to next V-pack switched off	<ul style="list-style-type: none">• Disconnect all next V-packs• Reconnect next V-packs one by one and check Vi LED (green)
17	CAN bus high voltage (> 10 V): CAN terminator shut off	<ul style="list-style-type: none">• Check CAN cable for damages or shortcuts• Check connectors



Error code	Description	Possible solution(s)
18	Power to next V-pack switched off (max current and time)	See error code 13 or 19
19	Output voltage to next V-pack too low at activation: Power to next V-packs switched off.	<ul style="list-style-type: none"> • Disconnect all next V-packs • Reconnect next V-packs one by one and check Vi LED (green)
22	Offset voltage on CAN bus too high	<ul style="list-style-type: none"> • Check CAN cable for damages or shortcuts • Check connectors
23	Output 5: output error. Possibly caused by error 01 to 08.	Check connected device on output 5

Identification performance and disturbance

Identification performance may be decreased by disturbance caused by variable-frequency drives that are used for ventilation, milk pumps, vacuum pumps, etc. Also ballasts used for fluorescent tube lighting may interfere.



Caution

Most of the time when a variable-frequency drive is causing a problem, it is due to bad installation or the mandatory main filters have not been installed.

If there is interference, try to locate the source:

1. Follow the instructions in the manual "Optimizing animal identification", which can be obtained from your dealer or on our Business portal: <http://www.nedap.com/livestockmanagement-portal>.



7 Glossary

Term	Description
Antenna Power Boost	The extra ID option (licensed) that comes with the B-version V-pack, to enable the extra power option of the transmitter, which gives a boost to the antenna output.
Behavior component (BC)	The behavior of a standard hardware component and / or the total management system, set by Velos software.
CAN bus	Controller Area Network. A standard serial bus to connect electronic controllers and to allow the controllers to communicate with each other.
DHCP	Dynamic Host Configuration Protocol
Ethernet	Network communication standard for PCs in a LAN
FDX	Full Duplex is a bidirectional data communication system, where at both ends data signals are sent and received at the same time.
HDX	Half Duplex is a bidirectional data communication system, where data signals are sent and received in one direction at the time.
LAN	Local Area Network
Nedap product	The device or software of which the installation or use is described in this manual.
Router	Networking device that forwards data packets between computer networks
RSSI	The Received Signal Strength Indication is an indication of the signal strength received by the receiver. The higher the RSSI value, the stronger the signal.
Squelch	The traditional squelch circuit is an audio switch controlled by the radio signal level using a fixed or manually adjustable threshold (level). When the received signal strength falls below this, the receiver is muted. When the VP1007-B reads the tag with an RSSI level below this threshold, the tag will not be read.
Switch (connection box)	Device that connects the VPU's to a PC (network)
System	Multiple devices grouped together
V-box	Housing for V-packs (available in model 1, 1.5, 2 or 3).
V-pack	VPU or Nedap PCB
VP1007-B	Reader Input/Output controller
VP2001	Power supply (25 Vdc, 2x 4 A)
VP8001	Velos Processing Unit (VPU/VP8001)
VP8002	Velos Processing Unit (VPU/VP8002)
VPU	Velos Processing Unit (VP8001 / VP8002)
Velos software	Nedap software to control the system
Velos CAN cable	Shielded 5 + 2-pole communication / power cable to connect VPU's and V-packs
Wi-Fi	Wireless technology that uses radio signals to provide network and Internet connectivity.
WLAN	Wireless Local Area Network



8 Technical specifications

VP1007-B

Item	Specification
Dimensions (L x W x H)	143 x 120 x 68 mm (5.63 x 4.72 x 2.68 in.) (excluding mounting rail)
Weight	Approx. 360 g (12.7 oz.)
Power supply	The power supply or power adapter must comply with local regulations for a SELV, limited power (NEC class2, ps2) output (e.g. Nedap VP2001 or Nedap power adapter part no. 9223126).
Power supply input voltage	25 VDC, ± 20%
Power consumption, minimum	300 mA with the antenna switched on
Power consumption, maximum	4.5 A
Inputs	Reading inputs, five analog (0-35V) and two digital Suitable for NPN and PNP sensors
Outputs	Max. 2A short-circuiting protected and over temperature protected, I/O safeguard when total I/O current > 4A
Communication	CAN bus 125 kbit/s
Serial interface	RS-232, RS-485 (to connect other sensors with serial interfaces)
Cable specifications	
Power	1.5 mm ² (0.0023 in. ²) < 90 m (98 yd) 2 mm ² (0.0031 in. ²) < 100 m (109 yd)
CAN bus	Velos cable, min. 0.34 mm ² (0.0005 in. ²) twisted pair shielded < 90 m (98 yd)
Antenna	Coax RG58. Max. length depending on antenna type.
Outputs	CE approved at cable length < 3 m (10 ft)
Inputs	CE approved at cable length < 3 m (10 ft)
Other	
Antennas	Nedap antenna: Single Loop Walk Through, Single Loop Walk Over, VP6011, VP6012, VP6030, VP6040, VP6041, VP6042 and VP6050.
Detection distance	Varies per antenna
Synchronization	According to ISO 11785
Software	Downloadable by CAN network
Operating temperature range	-10 to 50 °C (14 to 122 °F)
Storage temperature range	-20 to 70 °C (-4 to 158 °F)
Operational relative humidity	< 93% @ -20 to 70 °C (-4 to 158 °F)
Enclosure protection class	IP30. When installed in V-box IP65 (cover and cables installed correctly!)
Maximum allowed environmental noise level	10 dBµA/m quasi peak, according to CISPR 16-1-1
Maximum allowed conducted noise	According to EN55032: 2015
Certifications	CE, EAC, FCC, IC and KCC




