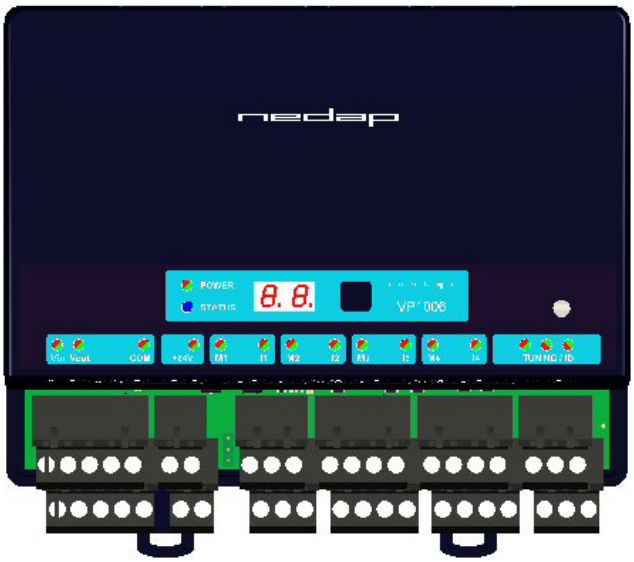
Service manual

For installation, operation and service

ISO Reader I/O



VP1007

April 2009 / Manual version 0.4

nedap®

Nedap Agri - P.O. Box 104 - 7140 AC Groenlo - The Netherlands - T (+31) 544 471 444
F (+31) 544 466 839 - info@nedap-agri.com - www.nedap-agri.com

Version overview

Manual version 0.4 / 4 - 2009

VP1007 ISO Reader I/O

Contents

Preface

This manual is part of the service documentation for Nedap Velos. Reference is also made to other manuals that are part of the Nedap Velos documentation. For an overview of available Nedap Velos manuals see the manual “Nedap Velos General Description”, or visit the Nedap Agri website www.nedap-agri.com.

1 Introduction

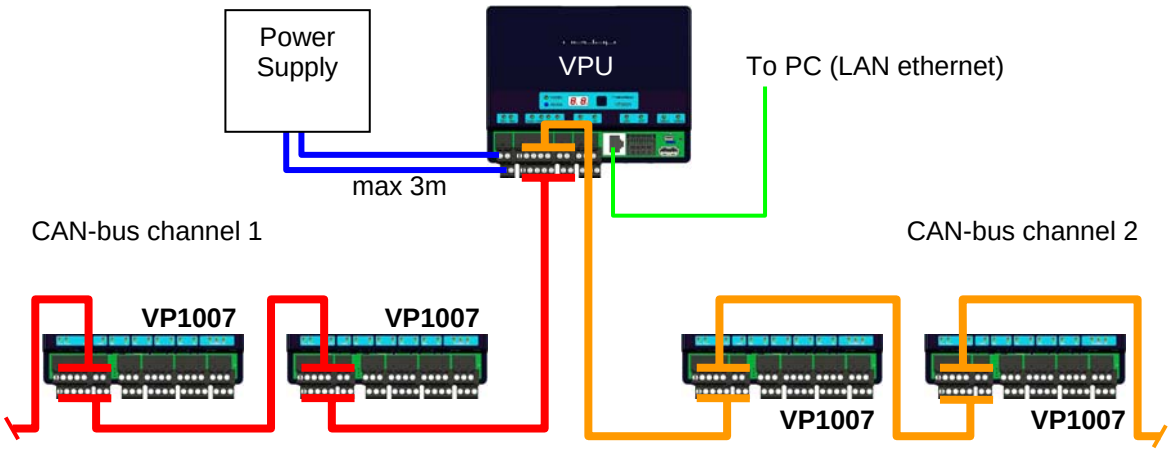
The Velos VP1007 is used for identification of animals for feeding, weighing, milking, heat detection etc. The VP1007 must be connected to a computer (controller) and can communicate by a CAN, RS485 or RS232 protocol. The connected computer must give controlling commands to the VP1007 to operate inputs, outputs and identification.

The VP1007 has the following main tasks:

- Identification of tags (ISO 134.2 kHz FDX/HDX)
  Two antenna connections available, 1 active at the time
- Controlling outputs
  5 outputs are available to activate e.g. lights, motors, valves, relays
  5 protected outputs for continues 25V, e.g. power for sensors
- Reading inputs
  5 inputs available for e.g. sensors, switches
- Communication
  RS232 or RS485 to connect e.g. a weigh computer

Following antenna types can be used: V-sense antennas

The VP1007 must be installed in a housing suitable for farm conditions, for example in a V-box.



Max number of V-packs and cable length depends on configuration used

Reference manuals : PS0000-200PM-00 Velos general description

Compliance statement (part 15.19)
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.

Warning (part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2 Description and functioning

A VP1007 has 5 inputs used for reading e.g. sensors or switches.
There are also 5 outputs available to activate e.g. lights, motors, valves or relays.
The VP1007 can read tags FDX/HDX 134.2 kHz.

