# BROADCAST AUDIO PROCESSOR

# Falcon 3i


## DIGITAL AUDIO PROCESSOR

## HIGHLIGHTS

1. 4-Band digital Audio Processor
2. Analog and AES/EBU input and output over XLR
3. 2 composite outputs and 2 AUX inputs
4. Stereo generator with composite clipper
5. Digital RDS encoder, 2 dataset
6. AGC, Brilliance control, speech detector,3-Band Eq
7. Usb, Serial, 4 GPIn-4 GPOut
8. Front headphone output
9. Hardware bypass

## MAIN DESCRIPTION

Falcon 3i is a Digital Audio Processor, a Stereo Generator and a RDS Encoder all in one. Everything has been specifically studied for the FM broadcasting, Webradio and Satellite market.

Falcon 3i audio processor is based on a dedicated DSP technology with a 4 band architecture for the audio processing. The completely digital Stereo Generator allows the generation of a Multiplex Signal extremely precise. To accomplish Falcon 3i equipment, a digital RDS Encoder is provided. Falcon 3i gives the broadcaster advanced features, producing an excellent signal that guarantees a total reliability and steadiness in modulation.

All features available in the audio processor are complete and fully customizable: 4-band compression control with *drive* and *threshold*, a powerful AGC double-band, a three-band equalizer for Low-Middle-High frequency and a brilliance control. The check of the phases of the monophonic audio signals gives to the sound of the human voice a more natural and pleasant structure; the final limiter drive pushes to maximum the sound presence. The *soundprint* of every transmitter can be created starting from one of the ten *audio presets* already present in Falcon 3i and it can be saved on the equipment in order to be able to recall it in a second moment accordingly to the program; furthermore it is also possible to recall a preset through a command on the GPIn port.

On board of the audio processor there is also a completely digital generator of sample tones with variable frequency and amplitude. It is available on analogue, digital and MPX outputs for a precise and correct calibration of the network. The *Composite Clipper*, put on the back side of the stereo generator guarantees the best modulation level, in respect of the deviation limits acknowledged by worldwide standards. Falcon 3i makes every sound unique and artifacts free.

The frontal panel of Falcon 3i shows two large LCD displays: the first one shows the whole process input to output from the audio processor, including the amount of interventions on every single band of the compressor, of the limiters and of the AGC multi-band and input/output levels of the analogue, digital and MPX sources. The second display on the other hand displays all operative parameters of the machine such as on air presets, RDS status, station name and status display of both GPIn and GPOut ports. Again on the front panel there is a headphone output for the audio process monitoring introduced by the apparatus. It is possible to listen both to the original audio signal input to the apparatus and the processed audio signal, and quickly make comparative tests between the various presets available.

The internal RDS encoder available as option provides two DataSet, each one with a wide range of static services including 60 PS programmable posts, 16 RadioText posts, Alternative Frequency (AF) to receive the best frequency in function of the coverage area, the Traffic Program (TP) / Traffic Announcement (TA) to listen to traffic information and functions such as EON, M / S, A, CT, PI, PTY, PIN. The switch between DataSets is via serial commands or GPIO from the radio automation system. The RDS encoder complies with UECP SPB490.

The connection abilities of Falcon 3i is complete and mainfold. On the rear panel of Falcon 3i are installed balanced XLR connectors for the connection of the inputs and outputs in balanced analog and digital AES/EBU. As regards the Multiplex part two outputs individually buffered are available and independent for the MPX + RDS signal, plus two additional AUX (SCA) inputs with different functionalities. An AUX (SCA) input expressly intended to the use of external RDS encoders, whereas a second input is able to switch the audio from another MPX processor and create a subnetwork managed by an automation system. All outputs are equipped with hardware bypass in case of fault of the apparatus.

For remote connections are available a RS232 serial port, a USB port and a GPIO connection port with optocouplers and open collector representing the operating states and possible alarms, together with the reception/transmission of commands and logic states from the outside. Universal power supply 90-264Vac 47-63Hz to operate in any region of the world. Falcon 3i occupies one 19” rack unit.

Falcon 3i for all its features is the audio processor and RDS encoder with the best quality/price ratio on the market.

