



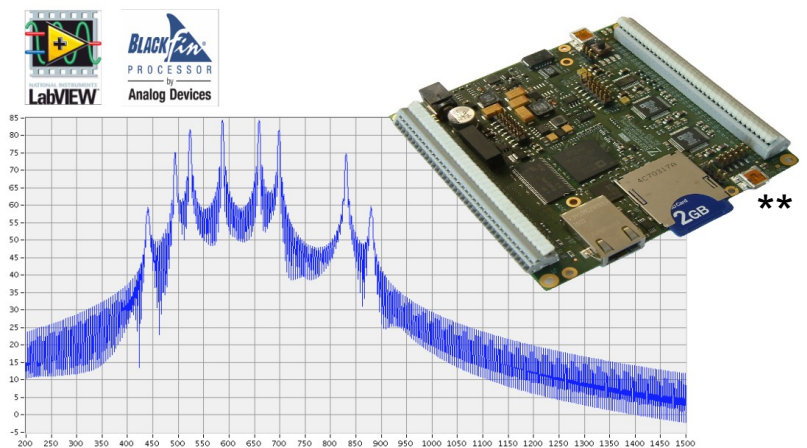
Datasheet ZSV

Preliminary

Industrial Platform For Embedded Sound & Vibration Monitoring

Based on many years of industrial experience with modular, low-power ZBrain systems, Schmid Engineering has created reference platforms for various application areas, including "Sound & Vibration", "Measurement, Control & Motion" and "High-Speed Signal Processing". These platforms can be used for development, proof of concept and rapid prototyping as well as for series production.

ZSV is a low-power, rugged mixed-signal module for standalone embedded systems in industrial environments. It provides onboard analog I/O, digital I/O and communication I/O for typical **audio, noise, vibration** and **machine condition** analysis applications. ZSV easily connects to **microphones, accelerometers, displacement probes** and **tachometers**. Built-in NI LabVIEW VIs help to streamline the application: **signal processing** (filtering, windowing, averaging), **time-domain analysis** (sound and vibration level measurements), **frequency-domain analysis** (power spectrum, frequency response, power-in-band, peak search, distortion) and **order analysis** (tachometer processing, order power spectrum, order tracking, order extraction). The platform is powered by a high performance ADI BF548 Blackfin Processor and easy to program using the high-level **NI LabVIEW™ Embedded Module** and the **ZBrain real-time system services**. Every board function can also be accessed with a "C" **Application Programming Interface (API)**, even in a preemptive multithreading environment such as VDK (**V**isual**D**SPP++ **K**ernel).



Custom specific platforms can be derived in the shortest of times by reducing or adding features/functions or creating individual form factors. Due to the low power consumption they can easily be scaled also for **battery supported systems**, handheld metering devices and rugged PLC platforms. Every generated platform will be supported by a consistent board support package (BSP).

- ▶ Check **Whitepaper "Pipeline Monitoring Through Sound"**
- ▶ Check **Flyer "Rapid Prototyping for Low Power Embedded Measurement, Control & Motion"**
- ▶ Check **ZReference Overview**
- ▶ Check **Datasheet reference platform ZMC**
- ▶ Check **Datasheet reference platform ZDSP**
- ▶ Check **Datasheet reference platform ZMobile**
- ▶ Check **ZBrain BSP for NI LabVIEW Datasheet for software details**
- ▶ Check **ZMobile Development Kit ZMDevkit Datasheet**

Key Features

- **Graphical programming with LabVIEW**
- **Out-Of-The-Box, ready to start**
- **High-level functions for every low-level board feature (Virtual Instruments, VI's)**
- **Fast debugging in graphical context**
- **Graphical preemptive multitasking**
- **Drag and drop embedded GUI**
- **C/C++ programmable**
- **Deterministic realtime services in [µs]**
- **Scalable power for mW/Battery operation**
- **Based on the ADI Blackfin® BF548 Processor**
- **All process I/O and data signals on rugged connectors**