The VP1007 must be connected to a computer and can communicate by a CAN, RS485 or RS232 protocol. The connected computer must give controlling commands to the VP1007 to operate inputs, outputs and identification.

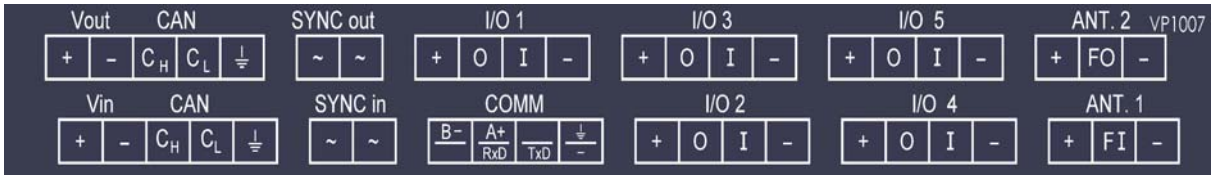


Figure : Sticker on the VP1007 with indication of the connections

Operation of the VP1007
Antenna : for reading tags, normally on
Inputs : read continuously with status change sent to the controller
Outputs : switched on or off by commands from the controller
LEDs : switched on or off by the VP1007 according to the status
Error : errors are sent to the controller

All inputs and outputs can be tested by the use of the push button and display. For operation of the push button and display see appendix B.

3 Safety

Installation and service only by trained personnel.
Always turn off the main power when working on the electrical installation.

4 Installation

Installation consits of the following steps:

1. Mounting
2. Installation of all wiring (connections)
3. Power up
4. Set address (when more then one VP1007)
5. Check antenna adjustment (green LED on)
6. Check the connected equipment like lamps, motors, sensors etc.
7. Configuration in the PC

Follow this manual to complete the steps.

4.1 Mounting

See the relevant equipment manual relating to where the VP1007 is to be installed.

4.2 Connections

See the relevant equipment manual relating to where the VP1007 is to be installed.

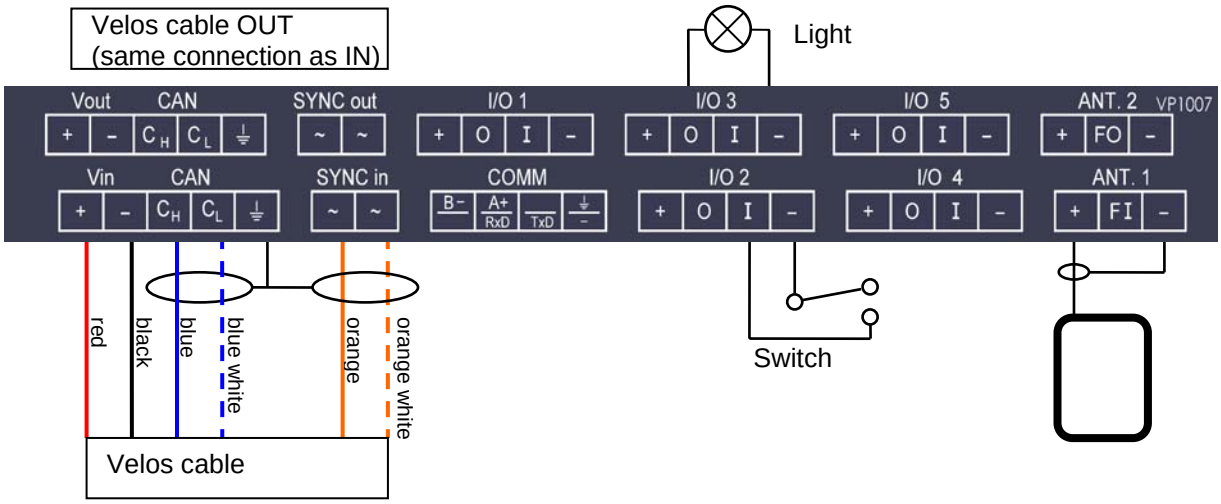


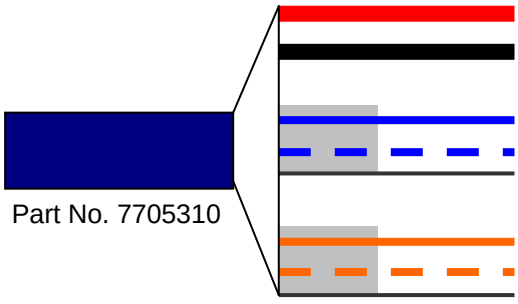
Figure : I/O of the VP1007. The input and output connections are shown above as an example.

