

Falcon BMS Cockpit Suite

User manual for BMS Live Monitor and BMS Cockpit Display Client

ONE SYSTEM · ONE DATA PATH

The server reads Falcon BMS, displays cockpit data locally, and routes selected modules to individual LAN clients.

Software release	Server 1.7.0 · Client 1.6.0
Target system	Windows x64 · Falcon BMS 4.38 · FlightData 118 / FlightData2 23
Main application	BmsLiveMonitor.exe · central cockpit server
Network client	BmsDisplayClient.exe · receive-only LAN display
Data direction	Read-only from Falcon BMS; no simulator control commands

Completely revised edition · Documentation date 27 August 2026

About this manual

CURRENT IMPLEMENTED STATE

This edition describes Server 1.7.0 and Client 1.6.0. Earlier descriptions of one global module selection, nine modules, or only one MFD are obsolete.

The Falcon BMS Cockpit Suite is my private F-16 cockpit project. The server window is still titled BMS Live Monitor. This manual refers to the two applications as the server and the client.

What the suite currently provides

- Reads Falcon BMS 4.38 shared memory using FlightData 118 and FlightData2 23.
- Displays local instruments, both MFDs, indexers, DED/PFL, RWR, radios, CMDs, ECM, and the Caution Panel.
- Provides test and production modes with separate local and network rates.
- Routes twelve display groups independently to persistent client profiles.
- Stores routing assignments and the positions of many detached windows.

Scope

The suite is not an official Benchmark Sims product. It reads simulator states, but it is not an input device, not yet a public cockpit-control server, and not yet a DCS adapter.

TRUSTED LAN ONLY

The TCP stream is not encrypted. Never expose port 43860 to the internet; use it only on a private home or cockpit network.

Contents

About this manual	2
What the suite currently provides	2
Scope	2
Contents	3
1 · System roles and data path	5
1.1 Architecture	5
1.2 Compatibility contract	5
1.3 Terms	5
2 · Installation and first launch	6
2.1 Requirements	6
2.2 Install the applications	6
3 · Licence, help, and updates	7
3.1 First launch and licence	7
3.2 Offline use	7
3.3 Updating	7
4 · Server interface	8
5 · Operating mode and rates	9
5.1 Test and production modes	9
6 · Network server and task router	10
7 · The twelve client modules	11
8 · Configure the Display Client	12
9 · Center Console	13
10 · Center Console on a client	14
11 · MFDs and RTT	15

12 · Indexers and analog instruments	16
13 · DED and PFL	17
14 · RWR	18
15 · LEDs and Caution Panel	19
15.1 Cockpit LEDs and system bits	19
15.2 Caution Panel	19
16 · CMDS and ECM	20
16.1 CMDS	20
16.2 ECM	20
17 · Radios and IVC	21
18 · Diagnostics and troubleshooting	22
18.1 No Falcon data	22
18.2 Client does not connect	22
19 · Common symptoms	23
20 · Cockpit operation and stored data	24
20.1 Recommended sequence	24
20.2 Storage locations	24
21 · Quick reference	25
22 · Verified state and limits	26
Technical verification	26
Appendix · Release files and support	27
Include in a support report	27

1 · System roles and data path

1.1 Architecture

Falcon PC	Falcon BMS 4.38, shared memory, optional RTT and IVC/RCC/RCS, plus BMS Live Monitor
Local server	Eighteen tabs and freely positioned cockpit displays
LAN clients	Receive only their assigned modules; no direct Falcon access
Data path	Falcon/IVC → server → local display and targeted TCP delivery

1.2 Compatibility contract

- Only Falcon BMS 4.38 is supported.
- FlightData structure 118 and FlightData2 structure 23 are required.
- Falcon BMS 4.37 and DCS are not supported by the current release.
- The client sends only its profile identity and heartbeat; no cockpit commands.

1.3 Terms

Module	A functional display group enabled independently for each client
Profile	A persistent client identity with its own name and assignments
Detach	Move a display into its own freely positioned window
RTT	Falcon output source for the two MFD images

2 · Installation and first launch

2.1 Requirements

- 64-bit Windows 10 or Windows 11.
- Falcon BMS 4.38 on the server PC.
- A working Falcon RTT export for MFD images.
- A private wired or wireless LAN for display clients.
- Internet access for the first licence and update check whenever possible.

2.2 Install the applications

- 1 Extract the complete server package to a writable folder on the Falcon PC.
- 2 Extract the complete client package on each display PC.
- 3 Run BmsLiveMonitor.exe or BmsDisplayClient.exe directly. The required .NET runtime is included.
- 4 Allow firewall access only for private networks when LAN clients are used.

Server	BmsLiveMonitor.exe · version 1.7.0
Client	BmsDisplayClient.exe · version 1.6.0
Manual	English user manual · issued 27 August 2026

DO NOT MIX RELEASES

Use server and client files from the same release. Do not copy individual old binaries into the new application folder.

3 · Licence, help, and updates

3.1 First launch and licence

Both applications show the licence agreement on first launch. The server performs the licence check and activation when required. The client has no serial-number field; it receives a signed licence grant from the server during the handshake.

3.2 Offline use

A stored and still valid licence grant permits operation until the date shown in the application. The first launch should therefore have internet access. Always follow the exact status shown under LIZENZ & HILFE.

3.3 Updating

- 1 Start the update check or wait for the automatic check.
- 2 Read the version notice and explicitly confirm installation.
- 3 The application downloads the package and checks its size and SHA-256 checksum.
- 4 After the automatic restart, verify the displayed version.

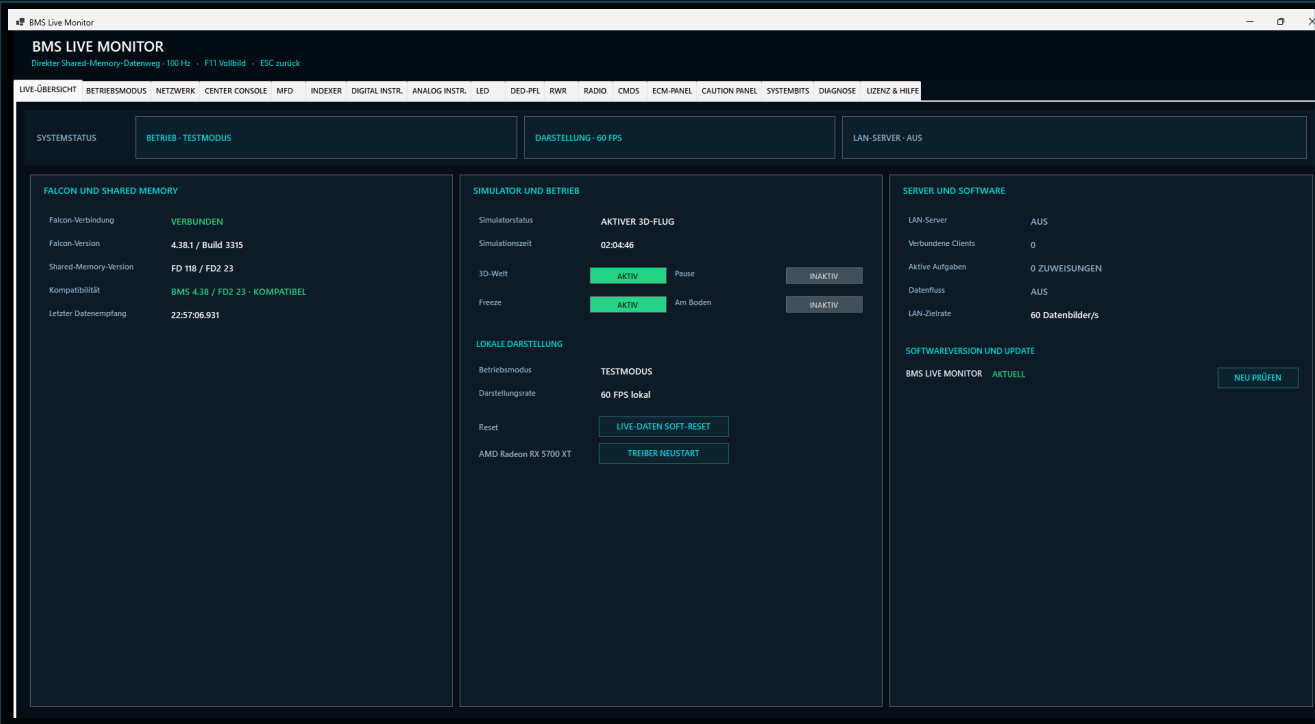
PROTECT PRIVATE IDENTIFIERS

Redact installation IDs, serial numbers, user names, and local paths from screenshots and support reports.

