

1.0 INTRODUCTION	2
2.0 DESCRIPTION OF CONTROLS	2
3.0 LIQUID CRYSTAL DISPLAY	3
3.1 ELEMENTS OF THE DISPLAY	3
3.2 CURSOR POINTS	4
3.3 DESCRIPTION OF CURSOR POINTS	4
3.4 CIRCULAR DISPLAY FOR VARIO OR SPEED TO FLY MODE	7
3.4.1 CIRCULAR DISPLAY IN VARIO MODE	7
3.4.2 CIRCULAR DISPLAY IN SPEED TO FLY MODE	7
3.5 FOUR DIGIT HEIGHT DISPLAY	8
3.5.1 HEIGHT AND HEIGHT DIFFERENCE DISPLAY IN VARIO MODE	8
3.5.2 HEIGHT DISPLAY IN SPEED TO FLY MODE	8
3.5.3 SPEED TO FLY DISPLAY	8
4.0 GPS INTERFACE	9
4.1 WIND DISPLAY WITH GPS INTERFACE	9
5.0 CHANGE FROM VARIO TO SPEED TO FLY	10
5.2 VARIO/SPEED TO FLY VIA FLAPS OR STICK SWITCH	10
5.3 VARIO/SPEED TO FLY VIA SPEED CONTROL	10
5.4 VARIO/SPEED TO FLY VIA GPS	10
5.4.1 CHANGE OVER FROM SPEED TO FLY TO VARIO VIA GPS	10
5.4.2 CHANGE OVER FROM VARIO TO SPEED TO FLY VIA GPS	10
6.0 CALCULATING YOUR SPECIAL POLARS	10
6.1 ESTABLISHING THE POLAR VALUES	10
6.2 CALCULATING THE POLAR COEFFICIENTS	11
6.3 ENTERING POLAR COEFFICIENTS	11
7.0 OPTIMISED CURSOR MOVEMENT	12
8.0 ACOUSTICS	12
9.0 SETUP	13
9.1 ITEMS IN SETUP	13
9.2 EXPLANATION OF SETUP	14
10. THE FIRST FLIGHT	15
10.1 SWITCHING ON AND OFF	16
10.2. THE POLAR OF YOUR GLIDER IN SETUP	16
10.2.1 FINAL ADJUSTMENT OF POLAR	16
10.3 COMPENSATION	16
10.3.1 COMPENSATION AND THE C4 COMPETITION	16
10.4 VARIO DISPLAY	16
10.5 DIRTY WING POLARS	16
10.6 SPEED TO FLY	17
11.0 INSTALLATION	17
11.1 MECHANICAL INSTALLATION	17
11.2 ELECTRICAL INSTALLATION	17
11.2.1 DESCRIPTION OF ELECTRICAL CONNECTIONS	17
11.2.2 DIE STECKERBELEGUNG WITH KABELFARBEN PATCHKABEL (RJ45)	18
11.3 GPS INTERFACE	18
11.4 PNEUMATIC FITTING	19
12.0 TECHNICAL DATA (SPECIFICATIONS)	19
13.0 GUARANTEE	19
14.0 DEVELOPMENT AND SALES	20

1.0 Introduction

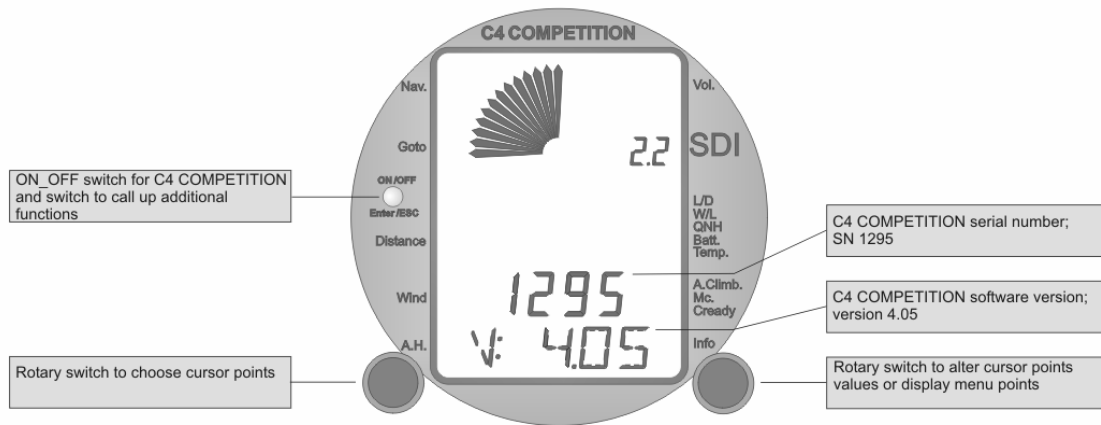
Dear glider pilot,

You are now the proud owner of a modern flight computer. The C4 Competition is well proven and operates with optimum efficiency.

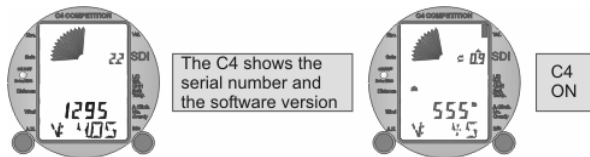
The following changes from version 3.01 have taken place;

- ◆ simple change over from metres to feet
- ◆ new vario characteristics – very fast and steady
- ◆ two vario scales; 2.5 and 5 m/s or 5 and 10 feet/sec
- ◆ new final glide calculation via laid off turning point to goal
- ◆ new flight statistics with displays of average speed over the last 30 minutes and the last 2 hours

2.0 Description of controls



- ◆ The label on the ON/OFF switch shows that the switch has several functions.
- ◆ When **switching on** press the ON/OFF switch until the display appears, then you'll see a version number appear for a few seconds; this is the software version of your C4 Competition.

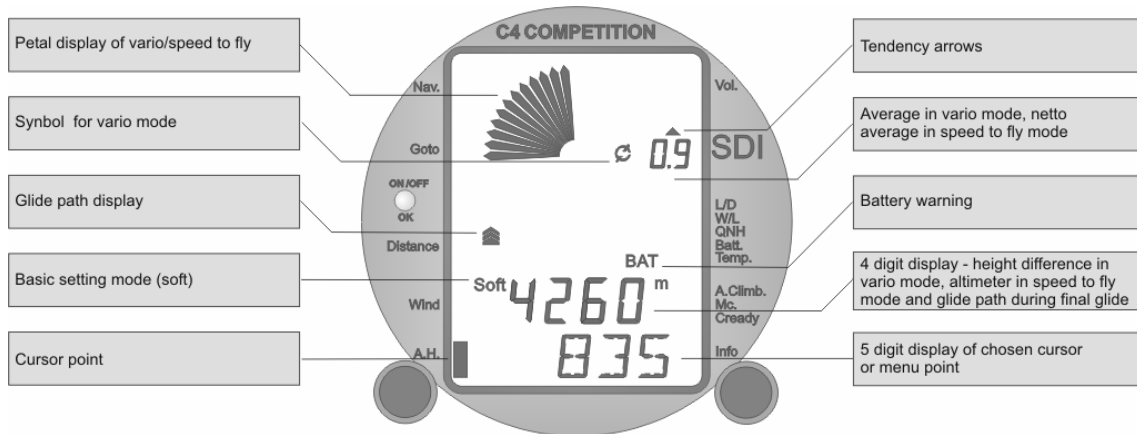


Now you must enter QNH and confirm it with the OK switch.