Details VP1007 inputs and outputs

Vin	**+**	Power
	-	Minus
RS232 / 485	**RxD / B-**	Data receive
	TxD / A+	Data send
	- / ⏚	Minus for RS232 / shield for RS485
SYNC	**~**	Synchronisation for HDX, AC (no plus or minus, cable must be twisted pair)
	~	See above
I/O 1 .. 5	**+**	Output max 400mA
	O	Output max 400mA / 1.7A input
	-	Minus for output (O) and minus input (I)
	I	Input
ANTENNA	**+**	Antenna
F SYNC	**FI/FO**	Frequency synchronisation FI=in FO=out
	-	Antenna minus (shield of coax cable)

IMPORTANT : Use power supply with a fused output such as Velos VP2001, VP2002.

Details Velos cable



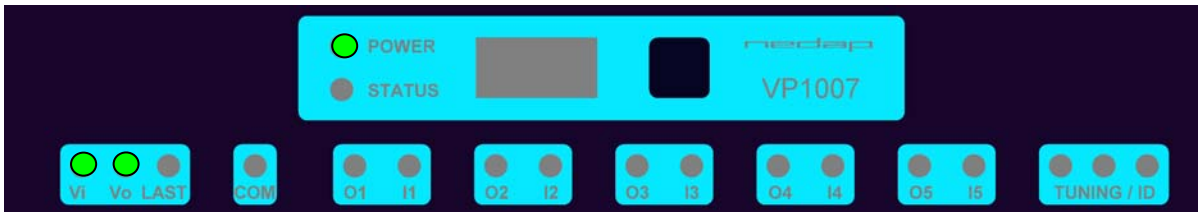
Red (+)	**Power**
Black (-)	1,5 mm^2
Blue (C_h)	**Communication**
Blue/white (C_l)	0,34 mm^2
Shield	Twisted pair shielded
Orange (Sync)	**HF Synchronisation**
Orange/white (Sync)	0,34 mm^2
Shield	Twisted pair shielded

5 Adjustments

Before starting with adjustments first install all components and wiring. Follow the sequence as indicated in this chapter.

5.1 Check after power up

Check if the VP1007 has power after power up. This means 3 green LED's are on, see figure below.



For more details about the LED indicators see Appendix D.

If LED's are green, continue with address settings

5.2 Address

Each VP1007 requires a unique address on the communication bus. Use the display and push button to set the address. How to use the display and push button is shown in appendix B. See appendix C for the complete overview of the display menu.
The display will indicate the actual address at startup (01 for a new unit). If an address is accepted by the communication bus the display goes blank. If there is no communication with the controller also the address is shown. If the address is not accepted, the display will show the address.

How to change an address (for example set address to 12)

1. Short press on the button. Ad will appear.
2. Now hold the button till the display starts blinking. dA will appear.
3. Short press on the button. SA will appear.
4. Now hold the button until the display starts blinking. 0- will appear.
5. Short press on the button. The 0- is now changed into 1-.
6. Hold the button until the display starts blinking. 10 will appear.
7. Short press on the button. The 10 is now changed into 11.
8. Short press on the button again. The 11 is now changed into 12.
9. Hold now the button until the display starts blinking. The 12 is now stored in the memory.
10. There will now be 12 blinking on the display now. If the address is accepted by the process unit the display goes blank.

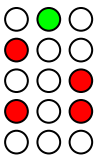
How to check the address

1. Short press the button. Ad will appear.
2. Now hold the button until the display starts blinking. dA will appear.
3. Hold the button again until the display starts blinking. The actual address will be shown.
4. Leave the menu by pressing the button until the display goes blank.

If the display does not go blank (address remains on the display), the address in not accepted.
When the address setting is ok continue with the antenna adjustment.

5.3 Antenna

After power up the antenna tuning starts automatically. LEDs are indicating the status.

	Green on	Antenna tuning ok
	Red on	Antenna out of range
	Red on	Antenna out of range
	Red blinking	No antenna connected or low antenna signal
	All off	Antenna switch off by the software

5.4 Software setup

The software in the connected controller determines how the inputs and outputs on the VP1007 are controlled. See manual with the relevent settings to configure the software for this VP1007.
When the software setup is done the VP1007 is ready for use.

6 Advanced

Tests and adjustments described in this chapter are not used for a standard startup and configuration of the VP1007.

6.1 Testing inputs and outputs

Output test
Use the test L1, L2, .. L5 to test the connected equipment e.g. lights, valves or relays. This test will switch on the selected output. The test is stopped by a short press on the button.

Example of a light test (connected to output 5)

1. Short press on the button until “It” appears.
2. Now hold the button until the display starts blinking. “dE” will appear.
3. Short press on the button until “L5” appears.
4. Now hold the button until the display starts blinking. Output 6 will be switched on. To switch off, a short press on the button.

Input test
Use the test i1, i2, .. i5 to test the connected equipment e.g. switches and sensors. This test will read the selected input. The results are indicated with a “0” or “1”. Open or closed depends on the settings from the behavior component. The test is stopped by a short press on the button.

