

# VW 1150 Interface for Variometer

## Operating Instructions



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VW1150 Operating Instructions  
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# 1 INTRODUCTION

## 1.1 SPECIFICATION OF INTERFACE VW1150

Interface VW1150 connects the variometers of the VW10xx series to GPS sources (Logger, Flarm) and PDA or PNA. Hereby the variometers are connected to the CAN bus; for other components three COM ports are available.

The baud rate of each individual COM port can be set between 1200 and 115200. Thus components can be connected that normally could not communicate with each other due to their different transmission rates.

The direction of the data streams can be controlled over a wide range. For the CAN bus as well as for all three COM ports in you can define to which interfaces the data will be sent. By means of filter functions you can make a choice of the transmitted data.

Two direct channels can be switched externally. Thus you can connect two ports pre-selected for the corresponding direct channel during operation. So for example a logger can directly communicate with a PDA when programming a function without disturbing data streams of other interfaces.

The manifold setting options of the interfaces can be easily effected. For this in a configuration mode a computer or a PDA with a terminal program is connected to one of the COM ports and operated by means of the keyboard of the computer (PDA). The settings can be saved internally in a flash memory and will then be available at each application.

Interface VW1150 is equipped with an installed switch-mode power supply. It provides an output voltage of 5 V at an output current of up to 2.5 A. Hereby plugged-in PDAs can be provided with electricity. Therefore supplementary power supply units and wirings are not required.

Depending on the connected variometer VW1000, VW1010 or VW10201, data can be transmitted via interface VW1150 to the other connected components. For example

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1 For the variometers at least version 1.06 of the firmware is required for communication with the VW1150.

the climb rates of the variometer, the altitude and the flying speed, medium climb, speed command, battery voltage and the outside temperature. Also setting parameters of the variometer can be transmitted. In return you can make modifications directly at the variometer by means of the PDA software (MC, wing loading, volume of the audio, integration time and others).

For this Westerboer provides specific data records as NMEA format that can be used by the producers of the PDA software. For older program versions of the PDA software that do not yet comply with the Westerboer data records, some data can be transmitted in the Borgelt B50 or LX1600 formats.

## 1.2 IMPORTANT INFORMATION

In this chapter we give you some important instructions you should follow in order to avoid damages neither to the VW1150 nor to devices connected to it caused by inappropriate use. Also in other chapters you can find, if necessary, further important information being marked with a warning symbol, shown here at the lateral margin, for a better recognition.



Interface VW1150 allows numerous options for connecting devices. However provided that the connections and settings at the VW1150 are adjusted to the corresponding configuration. In detail the following must be observed:

1. For each COM port a supply voltage of 5 V or 12 V is also available. For this you have to install the corresponding link plug in the VW1150. Make sure that at the COM port only the device the port has been configured for is plugged in. **If a connected device is supplied with the wrong operating voltage, the device might be destroyed!**
2. Make sure that the device is disconnected, when opening the housing of interface VW1150.
3. The pin assignment of COM-Port1 differs from Port COM 2 and COM 3. Please select appropriate cables.
4. Ensure the voltage supply to VW1150 by means of an appropriate external fuse (3.15 A, slow).
5. Configure the corresponding interfaces (baud rate, direc-

tion of the data streams, filter functions) according to the corresponding use.

In Chapter 2 you can find a description how to install connections correctly and how to set link plugs correctly for feeding connected devices. In Chapter 3 you can find information on the configuration of interface VW1150. The configuration can be effected manually via a plugged-in PC as well as automatically by loading the corresponding configuration file. Examples for configuration files are available on our website. In Chapter 4 we show you how VW1150 works in normal operation.

### **1.3 SCOPE OF DELIVERY**

- VW1150 interface module
- CAN-Bus-cable (Patch Cable)
- Connecting cable for PC (D-Sub-Connector to RJ45)
- Connecting cable for PDA (D-Sub-Connector to RJ45)
- Set of cables for 12-V-voltage supply
- Separate lines for 5-V-voltage output
- Set of cables for the connection of switches for the direct channels
- Labels for identifying cables and RJ45-connectors

Not being supplied are cables that can be directly connected to the diverse PDAs and loggers. These are either added to the devices or can be bought in the accessories trade. You also buy switches for being installed in the instrument panel for the direct channels according to your requirements.

### **1.4 INSTALLATION OF INTERFACE VW1150**

The interface VW1150 is situated in a small aluminum housing. At the bottom of the housing there are four tap holes M3 at a distance of 46 mm resp. 50 mm for screwing in the plane. Due to its compact construction, the interface can also easily be fixed to a tube in the instrument housing by means of cable ties or adhesive tapes.

Hereby the decode switch positioned laterally should be accessible. And of course all four RJ45-connectors and

both panel plugs (voltage supply and direct channels) must remain accessible, too.

