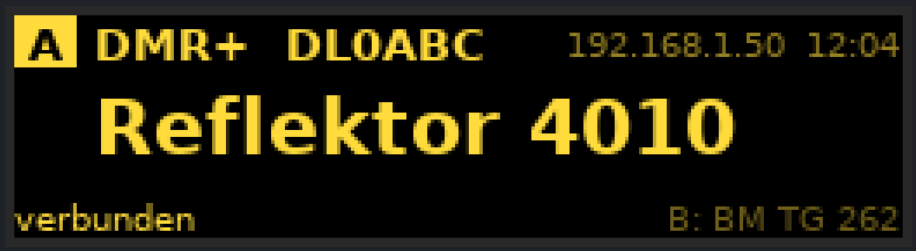
DV-Box · Software 3.3.12

User Manual

Digital voice over the internet: DMR BrandMeister, DMR+, D-Star, C4FM/Fusion and FM-Funknetz – with two independent channels



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Overview

> **Note:** The DV-Box display, web interface and installer are still in German – an English version is in the works. Until then, German texts are explained in brackets.

The DV-Box connects you to the major digital voice networks over the internet. You do not need a radio for this: microphone, loudspeaker, display and control knob are built in, and via the web interface you can also listen and talk from any browser.

The box has **two channels, A and B**. Each channel has its own voice codec (AMBE chip) and can be set up independently:

Mode	Network	Target
BrandMeister	DMR, worldwide BrandMeister network	Talkgroup (e.g. 262 Germany)
DMR+	DMR, IPSC2 network (xreflector.net)	Reflector 4000–4999
D-Star	D-Star via ircDDB	DCS, XLX, REF or XRF reflector with module
C4FM / Fusion	Yaesu System Fusion	YSF reflector or FCS room
FM-Funknetz	analogue FM voice network (SvxLink reflector)	Talkgroup (e.g. 262); possible on one channel only

Both channels are permanently connected to their network. You hear the **active channel** and transmit on it. A short press on the rotary knob switches to the other channel immediately – with no wait for the connection to be set up. What is happening on the other channel is shown at the bottom right of the display.

Example: channel A is set to DMR+ reflector 4010 (Lower Saxony), channel B to BrandMeister TG 262. You hear 4010; as soon as someone talks on TG 262, the display shows “B: … ● Aktiv” (active), and one press on the knob brings channel B to the loudspeaker.

Controls

Element	Function
Turn the rotary knob	Volume (in steps of 2 %)
Press the rotary knob briefly	in standby: switch on · in operation: change channel A ⇄ B
Press and hold the rotary knob (1.5 s)	switch to standby
Press, hold and turn the rotary knob	Quick select: browse the favourites of the active channel
Hold for 5 s in standby	shut the device down (with countdown)
PTT button	Transmit while pressed
Display	Channel, mode, target, connection, caller

“Briefly” means: less than 0.8 seconds. Between 0.8 and 1.5 seconds nothing happens on purpose – so you do not trigger anything by accident.

Switching on, standby and switching off

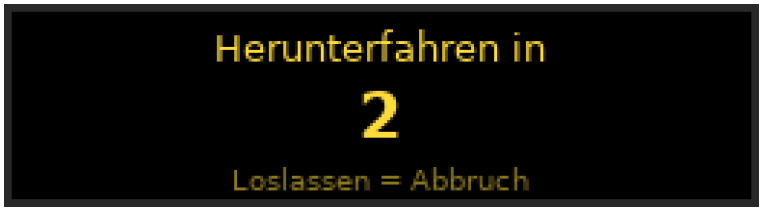
When power is connected the box starts up in about a minute. It returns to the state it was last in – switched on or standby – and to the channel last selected.

Standby: hold the rotary knob pressed for 1.5 seconds. The stop animation appears, the connections are closed and the display only shows the time and IP address, dimmed. The web interface remains reachable.



Switching on from standby: press briefly. The start animation appears, and after a few seconds both channels are connected again (display “verbunden” – connected).

Shutting down: in standby, press the knob again and hold it for **5 seconds**. The display counts down “Herunterfahren in 3 … 2 … 1” (shutting down in 3 … 2 … 1). If you let go during the countdown, the shutdown is cancelled. Once the box has shut down, the power supply can be disconnected. To switch on again, unplug the power and plug it back in.



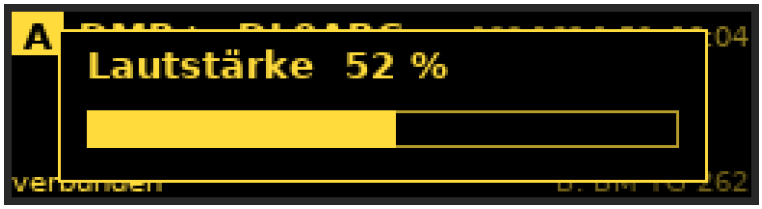
> If you simply keep holding the knob during operation after the device has gone into standby, it does **not** shut down. Shutting down always needs a fresh press in standby.

Changing channel, volume, quick select

Changing channel: press briefly. The box at the top left shows the active channel (A or B). While you are transmitting, changing channel is blocked.



Volume: turn. A bar shows the setting for two seconds. The volume is kept even after a restart.



Quick select (favourites): hold the knob pressed and turn it at the same time. The display shows the favourites of the active channel one after the other. **Releasing** applies the favourite shown. The first entry is "← unverändert" (unchanged) – turning back to it and releasing cancels.



You create favourites in the web interface (section Favourites). With DMR+, quick select triggers a short transmission on the reflector – that is how switching works on DMR+.

Transmitting

Press the PTT button and speak into the microphone from about 10–20 cm away. The display shows “TX”, the target and a level bar. Release the button when you have finished.



- You always transmit on the **active channel**.
- Only one place can transmit at a time: whoever presses the transmit button first – on the device or in the web radio – has the transmitter. The other side sees “Sender belegt” (transmitter busy).
- After the configured maximum duration (default 180 seconds) transmission ends automatically (“Sendezeit abgelaufen” – transmit time expired).
- On **BrandMeister** TG 9990 reaches the echo (parrot): you hear your own transmission played back shortly afterwards. The best way is to create a favourite `9990#` for it (the `#` stands for private call).

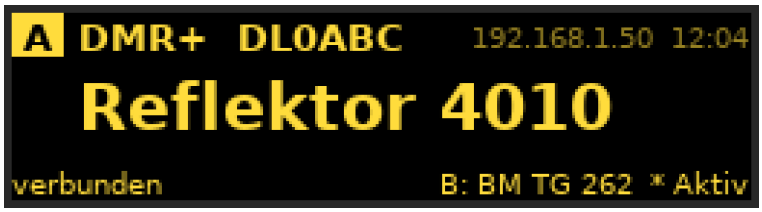
The display

Idle display



- Top left: active channel (A/B), mode, your callsign; on the right the IP address and time.
- Centre, large: the target – talkgroup, reflector or room.
- Bottom left: connection status. “verbunden” (connected), “Login…” (connection is being set up) or “getrennt” (disconnected). If the channel is connected and there has already been traffic on it, the station last heard is shown here instead, e.g. “Zuletzt: DL0XYZ vor 3 min” (last: DL0XYZ 3 min ago; after one hour with the time, after 12 hours no longer). If space is short, only the callsign remains.
- Bottom right: the other channel. “● Aktiv” (active) appears when someone is talking there.





Receiving



The callsign in large letters, below it name and location from the DMR ID database, at the bottom DMR ID, time slot, target and the duration of the transmission. On D-Star the suffix (e.g. “ID51”) appears instead of the name, on Fusion the callsign.

After the transmission ends, the station remains on screen, dimmed, for another 10 seconds together with the total duration. That way even a short transmission can still be read. Very short transmissions of less than one second appear neither here nor in the call list.



Other modes





Messages

Display	Meaning
“Login…”	Connection to the network is being set up or has been interrupted
“Wechsel während Senden gesperrt” (change blocked while transmitting)	The channel cannot be changed during TX
“Sender belegt” (transmitter busy)	Someone is transmitting in the web radio right now
“Sendezeit abgelaufen” (transmit time expired)	Maximum duration reached, transmission ended
“Einrichtung erforderlich” (setup required)	Callsign/DMR ID missing – please set up in the browser
“Einrichtung im Web” (set up on the web; bottom left)	this channel lacks access details, it stays switched off



After the configured time without activity the display is dimmed (default 5 minutes). On reception or when operated it becomes bright again immediately. How bright the dimmed display and the standby display are is set in the web interface under *Station* with “Helligkeit gedimmt / Standby” (brightness dimmed / standby).