9 Handling instructions

Storage

- If the product is to be stored for some time, make sure that it is under a protective cover to prevent dirt and moisture from entering.
- Do not expose the product to direct sunlight and / or adverse weather conditions such as storm, rain, hail or snow.
- Storage temperature range: -20 to 70 °C (-4 to 158 °F).
- Relative humidity < 93%

Disposal

The owner or last user of the product is responsible for the proper disposal of (parts of) the product according to local rules and regulations.

The WEEE  symbol in Europe indicates that the relevant electrical product or battery should not be disposed of as general household waste in Europe. To ensure the correct waste treatment of the product and battery, please dispose them in accordance to any applicable local laws of requirement for disposal of electrical equipment or batteries. In so doing, you will help to conserve natural resources and improve standards of environmental protection in treatment and disposal of electrical waste (Waste Electrical and Electronic Equipment Directive WEEE 2012/19/EU).



10 Compliance

FCC and ISED Compliance statement

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 licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes: (1) cet appareil ne doit causer aucune interférence, et (2) cet appareil doit accepter n'importe quelle interférence, y compris l'interférence qui peut causer une opération non souhaitée 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.

FCC and ISED Radiation Exposure Statement

This equipment complies with FCC and Canadian radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 3 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites énoncées pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 3 cm entre le radiateur et votre corps.

ISED EMC Declaration

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de Classe B est conforme à la norme Canadienne ICES-003.

FCC and ISED Information to the user

Note: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. To ensure compliance with FCC regulations, use only the shielded interface cables provided with the product, or additional specified components or accessories that can be used with the installation of the product.

This Class B digital apparatus complies with the Canadian standard ICES-003. Cet appareil numérique de Classe B est conforme à la norme Canadienne ICES-003.

Antennas

This device may be used with the following Nedap antennas: VP6011, VP6012, VP6030, VP6040, VP6041, VP6042 and VP6050. Antennas VP6041 and VP6042 are identical. However, model VP6041 is adjusted for environments with lots of steel for short distances. The VP6042 is adjusted for longer distances (1 m) recognition.

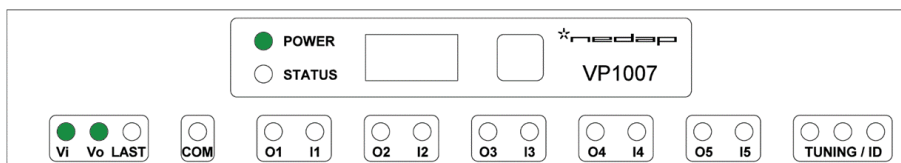
CE

Hereby NEDAP N.V. declares that the subject equipment is in compliance with the directives 2014/53/EU (Radio Equipment Directive) and 2011/65/EU (Restriction of the use of certain hazardous substances). The full text of the EU declaration of conformity is available at our Business Portal: <http://www.nedap.com/livestockmanagement-portal>.