- ◆ When **switching off** press the ON/OFF switch until OFF 9 appears. After that a countdown takes place and after showing OFF 0, the C4 Competition switches off.



- ◆ You choose the required cursor point with the left rotary knob. The right rotary knob allows you to change the values of the chosen cursor point and to leaf through Info when this cursor point has been chosen (flight statistics). The cursor point you have chosen is shown on the 5 digit display.



3.0 The Liquid Crystal Display

A special liquid crystal display was developed for the C4 Competition which provides good contrast over a wide range of temperatures to allow reading in all light conditions.

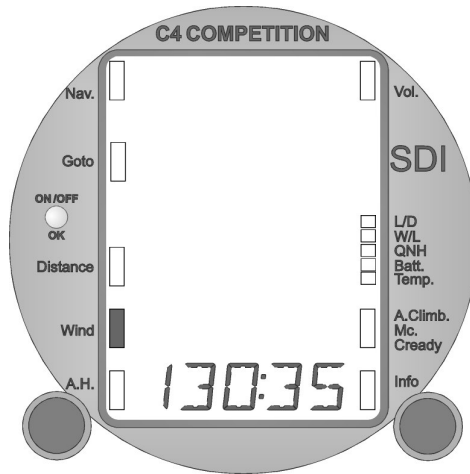
3.1. Elements of the display

- ◆ The circular petal display shows vario and speed to fly values.



- ◆ The circular symbol \uparrow shows you are in vario mode. When in speed to fly mode the symbol \downarrow appears.
- ◆ The 2.5 digit display **0.9** shows average climb in vario mode and is a netto vario in speed to fly mode. (The netto vario shows the vertical movement of the air mass minus the sink rate of the glider.)
- ◆ The tendency arrows \uparrow above and below \downarrow the 2.5 digit display show whether thermal strength is increasing or decreasing and is a useful aid for centering.
- ◆ If the battery voltage falls below the voltage set in the setup menu then **BAT** flashes.
- ◆ The 4 digit altimeter **4260** displays altitude.
- ◆ The 5 digit display **138:35** shows the chosen cursor point. (Further information about this under 3.3.)
- ◆ The glide path arrows \updownarrow show if you are above or below glide path. The arrows divide into three with each division showing the deviation from the glide path (above or below) in steps of 50 metres.
- ◆ The sign **Soft** shows when you are in SETUP.

3.2 The cursor points

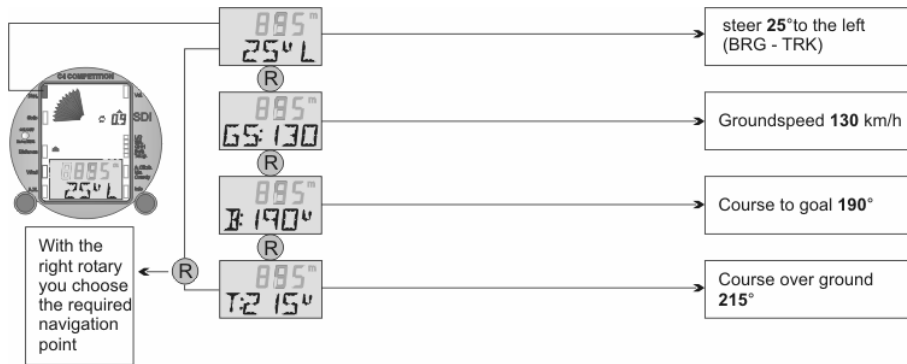


3.3 Description of cursor points

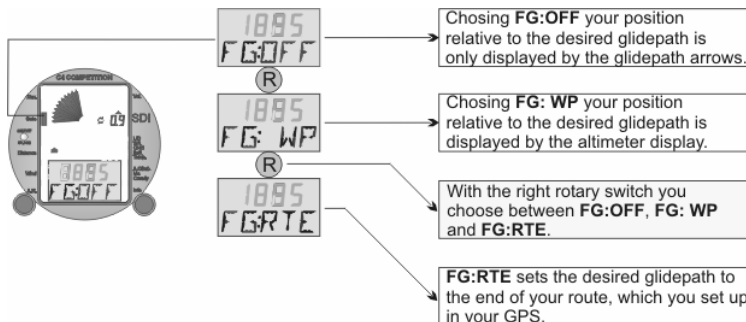
The framing of the four digit height display and the five digit cursor display is used to highlight the chosen cursor point.

When switching on the C4 COMPETITION the **Wind, Mc.Cready** value and all values in the **Info-Menu** are set to **0**.

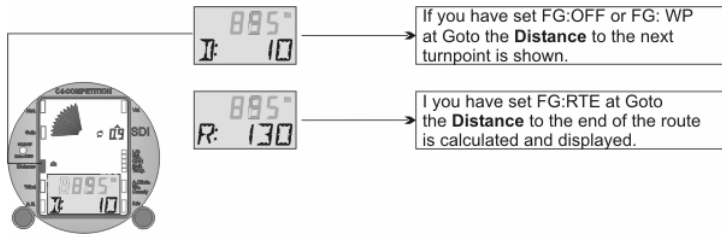
- ◆ At **NAV** you can call up the various displays for navigation.



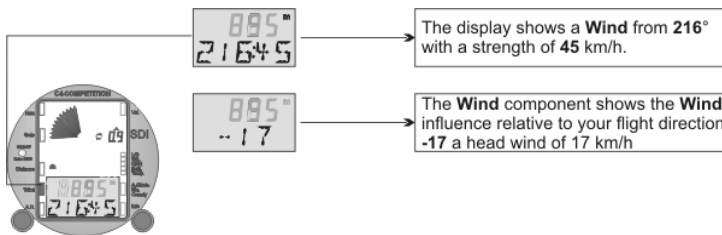
- ◆ At **Goto** you can call up the various displays for final glide.



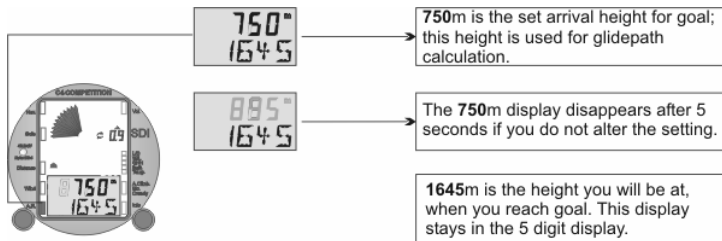
- ◆ Distances are taken automatically from the GPS or logger and shown under **Distance**.



