

ATX 7006A

Data Converter Test System



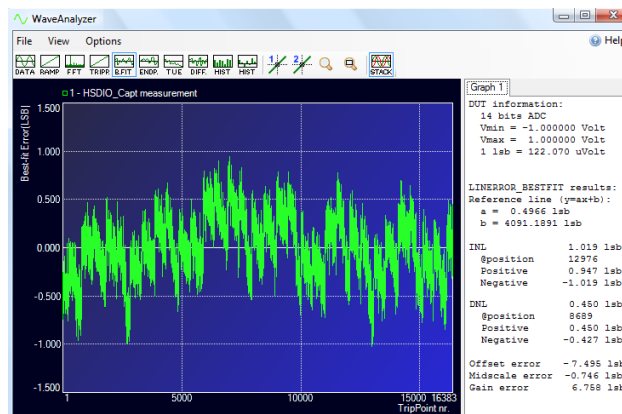
Features

- Fully integrated data converter test solution
- Sample rates from DC up to 200/400MHz
- Unsurpassed signal quality and accuracy
- Coherent measuring by default
- Flexible and versatile digital IO
- Extended Analysis software
- Static, Dynamic and Histogram testing
- Easy -user defined- test scripting

Very high Accuracy, Low Noise and Fast Sampling

The ATX7006A is a fully integrated solution for testing ADCs, DACs and other Analog functions. It combines very high accuracy, low noise and fast sampling with an exceptional ease of use. Traditionally data converters are tested using a whole stack of bench instruments, filters, switch matrices and user made software. Many engineering hours are needed to get re-

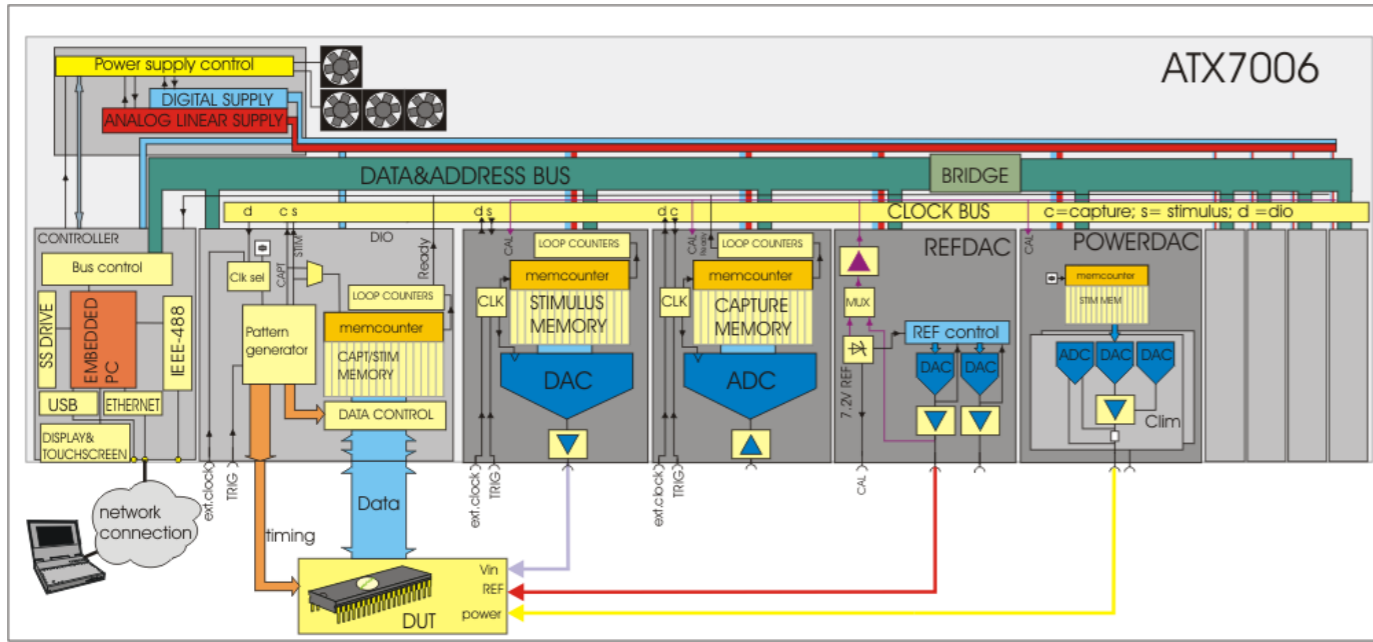
liable results. The ATX7006A is a single instrument for all your data converter testing and test methods. This means you can concentrate on testing your converters rather than fine-tuning the test set-up. The ATX7006A is capable of testing converters from 4 to 24-bit. Its versatile digital I/O makes interfacing to the DUT easy, even for embedded converters. The Single Reference Architecture improves the stability and reduces calibration effort. The backplane distributed clock ensures coherent measuring. The ATX7006A is also ideally suited as an add-on upgrade for ATE systems.