4 · Server interface

Server 1.7.0 provides 18 tabs. Test mode shows every local area; in production mode the local module selection controls what this PC renders.

Operation	LIVE-ÜBERSICHT · BETRIEBSMODUS · NETZWERK
Flight instruments	CENTER CONSOLE · MFD · INDEXER · DIGITAL INSTR. · ANALOG INSTR.
Avionics	LED · DED-PFL · RWR · RADIO · CMDS · ECM-PANEL · CAUTION PANEL
Technical	SYSTEMBITS · DIAGNOSE · LIZENZ & HILFE



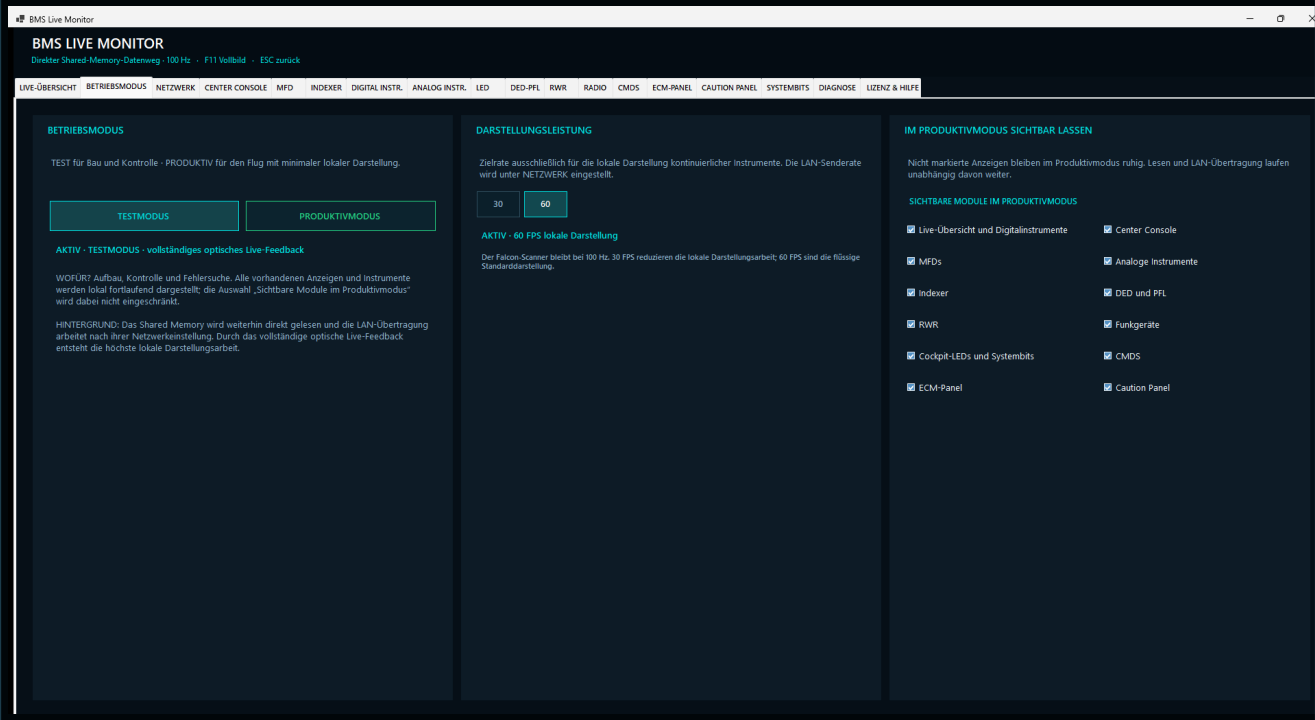
LIVE overview: Falcon connection, flight state, and central telemetry.

5 · Operating mode and rates

5.1 Test and production modes

Test mode renders all local areas for construction and troubleshooting. Production mode renders only locally selected modules. Network assignments remain independent and are configured per client.

Shared-memory scan	Target approximately 100 samples per second
Local display	30 or 60 FPS
LAN telemetry	30 or 60 FPS, configured separately
MFD image stream	JPEG transfer only while an active 3D/RTT source is available



Operating-mode page with local module and FPS selection.

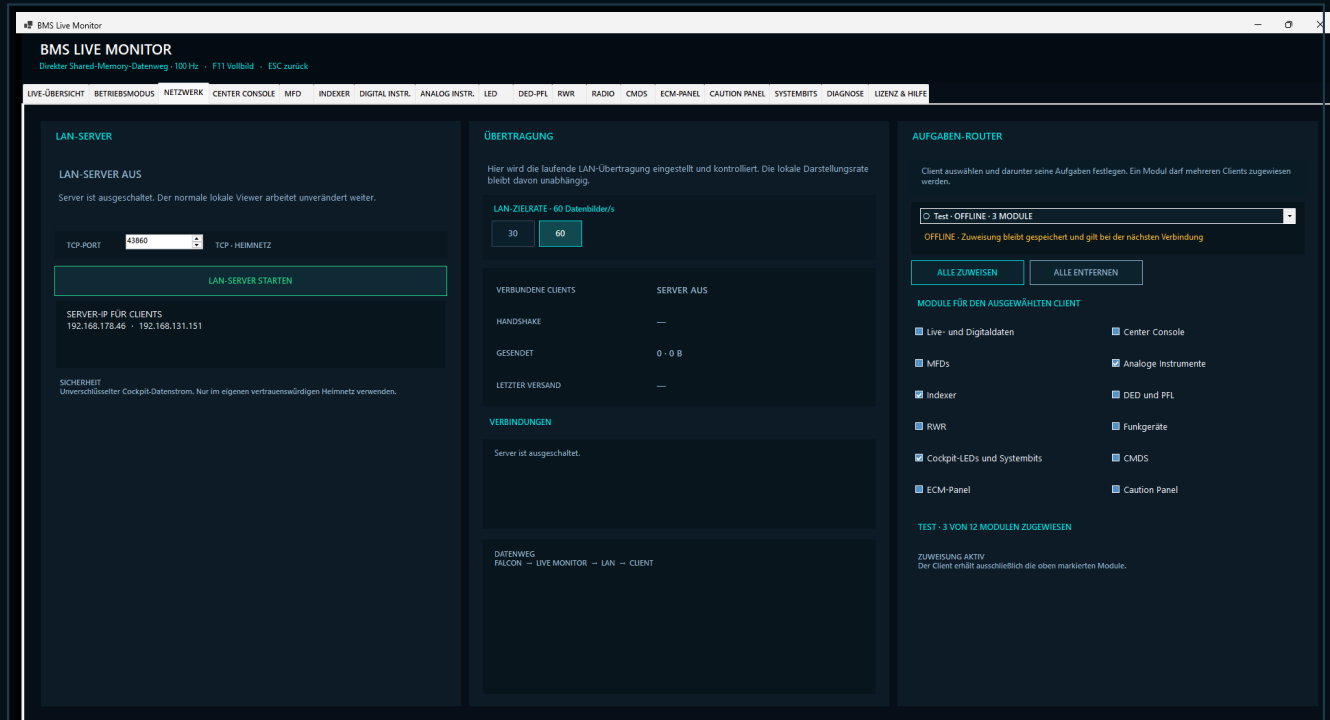
RECOMMENDATION

Use production mode and start with 30 FPS for normal operation. Select 60 FPS only where the additional smoothness is useful.