# 2 CONNECTIONS

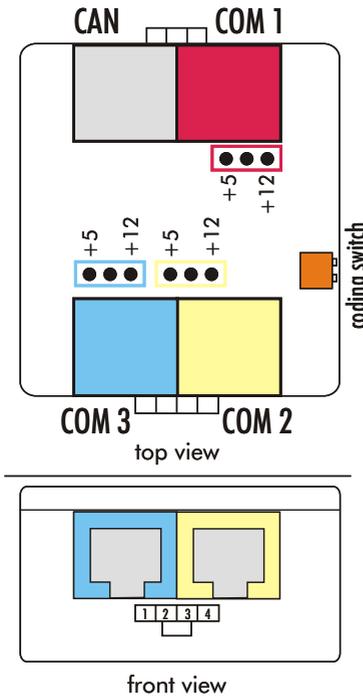
## 2.1 EXTERNAL CONNECTIONS

### COM-Ports

As shown in the following illustration, on both front sides each two RJ45-connectors are installed. One of them serves as connection of the CAN-bus, the other three ones as connection to all three COM-Ports of the VW1150. The alignment of the ports is also printed on the specification plate on the housing cover.

COM-Port COM1 is configured as input (for example for a logger or a Flarm). Standard cables of many loggers can be directly plugged in.

The pins of COM2 and COM3 are reserved as output connectors. COM3 is also the port where in configuration mode a computer or a PDA with a terminal program has to be connected to. The pin assignment of the three RJ45-connectors of the COM-Ports is shown in the following chart. TxD and RxD hereby refer to the type of lines of the VW1150.



Pict. 2.1: Schematic of the plugs of the VW1150

Pin	Color	COM1	COM2	COM3
1	or/wt	GND	GND	GND
2	or	GND	GND	GND
3	gn/wt	RxD	TxD	TxD
4	bl	TxD	RxD	RxD
5	bl/wt			
6	gn			
7	br/wt	+V	+V	+V
8	br	+V	+V	+V

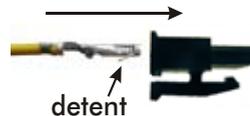


*Chart. 2.1: Assingment of the RJ45-plugs (with colour coding of the patch cables)*

## Supply Voltage

Below the RJ45-connectors you can find a 3-pole and a 4-pole panel plug. The 4-pole plug serves as input for the 12 V voltage supply and as output of the internal 5 V switch-mode power supply. Please lead the 12 V lines via a switch installed in the instrument panel by means of which you can disconnect the VW1150 from the on-board power supply, if necessary. The switch must be appropriate for a current load of at least 3 A, when only the VW1150 is connected hereto. If there are further devices connected to this switch, it must be appropriate for the correspondingly higher current loads. Please be aware that all the other devices being provided with voltage by the VW1150 will also be disconnected when switching off the VW1150. The VW1150 does not dispose of a separate closing switch, as it is normally positioned inaccessibly in the instrument housing.

The cables of the 5 V output can be used in case the feeding of an external device shall not be effected via the RJ45-connectors (for example during Bluetooth data transfer). A yellow and a black cable with pre-mounted pins for leading out the 5 V supply is included and can be locked in the 4-poles panel plug, if necessary. For this insert the crimp contacts with the detent (small clip bent downwards) showing downwards into the plug housing, whose locking is show-



ing downwards, too. The assignment of the cables from the left to the right (the cable ends show in the direction of the spectator) is shown in chart 2.2.

Pin	Color	Assignment
1	red	+12 V
2	blue	GND
3	black	GND
4	yellow	+5V

*Chart 2.2: Assignment of the supply cables*

Note: The 12 V voltage supply must be protected by means of an external safety fuse with a release current of 3.15 A (Slow). Please also pay attention to the correct polarity of the connecting wires!



In line 4 there are 5 V. Please pay attention to an adequate insulation in case the line remains open. Otherwise the switch-mode power supply is shorted!



### **Connection for Direct Channel Switches**

The 3-poles plug (below the RJ45 connectors for CAN and COM 1) leads out the connections for the direct channels. In the following you can see the pin assignment from the left to the right:

Pin	Color	Assignment
1	black	Channel 1
2	Shielding	GND
3	braun	Channel 2

*Chart 2.3: Assignment for direct channel*

For operating the direct channels you require one or two appropriate switches that should preferably be mounted to the instrument panel. If both channels are used, you can also use one single change-over switch which however must dispose of a middle OFF-position. In case of a normal change-over switch, always one direct channel would be connected and the interface VW1150 could neither be configured nor be operated in normal mode.

For switching one direct channel the corresponding pin 1 or 3 must be connected with ground to line 2.