The web interface

In the browser of a computer, tablet or smartphone on the same network, open the address shown at the top right of the display, for example:

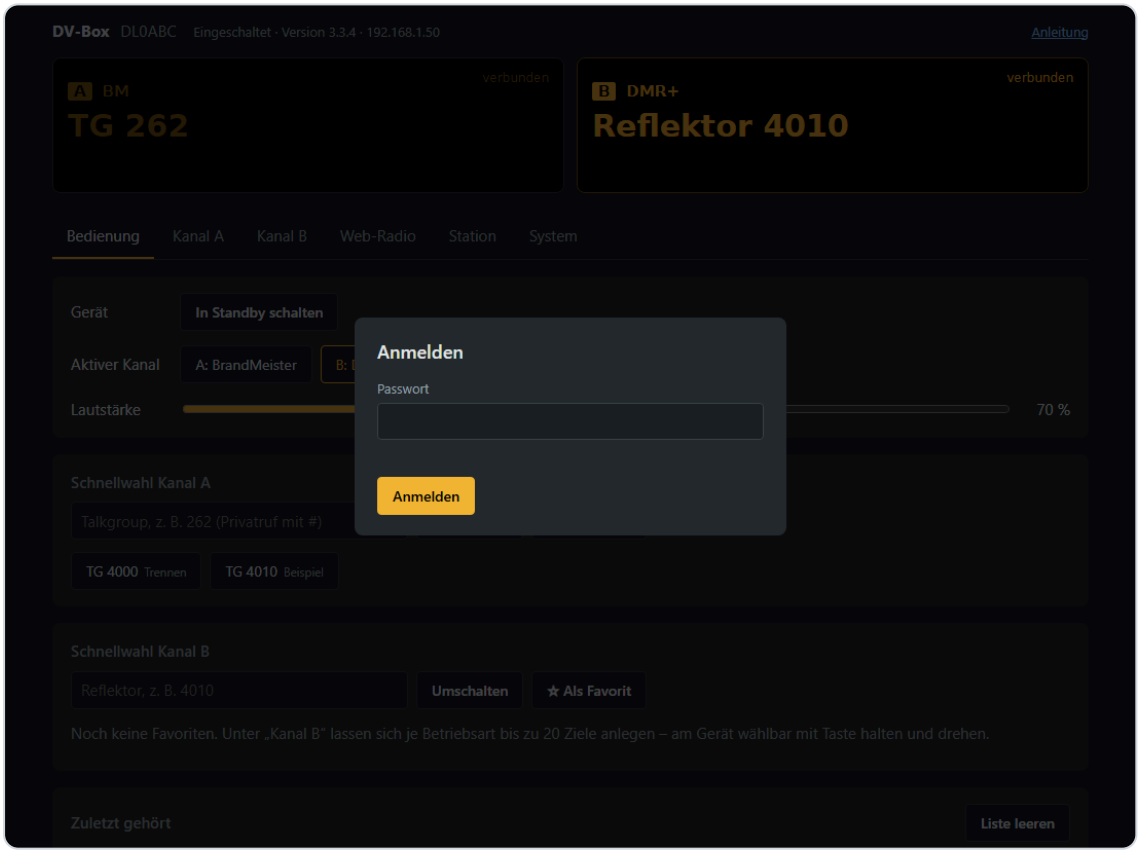
https://192.168.1.50

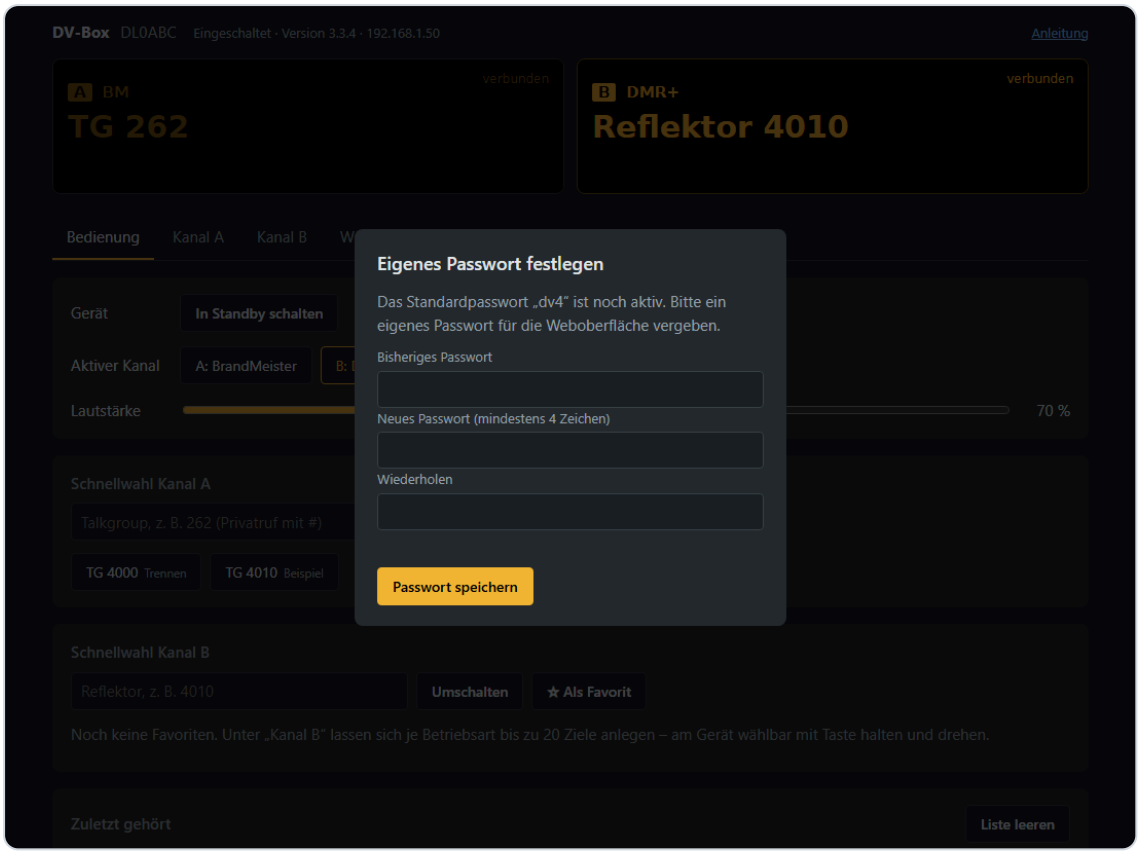
Security warning on first access: the box uses an encrypted connection with a self-signed certificate. The browser therefore warns you the first time (“Your connection is not private”). This is normal for devices on a home network.

- **Chrome / Edge:** “Advanced” → “Proceed to 192.168.1.50 (unsafe)”
- **Firefox:** “Advanced…” → “Accept the Risk and Continue”
- **Safari:** “Show Details” → “visit this website”

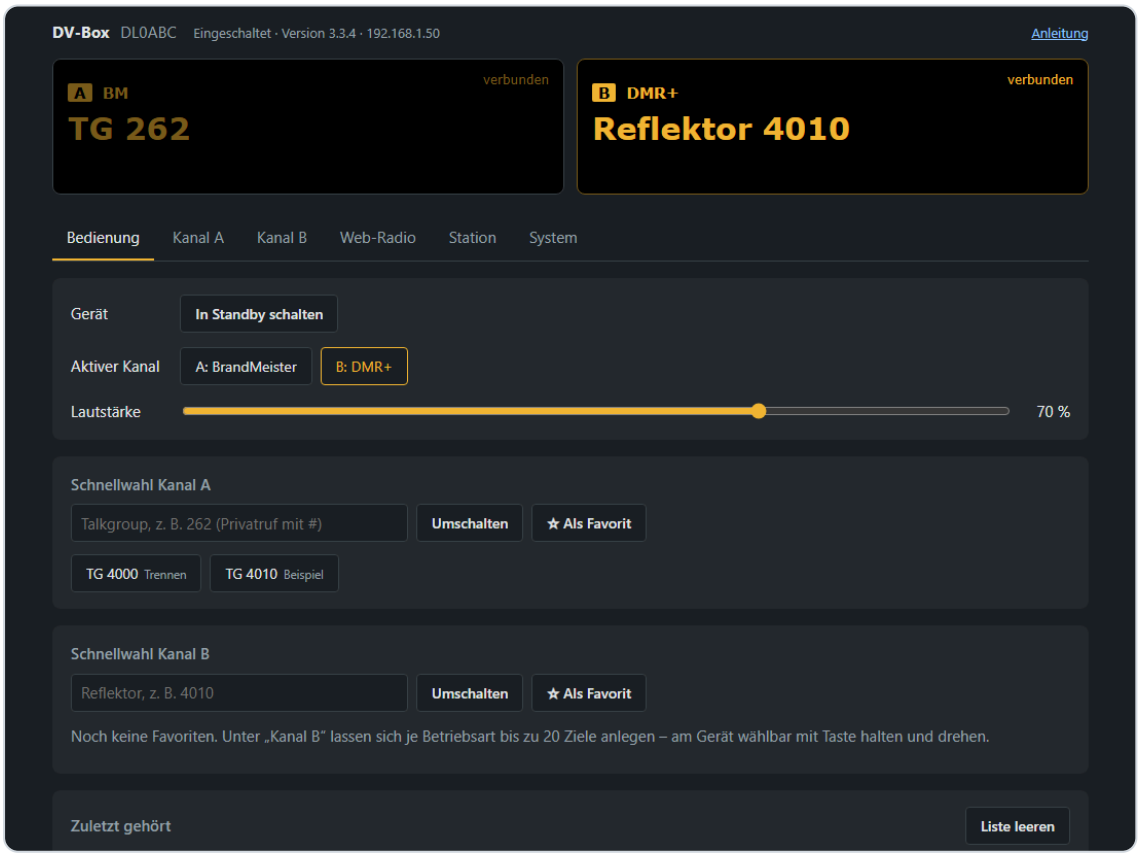
The encrypted connection is required for the browser to allow the microphone in the web radio.