6 · Network server and task router

- 1 Open NETZWERK and verify the TCP port; the default is 43860.
- 2 Select a network rate of 30 or 60 FPS.
- 3 Start the TCP server and note its private LAN address.
- 4 Select a client profile, mark its required modules, and save the assignment.

Each profile has a persistent identity. New profiles intentionally start with no tasks. Assignments remain stored while a client is offline, and the same module may be sent to several clients.



NETWORK: twelve modules are routed independently for each client profile.

LOCAL AND LAN SELECTIONS ARE SEPARATE

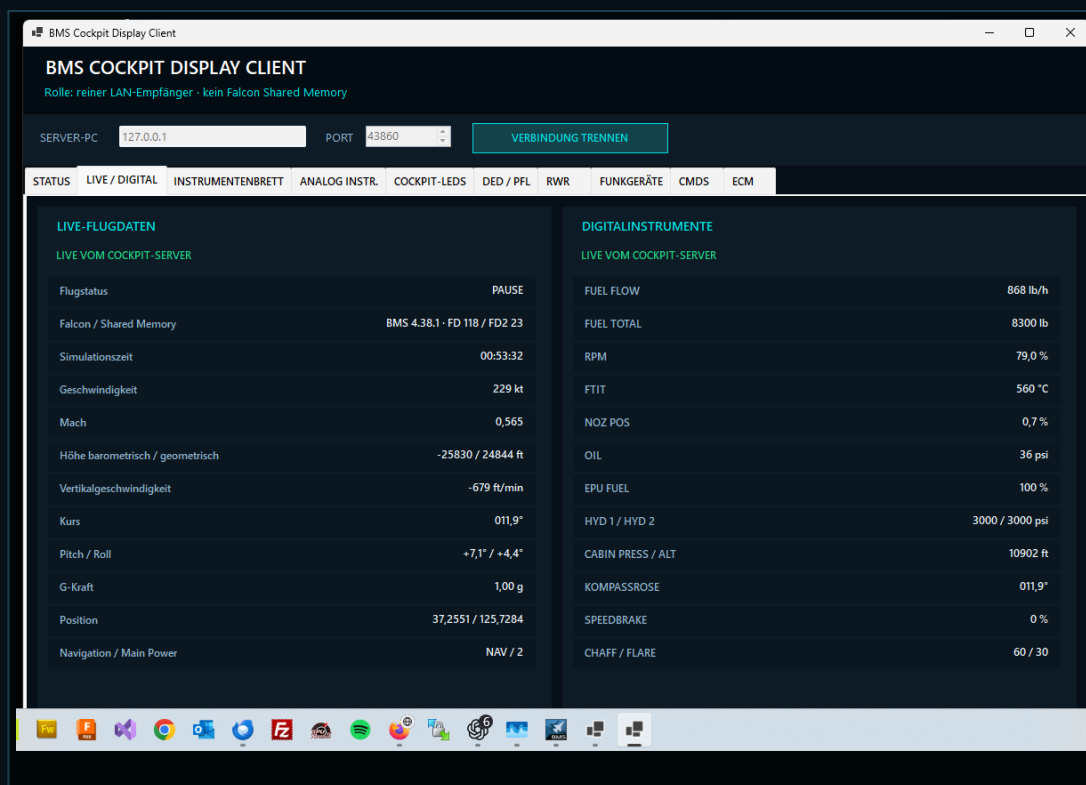
Disabling a local server module does not remove it from a client. The saved assignment of that client profile is authoritative.

7 · The twelve client modules

LIVE / DIGITAL	Live flight data and numeric instrument values
CENTER CONSOLE	Airspeed/Mach, altimeter, AOA, ADI, VVI, HSI, and marker beacon
MFDs	Left and right MFD as compressed image streams
ANALOG INSTR.	Twelve engine, fuel, hydraulic, and aircraft instruments
INDEXER	AOA indexer and AR/NWS indexer
DED / PFL	Two displays with five rows of 25 characters
RWR	RWR scope, Threat Warning Prime, and contacts
FUNKGERÄTE	COM1/UHF, COM2/VHF, backup UHF, Guard, and IVC when available
COCKPIT-LEDS	Cockpit lamps and relevant system bits
CMDS	Countermeasure Dispensing Set
ECM	Exported ECM program and LED states
CAUTION PANEL	F-16 Caution Panel with 32 indicators

8 · Configure the Display Client

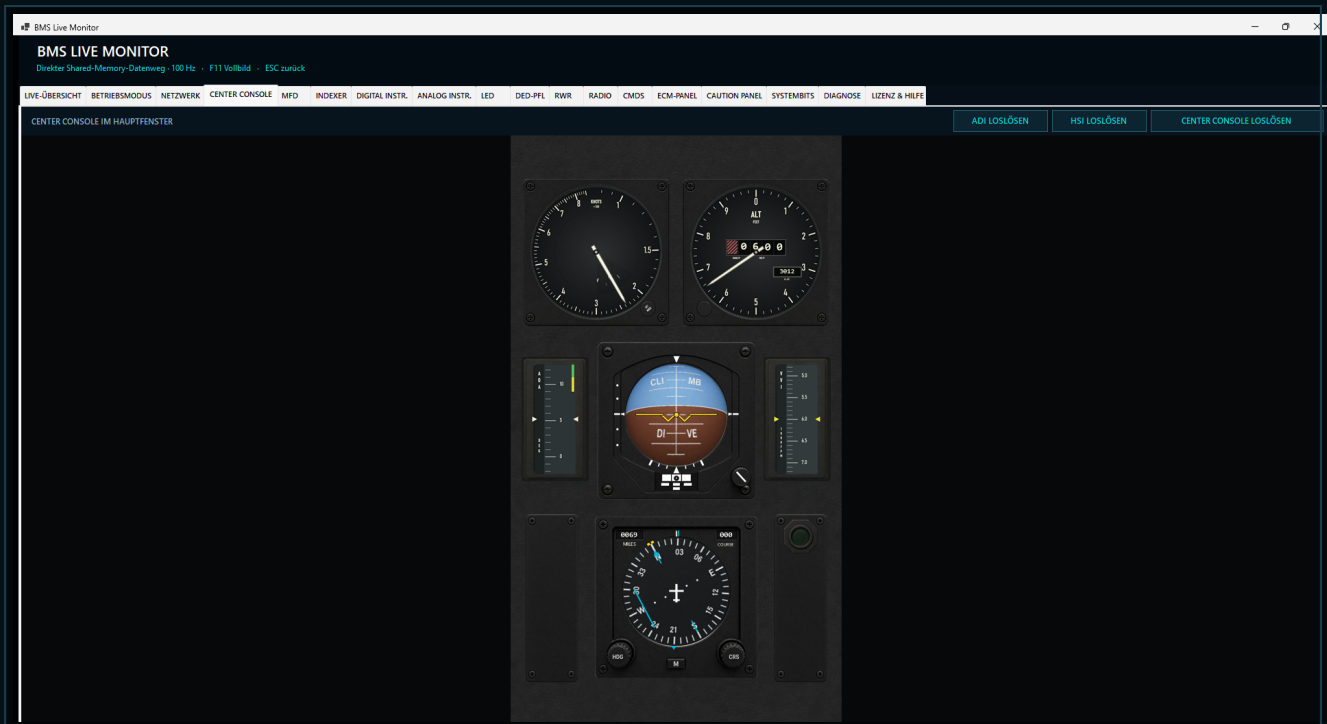
- 1 Start BmsDisplayClient.exe and create a unique profile name of up to 48 characters.
 - 2 Use separate profiles for two client instances running on the same PC.
 - 3 Enter the Falcon PC's private IP address and port 43860.
 - 4 Select MIT SERVER VERBINDEN and verify handshake, server version, licence, and assigned modules.
- STATUS and LIZENZ & HILFE always remain visible.
 - Module tabs appear and disappear according to the server assignment.
 - After a disconnect, the client retries automatically after about two seconds.
 - Stale frames are discarded instead of building a playback backlog.



