air avionics

AIR Glide Display M and Display L

Pilot's Manual

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Important!

Please read this manual carefully before using the device!

Observe restrictions and safety instructions!

This manual is an essential component of the device and must be kept in a safe Place!

Dokumenten-ID / Revisionsstatus

This manual covers the following product types:

P/N T279 “AIR Glide Display L”
P/N T278 “AIR Glide Display M”

Änderungen

Rev.	*Datum*	*Status*	*Autor*	*Änderungen*	*Genehmigt*
0.1	2015/06/07	Draft	M. Förderer	Initial Draft	–

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Flight parameters

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1 IMPORTANT NOTES FOR 2015 SEASON

The first AIR Glide Display M and L were delivered after the start of the season in early 2015. With most new systems of this type and complexity not all functions can be delivered. The development of the system software is usually carried out over the entire life cycle of such a product. We are continuously improving Display M and L.

Although extensive functions are already integrated, we are pursuing in Display M and L a strict schedule of free software updates that will gradually add more functionality. We are always pleased to receive suggestions from users for any feature requests and problem reports.

Of particular importance for the installation of the display M and L to the end of 2015 can only in combination with at least one display S (T275). The stand alone use with sensor unit is only available for the 2016 season and later.

Operation of the display M and L without an attached display S is currently not possible

General Description

AIR Glide displays are display devices that in an AIR Glide installation display maps, navigation information and flight parameters, values. Display M and L in this case serve primarily as a navigation display, but can also be configured to display variometer values and traffic information. The displays are compact and are in a 57mm standard cut mounted from the front.

They feature large screens and in the case of L with a touch screen like any modern smart phone or tablet. They are designed to ensure optimum usability in different cockpits.

A typical AIR Glide installation comprises at least one display and one ISU Integrated Sensor Unit.

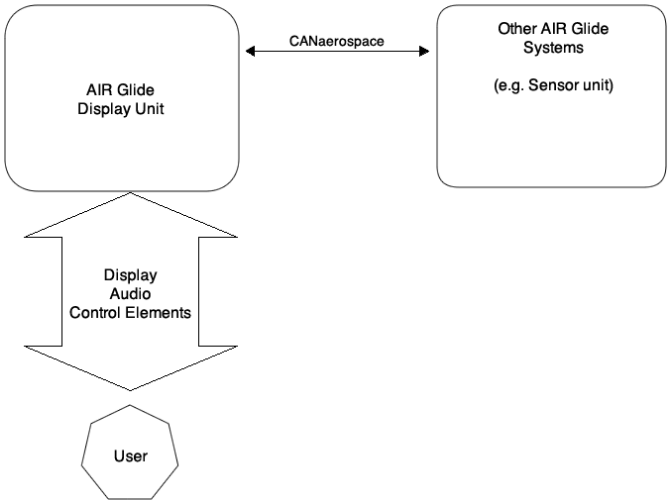

Abbildung 2.1: System-Diagramm

Design

Design-Goals

AIR Glide was developed for use in gliders as an aid to improve situational awareness of the pilot.

The device is small, lightweight, has only a few operator control inputs and can be installed with a small footprint in the instrument panel.

AIR Glide is designed to improve flight safety. The unit has the latest technology and has a simple user interface that is easily operated. Navigation on task, competitions, heavily used airspaces and unknown terrain can lead to high stress on the pilots.

One of the goals of the design is to relieve the pilot in these situations, increase the situational awareness of the pilot and in potentially unsafe flight situations, issue warnings.

Display M and L are operated via the integrated control elements. Two knobs with push-button function, and three pushbuttons are available. Display L also has a touchscreen.

Knobs can be endlessly rotated and have fixed locking points. The touchscreen on display L is projective capacitive and can therefore be operated even when wearing gloves [1]

> In display L it is always possible to change the operating mode between keys and touch screen seamlessly.