Example of a switch test (connected to output 5)

1. Short press on the button until “It” appears.
2. Now hold the button till the display starts blinking. “dE” will appear.
3. Short press on the button until “i5” appears.
4. Now hold the button until the display starts blinking. Input 5 will be read.
5. Activate the switch on and off. If ok, the display value will show zero and one

6.2 Advanced antenna adjustment

Antenna power
The antenna power default is set to maximum (99) and needs no adjustments.
Lowering the antenna power will reduce the reading distance of the antenna.

Check the antenna power
The antenna power level is shown on the display in the service menu at HF option AP (Adjust Power)

1. Select menu option AP (Adjust Power) on the display by using the push button
2. Push the button until the display starts to blink, a value will appear on the display
3. The value on the display is the actual power setting. 99 is the default factory setting.
4. To leave the menu without modifying the settings press the button until the display goes blank (press about 4 seconds)

Modify the antenna power

1. Select the actual antenna power on the display (see above antenna power check)
2. Short press on the button and the first digit of the value will change
3. Continue to press until the desired value, then hold the button until blinking
4. The second digit can be changed in the same way
5. When the desired value is on the display, press until the display blinks
6. The next menu item AS is now indicated.
7. To leave the service menu and return to normal operation, press the button until the display goes blank (press about 4 seconds)

Antenna squelch
Antenna squelch is a possibility to set a threshold for the ID level of a tag. It means the antenna power is still the same, but the software will not transfer weak received tag numbers.
The antenna squelch default is set to minimum (-0). This means no threshold. Maximum is -9.

Check the antenna squelch level
The antenna squelch level is shown on the display in the service menu at HF, option AS (Adjust Squelch)

1. Select menu option AS (Adjust Squelch) on the display by using the push button
2. Push the button until the display starts to blink, a value will appear on the display
3. The value on the display is the actual setting. -0 is the default factory setting.
4. To leave the menu without modifying the settings press the button until the display goes blank (press about 4 seconds)

Modify the antenna squelch level

1. Select the actual antenna squelch level on the display (see above squelch level check)
2. Short press on the button and the value will change
3. Continue to press until the desired value, then hold the button until blinking
4. The next menu item “df” is now indicated.
5. Hold a tag in the antenna and determine the maximum reading distance
6. If reading distance is ok leave the menu. If not ok try another level.
7. To leave the service menu and return to normal operation, press the button until the display goes blank (press about 4 seconds)

6.3 Identification test options

Identification test with option “id”
When a tag is in the antenna field, the green LED used for the antenna tuning will be blinking. There is also a test in the internal test menu called “id”. This test will also show the green LED blinking but also shows the last two digits of the tag number on the display.

Signal level indication option “SF” and “SH”
There is a test available to give an indication about the signal received on the reader of the VP1007. This test is separated in a FDX (SF) and HDX (SH) noise indication test. This test is mainly used for HDX because at HDX there is a greater risk of external influence on the antenna field.

How to use the signal level test

1. Select option “SH” on the display and press the button until the display starts to blink. A value will appear on the display.
2. Now move a HDX tag slowly into the antenna field. The display value will normally increase when getting closer to the antenna. If there is negligible or little increase in display value this is an indication something external is causing noise.

The possible cause of noise can be frequency controlled electric motors or a transmitter operating on or close to 134.2 kHz

7 Trouble shooting

Errors / malfunctioning is indicated by the indicator LED's or the display.

Error by indicator LED

Indicator LED's are normally green or switched off. A red or orange indicator LED means normally there is something not ok. See Appendix D for the explanation of the different colors.

Errors indicated at menu option "dE"

In menu option "dE" it is possible to see actual error codes. When entering the display menu option "dE" the errors code will be shown and the error will be cleared. If the error is not cleared it means there is still an error. There can be more than one error. Further errors are displayed one after another with a short delay between each code.

"dE" code on the display	Description
00	No errors
01	Max I out error, next module shut off
02	Short circuit detected at reset
03	Max I out high-side
04	Max I out low-side
05	CAN over voltage
06	CAN offset too high
07	-
08	-
09	Short circuit out5 <-> minus
10	Short circuit out4 <-> minus
11	Short circuit out3 <-> minus
12	Short circuit out2 <-> minus
13	OUT1 off : +24V on OUT1
14	Short circuit out1 <-> minus
15	IO5 off: +24V on OUT5
16	IO5 on: short circuit IO5
17	IO4 off: +24V on OUT4
18	IO4 on: short circuit IO4
19	IO3 off: +24V on OUT3
20	IO3 on: short circuit IO3
21	IO2 off: +24V on OUT2
22	IO2 on: short circuit IO2
23	IO1 off: +24V on OUT1
24	IO1 on: short circuit IO1

Identification performance and disturbance

Identification performance can be reduced by disturbance caused by variable-frequency drives used for ventilation, milk pumps, vacuum pumps, etc. Also ballasts used for fluorescent tube lighting may interfere. If there is interference one can locate the source by switching off all the equipment on a farm and then switch them on again one by one. Most of the time when a variable-frequency drive is causing a problem it is due to bad installation or without the mandatory main filters.