LIVE / DIGITAL on a connected Display Client.

9 · Center Console

- Airspeed/Mach indicator and barometric altimeter.
- AOA, ADI, VVI, HSI, and marker-beacon indication.
- The complete console detaches; ADI and HSI can also detach individually.
- F11 toggles borderless full screen for the detached console; Esc returns to windowed mode.
- Window positions and detached states are stored.

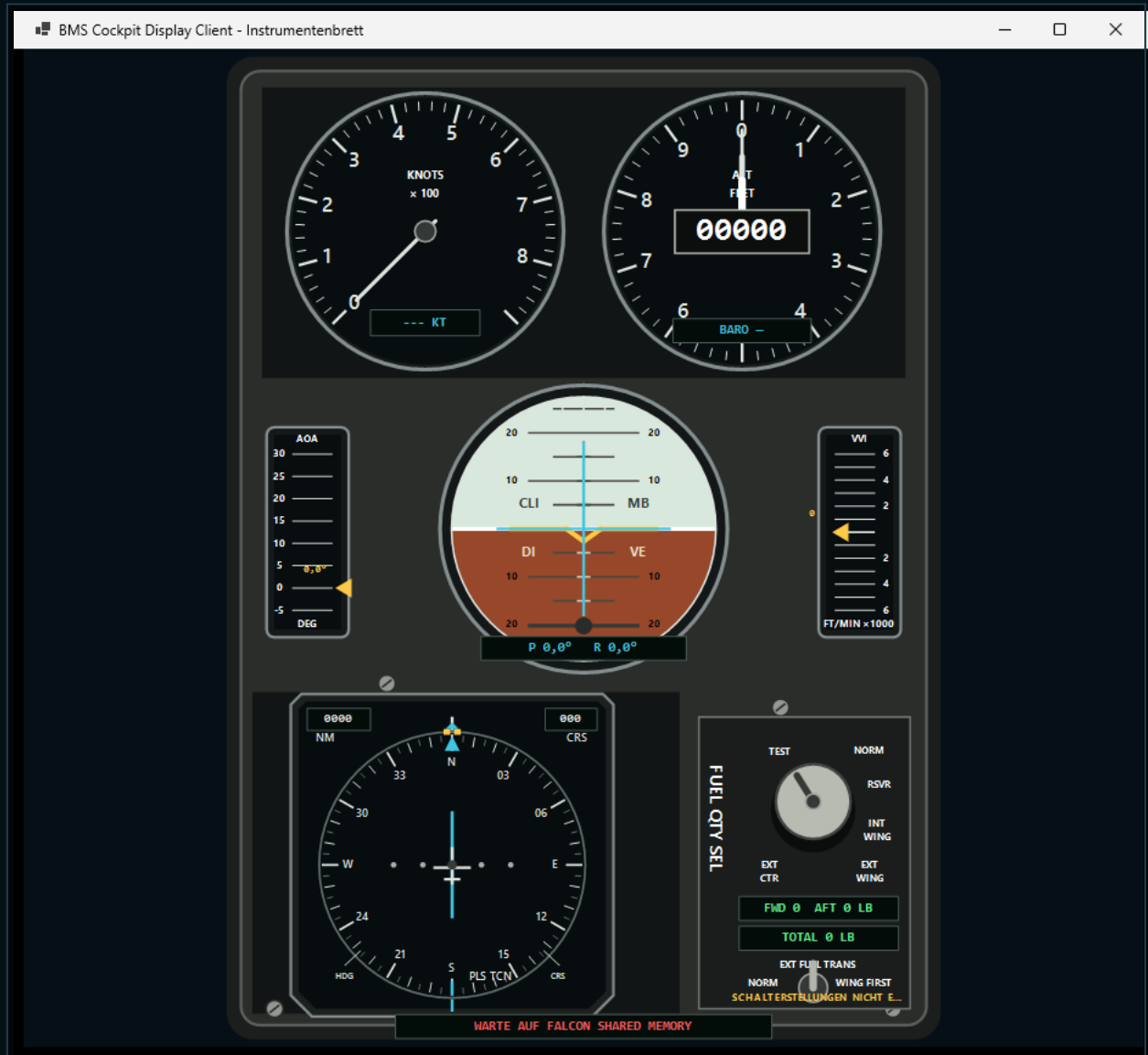


The server's Center Console.

10 · Center Console on a client

The Display Client can run the Center Console in a separate instrument window, allowing a dedicated display PC to sit directly behind a cockpit monitor.

- 1 Assign the CENTER CONSOLE module to the profile.
- 2 Open the new client tab and verify live values.
- 3 Detach the console and move it to the target monitor.
- 4 Use F11 for borderless full screen and Esc to return.

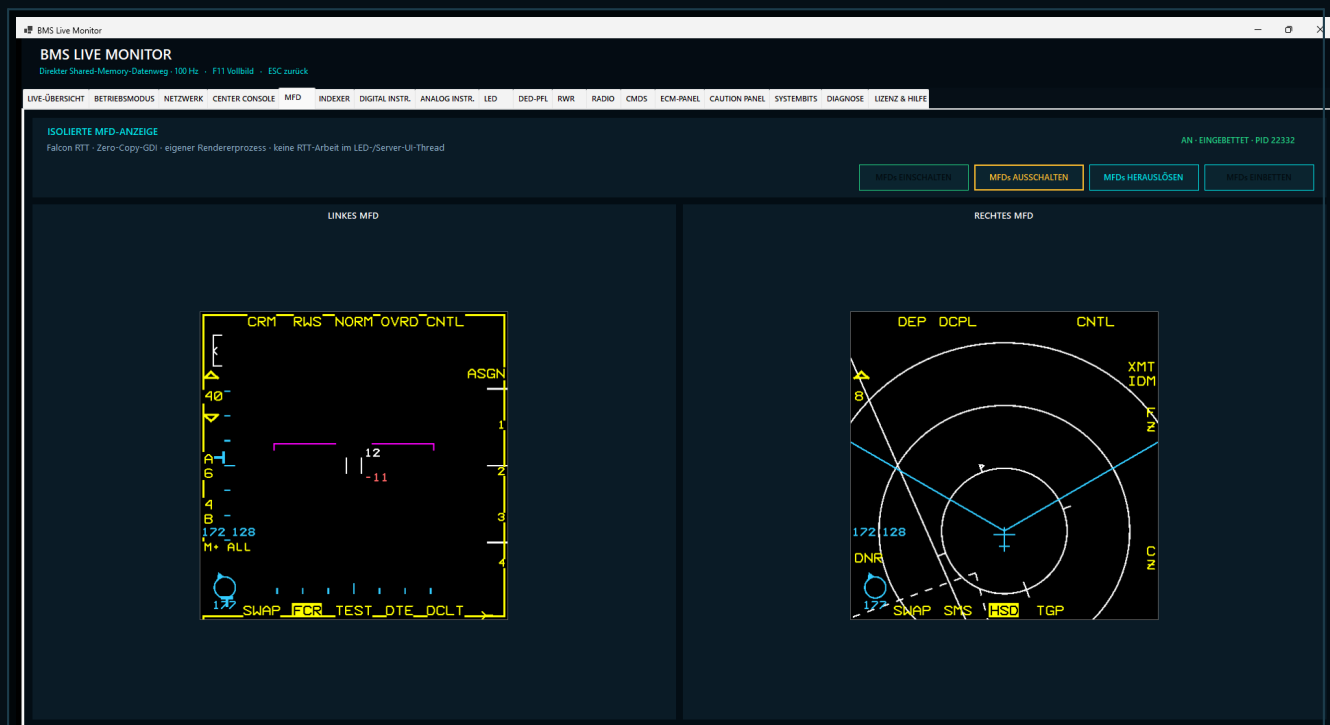


Detached Center Console on the Display Client.