Logging in: the first time, the password is **dv4**. You will then be asked to set your own password; until then no settings can be changed.





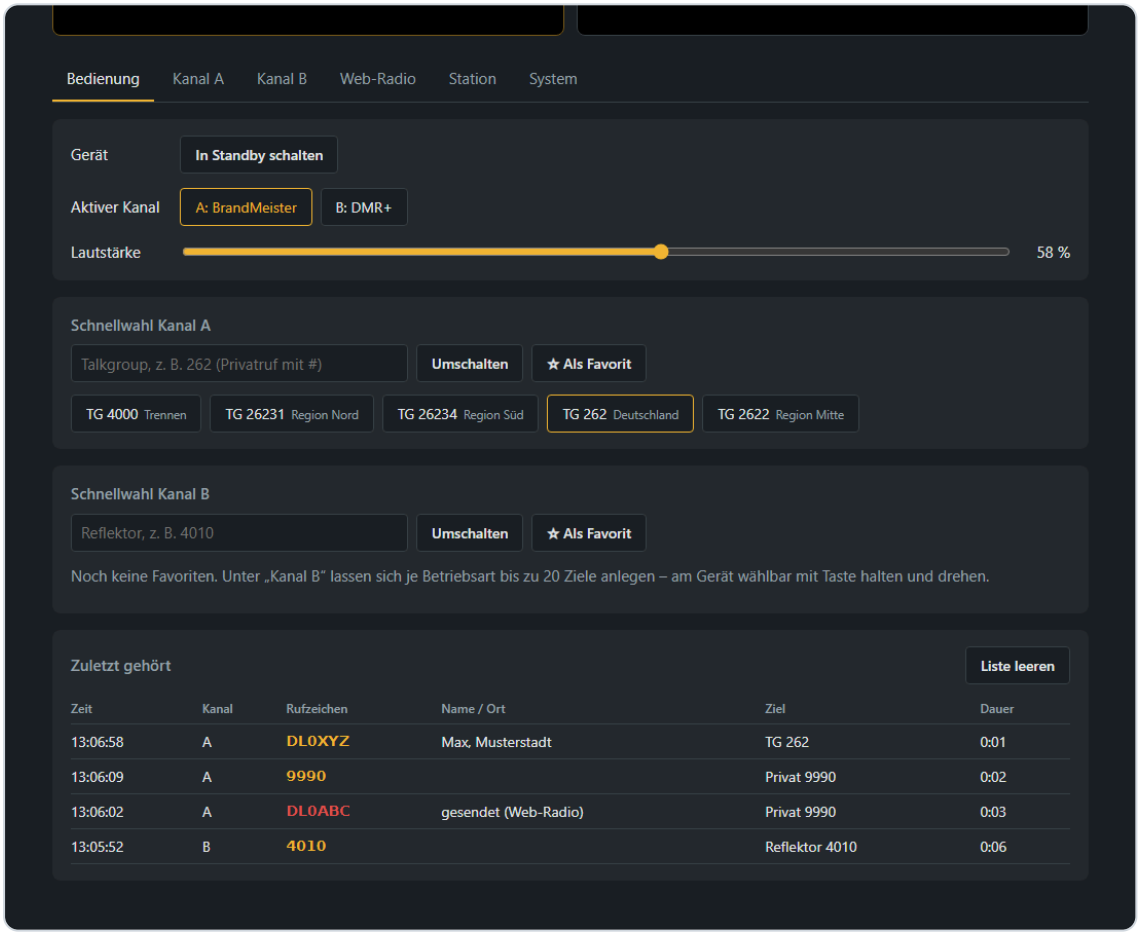
Layout: at the top you see the two channels as tiles in the style of the display; the active channel is lit brightly. Clicking the other tile switches over – just like pressing the knob on the device. Below are the sections *Bedienung* (operation), *Kanal A*, *Kanal B* (channel A/B), *Web-Radio*, *Station* and *System*, plus *FM-Chat* when FM-Funknetz is in use.



In the **Bedienung** section you switch on/standby, choose the active channel, set the volume and call up the favourites of both channels with a click.

Selecting a target directly: each channel's quick select has an input field. Type in the target (e.g. `262`, `4010` or `DCS001C`) or choose it from the suggestion list and press "Umschalten" (switch) or the Enter key – the channel switches immediately. "☆ Als Favorit" (as favourite) adds the target you entered to the favourites of the current mode; with no input, the target currently set is added. You can then change the favourite's name under *Kanal A/B*.

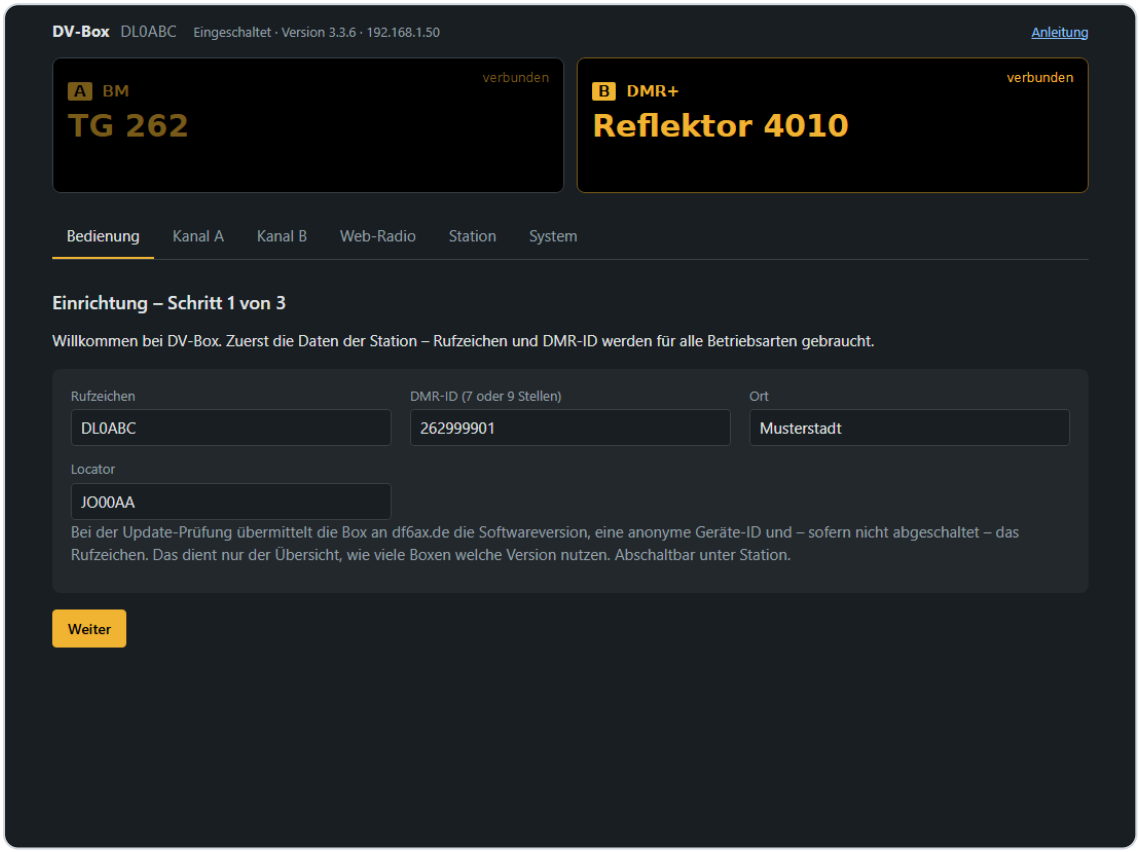
Zuletzt gehört (last heard): at the bottom of the *Bedienung* section is the call list with the last 50 transmissions on both channels – time, channel, callsign, name and location (on DMR from the ID database), target and duration. Your own transmissions appear in red marked "gesendet" (transmitted). A transmission in progress is highlighted in colour. The list updates itself, is kept after a restart and can be cleared with "Liste leeren" (clear list). Very short transmissions of less than one second are not entered; if the same station continues after a short break, this is merged into one entry.



