5020 GPS Short Manual   Vers.1.18

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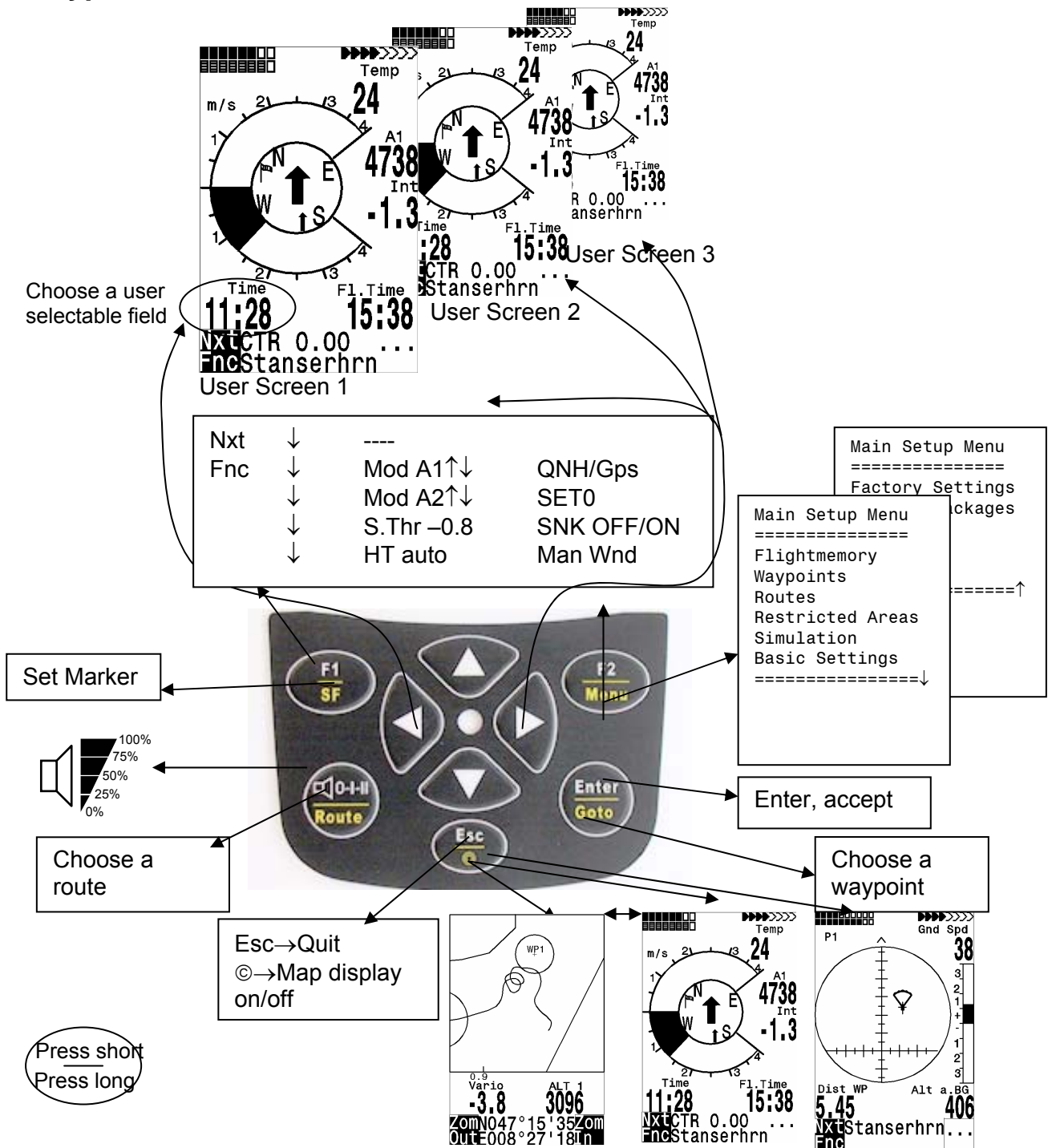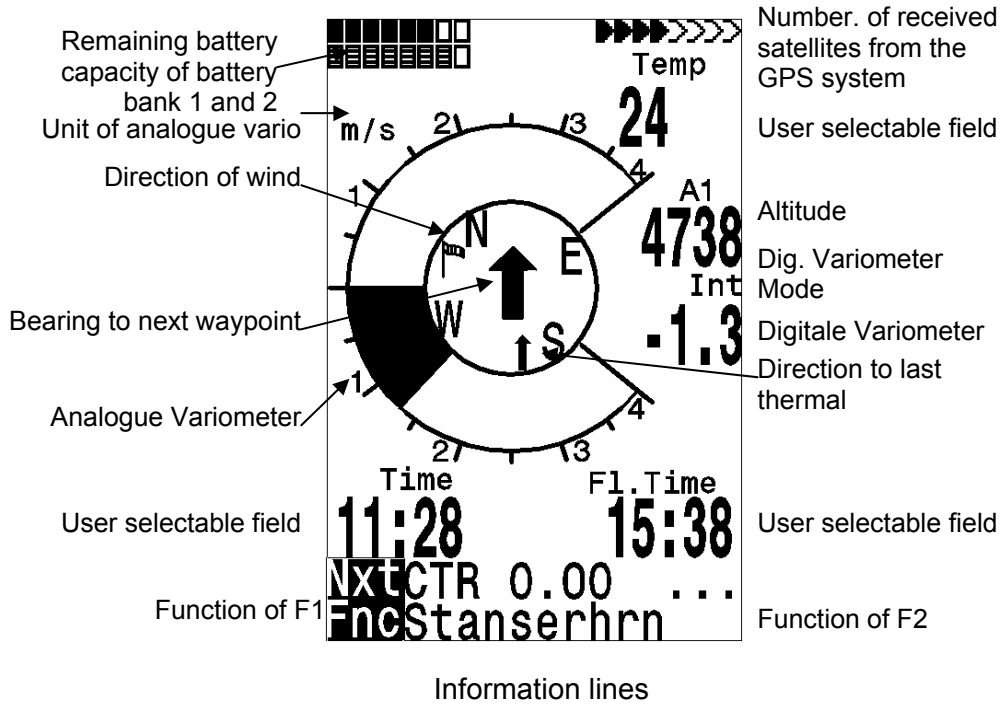
1 Operation