11 · MFDs and RTT

MFD images come from Falcon's RTT export. Without an active 3D scene and a valid RTT source, the server cannot display or transmit them.

- The left and right MFD can be enabled independently.
- Both use an isolated renderer process so RTT work does not block the main UI.
- Each MFD can remain embedded or open as a freely positioned square window.
- Window positions and sizes are stored.
- Both MFDs are transferred to assigned clients as JPEG images when an active 3D/RTT source is available.

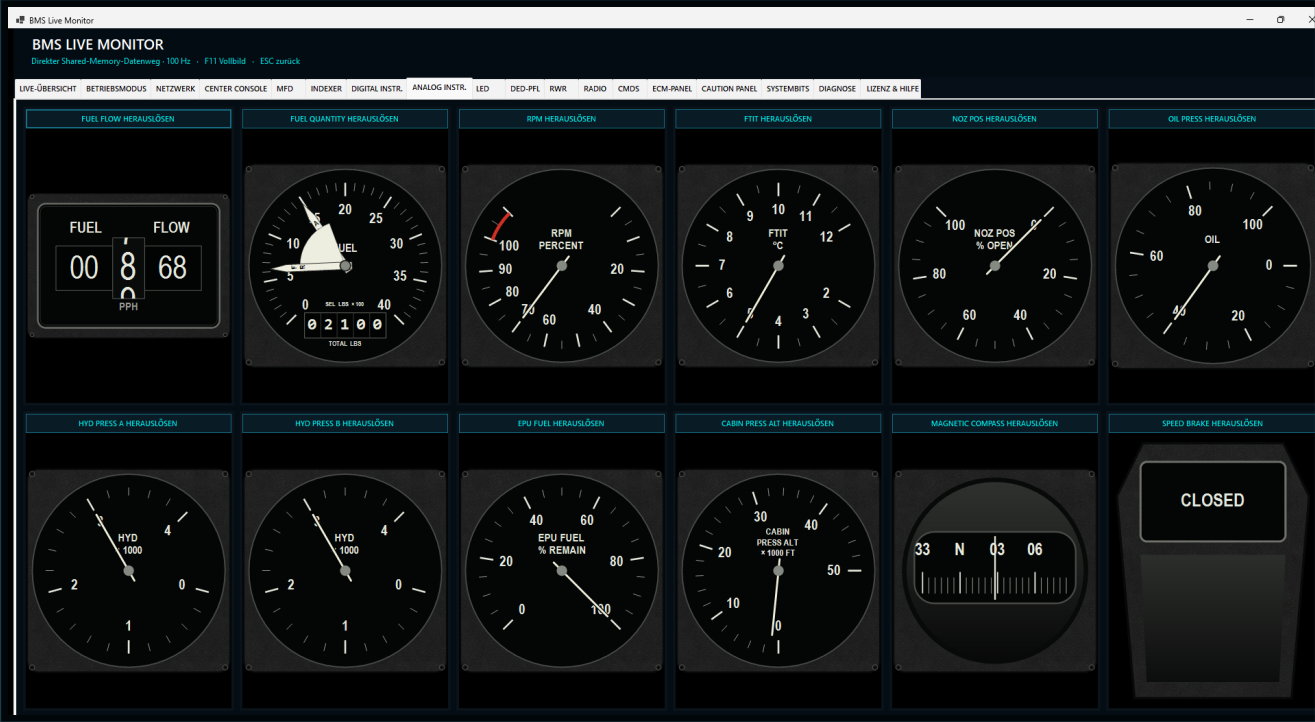


MFD tab with live left and right displays.

12 · Indexers and analog instruments

The indexer module includes the AOA and AR/NWS indexers. All twelve analog instruments can detach individually; position, size, and detached state are retained. Assigned clients receive the same instrument set.

Engine	FUEL FLOW · RPM · FTIT · NOZ POS · OIL PRESS
Fuel	FUEL QUANTITY · EPU FUEL
Hydraulics	HYD PRESS A · HYD PRESS B
Aircraft	CABIN PRESS ALT · MAGNETIC COMPASS · SPEED BRAKE



Twelve individually detachable analog instruments.

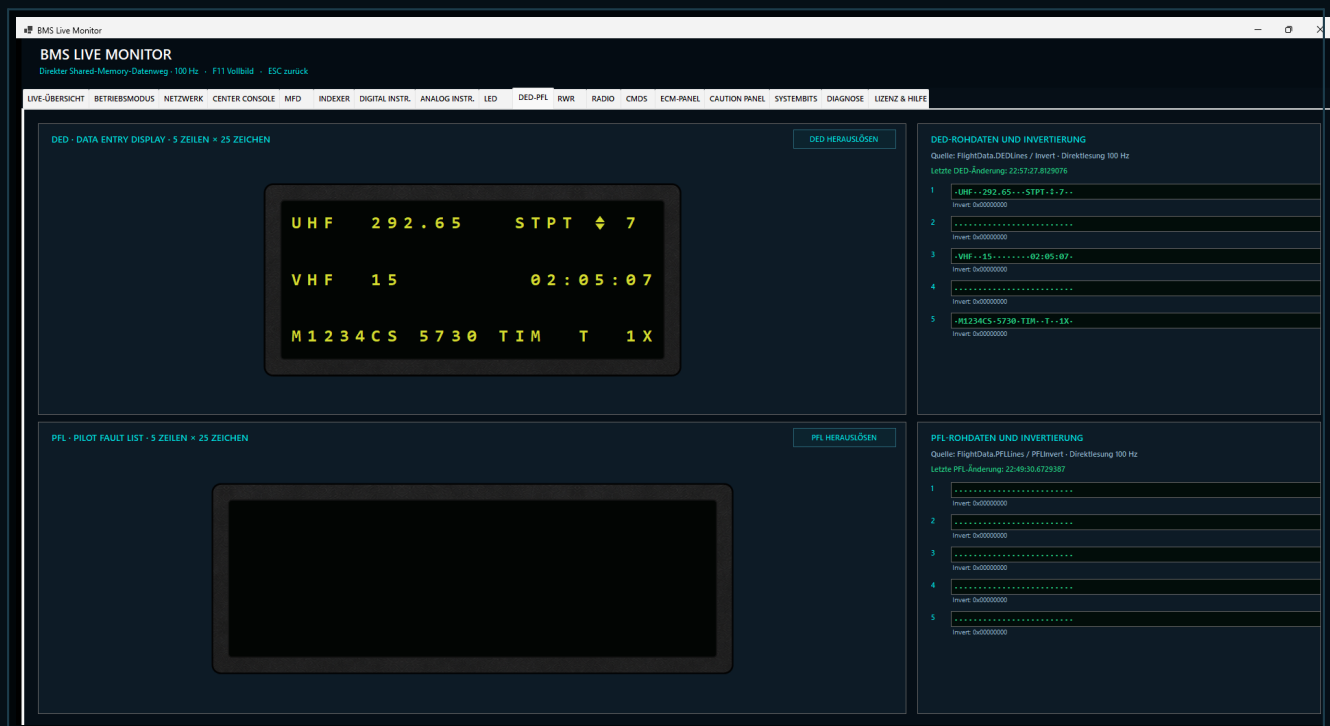
13 · DED and PFL

DED and PFL each display five rows of up to 25 characters. They can be inverted and detached independently.