## CAN Interface

For communication between different Westerboer devices, the CAN bus has been selected, having been developed for the automotive industry and being characterized by high transmission rates and its interference resistance during data transmission. Also the variometers VW10xx use this bus and can be connected to the CAN interface of the VW1150 by means of a standard patch cable (with 1:1 wiring). If further components are to be connected to the variometer (for example a supplementary display VW1050 or VW1060), another junction can be added to the CAN bus.

## 2.2 CABLE CONFIGURATION RS232

Along with interface VW1150 two cables disposing of a 9-poles D-Sub connector resp. a D-Sub plug are delivered. The cable with connector can be used for connection to a PC; the cable with plug can be used for connection to a PDA. To each second end of the cables a RJ45 plug with standard color coding of the connecting wires is mounted (see above).

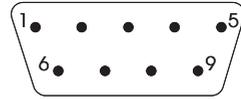
Pin	COM1 D-Sub-plug	COM2/COM3 PC D-Sub-connector	COM2/COM3 PDA D-Sub-plug
1			
2	bl	bl	gn/ws
3	gn/wt	gn/wt	bl
4			
5	or, or/wt	or, or/wt	or, or/wt
6			
7			
8			
9	br, br/wt		br, br/wt

*Chart 2.4: Assignment of D-Sub connector and plug*

A logger or another GPS source is normally directly connected to COM1 by means of a patch cable provided that the GPS source is correspondingly equipped. In case a cable with D-Sub connection shall be used here too, a corresponding cable can be obtained from Westerboer.

The configuration of the D-Sub plug connections is

shown in chart 2.4. The pin assignment of a D-Sub connector seen from the soldering side is shown in the small picture on the right.



## 2.3 INTERNAL LINKS

At Pin 7 and Pin 8 of the RJ45 connector you can apply either 12 V (e.g. for Logger) or 5 V for the feeding of a PDA. For this internal links have to be set in the VW1150. As especially when feeding PDAs, current flows of up to 2.5 A may occur, links for an adequate current load are added to the delivery (at delivery the links are plugged on the ports in the instrument, however without establishing contact). Please use exclusively these links.



First make sure that the interface VW1150 is disconnected, for example by removing the 4-poles plug for the voltage supply. Now open the housing by loosening all four screws in the cover.

There are three extension ports each with three poles on the board. The alignment of the extension ports on the board has been effected in a way that they can easily be assigned to the corresponding RJ45 connectors (see also colored classification in illustration 2.1).

The middle pole in the extension port leads to the contacts 7 and 8 of the RJ45 connectors. As marked in illustration 2.1 and also as printed on the board, always one of the outer poles is marked with +5V and the other one with +12V. By plugging in the links between the middle contact and one of the outer contacts, either 5 V or 12 V at the RJ45 connector are at disposal. If you don't want to lead out any voltage at a RJ45 connector, simply remove the link or plug it on one single pin.

For an easy assignment of the links, you can stick the supplied labels on the RJ45 connector and the corresponding plug.

Then reclose the housing. Pay attention to the correct orientation: the 4-poles link for the voltage supply must comply with the inscription +12 V and +5 V.

If the supplied adapter cable is used for PDA at COM2/COM3, there is output supply voltage at Pin 9 of the D-Sub plug (see Chart 2.4)



Before connecting an external instrument to the interface, first check the connecting plug of the external instrument if the correct voltage supply at the corresponding pin of the connecting plug can be measured. Only then you may connect the instrument.

# 3 CONFIGURATION

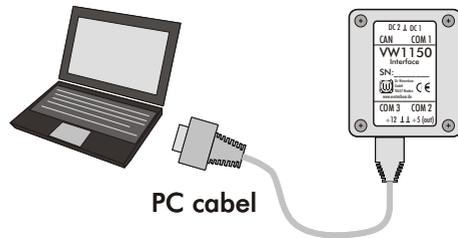
## 3.1 CONNECTION TO THE PC

For being able to use the whole range of functions of the VW1150, the interface can be configured in many ways. The configuration has to be done only once. The settings are then permanently saved in the VW1150 and can be called at every new start.

For configuring you just require a terminal program on a PC or PDA<sup>1</sup>. The keyboard of the PC is hereby used for data input for the VW1150. And the actual settings are shown on the screen.

For configuration, the connection between the VW1150 and a PC (or PDA) is generally established via COM3 of the VW1150 and any COM port of the PC. If the PC does not dispose of any COM-Port, the connection can be established by means of an adapter via an USB port of the PC. Appropriate RS232-USB adapters are available in the accessories trade. Use the PC cable supplied along with the VW1150 for establishing the connection of COM 3 of the VW1150 and the COM port of the PC. The settings of the COM interface are predetermined by the VW1150 and must be selected at the PC accordingly:

- 19200 baud
- 8 data bits
- 1 stop bit
- no parity
- no flow control



*Pict. 3.1: Connection to the PC always via COM 3 of the VW1150*

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<sup>1</sup> In the operating program Windows® the program Hyper-terminal is available and can be used herefore.