INL / DNL measurement of a 14-bit / 65Mps ADC

General

The ATX7006A is a modular system that can be configured according to the user's needs. The available Generator and Digitizer modules cover the range from low speed high accuracy testing to high



Block diagram

speed medium accuracy testing. Auxiliary modules provide all other signal needs like Reference voltages, Supply voltages, clocks and Digital IO. The ATX7006A measures linearity parameters just as easy as dynamic parameters, all within the same test set-up.

The system controller runs Windows™ embedded and gives the user full access to software features. For production style testing the ATX7006A can run as slave of an ATE system. For lab measurements a PC is used to control the measurement and display the results. There are three communication pos-

sibilities; Ethernet, GPIB and USB. The controller supports the Lua scripting language providing an easy way to add user defined test methods and calculation routines.

Performance

The ATX7006A has been designed with one important goal in mind: low system noise. It therefore has linear power supplies for the analog section and thorough Shielding and Grounding to maintain analog signal integrity even in a harsh production environment. The DIO module can provide a low

jitter sample clock that is distributed to all other modules and to the DUT.

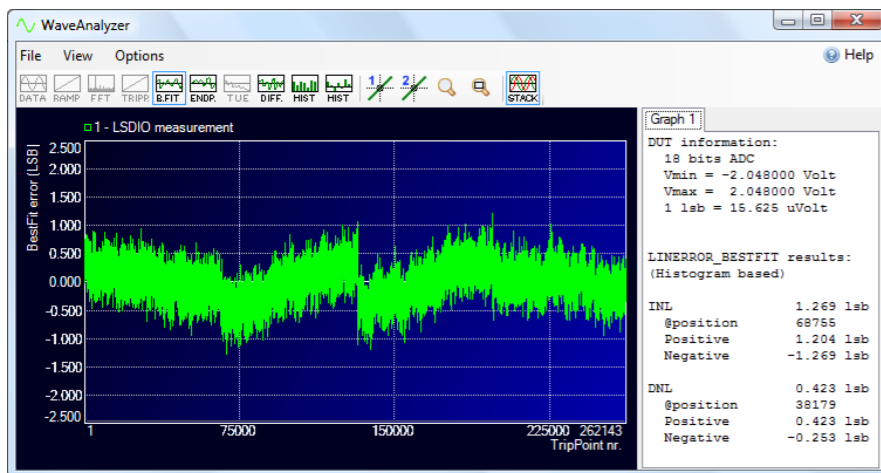
The 20- and 22-bit high accuracy Generator and Digitizer modules offer an outstanding DC accuracy in combination with better than 110dB dynamic performance at sample rates up to 2MSPs. The 16- and 18-bit modules allow testing up to 400MSPs. The ATX7006A features auto calibration and built-in self test.

Capabilities

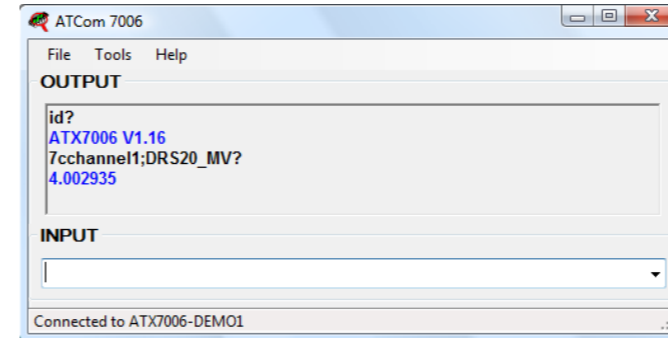
- Linearity**
 - Offset error, Gain error, Full scale error
 - INLE, DNLE, TUE, Transition noise (jitter)
- Dynamic**
 - SNR, SINAD, ENOB
 - THD, SFDR, Peak Spurious, PSRR

Software

The ATX7006A is a command driven system that can easily be controlled from almost any programming environment. With ATCom commands can be sent and results read. This allows testing command sequences before implementing them in software. LabView drivers are also available.