Initial setup

If no callsign has been entered yet, a wizard guides you through the setup in three steps:

1. **Station:** callsign, DMR ID (7 digits, or 9 digits as a hotspot ID), location and locator.
2. **Kanal A** (channel A): mode and target.
3. **Kanal B** (channel B): mode and target.



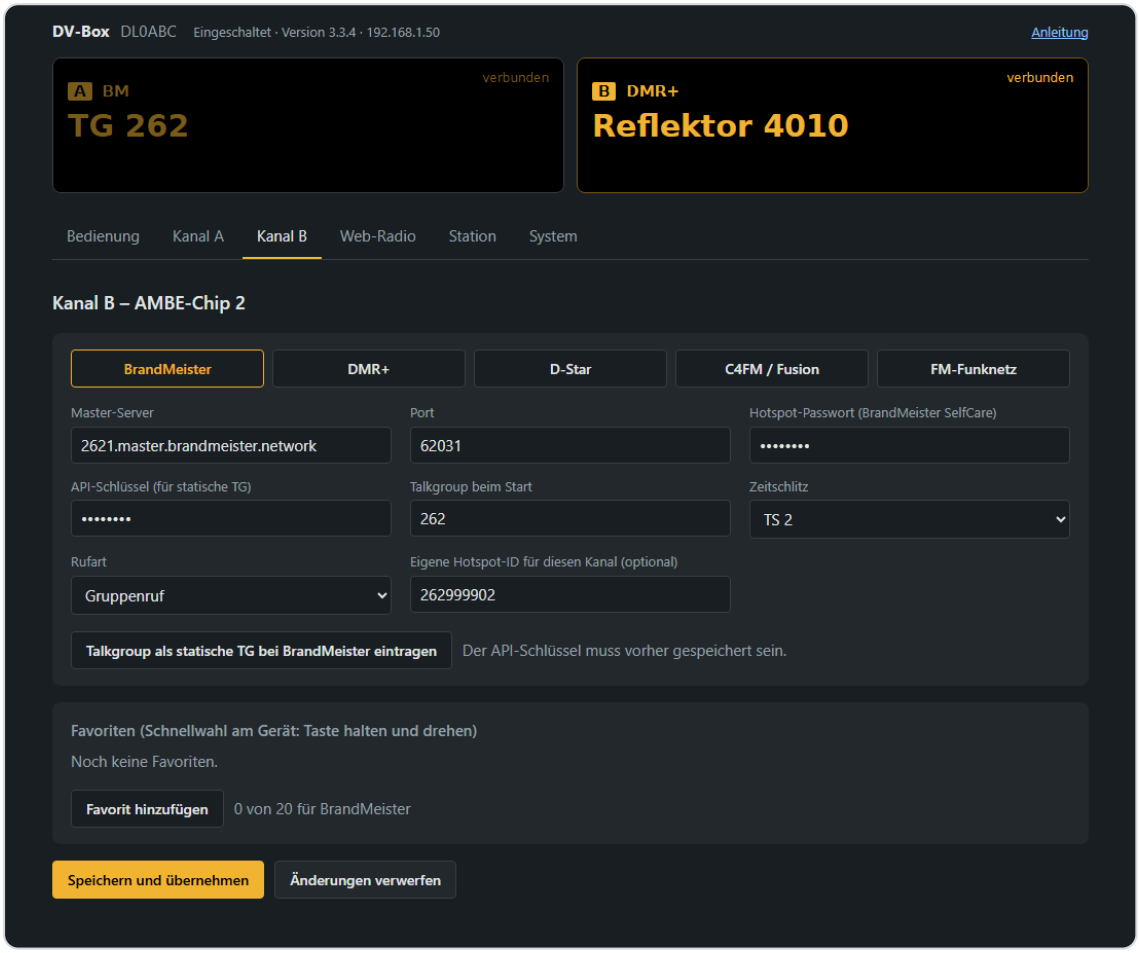
“Einrichtung abschließen” (finish setup) saves everything, and the box connects. All details can be changed later under *Station*, *Kanal A* and *Kanal B*.

Setting up the channels

In the *Kanal A* or *Kanal B* section, choose the mode at the top. The matching fields appear below. Many fields offer a selection list as you type (servers, talkgroups, reflectors). “Speichern und übernehmen” (save and apply) reconnects **only the changed channel**; the other channel keeps running undisturbed.

Invalid entries are marked in red with a hint; nothing is saved until everything is correct.

BrandMeister

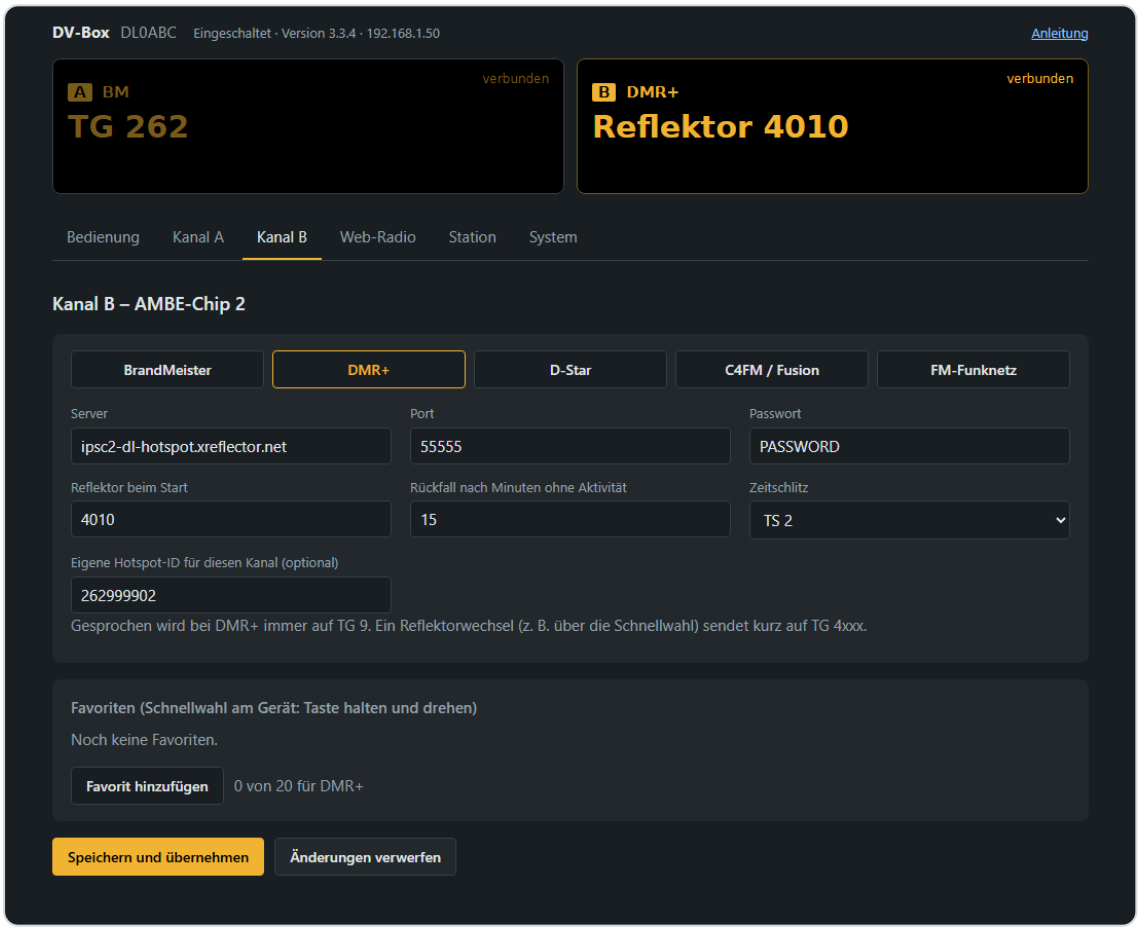


Field	Meaning
Master server	e.g. `2621.master.brandmeister.network` (Germany)
Port	normally 62031
Hotspot password	the hotspot password set in BrandMeister *SelfCare*
API key	for static talkgroups (BrandMeister → Profile → API Keys)
Talkgroup at start	target after connecting, e.g. 262
Time slot	normally TS 2 for hotspots

Call type	Group call (talkgroup) or private call (to a DMR ID)
Own hotspot ID	only needed if **both channels** are on BrandMeister: channel B then needs its own 9-digit hotspot ID (e.g. 262999901 for A and 262999902 for B)

Static talkgroup (automatic): otherwise BrandMeister only sends a talkgroup “dynamically” – only after you have transmitted on it, and after about 15 minutes without transmitting yourself BrandMeister drops it again. If an **API key** has been entered, the box therefore automatically adds the selected talkgroup as a **static TG**: when switching on, when saving and on every talkgroup change (web, quick select with the rotary knob). The previous static TG of this channel is replaced, so exactly the selected talkgroup is always running. Private calls such as the echo `9990#` do not change the static TG. You create the API key in your BrandMeister profile under “API Keys”. The button “Talkgroup als statische TG bei BrandMeister eintragen” (add talkgroup as static TG at BrandMeister) does the same by hand.