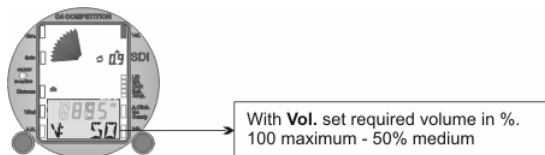
- ◆ From the GPS interface you receive precise information about the wind. In vario mode the wind direction and strength is displayed. In speed to fly mode the wind component is shown in addition to the direction and strength. You may see, for example, **216:45**, then **C: - 45**.



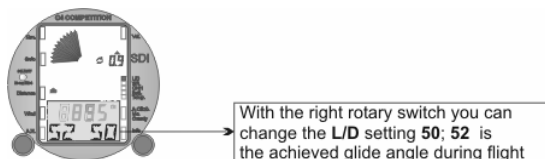
- ◆ If the cursor is set on **A.H.** (arrival height), the set arrival height (750m) of the next waypoint or goal appears for 5 seconds in the four digit display. In the five digit display you see the calculated arrival height (1645m) of the next waypoint.



- ◆ With **Vol.** you alter volume strength from 0 to 100.



- ◆ Glide angle, **L/D**, is used to set your polar precisely. Enter the best glide angle of your glider. The polar can be changed during flight if necessary (e.g. dirty wings from insects). In flight, in addition to the set L/D (1:50 right) the achieved L/D is shown (1:52 left).



- ◆ Enter your wing loading for the day at **W/L**. Wing loading is always in kilos per metre squared. You can change the wing loading value in flight.



With the right rotary switch you can change the set **W/L 35** kg/m²

- ◆ With **QNH** you can set your altimeter to the desired pressure. The four digit display shows pressure in hPa and the five digit display shows altitude.



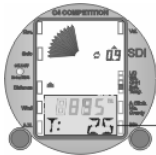
With the right rotary switch you can set the altimeter's **QNH** setting.

- ◆ **Batt.** displays the voltage of your battery.



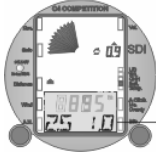
Batt. shows the voltage of your battery **12.5** volt.

- ◆ **Temp.** shows the temperature at the temperature probe (cable 1).



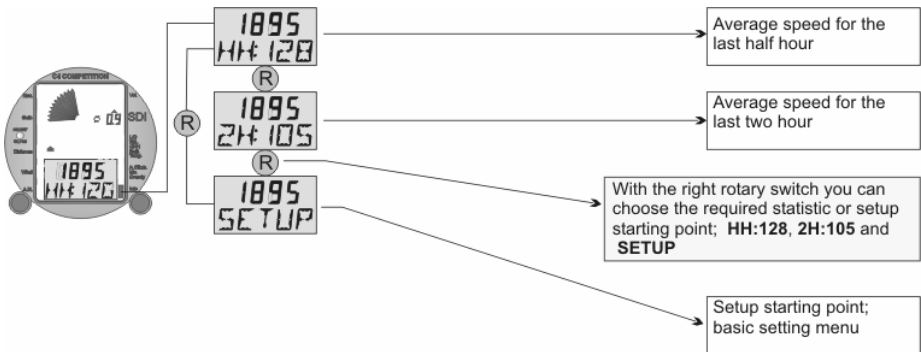
Temp. shows the temperature as measured at the temperature probe **25°C**

- ◆ **A.Climb/McCready** shows the average strength of the last thermal and, at the same time, you can set a suitable McCready value. The average thermal strength is calculated using the total time spent in the thermal. The change over point from speed to fly to vario is used as a measuring criterion.



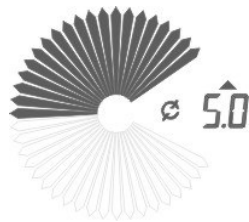
A.Climb/McCready shows the average climb **2.5** m/s and the set McCready value of **1.0** m/s

- ◆ **Info** displays the average speed over the last half hour and over the last two hours. You can enter the set up menu when **SETUP** is displayed.

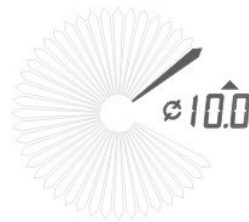


3.4. The circular petal display for vario and speed to fly

The petal display provides an optical display of values for vario and speed to fly modes. A special feature is the vario display range.



eg. 5m/s climb

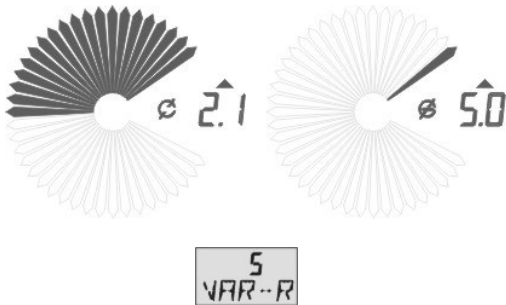


eg. 10m/s climb

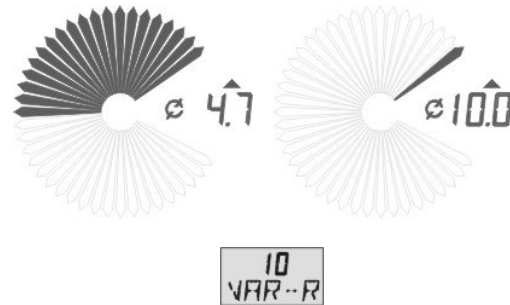
The circular petal display of the C4 has a double display image. At the beginning the display fills from 0–5m/s followed by the emptying of the display area from 5–10m/s.

3.4.1 The circular petal display in vario mode

In vario mode the display can be set to 0-5m/s or 5-10m/s. You can change between them by putting the cursor to A.Climb/McCready and pressing OK. After the change over you will see the chosen vario range displayed for a few seconds.



Range 2.5–5m/s

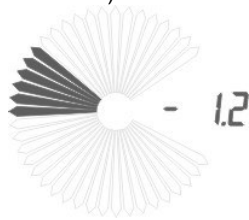


Range 5–10m/s

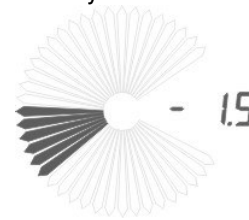
The non-linear display shows the vario values well. Nearer to 0 the vario becomes more sensitive. With an additional analogue vario the values are presented in a linear display. The digital display to the right of the circular petal display shows the vario average, taking into consideration the set time constant.

3.4.2 The circular petal display in speed to fly mode

In speed to fly mode the circular petal display shows the speed deviation from speed to fly. Flying too fast is shown by petals above 0 and flying too slowly is shown by petals below 0. Every petal change (excluding the central one) shows a deviation of 4km/h from speed to fly.