Processor, Memory, Debugging

- Analog Devices Blackfin Processor BF548, 600 MHz 16/32 Bit RISC CPU
- 64 MB DDR SDRAM
- 16 MB Burst Flash, 2KB FRAM
- Highspeed USB JTAG Interface, FDM interface, Debug Agent interface (low-cost USB-ICE)
- 1x SD card interface, embedded file system

Analog Process I/O

- 4x Analog In, 24Bit, 2-100kHz, ±5V, synchronous sampling, selectable anti-aliasing filter, oversampling by 128, selectable coupling (ac,dc), IEPE current (2mA)

Digital Process I/O

- 6x 3.3-24V debounced switch button inputs
- 6x 24V/600mA open collector outputs
- 2x TTL impulse counting inputs
- 1x differential A/B encoder input
- 3x TTL PWM outputs
- 8x GPIO

User Interface

- 272 x 480 color TFT with resistive touch. Further displays on request.
- GUI programmable by drag & drop with LabVIEW Embedded front panels
- 1x main push button, 4x4 key matrix
- Wake up on touch

Communication

- 1x RS232, 1x TTL, 1x RS422/485, 1x TWI
- 1x 10/100 Ethernet with PHY
- 1x USB OTG, 1x USB Device
- 2x CAN

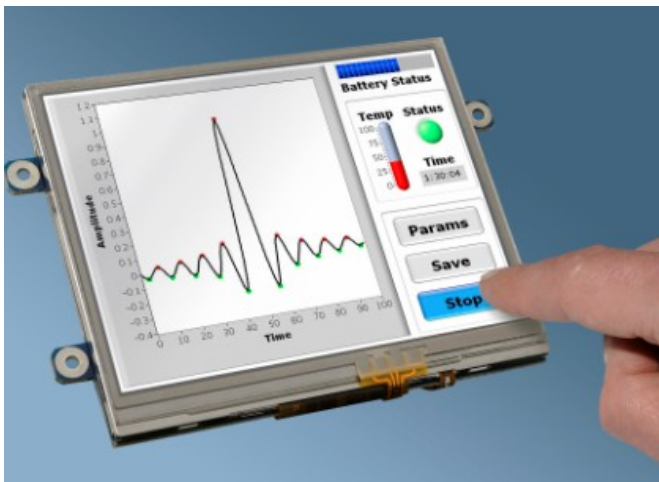
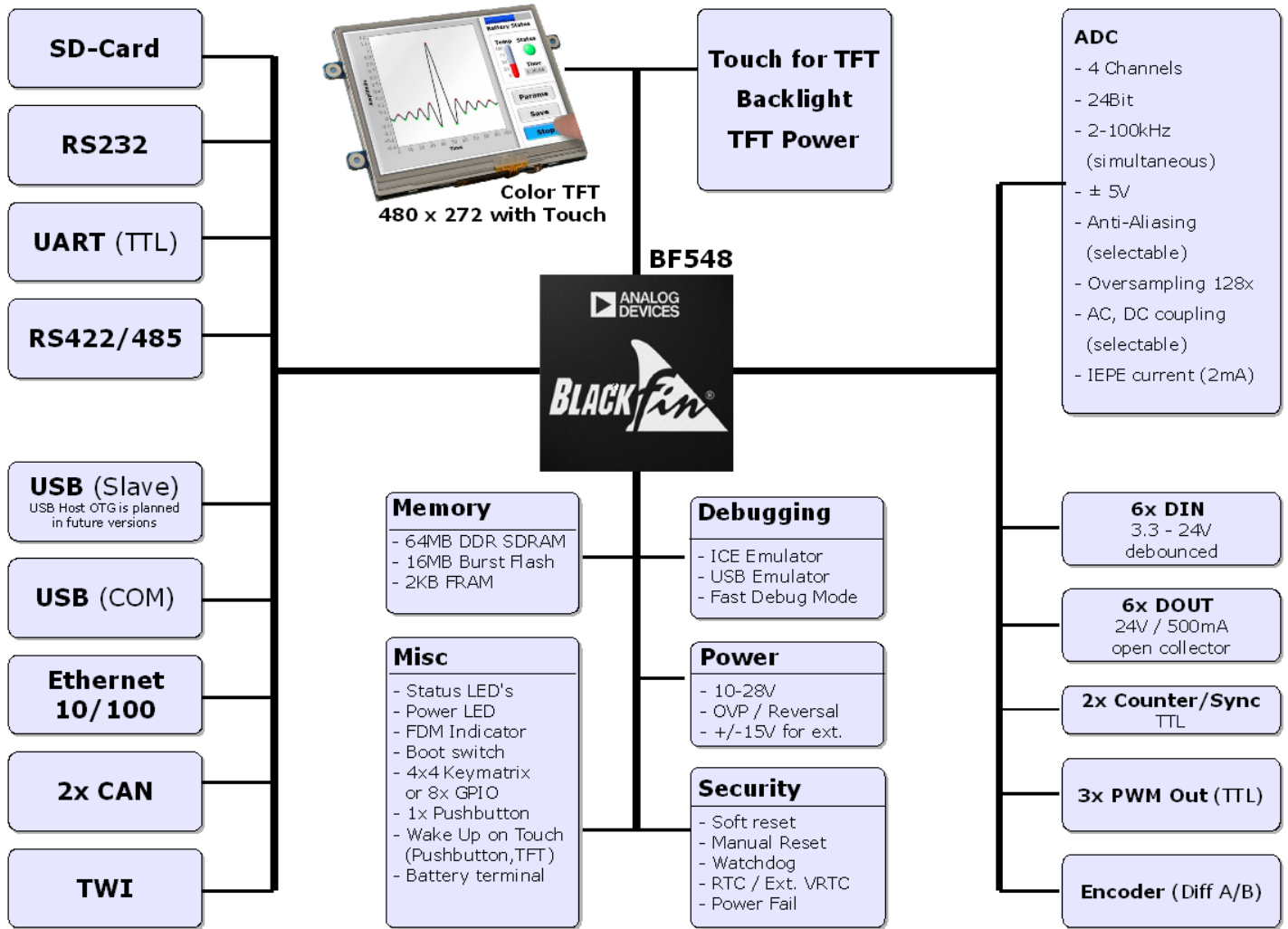
Power, Configuration & Safety