DMR+

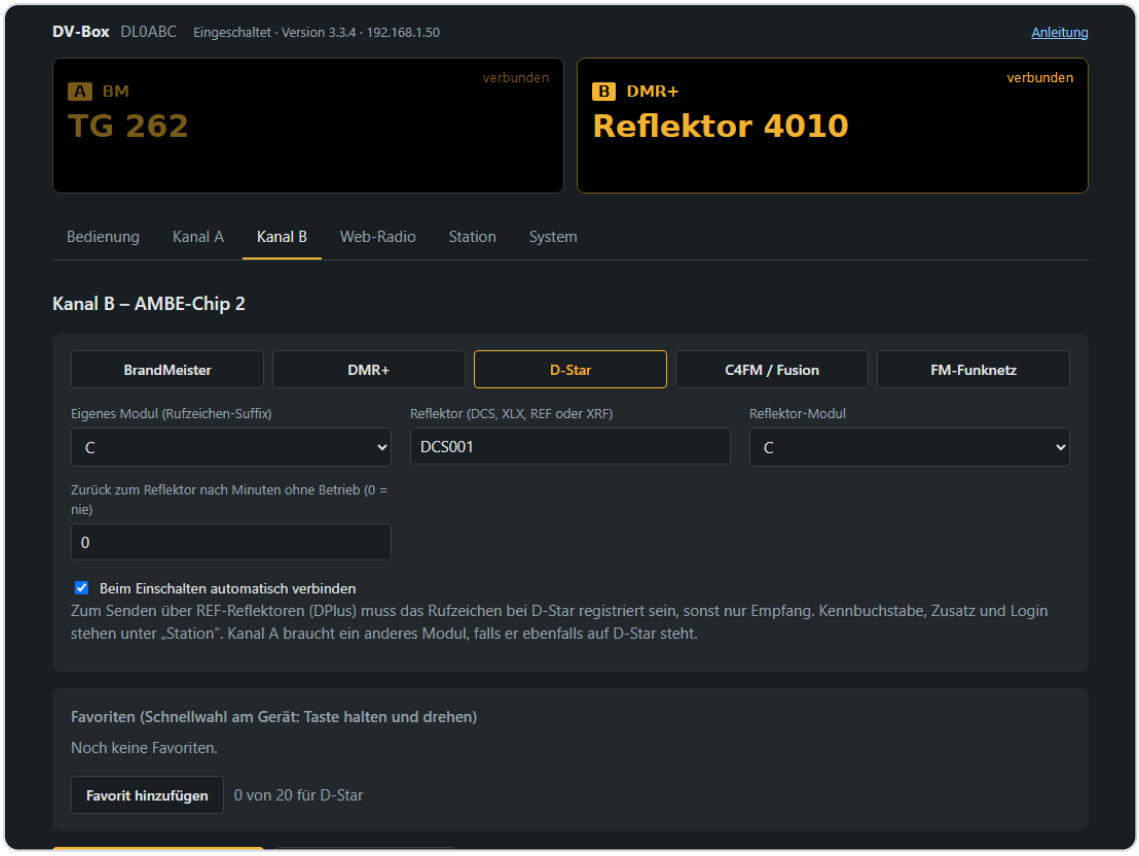


Field	Meaning
Server	e.g. `ipsc2-dl-hotspot.xreflector.net`
Password	normally `PASSWORD` on DMR+
Reflector at start	e.g. 4010 (Lower Saxony); 4000 disconnects
Fallback after minutes	without activity the server returns to the start reflector

Own hotspot ID	only needed if both channels are on the same DMR+ server

On DMR+ you always talk on TG 9; the reflector determines whom you reach.

D-Star



Field	Meaning
Own module	letter after your callsign (e.g. DL0ABC **C**). If both channels are on D-Star, each needs a different module.
Reflector	DCS (e.g. DCS001), XLX (e.g. XLX262), REF (DPlus) or XRF (DExtra)
Reflector module	letter of the reflector module (e.g. C = Germany on DCS001)
Back to reflector after minutes	after this many minutes without receiving or transmitting the channel returns to the reflector set here, e.g. after you have switched via quick select; 0 = never
Connect automatically on switch-on	sets up the connection by itself after start-up

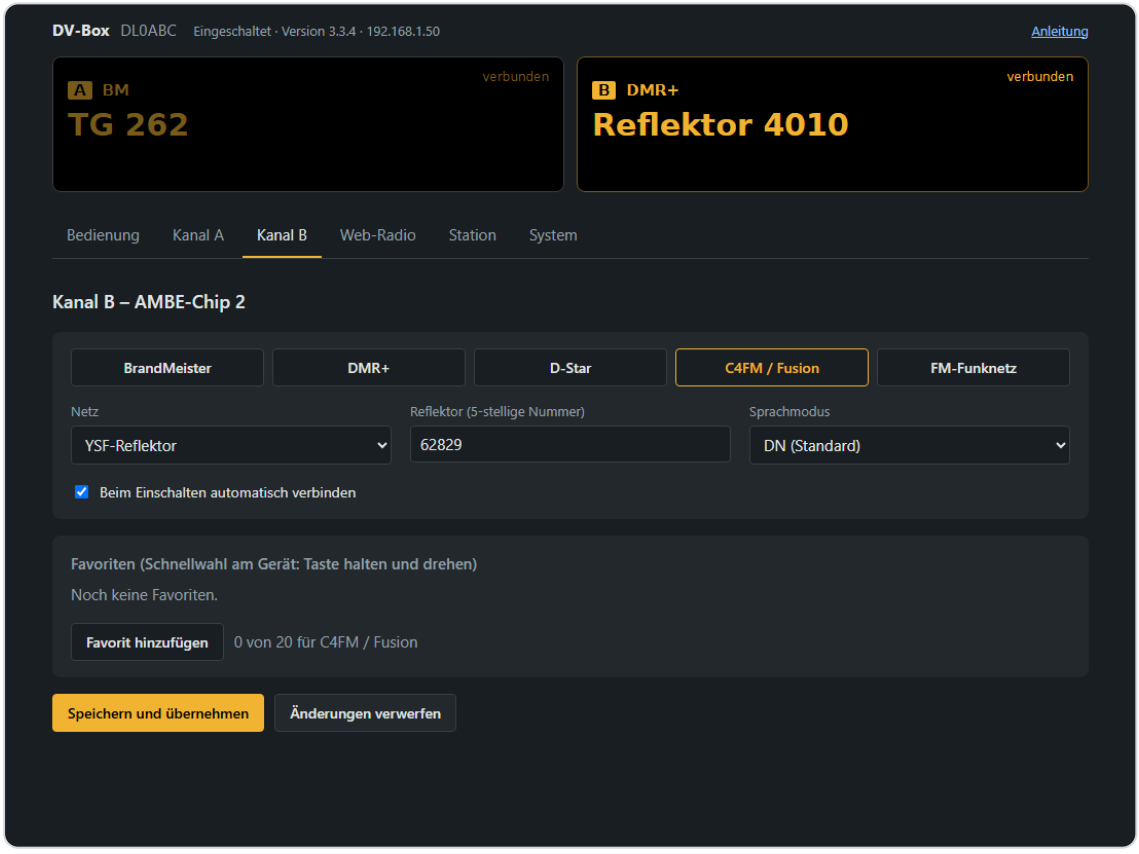
Settings that apply to both channels are found under *Station → D-Star*:

Field	Meaning
Terminal letter	the terminal letter from your D-Star registration (e.g. **H**). The box then transmits as `DL0ABC H`. Empty = no terminal letter. **G** is reserved for the gateway.

Callsign suffix	up to 4 characters that others see after your callsign (e.g. `DL0ABC/DV4`). Empty = `DVSW`.
D-Plus login	callsign with which the box logs in to REF reflectors; empty = your callsign
ircDDB server, password	default `ircv4.openquad.net` without password; only change if your ircDDB access requires it
Language of announcements	German or English for the gateway's status announcements (e.g. "connected to …")
Info announcements, echo test	switch status announcements after connecting or the echo module (target `E`) on or off

To transmit via REF reflectors (DPlus), your callsign must be registered with D-Star (US Trust, regist.dstargateway.org). Without registration the DV-Box still connects and you can listen; the display and web then show "nur RX (nicht reg.)" (RX only, not registered) or "nur Empfang" (receive only), and your transmissions are discarded by the reflector. After switching on, it takes about a minute for the D-Star connection to be established, because the gateway first loads the reflector lists.