20km/h too fast



20km/h too slow

The digital display to the right of the circular petal display shows the netto vario average, taking into consideration the set time constant. Flying straight the netto vario shows the movement of the air minus the sink of the glider.

3.5 The four digit height display

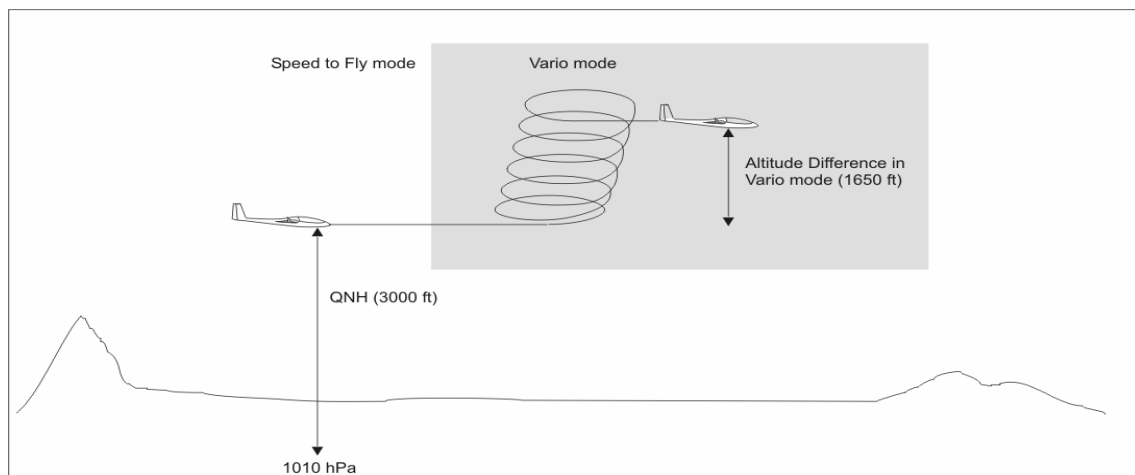
The four digit altimeter display is used to show different heights.

- ◆ An altimeter (QNH) and height difference in vario mode
- ◆ An altimeter (QNH) in speed to fly mode
- ◆ Height above or below glide path during final glide

Info: You can change the altimeter between metres and feet by putting the cursor to QNH and pressing OK.

3.5.1 Height and height difference in vario mode

In vario mode and by choosing **FG:OFF** the four digit display operates as a precise altimeter that is set to QNH. When **H:G.VAR** is put at **1** in Setup, the four digit display shows height gain or loss in vario mode – after the change over from speed to fly to vario mode.



3.5.2 The altimeter in speed to fly mode

In speed to fly mode and when using **FG: OFF** the four digit display operates as a precise altimeter that is set to QNH.

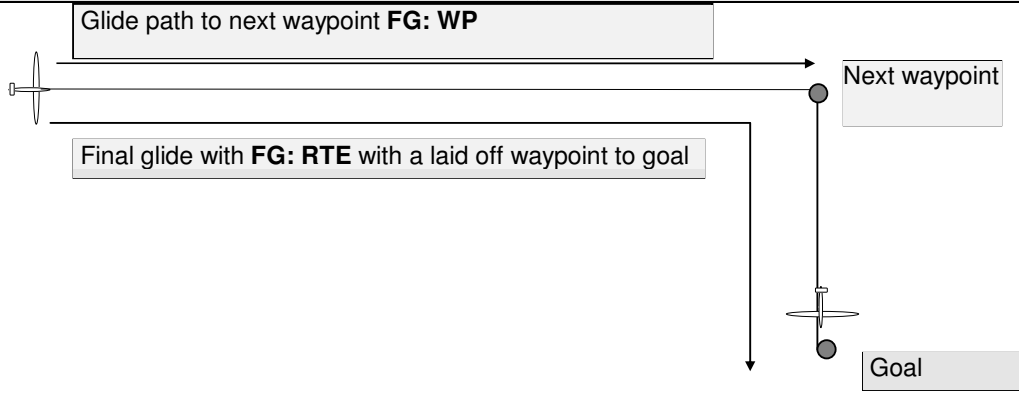
3.5.3 Glide path display

If you have chosen **FG:WP** or **FG:RTE** in the Goto menu, you get a glide path display instead of the height display. In addition, on the left, you see several glide path arrows. These arrows appear in vario and speed to fly mode. The arrow symbol divides into 3 arrows up or down. Each arrow represents a height of 50m.

The speed to fly glide path is the glide path to goal or waypoint and takes into consideration set polar, set glide angle, wing loading, distance, McCready value, wind and set arrival height. If you call up **FG:WP** or **FG:RTE** on Goto, the cursor jumps automatically to **A.H.** after 5 seconds and waits for confirmation or change of the required arrival height **AH-WP** or **AH-FI**. **AH-WP** is the chosen arrival height at the next waypoint and **AH-FI** the arrival height at goal.

A C4 linked to a PosiGraph from SDI, takes the arrival height from the PosiGraph, assuming that a height for this waypoint has been set in the PosiGraph. You can change this height if you wish. When no height is given a standard height of 400 metres is used. This value can also be altered.

The arrival height will be used after you have pressed **OK**. If you want to change the arrival height again later, then put the cursor to **A.H.** and press **OK**. Now you can alter the height. The new arrival height set will be used when you press **OK** again.



Warning: Final glide with **FG: RTE** only functions with a laid off waypoint before goal. Otherwise you will get a message **NOT: FI** and **8888** on the altimeter.

If your goal is another airfield, the setting of QNH is important for final glide because glide path calculation for final glide is not complete without it. The setting of QNH should therefore be checked before final glide.

4.0 The GPS Interface

The C4-GPS interface allows you to concentrate on flying and provides you with the following useful information.

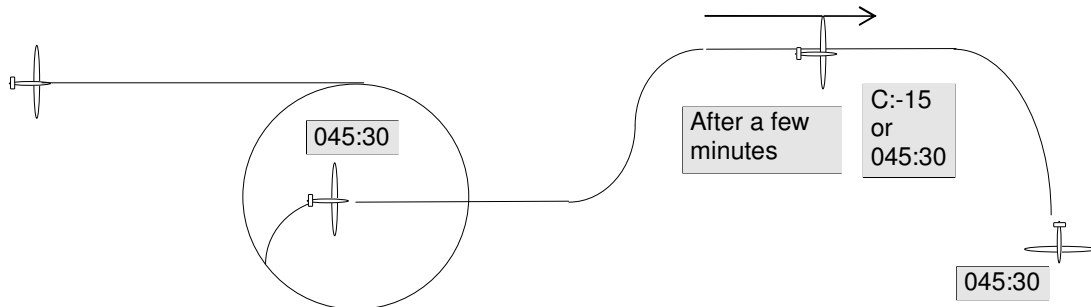
- ◆ wind component on each leg
- ◆ wind component for glide path calculations
- ◆ wind direction and strength
- ◆ distance to a waypoint or for the whole route
- ◆ navigation data
- ◆ altitude of goal – only when linked to a PosiGraph

The C4 can be connected to nearly every GPS system with a standard NMEA 0183 output (we recommend, for example, PosiGraph, GARMIN).