## APPLICATIONS

- RADIO BROADCASTING FM/WEB/SAT
- RECORDING ROOMS
- LEVEL CONTROL BY STL
- MASTER CONTROL ROOM
- OB VAN / S.N.G

## ORDERING INFORMATION

| MODEL | COMMERCIAL DESCRIPTION | NOTE |
|---|---|---|
| **FALCON 3i** | Digital FM Audio Processor 4-Band with MPX stereo generator, Analog, Digital and MPX Input and Output. Double MPX Out. AGC, Equalizer e Speech Detector, Final Limiter Drive, Brilliance Control. 4 GPIn and 4 GPOut, Serial Rs232 and USB port. Remote control Software. | |
| **FALCON VS** | Digital FM Audio Processor 5-Band, MPX stereo generator, Multiband AGC, Stereo Enhancer, Brilliance control, Limiter LookAhead, Expander, Overdrive. Audio changeover, I/O Analog, Digital and MPX. Double MPX Outs. MPX Split. 4 GPIn and 4 GPOut, USB and Serial port. Remote control software. | |
| **FALCON XT** | Digital FM Audio Processor 5-Band, MPX stereo generator, AGC Multiband, SuperBass, Stereo Enhancer, Overdrive, Brilliance Control, Limiter LookAhead, Audio changeover, IN/OUT analog, digital and MPX.MPX Split. Ethernet. Web Server.SNMP Agent, GPS interface. 4GPIn and 4GPOut. Remote control Software. | |

## AVAILABLE OPTION

| MODEL | COMMERCIAL DESCRIPTION | NOTE |
|---|---|---|
| **F-RDS** | Digital RDS/RBDS encoder. Static services generation: 60 PS programmable messages for each DataSet. RadioText, Alternative Frequency (AF), Traffic Program (TP), Traffic Announcement (TA), EON, M/S, CT, PI, PTY, PIN. 2 interchangeable DataSet via remote control. UECP SPB490 compliant. | Available on all Falcon audio processors. |
| **F_VS-LAN** | Optional Ethernet port for LAN connection (TCP/IP and UDP) and Rs232 (Parser ASCII). Option available only on Falcon VS | Option available only on Falcon VS |

## TECHNICAL SPECS

| *GENERAL* | *VALUE* |
|---|---|
| **Dimension** | 434x351x44mm (1 rack unit) |
| **AC Rate** | 230Vac / 110Vac 50 Hz / 60 Hz 30VA |
| **Type of power supply** | Switching power supply |
| **Processing architecture** | Fully digital, based on DSP 24bit/100Mhz. Signal processing is performed by phase linear filter |
| **Weight** | ≈ 3 Kg |
| **Operating Temperature** | -5°C / +50°C |
| ***ANALOG INPUT MODULE*** | |
| **A/D Conversion** | 24bit Sigma-Delta Conversion (Crystal CS4272) |
| **Connectors:** | XLR, female - Electronically balanced |
| **AD Clipping Point** | +20.0dBu |
| **Operative Nominal Level:** | From –12.0dBu to +12.0dBu (0.1dBu Step) |
| **Line Impedance** | 10 kΩ (Electronically balanced selectable) EMI–suppressed |
| **Distortion:** | less than 0.01% TDH+NOISE (0.0dBu 1Khz) |
| **AD Dynamic Range:** | 108 dB RMS (110 dB A weighted) |
| **Input Modes:** | Stereo, Mono (Left), Mono (Right), Mono (Left+Right) |
| | |
| ***DIGITAL INPUT MODULE*** | |
| **Connectors:** | XLR, female – Electronically balanced |
| **Format** | AES3/EBU |
| **Sample rates** | 32 kHz / 44.1 kHz / 48 kHz / 64 kHz / 88.2 kHz / 96 kHz with src and jitter correction |
| **Operative Nominal level:** | From 0.0 dBFs to -24dBFs (0.1 dBu step) |
| **Dynamic Range:** | 125 dB (Typ), 122 dB (Min) |
| **Distortion** | less than 0.01% TDH+NOISE (0.0dBu 1Khz) |
| **Input Modes:** | Stereo, Mono (Left), Mono (Right), Mono (Left+Right) |
| | |
| ***ANALOG OUTPUT MODULE*** | |
| **D/A Conversion** | 24bit Sigma-Delta Conversion (Crystal CS4272) |
| **Connectors** | XLR, male - Electronically balanced |
| **Output Level** | -12.0dBu to +14.0dBu (0.1dBu Step) – Max (+19dBu) |
| **Impedance Source** | 10 Ω |
| **Load Impendance** | 600 Ω or greater |
| **Distorsion** | Less than 0.01% TDH+NOISE (0.0dBu @ 1Khz) |
| | |
| ***DIGITAL OUTPUT MODULE*** | |
| **Connectors:** | XLR, Male – Electronically balanced |
| **Format** | AES3/EBU |
| **Sample rates** | 32 kHz / 44.1 kHz / 48 kHz / 64 kHz / 88.2 kHz / 96 kHz with src and jitter correction |
| **Resolution** | 16 bit – 20 bit – 24 bit |
| **Operative Nominal level:** | From 0.0 dBFs to -24dBFs (0.1 dBu step) |
| **Dynamic Range:** | 125 dB (Typ), 122 dB (Min) |
| **Distortion** | less than 0.01% TDH+NOISE (0.0dBu 1Khz) |
| **Input Modes:** | Stereo, Mono (Left), Mono (Right), Mono (Left+Right) |
| | |
| ***REMOTE INTERFACE*** | |
| **Digital Inputs GPIn** | 4x GP In optocoupled |
| **Digital Outputs GPOut** | 4x GP Out Open Collector optoisolated |
| **Serial Interface** | 1x RS-232 Serial protocol ports EMI filtered |
| **USB** | 1x Universal Serial Bus port – B type EMI filtered |
| **Ethernet Port and Parser ASCII protocol** | Ethernet port by option, over RJ45 connector with web server interface. |

