ISO DSP Reader IO

VP1910

9 - 2012 / Manual version 1.2

Manual part no. 5278503

Version overview

Manual version 1.0 / 10 - 2011
First release

Manual version 1.1 / 12 - 2011
New menu options described and appendixes added.

Manual version 1.2 / 9 - 2012
FCC and industry Canada text added. Max. antenna power level added for USA/Canada and Europe.

Compliance statement (part15.19)
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.

Déclaration Conformité
Cet appareil se conforme aux normes RSS210 exemptés de license du Industry Canada. L'opération est soumis aux deux conditions suivantes:
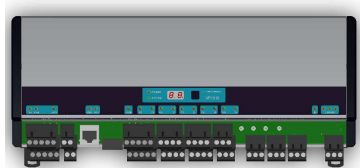(1) cet appareil ne doit causer aucune interférence, et

(2) cet appareil doit accepter n'importe quelle interférence, y inclus interférence qui peut causer une opération non pas voulu de cet appareil.

Warning (part15.21)
Changes or modifications not expressly approved by party responsible for compliance could void the user's authority to operate the equipment.

VP1910 DSP ISO Reader

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 VP1910 is used for identification of animals and for controlling processes. The VP1910 must be connected to a computer (controller) and can communicate by a LAN, CAN, RS485 or VC3 protocol. The connected computer must give controlling commands to the VP1910 to operate inputs, outputs and identification.

The VP1910 has the following main tasks:
- Identification of tags (ISO 134.2 kHz FDX/HDX)
- Controlling outputs - 5 outputs are available to activate e.g. lights, valves, relays
- Reading inputs - 5 inputs available for e.g. sensors, switches
- Digital noise filtering (European Burg Mainflingen filter)

Following antenna types can be used:
- V-sense antennas with auto tuning

The VP1910 must be installed in a housing suitable for farm conditions, for example in a V-box.

Figure : V-box2 with a VP1910 reader

2 Description and functioning

A VP1910 has 5 inputs used for reading e.g. sensors or switches.
There are also 5 outputs available to activate e.g. lights, valves or relays.
The VP1910 can read tags FDX/HDX 134.2 kHz.
In case installing in or near Germany there is a filter available to reduce disturbance for transmitters near Burg and Mainflingen.
The VP1910 must be connected to a computer and can communicate by a LAN, CAN, RS485 or VC3 protocol. The connected computer must give controlling commands to the VP1910 to operate inputs, outputs and identification.

Figure : Sticker on the VP1910 with indication of the connections

Operation of the VP1910
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 VP1910 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 than one VP1910)
5. Check and set required settings
6. Antenna adjustment (green LED on)
7. Checking the connected equipment like lamps, sensors etc.
8. Configuration in the PC

Follow this manual to complete the steps.

4.1 Mounting

See the relevant equipment manual relating to where the VP1910 is to be installed.

4.2 Connections

See the relevant equipment manual relating to where the VP1910 is to be installed. See also appendix E, F and G for the different connection possibilities.

Antenna
- **-** Antenna (shield of coax)
- **+** Antenna (core of coax)

Antenna Y X Z
Not used

ID (external lamp to indicate ID)
- **-** Minus
- **o** Plus

F-sync (antenna frequency synchronisation)
- **-** Minus
- **I** In
- **o** Out

I1 – I5 (I=input)
- **-** Minus
- **I** Input contact

O1 – O5 (O=output)
- **+** plus
- **O** Output

VC3 / RS485
- $\perp$ **Ground**
- **A-** RS485
- **B-** RS485
- **DS** VC3 data send
- **DR** VC3 data receive

LAN
- $\perp$ **Ground**
- **RX-** Receive
- **RX+** Receive
- **TX-** Transmit
- **TX+** Transmit

Sync in/out (ISO sync)
- **~** Antenna synchronisation (twisted pair)
- **~** Antenna synchronisation (twisted pair)

Velos CAN
- $\perp$ Ground
- C_L CAN high (wire is twisted pair with C_L)
- C_H CAN low (wire is twisted pair with C_H)

V in / V out
- **-** Minus
- **+** Input voltage 24 VDC

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 VP1910 has power after power up.

For more details about the LED indicators see Appendix D.

If LED's are green, continue with address settings

5.2 Communication

Check if the VP1910 has communication leds switched on.

5.3 Address

Each VP1910 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.

5.4 Antenna tuning

After the first time power up the antenna tuning must be checked. Check the TUNING LED, green is OK and means the antenna is correctly tuned.