4.1 The wind display with a GPS Interface

A GPS interface enables calculations about wind to be made. In vario mode when a change of direction takes place such as centering weaving and figures of eight etc. the wind direction and strength is displayed. **045:30** (45 degrees - 30km/h). In speed to fly mode and flying straight ahead the wind component along your flight path is shown **C:-15** (headwind 15km/h). The automatic wind calculations are fed directly into the glide path calculations.

Unlike other systems, the C4 only uses data for wind calculation provided by the GPS. Mistakes arising from the use of faulty compasses are therefore avoided.



5.0 Change over from vario to speed to fly

There are four options for changing from vario to speed to fly.

- ◆ flap switch
- ◆ switch on the stick
- ◆ speed determined
- ◆ GPS controlled

5.2 Vario/speed to fly change over via flaps or stick switch

For connection to flaps or stick use the lead provided on the number 2 cable. In Setup you have to set **VS: SW** to **1** or **-1**, depending on the type of switch you are using.

5.3 Vario/speed to fly change over – speed controlled

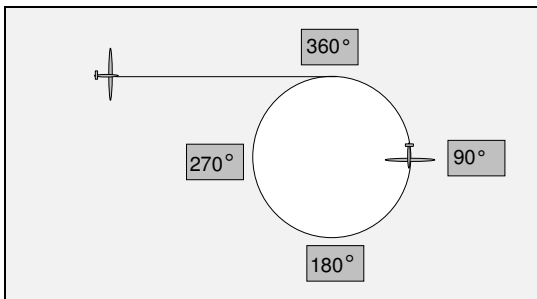
To activate the vario/speed to fly change over via speed you have to set **VS: SW** to **0** in Setup.

The speeds for the change over are chosen in Setup with **VS: VOF** and **VS: VON**. **VS: VOF** is the speed when **vario changes to speed to fly** and **VS: VON** is the speed when **speed to fly changes to vario**.

5.4 GPS controlled vario/speed to fly change over

The GPS controlled change over uses the data supplied by the GPS, speed over ground, vario and set McCready.

5.4.1 GPS controlled change over from speed to fly to vario



- ◆ The speed to fly/vario change over takes place between 90° and 270° if the vario value is greater than the set McCready value.
- ◆ The speed to fly/vario change over takes place between 180° and 360° if the vario value is less than the set McCready value and the circle is completed in less than 30 seconds.

5.4.2 GPS controlled change over from vario to speed to fly

The vario/speed to fly change over takes place within 10 seconds if your change of direction is less than 30°.

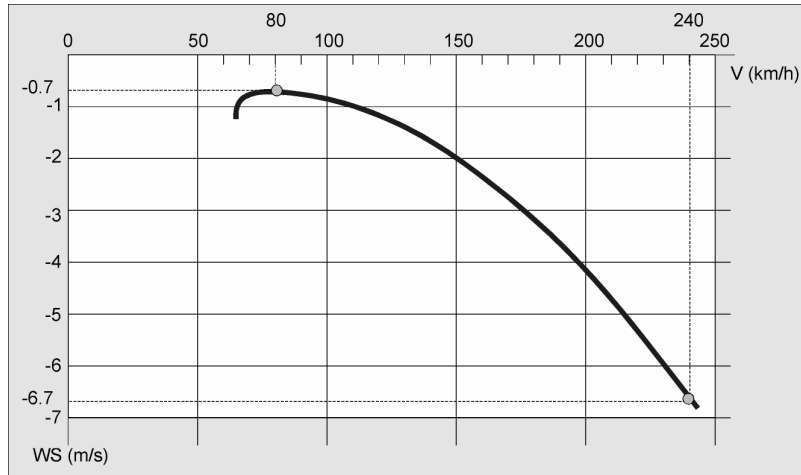
6.0 Calculating your individual polars

6.1 Establishing the polar values

To establish your special polar you need a few values from the speed polar of your glider;

1. speed at minimum sink (V1) and the minimum sink (W1),
2. speed (V2) at 150km/h sink (W2) at 150km/h.
3. If your sink polar is very flat, take the speed (V2) and the corresponding sink (W2) from the upper speed area of your glider polar.

Speed polar (L/D) for the ASW 19 (V1=80km/h, W1=0.7m/s, V2=240km/h, W2=6.7m/s)



6.2 Calculating polar coefficients

Polar curve: ASW19, G/F (W/L 33.3kp/m²)

1. Calculation of the polar coefficients (a') and (c'):

$$a' = (-3.6) \times \frac{(W2 - W1)}{(V2 - V1)^2} \quad a' = (-3.6) \times \frac{(6.7 - 0.7)}{(240 - 80)^2} \quad a' = -0.0008437$$

$$c' = (a') \times (V1)^2 \times (W1 \times 3.6) \quad c' = (-0.0008437) \times (80)^2 \times (0.7 \times 3.6) \quad c' = -7.9119$$

Now the values have to be standardised to the right W/L (a) and (c):

$$a = \sqrt{\frac{W/L}{28}} \times (a') \quad a = \sqrt{\frac{33.3}{28}} \times (-0.0008437) \quad a = -0.00092$$

$$c = \sqrt{\frac{28}{W/L}} \times (c') \quad c = \sqrt{\frac{28}{33.3}} \times (-7.9119) \quad c = -7.25$$

6.3 Entering the polar coefficients into the C4

To enter the polar coefficients the calculated values (a) and (c) have to be altered a little.

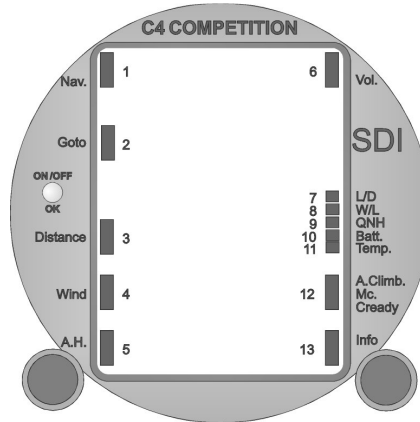
Calculated polar coefficient	Change	Ready for entry in Setup menu
a - 0.00092	multiplied by (- 1 000 000)	920 P5-A
c - 7.62	multiplied by (- 1 000)	7620 P5-C

7 Optimal cursor movement

The optimised cursor movement allows you to pre-set cursor points which are often used during flight. They are automatically selected when circling and flying straight ahead.