- 1 Enter a Falcon cockpit state with an active display.
- 2 Open DED-PFL and verify that text rows arrive.
- 3 If polarity is wrong, invert only the affected display.
- 4 Detach DED and/or PFL and position them on the target monitor.

EMPTY DOES NOT AUTOMATICALLY MEAN FAILURE

First check the Falcon state, shared-memory connection, and the actual cockpit display. Not every state provides content.

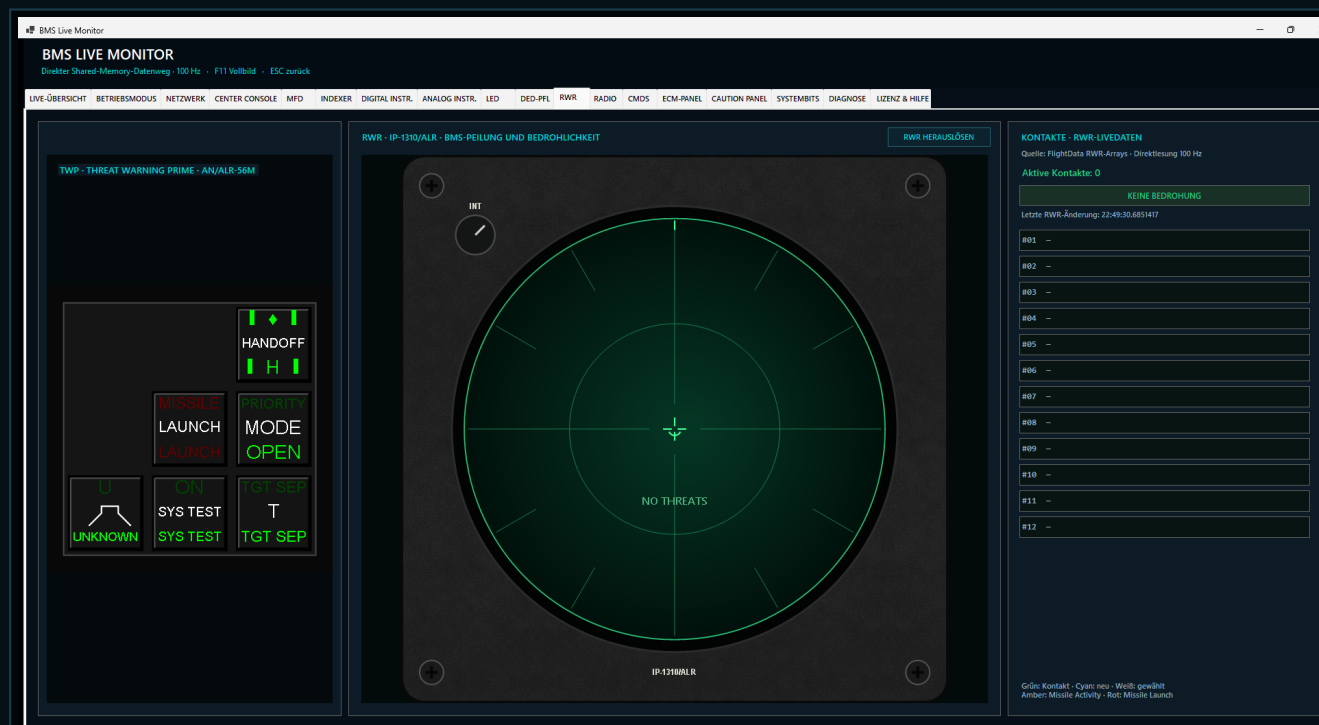


DED and PFL in the current server release.

14 · RWR

- Graphical IP-1310/ALR scope.
- Threat Warning Prime and related warning states.
- Processing for up to 40 exported contacts.
- A detachable window with stored position.
- The same functional view on an assigned client.

Symbols appear only when Falcon exports matching contacts. An empty scope may therefore be correct.



RWR scope, warning area, and contact list.

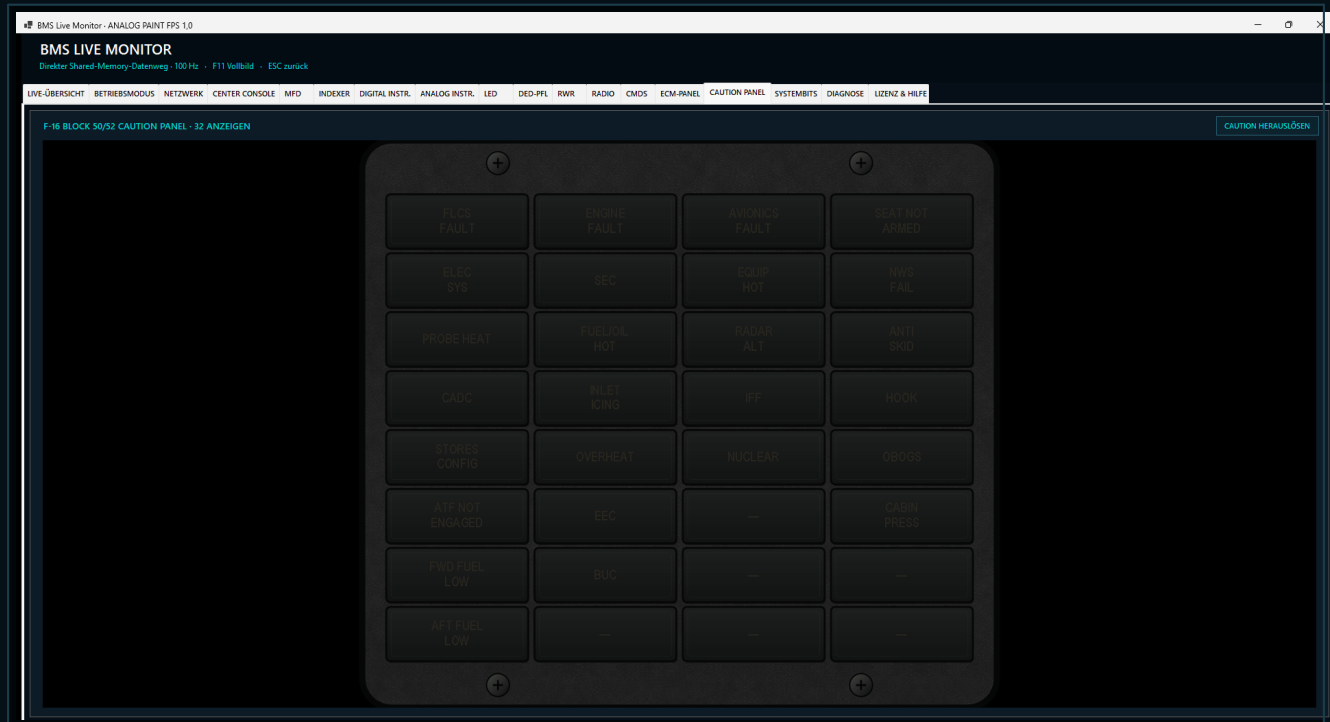
15 · LEDs and Caution Panel

15.1 Cockpit LEDs and system bits

The LED view evaluates lightBits, lightBits2, lightBits3, and relevant power, blink, misc, and Betty states. SYSTEMBITS helps compare a visible lamp with its exported raw state.

