

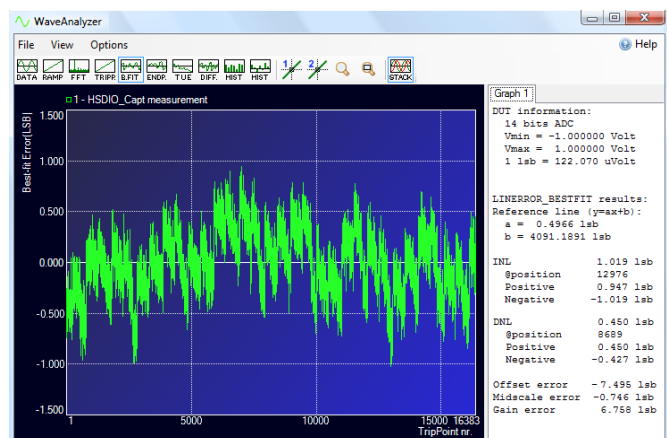
ATX7006 data converter test system



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 included
- Static, Dynamic and Histogram testing
- Lua script for easy user test implementation

The ATX7006 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 reliable results. The ATX7006 is a single instrument for all your data converter testing and test methods.



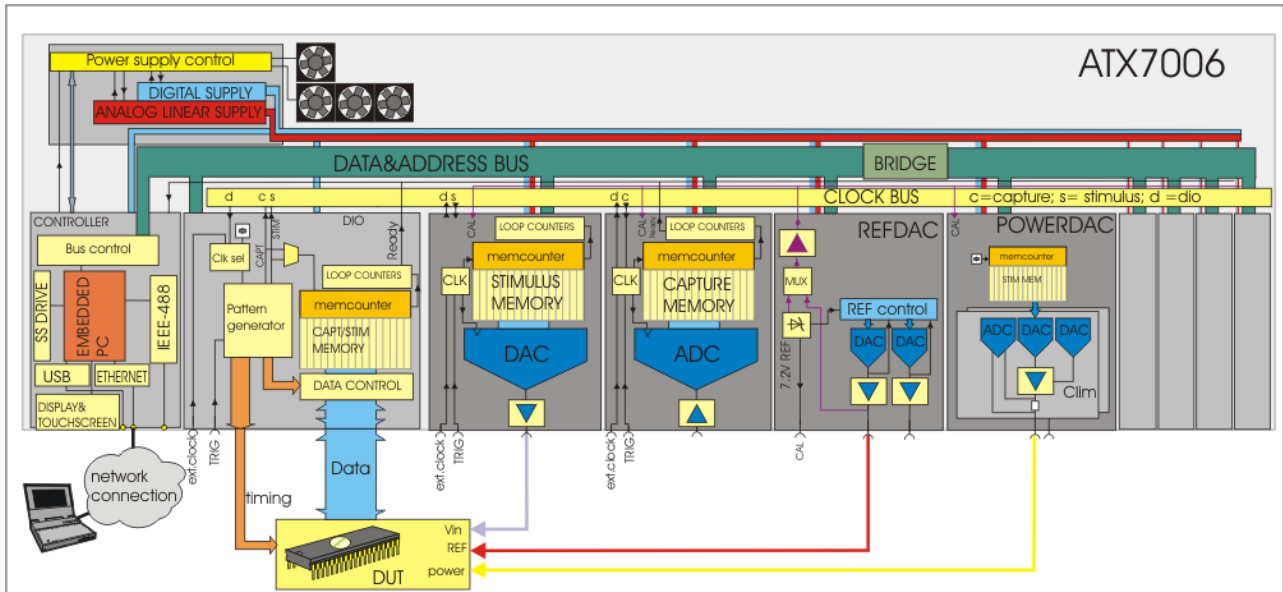
INL / DNL measurement of a 14-bit / 65Msps ADC

This means you can concentrate on testing your converters rather than fine-tuning the test set-up. The ATX7006 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 ATX7006 is also very suitable as an add-on upgrade for ATE systems.

