ADL110 - ADL110B - ADL120

User Manual

Version 3.01

28.03.2018

Valid for ADL110, ADL110B, ADL120 and ADL130
firmware version 2.00 and later

Due to different firmware versions you may find
minor differences in the user interface.

Contents

1 Version History

Version 0.9   published 10.12.2012
Version 0.91 published 22.01.2013
Version 0.92 published 29.01.2013
Version 0.93 published 08.02.2013
Version 0.94 published 12.02.2013
Version 1.20 published 16.04.2013
Version 1.30 published 20.06.2013
Version 2.00 published 06.09.2013
Version 3.00 published 20.08.2016
Version 3.01 published 28.03.2018

2 Page Index

This manual contains numbered pages 1 to 27.

3 General Description

The ADL devices provide data link services. They can download weather data while in flight. Besides they feature in flight SMS communication. The data link works through the Iridium satellite network with global coverage.

4 Certification ADL110 – ADL110B – ADL120

The ADL devices can be installed in certified aircraft if a suitable minor change is used. The device itself does not come with any certification. Please consult the minor change documentation for details.

5 Disclaimer

The ADL devices are provided as non certified components. The only basis on which they can be installed permanently is an appropriate minor change. It is the sole responsibility of the user and installer that they are installed and used in a legal way. The devices may stop working at any time. Do not undertake flights you would not undertake without the ADL devices.

6 Warning!

While we do everything we can to ensure quality the ADL devices might not work at any time. In addition they may display false information. **Never penetrate weather based on the information provided by the ADL110 – ADL110B or ADL120**. This information is for situational awareness only. The devices features a GPS moving map system. This system is designed to display the aircraft position in relation to the weather data. It is not designed as a means of primary navigation. Especially the build in database is not updated in a regular aviation cycle. It is also not maintained to the standards of certified aviation databases.

7 Emergency procedures

If you suspect any malfunction of the ADL devices or interference with other aircraft systems, deactivate the device by pulling / deactivating the aircraft circuit breaker for the device or unplugging it from the cigarette lighter socket. Whichever is applicable depends on your installation. Do not reactivate the device until the problem has been investigated and resolved on the ground.

In case of a generator failure or similar situation requiring electric load shedding, deactivate the ADL devices by pulling / deactivating the aircraft circuit breaker for the device or unplugging the cigarette lighter cable.

8 Dedicated touchscreen interface vs. WLAN iPad interface

Depending on your device it will feature a dedicated touscreen, a WLAN interface for the iPad or both. The devices have the following capabilities:

ADL110	Dedicated touchscreen only
ADL110B	Dedicated touchscreen and WLAN iPad interface
ADL120	WLAN iPad interface only
ADL120 with external display	Dedicated touchscreen and WLAN iPad interface

9   iPad Interface

The ADL110B and ADL120 feature the WLAN interface. This way you can connect an iPad and control the ADL device using the ADLConnect App.
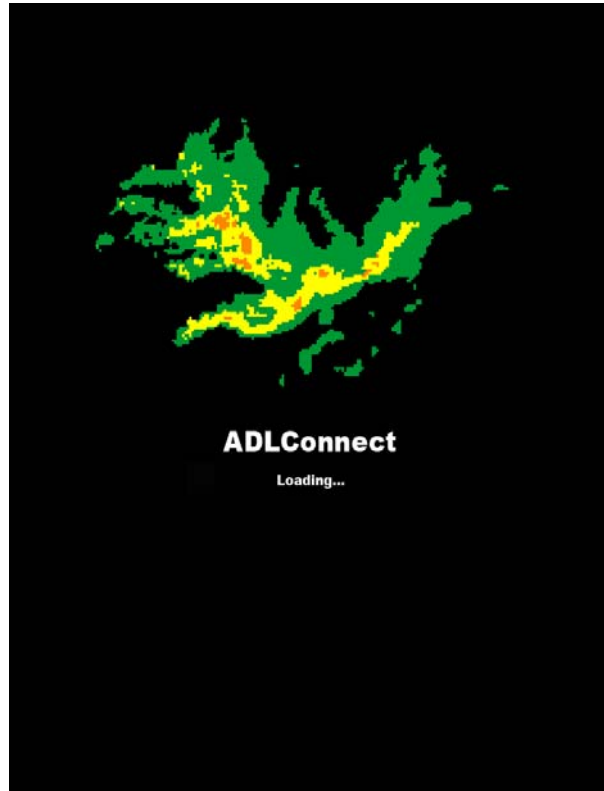

Figure 1   ADLConnect application starting

9.1   Installing the iPad App

Before you can start to use the ADL devices with your iPad, you have to install the ADLConnect iPad App. Please contact us so we can register your iPad for the App and provide you the download link.

9.2   Connecting the WLAN

After powering up the ADL device you have to connect the iPad to the WLAN access point provided by the ADL device. Go to the Setting screen of your iPad. Choose "Wi-Fi" on the left side. On the right side you will see the network "ADLConnect". Choose this network and if prompted for a password type "**adl110adl120**". Make sure the iPad really connects to the ADLConnect wireless network.

Figure 2   WLAN settings

9.3   Using the ADLConnect app

Please look at the dedicated tutorial regarding the ADLConnect app. Because of the frequent changes to the ADLConnect app we removed this section from this general manual.

10 Dedicated touch screen interface

The ADL110, ADL110B and ADL120 with external display are operated through a touch screen.