1.1 Turning the Unit On and Off

The unit is switched on by pressing the [Esc ○] key. You must confirm the switch on, by pressing the "Enter" key.

To switch it off, you need to press the same key for three seconds. The unit will then display the question 'switch off?? Press Enter' Confirm by pressing "Enter". After a long flight with short record intervals the calculation of the digital signature can take up to one or two minutes. Please wait until this process is finished. Press O/ESC key again to turn off the unit.
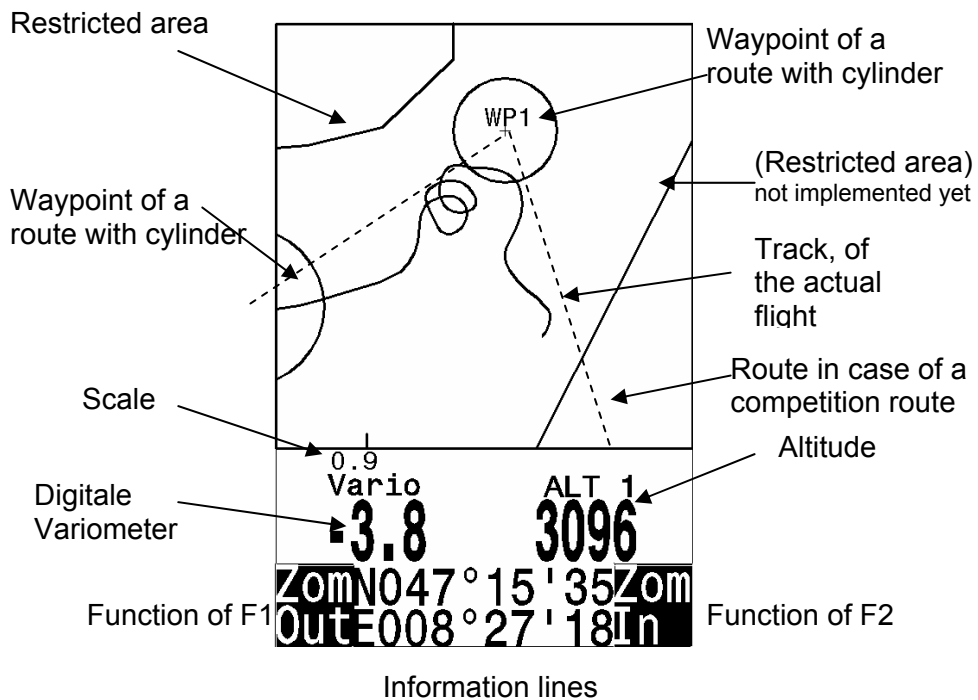
1.2 Keypad