## 3.2 START OF THE CONFIGURATION MODE

In a small opening at the side of the housing there is access to a coding switch. By means of the left of both visible switches you can switch between normal mode (lower switch position) and the configuration mode (upper switch position). Move the switch by means of a pointed object to the requested position. Do not apply too much force, otherwise the switch might be damaged. Changing over is also possible during operation of interface VW1150. VW1150 can also be activated directly via switch position for the configuration mode.

When changing to configuration mode, COM ports 1 and 2 will be deactivated and the parameters for COM 3 are set as described before. The PC should be connected and the terminal program should be installed and ready-to-receive. When changing to configuration mode, the main menu including its parameter scheme is shown on the screen.

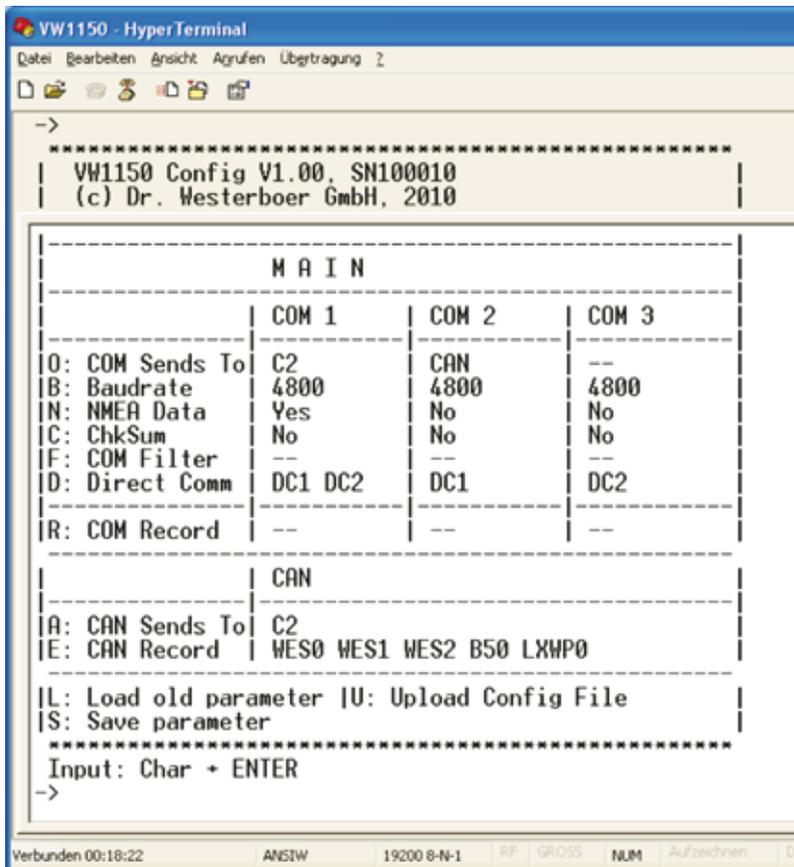
## 3.3 MAIN MENU

As soon as the connection to the PC has been established as described in Chapter 3.1 and the configuration mode has been started, the main menu is generated on the PC screen.

Here all configuration parameters are clearly arranged. In the headline you can find the serial number of the connected VW1150 as well as its firmware version.

Thereunder you can find the name of each menu, in this case: *Main*. Arranged in three columns, you can find the parameters of COM ports COM 1, COM 2 and COM 3. In the following the parameters of the CAN bus are shown. In the last field you can find the commands for the parameter administration.

The bottom end of the menu window is an input line starting with symbol "->". Here you can enter via keyboard commands for the configuration control. Letters, figures and symbol "\$" are admitted. It does not matter if you type in capital or small letters. They will always be displayed as capital letters in the command line. Corrections can be made by means of the *Backspace*-key. Each input is acknowledged by pushing the *Enter*-button.



*Pict. 3.2: Main Menu in the Terminal Program Hyperterminal*

The menu is configured self-explanatory. You can move from the main menu to a submenu by entering one letter, positioned in front of the corresponding parameter line, and by pushing the Enter-button, where you can then modify the parameters. You can get back to the Main Menu by entering letter M + *Enter*.

### 3.4 PARAMETERS OF THE CONFIGURATION

The configuration parameters as listed in the Main Menu have following functions:

#### **O: COM Sends To**

The data received by the COM-port listed on top of the column are forwarded to the receiver ports listed in this parameter. Receivers can be the other both COM-ports and the CAN-port (and herewith connected Westerboer instruments). In the demonstrated example, input C2 in column COM1 means that the data received by Port COM 1 are forwarded to Port COM 2.