The ADL devices do not feature an on/off switch. The devices are switched on and off using the radio master switch of the aircraft. After electrical power is delivered to the device it will show the boot screen. At the bottom of the screen you will see boot messages. After booting the warning page will be displayed. You have to confirm that you understood the warning by pressing "Ok". Then the map page will be displayed and the device is ready for operation.
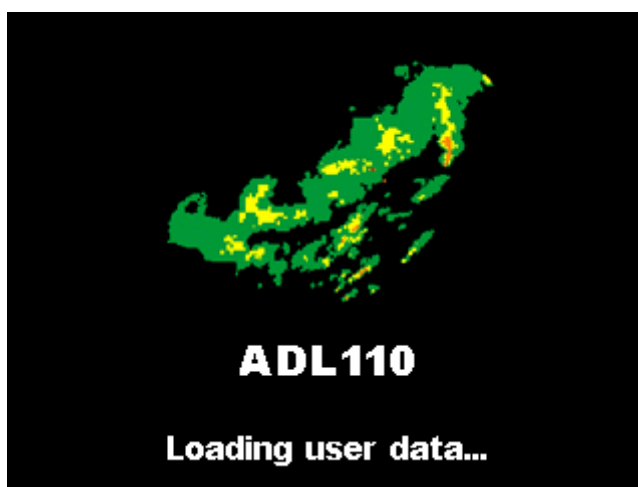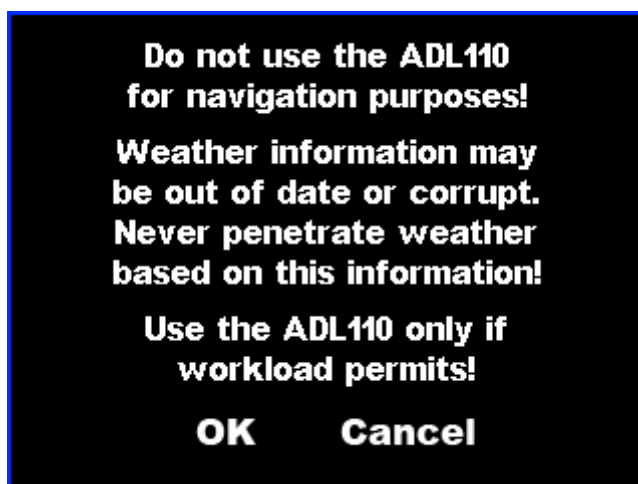

Figure 3   ADL110 Boot screen

Figure 4   ADL110 general warning

Once booted the main navigation of ADL devices is found on the bottom of the screen. The selected page of the user interface will be highlighted in blue.

Figure 5   Empty MAP page showing the bottom navigation

10.1 Permanent Status Information

On the right top of the screen you will permanently see status information. This includes the current time in UTC as provided by the GPS receiver. Below you will see two signal quality indicators. The left symbol related to the Iridium satellite signal quality. On the right side you see the GPS quality bars. At least 1 bar will be required in order to get a GPS position fix. If no GPS position is available the last aircraft position will be shown on the map overlaid with a red question mark.
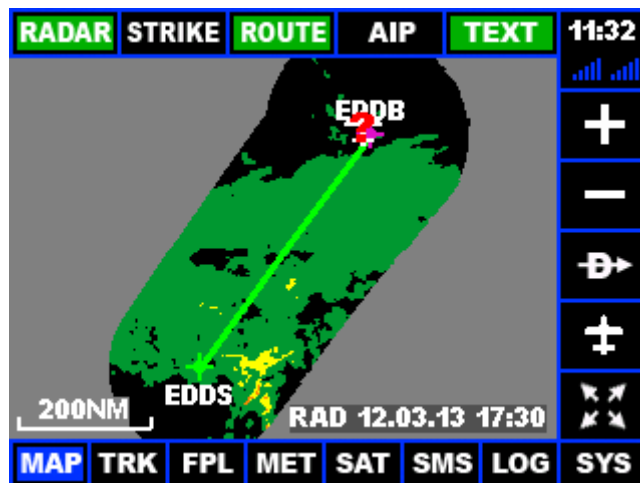

Figure 6   Time: 10:51 UTC, five bars Iridium reception, five bars GPS reception

10.2 MAP: Moving Map with Weather Overlay

The MAP page shows a moving map. The current aircraft position is displayed using a white airplane symbol. The symbol will be turned according to the current true ground track. Please not if any side wind component exists, this will not be the heading of your aircraft. Thus in strong winds weather you see in front of your aircraft may not be in front of your aircraft symbol on the moving map and vice versa.
The map is displayed using a mercator projection. Therefore true north will always be at the top of the screen but surface representation may be distorted compared to the real dimensions on the globe. Please note the ADL devices have not yet been tested for operations near the geographic earth poles.

10.2.1 Using the map

By default the map will be centered at the current aircraft position. If you wish you can pan the map by touching the borders and corners of the map. The map will then pan in this direction.

If the "TEXT" Overlay is activated (see below) a scale in nautical miles will be indicated at the bottom left corner of the map
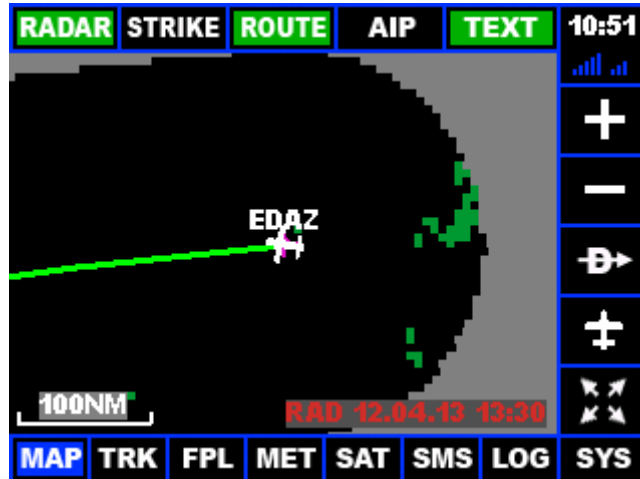

Figure 7   Using the map

10.2.2 Zoom the map

You can zoom in and out of the map using the plus und minus buttons on the right side.
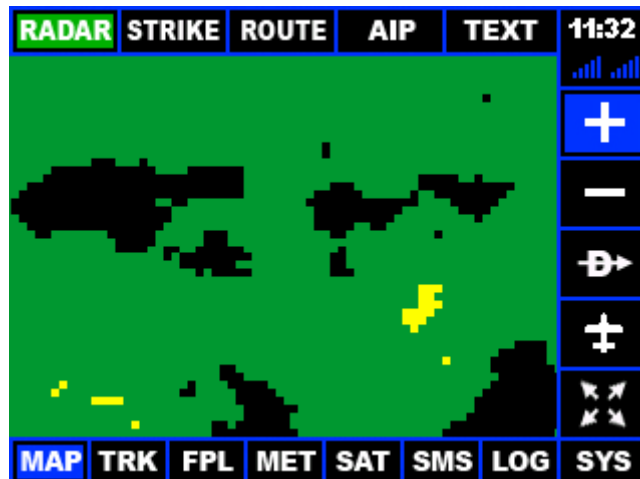

Figure 8   Zooming into the map using the plus button

10.2.3 Direct To

When you operate in manual flight plan mode, which means that the flight plan is not loaded automatically from an external device, you can use the "Direct To" shortcut in order to enter a direct flight plan to a destination. For further flight plan details please refer to the "FPL" section below.

