

EZ-ANC II Specifications

Software

The software for the EZ-ANC II includes firmware on EPROM's installed inside the controller enclosure and a Microsoft Windows interface that can operate on Windows 95/98, NT3.51, NT4.0 and W2000. The version of the software in the EPROM is test version 1.05 and the version of the Windows interface is test version 1.05b, which are released in June 2002.

Number of Channels

- 10 analog input channels (reference + error)
- 10 analog output channels
- 4 Reference signals (from software generated signals or from analog input channels)
- 9 Control signals
- Grouping of control signals and error signals, into control systems achieved using a 9×10 matrix
- Error and reference signals are defined as the weighted sum of analog input channels and signal generators

Adaptive Algorithms

Gradient descent feed-forward control

- Filtered-x LMS (FIR)
- Filtered-u LMS (IIR)

Control Filter Types

- FIR
- IIR

Maximum Tap Length for Control Filters

Depends on the number of channels used.

- For 1 error, 1 control and 1 reference signal, then a FIR filter with 1024 taps can be used.
- For a IIR filter, 512 forward taps and 512 backward taps can be used.
- For 9 error, 8 control and 1 reference signals, then a FIR filter with 128 taps can be used.
- For a IIR filter, 64 forward and 64 backwards tap can be used.

Adjustable Algorithm Parameters

- Convergence coefficient
- Leakage coefficient
- Cancellation path ID update rate

Cancellation Path System Identification

- Adaptive FIR model
- Cancellation Path Modelling Signal
 - Control signal
 - Pseudo random noise in the control signal or added to the feedback path in the IIR filter
 - Off-line using generator or primary noise signal

Adjustable Cancellation Path ID Parameters

- The maximum number of filter taps for the model depends on the number of channels used.
 - For 1 error, 1 control and 1 reference signal, then the maximum number of taps is 1024 for the Cancellation Path Model and 1024 for the Extended ID model
 - For 9 error, 8 control and 1 reference signal, then the maximum number of taps is 113 for the Cancellation Path Model and 113 for the Extended ID model
- Convergence coefficient
- Leakage coefficient

Sampling Rates

- The sampling rate range is from 86Hz to 32kHz.
- Hardware sampling rates are from 5.513kHz to 32kHz, in 10 steps.
- Sampling rates can be reduced in software by a factor of 8 or 64.

Input and Output Filtering

- The signals can be high pass, low pass and band pass filtered using software with 19 different filters from 1/3 to 1/100 the sampling rate. The software uses a FIR filter.

Analog Inputs

- Signal maximum is 1Vrms
- Software selectable input gain from 0dB to 22.5dB, in 16 steps.
- AC coupled inputs

Analog Outputs

- Signal maximum is 8Vp-p
- Factory set output maximum 1V rms (9dB attenuation)
- Software selectable output attenuation from 0dB to 94.5dB, in 64 steps.
- AC coupled outputs

Signal Generator

- 3 Sine wave generators
- 1 Pseudo-random noise generator
- Frequency range 0Hz to 2kHz
- Generator signal is the summation of the sine and pseudo random signal generators.

Saving Data

- System setup can be saved to disk or in FLASH EPROM

Signal Displays

- 2 Channel FFT analyzer
- 4 time plots
- 1 plot of filter weights
- All plots can be saved to or loaded from disk

Overflow Signals

Software display of over ranges in

- Input signals
- Cancellation path ID model
- Control output

Hardware

Digital Signal Processor

- **Main Processor**, Analog Devices 33MHz ADSP21062 floating point
- **Co-processor**, ADSP-2181 fixed point
- 2 Mbit (64K of 32 bit words) on chip memory
- 131K of 48 bit words external memory

Analog Inputs

- 10 analog inputs sampled simultaneously, using 5 Analog Devices AD1847 CODECs (also used for analog output)
- 1Vrms input range
- 16 bit precision
- software controlled input gain
- high input impedance
- switch selectable bias voltage for microphones
- BNC front panel connectors

Analog Outputs

- 10 analog outputs sampled simultaneously, using 5 Analog Devices AD1847 CODECs (also used for analog input)
- 8Vp-p output range
- 16 bit precision
- software controlled output attenuation
- low output impedance for driving power amplifiers
- BNC front panel connectors

Appendix: EZ-ANC II Specifications

Sampling Rate

- The sampling rate range is from 86Hz to 32kHz.
- Hardware sampling rates are from 5.513kHz to 32kHz, in 10 steps.
- Sampling rates can be reduced in software by a factor of 8 or 64.

Group Delay

- Minimum of 30 sample periods. However, this will be considerably less when the /8 and /64 software sample rate divisions are used.

Host Communication

- RS232 connector, 3 wire connection
- 19200 bps, 8 bit, no parity, 1 stop bit

Power Requirements

- Accepts 90V to 240V AC at 50Hz or 60Hz
- Less than 60 Watts power consumption
- IEC power cord connector
- Variable 10-30V DC power supply available as additional option

Size

- 450mm wide x 390mm deep x 90mm high

Weight

- 5.75 kg