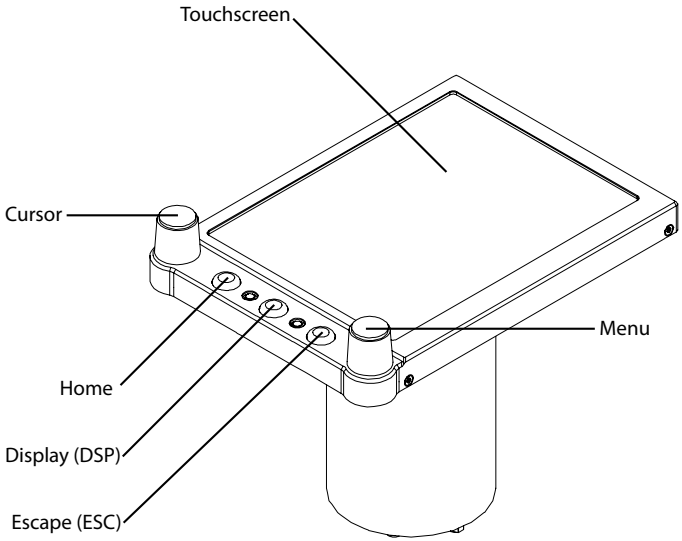

Abbildung 3.1: AIR Glide Display L Control elements

Rotary knobs and pushbuttons

The following is a brief description of the various controls and their main tasks.

- The left knob (cursor knob, CRSR) is used to control a pointer / cursor on the map
- With the home button (printed with an airplane icon) you can always get directly back "home" to the airplane icon on the map.

[1] Not all types of gloves work well, especially conductive touchscreen gloves are recommended.

- The DSP button (“Display”) opens a menu with display details for the map, for example overlays can be activated/deactivated.
- When you push the ESC pushbutton (Escape) you go back one menu level.
- The right knob (also menu knob) is for menu control and the selection of the current page. The integrated push button opens the main menu and executes a menu item.

Knob functions and gestures

- By turning a knob the current menu focus is moved. In the menu the focus is a light blue highlight.
- By pressing and simultaneously turning a knob, a special function is executed, for example, you can zoom the map or quickly scroll a list.
- Pressing a knob executes the element in focus.

Touchscreen

Display L uses touch screen technology. Tapping with a finger, wiping and other gestures are interpreted.

All menu items are structured so that they are easy to use with the touch screen. Even operation in turbulent air is possible.

In addition, faulty touch inputs or such inputs that are done accidentally are ignored.

Tap

By tapping on an item, for example in the menu, the item is executed.

Wipe

Wiping moves the current screen contents. For example by wiping you can scroll a list or the Map can be moved. Fast wipeing lists is a way to scroll through the list quickly.

Switching On- and Off

All Air Glide displays are turned on and off with the menu knob.

Switch On

To turn the unit on, press the menu knob more than 1.5 seconds and let it go. Orange lighting of the status LED informs you that the system is booting.

After a few seconds, a start screen is displayed with information about the software version.

Abbildung 3.2: Bildschirmanzeige während des Hochfahrens

Switch off

To turn off the display, press longer than 4 seconds on the Menu knob. The device and any connected peripherals are turned off.

Alternatively, you can also switch the display off over the main menu.

Hard off

To turn the display off regardless of software status, press (menu knob) longer than 15 seconds. A "hard off"will not delete information already stored on the device, however some data can still get lost.

> Data that has not been stored already may be lost if switching the unit off this way.

Text Input

Normal operation requires text inout at some stage. The text is entered on the AIR Glide Display M and L with the menu control button or with the touchscreen. You can switch between the two at any time.

Button based text input

Text is put in letter-wise. The current letter is marked in green. The desired character on the keyboard can be entered by selecting it with the (menu-knob) .

Selecting a Character:

Turn the menu knob until the desired character is in focus (blue). Press the menu knob to set the character and move to the next letter in the word.

Selecting letters

To move to the next letter, press and turn simultaneously the menu knob to the right.

Deleting letters:

To delete a letter, press and turn simultaneously the menu knob to the left.