○ ● ○	Green on	Antenna tuning ok
○ ● ○	Red blinking	Antenna resistance too high, in case of EWA readjust.
● ○ ○	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

See also the manual of the antenna being used for information about tuning

Two parrallel auto tune antenna's

 In situations where two auto tune antenna's are installed in parrallel of each other, the minimal distance must be at least 200cm measured from center to center.
Before powering up the readers, the antenna's must be locked and both ISO and FSYNC cabels must be installed. Both antenna's must have the same polarity (faces in the same direction).

1. After power up and a few seconds, one or more tuning leds will toggle.

2. Unlock the first antenna's for 10 seconds and lock again.
3. Wait for 5 seconds and unlock the second antenna for 10 seconds and lock again.
4. Wait for 10 to 60 seconds to get both readers in the mode where the center green leds are continuously on.
5. If the center green leds are not continuously on after 60 seconds, restart with step 2.

6. Verify the valid power level on both readers, and adjust if neccesary. The displayed level is the current level and is subject to rounding errors and the measured antenna impedance. If the displayed value is outside 10% tolerance, the level must be adjusted.

7. Unlock the first antenna for 5 seconds and lock again.
8. Unlock second antenna for 5 seconds and lock again.

9. Power off both readers.

10. Power on both readers and verify after a few seconds that both readers has their center tuning led continuously on and that the power levels are within 10% tolerance of the programmed level.

5.5 Antenna power

The antenna power default is set to 25% (max 99) and can be set higher for more antenna power. Lowering the antenna power will reduce the reading distance of the antenna. See table below for maximum power level.

Max antenna power USA and Canada

	Antenna Model	Power setting of the VP1910 (%)
1	VP6150	60
2	VP6151	66
3	EWA Walk Through Loop antenna	37
4	VP6154 Walk Through Loop antenna	26
5	EWA Walk Over Loop antenna	55
6	VP6154 Walk Over Loop antenna	39

Max antenna power Europe

	Antenna Model	Power setting of the VP1910 (%)
1	VP6150	99
2	VP6151	99
3	EWA Walk Through Loop antenna	89
4	VP6154 Walk Through Loop antenna	63
5	EWA Walk Over Loop antenna	99
6	VP6154 Walk Over Loop antenna	93

Check the antenna power level
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 level
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)

5.6 Software setup

The software in the connected controller determines how the inputs and outputs on the VP1910 are controlled. See manual with the relevant settings to configure the software for this VP1910.
When the software setup is done the VP1910 is ready for use.

6 Advanced

Tests and adjustments described in this chapter are not used for a standard startup and configuration of the VP1910.

6.1 Testing inputs and outputs

There are two types of output tests. An output test to switch the output on and off. There is also available an input test for checking connected equipment like switches and sensors.
Use the display and push button for testing, see appendix B how to use it.

Output test
Use the test L1, L2, .. L6 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 6)
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 "L6" 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 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.
There is squelch setting for FDX and HDX.

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. Select menu option AF (FDX) or AH (HDX) on the display by using the push button
3. Push the button until the display starts to blink, a value will appear on the display
4. The value on the display is the actual setting. -0 is the default factory setting.
5. 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)

Antenna tuning with option "AA"
With HF menu option "Adjust Antenna (AA)", it is possible to see the antenna tuning on the display. The display value is an indication and shows minimal value when tuned ok.

Return identification settings to factory defaults
There is an option available called "dF" to set the antenna settings back to factory settings.

How set back to factory defaults
1. Select the option "dF" on the display.
2. Press button until blinking. "OF" will appear now.
3. Short press on the button, "On" will appear. Press until blinking. The defaults are now restored. "OF will now be on the display.
4. 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 ID will be on. There is also a test in the internal test menu called "id". This test will also show the green LED on 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 VP1910. 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
- -	No errors

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 VP1910 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 VP1910 must be installed in a suitable housing (V-box) so cleaning of the VP1910 is not required.