The setting of these points is done in Setup. The cursor points are numbered from 1 to 13. The numbers are for setting purposes only and do not appear on the display.

Virtual number	Cursor point
1	Nav.
2	Goto
3	Distance
4	Wind
5	A. H.
6	Vol.
7	L/D
8	W/L
9	QNH
10	Batt.
11	Temp.
12	A.Climb/McCready
13	Info



For optimal cursor movement via vario/speed to fly there are two setting points available in Setup.

1. Vario/speed to fly change over **C:V-S**
2. Speed to fly/vario change over **C:S-V**

For example if you were to choose the following cursor values

- ◆ **C:V-S** set to 12 **A.Climb/McCready**
- ◆ **C:S-V** set to 4 **Wind**

When change over from vario to speed to fly takes place, the cursor automatically jumps to average climb/McCready. When the change over from speed to fly to vario takes place the cursor automatically jumps to wind.

8 Acoustics

Volume can be changed by putting the cursor to **Vol.** **V: 100** is the maximum volume and **V: 0** is volume off.

You can alter the frequency of the sound using **A: FREQ** and the speed of the broken tone using **A:TACT**.

For automatic volume, controlled by your flying speed, use **A- AVOL**. The setting range in **A: AVOL** is from **0** to **5**.

You can change these values; **A: FREQ**, **A: TACT** and **A: AVOL** in Setup.

9.0 Setup

In Setup you can configure the C4 to your own requirements.

How to enter Setup

- ◆ Put the cursor to Info.and turn the right rotary knob to bring up Setup.
- ◆ Briefly press the **OK** switch
- ◆ If there is no safety code entered you are now in Setup. If there is a safety code, you have to enter your code and press the **OK** switch to enter it.

How to leave Setup

- ◆ When you want to leave the Setup menu press the **OK** switch briefly

Moving from one Setup-Menupoint to another

- ◆ Turn the left hand rotary knob.

Altering values in Setup

- ◆ Turn the right hand rotary knob.

9.1. Items in Setup

Abbreviation	Items	Value	Units	Recommended setting
CONTR	Contrast	0 to 30	none	18
INT:D	Average time	1 to 120	seconds	15
VAR:D	Vario damping	1 to 6	seconds	3
SF:D	Speed to fly damping	1 to 6	seconds	4
NET:D	Netto vario damping	1 to 60	seconds	5
LD:D	L/D display delay	10 to 300	seconds	120
POLAR	Polar	1-4	none	
P5:A	Polar coefficient a	10 to 9990	none	
P5:C	Polar coefficient c	100 to 9990	none	
COMP	Compensation	-25 to 125	%	
VS:GPS	GPS controlled vario/speed	0	off	
	to fly change over	1	active	
VS:SW	External switch	0	0 = off	
		1	Closed	
		-1	Open	
VS:VOF	Automatic change from vario to speed to fly (speed controlled)	0 to 200 0 to 120	km/h Kts	110
VS:VON	Automatic change from speed to fly to vario (speed controlled)	0 to 199 0 to 109	km/h Kts	90
BAT:LO	Low battery warning	10 to 16	Volt	11
TEMP	Temperature adjustment	-30 to + 100 -80 to +170	° Celsius or Fahrenheit	
A:FREQ	Frequency (pitch)	-10 to 10	None	-7
A:TACT	Broken tone	-10 to 10	None	6
A:AVOL	Automatic volume adjusted to speed	0 to 5	None	3
A:SF-N	Dead band on speed to fly	0.1 to 4.0 20 to 800	m/s ft/min	1 200
A:VAR.S	Dead band for sink in vario mode	0 1	off active	0
H:G.VAR	Height gained when switching from speed to fly to vario	0 1	off active	0
H:AR.WP	Pre-set arrival height for waypoints	0 to 5000m 0 to 15000 ft		0

Abbreviation	Items	Values	Units	Recommended value
H:METR	Value of displayed units and change over from metric to English units	0	m, km, m/s, km/h, hPa	0
H:FEET		1	ft, nM, ft/min, Kts, hPa	
H:QNH	Calibration of altimeter	600 to 1100	hPa	-
IAS:N	Calibration of air speed indicator	-	-	-
VAR:N	Calibration of vario	-	-	-
VAR:R	Range of vario movement	5 or 10	m/s	10
VAR:S	Vario LCD display	1000 or 2000	ft/min	2000
		0	linear	1
		1	non-linear	
VAR:T	Delay in tendency arrows	0.1 to 2.0	m/s	0.4
		20 to 400	ft/min	80
AN:NUL	Vario 0 setting	-50 to +50	none	0
AN:MAX	Sensitivity of analogue vario	75 to 125	none	100
AN:RUN	Possible settings for analogue instrument	0	As pseudo analogue display	0
AN:VAR				
AN:SF				
AN:NET		1	always vario	
AN:V-N		2	always speed to fly	
		3	always netto vario	
		4	vario in vario mode and netto vario in speed to fly mode	
C:V-S	Cursorpoint for speed to fly setting	0 to 13	none	13
C:S-V	Cursorpoint for vario setting	0 to 13	none	4
COD-A	Security code A	111 to 999	none	
COD-B	Security code B	111 to 999	none	

9.2 Explanation of Setup features

- ◆ Contrast can be set over a range of 0 to 30. You choose the setting to suit your seating position.
- ◆ The averager can be set on **INT:D** from **1** to **120** seconds.
- ◆ The damping of vario and speed to fly can be varied using **VAR-D** and **SF-D**.
- ◆ The netto vario damping can be varied from **1** to **60** seconds using **NET: D**.
- ◆ The calculation of the true L/D uses averages. The time for calculations can be set in 10 second steps with **LD: D**.
- ◆ There are four possible basic polar settings (**POLAR**) in Setup: Club class (Polar Nr.1), Standard class (Polar Nr.2), Racing class (Polar Nr.3), Open class (Polar Nr.4). With Polar Nr.5 you can put in a polar to suit your glider. The precise calibration of your polar uses **W/L** (wing loading) and **L/D** (glide angle).
- ◆ With **P5: A** and **P5: C** you can input the values you calculated for your own glider (see section about calculating polars on page 14).
- ◆ **COMP** shows the electronic compensation value of the C4 in %.
- ◆ If **VS: GPS** is set to 0 no input from the GPS is taken by the C4. When **VS: GPS** is on 1, the change over from vario to speed to fly is done automatically using GPS data.

Note: When vario and speed to fly change over is activated via **VS: GPS** this automatic change over has preference. Only when you switch off the GPS connection does the vario/speed to fly change over via stick or flaps become active.

- If you want the change over from vario to speed to fly to be activated by a flap switch you must put **VS: SW** to **1** or **-1**, depending on whether, in vario mode, your switch is open **1** or closed **-1**.