Input via Touchscreen

The input via touch screen is similar to modern mobile phones or tablet computers directly from the keyboard on the screen

Status-LED and Lightsensor

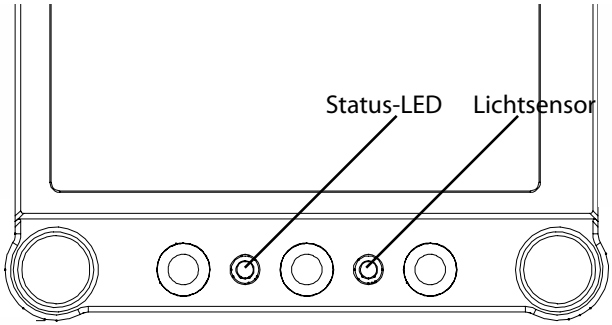

Abbildung 3.3: Lichtsensor und Status-LED am Display L

The status LED displays information about the current system status:

Dark:	Unit running normally
Orange light:	Unit running, main display not running

A light sensor continuously measures the ambient light level and adjusts the backlight illumination of the display accordingly. This ensures that the display is always optimal and is readable and no energy is wasted unnecessarily.

> The display illumination is automatically and manually adjustable, but AIR Glide devices are not approved for night flying because buttons are not illuminated.

Opening the menu and menu levels

To open the menu, press the menu knob. Push the menu knob to execute the menu item in focus.

Bedienelement	*Aktion*
Push Menu Knob	Open menu, execute menu item
Rotate Menu Knob	move focus
Push ESC-Button	escape menu / one menu level higher

Menu Items

A distinction is made between several types of menu items, for example those with further sub-menus and menu items without sub-menus.

- Menu item has sub menus (usually symbolized by an arrow on the side)
- Button that directly executes an action (rectangle with rounded corners)
- Selection element, to select an element from a list.
- Switch element to switch something “on” or “off”

5 Pages

General Information on pages

There are several pages available to display information on the instrument. Switching between pages is done via the Menu rotary knob. Turn the menu knob to switch between pages. One page always consists of a main element, for example, a map.

Main element

The main element of a page is the general content type of this page. The following types are available to date, more types are to be integrated:

- A moving map showing details such as airspaces, terrain, traffic, etc.

Navboxes

Navboxes are small areas that can show values. Navboxes can be displayed above and below the main element (e.g. map). Navboxes are arranged in a grid and can be configured in content and size. The size of Navbox text is dynamic, text is always displayed as large as possible and automatically reduced to fit within the confines of the navbox.

> Please find details about Navbox setup below in this manual

Switching between pages

The knob operation of switching between pages is not continuous, i.e. if you rotate the knob left you will end up on the far left page. This allows the pilot to return to a certain page without having to concentrate on the screen.

When switching between pages, there appears a small navigation view, indicating where you are in the page structure.

Page setup and configuration

The number of available pages, names and content are freely configurable.

Creating Pages

- To create a new page, execute the “page add”-button in the top right-hand corner.
- Go to the newly created page and configure in the desired way

Configuring or deleting pages

To configure a page, for example, to change a Navbox, you can select the page in Menu > Settings View > Page Layout. Desired changes can be made. It is also possible to delete pages by executing the “delete” button.

6 The Map

The map can be displayed on all pages. It includes many types of information that can be easily interpreted. It especially displays aeronautical information such as airfields, navigation aids or airspace but also dynamic content such as routes, tasks and traffic.

The Map optionally contains additional topographic information such as terrain and elevations. The presentation is done in ICAO standard colors with standard symbols.

The map is interactive, i.e. it can be operated and changed by the user The map can be zoomed or moved.

The type and nature of the information presented may also be changed in flight with the DSP pushbutton.

Display and Operation

Panning and Zooming

Panning the Map

The Map can be moved at any time away from the aircraft icon, e.g. to to check airspace on the route.

This can be achieved with the touchscreen by wiping, or using the cursor through the CRSR knob.

> The cursor moves the map to where ever the cursor is. Details about the cursor and its operation can be found below.

Once the map is moved, it will no longer follow the aircraft symbol. To return back to the aircraft symbol, tap the "HomeButton on the touch screen or press the home button on the device (the button with the aircraft symbol).

Zooming the map

The map scale can be enlarged / reduced, in order to view details better or to look at the entire route at a glance. Zooming can be achieved via the menu knob by simultaneously pushing and turning.

