AxelTech
Playing it loud!

Falcon X7

Broadcast Audio Processor for FM & HD Radio

>> Falcon X7 Makes Your Radio Sound Great!

Falcon X7 is the top level unit among AxelTech's Audio Processors.

Falcon X7 features powerful DPSs, 5-bands architecture, dual bands AGCs, 3-bands equalizer, stereo enhancer, speech detector and 5 limiters.

Falcon X7 is an all-in-one equipment: Audio Processor, MPX Generator, RDS Encoder, Loudness Control, Change Over. It works for FM and DAB, HD Radio, Sirius XM, Web.

Dante SPOKEN HERE

R·D·S

// Overview

Clarity of sound
Falcon X7 high-quality hardware design and software algorithms produces a detailed, crystal-clear sound on any speaker system, always preserving original audio signature.

Complete Set of Inputs
Extended Changeover/Silence Detector with configurable source priorities out of the following sources: 1xAnalog, 2xAES/EBU, 2xIP, 2xMPX, 1xMPX-AES192, 2x Dante™ (Optional), 1xInternal Player. Sampling rate from 32 kHz TO 192 kHz.

Complete Set of Outputs
1xAnalog, 2xAES/EBU, 1xIP, 2xMPX, 1xMPXAES192, 1x Dante™ (Optional).

Voice Processor
A dedicated processing section boosts presence of voice delivering a soft, silky sounding effect. Vocals are always on top of the mix, making lyrics comfortably audible. Each instrument and vocalist gains dominium of its own space.

Extreme Density
Falcon processors deliver full impact sound at the highest volume density preserving original audio detail, identity and mood. The dedicated 'Bass Enhancer' stage delivers a strong and effective 'Drum Punch' for a deep musical emotion.

Built-in Audio Player
Suitable like a backup source or for test purposes. A Test Signal Generator is also available.

Advanced SNM (Simple Network Management Protocol)
Allows data interchange and simplified configuration of third-party appliances connected in the same LAN using shared datasets MIB.

MPX Changeover
Manages the routing of MPX signals for Advertisement Area Splitting.

Advanced RDS (Optional)
Dynamic RDS fully supported, UECP Input implemented, 8 Datasets available. Suitable for network infrastructures.

Upgradable and Reliable
Internal microSD card with OS for Disaster Recovery. Easily Upgradable via WEB or Windows application.

Built-in Audio Encoder and Streamer
Can manage two audio streams like an input, can generate an output audio stream.

Web Based Control Panel
The whole system can be managed through a WEB page generated by the internal web Server. The main functions can be managed through the physical panel.

Advanced features

Processing delay
A configurable delay (from 0 to 3.5") can be applied to the FM process to synch with those distribution channels having a significant latency like the DAB.

Dual Processing
15 kHz processing allows to use it as FM Audio Processor.
20 kHz processing for digital broadcasting, allows to use it as DAB Audio Processor, HD Radio Audio Processor, Sirius XM Audio Processor, Web Radio Audio Processor.

MPX Loudness Processing
ITU BS.412 MPX Power Loudness Recommendations available for MPX processing chains compliant with every country loudness rules.

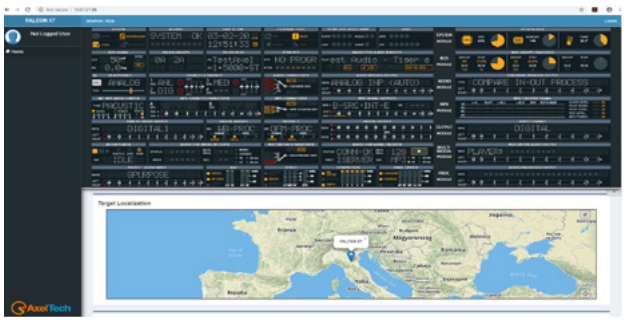
MPX Over AES 192 (AES3)
This is the standard for exchange the digital MPX+RDS signals between professional audio devices.192 kHz standard is supported by several transmitter manufacturers.

Advanced Changeover
The Advanced Audio Changeover/Silence Detector can switch between any available input source: Analog, Digital, MPX, FM, IP, Dante™, Internal Audio Player.

Real Time Monitor
Processing delay is quite non audible, 10 to 30mS depending on the processing complexity.

The Falcon X Series

Different users have different needs: that's the reason why AxelTech features a whole line up of processors with different models suitable for different workflows. Falcon X7 is the full option unit while Falcon X5 is entry level unit with the same processing power of the Falcon X7 and a simplified I/O and changeover section.