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Block Diagram



General:

The ATX7006 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 speed medium accuracy testing. Auxiliary modules provide all other signal needs like Reference voltages, Supply voltages, clocks and Digital IO. The ATX7006 measures linearity parameters just as easy as dynamic parameters, all within the same test set-up.

The system controller runs Windows™ XP-embedded and gives the user full access to software features. For production style testing the ATX7006 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 possibilities; 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 ATX7006 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 standard 20-bit Generator and Digitizer modules offer an outstanding DC accuracy in combination with better than 106dB dynamic performance at sample rates up to 2MSPs. The 16-bit modules allow testing up to 400MSPs. The ATX7006 features auto calibration and built-in self test.

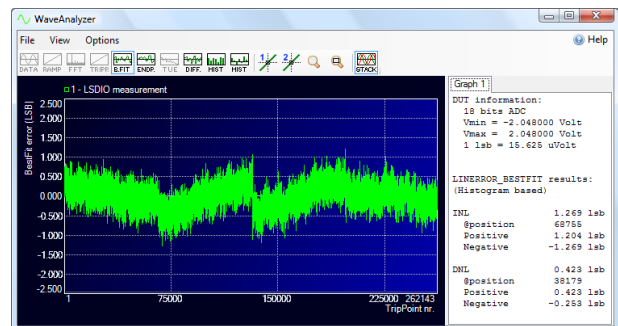
Capabilities:

Linearity

- Offset error, Gain error, Full scale error
- INLE, DNLE, TUE, Transition noise (jitter)

Dynamic

- SNR, SINAD, ENOB
- THD, SFDR, Peak Spurious, PSRR

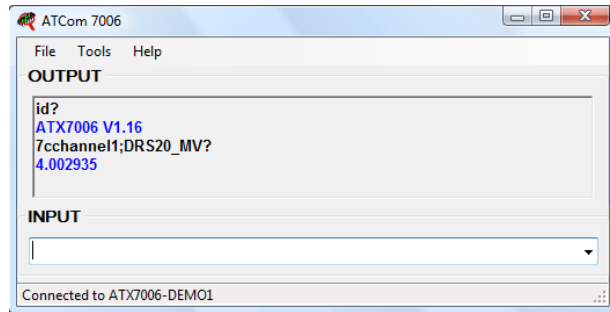


Linearity result of an 18-bit ADC using histogram testing.

ATX7006 data converter test system

Software:

The ATX7006 is a command driven system that can easily be controlled from almost any programming environment.

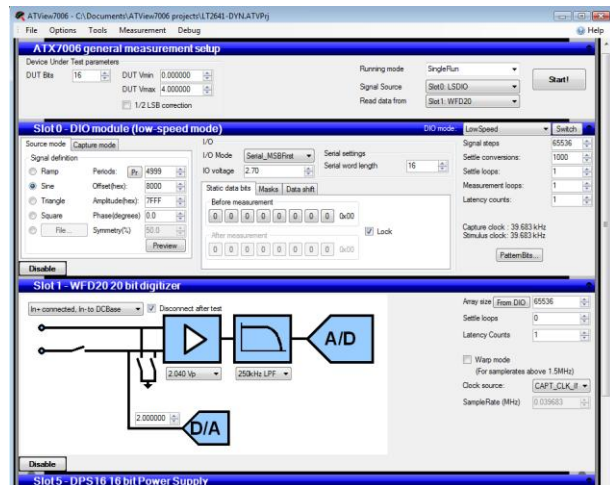


Command level communication with the ATX7006 using ATCom (ID request and measure voltage at DRS channel1)

With ATCom commands can be sent and results read. This allows testing command sequences before implementing them in software. LabView drivers are also available.