10.2.4 Center on Airplane

This button centers the map at the current airplane position if the map has been panned manually before.
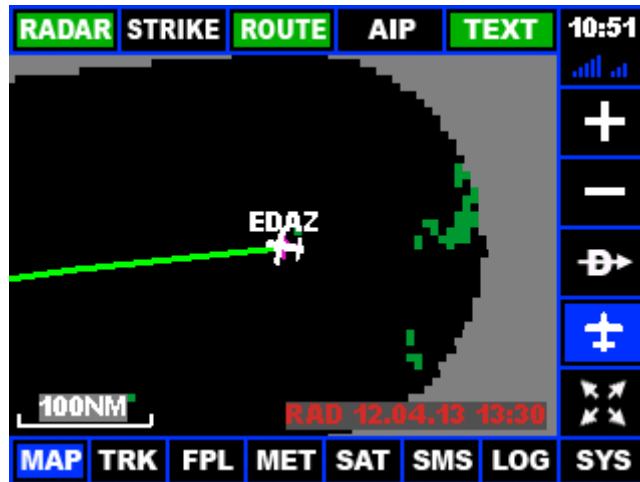

Figure 9   Centering the panned map using the airplane symbol

10.2.5 Enlarge Map / Hide Navigation

Using this button you can enlarge the map area by hiding the top navigation controls. In order to show the controls again you have to press this button again.
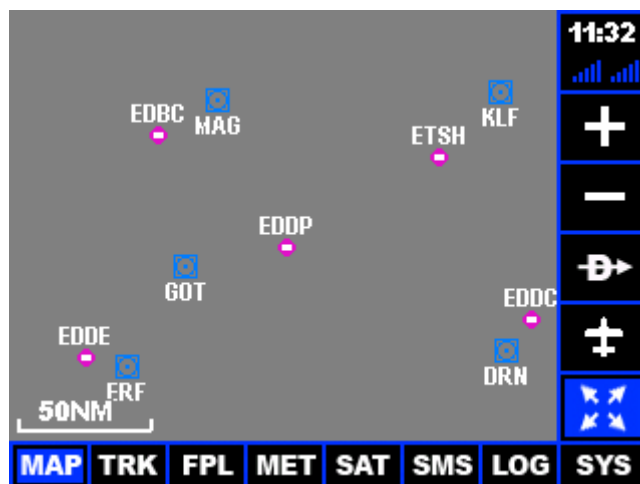

Figure 10   Enlarged map

10.2.6 Map Overlay options

On the top of the screen you see the sub navigation for the different map overlays. You can select the following overlays. If an overlay is selected the corresponding button will turn green.

10.2.6.1 RADAR: Weather Radar Overlay

This overlay shows the currently loaded weather radar image. For instructions on how to load new data please refer to the SAT section.
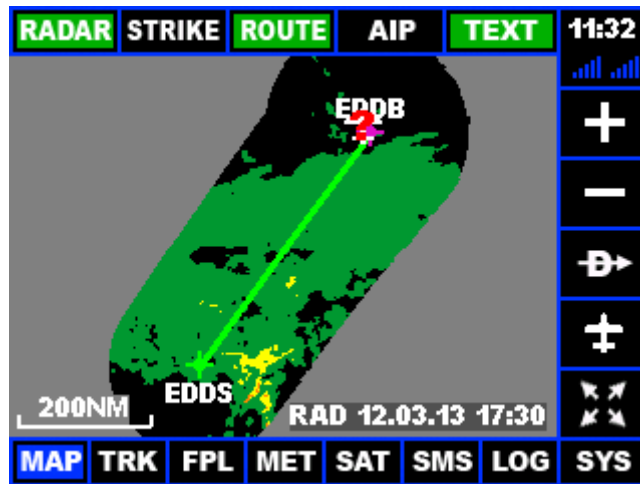
Figure 11   Sample weather radar overlay

The weather is always downloaded for the current route. The software will offer you a radar image around your programmed route as long as it lies within the coverage area.

Depending on data compression the shape of the available radar patch around a route can vary. Black color mean that the area is part of the radar map patch and no echoes are present. Light gray indicates that no data is currently loaded for this location.
In the right bottom corner of the map you can see (option "TEXT" being selected) the timestamp of the radar image. Currently the European radar images are produced with a timestamp at the hour and at 15, 30 and 45 minutes. Please note that DWD takes approximately 3min to produce the final image. Thus, new radar data is available for download at 03, 18, 33 and 48 minutes each hour. Radar data is displayed using five colors including black.

Warning: Weather radar is for situational awareness only. The moving map system can produce unnoticed errors or the radar image provided by DWD could contain errors. Even if no fault exists the radar information will always be several minutes old. Therefore this system is not suitable for weather penetration.

10.2.6.2 STRIKE: Strike Overlay

The strike overlay displays the available strike / lightning map. On the display black color indicates that this area is part of the loaded strike map patch. Light gray indicates areas which are not included. Strike events are indicated by mangenta or yellow crosses depending on your firmware version. Please note that the cross will be centered in a map pixel containing strikes. If multiple strikes have been measured in the raw data for this area only one cross will appear on the strike map.
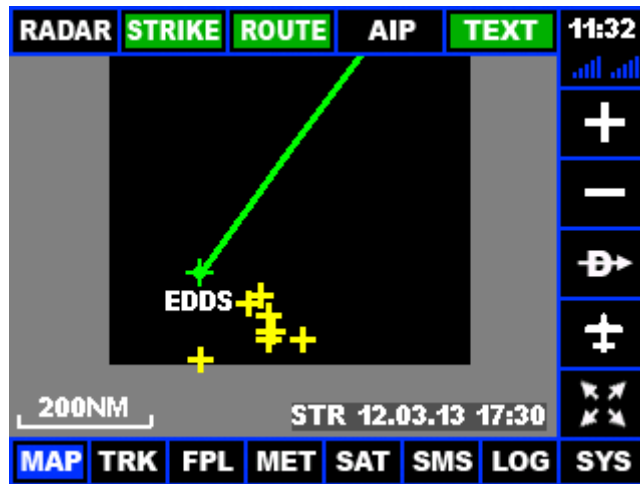
Figure 12   Sample strike overlay

Warning: Strike information is for situational awareness only. The moving map system could produce unnoticed errors or the strike image provided by DWD could contain errors. Therefore this system is not suitable for weather penetration.