8 Maintenance, cleaning and disposal

Maintenance
No regular maintenance required.

Software update
A VP1007 is equipped with software to activate inputs and outputs, display / push button and a motor safeguard. This software is called firmware. During manufacturing the firmware is programmed and ready for use. In case of an update it is possible to download new firmware thru the CAN-bus. In the Velos system the web browser interface of the VPU (VP8001) is used to handle this. For more details about downloading new firmware see also the manual of the VPU (VP8001).

Cleaning
A VP1007 must be installed in a suitable housing (V-box) so cleaning of the VP1007 is not required.

Disposal
Discard according to the regulations prevailing at the time of disposal

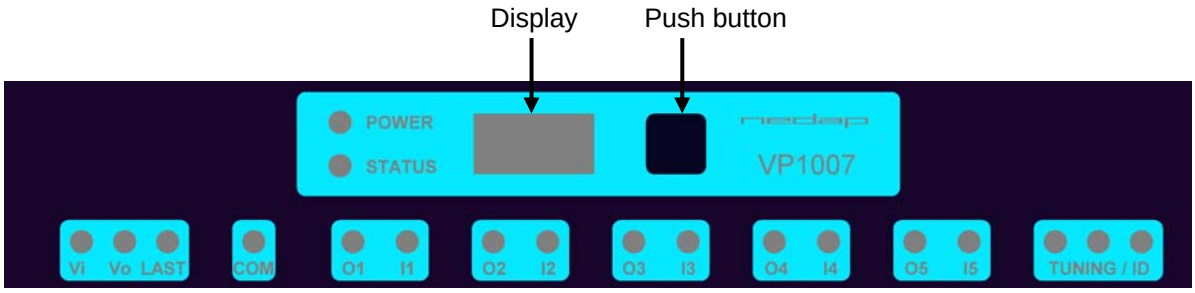
Appendix A: Specifications

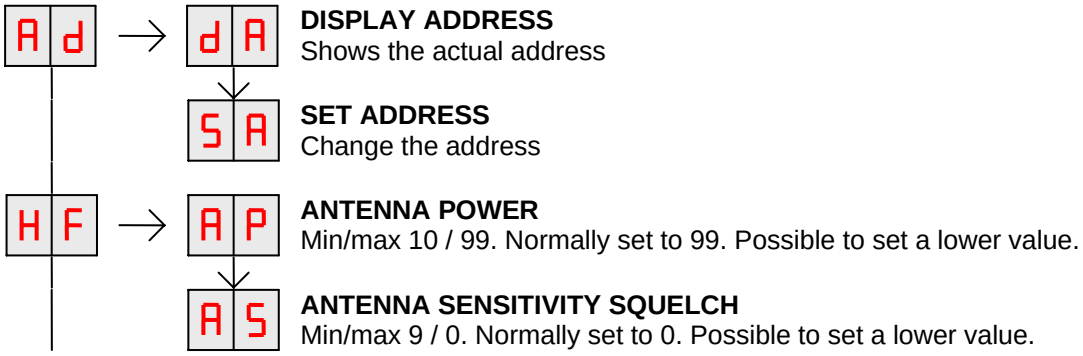
Specifications VP1007 (part no 9926542)	
Dimensions	143 x 120 x 68 mm LxWxH (excluding mounting rail) Weight: ± 360 gr
Power	Input voltage 25 VDC, +20% -20% Minimal power consumption 300 mA with antenna switched on Maximum power consumption 4,5 A Protected against reverse connection power supply
Communication	CAN, RS485 and RS232
Software	Downloadable thru network
Inputs	Reading inputs, analog (0-40V) and digital. Suitable for NPN and PNP sensors.
Outputs	Max. +0.4 / -1.7 Amp by current limiter, short-circuiting protected I/O safe-guard when total I/O current > 4A
Antennas	Different types possible
Detection distance	Varies per antenna
Synchronisation	Synchronization according to ISO 11785
Environment	Temperature: Operating: -10 – 50 °C, Storage: -25 – 70 °C Relative humidity: 10 – 93% non condensing
IP class	IP 30. When installed in V-box IP 65 (cover and cables installed correctly!)
Cable specifications	
Power	Min. 1.5 mm^2
CAN-bus	Min. 0.34 mm^2 twisted pair shielded
Antenna	Coax RG58. Max. length depending on antenna type.
Outputs	CE approved at cable length < 3m
Inputs	CE approved at cable length < 3m
Synchronisation	Twisted pair min. 0.34mm^2 shielded Total max. 500m

Always use a NEDAP power supply
The Nedap guarantee-regulations are only valid when is installed as indicated in this manual.
Install data cables at a safe distance from (high) powered cables

More information
For more detailed information contact your local Nedap supplier or check the internet site.

Appendix B: Display and push button





DISPLAY ADDRESS
Shows the actual address

SET ADDRESS
Change the address

ANTENNA POWER
Min/max 10 / 99. Normally set to 99. Possible to set a lower value.