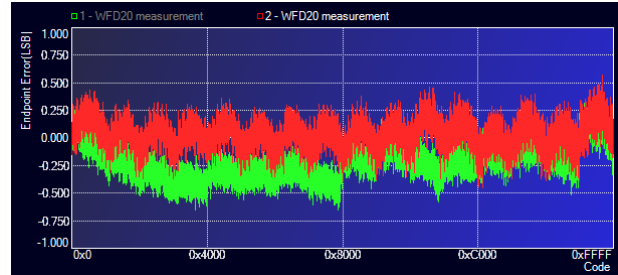
ATView:

The ATX7006 comes with ATView, a sophisticated software package for configuring, programming and controlling the ATX7006 and analyzing the results.



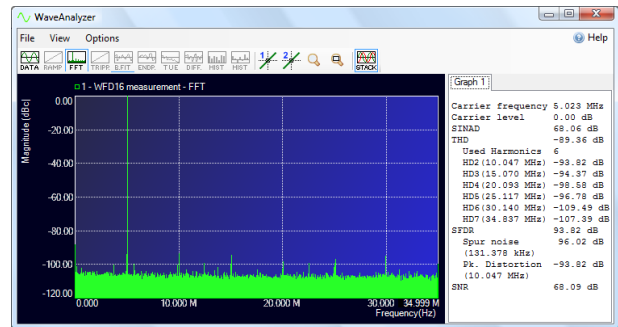
Example of ATView instrument panels

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.



Stacked linearity result of two different 16-bit DAC devices

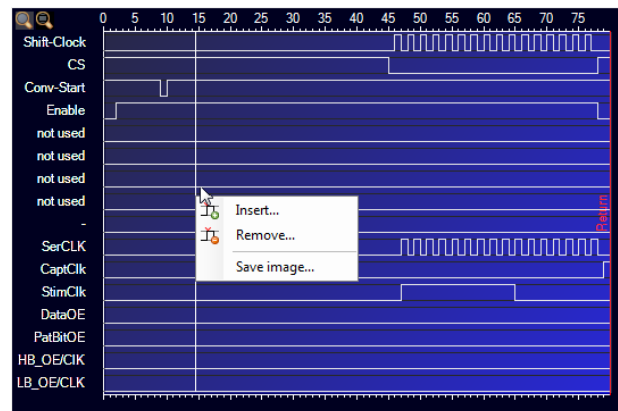
When saving test results all settings are included. So when reviewing the results later, there never has to be any doubt about the exact conditions. Results and settings are stored in human readable XML format which allows easy user processing. Export in CVS format is possible and graphs can be saved in graphical format for easy importation into reports.



Dynamic result of a 14-bit/70Mps ADC

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.



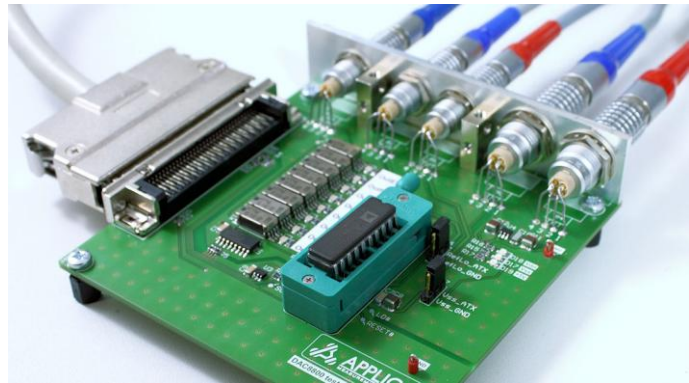
Example of a digital pattern, editable with the mouse or a script.

ATX7006 data converter test system

General specifications:

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

Standard configuration: 20-bit AWG, 20-bit WFD, Dual Ref. Source, Dual Power Supply and the Digital-IO module.



Test fixture with 5 analog signal connections.