## COMPARISON TABLE

| *General Features* | Falcon 3i | Falcon VS | Falcon XT | Note |
|---|---|---|---|---|
| Price List / MSRP | | | | |
| | | | | |
| Audio processor band management | 4 | 5 | 5 | |
| Audio process architecture | 24Bit-120Mhz DSP-Based audio process | | | |
| Stereo Generator – MPX Encoder | ✓ | ✓ | ✓ | |
| RDS Encoder | *by option* | *by option* | *by option* | |
| | | | | |
| ***Input and Output*** | | | | |
| Analog XLR In/Out | ✓ | ✓ | ✓ | |
| Digital AES/EBU XLR In/Out | ✓ | ✓ | ✓ | |
| 2 BNC MPX Out and 2 BNC AUX IN | ✓ | ✓ | ✓ | |
| Hardware bypass I/O XLR/XLR–BNC/BNC | ✓ | ✓ | ✓ | |
| MPX Split Mode | ✓ | ✓ | ✓ | |
| | | | | |
| ***Audio Management*** | | | | |
| Band management | 4 | 5 | 5 | |
| 3-Band Equalizer | ✓ | ✓ | ✓ | |
| Remote preset changer | ✓ | ✓ | ✓ | |
| Final Limiter Drive | ✓ | ✓ | ✓ | |
| Test tone generator | ✓ | ✓ | ✓ | |
| Brilliance control | ✓ | ✓ | ✓ | |
| Double band AGC (LO/HI) | ✓ | ✓ | ✓ | |
| AGC control | ✓ | ✓ | ✓ | |
| AGC *power control* | - | ✓ | ✓ | |
| Audio Fault input changeover | - | ✓ | ✓ | |
| MPX ITU-R BS.412 Control | - | ✓ | ✓ | |
| Stereo Enhancer | - | ✓ | ✓ | |
| Limiter LookAhead mode | - | ✓ | ✓ | |
| Expander *(noise reduction)* | - | ✓ | ✓ | |
| Overdrive *power control* | - | ✓ | ✓ | |
| Super Bass *control* | - | ✓ | ✓ | |
| Super Bass Harmonizer | - | - | ✓ | |
| Final Main Band Limiter Drive | - | - | ✓ | |
| Final Low Band Limiter drive | - | - | ✓ | |
| Preset clock-based manager | - | - | ✓ | |
| | | | | |
| ***Remote Control*** | | | | |
| GPIO Connector – Type | SubD 15p HD - 4x GP In opto coupled, 4x GP Out Open Collector opto isolated | | | |
| USB | 1x USB – B Type EMI Filtered | | | |
| Serial | 1x Rs232 EMI Filtered | | | |
| Software Remoter | ✓ | ✓ | ✓ | |
| Ethernet Port /Web Server | - | *by option* | ✓ | |
| Parser ASCII protocol via TCP/IP UDP/IP | - | *by option* | ✓ | |