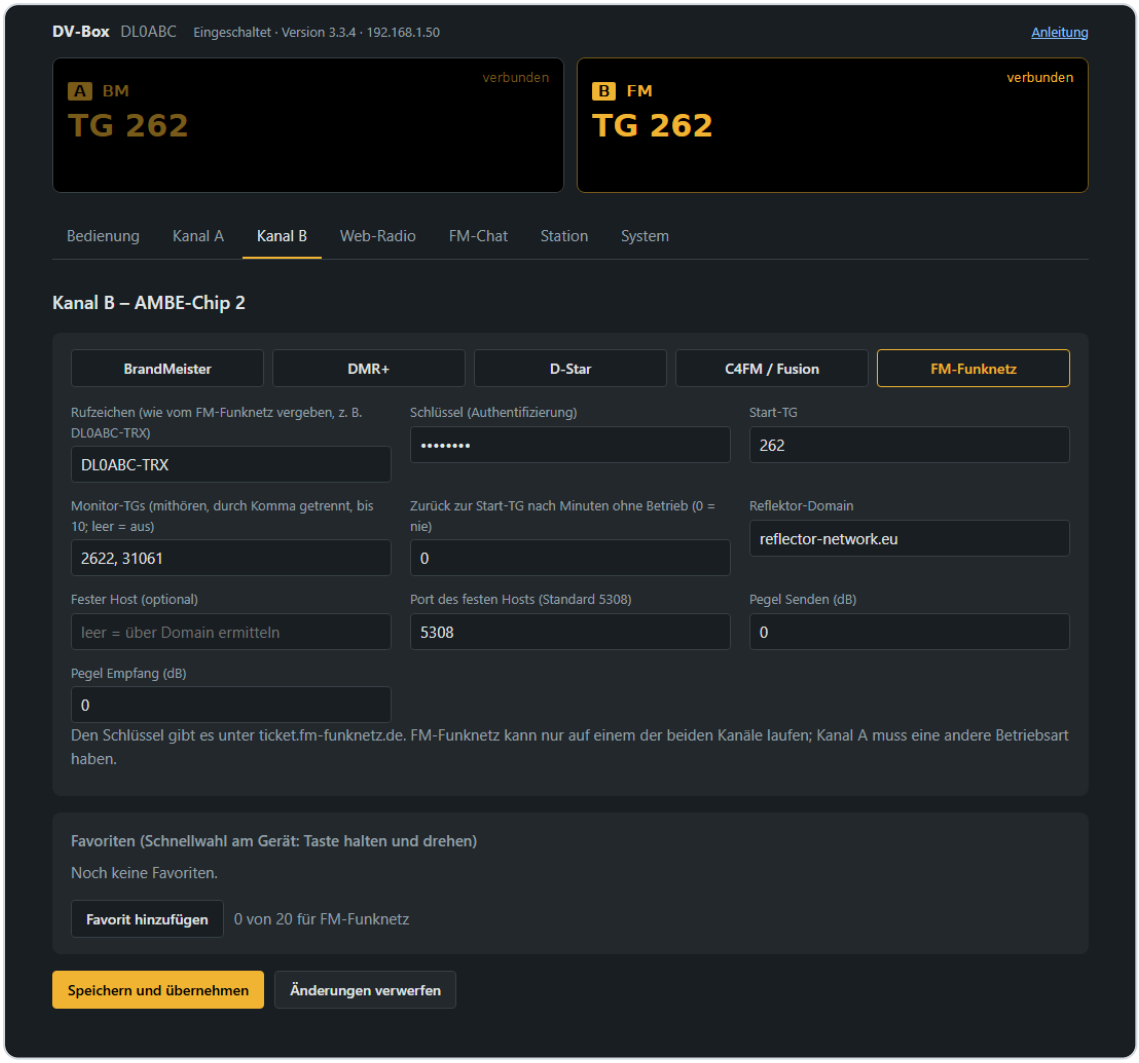
C4FM / Fusion



Field	Meaning
Network	YSF reflector or FCS room
Reflector / room	YSF: five-digit number (e.g. 62829 "DE Germany"); FCS: e.g. FCS00290
Voice mode	DN (default) or VW (Voice Wide)

FM-Funknetz

The FM-Funknetz is a voice network organised by talkgroups (TG). The DV-Box logs in to it like a radio node. **One channel only:** FM-Funknetz can run either on channel A or on channel B, not on both at the same time. If one channel is set to FM-Funknetz, the other must use a different mode; the web interface points this out.



Applying for access: without a key (authentication) the server will not let the box in. You apply for the key for your callsign at **ticket.fm-funknetz.de** and enter it under *Kanal* → *Schlüssel* (channel → key).

Field	Meaning
Callsign	callsign under which the box logs in, exactly as assigned by the FM-Funknetz (e.g. DL0ABC-TRX, suffix up to 4 characters); empty = station callsign
Key (authentication)	the access key from ticket.fm-funknetz.de
Start TG	talkgroup selected after switching on (e.g. 262)
Monitor TGs	up to 10 talkgroups that are monitored, separated by commas (e.g. `262, 2622`); empty = off. See below
Back to start TG after minutes without activity	after this many minutes without receiving or transmitting the channel returns to the start TG, e.g. after you have switched via quick select; 0 = never

Reflector domain	default `reflector-network.eu`; the server is determined via this domain
Fixed host (optional)	server name instead of lookup via the domain; empty = via domain
Port of the fixed host	default 5308, only together with a fixed host
Transmit level (dB), receive level (dB)	volume adjustment from −20 to +20 dB; 0 = unchanged

You change the talkgroup as with the other modes, via quick select (favourites) or in the web interface. As a favourite, enter the TG number, e.g. `262`.

Monitor TGs (listening in): if you enter monitor TGs, the box also listens to these talkgroups in addition to its own TG – like a hotspot with a monitor list. It works like this:

- If there is no traffic on the selected TG for one minute, the box releases it. The display then shows **“Monitor”** instead of a TG number.
- If someone then talks on one of the monitor TGs or on the start TG, the box automatically switches to that TG and plays the conversation. You can then reply directly.
- Ongoing conversations are not interrupted: as long as there is traffic on the selected TG, the box does not switch.
- A TG that you select via quick select stays additionally monitored for 24 hours, even if it is not on the list.
- Without monitor TGs the selected TG stays set permanently (as before).

Display “TG nicht freigegeben” (TG not enabled): some talkgroups in the FM-Funknetz are only enabled for certain callsigns. If the box selects such a TG, the reflector silently refuses the selection: you hear nothing, and your own transmissions do not get through. The box therefore checks about 20 seconds after each TG change, in the FM-Funknetz dashboard (dashboard.fm-funknetz.de), whether the reflector lists it on the selected TG. If not, the display briefly shows “TG … nicht freigegeben” and then “TG nicht freigegeben” in the status line; the web interface shows the notice on the channel tile. The box remembers blocked TGs (also across a restart) and marks them everywhere with ⊘ after the number, e.g. “TG 37574 ⊘” – on the display, in quick select and in the web interface on tiles and favourites. If the TG is enabled later, the box detects this the next time it is selected and removes the mark. Ask the FM-Funknetz or the talkgroup’s administrator to enable it. If the dashboard cannot be reached or the channel uses its own server (fixed host), the check is skipped.

Display “Zugang abgelehnt” (access denied): if the server rejects the key, the display shows “FM: Zugang abgelehnt – Schlüssel prüfen” (access denied – check key) and the channel is listed as “Zugang abgelehnt”. The box then does not keep trying to log in again. Check the key and callsign and save the settings again; the channel then logs in afresh.

FM-Chat: as long as a channel is set to FM-Funknetz, the web interface additionally shows the *FM-Chat* section. It contains the WebChat of the FM-Funknetz (chat.fm-funknetz.de). You log in there with your callsign, e.g. DL0ABC-TRX. The chat stays connected while you switch to other sections in between; via “In neuem Fenster öffnen” (open in new window) it can also be used separately. The chat is a service of the FM-Funknetz, not of the DV-Box; the box does not pass on any data.

Favourites

For each channel you can create up to 20 favourites per mode – in the *Kanal A* or *Kanal B* section under “Favoriten” (favourites). A favourite consists of the **target** and a **name** that appears on the display. The arrows change the order.