11 Appendix

11.1 VP1007-B reader LED indicators

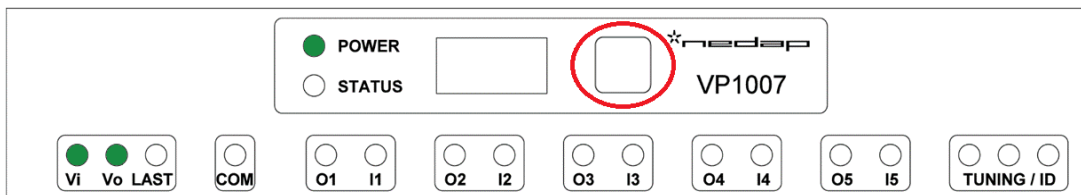


LED	Color		Mode	State
POWER	Green	●	On	Power on
	Blank	○	Off	Power off
STATUS	Blue	●	Slow blinking	Working and linked to Behavior Component
			1 long flash	Working and not linked to Behavior Component
			Fast blinking	Downloading or error during download
			1 short flash	V-pack not coupled
			2 short flashes	Firmware present but not active
			3 short flashes	No firmware present
Display	On		Address indicated	No communication
	Off			Communication status OK
Vi	Green	●	On	Power on
	Blank	○	Off	No power
	Orange	●	On	Low power warning, lower than 20V
			Blinking	Wrong CAN bus connection, Vi and Vo swapped
Red	●	On	Error (Overload or Vi and Vo swapped)	
Vo	Green	●	On	Power on
	Blank	○	Off	No power
	Orange	●	Blinking	Low power warning
	Red	●	Blinking	Error (Overload or Vi and Vo swapped)
LAST	Green	●	On	V-pack is last one on the CAN bus
	Blank	○	Off	V-pack is not last one on the CAN bus
	Orange	●	Blinking	CAN bus error and last V-pack on CAN bus
	Red	●	On	CAN bus error
			Blinking	CAN bus warning / connected wrong
O1 .. O5	Green	●	On	Output on
	Blank	○	Off	Output off



LED	Color		Mode	State
	Red	●	Blinking	Output error / overload
I1 .. I5	Green	●	On	Input contact open
	Blank	○	Off	Input contact closed
TUNING/ID	Various	● ● ○	On	Antenna 1 tuned correctly
		● ● ○	Blinking	Antenna 1 identified tag
		○ ● ●	On	Antenna 2 tuned correctly
		○ ● ●	Blinking	Antenna 2 identified tag
		● ● ○	Red on	Antenna 1 not tuned correctly (turn left)
		● ● ○	Red on	Antenna 1 not tuned correctly (turn right)
		○ ● ●	Red on	Antenna 2 not tuned correctly (turn right)
		○ ● ●	Red on	Antenna 2 not tuned correctly (turn left)
		● ● ○	Red blinking	Antenna 1 not connected or low antenna signal
		○ ● ●	Red blinking	Antenna 2 not connected or low antenna signal

11.2 VP1007-B reader menu overview




Use the button to access the menu and to display or change the settings:

1. Push the button briefly to go through the menu options.
2. Push and hold down to go to the second or third level of the menu.
3. Push and hold down until the display blinks to change a menu item.

- ⚠ • If the button is not pushed again, the display goes blank automatically.
- To leave the menu at any point, push and hold down the button until the display goes blank.

First level	Second level	Third level	Settings	Description
Show IP address				The first time the button is pushed briefly, the current IP address is shown in the display
Ad				Address settings
	dA			Display address



First level	Second level	Third level	Settings	Description
	SA			Set address  Menu option SA is only available to set an address. After entering an address it is not available again until factory default settings are restored using option dF.
HF				High frequency
	H1 to H2			Antenna 1 to 2
		tU		Tune antenna: Start auto tuning
		AA		Adjust antenna: Manual tuning, switches autotuning circuit off
		AP		Antenna power: Default maximum setting 99; possibility to set a lower value
		AS		Adjust squelch
			SF	Set FDX squelch
			dF	Display FDX RSSI
			SH	Set HDX squelch
			dH	Display HDX RSSI
			id	Identification test
	Ao			Antenna options
		nF		Notch filter (VP1007-B only)
			oF	Notch filter off
			on	Notch filter on
			ot	Notch filter temporarily on (for 24 hours)
		tS		Tag mode Select option
			Fo	FDX only mode (continuously). Only FDX tags are identified.
			H0	HDX only mode (iso). Only HDX tags are identified.
			Ho	HDX only mode (iso) temporarily on (for 24 hours)
			FH	FDX/HDX mode (iso). Both HDX and FDX tags are identified.
			Fh	FDX/HDX mode (iso) temporarily on (for 24 hours)
		rF		Responder number filter
			oF	Set responder number filter off
			on	Set responder number filter on
		dF		Default Ao settings
			n	Set Ao settings not to default



First level	Second level	Third level	Settings	Description
			9	Set Ao settings to default
	id			Identification test
It				Internal test
	dE			Display error
	o1			Test output 1 as a motor control
	o2			Test output 2 as a motor control
	o3			Test output 3 as a motor control
	o4			Test output 4 as a motor control
	o5			Test output 5 as a motor control
	L1			Test output 1
	L2			Test output 2
	L3			Test output 3
	L4			Test output 4
	L5			Test output 5
	i1			Test input 1
	i2			Test input 2
	i3			Test input 3
	i4			Test input 4
	i5			Test input 5
dF	00			Default settings. Enter value 99 to set all settings on the V-pack to factory defaults.

11.3 Wiring color coding

Table 1: Wiring colors

Color code	Wire color
BK	Black
BL	Blue
BN	Brown
GN	Green
GY	Gray
OR	Orange
PK	Pink
RD	Red



Color code	Wire color
VT	Violet
WH	White
YW	Yellow
BK-WH	Black-White
BL-WH	Blue-White
BN-WH	Brown-White
GN-WH	Green-White
GY-PK	Gray-Pink
OR-WH	Orange-White
RD-BL	Red-Blue
YW-GN	Yellow-Green
YW-WH	Yellow-White





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