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

Appendix A: Specifications

Specifications VP1910	
Dimensions	290 x 128 x 70 mm LxWxH (excluding mounting rail) Weight: ± 1200 gr
Power	Input voltage 25 VDC, +20% -20%
	Power consumption minimum 7 Watt / maximum 35 Watt
	Protected against reverse connection power supply
Communication	Ethernet, CAN, RS485 and VC3 (slave)
Software	Downloadable thru network CAN and Ethernet
Inputs	Reading inputs digital.
	Suitable for NPN sensors en switches to ground.
Outputs	Max. 0.4 Amp per output short-circuiting en terminal protected.
	Total output current limited to 3A.
Antennas	Antennas with autotune, check antenna manual
Detection distance	Varies per antenna
Synchronisation	Synchronization according to ISO 11785
Environment	Temperature: Operating: -10 – 50 ℃, St orage: -25 – 70 ℃
	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
Frequency Sync	Coax RG 58 < 3m
ISO 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: Installation in V-box

remove protective film

Appendix C: Display and push button

Display   Push button

DISPLAY ADDRESS
Shows the actual address

SET ADDRESS
Change the address

ADJUST ANTENNA

ANTENNA POWER

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 D: Overview display menu

A d →	**d A**	**DISPLAY ADDRESS** Shows the actual address		

A d →

d A — **DISPLAY ADDRESS**
Shows the actual address

S A — **SET ADDRESS ***
Change the address

d S — **DISPLAY SECTION**
Show section (Default 1)

S S — **SET SECTION**
Change section

d ı — **DISPLAY IP ADDRESS**
Shows actual IP address (one by one)

S ı →

n 1 — **SET IP ADDRESS**
192.168.1.101

n 2 — **SET IP ADDRESS**
192.**168**.1.101

n 3 — **SET IP ADDRESS**
192.168.**1**.101

n 4 — **SET IP ADDRESS**
192.168.1.**101** (n=no change, y=yes for saving new IP)

d F — **SETTINGS TO DEFAULT**
All address settings back to factory settings

H F → Next page

*Link between Address en IP-Address
There is a connection between address and the IP-address. The last two digits of the IP-address is linked to the address. Changing the address will also change the last to digits of the IP-address.
Example : Address 04 = IP-address 192.168.1.104

HF →	**A A**	**ADJUST ANTENNA**	Antenna tuning level will be shown

A P — **ANTENNA POWER**
Min/max 10 / 99. Normally set to 25 (=25% of maximum power).

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

→ **A F** — **SQUELCH LEVEL FDX**
Normally set to 0

A H — **SQUELCH LEVEL HDX**
Normally set to 0

S d — **SET DSP FILTER**

→ **n o** No = no DSP filter

E u European Mainflingen filter

r F — **RF FILTER**
OF=no filter on tag numbers. ON=management tag only (>900000000000000)

d F — **SETTINGS TO DEFAULT**
All HF settings back to factory settings

I t → **d E** — **DISPLAY ERROR – CLEAR ERROR**
Shows error code and error clearing after showing.

L - — **TEST OUTPUT 1 - 5**
L1 … L5 (L6 = external lamp ID)

I - — **TEST INPUT 1 - 5**
I1 … I5

S F — **SIGNAL LEVEL FDX**
Shows signal level measured by the FDX receiver

S H — **SIGNAL LEVEL HDX**
Shows signal level measured by the HDX receiver

I d — **TEST IDENTIFICATION**
Shows last 2 digits of a tag number

d F → **9 9** — **DEFAULT**
Enter value 99 to return to factory defaults
(IP address 192.168.1.101)