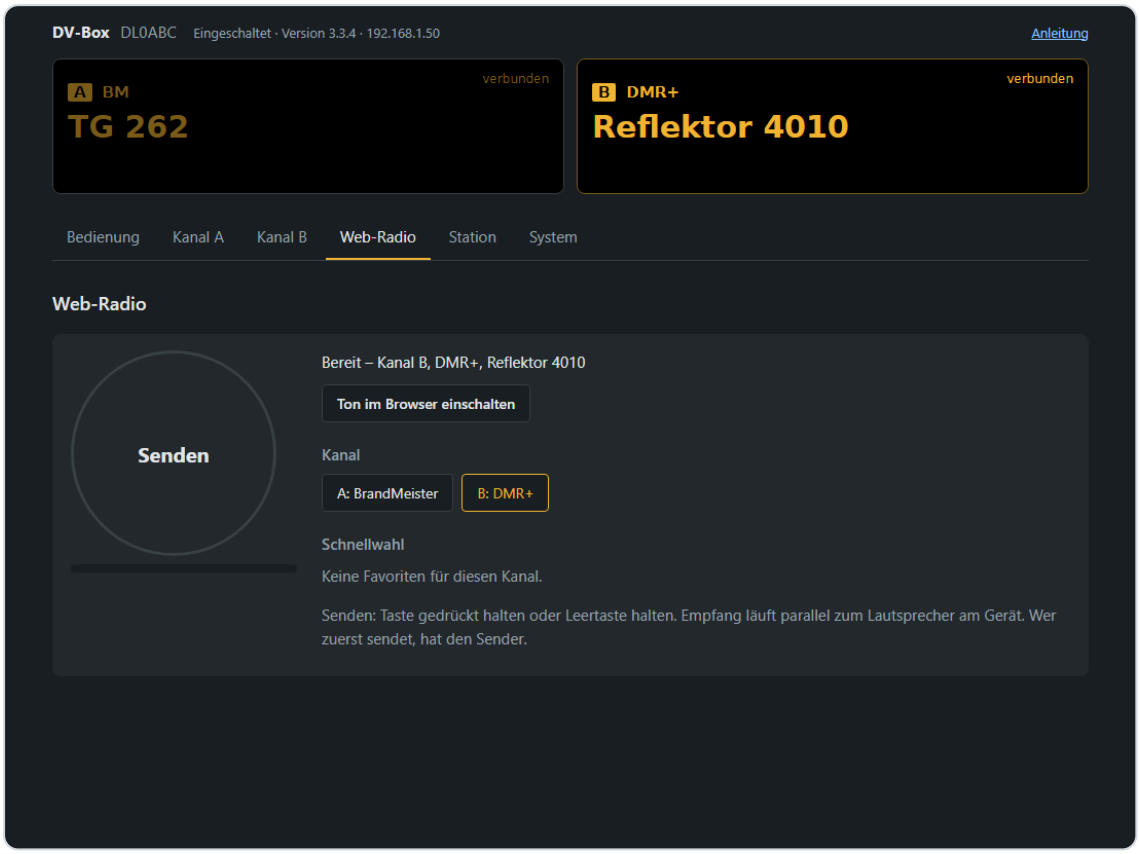
Mode	Example targets
BrandMeister	`262`, `2621`, `9990#` (echo, private call)
DMR+	`4010`, `4000` (disconnect)
D-Star	`DCS001C`, `XLX262A`, `REF001C`
Fusion	`62829`, `FCS00290`

Favourites belong to the mode in which they were created. If you switch a channel to another mode, its other favourites appear; when you switch back, the old ones are there again.

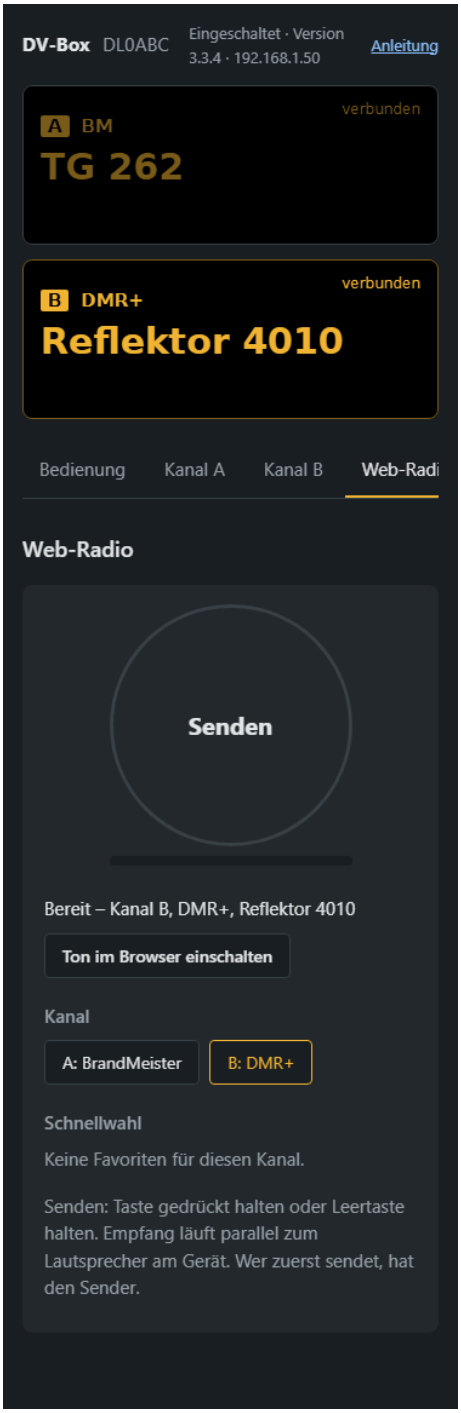
Favourites are used in three places: on the device (hold and turn the knob), in the *Bedienung* section and in the *Web-Radio*.

Web radio

With the web radio you listen and transmit directly in the browser – from a smartphone too.



1. **“Ton im Browser einschalten”** (switch on sound in browser) – from now on you hear the active channel in the browser, in parallel with the box’s loudspeaker.
2. **Transmitting:** hold down the large round button (or the space bar) and talk. The first time, the browser asks for permission to use the microphone – please allow it.
3. You choose the channel and favourites to the right of it; the device switches along.