ANTENNA SENSITIVITY SQUELCH
Min/max 9 / 0. Normally set to 0. Possible to set a lower value.

Figure: a section of a display menu

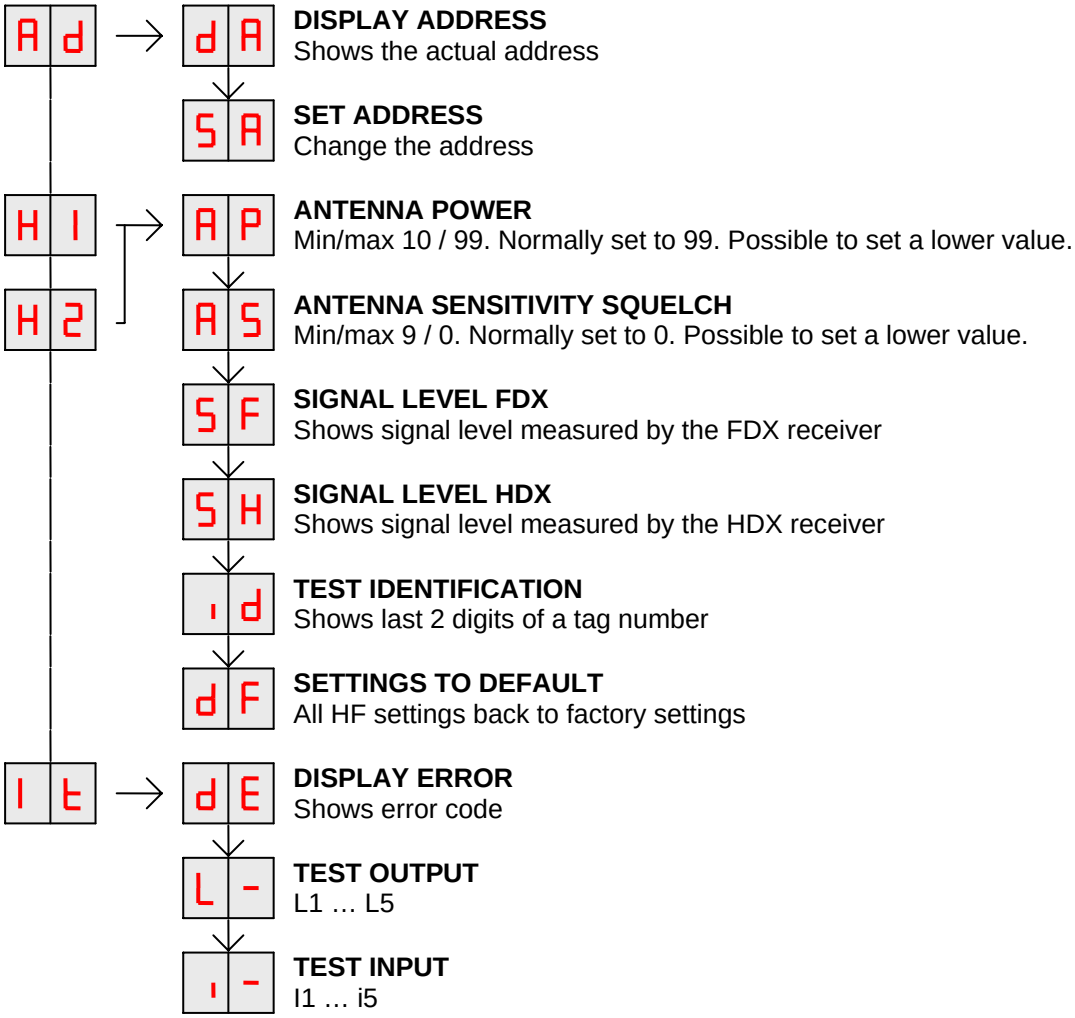
→	Press button until blinking		To leave menu:
↓	Short press on button		Press button until display goes blank

How to use the display and push button
Normally the display is off. If there is no connection to the VPU the address is shown. It is also possible some program states of a behavior component are shown during operation.

Activate the menu	short press on the button, the display menu is shown
Scroll down	short press on the button
Select	press button until blinking
Change and store	select item to change, open item by pressing button until blinking, change by short press on button, store by pressing button until blinking
Check a setting	select the item to check, press button until blinking, first value shown is actual setting

The display is normally automatically switched off after 30 minutes.