Choose a user selectable field

User Screen 1

User Screen 2

User Screen 3

Nxt	↓	----	
Fnc	↓	Mod A1↑↓	QNH/Gps
	↓	Mod A2↑↓	SET0
	↓	S.Thr –0.8	SNK OFF/ON
	↓	HT auto	Man Wnd

```
Main Setup Menu
===============
Factory Settings
       ckages


       ======↑
```

```
Main Setup Menu
===============
Flightmemory
Waypoints
Routes
Restricted Areas
Simulation
Basic Settings
===============↓
```

Set Marker

Choose a route

100%
75%
50%
25%
0%

Choose a waypoint

Enter, accept

Esc→Quit
©→Map display on/off

Press short
Press long

- 2 -

1.3 Main Screen

Remaining battery
capacity of battery
bank 1 and 2

Unit of analogue vario

Direction of wind

Bearing to next waypoint

Analogue Variometer

User selectable field

Function of F1

Number. of received
satellites from the
GPS system

User selectable field

Altitude

Dig. Variometer
Mode

Digitale Variometer

Direction to last
thermal

User selectable field

Function of F2

Information lines

1.4 Map Screen

Restricted area

Waypoint of a
route with cylinder

Scale

Digitale
Variometer

Function of F1

Waypoint of a
route with cylinder

(Restricted area)
not implemented yet

Track, of
the actual
flight

Route in case of a
competition route

Altitude

Function of F2

Information lines

The flight route of saved flights can also be shown on the display and viewed. Flight
Analysis is reached by pressing F1 to display the function Show Map. The screen-optimized
flight route is shown on the display. (North is located at the top) Additionally, stored way-
points are plotted with a cross and name. The map scale is displayed too.
The graph can now be changed as follows:

F2: Zoom in: The map scale is gradually increased to approx. 0.5-1.0km. Thus, individual circles during a climbing period are clearly recognizable
(This is dependent on the set recording interval).

F1: Zoom out: The map scale is gradually decreased until the screen display is optimized.

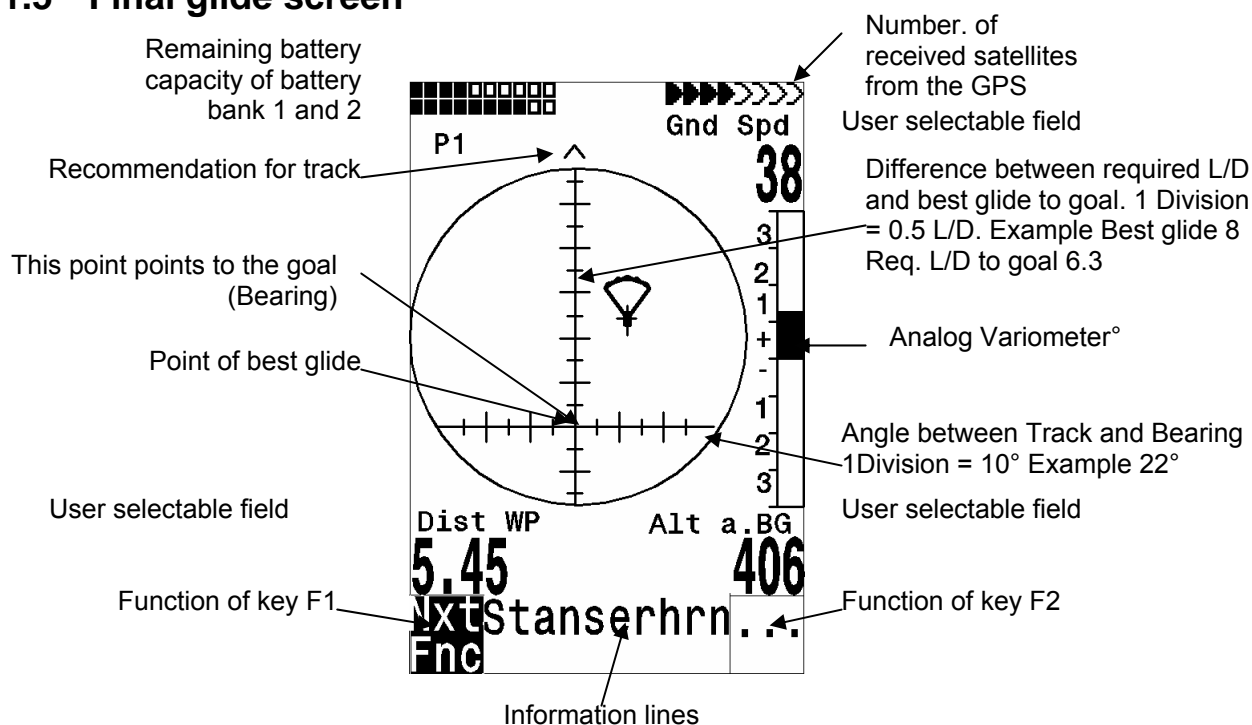**Enter**: From each graph back again to the screen optimized graph.