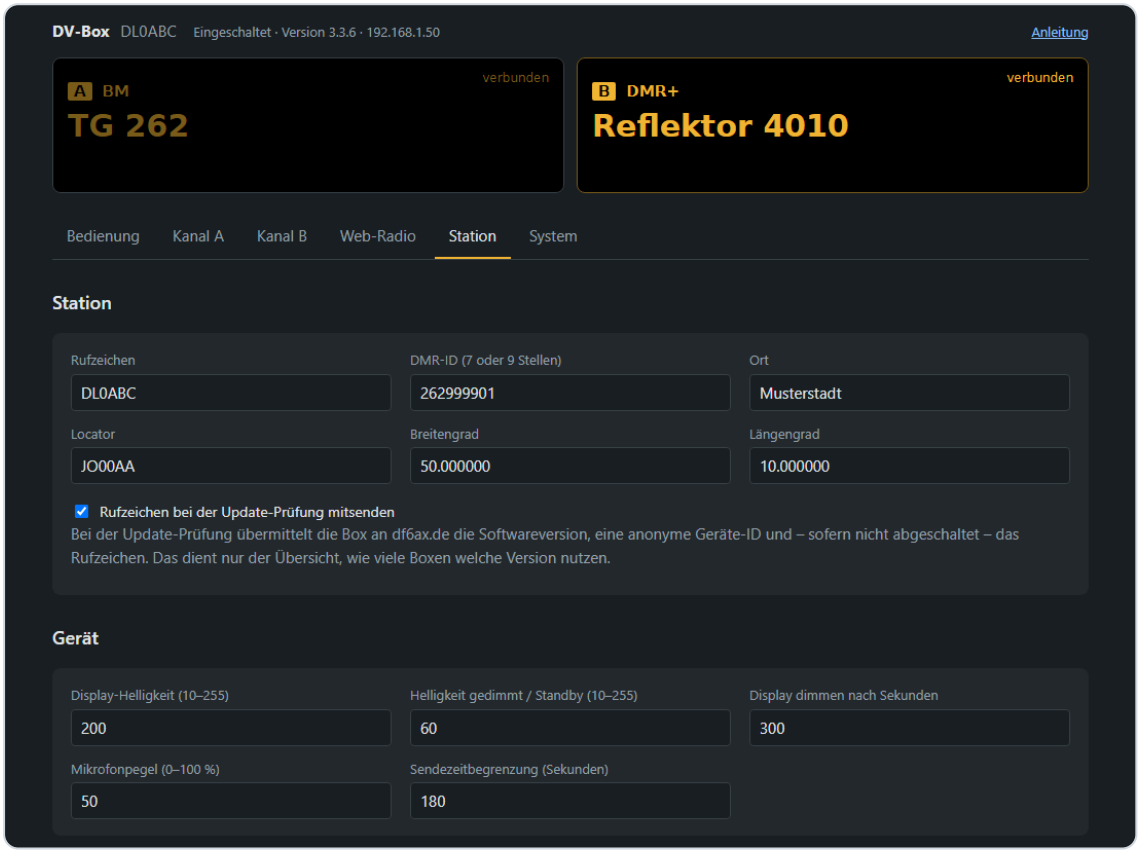


Notes

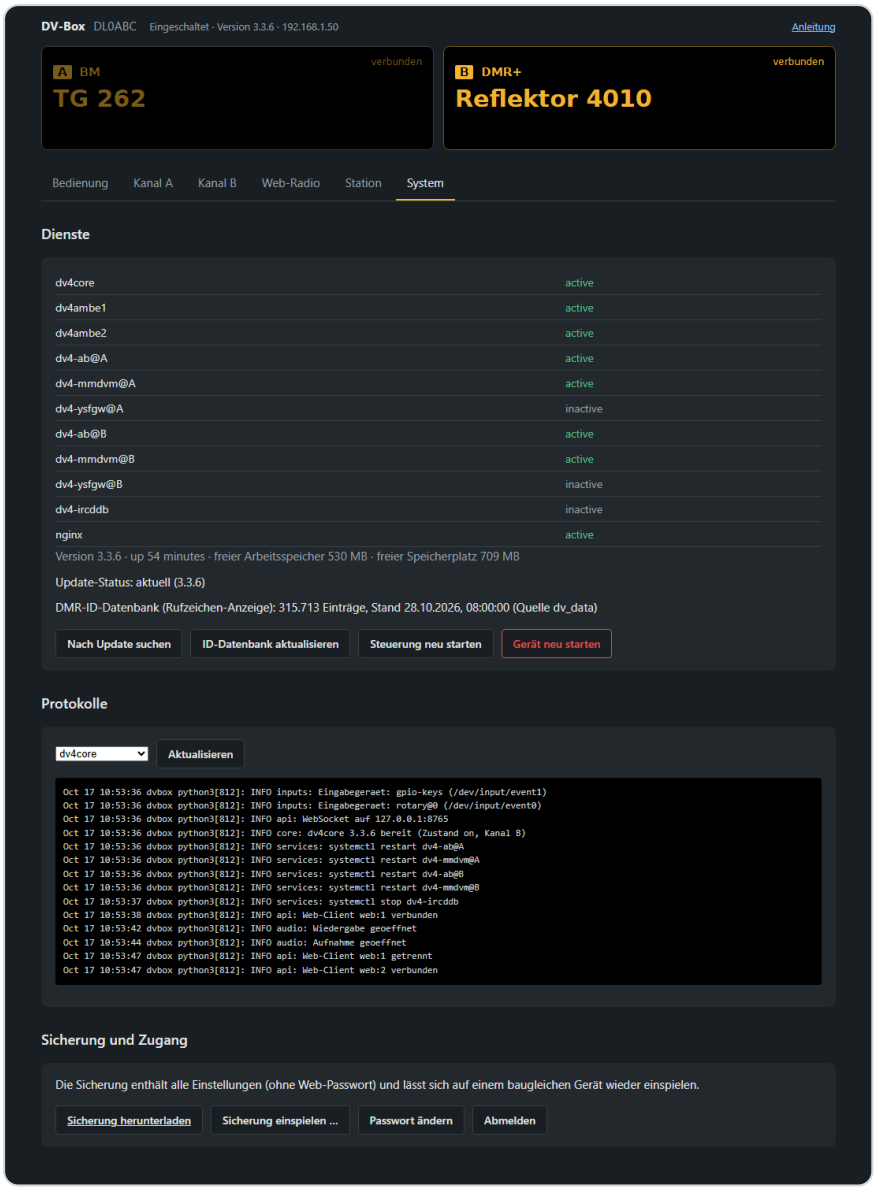
- A headset avoids feedback when the box and the browser are in the same room.
- If you leave the browser tab or the connection drops, transmission ends immediately.
- Whoever transmits first has the transmitter – the PTT on the device is blocked during a web transmission and vice versa.
- The web radio needs about 130 kbit/s in each direction.

Station, system and backup

Station: callsign, DMR ID, location, locator and coordinates as well as the switch “Rufzeichen bei der Update-Prüfung mitsenden” (send callsign with the update check). During the update check the box sends df6ax.de the software version, an anonymous device ID and, unless switched off, the callsign. This only serves to get an overview of how many boxes are running which version. Also display brightness, brightness dimmed / standby, time until dimming, microphone level and the maximum duration of a transmission.



System: status of all the box’s programs (green = running), version, free storage, update status, state of the DMR ID database (red if it is missing or the last update failed) and the logs of the individual services.



Button	Effect
Nach Update suchen (check for update)	checks on df6ax.de and installs a new update
ID-Datenbank aktualisieren (update ID database)	reloads the DMR ID list from which the box takes callsign, name and location for a DMR ID
Steuerung neu starten (restart control)	restarts the control software (connections are briefly interrupted)
Gerät neu starten (restart device)	restarts the whole box (approx. 1 minute)
Sicherung herunterladen (download backup)	saves all settings as a file (without the web password)
Sicherung einspielen (restore backup)	loads such a file – also on another identical box
Passwort ändern (change password)	new password for the web interface (the current password is requested)

Updates are also searched for and installed automatically at every start. Before each installation the box backs up its previous software; your settings are kept.

If two people change settings at the same time, the box refuses to save an outdated page (“inzwischen an anderer Stelle geändert” – changed elsewhere in the meantime). Reload the page in that case.

Frequently asked questions and troubleshooting

Observation	Cause	Remedy
Display shows “Einrichtung erforderlich” (setup required)	Callsign or DMR ID missing	Carry out the initial setup in the browser
Channel shows “Einrichtung im Web” (set up on the web)	Access details missing, e.g. the BrandMeister hotspot password	Add them under *Kanal A/B* and save
“Beide Kanäle melden sich mit derselben DMR-ID an” (both channels log in with the same DMR ID)	both channels on the same DMR network	Enter an own hotspot ID for channel B
Channel stays on “Login…” (BrandMeister)	Hotspot password wrong or DMR ID not registered with BrandMeister	Check the password in SelfCare and enter it under *Kanal*
BrandMeister: talkgroup drops after a while	no API key entered, TG only running dynamically	Enter the API key under *Kanal* and save – the TG then becomes static automatically
Display: “BM: statische TG … fehlgeschlagen” (static TG … failed)	API key invalid or no internet connection	Check the key in the BrandMeister profile and enter it again
D-Star stays on “Login…” for approx. 1 min after start-up	Gateway is loading reflector lists	wait
D-Star REF reflector: “nur RX (nicht reg.)” (RX only, not registered), transmissions do not get through	Callsign not registered with D-Star	Register the callsign or use DCS/XLX for transmitting
Fusion does not connect	Reflector number unknown	Choose the number from the selection list
FM-Funknetz: display “Zugang abgelehnt” (access denied)	Server rejects the key: key wrong, expired or issued for a different callsign	Check key and callsign under *Kanal* and save; the channel then logs in again
FM-Funknetz: “TG nicht freigegeben” (TG not enabled), nothing to be heard on the TG	the TG is only enabled for certain callsigns, the reflector does not accept the selection	Ask the FM-Funknetz to enable it for the box’s callsign; until then choose another TG
FM-Funknetz cannot be saved	the other channel is already set to FM-Funknetz	Set the other channel to a different mode
No sound	Volume too low, wrong channel active	Turn the knob, change channel with a press
Web radio: no microphone	Page opened via http:// instead of https:// or permission refused	Use https://, allow the microphone in the browser settings
“Sender belegt” (transmitter busy)	Someone is transmitting on the device or in another browser	wait

Browser warning about the certificate	self-signed certificate	Confirm once (see The web interface)
Web password forgotten	–	Technical handbook, section “Web-Passwort zurücksetzen” (reset web password)
Box does not respond	–	Briefly disconnect the power; settings are kept

Technical data

Feature	Value
Modes	DMR BrandMeister, DMR+ (IPSC2), D-Star (DCS, XLX, REF, XRF), C4FM/Fusion (YSF, FCS), FM-Funknetz (SvxLink reflector, one channel only)
Channels	2, one AMBE codec chip each, connected simultaneously
Audio	8 kHz, 16 bit, mono; built-in microphone and loudspeaker
Display	OLED 256 × 64 pixels
Controls	Rotary knob with push button, PTT button, web interface
Network	Ethernet, web interface via HTTPS
Web radio	Browser with Web Audio (Chrome, Edge, Firefox, Safari)
Software	DV-Box 3.3.12, updates via df6ax.de