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

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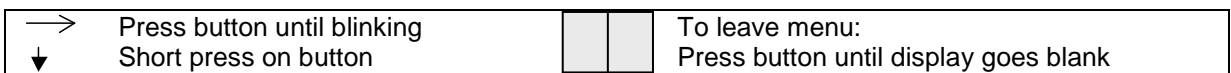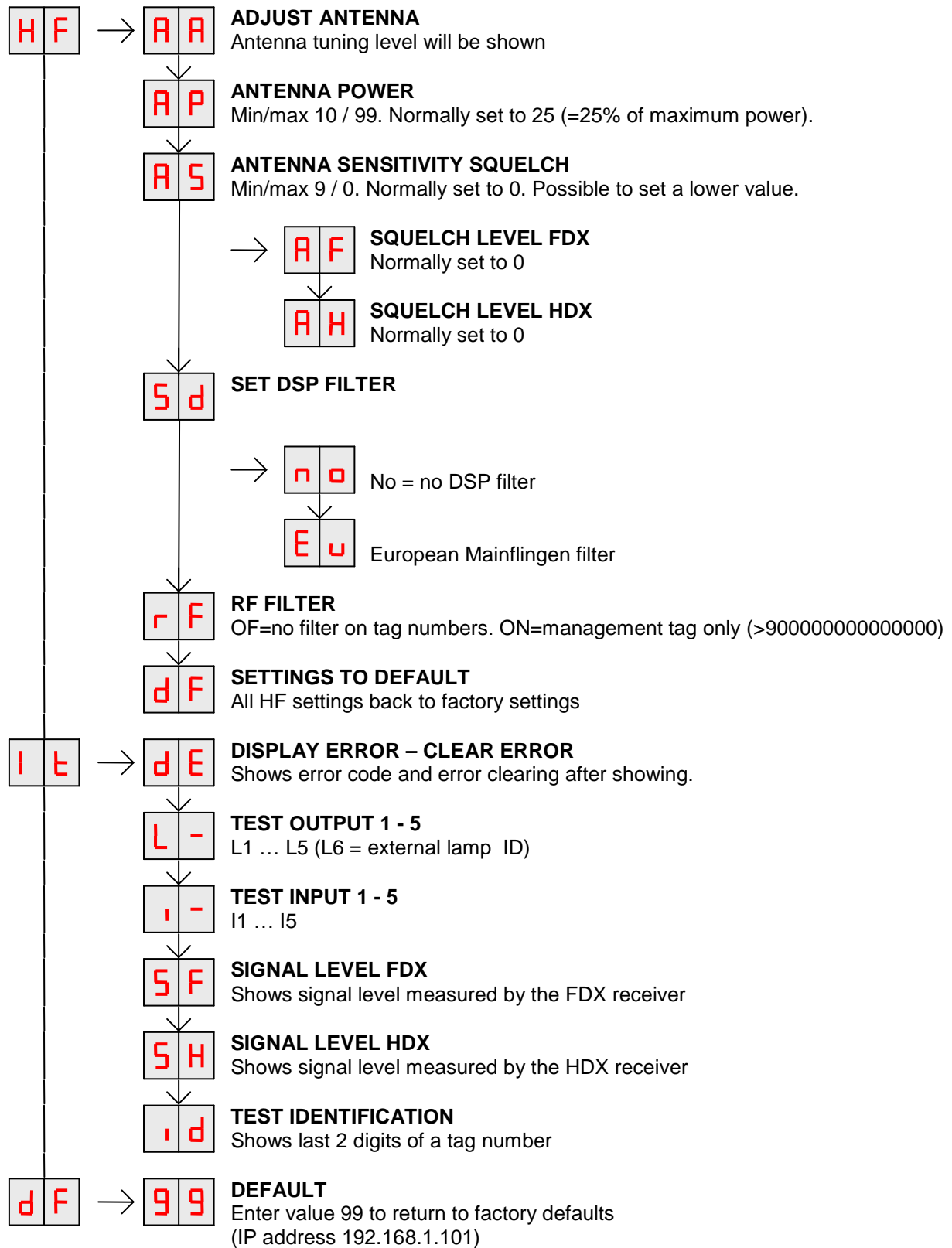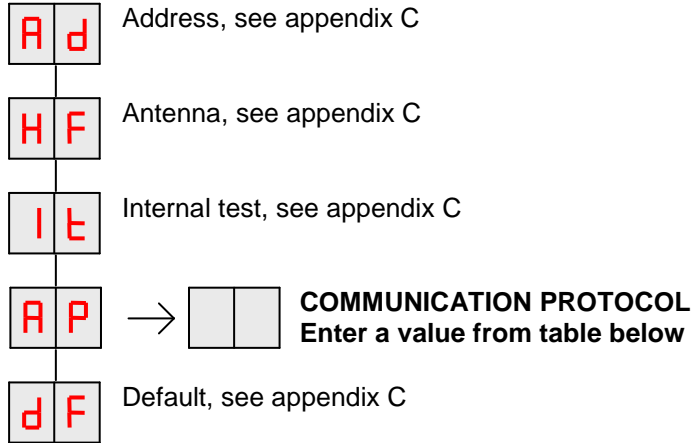# Appendix E: Overview display menu, VC3 options

Extra available options compared to standard (Appendix C)

| A d | Address, see appendix C |

| H F | Antenna, see appendix C |

| I t | Internal test, see appendix C |

O c	→	b r	→	1 2	**BAUDRATE** **1200 baud**
				2 4	**2400 baud**
				4 8	**4800 baud**

A P	→	n o	**APLICATION** **No application**
		i L	**ILS application**
		h b	**WHS application**

| d F | Default, see appendix C |

Appendix F: Overview display menu, RS485 options

Extra available options compared to standard (Appendix C)