ESC: Back to the main setup menu. All other keys cause the track in the current selection to be redrawn.

Arrow keys: Pan: With these keys, the plotted area can be shifted up, down, left and right. This function is only enabled in flight memory mode. During flight, the actual position is in the center of the map. If the position reaches a border, the map pans automatic.

Note: As the picture takes a few seconds to appear, depending on the amount of data, Wait and Ready appear on the status line as user information; if a zoom or pan key is touched during the process then it will be broken off and will start over again with new values. You can thus obtain the desired graph quickly. Even past flights can be graphed as long as they are still saved.

During the flight, touching the ESC key briefly will bring you a real-time track and map display. Vario and height appear digitally under the map. For competition routes, the cylinder of the active waypoint, WP names, and a thin dotted line to the next WP are also displayed. During the flight the Zoom In/Out functions are accessible.

1.5   Final glide screen

Remaining battery capacity of battery bank 1 and 2

Recommendation for track

This point points to the goal (Bearing)

Point of best glide

User selectable field

Function of key F1

Number. of received satellites from the GPS
User selectable field

Difference between required L/D and best glide to goal. 1 Division = 0.5 L/D. Example Best glide 8 Req. L/D to goal 6.3

Analog Variometer°

Angle between Track and Bearing 1Division = 10° Example 22°

User selectable field

Function of key F2

Information lines

The final approach - screen serves as an assistance for the final glide. It is less suitable for the normal flight. It will be normally activated in the last thermal before the goal. The horizontal scale shows the deviation between current track and bearing (the direction to the goal). 1 division line is 10°, between two large lines is 20°. The vertical scale shows the deviation of the necessary lift/drag ratio to the goal by the number of best glide of the aircraft, which will is set in the basic Settings. A division line corresponds to 0,5 lift/drag ratio. Between two large division lines is 1 lift/drag ratio.

The example shows an aircraft with lift/drag ratio 8. The necessary lift/drag ratio to the goal is 6.3. The aircraft symbol is around 2.3 units above the point of best glide.
The strategy is, to hold the symbol in the crossover during the final glide. In order to hold something reserve, experienced pilots will fly rather above the point of best gliding. During thermalling the symbol remains in the center. As long as the deviation is larger than approx. 20 lift/drag ratios, the symbol appears grey in the center. Below that margin, the symbol disappears to approximately 20 lift/drag ratios deviation. With approximately 6 lift/drag ratio it appears then again from down in the window. If it comes upward over the delimitation, it appears again grey.
A small arrow appears ^ above with the increase as a heading assistance, if track and bearing are within +/- 10°. When sinking the arrows < ^ > indicate a recommendation, where one should hold. If the symbol leaves the range of approximately plus minus 60°, the symbol is grey again. One should switch then with the Esc key to the Vario screen, in order to see the compass with the direction markers.