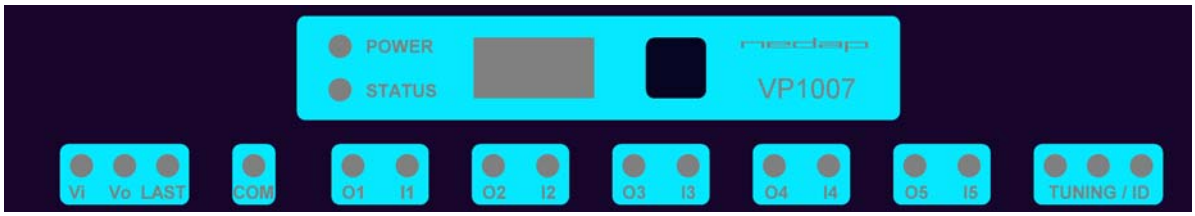
Appendix C: Overview display menu



REMARK

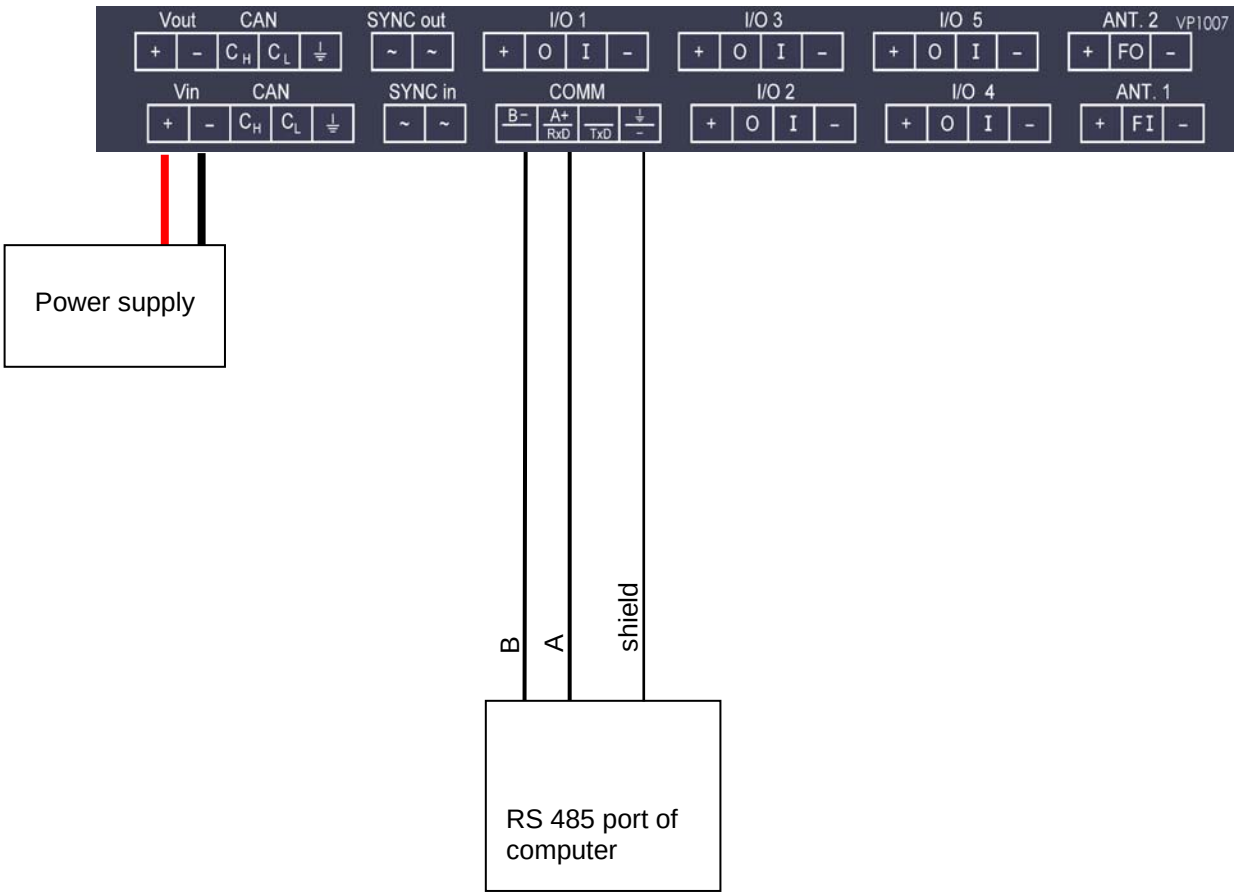
→	Press button until blinking		To leave menu:
↓	Short press on button		Press button until display goes blank