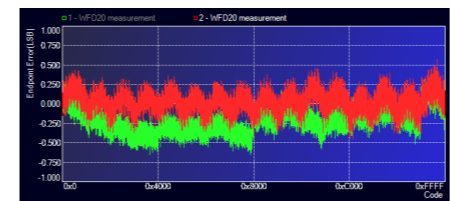
Linearity result of an 18-bit ADC using histogram testing.



Command level communication with the ATX7006A using ATCom (ID request and measure voltage at DRS channel1)

ATView

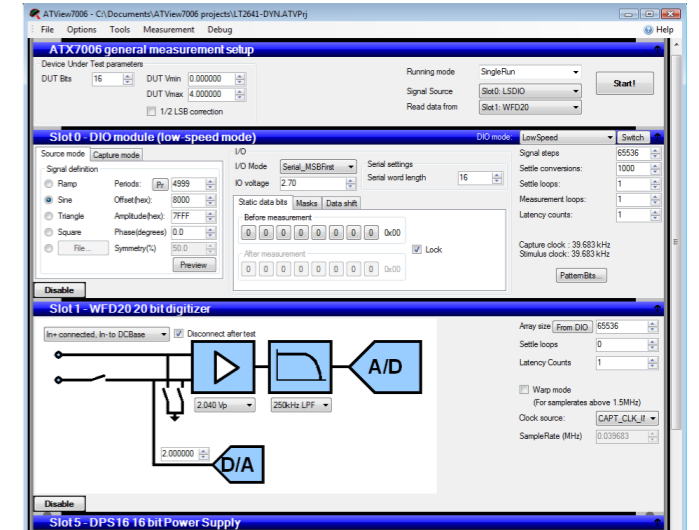
The ATX7006A comes with ATView, a sophisticated software package for configuring, programming and controlling the ATX7006A



Stacked linearity result of two different 16-bit DAC devices

and analyzing the results. Setting up a test is just a matter of filling in the fields of the instrument panels, program a digital pattern if applicable, and press the START button. After a test the results are viewed in the WaveAnalyzer. The WaveAnalyzer can show the results of time domain, frequency domain and histogram tests. Zoom, stack, and cursor functions are available at any level.

When saving test results all settings are included. So when reviewing the results later, there never has to be any doubt about the exact conditions. Results and settings are stored in human readable XML format which allows additional user processing. Export in



Example of ATView instrument panels

CVS format is possible and graphs can be saved in graphical format for easy importation into reports.

Test Methods

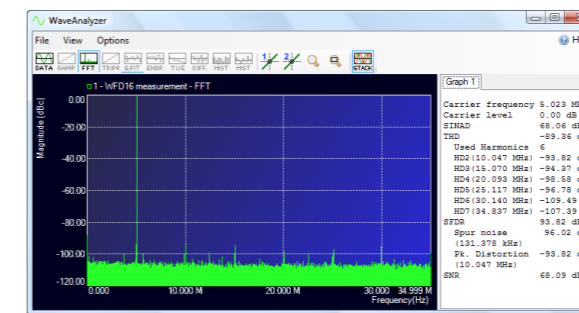
All standard data converter test methods are supported. Dynamic parameters are

measured with sine waves and the results can be analyzed in time domain as well as in frequency domain. Static parameters can be measured with direct ramp testing or with histogram testing. Histogram testing is supported for ramp, triangle and sine wave signals.