1.6 Main Setup Menu

Flightmemory	List of the flights in memory.
Waypoints	List of the waypoints with the possibility to edit waypoints and coordinates
Routes	List of the routes with the possibility to edit
Restricted Areas	List of the restricted areas with the possibility to edit
Simulation	Here you can simulate most of the important flight parameters.
Basic Settings	Here you can change the most important parameters
Factory Settings	Only for service
Opt. SW-Packages	Here you can enable SW packages you bought from Flytec.

1.7 Basic Settings

A series of settings permit the unit to be programmed according to the user's wishes. Every pilot can realize his/her own ideas. If too much information bogs you down and causes confusion, it is always possible to reset the unit at Basic Settings/ Init EEPROM, which are the manufacturer's tested basic settings. You are basically starting again.
But please note! All WP and routes will be a deleted too. As a minimum, settings possible and default values set will be shown at the setting points. Should these values be changed, you move to the change mode by pressing Enter. The value to be changed will blink and can be modified with the help of the ▼ and ▲ keys. Pressing the Enter key confirms the new value. Pressing the ESC key recalls the previous setting.

Term	Meaning	Reference	Factory Setting
Display contrast	Range 0 ... 100 %		70 %
Record-Interval	Time interval per recorded (track log) point		10 Sec
Recording mode	Autom. or manual flight recording		Aut.
Digital Variomode	Averager ; Averager time delay		1 sec 30 sec
Vario tone	Frequency of Climb and Sink tone, Pitch Modulation, Acoustic Integrator		1200 Hz ; 700 Hz Mod = 5 ;Pi=3; 8
Battery type	Type of battery used. This has an influence on the Bargraph and the switching thresholds		Alcaline

Audio threshold	Fine tuning of climbing tone max 20 cm		2 cm/sec
Sink tone thres.	Activation point of sink tone		0,8 m/s (ft/m)
L.thermal thres	Threshold for the last thermal		0.5 to 3.0 m/s
Vario/Spd delay	Response time delay for Analogue Vario and Speed		12 (» 1,2 sec)
Best L/D	Best glide ratio with according speed		
Stallspeed	Use of stall alarm and altitude limit		0 km/h (mph)
Spd corr. vane	Windwheel 70 ... 150 % correction		100 %
Units	Meter or feet; Km/h or mph or knots Temp.: In Grd C or Grd F		m ; km/h ; Grd C
Coordinate Format *	dd°mm,mmm or dd,ddddd or dd°mm'ss" UTM ; Suisse Grid #		dd,mm,mmm
Time Date Year	Time difference to UTC		Present
Pilotname	Pilot name entry; max 25 letters		not set
Glider type	Name of glider for OLC		not set
Glider ID	Glider registration for OLC		not set
Del all records	Deletion of flight memory (all records)		no
Del all WP& Rts	Deletion of all WPs and Routes		no
Init EEPROM	Back to factory settings		No
Init CTRs	Reorganization of the memory		

Attention: The deletion of waypoints, routes or records needs a few seconds to perform. Please wait until the confirmation shows up.

1.8 User selectable fields

The main screen as well as the final approach screen can show up to three pages with user selectable fields. The pages can be selected with the ► key and the page number is displayed under the battery status as P1 to P3.

Alt a. BG   Safety height above the best glide path* (Not available in first SW release 1.10 and 1.11)

FL (ft)   Flight Level not adjustable by the user

Airspeed   Speed measured with the vane wheel, true air speed or calculated airspeed

Alt a. Gl   Calculated height above goal, calculated for a route, including Windspeed an direction*

Dist Gl   Distance to goal calculated along a route*

WindSpd   Wind strength*

Vario   The digital vario as userfield for the final glide screen

A1   The altitude A1 as userfield for the final glide screen

Dst Toff   Distance to start or flight recognition (acceptance)

Dist Cyl   Distance to the radius of a waypoint cylinder in case of a competition route

Dist to WP   Distance to chosen destination (waypoint)*

Fl.Time   Flight time since take off

GND speed   ground speed*(=GS)

Time   Time

Bearing   Direction to chosen destination*

Wind Spd   The calculated Windspeed, derived from a circle.