If the Map has the aircraft symbol centred, the zoom will always be centered on the aircraft symbol. If the Map is panned away from the symbol, the zoom is always centered on the screen center.

Map orientation

The user has two Map orientations available. Track Up, i.e. the current heading is up and Northup, i.e. North is up. Track Up and North Up can be selected via the display menu with the the DSP-Button.

Symbols

Current Position

At the aircraft's current position a symbol is displayed. The symbol depicts the current GPS-state. A magenta aircraft symbol shows that in the last 5 seconds an update to the position has occurred. If there is an issue, for example because no adequate GPS reception is possible, a gray cross is displayed instead.

The orientation of the aircraft symbol corresponds to the current orientation of the Aircraft.

Background Maps

Topographic Base Map

The topographic base map has many symbols of topographical features thar are recognizable from the air.

Aeronautical information

There are a variety of records for aeronautical information such as airspace, navigation waypoints or airfields available.

Route

The currently planned route, their turnpoints and course lines are shown on the map. ifferent elements of a route are color coded.

Traffic

Received traffic is shown as traffic symbols with altitude information.

User interactions with the map

The map is interactive. It is possible to get further information about map-items or to change the currently planned route on the map. Interactions are possible using the CRSR knob or the touchscreen.

Anywhere on the map a contextual menu can be opened. In the menu certain actions can be carried out, for example moving the route or inserting waypoints.

Using the cursor to interact with the map

The cursor is a pointer, like a mouse pointer on computers. It can either be moved along the currently planned route ("Route cursor"-Mode) or freely elsewhere on the map ("free cursor"-moce).

The cursor is accessed and operated through the CRSR knob .

- push on the CRSR-knob or rotting the knob will select the route cursor on the aircraft

symbol. The Route cursor moves only along the planned route. Turn the CRSR knob to move the cursor along the planned route.

- push on the CRSR-knob will change the route cursor to a free cursor. The free cursor can be moved anywhere on the map. Turn the CRSR knob to move the cursor in the direction depicted with arrows. Short push on the changes the moving direction.
- Press the ESC-button to close the cursor and to get back to the aircraft symbol. If the cursor is moved back to the aircraft symbol by rotating the CRSR-knob it disappears automatically.
- To interact with an item the cursor points to, push the Menu-knob to open the context menu.

The following table shows all possible control steps on CRSR-knob:

CRSR-knob	*Function*
Short push	evoke route-cursor / free cursor
Short push	change free-cursor direction
Rotate	Move cursor
Push and simult. turn	Switch between route waypoints

Using the cursor to interact with the map

To interact with an item on the map, a short tap on the desired item is used to open to the context menu. Tap, hold and wipe to move a route item.

The Context-Menu

The context menu offers a number of options to interact with individual elements on the map. It is a hierarchical menu usable with the touch screen or rotary knobs.

The operation in the context menu is homologous to the operation of the main menu and also carried out using the Menu-knob.

Control Element	*Function*
push Menu-knob	open context menu / execute menu item
rotate Menu-knob	move menu item focus
push ESC-button	close context menu

In order simply to navigate from the current position to a destination, there are several easy to use features available. New navigation destinations can either be menu selected or be selected directly on the map.

Route changes in general

Change the planned route is an important process during flight. To avoid unwanted changes, AIR Glide displays have a two stage route change process:

- The route is changed, e.g. a new destination selected
- The change is approved by the user (EXECUTE) or cancelled (CANCEL).

Selecting a destination from the menu

Nearest

From the main menu under Nearest, the surrounding waypoints are listed by distance.

In the waypoint detail-view, more information is shown. There is additional information such as required height, distance and direct course to the waypoint.

> To scroll through the list quickly, you can simultaneously push and turn on the (Menu- knob).

To select a waypoint as a navigation destination, execute the button called *Direct To*. Confirm the route change on the map with the button *Execute*.

Direct-To

In the main menu under *Direct To* the entire database of activated countries can be searched. In the waypoint detail-view, more information is shown. There is additional information such as required height, distance and direct course to the waypoint.