10.2.6.3 ROUTE: Flightplan Overlay

This function allows overlying the currently active flightplan over the map. The active leg is drawn in magenta. The rest of the route is drawn in white color.
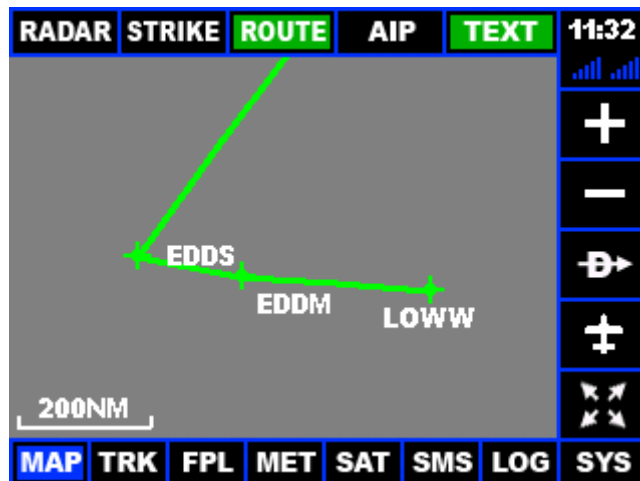ATTENTION: In later firmware versions the route is always visible and the button "Route" has been removed.

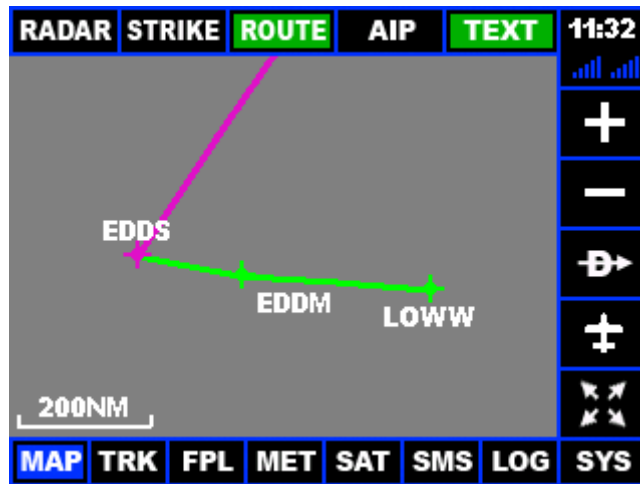Figure 13   Sample flightplan overlay

Figure 14   Sample flightplan with active waypoint EDDS

10.2.6.4 AIP: Airports and Navaids

Displays or hides the database airports and navaids. Depending on the zoom level of the map only major airports or in some cases no airports at all will be shown.
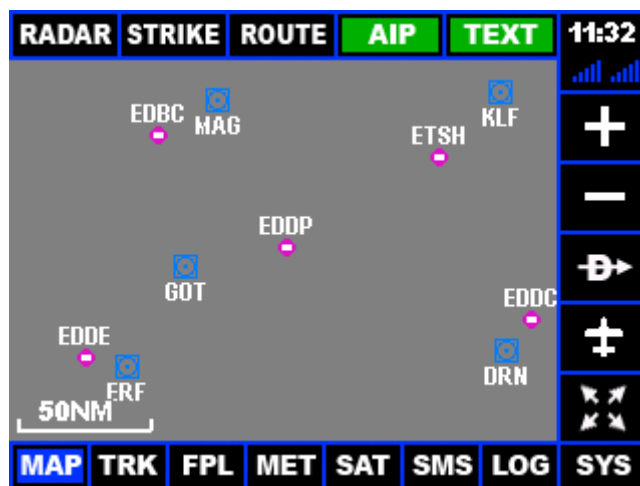

Figure 15   Sample view with AIP overlay

Warning: The incorporated database is for situation awareness only. The database is not compiled and updated following aviation standards.

10.2.6.5 TEXT: Text data fields

Activates and deactivates the data fields and annotations on the map screen.
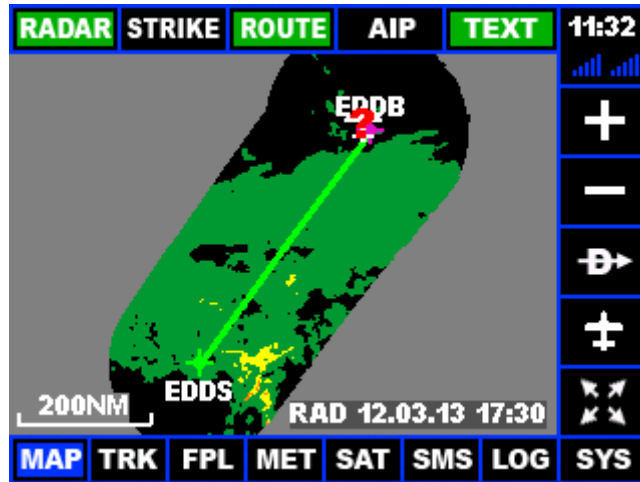ATTENTION: This option has been removed in later firmware version

Figure 16   Sample screen with TEXT data fields

10.3 TRK : Track Up Mode

The track up mode is very similar to the map mode. Only in this case the airplane symbol is displayed at the bottom of the screen and the map is oriented in the direction of the true track measured by the GPS receiver.

Warning: The track up mode shows the map oriented in the direction of true GPS track. If the airplane flies with a wind component from the side this will not be the direction at which the pilot is looking strait out of the cockpit.
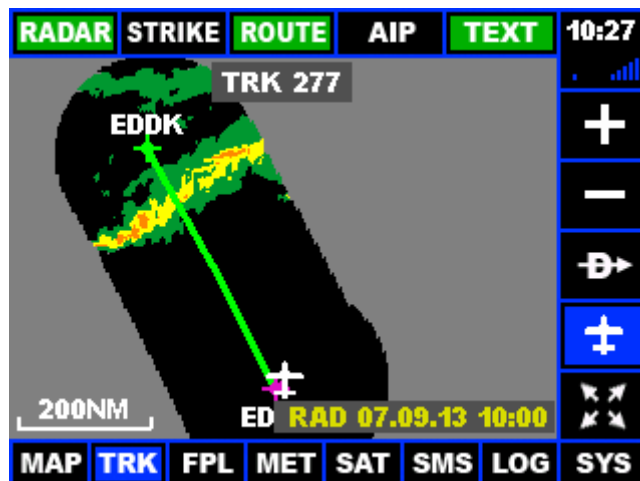

Figure 17   Track Up map

Contrary to the MAP mode it is not possible to pan the map in track up mode. But the map can be zoomed in and out.