15.2 Caution Panel

The graphical F-16 Caution Panel contains 32 indicators. It can detach as a complete scalable window and retains its position. An assigned client receives the same states.

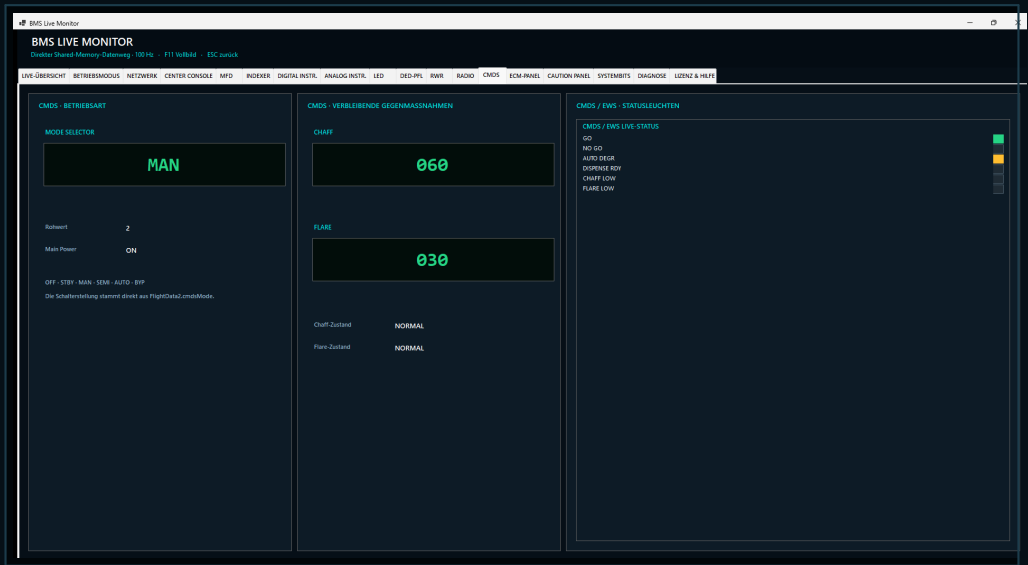


Caution Panel in Server 1.7.0.

16 · CMDS and ECM

16.1 CMDS

CMDS shows available Countermeasure Dispensing Set states and counters. Values depend on the current cockpit state and the fields exported by Falcon.



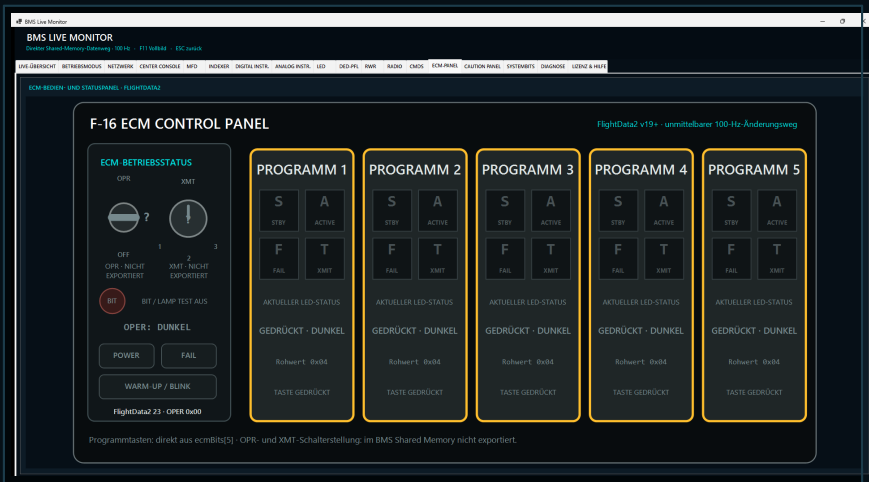
The server's CMDS view.

16.2 ECM

ECM displays exported program and LED states. Falcon BMS shared memory does not provide the actual OPR/XMT switch position, so that position cannot be shown reliably.

KNOWN DATA LIMIT

A missing OPR/XMT position is not an application defect; it is a limit of the available shared-memory data.



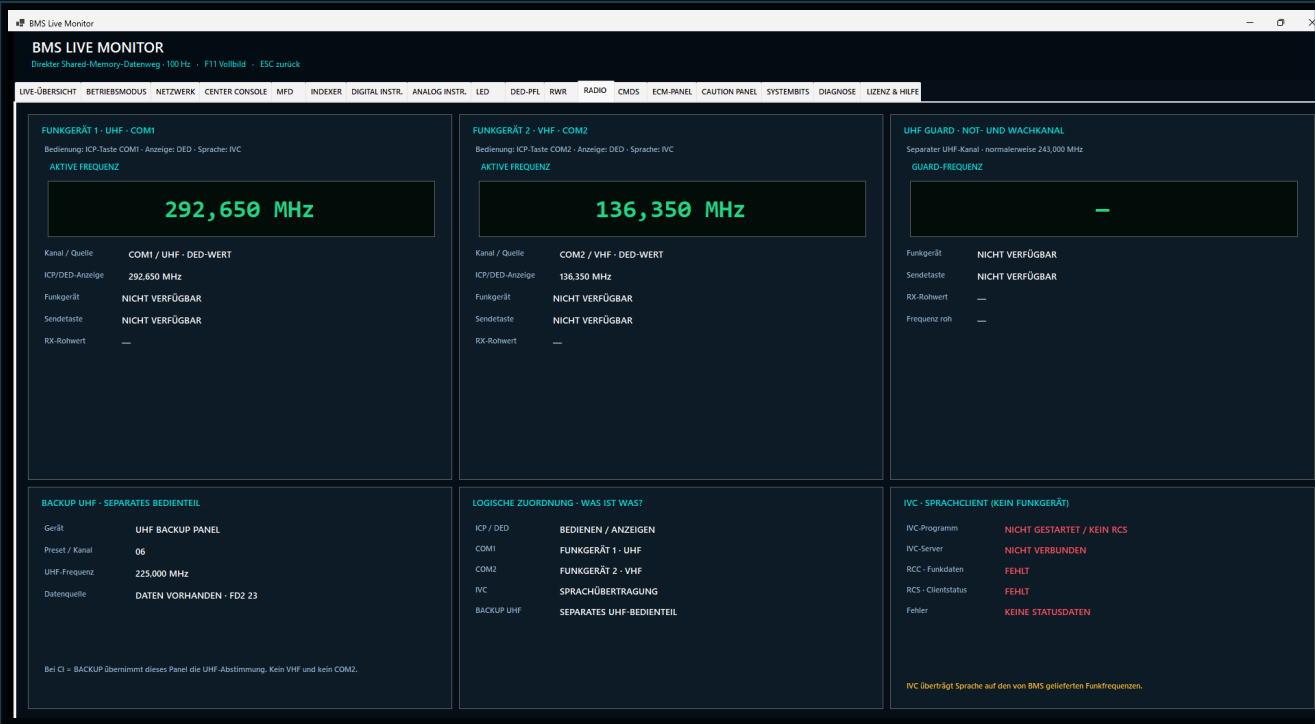
ECM panel with the known data limit stated clearly.

17 · Radios and IVC

COM1/UHF and COM2/VHF are resolved in this order: live RCC data, an explicit DED frequency, a DED preset resolved through the current DTC table, and finally a FlightData2 fallback.

At startup and session changes, the server attempts to load DTC presets 1 through 20. RCC/RCS adds live frequencies, Guard, PTT, volume, and IVC state when that optional source is available.