- ◆ When you want the change over to be linked to the speed of your glider, you can set this in **VS: VOF** and **VS: VON**, but you must also put **VS: SW** to 0 to make this link active.
- ◆ The battery warning **BAT:LO** can be set to a voltage you regard as low for the safe operation of the instrument (10volt minimum)
- ◆ In **TEMP** you can calibrate the temperature shown with the real temperature of the probe (right rotary knob). Use a good thermometer for reference.
- ◆ To change the frequency of the audio output use **A: FREQ** and the broken tone **A: TACT** whereby you can select the audio output that suits you best.
- ◆ **A: TACT** controls the speed of the broken tone. The higher the value of **TACT**, the faster the breaks in tone occur for an increasing climb rate. A lower or negative value produces a slower break in tone.
- ◆ With **A: AVOL** you can regulate the variation of volume with changes in air speed. **0**=no change and **5**=maximum change in volume with speed.
- ◆ With **A: SF-N** you can set a dead band on speed to fly.
- ◆ If you want to hear a signal when you are vario mode and in sink set **A: VAR.S** to **0**.
- ◆ When **H:G.VAR** is set to **1**, the altimeter displays the height difference achieved since the last change over from speed to fly to vario
- ◆ Input an arrival height for a waypoint at **H: AH.WP**.
- ◆ Metric units are set in **H: METR** when **0** is chosen (m, km, m/s, km/h, hPa). English units are set in **H:FEET** when **1** is chosen (ft, Nm, ft/min, °C, Kts, hPa) You can see the set units on the altimeter display (either m or ft)
- ◆ In **H: QNH** you can set the correct pressure for the displayed height. The relationship between pressure and height can vary through changes in the pressure transducer.
- ◆ Indicated Air Speed (IAS) displays the indicated air speed. You can alter the value of the IAS in **IAS: N**. On the ground set the value with the last turn of the right rotary knob to **0**.
- ◆ Calibrate the 0 point of the vario in **VAR: N**.
- ◆ In **VAR-R** you set the full deflection of the vario.
- ◆ If you would like a finer vario display in the 0 area, you can spread this display in **VAR: S**.
- ◆ The tendency arrows at the average display show if the thermal is improving or deteriorating. In **VAR: T** you can change the sensitivity of the arrows.
- ◆ The zero point for an analogue instrument is set in **AN: NUL**. As soon as you have chosen this menu point the vario should show 0 (NUL). Should this not happen use the right rotary knob to set the vario to 0.
- ◆ To adjust the maximum range of the analogue instrument use **AN: MAX**. As soon as you have chosen this menu point, the vario should show 5m/s climb. Should this not happen adjust it with the right rotary knob.
- ◆ With **AN:RUN**, **AN:VAR**, **AN:SF**, **AN:NET** and **AN:V-N** you can choose what is going to be displayed on your analogue instrument.
 - **AN:RUN** = analogue instrument same as C4
 - **AN:VAR** = analogue instrument is always vario
 - **AN:SF** = analogue instrument is always speed to fly
 - **AN:NET** = analogue instrument is always netto vario
 - **AN: V-N** = when C4 in vario mode analogue instrument shows vario; when C4 is in speed to fly mode, analogue instrument shows netto vario
- ◆ **C.V-S** marks the cursor point which will be displayed by changing from vario to speed to fly mode.
- ◆ **C.S-V** marks the cursor point which will be displayed by changing from speed to fly to vario mode.
- ◆ The safety code can be changed by using **COD-A** and **COD-B**. To prevent undesirable and rapid changing of the codes the cursor points **COD-A** and **COD-B** have to be set to the same number. The new code becomes effective when the C4 COMPETITION is switched on again. The values of **COD-A** and **COD-B** return automatically to **111** and **999** after the new code has been set.

10.0 The first flight

Before you fly with the C4 for the first time, you have to set the following items.

10.1 Switching on

After switching on the cursor will go to QNH (airfield height). Input the correct height with QNH to activate the altimeter. Confirm by pressing OK.

10.2 Inputting your polar in Setup

◆ Club class (Polar Nr.1)	◆ Standard class (Polar Nr.2)	◆ Racing class (Polar Nr.3)	◆ Open class (Polar Nr.4)	◆ Individual Polar (Polar Nr.5)
------------------------------	----------------------------------	--------------------------------	------------------------------	------------------------------------

10.2.1 Final adjustment of polar

- ◆ set L/D
- ◆ set W/L

10.3 Compensation

There are two options:

1. electronic compensation
2. compensation with the Brunswick tube

We prefer Brunswick tube compensation.

The criteria for good compensation are;

- (a) the choice of the right tube,
- (b) the position of the tube on your glider and
- (c) air tight connections of your pneumatic tubes.

Should you decide to use electronic compensation, static pressure is important. It might be necessary to fit an extra static tube. True compensation is an important factor when flying a glider. You could ask the manufacturer of your glider for advice about this.

10.3.1 Compensation and the C4 COMPETITION

The **COMP** value shows you in % the electronic compensation of the C4. If there is no leak in the pneumatic fittings from the Brunswick tube the **COMP** value should be **0**. If no Brunswick tube is used then the **COMP** value should be **100** and the **TE/STATIC** should be connected to **Stat.** with a V-connector. Leaks in the pneumatic connections can be compensated over a range from **-25** to **125%**.

The correct setting of the **COMP** value has to be carried out in flight:

Proceed as follows:

- ◆ increase the speed of your glider to about 100kts and keep this speed for at least 20 seconds. Then reduce your speed by slowly pulling back the stick to about 50kts. During this procedure the vario should show the descent of your glider as per polar.
- if the vario shows climb, the vario is under compensated and the **COMP** value has to be increased. If the vario shows too much sink, the vario is over compensated and the **COMP** value has to be reduced.

10.4 Vario characteristics

The setting of the delay time for the vario and speed to fly depends on the pilot's preference. There is a wide choice from very fast (nervous) to very slow (lazy).

The following values have been found useful during many hours of flight and can be input in Setup.

Vario delay: about 2- 3 seconds

Speed to fly delay: about 4 seconds

10.5 Dirty wing polars

Dirty wings destroy performance! Realistically there may be a decline of 20% due to flies on the wings. Measurements on a Nimbus 4 have shown a decline in the best glide angle from 60 to about 45. Do consider dirty wings during a final glide and choose a realistic glide angle.

10.6 Speed to fly

The **Info** menu contains the points **HH** and **2H**. **HH** shows the average speed achieved over the last half an hour and **2H** shows the average speed achieved over the last two hours. If you have chosen one of these points you can set it to **0** by pressing the **OK** key.

Comparing the two achieved speeds allows you to judge if completion of a set task is possible.