#### **B: Baud Rate**

The transfer rates of the corresponding COM-ports. Following Baud rate values are possible: 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600 and 115200.

We intentionally renounced of an automatic adjustment to the Baud rate of the connected instruments, as for example PDA programs usually adapt the Baud rate by themselves. Communication problems would thus be preassigned.

#### **N: NMEA Data**

If a Yes is shown here, only data conforming to the NMEA format will be forwarded. That means the data lines begin with "\$" and end with "\*", followed by a two-digit check sum and the formatting marks <CR><LF>.

#### **C: ChkSum**

Yes in this line means that the check sum of a NMEA data line is checked. The data are only forwarded when the obtained check sum matches the one transmitted at the end of the NMEA line.

A test of the check sum is only made, when at the same time the NMEA format is being checked.

#### **F: COM Filter**

In COM Record individual data records can be defined, according to which the filtering is made. Here three values are possible:

- *no test* = no test is made
- *block records* = the defined data records are blocked

- *pass records* = only the defined data records are forwarded

### **D: Direct Com**

Two direct channels can be defined - *DC1* and *DC2*. Direct channel means that the data between both COM-ports of a channel are forwarded unfiltered and without being adapted to the Baud rate as if the instruments connected to these ports would be connected directly to one another. This is for example necessary for loading functions into a logger by means of PDA Software.

The direct channels are connected by means of switches that can be mounted to the lines of the 3-pole plug contact at the front side of the VW1150.

### **R: COM Record**

Up to ten data records can be defined to which the filter function *COM Filter* applies. The definition of the data records is made by entering the first up to six figures. For NMEA data the preceding figure "\$" must be entered in addition.

### **A: CAN Sends To**

Data of a connected variometer of the VW10x0 series arriving via CAN-bus are transformed in the VW1150 in a NMEA data record and can then be forwarded via the COM-port to a PDA for example. With *CAN Sends To* the ports that shall receive the data of the variometer are defined.

### **E: CAN Record**

Here the data records the VW1150 is sending are defined. You can set all three Westerboer data records \$PWES0, \$PWES1, \$PWES2 as well as \$PBB50 of Borgelt and \$LXWPO of the LX1600. Both latter data records have been integrated for enabling users of older PDA software versions to exchange data with the Westerboer variometers.

### **L: Load old Parameter**

Modifications can be cancelled as long as they have not yet been saved by pressing *Save Parameter*.

### **U: Upload Config File**

By means of the terminal program you can call a file where configuration parameters are listed as texts.

## **S: Save Parameter**

Modifications of the configuration parameters are permanently saved in the VW1150.

## **3.5 SAVE PARAMETERS**

Modifications of the configuration parameters will not be permanently saved before order *S + Enter (Save Parameter)* had been entered in the Main Menu. In case savings are not made, the modifications are only temporarily valid as long as the VW1150 has not been switched off (disconnected). When switching on again, however the previously saved parameters would be loaded again.

You can cancel modifications also directly by entering order *L + Enter (Load old Parameter)*.

## **3.6 SUBMENUS**

For concretely modifying parameters, you can call submenus by entering orders in the Main Menu described in Chapter 3.4. Like the Main Menu, these are also composed of three columns for the COM-ports parameters and one column for the CAN-bus parameters. You can return from the submenus to the Main Menu by entering *M + Enter*.

In each submenu the syntax for entering parameters is indicated in *Input* and an example is shown ahead of the input line. Therefore we can here renounce of a detailed description of all submenus. We only give general information and some features.

### **Use of Wildcards in the Syntax**

Example: Submenu *COM sends to* (see picture 3.3).

<i> is a wildcard for the COM port to which the setting applies. <r> is the receiver to which the data are sent from COM-Port <i>. <r> may here adopt values from 1 to 4, while 1 stands for COM1, 2 for COM2, 3 for COM3 and 4 for the CAN port.

The command lines are described as:

- A<i><r>: receiver <r> is added to COM port <i>.
- D<i><r>: receiver <r> is removed from the list of receivers of COM port <i>.

Herewith the shown input example is self-explanatory:  
A21 = receiver COM1 is added to COM2.