Spd-Diff   Wind component (ground speed minus true airspeed)*

Track   Flight direction (course)*

Temp   Internal temperature

Alt 2	Reference height (if desired can be set at 0)
Alt 3	Cumulated gained height
QNH hPa	Air pressure in hector-Pascal
L/D gnd	Actual L/D over ground (=Ground Speed/Sink)*
L/D air	Actual L/D in air, only available with vane wheel connected
L/D req	L/D required to reach a WP*
L/D r. Gl	L/D required to goal over the next waypoints
Dist to^	Distance to last thermal*

* Only active when the GPS receiver is switched on

1.9 Battery management

Two bar graph scales indicate the capacity of the batteries. The Flytec 5020 has 2 banks with 2 batteries each. Bank 1 must always be equipped. Bank 2 can remain free. However, we recommend to equip bank 2 also. As soon as the first bank is used up, the instrument switches automatically to the second bank. If the second bank is not yet used up, and bank 1 is equipped with new batteries, the instrument switches to the first bank again. After a long flight we recommend to insert the partly used batteries of the bank 2 into bank 1 and to equip bank 2 with new batteries. Thus it is ensured that the instrument can use up the batteries always completely, without the danger of having empty batteries during a flight. Before S/N 5500 the two banks in the battery compartment where changed.
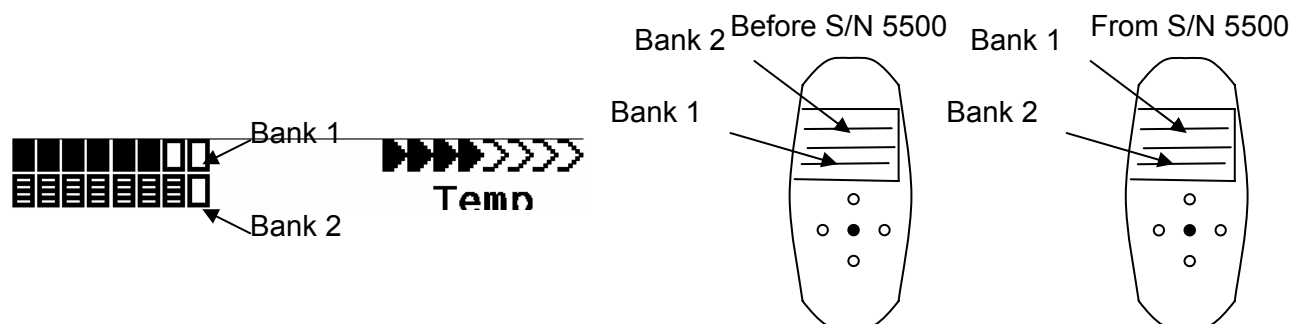
The following battery types could be used
2 pieces per bank Alkaline High Power Batteries 1.5 Size AA. Estimated life time 2 * 13h = 26 h together (recommended types: VARTA or Duracell)
2 pieces per bank NiMH Accu 2100mAh, 1.2V Size AA. Estimated life time 2 * 11h = 22h together. The bargraph shows only the actual battery voltage, not the capacity.
We don't recommend NiCd Accu because they have clearly smaller capacities and are not pollution free. The battery thresholds are optimized for NiMH Accus.
Please dispose of the batteries properly.

The estimated life time bases on normal temperature conditions. If the batteries are hotter or colder they have another capacity, and therefore another life time. The Bargraph shows only the actual battery voltage, not the capacity.

The inserted battery type is not recognized automatically. Because the battery types have different voltages and a different temperature behaviour, the battery type must be entered into the basic Settings. If the wrong battery type is specified, it is possible that the instrument switches off during switching between bank 1 and bank 2.