10.4 FPL : Flightplan / Route

The FPL page will display the current route. We have to distinguish two totally separate operating modes. First automatic flightplan mode (FPL IN activated) and manual flightplan mode FPL IN deactivated.
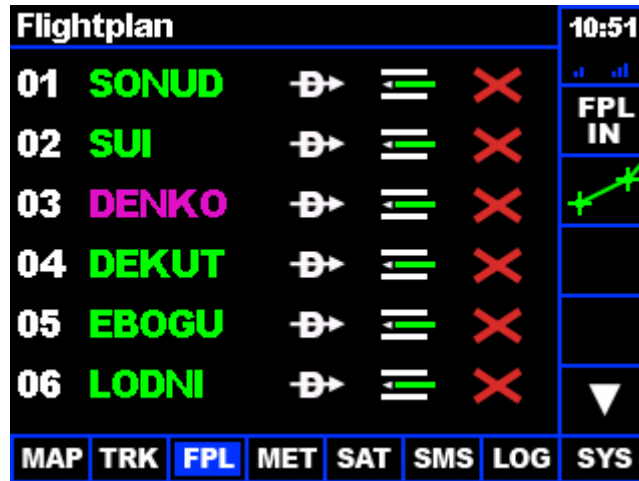

Figure 18   Manual flightplan with waypoint DENKO activated

10.4.1 Automatic FPL / Serial Aviation In

The automatic flightplan mode is selected by pressing the "FPL IN" button on the right side. In this mode the current flight plan is received through the serial port from another FMS/GPS System. The ADL device will only display this flight plan. Any changes must be made in the primary system. If available this is the preferred mode because the database in the primary GPS will probably contain more data and no work is required entering the route multiple times for different devices.
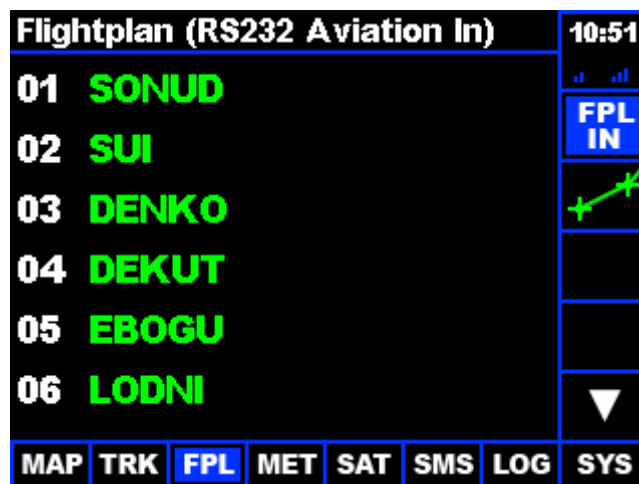

Figure 19   Automatic flight plan (FPL IN)

10.4.2 Manual FPL

If no automatic flight plan mode is activated the flight plan is entered manually by the user as follows.

10.4.2.1 Adding a new waypoint

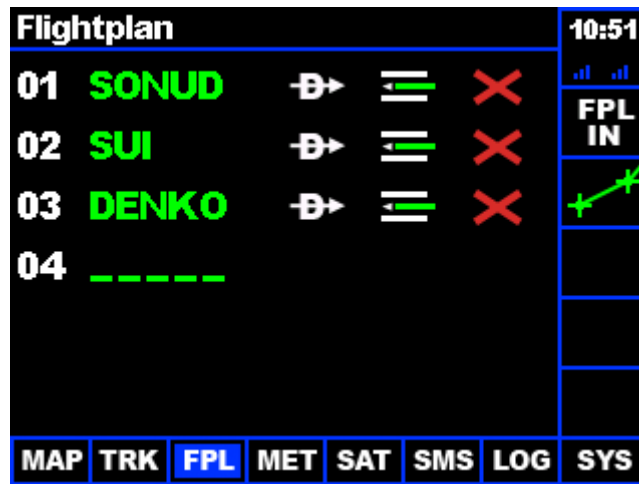Touch the green dashes (placeholder) at the end of the flightplan in order to add a new waypoint.

Figure 20   Flightplan edit interface

10.4.2.2 Modifying a waypoint

Touch the name of the waypoint and change its name.

10.4.2.3 Activating a waypoint

Use the "Direct To" button next to the waypoint name in order to navigate directly to this waypoint.

10.4.2.4 Inserting a waypoint

The Insert Waypoint button allows inserting a waypoint into the current flightplan before the row where the button has been pressed.

10.4.2.5 Delete a waypoint

Use the delete waypoint function in order to delete a waypoint from the flightplan.

10.4.3 Center Map on Flightplan

The center map on flightplan button on the right side will switch to the map page and center the map on the current flight plan to give the best possible overview of the whole route.
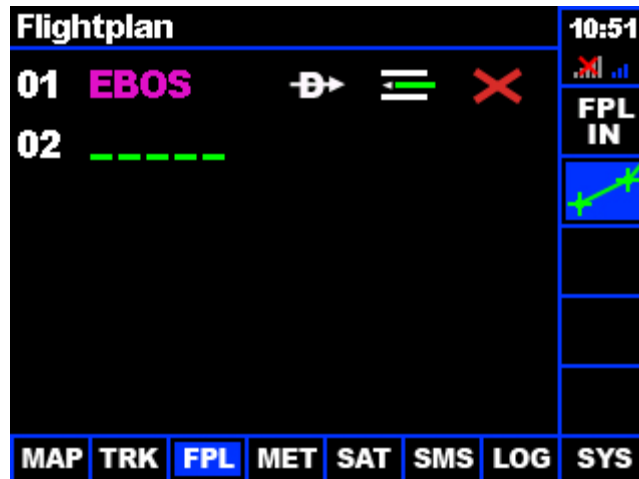
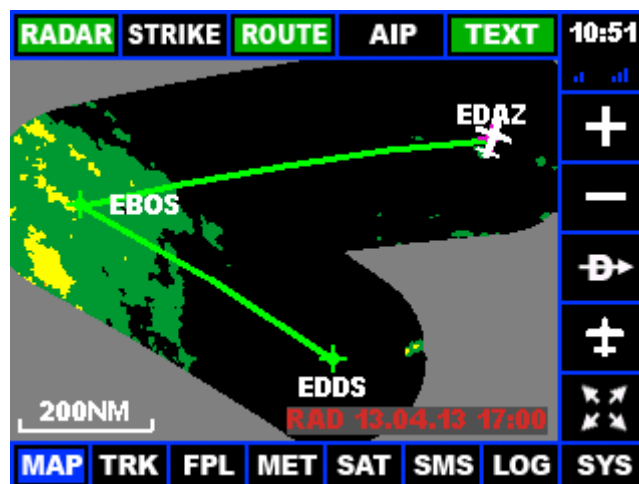Figure 21   The center on flightplan button on the FPL page

Figure 22   Map centered on the flightplan for better overview

10.5 MET: METAR / TAF

The met page displays the currently available METAR/TAF reports. If reports are available the list of corresponding airports will be displayed. By touching the airport name you get to the detail page where you can read METAR and/or TAF.
Use the arrow on the right side in order to get back to the overview. With the red cross button on the overview you can delete all METAR/TAF. With the red cross symbol on the individual METAR/TAF detail page you can delete this specific message. For information on how to download METAR/TAF please refer to the "SAT" section below.
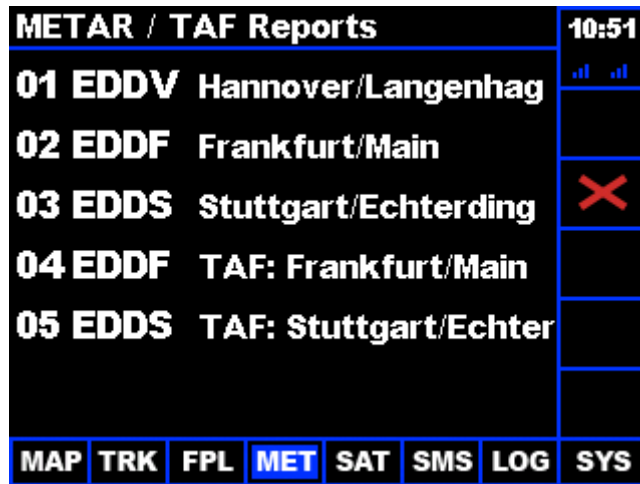
Figure 23   METAR/TAF overview

Figure 24   METAR/TAF details

Figure 25   METAR/TAF details

10.6 SAT: Satellite downloads

This page allows you to download weather data using the Iridium satellite network. For these functions to work properly you must have signed up for the Iridium data service and configured your DWD passwords. Concerning data service activation please contact us and concerning password configuration please refer to the section SYS below. Before starting a satellite download you have to specify which data to load.
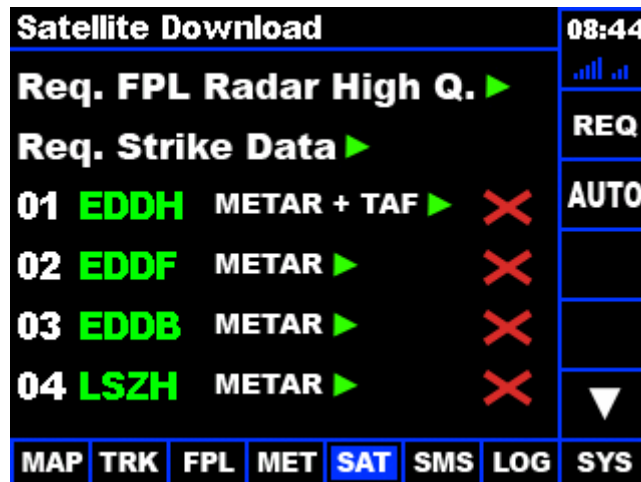

Figure 26   Configuring the weather download

ATTENTION: Later firmware versions have additional features like "Infrared", "Wind" and "Approach Minima". Those can be selected in a similar manner than the features described below.

Concerning weather radar you can select between:

No Radar Requested: No radar download

Req. FPL Radar Low Q.:   Download radar image along current flight plan in low quality

Req. FPL Radar High Q.:   Download radar image along current flight plan in high quality

Req. Radar Destination: Download radar image around the destination (last entry in flight plan) in low quality.

Req. Radar Current Pos. :   Download radar image around current GPS position in high quality.

The high and low quality settings differ in the resolution of the downloaded radar image. In general we recommend loading the smaller and more cost efficient low quality image in order to get a rough overview of your route. For any more detailed analysis the high quality data can be requested.
Please keep in mind that new radar data will be available at 04, 19, 34 and 49 minutes each hour. When loading data for a flight plan the data is always downloaded for the active segment and any subsequent segments of the flight plan. Familiarize yourself with the weather radar coverage area by Deutscher Wetterdienst. It will not do any

harm but in general it does not make sense to request radar when flying outside the coverage area.

Strike information can be requested by toggling the states "No Strike Requested" and "Request Strike Data" using the green arrow on the right or by touching the text itself. Similar to the weather radar please have a look at the coverage area of the strike data by Deutscher Wetterdienst.

Below you can enter up to 8 ICAO codes for which you would like to receive weather reports. Right of the ICAO code you can specify if you want to download METAR, TAF or both. Using the delete button ICAO codes can be deleted from the list.

After completing the download settings you have the possibility to do a single download or to activate the automatic download mode.

10.6.1 Starting a single download

In order to actually download the data use the request "REQ" button on the right side. After you do so a log screen will open indicating the progress of your download. Please note that a minimum of two signal quality bars for the Iridium network are necessary in order to download data. You can nevertheless start the download whenever you like. The software will then wait until the required satellite signal is detected.

Figure 27   Transmission log screen

You can abort the transmission at any time using the stop button. Please note that before the data request message is uploaded to the satellite, the transmission will be stopped. Once the message is uploaded you can still cancel but the data packets will be transmitted to the satellite and data usage will be charged.
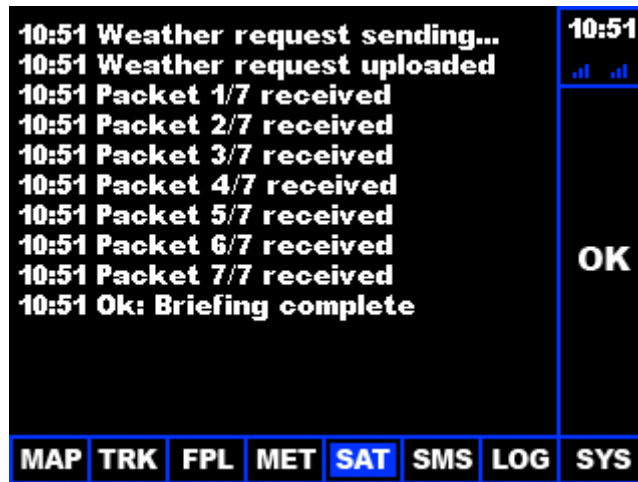
Figure 28   Transmission log screen

The satellite transmission works in data packets. First a request package is send to our proxy server. The data is downloaded using your credentials from the DWD servers and finally the data is split into multiple packets for the transmission to the ADL device. Finally the ADL device will receive the individual packets until the request weather download is completed. The log will indicate the receipt of the individual packets. In general you can expect a total duration of two minutes for the download depending on conditions.

When the download is finished the stop button on the right transforms into an Ok button. Pressing this button brings the SAT page back to its initial stage and directs you to the MAP or MET page depending on your weather download.

The actual transmission costs will depend on your individual data contract.

10.6.2 Activating automatic downloads

Besides the possibility to start an individual download you can activate automatic downloads. In this mode the device will automatically download the data selected when new data is available. In order to start this mode you have the press the Auto button on the right side and confirm in the pop up dialog that you want to start this mode.

A green border around the SAT button in the bottom navigation indicated that auto mode is activated.
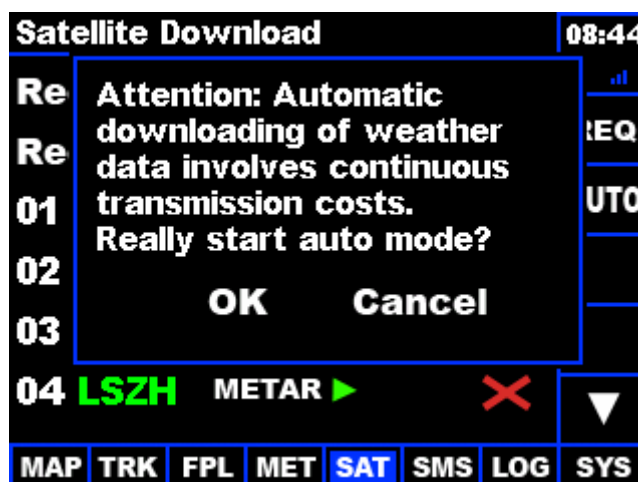
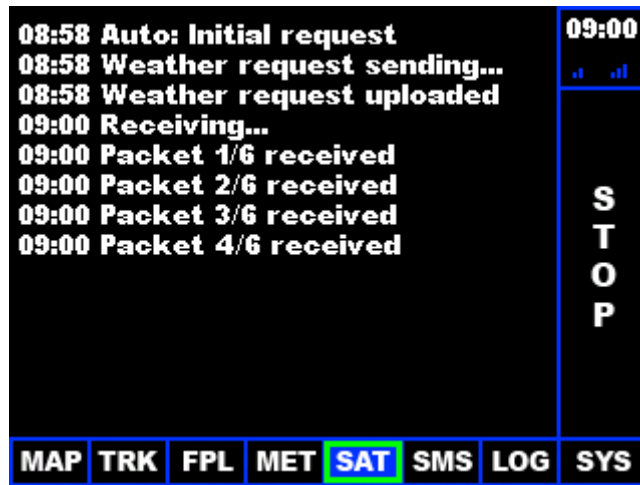Figure 29   Automatic download pop up dialog

Figure 30   Green border in the bottom navigation indicates
active automatic downloads

Please note using the auto mode involves continuous transmission costs. Depending on the data selected this can be approximately 10 Euro per hour. In order to stop the auto mode press the stop button on the right side.

10.7 SMS: Sending and receiving SMS

10.7.1 SMS / Inbox

When initially opening the SMS page you will be on the SMS / Inbox subpage. Here all incoming messages are shown. Unread messages in yellow, read messages are displayed in white color. Touch any message in order to get to the detail subpage. While unread messages exist the SMS symbol in the bottom navigation will be highlighted by a yellow frame.
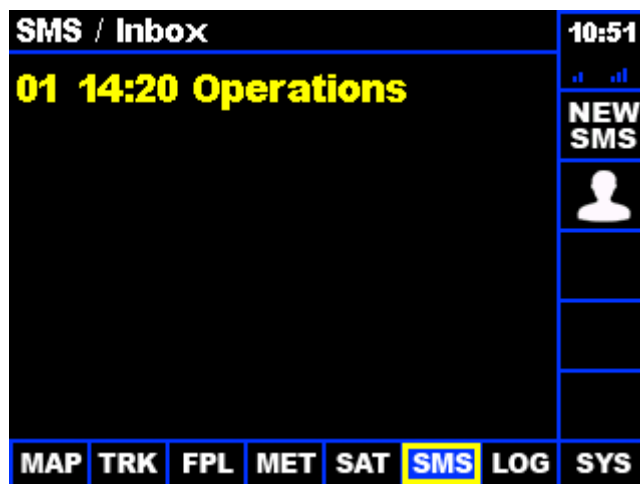

Figure 31   SMS inbox with one unread message

10.7.2 SMS / Details

The detail subpage allows you to read the SMS message. The buttons on the right allows to answer this message or to delete it. In order to go back to the overview please use the left arrow on the right side of the screen.
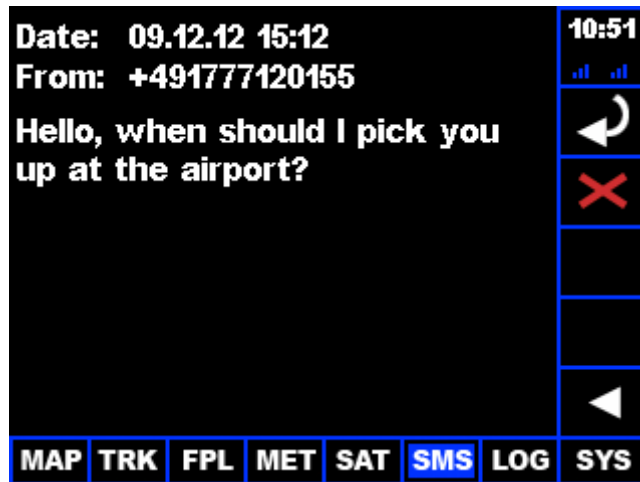

Figure 32   SMS details

10.7.3 SMS / Phonebook

In order to avoid the lengthy entry of phone numbers while in the air we encourage you to use the phonebook. With the phonebook button on the right side of the SMS / Inbox you can get to the phonebook. Here you can view, edit and create new entries. Please remember when entering phone number for you contact to always use the international notation using the plus sign and the country code. For example a German mobile phone number 0172/1234567 has to be entered as +491721234567.
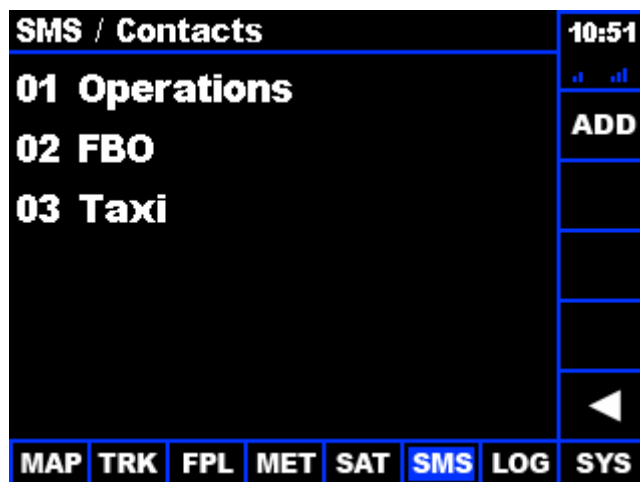