Falcon X Series Web Based Control Panel

Falcon X7 Rear View

AxelTech

For more information about Falcon X7, visit our website

// Specifications

Analog Input - AUDIO

Number of Inputs	1 Stereo
Connectors:	2 XLR, female - Electronically balanced – EMI Suppression
A/D Conversion:	24bit Sigma-Delta Conversion (Crystal CS4272)
AD Clipping Point	+24.0 dBu
Operative Nominal Level	From –12.0dBu to +13.0dBu (0.1dBu Step) Software adjustable
Line Impedance	10 kΩ (Electronically balanced selectable)
Distortion	Less than 0.01% TDH+NOISE (0.0 dBu 1Khz)
AD Dynamic Range	108 dB RMS (110 dB A weighted)
Input Modes	Stereo, Mono (Left), Mono (Right), Mono (Left+Right)
CMRR input	>60 dB (20 Hz to 20 kHz)
FM Frequency range	5 Hz-15 kHz (+/- 0,5dB when processing is disabled)
DAB Frequency range	5 Hz-20 kHz (+/- 0,5dB when processing is disabled)

Digital Input – AUDIO

Inputs Number	2 (1st for audio, 2nd for audio or Digital MPX)
Connectors	XLR, female – Electronically balanced– EMI Suppression
Format	AES3/EBU
Input impedance	110 Ω
Sample rate	32 kHz / 44.1 kHz / 48 kHz /96 kHz / 192 kHz with src and jitter attenuation
Operative Nominal level	From 0.0 dBFs to -25.0 dBFs (0.1 dBu step) Software adjustable
Dynamic Range	125 dB (Typical), 122 dB (Minimal)
Distortion	Less than 0.01% TDH+NOISE (0.0 dBu 1Khz)
Input Modes	Stereo, Mono (Left), Mono (Right), Mono (Left+Right)
Conversion dynamic range	124 dB (32 KHz) | 126 dB (44,1 kHz) | 126 dB (48 kHz) 122 dB (96 kHz)
Conversion resolution	24 bits
FM Frequency range	2 Hz-15 kHz (+/- 0,025dB when processing is disabled)
DAB Frequency range	2 Hz-20 kHz (+/- 0,025dB when processing is disabled)

Digital Input MPX

Connectors	Balanced on 1 XLR – EMI Suppression
Input impedance	110 Ω
Format	AES192
Sample rate	192 kHz
Nominal input level (sensitivity)	From 0 dBFs to –25,0 dBFs (0,1 dB step)

MPX input

Input Number	2
Connectors	Unbalanced on BNC – EMI Suppression
Input impedance	50 KΩ
Adjustable Nominal Input Level (Sensitivity)	-6 dB to +13,0 dB (0.1 dBu step) Software adjustable
Max Input Level	+18,0 dBu
A/D Conversion	Texas PCM4220

Analog Output AUDIO

Output Number	1
Connectors	2 XLR, female - Electronically balanced – EMI Suppression
D/A Conversion	24 bit Sigma-Delta Conversion (Crystal CS4272)
Output Level	-6.0 dBu to +20.0 dBu (0.1 dBu Step)
Output Level Max.	+ 24,0 dBu
Output Impedance	10 Ω
Load Impedance	600 Ω or greater
THD + Noise	Less than 0.01% (0.0dBu @ 1 kHz)
Signal to noise Ratio	>80 dB unweight - 100% Mod. 20 Hz–15 KHz
L/R CrossTalk	< –70 dB, 20 Hz–15 KHz
Pre-emphasis	50 µsec, 75 µsec
FM Frequency range	5 Hz-15 kHz (+/- 0,5dB when processing is disabled)
DAB Frequency range	5 Hz-20 kHz (+/- 0,5dB when processing is disabled)

// Specifications

Digital Output AUDIO

Outputs Number	2 (1st for audio, 2nd for audio or Digital MPX)
Connectors	Balanced on 1 XLR – EMI Suppression
Format	AES3/EBU
Output impedance	110 Ω
Sample rates	32 kHz / 44.1 kHz / 48 kHz / 96 kHz / 192 kHz Software selectable
Resolution	24 bit
Operative Nominal level	From 0.0 dBFs to -30dBFs (0.1 dBu step)
Dynamic Range	125 dB (Typ), 122 dB (Min)
Distortion	Less than 0.01% TDH+NOISE (0.0 dBu 1 Khz)
Pre-emphasis	50 µsec, 75 µsec
FM Frequency range	2 Hz-15 kHz (+/- 0,025 dB when processing is disabled)
DAB Frequency range	2 Hz-20 kHz (+/- 0,025 dB when processing is disabled)