In most menus wildcards are used likewise for entering commands.

```

*****
VW1150 Config V1.00, SN100010
(c) Dr. Westerboer GmbH, 2010
-----
                C O M s e n d s T o
-----
<i>              | COM 1      | COM 2      | COM 3
-----|-----|-----|
receiver <r>    | C2         | CAN        | --
-----|-----|-----|
<r>:           | 1=COM1;   | 2=COM2;   | 3=COM3;   | 4=CAN;
-----|-----|-----|
A<i><r>: add to port <i> receiver <r>
D<i><r>: delete from port <i> receiver <r>
-----|-----|-----|
M: back to Main
*****
i.e. A21 ENTER -> adds COM 1 to COM 2
->

```

Pic. 3.3: Submenu ,COM sends to'

### Definition of the Filter String

In menu *Filter Record* strings being forwarded resp. blocked by a COM port, depending on how the parameter has been set in *COM Filter*, can be defined. For this two command sequences are specified in menu *COM Records*:

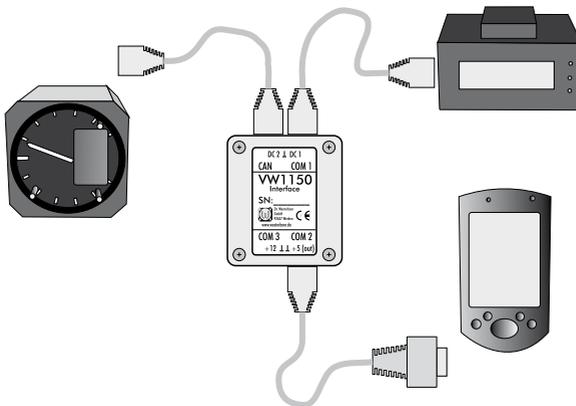
- A<i><string>, means: the string is added to COM port <i> in <string>. Here <string> may be composed of up to 6 characters.
- D<i><r>, means that input number <r> is removed from COM port <i>.

Examples for possible strings are GPS data record ,*\$GPRMC*' or ,*\$GPGGA*'. You may however also address numerous data records by one single string. For example all GPS data records beginning with the short string ,*\$GP*' are addressed. That means for example ,*\$GPGGA*', ,*\$GPRMA*', ,*\$GPRMB*', ,*\$GPRMC*' and all other GPS data records.

### 3.7 STANDARD SETTINGS

At delivery, the parameters shown in picture 3.2 are set in the VW1150. Herewith you can generally use the interface for the most common application specified in this manual without further settings.

A variometer is connected to the CAN bus, a logger is connected to COM 1 as GPS source and a PDA is connected to COM 2 including the corresponding software. The logger can communicate directly with the PDA via direct channel DC 1. A transfer rate of 4800 baud, most loggers are run with in the factory setting, has been set.



*Pict. 3.4: Standard Application with Logger, Variometer and PDA*

The CAN bus sends the values of the vario with all data records at disposal (,\$PWES0`,,\$PWES1`,,\$PWES1`,,\$PBB50` and,\$LXWP0`) to COM 2, so that readable data are provided for the diverse PDA programs.

When you have acquainted yourself with the system, you should make settings for special application. Hereby you can limit the data stream by setting appropriate filters and *COM Records* as well as by limiting to the really necessary data records of the CAN interface and thus increase the performance of the complete system. In the following chapter we show you how to do this appropriately.

## 3.8 STEP-BY-STEP CONFIGURATION INSTRUCTIONS

Before setting the configuration, you should first determine which instruments shall be connected to which ports and how the data streams shall flow. In Chapter 5.1 of the attachment you find a form where the necessary strategy parameters can be entered.

When the planning has been finished, the parameters can be quickly entered into the corresponding menus by means of the terminal program on the PC. You can also make the settings by means of a file being loaded into the VW1150 by the terminal program. For more detailed information see the following chapter 3.9.

When planning, COM1 should be reserved for the GPS source – generally a logger or a Flarm. In principal any other COM port would be appropriate too; the pin assignment of COM1 is however designed herefore.

In your planning also determine which of the connected instruments shall be provided with power by the VW1150. Then carefully set the provided links in the VW1150 as described in Chapter 2.3. For a logger or the Flarm this will normally be 12 V. Here the instructions in the operating manual of the corresponding connected instrument must be absolutely respected.



After having determined which instruments will be connected to the COM ports, you have to think about with which other connected instruments they shall exchange data – respectively between which COM ports the data streams shall flow.

In the application shown in picture 3.4, the logger (COM 1) is sending data to the PDA (COM 2). So in the planning chart in column COM1, COM2 must be entered as data receiver. Now in the example a regulation of the connected variometer via PDA shall be enabled. Therefore the CAN bus – along with the variometer – must be the receiver of COM2. In line *sends to CAN* of the chart, input *yes* should be marked in the column below COM2.

For a correct communication you have to select the correct transfer rate in baud for each connected instrument. First find out at which data rate the connected instruments are

sending or receiving and enter it accordingly in the chart.

In case the NMEA conformity shall be checked or the check sum shall be tested before data are forwarded by the VW1150, this must be entered in the corresponding column. Normally this is not necessary.

Sometimes it may make sense to reduce the data records sent by the GPS source. One reason herefore might be that the available transfer rates to the connected instruments are very low and numerous unnecessary data are sent. Thus the interface would be overloaded. Another reason herefore might be the software of the PDA that sometimes does not cope with some data records. For information on the kind of data records being transmitted by the GPS sources and the data records being required for evaluation in the PDA software, see the corresponding manuals.