- 10-28 VDC power supply, OVP/reversal protection
- ± 15V for external analog bipolar supplies
- Battery terminal
- Power LED, Debug indicator LED
- Boot switch
- Soft reset, manual reset, watchdog
- RTC / Ext. VRTC supply
- Power fail

Characteristics

- Dimensions: 110 x 110mm
- Temperature range: -20...75°C, extended range on request.
- ROHS compliant
- 2 years product warranty

ZSV Hardware Block Diagram



Drag and Drop User Interface (GUI)

Creating Graphical User Interfaces (GUI) does not only entail an immense programming effort but also coordination with designers, marketing experts, customers, and end users. Everyone wants to have a say, wants changes and needs to be involved in the decision-making process. After a short introduction, each of the involved groups or persons can design, realize, and validate their suggestions themselves by combining graphical elements or instruments on this platform.

The LabVIEW front panel concept for embedded applications supports this process with easy to use faceplates.

The drag and drop feature allows the construction of a range of variants and strategies, from the simple process monitor to complex, multifaceted menus. User interfaces can comprise control elements, input fields, push buttons, slider controls and rotary switches, displays, line plots, speedometers, and bar graphs.

JPG pictures in different sizes yield very good results. They are made visible and positioned with VIs (Virtual Instruments). In this way, GUI prototypes or ergonomic graphics elements are designed on the PC with a normal drawing program and then loaded into the target system.

VIs evaluate the user entries which are processed as events by the program logic. Then the code is generated which gives the embedded CPU the entire control over the GUI. Compact color TFTs with touch functions are the interface