Summary of modules specifications:

AWG20 module

Resolution	20-bit
Update rate (max.)	2Msps
Pattern depth	4M-words
Output ranges (Vpp, SE)	80mV to 10.24V in x2 steps
Common mode voltage	-5V to + 5V (20-bit resolution)
Output configuration	Differential, Single Ended, 50Ω
Output filters	None, 200kHz, 40kHz, 12kHz, 1.2kHz
Absolute accuracy	±(40μV + 10ppm of range)
Non Linearity	±8ppm of range (4ppm typical)
SNR (1kHz, 5Vpp)	92dB (BW= DC-800kHz)
THD (1kHz, 5Vpp)	-108dB (-115dB with 1.2kHz filter on)
THD (10kHz, 5Vpp)	-106dB
SFDR (1kHz, 5Vpp, 1.67Ms)	108dB (no filter)

AWG16 module

Resolution	16-bit
Update rate (max.)	200Msps DIO clk/400Msps ext. clk
Pattern depth	8M-words
Output ranges Single Ended	480mVpp to 5.12Vpp in 8 ranges
Output ranges Differential	960mVpp to 10.24Vpp in 8 ranges
Common mode voltage	-2.56 to +2.56V (16-bit resolution)
Output configuration	Differential or single ended, 50Ω
Output filters	None, 60MHz, 30MHz, 15MHz
Absolute accuracy	±(500μV+0.08% of range)
SNR (fs=200Ms, fout=1MHz)	70dB (BW DC-100MHz)
THD (fs=200Ms, fout=1MHz)	-87dB
SFDR (fs=200Ms, fout=1MHz)	88dB

WFD20 module

Resolution	20-bit
Sample rate (max.)	2Msps
Capture memory	4M-words
Input ranges (Vpp)	0.544V to 8.16V in 8 ranges
DC offset voltage	-5V to + 5V (19-bit resolution)
Input configuration	differential or single, 100MΩ / 35pF
Input filters	Bypass, 800kHz, 250kHz, 40kHz
Non Linearity	±(40μV + 10ppm of range)
Relative accuracy (INL)	±8ppm of range (3ppm typical)
SNR (1kHz, 5Vpp)	93dB (BW= DC-800kHz)
THD (1kHz, 2Vpp)	-110dB
THD (10kHz, 2Vpp)	-106dB
SFDR (1kHz, 2Vpp, 1.67Ms)	108dB (no filter)

WFD16 module

Resolution	16-bit
Sample rate (max.)	180Msps
Capture memory	8M-words
Input ranges	0.512Vpp to 7.688Vpp in 16 ranges
Input impedance	50Ω or 10kΩ/25pF
Input configuration	Differential/single ended, AC/DC
Input filters	Bypass, 60MHz, 30MHz, 15MHz
Absolute accuracy	±(800μV+0.1% of range)
Non Linearity	±0.006 of range
SNR (fs=160Ms, fout=1MHz)	70dB (BW DC-80MHz)
THD (fs=160Ms, fout=1MHz)	-89dB
SFDR (fs=160Ms, fout=1MHz)	90dB

Dual Reference Source		Dual Power Supply	
No. of outputs	2	2	
Resolution	20-bit	16-bit	
Settling time	20ms	10ms	
Output configuration	2 or 4-wire	2 or 4 wire	
Output range	±10V	±12V	
Accuracy	±(25μV+10ppm.Vo)	±(4mV+0.2%.Vout)	
Noise (DC- 100kHz)	5μVrms (typical)	18μVrms (typical)	
Output current	10mA	200mA	
Current limit range	n.a.	10mA - 200mA	
Voltage readback	24-bit (DVM function)	16-bit (volt¤t)	
V-out modulation	n.a.	1mHz - 1kHz	

Digital-IO module

Data In- Outputs	20-bit parallel, 24-bit serial
Data IO Formats	parallel, byte by byte, serial
Capture / Stimuli memory	4Mword x 24 bits
Maximum data rate	50MHz (low speed mode)
Pattern generator	100MHz, 64kword x 16 bits
Digital I/O levels	1.2V to 3.3V/5V CMOS.
<i>High Speed Mode:</i>	
Data source / capture rate	200MHz (max.)
External clock rate	400MHz (max.)
Capture / Stimuli memory	8Mword x 16 bits
Digital I/O levels	LVDS (or converter board)

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTIFICATION