KTX2
Mode-S Transponder
Standard

KTX2-S (Standard) with ADS-B with Part-No 304110

Operation and Installation Manual

2. Operation

2.1 Controls and Display

Figure 1: Operating and display elements

2.1.1 Controls

This chapter describes the use of the buttons and knobs during normal operation.

The usage while in setup mode is described in chapter 3.3.

Button	Designation	Function
	ON/OFF	Press to switch the transponder on and off. This switch is mechanically locked until it is pressed a second time
	VFR	1. Activate/deactivate VFR Squawk 2. Pressing the button for more than 3 seconds will show the brightness menu (see chapter 2.2.8.2)
	CHANGE	1. Exchange of the active and Standby Squawk 2. Pressing the button for more than 3 seconds will show the GNSS data menu (see chapter 2.2.9)
	IDENT	1. „Squawk Ident", a SPI Pulse is transmitted for 18 seconds (in normal mode). 2. Pressing the button for more than 3 seconds will show the Flight ID menu (see chapter 2.2.8.1)
	MODE	1. Select Transponder-Mode STBY, GND, ON or ALT. 2. Pressing the button for more than 3 seconds will toggle the ADS-B mode (On/Off)
	Rotary knob	1. Enter a new Squawk (see chapter 2.2.2) 2. Enter values and select options in submenus (see chapter 3.3) 3. Confirm warnings and notifications

Table 1: Control Elements

2.1.2 Display Indications

Indication	Meaning	Remark
↑	Transponder is transmitting Mode A/C Replies on interrogations	Appears per reply and persists for some time
↑	Transponder is transmitting Mode S Replies on interrogations	Appears per reply and persists for some time
.↑	Transponder is locked by a ground station and will be directly addressed	Appears at every addressed reply and persists for some time
A	ADS-B out status	Status of ADS-B transmission, For more information see chapter 2.2.7
7000	Active Squawk	Is shown at upper position
BAT LOW	Battery power too low	Appears above Standby Squawk
ANT	Failure indication	Indication for the last occurred and confirmed severe error. For more information see chapter 4.1.1
IDT	IDENT- Marking is transmitted	ID („Squawk Ident") has been pressed – active for 18s
FL 095	Current Flight Level	Flight Level (in 100ft steps)
ALT	Mode display (STBY, ON, GND, ALT)	See chapter 2.2.2
4711	Standby Squawk	Is shown at lower position. Can be exchanged with Active Squawk by pressing the "CHANGE" button
DL0TQ	Flight ID	Only shown if a Flight ID is configured with a valid Aircraft Address
VFR	VFR indication	Shown while VFR Squawk is used
FLY	Transponder is in airborne mode	Only shown if Ground-Switch support is configured.
GND	Transponder is in ground mode	Only shown if Ground-Switch support is configured.

Table 2: Screen display elements and indicators

2.2 Normal Operation Menu Structure
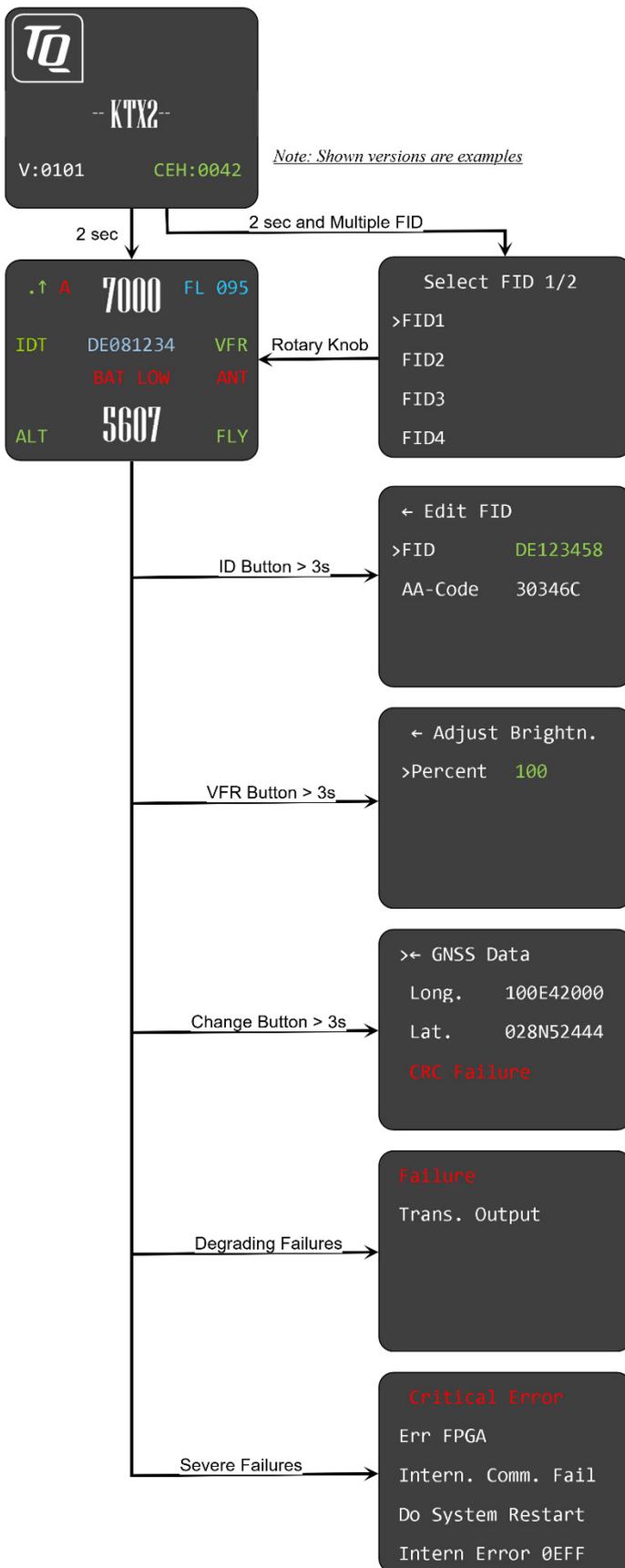
Figure 2: Operational screen and menu structure

2.2.1 ON/OFF Switching

To switch on the transponder, press the "ON/OFF" button once. The button will be locked in the "ON" position. Press the button again to switch it off.

The start screen is displayed immediately after the transponder is switched on (see figure below).

The screen displays the current version of the running software and the FPGA revision.

Figure 3: Start screen of a device with enabled "Extended Squitter ADS-B out" feature

Figure 4: Start screen of a device with "BASIC" functionality (Mode A/C/S only)

After approx. two (2) seconds the transponder switches either to its normal operation display or a selection menu is shown if multiple Flight IDs are configured.

	If a failure is detected during start-up a fault notification is displayed. In that case see chapter 4 for details.

2.2.1.1 Multiple Flight ID selection

If multiple Flight IDs are configured a selection menu is displayed.

2.2.1.2 Normal operation

The normal operation always starts in standby mode. The normal operation display is shown as follows:
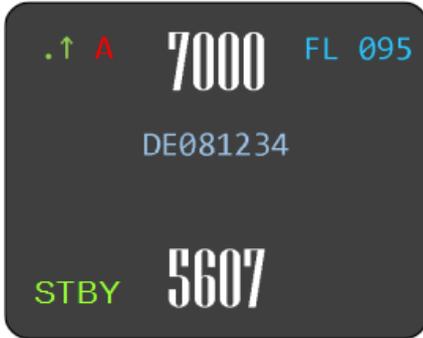
Figure 5: Normal Operation screen

Note:

The Flight ID is not shown if no valid Flight ID was configured.

2.2.2 Transponder-Modes

The currently active mode is displayed at the lower left corner of the display.

Note:

ADS-B out is only supported if "Extended Squitter ADS-B out" feature is enabled (unlocked).

For information on enabling (unlocking) "Extended Squitter ADS-B out": see chapter 3.4.6.

The ADS-B out function is automatically enabled if a GNSS device is configured (see chapter 3.4.2.1.3.4).

Mode	Explanation
STBY	Transponder is switched on but does not respond to any interrogation. ADS-B out is inactive.
GND	Transponder responds to Mode S interrogations. ADS-B out is active (Surface Squitter).
ON	Transponder responds to all interrogations, but altitude is not transmitted. ADS-B out is active.
ALT	Transponder responds to all interrogations. ADS-B out is active.

Table 3: Transponder Modes

During the flight the Mode "ALT" should always be set, unless the ATC gives other instructions.

While rolling on the ground the transponder should be set to "GND".
If the installation includes a weight on wheels switch and it is correctly configured then the mode is changed automatically.

To change the mode press the "MODE" button until the desired mode is displayed.

The "MODE" button is also used to activate or deactivate the ADS-B out function. Press the "MODE" button for at least 3 seconds until the ADS-B indication changes (see chapter 2.2.7).

2.2.3 Squawk Code Change

To change the Squawk code perform the following procedure:

1. Press the rotary knob. The first digit of the Standby Squawk turns green.
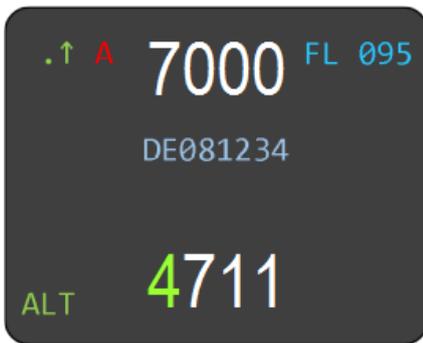
2. Turn the rotary knob to change the value.
3. Press the rotary knob again to save the selected digit. The next digit turns green.
4. Repeat steps 2 and 3 until all four (4) digits are set to desired Squawk code.
5. Press the "CHANGE" button. The Standby Squawk code is exchanged with the currently Active Squawk code.
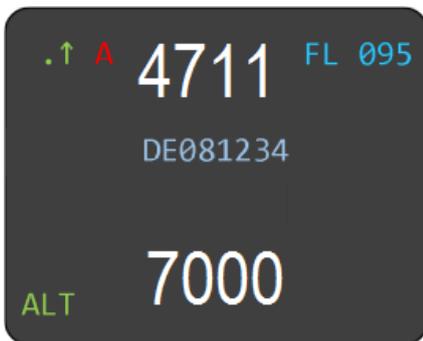
Note:

The top line shows always the Active Squawk.

2.2.4 VFR Squawk

To set the Active Squawk to a predefined code press the "VFR" button. The VFR Squawk code is now shown as Active Squawk. "VFR" is indicated on the right hand side of the display and the former Active Squawk becomes the Standby Squawk.
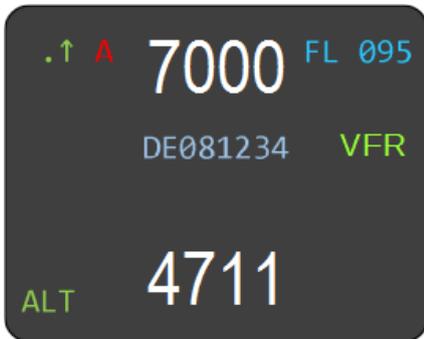
Figure 6: VFR Squawk

Press the "VFR" button again to restore the previous Squawk code as Active Squawk. The "VFR" indication disappears.

The factory setting of the VFR Squawk code is "7000". The VFR Squawk code can be configured in accordance with local requirements using the setup mode (see chapter 3.4.3).

2.2.5 Squawk Ident (ID, SPI)

Press the "IDENT" button if the ATC requests you to send "Ident" or "Squawk Ident".

For 18 seconds the ident pulse is activated in the transponder replies. This is indicated by "IDT" on the left hand side of the display.
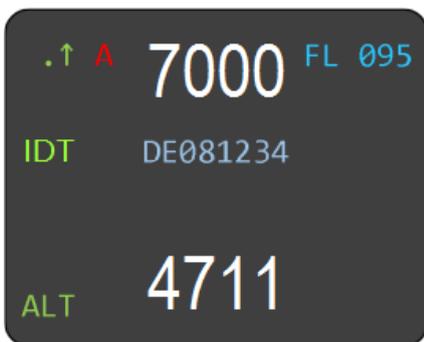
Figure 7: Squawk Ident

2.2.6 Airborne/Ground Indication

If the aircraft is equipped with a "weight on wheels" switch or has an automatic air/ground system the transponder can be configured to use it for Airborne/Ground mode switching (see chapter 2.2.2 and 3.4.2.1.3.1).