By means of the filter functions pass or block you can select individual data records that may pass or are blocked, defined by their first up to six figures.

In case individual instruments shall directly communicate from time to time, as if they would be connected without any VW1150 between them<sup>1</sup>, a maximum of two direct channels can be defined herefore. Enter both involved COM ports for each direct channel into the chart.

At last you must plan where the CAN bus shall send data to and which data format shall be used. In the shown example, the variometer shall send its measuring values to the PDA. For this the CAN bus must send to COM 2. Most appropriate herefore are the Westerboer data records \$PWES0, \$PWES1 and \$PWES2. Select the same data records also in the PDA software.

When all required parameters of the VW1150 have been defined, the settings can be made at the PC via a terminal program as described before in this chapter. Don't forget to save the parameters in the VW1150.

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<sup>1</sup> For example for uploading of functions defined in the PDA into the logger.

### 3.9 CONFIGURATION BY MEANS OF A FILE

All settings can also be entered as special data records in a text file and then be transmitted to the VW1150 by means of the terminal program. Six different data records have been defined. They all begin with string ‚\$VW1150‘ and end with symbol ‚\*‘. They are specified in Annex 5.2.

When editing data records, pay attention to the correct syntax. It is not obligatory that values of all parameters are entered. Instead of the missing parameters, the previous settings are maintained. The number of commas must however be maintained, even if some parameters have not been indicated.

With data record ‚\$VW1150,SAVE\*‘ all modifications can be permanently taken over in the VW1150. At the end of the file, there must be data record ‚\$VW1150,END\*‘. In a configuration file at most ten data records in a row are allowed. Per line exactly one data record is allowed. Other inputs besides the ones mentioned in 5.2, are not allowed in the file.

In the terminal program it must be regulated that when sending ASCII data at the end of the line, a line feed is sent. The other settings are identical to the values indicated in Chapter 3.1. On our website there is an initialization file (VW1150.ht) for the terminal program Hyperterminal, where all necessary settings are memorized. By starting the terminal program by means of this file, all internal parameters of the terminal program are automatically taken over.

For uploading the configuration file, the VW1150 must be in configuration mode and connected at COM3 to the PC. Select *U: Upload Config File* in the Main Menu. A submenu now asks for uploading. For this, start sending a text file in the terminal program. In case of Hyperterminal there is a corresponding input in menu ‚Transmission‘ and then ‚Send text file...‘, whereupon a window opens for selecting the file. After a successful transmission the Main Menu shows up again containing the new parameters.



# 4 NORMAL OPERATION

## 4.1 STARTING NORMAL OPERATION

For starting normal operation, both coding switches at the housing side must be in lower position. Hereby it does not matter if the VW1150 is switched on with this switch position or if the switches are put into this position by the configuration.

## 4.2 THE DATA RECORDS OF THE VW1150

The variometers of the VW10x0 series send and receive data in a separate data format via the CAN bus. As communication with loggers and PDA is normally effected serially by means of NMEA data records, the VW1150 converts both bus systems using special NMEA data records.

For a comprehensive data exchange the data records \$PWES0, \$PWES1 and \$PWES2 have been introduced. \$PWES0 is sent once a second, in case of lower baud rates of the receiving COM port up to every three seconds. It contains values of the measured climb, the medium climb, the netto vario, the speed command, the standard and QNH height, the airspeed, the battery voltage and the outside temperature<sup>1</sup>.

\$PWES1 and \$PWES2 are only transmitted on demand or in case of modification of the variometer parameters. This includes the MacCready value, the position of the speed command/vario switch, the integration time, the vario damping and the volume of the audio.

The suppliers of PDA programs will decide which data will finally be evaluated.

For users of older versions of the PDA programs, the VW1150 can also send the data records \$PBB50 and \$LXWP0. With the first of both data records, the VW1150 transmits the values of the vario, the airspeed, the MacCready value, the position of the speed command/vario switch and the outside temperature. At \$LXWP0 the climb values, the airspeed and

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<sup>1</sup> The transmitted parameters depend on the type of the connected variometer.

the height are transmitted.

For the control of the variometers, further data records are used by means of which for example the MacCready value can be set at the VW1000 or its volume can be adjusted via the PDA. Here too, it depends on which parameters are really used by the PDA programs. Please refer to the operating instructions of the PDA program.

### **4.3 WORKING WITH DIRECT CHANNELS**

In the VW1150 up to two direct channels can be programmed. In mode Direct Channel the involved COM ports behave as if a direct connection exists between the connected instruments. Direct channel connections are used for example for uploading functions from the PDA into a logger or for downloading flight track records. In this mode in VW 1150 the settings for baud rate and filter functions of the Com ports are deactivated and exclusively a data exchange between both involved COM ports is established. Transfer rates up to 115200 baud are possible. This is however not a purely galvanic connection. The data also flow in direct channel mode via the microprocessor of the VW1150. The VW1150 must therefore also be activated for this mode.