Appendix D: LED indicator overview



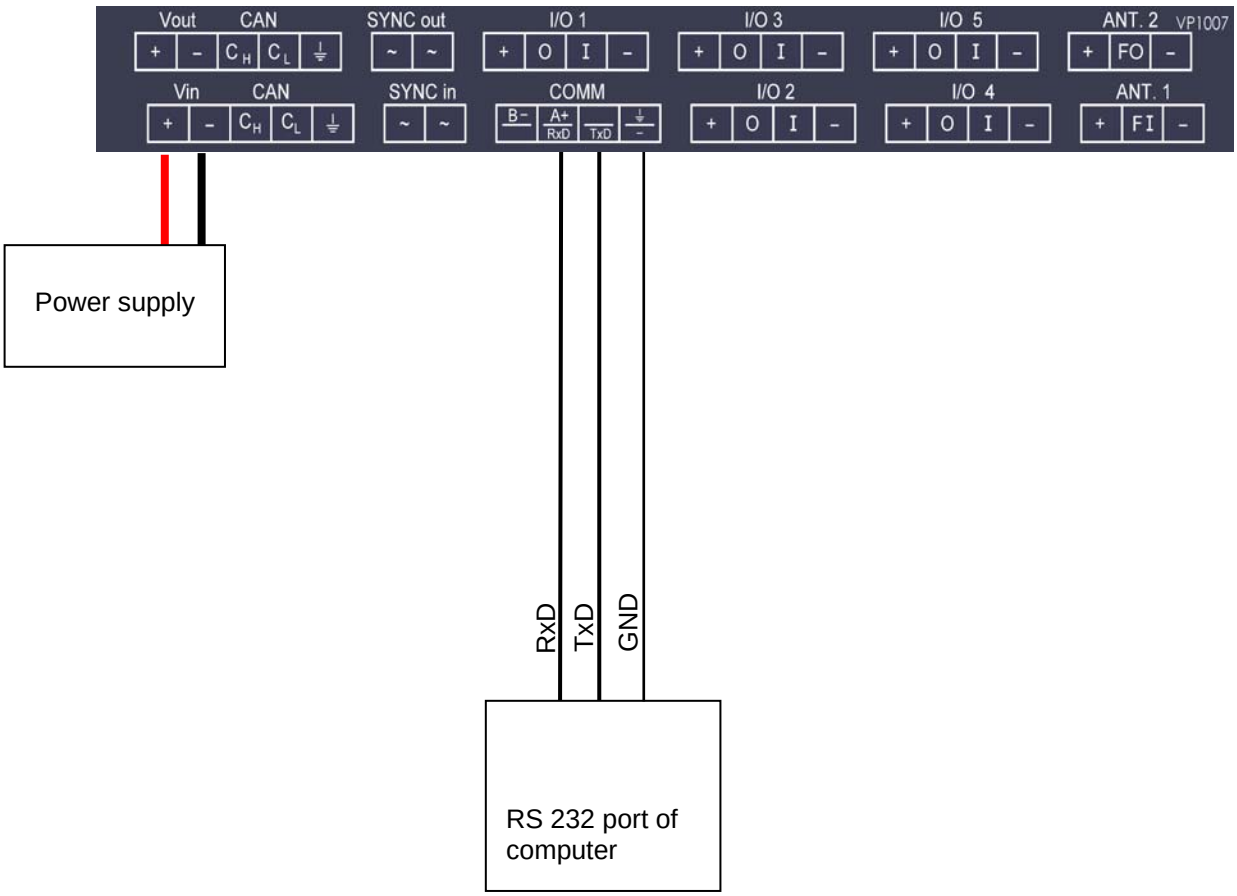
POWER	●	Green on	Power on
	○	off	No power
STATUS	●	Blue	
		Slow blinking	Operating ok
		Fast blinking	Downloading or error during download
		1 short flash	V-pack not coupled
		2 short flashes	Firmware present but not active
		3 short flashes	No firmware present
Display	on	Address indicated	No communication
	off		Communication status ok
Vi	●	Green on	Input power applied
	○	off	No power
	●	Orange	Low power, less than 20V
	●	Orange blinking	Wrong CAN-bus connection, Vin and Vout swapped
	●	Red	Error, plus and minus swapped / overload
Vo	●	Green on	Output power
	○	off	No power
	●	Orange blinking	Low power
	●	Red blinking	Error, plus and minus swapped
COM	●	Green on	V-pack is last one on the bus
	○	off	V-pack is not last one on the bus
	●	Orange blinking	CAN-bus error and last V-pack on the bus
	●	Red	CAN-bus error
	●	Red blinking	CAN-bus warning / connected wrong
O1 .. O5	●	Green on	Output on
	○	off	Output off
	●	Red blinking	Output error / overload
I1 .. I5	●	Green on	Input contact open
	○	off	Input contact closed
TUNING /ID	○ ● ○	Green on	Antenna ok
		Green blinking	Antenna ok and tag identified
	● ○ ○	Red on	Antenna not tuned correctly
	○ ○ ●	Red on	Antenna not tuned correctly
	● ○ ●	Red blinking	Antenna error / not connected

Appendix E: RS485 connection



RS485 cable specifications (computer to first VP1007):
Wires : min. 0.34 mm^2 twisted pair shielded
Max length between computer and VP1007 100m.
Longer length depends on used baudrate used.

Appendix F: RS232 connections



RS232 cable specifications :

Shielded cable

Wires min. 0.34 mm^2

Max length between Computer and VP1007 3m.

nedap®

Nedap Agri - P.O. Box 104 - 7140 AC Groenlo - The Netherlands - T (+31) 544 471 444
F (+31) 544 466 839 - info@nedap-agri.com - www.nedap-agri.com