Depending on the status either "FLY" (Flight) or "GND" (Ground) is shown on the display in the lower right corner.
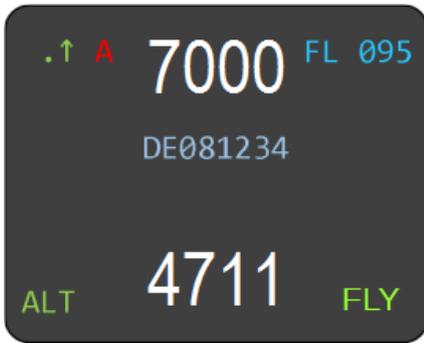
Figure 8: Airborne/Ground Indication "FLY"
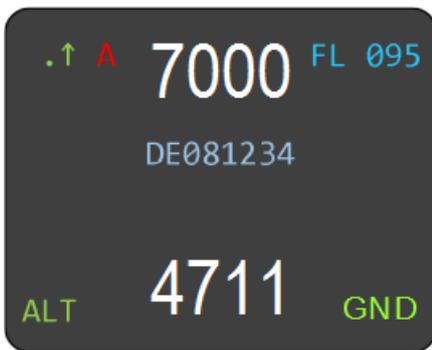
Figure 9: Airborne/Ground Indication "GND"

Note:

If this function is not activated, no indications are displayed and the mode must be manually selected (see chapter 2.2.2).

2.2.7 ADS-B Status Indication

The current operational status of the ADS-B is shown on the display as follows:

Note:

If the device has "Extended Squitter ADS-B out" feature disabled, it will only operate in Mode A/C/S (see chapter 1.7 and 2.2.2).

The "A" symbol in the display appears only if the ADS-B out is enabled and activated.

To enable (unlock) the "Extended Squitter ADS-B out" feature see chapter 3.4.6.

Indication	Function	Description
	ADS-B active. Letter "A" appears in white color.	ADS-B out function is active and transmitting messages.
	ADS-B active. Letter "A" appears in yellow color.	ADS-B out function is active, but no messages are sent because there is no information about valid position data yet.
	ADS-B active. Letter "A" appears in red color.	ADS-B out function is active and transmitting type ZERO position messages or no position messages due to missing position data (longitude, latitude, altitude).
	ADS-B inactive. No letter "A" displayed.	No ADS-B data is transmitted.

Table 4: ADS-B Indication Symbols

Note:

The above images are from the upper left display area.

2.2.8 Adjustable parameters in normal operation mode

Some parameters can be changed during in normal operation mode. The changes are effective immediately after confirmation, but will remain only until the transponder is powered off.

Note:

To make changes permanently the parameters have to be changed in setup mode (see chapter 3).

2.2.8.1 Flight ID

To modify the Flight ID press the "IDENT" button for at least 3 seconds.

```
← Edit FID Param.

>FID        DE123458

 AA-Code    30346C
```

Figure 10: Change Flight ID

The Flight ID can be adjusted in the same way as described in chapter 0.

Note:

The AA-Code is shown for information only and cannot be changed.

2.2.8.2 Display Brightness

To modify the display brightness press the "VFR" button for at least 3 seconds.

```
← Adjust Brightn.

>Display  1
```
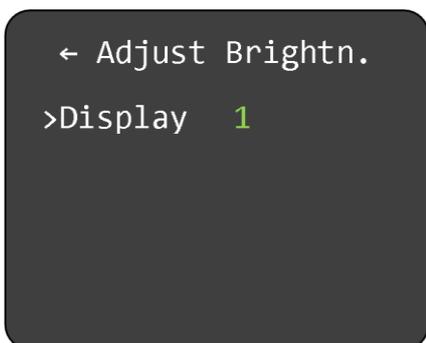
Figure 11: Adjust Display Brightness Menu

To change the display brightness select "Display" and press the rotary knob.

Turn the rotary knob to change the value for brightness level between 1 (lowest) to 5 (highest). Press the rotary knob to use the new value.

2.2.9 GNSS Position Data

Press the "CHANGE" button for at least 3 seconds to display the actual GNSS position data.

```
>← GNSS Data

  Long.    100E42000

  Lat.     028N52444
```
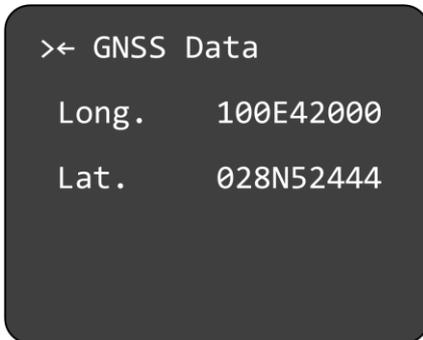
Figure 12: GNSS Position Data display

Press the rotary knob to return to the normal operation display.

Note:

Display of position data only possible if a GNSS device has been configured in the setup and is connected.