- Backup UHF preset and frequency come from FlightData2.
- Unavailable RCC or Guard values are labelled clearly.
- Missing RCC/RCS does not stop Falcon or shared-memory processing.
- Credentials or secrets are not required for this display.



RADIO identifies its sources and unavailable values transparently.

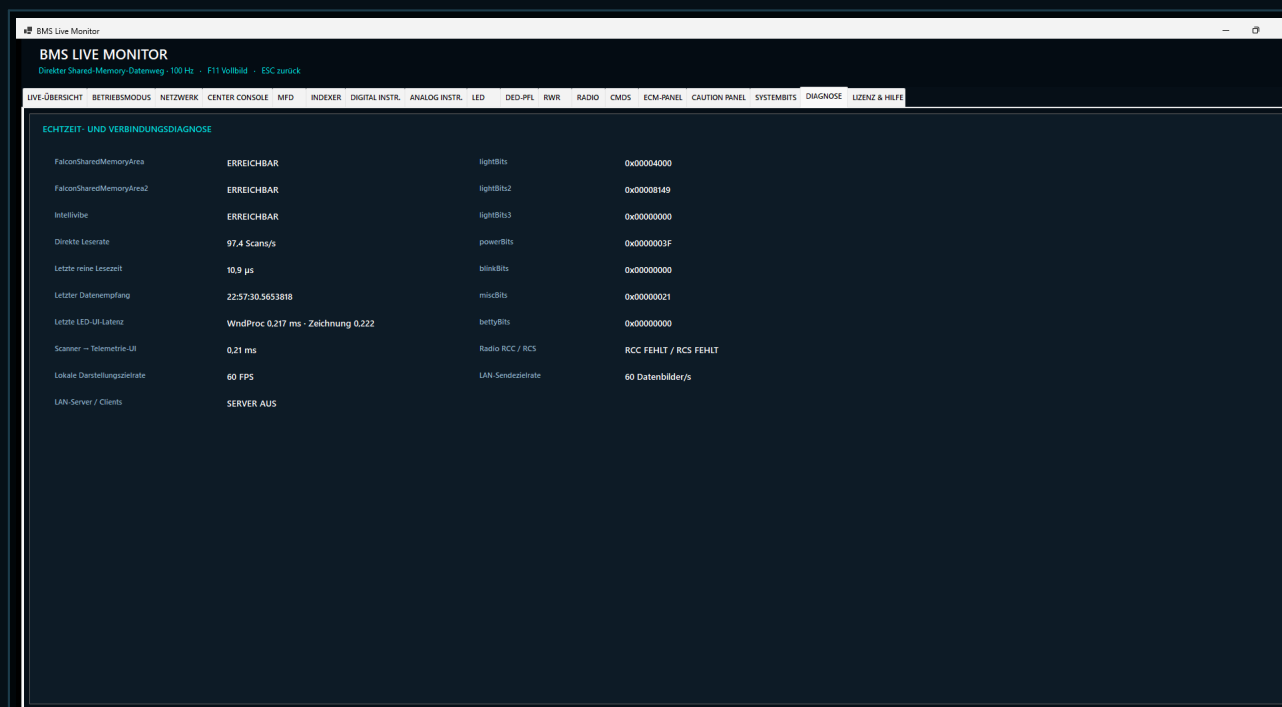
18 · Diagnostics and troubleshooting

18.1 No Falcon data

- 1 Verify that Falcon BMS 4.38 is running and shared memory is enabled.
- 2 Open LIVE-ÜBERSICHT and check FlightData 118 / FlightData2 23.
- 3 Open DIAGNOSE and read the scan rate, timestamps, and exact error.
- 4 Only then restart the server or Falcon as required.

18.2 Client does not connect

- 1 Compare server status, IP address, and port.
- 2 Verify the private LAN and Windows firewall profile.
- 3 Check that the profile is not already active in another client instance.
- 4 If connected without tabs, verify that profile's saved router assignment.



DIAGNOSE provides technical state for cause-based troubleshooting.

19 · Common symptoms

MFD is black	Enter Falcon 3D; verify RTT export and renderer status.
Radio shows dashes	RCC/RCS may be absent. Check DED, DTC, and the FlightData2 fallback.
RWR is empty	Only exported threats appear; verify flight situation and connection.
Client tab missing	The module is not assigned to the profile or has not been saved.
Window is missing	Check monitor layout; reset stored layout only after making a backup.
High load	Use production mode, 30 FPS, and only the required local modules.
Update rejected	Check internet access, write permissions, package size, and checksum.
Licence unclear	Read the exact message and validity under LIZENZ & HILFE.
CHECK THE SOURCE FIRST	
Check shared memory, RTT, RCC/RCS, or TCP before treating the visible display itself as the fault.	

20 · Cockpit operation and stored data

20.1 Recommended sequence

- 1 Start the server and verify version, licence, and Falcon state.
- 2 Start the TCP server and wait for client connections.
- 3 Load the mission and compare MFD, DED/PFL, RWR, and radio states.
- 4 After flight, close clients, stop the network server, and close the server.

20.2 Storage locations

Server	%LOCALAPPDATA%\BmsLiveMonitor\viewer-settings.json
MFD windows	%LOCALAPPDATA%\BmsLiveMonitor\mfd-window-layout.json
Client profiles	%LOCALAPPDATA%\BmsCockpitSuite\DisplayClient\client-profiles.json

BACK UP BEFORE RESETTNG

Rename configuration files only while the application is closed. Otherwise profiles, assignments, or monitor positions may be lost.

21 · Quick reference

Server / client	1.7.0 / 1.6.0
Simulator	Falcon BMS 4.38 only
Structures	FlightData 118 · FlightData2 23
TCP	Port 43860 · private LAN only
Local / network FPS	30 or 60 · configured separately
MFD	JPEG image transfer with an active 3D/RTT source
Reconnect	Automatic after approximately two seconds
Modules	Twelve, assigned independently per client profile
Profile name	Up to 48 characters
Full screen	F11 in the detached Center Console
Data direction	Falcon → server → client; no cockpit control
Not included	DCS, BMS 4.37, internet encryption, input control

22 · Verified state and limits

Local server	18 tabs, windows, TCP server, diagnostics, licence, and updates
Client	Dynamic tabs, Center/Analog windows, reconnect, and server licence grant
Router	Twelve modules per profile; offline persistence; multiple recipients
Source dependent	RTT MFDs, RCC/RCS/Guard, DTC presets, and Falcon bit fields
Known limit	ECM OPR/XMT switch position is absent from shared memory

Technical verification

Server and client were built in Release configuration with zero warnings and zero errors. Server images are from version 1.7.0; client images show the views matching the current implemented functionality.

NOT A COMPLETE FLIGHT-TEST RECORD

This manual documents the implemented state. A live display does not replace end-to-end testing of every mission, radio source, and hardware configuration.

Appendix · Release files and support

These checksums identify the local release files on which this manual is based.

BmsLiveMonitor.exe	1.7.0 · 132,962,041 bytes
Server SHA-256	C495925AA2BBD492356B6A051FFA474A734E2D48CD998541D310854AFCE3D7D2
BmsDisplayClient.exe	1.6.0 · 113,470,279 bytes
Client SHA-256	554978FEA110B9676B91D9B2B637590603264BB151218F2C59014CFFA95A6D41

Include in a support report

- Server, client, Falcon, and shared-memory structure versions.
- The exact message shown under STATUS or DIAGNOSE.
- The affected profile and assigned module.
- Whether RTT, RCC/RCS, or DTC is involved.

BEFORE SENDING

Remove installation IDs, serial numbers, user names, local paths, and public IP addresses.

Falcon BMS Cockpit Suite

Server 1.7.0 · Client 1.6.0 · Falcon BMS 4.38

End of the English user manual · issued 27 August 2026