> It is recommended that only the countries in which the flight takes place are activated. If all countries are activated, the list is very long and the search time correspondingly large. For details on country activation, please read the manual below.

> To scroll through the list quickly, you can simultaneously push and turn on the (Menu- knob).

To select a waypoint as a navigation destination, execute the button called *Direct To*. Confirm the route change on the map with the button *Execute*.

Selecting a destination from the map

Using the context menu it is possible at any time on the map to select a (new) destination.

- Tap on the desired waypoint using cursor or touchscreen
- Select the option *Direct To* in the context menu.
- EXECUTE or CANCEL the change.

The Route

Each planned route, regardless of whether a complex competition task or a simple distance from the current position to a point, is always referred to as the Route. In the menu under Route, the currently active route is always displayed.

It can be edited or saved as a template to the “Route List”. The route list can store many such route templates that can be activated later.

Editing the currently active route

The current route can be changed both in the menu and on the map. All Changes to an active route are subject to the above-mentioned route change process, the confirmation or cancellation of changes (EXECUTE or CANCEL) is required.

Editing on the map

A route can be edited on the map by using the context menu. Waypoints can be inserted, moved or deleted.

Editing in the menu

In the menu the current route can be changed in the route menu.

A route from the route list can be selected and activated. This process replaces the hitherto active route.

Adding and saving a route-template to the route list

A route template can either be created as new or as a copy from an exisiting template. It is also possible to save the currently active route as a template to the route list.

To create a template as new, go to *Route list* in the menu and tap on the *Add Route* button in the upper right hand corner.

To copy an exisiting template, tap on the *Copy* button in the Route-Template detail view.

To save the current route into a template in the route list, tap on the *Save to Routelist* button in the Route detail view.

Activating a route template

To activate a route template, in the menu go to *Route list*, then open the desired route template and execute the button “activate”. Confirm the action with EXECUTE or cancel with CANCEL.

Setting flight parameters in flight

The following flight parameters can be set by the user in flight and have influence on calculations. The flight parameters can be set up in the menu *Flight*.

Parameter	*Funktion*
QNH	Current QNH-Value (Nautical height reference)
Wind	Current Wind (if to be manually entered)
Mac-Cready Value	Expected rate of climb in next thermal
Ballast	Ballast
Bugs-Factor	polar degradation through pollution of wings. Specified as a percentage of performance decrease.
Safety margin	Reserve/ Safety height

The current MacCready value influences speed to fly calculation.

10 Data

Data-Settings

Display M and L come with preloaded worldwide topographical and aeronautical data. In order to be usable, desired datasets have to be activated. The whole openAIP dataset is included.

Which datasets are to be diplayed can be individually set up on a per-country basis.

Activating countries

To activate a desired country, go to *Menu*, *settings*, *data* and *data settings*. Here you can find a list of active countries. To activate or deactivate a country, open the country from the list and change the item “enabled” to “yes” or “no”.

Data setup for individual countries

To activate/deactivate certain data-features, e.g. airspace classes or airport types, select the feature in the detail view of a country.

> To update data, please import the current AIR archive file which is available for free download on www.air-avionics.com

Updating the database

In order to update the built-in aeronautical database, please do the following steps.

- Download the latest database version (AIR archive file) from www.air-avionics.com
- Put the archive into a folder called “IMPORT”on a USB-stick
- Insert the USB-stick into the AIR Glide Display
- Open the menu and go to *Settings*, *Data*, *Infos and updates*
- Here you can perform the database update.

User Data Import

User data like special waypoints or airspace files can be imported using a USB-Stick.

Compatible data formats

The following file types are compatible to AIR Glide.

- CUP Files (Waypoints)

- openAIR Files (Airspace)

Import process

To import data, please do the following steps.

- Put the files that are to be imported into a folder called “IMPORT”on a USB-stick
- Insert the USB-stick into the AIR Glide Display
- Open the menu and go to *Settings*, *Data*, *User Files*
- Here you can manage all user files on the USB-Stick and on the device.

11 Settings

Units

Units can be set up in the menu under *settings*, *display and view* and *units*.

More settings

A variety of other settings, in the menu under Settings can be found in the settings menu.