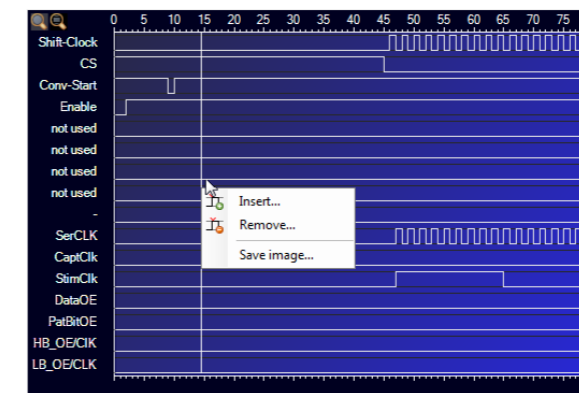
General specifications

- 19" Case Frame, 4U high, with integrated air cooling
- Power supplies, 115 / 230VAC
- Controller running Windows 10™ LTSP from SSD
- Ethernet, USB and GPIB communication ports
- Built-in signal generation
- Built-in error calculations for production testing
- ATView7006 Analysis software for Engineering and Qualification purposes (for Windows PC)

Standard configuration: Controller, AWG20, WFD20, Dual Ref. Source, Dual Power Supply and DIO module.



Dynamic result of a 14-bit/70MSPs ADC



Example of a digital pattern, editable with the mouse or a script.

Arbitrary Waveform Generator Boards

	AWG22 module	AWG20 module	AWG16 module	AWG18 module
Resolution / Update rate	22-bit / 2 Msps	20-bit / 2 Msps	16-bit / 400 Msps	18-bit / 300 Msps (600 Msps, 1.2 Gsps)
Pattern memory depth	4M-words	4M-words	8M-words	8M-words
Output ranges (Vpp, SE)	80 mV to 10.20 V in x2 steps	80 mV to 10.24 V in x2 steps	480 mVpp to 5.12 Vpp in 8 ranges	580 mVpp to 6.56 Vpp in 8 ranges
Absolute accuracy	±(25 µV + 8 ppm of range)	±(40 µV + 10 ppm of range)	±(500 µV+0.08 % of range)	±(300 µV+0.02 % of range)
Non Linearity (INL)	±3 ppm of range (1.5ppm typical)	±8 ppm of range (4ppm typical)	±0.003 % of range	±0.004 % of range
THD / SNR	-111 dB / 97 dB (@ f-out = 1 kHz)	-108 dB / 92 dB (@ f-out = 1 kHz)	-87 dB / 70 dB (@1 MHz)	-99 dB / 73 dB (@10 MHz)

Waveform Digitizer Boards

	WFD22 module	WFD20 module	WFD16 module
Resolution / Sample rate	2-bit / 1Msps	20-bit / 2 Msps	16-bit / 180 Msps
Capture memory depth	32M-words	4M-words	8M-words
Input ranges (Vpp)	0.425 V to 10.20 V in 10 ranges	0.544 V to 8.16 V in 8 ranges	0.512 V to 7.688 V in 16 ranges
Absolute accuracy	±(25 µV + 10 ppm of range)	±(40 µV + 10 ppm of range)	±(800 µV + 0.1 % of range)
Non Linearity (INL)	±3 ppm of range (1.5 ppm typical)	±8 ppm of range (3 ppm typical)	±0.006 % of range
THD / SNR	-115 dB / 99 dB (@ f-in = 1 kHz)	-110 dB / 93 dB (@ f-in = 1 kHz)	-89 dB / 70 dB (@ 1 MHz)

DC-Source and Power Supply Boards

	DRS20 module	DPS16 module
Outputs/ res./ settl.	2ch. / 20-bit / 20ms	2ch. / 16-bit / 10ms
Output range/config.	±10V / 2 or 4-wire	±12V / 2 or 4 wire
Accuracy	±(25µV+10ppm.Vo)	±(4mV+0.2%.Vout)
Noise (DC- 100kHz)	5µVrms (typical)	18µVrms (typical)
Output current	10mA	200mA
Voltage readback	24-bit (DVM function)	16-bit (volt¤t)
V-out modulation	n.a.	1mHz - 1kHz

Multimode Source / Capture Boards

	DIO & DIOII module
Data In- Outputs	20/24-bit, parallel, byte-byte, serial
Capture & Stimuli memory	8Mword x 16 or 4Mword x 24 bits
Max. data&clock rate	50MHz LS mode / 200MHz HS mode
DIOII max. clock rate	600MHz on backplane / 1GHz front
Digital I/O levels	1.2V - 3.3/5V CMOS & LVDS
Clock jitter (DIOII)	190fs (typical@100MHz)