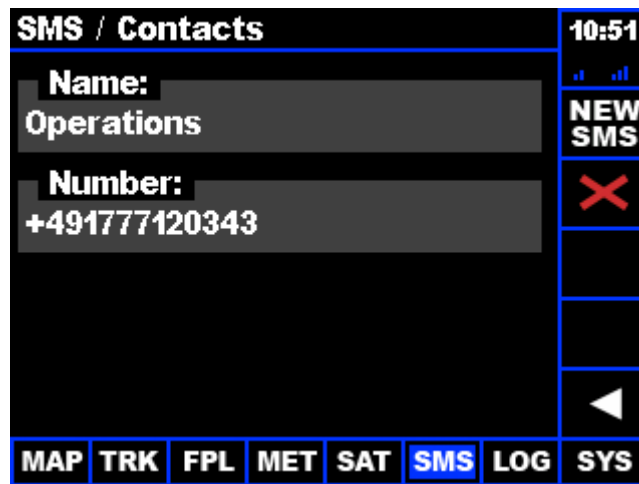Figure 33   SMS contacts overview / Phonebook

Figure 34   SMS contacts details

10.7.4 SMS / Compose

There are three ways to compose an new SMS message. First you can use the button "NEW SMS" on the right side of the SMS / Inbox subpage. In this case you will start with an empty form. Second you can use the "NEW SMS" button on any phonebook detail page. This way you start with the phone number of the recipient already filled in. Third you can use the reply button on the SMS / Detail subpage. This will also start up the dialog with the phone number already filled in.

No matter how you started the dialog you will see a screen which allows to enter or modify the phone number and the message text. Touch the corresponding field in order to start the touch screen keyboard. When finished you can use the "SEND" button on the right side to send the message or the delete button to clear all fields. When using the send button the message will be added to the send buffer and transmitted as soon as possible.
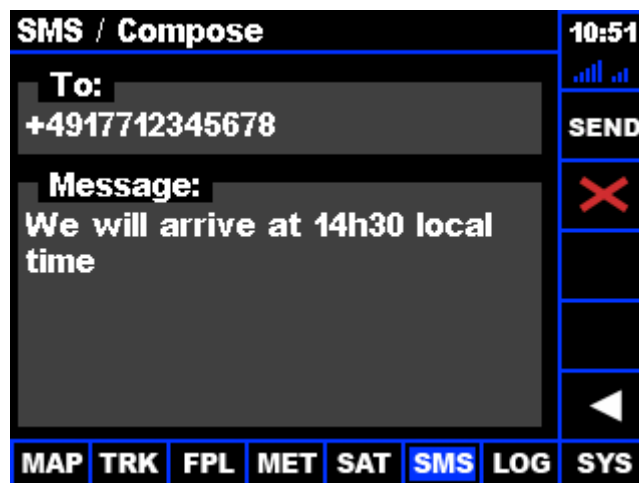

Figure 35   Compose a new SMS

Figure 36   Entering the phone number, always preceeded by a + sign

10.8 LOG: Weblog / Internet logging

ATTENTION: This feature has bas been removed from the user interface in later firmware versions. Tracking is enabled by default and tracking data can be found on the ADL website with your customer login.

10.9 SYS: System Data and Configuration

The SYS page displays current technical information including software versions, GPS receiver data etc. Plus und Minus Symbols on the right you can adjust the brightness of the display for night use.
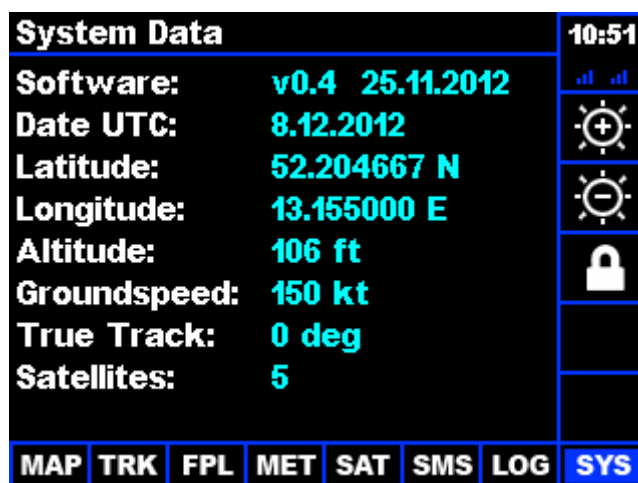

Figure 37   System Data page with display brightness controls on the right side.

10.9.1 Deutscher Wetterdienst Credentials

Using the lock symbol on the right side of the SYS page you can edit the login details. This is the same email/password combination as used for your login at www.ing-golze.de.
Please note: In the past a "Deutsche Wetterdienst login" was required. This is no longer the case.
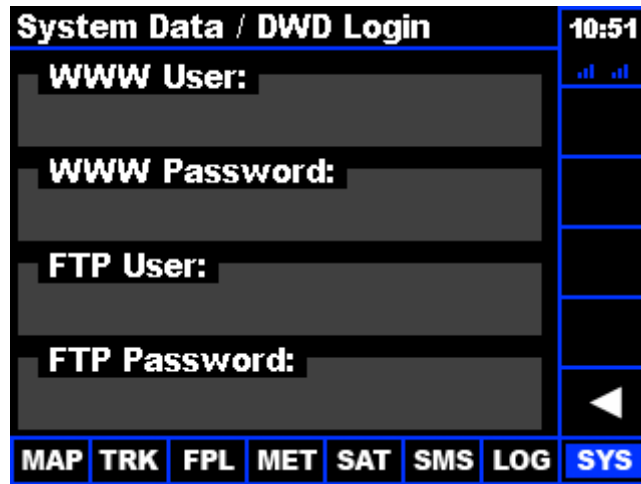
Figure 38   DWD login screen

11 Contact

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