MPX output

Connectors	Unbalanced on 2 BNC – EMI Suppression
Source impedance	10 Ω
Load impedance	600 Ω or greater
Maximum Load Capacitance	5 nF
D/A Conversion	Texas PCM 1796
Composite output level	-6,0 dB to +13,0 dB (0,1 dBm step)
Max Output Level	+18.0 dBm
Mod Power Limiter	Adjustable from -1.0 dB to +12 dB according to ITU-R BS.412
Pilot Frequency	19 KHz +/- 1 Hz
Pilot Level	-25.5 to -14.0 dB in 0.1 dB/Step - Ref 100% Mod
Pilot Stability	19 kHz, ± 1 Hz
Pilot Phase	Adjustable +/- 12 degrees, 1 degree step
Pilot THD+Noise	0.03% (TDH 0.002%)
Stability	+/-10 ppm (-10 to +55 °C)
Signal-to-Noise Ratio (S/N)	> 85 dB on a 60 kHz Bandwidth, referenced to 100% modulation, unweighted
Distortion	<= 0.01% THD - Bypass mode, de-emphasized, 20 Hz – 15 kHz bandwidth, referenced to 100% modulation, unweighted
Stereo Separation	Greater than 70 dB, 30 Hz – 15 kHz
Linear Crosstalk	> -80 dB - main channel to sub-channel or sub-channel to main channel referenced to 100% modulation
38 kHz Suppression	> 70 dB (referenced to 100% modulation)
Pilot Protection	> 65 dB relative to 10% pilot injection, ± 500 Hz.
Crosstalk M/S	> 80 dB
Crosstalk S/M	> 80 dB
MPX clipping & limiting	Based on look-ahead techniques
RDS/RBDS Protection	Better than -55 dB @ 56kHz, better than - 65dB@57 kHz (MPX Clipper Disabled)
Pre-emphasis	50 µsec, 75 µsec
MPX Modes	Stereo, Mono, L+R, L-R, Pilot only, No Pilot
MPX Clipper	On/Off and adjustable 95% to 105 %, 1% step

Digital Output MPX

Connectors:	Balanced on 1 XLR – EMI Suppression
Input impedance:	110 Ω
Format:	AES192
Sample rate:	192 KHz
Output level adjustment:	From 0,0 dBFs to –30,0 dBFs (0,1 dB steps)

Backup player

Physical support	USB Flash Drive, microSD CARD (max 64GB)
Audio file format	MP3, WAV
Sample Rate	32 | 44,1 | 48 | 64 | 96 kHz

// Specifications

RDS features (Optional)

RDS Level adjustment	Digitally controlled
Phase adjustment	Yes, 0 ÷ 359.9°
RDS Subcarrier	100% Digitally Generated Shape
CENELEC – EN50067 compliant	Yes
Accurate Clock Time (CT) Sync with Internet Connection	Yes
Remote TA actuation for Traffic Announcements	Yes
GPS module for automatic synchronisation of the built-in Real Time Clock (RTC)	Optional external via USB
Group Supported	All
Group Sequence	Configurable
PS	8 DSN x MAIN + 10 PSN
PI	8 DSN x MAIN + 10 PSN
PIN & PTY	RDS/RBDS
AF Method A	up to 1024 (64 lists)
AF Method B	up to 1024 (64 lists)
RT	Yes, 32 messages
RT rate adjustment	Group Sequence
RT+ for songs and content tagging	Yes
TP	Yes
TA Control	Command, Soft, GPI
PTYN	Yes
EON	10 PSN
CT	Yes
TMC, EWS, IH, TDC	Yes
Free Format Groups (FFG)	Yes
Open Data Application (ODA)	Yes
PS Scrolling	Yes
Scrolling by characters, by word, auto centre, truncate long words	Yes (Characters – from 1 up to 8)

Communication

Connection with radio automation: Software	Yes
Network connectivity	4 TCP ports / 4 UDP / 1 SNMP
Configuration software	Web Server, FTP
Password protection	Yes
ASCII Protocol	Configuration messages
REST Command	Yes
Alert notifications on user-defined events via SNMP traps	Yes
Embedded SNMP agent permitting: active management tasks	Yes
Supported Network Protocols	HTTP, SNTP, UDP, TCP, NTP, FTP
UECP Protocol	EBU SPB490 Ver. 7.05
PI Calculator	Yes
RDS 2.0 Ready	Yes

System Features

Remote interface GPIn	6x GP In optocoupled
Remote interface GPOut	4x Relays – dry contacts
Remote interface connector	DB 25 female connector - EMI suppressed
Remote interface GPIO Voltage and Current	DC 5V Source and Sink 10 mA
Communication Port	2 x RS232, 3 x USB, 1 x LAN
Serial Interfaces	1st RS232 on DB9 female connector - EMI suppressed 2nd RS232 on DB25 female connector - EMI suppressed
Firmware can be upgraded in the field	Yes
Front-panel Colour TFT Display	No (Falcon X6) / Yes (Falcon X5, X7, D7 and Fox 3)
Data may be entered on-site with Front-panel Buttons	No (Falcon X6) / Yes (Falcon X5, X7, D7 and Fox 3)
Front Panel LEDs	40

Physical

Dimensions	485 x 44 x 240 mm (1 rack unit)
AC Rate Voltage	230Vac / 110Vac +/- 10% - 30VA – Connector IEC 3-Wire detachable
AC Frequency	50 Hz / 60 Hz +/- 4%
Power factor	0,9
Processing architecture	Fully digital, based on DSP 24bit/250Mhz. 5 band Signal processing
Weight	3,5 Kg
Operating temperature	-5°C / +50°C up to 95% non condensing