1.10 Data Exchange Via PC

The 5020's basic equipment includes a data cable for a serial PC interface (9 pol Sub D plug). Data transfer can occur in both directions. The connection occurs with: 57.600 baud; 1 startbit; 8 databit; 1 stopbit; no parity, Xon/Xoff

The following can be read via this RS232 interface:

Serial numbers and pilot names
Waypoint list
Route list
A selected flight (track)
CTRs, restricted areas

The following can be uploaded to the 5020:
Waypoints and routes

> **Important:** the unit must first be switched on before plugging in the connection cable to the unit and the computer**.**

Before you transfer the waypoints and route data switch the 5020 to the Setup Menu. You should make sure that the waypoints show up in the unit's waypoint list before you transfer a route from your computer.
If you wish to download flight data, switch the unit to the Flight memory mode, and display the desired flight on the Flight Analysis screen before transferring it to your computer. There are a number of PC programs on the market that allow communication with the 5020.
We recommend the program Flychart which you can download from the Flytec Website
www.flytec.com

Other programs that permit data transfer with the 5020:

Trackview (Freeware) Daniel Zuppinger (for OLC und CCC) www.softtoys.com/
Compe-GPS   www.compegps.com
Seeyou   Program well liked by sailplane pilots www.seeyou.ws
Maxpunkte   Free program from DHV for reading flight data for evaluation
                       and submission to OLC.
                       http://www.flugplatz-beilrode.de/maxpunkte/download.html
GPSDump   Stein Sorensen . A simple program for IGC File dump.
                       http://www.multinett.no/~stein.sorensen/

1.11 Transferring New Firmware to the 5020

As is the case with many other new developments, particularly during the introduction phase, improvements or feature enhancements may be expected. Periodically Flytec will post firmware updates at www.flytec.com, which can be downloaded by the user free of charge, and then uploaded to the 5020.

To be able to write to the 5020's flash memory with a PC, it is necessary to use a compressed file named "Flasher.exe" that is available in zipped form flasher.zip. In addition, the actual firmware to be uploaded must be obtained. It is called "5020vxxx.moc" which corresponds to the version X.XX. Both of these are available from the download page at www.flytec.com
We recommend that you store all the related files in a separate subdirectory. (e.g. c:\programs\FlytecFlasher\). After decompressing the ZIP file a number of files are created. Double clicking on the file "flasher.exe" starts the program. Under "Setup", the serial port (COM1 or COM2) can be chosen. You select the file to be transferred with the extension ".moc" by pressing on the "Start" key. The data transfer starts automatically. The numbers shown on the right side are the answers of the instrument.

Sometimes the Flasher will give an error. In this case, the cable must be unplugged, and the 5020 turned off before making another attempt to flash the memory.

Important: Contrary to the instructions for data transfer of waypoints or routes, be sure that the 5020 is turned off when plugging the cable into the computer and the 5020.

Important: Never leave the PC cable hooked up to the unit when it is turned off. If this is done energy is consumed, and the battery can be drained.

2   Technical Data

Measurements:	165 x 73 x 38 mm
Weight:	286 grams (with 4 Alkaline batteries, without harness)
Electrical supply:	2 or 4 alkaline batteries AA or Nickel metal hydride accumulator 2 Ah; 1.2V
Battery life:	> 30 hrs with 4 alkaline batteries
Altimeter:	Max. 8000 m; 1 m (3 ft) steps
Variometer:	Analog+/-8 m/s; (1600 ft/m); 0.2m/s (20 ft/m) steps
Variometer	Digital +/-70m/s; (14.000 ft/m); 0.1m/s (20 ft/m) steps
Speed (vane wheel)	Digital 0 - 120km/h (or mph or kts)
Waypoints:	200 WP
Routes:	20 routes with max. 30 WP in each
Restricted areas	20 CTR's free, 150 CTRs due to costs
Max. memory time:	55 hrs flying time at 10 sec intervals
Number of track log points:	24 000
Number of registered flights:	100

Data memory and transfer according to the IGC format

Screen resolution	240 x 160 pixel (=1/8 VGA)
Operating temperature	-15...45 °C

Brackets for hang-gliders or paragliders are available.
The technical details may be altered without notification. Software upgrades can be made by downloading the latest firmware version from our homepage

3   Guarantee and liability

Our instruments carry a 24-month guarantee. However, physical damage such as a broken casing or glass breakage as well as damage resulting from water landings are excluded from this guarantee. Flytec can accept no liability for faults arising from any abuse or unapproved use of your instruments.

WARNING
In very rare cases it can happen that a flight instrument does not provide any data at all or the data is incorrect. Flytec AG will not be held responsible for accepting any damage claims arising from a malfunctioning unit. Responsibility for ensuring the safe execution of his/her flights lies with the pilot alone.