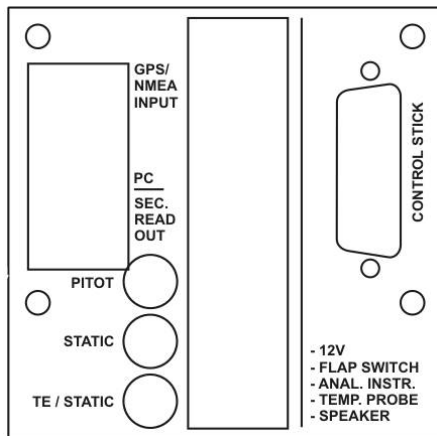
11.0 Installation

11.1 Mechanical installation

1. Cut out a normal 80mm diameter hole with 4 screw holes. The lower two holes should be bored out to 6mm diameter.
2. Take out the two Phillips screws from the front.
3. Take the caps off the control knobs and loosen the two screws inside the control knobs with a screwdriver. You can now remove the control knobs and the two hexagonal nuts using a suitable spanner.
4. Put the C4 into the panel from the rear and fasten it with the two Phillips screws.
5. Now fasten the two nuts firmly using a spanner. **Take care not to over-tighten.**
6. Put the control knobs on the shafts and fasten by tightening their retaining screws.
7. Finally, press home the two covering caps.

11.2 Electrical installation

Take care that cables or pipes are not trapped or subject to rubbing. You cannot switch on the instrument if it is connected wrongly. You must fit a 4amp fuse in the cable to the battery. The four linked RJ45 connectors with the labelling **12V**, **FLAP SWITCH**, **ANAL.INSTR.**, **TEMP.-PROBE**, **SPEAKER** are all wired in parallel. This means you can connect the cables to any position.



11.2.1 Description of electrical connections

Connections for 12V, FLAP SWITCH, ANALOGUE INSTRUMENT, TEMP.- PROBE, SPEAKER

- **12 V**; battery connection: Attach the red lead with the (+) terminal and the black lead with the (-) terminal of the battery. Put a 4amp fuse into the red lead for safety.
- **TEMP.-PROBE**; temperature probe with heat shrink on the end.

- **FLAP SWITCH**; flap cable connection. The white and brown leads should be attached to the flap or stick switch.
- **ANAL.INSTR.**; you can connect an analogue readout here
- **SPEAKER**; connection for loudspeaker

Connection for GPS/NMEA INPUT

- The connector for the NMEA interface complies with IGC standards. You can connect any data logger with an RJ11 or RJ45 connector directly.

Connection for PC/SEC. READ OUT

- **PC**; is used to input new software.
- **SEC. READ OUT**; connection for second read out for two seater

Connection for CONTROL STICK

- Option only

11.2.2 Wiring with coloured cables (RJ45)**Connections for 12V, FLAP SWITCH, ANAL.-INSTR., TEMP.-PROBE, SPEAKER**

- Pin 1, orange/white -> Plus lead for analogue vario
- Pin 2, orange -> Earth
- Pin 3, green /white -> Signal 1 loudspeaker; SPEAKER
- Pin 4, blue -> external switch vario/speed to fly change over; FLAP SWITCH
- Pin 5, blue/white -> Signal from temperature sensor; TEMP.-PROBE
- Pin 6, green -> Earth
- Pin 7, brown/white -> 12 volt
- Pin 8, brown -> Signal 2 loudspeaker; SPEAKER

Connections for GPS/NMEA INPUT

- Pin 1, orange/white -> free
- Pin 2, orange -> Earth
- Pin 3, green /white -> RXPC
- Pin 4, blue -> TXPC, NMEA INPUT
- Pin 5, blue/white -> isolate when lead is open
- Pin 6, green -> isolate when lead is open
- Pin 7, brown/white -> 12 volt
- Pin 8, brown -> free

Connections for PC/SEC. READ OUT

- Pin 1, orange/white -> Urlader < signal for Software update
- Pin 2, orange -> Earth
- Pin 3, green /white -> isolate when lead is open
- Pin 4, blue -> isolate when lead is open
- Pin 5, blue/white -> RX second readout for two seaters
- Pin 6, grün -> TX second readout for two seaters
- Pin 7, brown/white -> isolate when lead is open
- Pin 8, brown -> 5 volt

11.3 C4 – GPS interface

To operate the C4 COMPETITION with a GPS interface the NMEA output has to be activated as below.

◆ Data out = NMEA 0183; Data in = OFF (NONE)
--

Various GPS systems allow the transfer of several data sentences. The following sentences should be transferred.

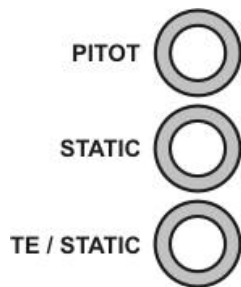
◆ GPRMB, GPRMC, GPROO, GPWPL,

Testing the C4 COMPETITION – GPS interface

- ◆ Connect the C4 COMPETITION to the GPS as described.
- ◆ Switch on the C4 and the GPS.
- ◆ As soon as the GPS has acquired sufficient satellites to determine your position, move the C4 cursor to NAV and NO:GPS should disappear from the screen. Should NO:GPS remain, test the electrical connections and make sure your GPS sends the NMEA183 signal (you have to call this function up in the setup menu of the GPS>)

11.4. Pneumatic fitting

For connection use a pipe with a 4-5mm diameter. Do not use a pitot that is connected with a basic instrument (German law).



- ◆ TE/STATIC takes Brunswick tube and you must set the **COMP** value in Setup to 0.
- ◆ If you do not use a Brunswick tube the TE/STATIC connection takes static pressure.
- ◆ If you do not use a Brunswick tube you must alter the value of **COMP** in Setup to 100.

12.0 Technical Data

Dimensions	Flight computer 160x82x82mm
Cut out	80mm circle
Weight	About 600 g
Current usage	About 80 mA
Supply	10-16 volts
Temperature range	-25 °C to +50 °C
Altimeter	-999 to 9999m
Vario range	+/- 10 m/s (+/- 20kts)
Outside temperature range	-30 °C to +100 °C
Standardisation	ICAO Standard atmosphere
GPS Interface	NMEA 183

13.0 Guarantee

The terms for delivery, products and services of the German electronic industry apply. Guarantee is for one year. Proof of guarantee is your bill of sale; please keep it in a safe place. In order to make use of the guarantee, you must follow the rules for use set out in the handbook and follow the correct installation procedure.

We will take no responsibility for secondary costs which could arise from the failure of our instruments. We draw your attention to the fact that our instruments do not replace **BASIC INSTRUMENTATION**.

14.0 Development and sales (Germany)

SDI Franz Pöschl GmbH
Mühlwinkl 4
D-83224 Staudach

Telephone 08641/5277
Telefax 08641/5276
Mobile 0171/5446757
e-mail info@sdi-variometer.de
Homepage www.sdi-variometer.de

Sales in the UK

Ernst Specht
9 Ennerdale Crescent
Nuneaton CV11 6HY
Tel: 024 76382190
Or
Frank Stevens
38 Endhill Road
Birmingham B44 9RR
Tel: 0121 3532146