Dual Arbitrary Waveform Generator ADS

Signal source of virtually unlimited flexibility, see also Application Software AWD-K1, IQSIM-K, DAB-K1

Photo 39395

Brief description

ADS is provided with two independently programmable synthesis channels. Thanks to its simple channel synchronization facility and precise phase setting, the ADS is ideal for generating complex signals.

ARB generators are essential tools for
- digital modulation,
- communications,
- navigation,
- automatic test equipment,
- component testing,
- audio and acoustics measurements,
- material testing,
- ultrasound measurements,
- filter design,
- video applications, control engineering,
- sensors and
- automotive engineering.

Complex modulation signals

The ADS is a high-precision signal source for driving I/Q modulators to produce digital modulation; it is particularly suitable for driving the I/Q modulator of Signal Generator SMIQ (page 133).

Main features

- Convenient editor functions for creating user-programmable waveforms, ARB sequences and ARB sweeps
- 12-bit amplitude resolution
- 64-Kpoints waveform memory per channel
- Sine synthesis with high spectral purity (0.1 Hz to 5 MHz)
- Generation of triangular waves with high linearity (0.1 Hz to 100 kHz)
- User-programmable frequency sweep
- ARB sequence mode for generating signals with extremely long periods
- Nonvolatile memory for storing 20 instrument setups as well as up to 99 ARB signals, ARB sequences and ARB sweeps
- Memory card for waveform libraries

Overview of options and software

See catalog "Test and Measurement Products"

Spectral purity

The low distortion (typ. −70 dB) and a frequency response of typ. 0.1 dB allow precise audio measurements. The high spectral purity close to the carrier throughout the entire sinewave frequency range enables testing of fast, high-resolution A/D converters.

Trigger functions

A variety of trigger functions (SINGLE, GATE, RESET, HOLD and HOLD/RESET in ARB mode, SINGLE and STEP in sequence mode) is provided for control of signal generation. In the sine mode, the modulation modes FSK (frequency shift keying), PSK (phase shift keying) and PM (pulse modulation) can be selected in addition to the trigger functions HOLD and HOLD/RESET. Triggering can be carried out with

Designation, functions	Type
Clock Generator: resolution improved by a factor of 4000 to further enhance the accuracy of setting the period of ARB signals	ADS-B1
Software: for generating complex waveforms	AWD-K1
Software: for generating I/Q signals for any digital modulation modes	IQSIM-K
Software: for generating COFDM signals	DAB-K1

the internal trigger generator, through an external source or manually.

Operation

Waveform editor
This is a highly convenient tool for synthesis and modification of any waveform or application-specific sweep. The complete waveform library stored by the user in the internal memory can be accessed and is available for editing.

Sequence mode
In this mode, ARB signals can be joined up to a continuous programmed sequence. By assigning a repetition rate to any element in the sequence, it is possible to create sequences that use a fraction of the memory capacity required for conventional ARB synthesis. Each element in the sequence can be assigned an individual read clock frequency; in this way, expanded ARB signals can be included in the sequence. The SEQ editor which is similar to the ARB editor is used for programming and modifying ARB sequences.

Specifications in brief

Specifications apply to both synthesis channels of ADS

Signal output

Output voltage (AC), EMF	0 to 20 V pp, $I_{max} = \pm100$ mA, 0 to 10 V into 50 Ω
DC offset setting range	-5 to $+5$ V into 50 Ω

Sine	0.1 Hz to 5 MHz
Triangle	0.1 Hz to 100 kHz
Phase setting range	CH1/CH2 $-180°$ to $+180°$

Trigger modes

Frequency shift keying (FSK)	phase-continuous
Phase shift keying (PSK)	setting range $-180°$ to $+180°$
Pulse modulation (PM)	
Reset (RESET)	triggered phase reset to 0°
Hold	triggered stop
Hold/Reset (HD/RS)	triggered stop and reset

Sweep mode
Digital, user-programmable frequency and phase sweeps, triggered internally, externally or manually

User-programmable waveforms

Length	2 to 65536 points, composite ARB sequences
Amplitude resolution	12 bits
Clock source (CLK)	
internal	400 Hz to 25 MHz
with ADS-B1	200 Hz to 33 MHz
external	DC to 33 MHz

Filters

	(DC) 400 Hz to 33.33 MHz
3rd-order Bessel filters, modified	10 kHz, 100 kHz, 1 MHz, 2.5 MHz
7th-order Chebychev filters, modified	500 kHz, 5 MHz

ARB sequences

Sequence length	2 to 8192 ARB curves
Repetition rate for single curves	1 to 65535, programmable
Expansion factor	(1 to 65535) x clock period, programmable for each ARB curve

Operating modes

Continuous mode	CONT
Trigger modes	SINGLE, STEP
Trigger mode	trigger source internal, external, manual

Internal triggering

	HCT/TTL-compatible, 50 Ω
Trigger period	1 μs to 2000 s
On/off ratio	adjustable, 1:6500 to 6500:1
Resolution, ON/OFF time	min. 500 ns

External triggering

Input impedance	50 Ω/600 Ω, selectable
Trigger threshold	0.2 V/2.0 V, selectable
Trigger edge	up/down selectable
Trigger state	active LOW/HIGH selectable
Frequency	DC to 25 MHz

Memory

	320 Kbyte, nonvolatile
Memory card	128 Kbyte

Clock generator (option ADS-B1)

Read frequency	200 points/s to 33.33 Mpoints/s
Resolution	0.01%, min. 10 ps
Reference frequency	
Input/output frequency	5 or 10 MHz, selectable

Remote control	IEC bus (IEEE 488.2), in line with SCPI

General data

Power supply	100/230 V $-10/+15$%, 120/220 V $-15/+10$%, 47 to 420 Hz, 150 VA
Dimensions (W x H x D)	435 mm x 192 mm x 350 mm
Weight	14 kg for fully equipped unit

Ordering information

Dual Arbitrary Waveform Generator	ADS	1012.4002.02
Option		
Clock Generator	ADS-B1	1013.5748.02
Extras		
Memory Card	CMS-Z2	0841.1509.02
Software for ARB Signals	AWD-K1	1026.4500.03
for I/Q Signals	IQSIM-K	1013.1642.02
for COFDM Signals	DAB-K1	1013.4649.02
Service Kit	ADS-Z2	1013.1494.02