For being able to use one of both direct channels, at the 3-pole pin (see picture 2.1 and chart 2.3) the contact between the middle and the corresponding outer pole must be established. For connecting appropriate switches, see description in chapter 2.1. above.

The VW1150 returns to normal operation mode as soon as the contacts of the direct channel switch are open again.

# 5 ANNEX

## 5.1 CONFIGURATION PLANNING FORM

	COM 1	COM 2	COM 3
connected instrument			
supply voltage [V] external	-- / 5 / 12	-- / 5 / 12	-- / 5 / 12
baud rate			
sends to COM	C2 / C3	C1 / C3	C1 / C2
sends to CAN	yes /no	yes /no	yes /no
filter NMEA	yes /no	yes /no	yes /no
use check sum	yes /no	yes /no	yes /no
belongs to direct channel 1	yes /no	yes /no	yes /no
belongs to direct channel 2	yes /no	yes /no	yes /no
filter function	no filter/ block/ pass	no filter / block/ pass	no filter / block/ pass
filter string #1			
filter string #2			
filter string #3			
filter string #4			
filter string #5			
filter string #6			
filter string #7			
filter string #8			
filter string #9			
filter string #10			

	CAN
CAN sends t	COM 1 / COM 2 / COM 3
CAN records	WES0, WES1, WES2, B50, LXWPO

## 5.2 DATA RECORD FOR CONFIGURATION WITH A FILE

All data records begin with string `,$VW1150`` and end with figure `,*``.

In the following description of the data records, the variables are indicated in angle brackets if they are obligatory. Variables in brackets can be left out, if the corresponding configuration parameters shall not be modified. Then no input is made at the corresponding position between the commas. The commas themselves must however remain.

***`$VW1150,<COM>,[R],[Baud],[NMEA],[CS],[F]*`***

<b>Variable</b>	<b>Values</b>	<b>Use</b>
COM	COM1 COM2 COM3	COM port which the settings apply to.
R	1, 2, 3, 4	Data receivers of the COM Port. 1=C1, 2=C2, 3=C3, 4=CAN. Strings of up to three digits can be entered. (e.g. 124). The sequence is irrelevant.
Baud	1 .. 9	Baud rate of the COM port; 1=1200 Baud; 2=2400, 3=4800, 4=9600, 5=14400, 6=19200, 7=38400, 8=57600, 9=115200
NMEA	0, 1	NMEA-Filter: 0=not set, 1=set
CS	0, 1	Test of the check sum: 0=no test, 1=test is made
F	0, 1, 2	Filter function: 0=no check of records, 1=block records, 2=pass records

***\$VW1150,DC,[DCH1],[DCH2]\****

<b>Variable</b>	<b>Values</b>	<b>Use</b>
DCH1	1, 2, 3	COM ports of the direct channel DC1, indicated as pair of numbers. E.g. 12: COM1 and COM2 are the ports of the direct channel
DCH2	1, 2, 3	As above, however for the direct channel DC2

***\$VW1150,<RECORD>,[S1],[S2],[S3],[S4],[S5],[S6],[S7],[S8],[S9],[S10]\****

<b>Variable</b>	<b>Values</b>	<b>Use</b>
RECORD	REC1 REC2 REC3	Filter records for COM1, COM2 and COM 3
S1 .. S10		S1 to S10 consist of strings of one to six coherent digits. Capital letters, numerics and figure \$ are allowed.

***\$VW1150,CAN,<R>,<DATA>\****

<b>Variable</b>	<b>Values</b>	<b>Use</b>
R	1, 2, 3	Receivers of the CAN bus; up to 3-digit numbers consisting of figures 1, 2 or 3. The figures apply to 1=COM1, 2=COM2, 3=COM3.
DATA	0 .. 4	Data records being sent via CAN port. The entry consists of up to 5 digits with 0=PWES0, 1=PWES1, 2=PWES2, 3=PBB50, 4=LXWPO

***\$VW1150,SAVE\****

Saving parameter modifications in the VW1150

***\$VW1150,END\****

This data record must be the last entry in the configuration file.

**Example for the Content of a Configuration File:**

```
$VW1150,COM1,2,3,1,0,0*  
$VW1150,COM2,4,3,0,0,0*  
$VW1150,COM3,,3,0,0,0*  
$VW1150,CAN,2,01234*  
$VW1150,DC,13,12*  
$VW1150,REC1,$GP,,,,,,,,*  
$VW1150,REC2,$PWES,,,,,,,,*  
$VW1150,SAVE*  
$VW1150,END*
```