A d — Address, see appendix C

H F — Antenna, see appendix C

I t — Internal test, see appendix C

A P → ☐☐ **COMMUNICATION PROTOCOL**
Enter a value from table below

d F — Default, see appendix C

COMMUNICATION PROTOCOL combinations

00	2400 bps	No end terminal
01	9600 bps	
02	19200 bps	
03	38400 bps	
16	2400 bps	End terminal
17	9600 bps	
18	19200 bps	
19	38400 bps	

Appendix G: LED indicator overview

Tuning
○ ● ○ **Antenna tuning OK**
● ○ ● **No antenne connected of out of range**

ID
○ **No tag identified**
● **Tag identified**

I1 – I5 (I=input)
○ **Input contact open**
● **Input contact closed**
● **Error**

O1 – O5 (O=output)
○ **Output not active**
● **Output switched on**
● **Error**

COM (RS485 – VC3)
○ **No communication**
● **Communication**
● **Error**

ACT (LAN)
○ **No communication**
● **Communication**

LAN
○ **No communication**
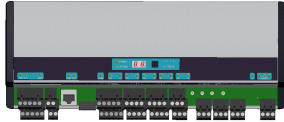● **Communication 100mps**

LAST (can bus)
○ **Not last on CAN bus**
● **Last on CAN bus**

Vin - Vout (Power IN - OUT)
● **Power on**
● **Error**

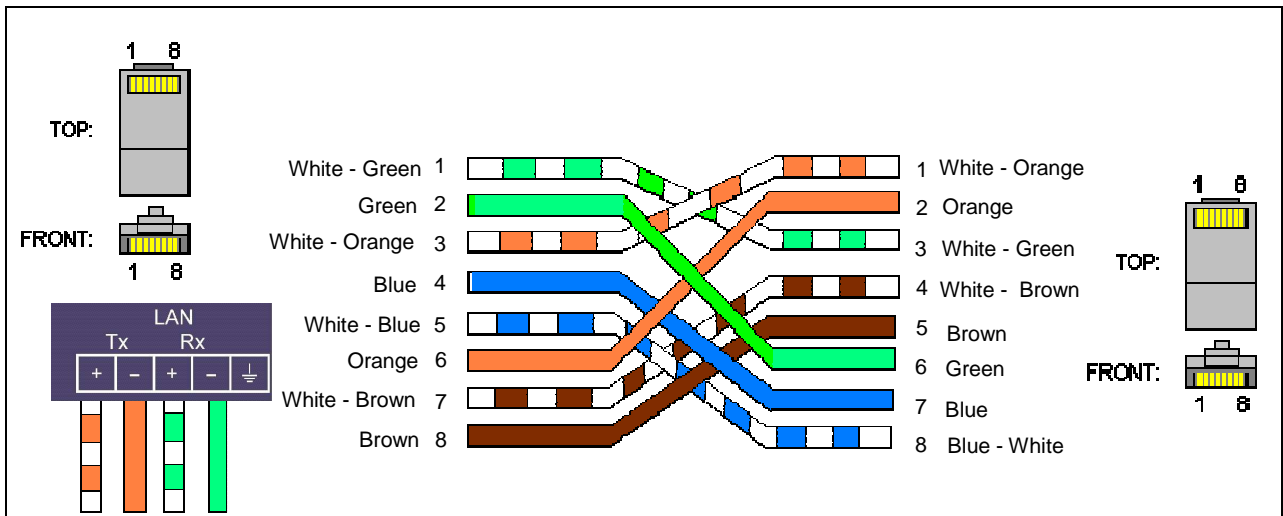# Appendix H: VP1910 connected to a Velos VP8001 (VPU)
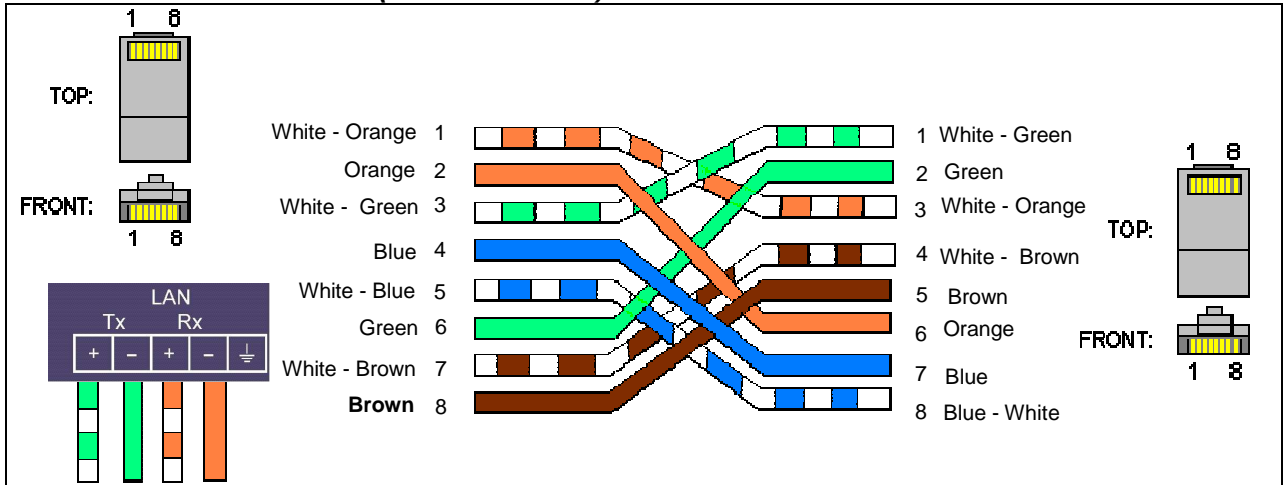
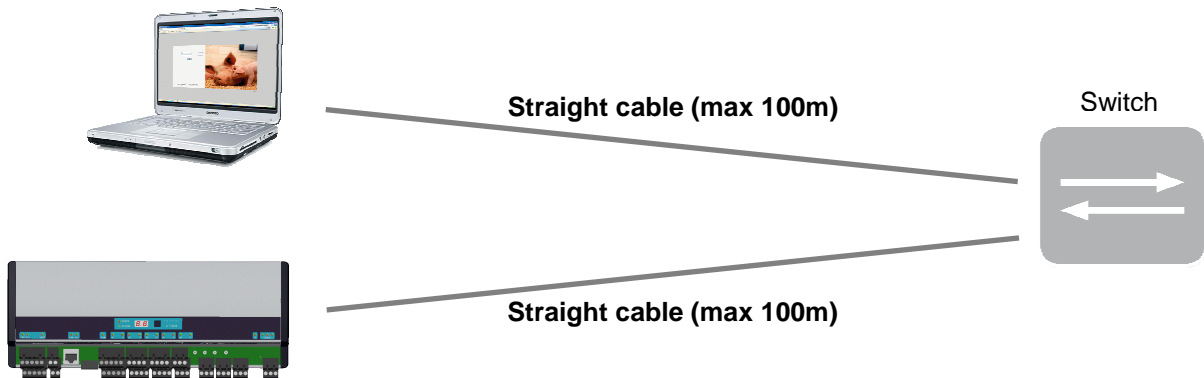# Appendix I: LAN Ethernet crossover cable

Cross cable (max 100m)

LAN Ethernet crossover cable *(TIA/EIA 568A)*

White - Green	1		1	White - Orange
Green	2		2	Orange
White - Orange	3		3	White - Green
Blue	4		4	White - Brown
White - Blue	5		5	Brown
Orange	6		6	Green
White - Brown	7		7	Blue
Brown	8		8	Blue - White

LAN Ethernet crossover cable *(TIA/EIA 568 B)*

White - Orange	1		1	White - Green
Orange	2		2	Green
White - Green	3		3	White - Orange
Blue	4		4	White - Brown
White - Blue	5		5	Brown
Green	6		6	Orange
White - Brown	7		7	Blue
Brown	8		8	Blue - White

Appendix J: LAN Ethernet straight cable

Straight cable (max 100m)

Switch

Straight cable (max 100m)

LAN Ethernet straight cable *(TIA/EIA 568A)*

1		1	White - Green
2		2	Green
3		3	White - Orange
4		4	Blue
5		5	White - Blue
6		6	Orange
7		7	White - Brown
8			Brown

LAN Ethernet straight cable *(TIA/EIA 568 B)*

1		1	White - Orange
2		2	Orange
3		3	White - Green
4		4	Blue
5		5	White - Blue
6		6	Green
7		7	White - Brown
8		8	Brouwn

Appendix K: Antenna connection

VP6150 antenna connection

Antenna HF+ (Brown / Blue)

Antenna HF- (Black / White)

Appendix L: Velos cable

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

Part No. 7705310

Appendix M: Two antennas < 3m distance

Use a F-sync cable to sync both readers.

master

F SYNC				F SYNC				F SYNC		
O	I	–		O	I	–		O	I	–

Coax RG58

F-sync kabel