

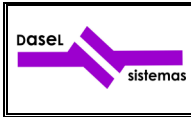
# Technical Datasheet

## AirScope TT



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Revision:	5
Revision Date:	04/05/2015



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## 1 CHANNELS

<b>Channels:</b>		
Emission channels	1 emission channel	
Reception channels	1 reception channel	

## 2 PULSER

<b>Pulser:</b>	Negative square wave pulse	
Excitation voltage	Programmable -20 V to -400 V	
Pulse width	Programmable from 200 ns to 25 $\mu$ s, with resolution of 5 ns	
Fall time	< 5 ns.	
Rise Time	< 15 ns.	
Pulse repetition frequency (PRF)	Up to 20 kHz	
Burst mode	Up to 256 consecutive pulses	

## 3 TRIGGER MODES

<b>Trigger Modes</b>		
Software Trigger.		
Internal PRF		
Encoder Trigger		
External Input Signal Trigger.		

## 4 TIME-GAIN COMPENSATION (TGC)

<b>Time-Gain-Compensation function (TGC)</b>		
Gain range	0 dB to 100 dB	
Time resolution	Programmable between 100 ns and 25.6 $\mu$ s, with resolution of 100 ns.	
Time range	Up to 105 ms depending on timing resolution.	

## 5 CONTROL SIGNALS

<b>Control Signals</b>	Trigger sources and I/O signals	
Encoder inputs	2 quadrature encoder inputs	
Input-Output	External trigger input, sync output	

## 6 RECEIVER

<b>Amplifier</b>	Wide-band and low-noise amplifier	
Gain	Programmable from 0 dB to 100 dB	
Bandwidth (-3 dB)	20 KHz to 2.5 MHz	
Input protection circuit	Active circuit with auto-blocking in emission and low impedance in reception.	
Maximum input signal	5 Vpp	
Input impedance	200 $\Omega$	

<b>Sampling (A/D Converter):</b>	Differential input A/D converters with LVDS output	
Resolution	14 bits	
Sampling frequency	25 MHz maximum, programmable from 24.4 MHz	

<b>Acquisition Modes:</b>	Pulse-echo, transmission. Each channel (connector) can be configured as emitter or receiver or emitter and receiver (pulse-echo).	
Automatic start of the acquisition with programmable threshold (echo-start)		
Acquisition depth	<p><b>1. Sampling frequency &lt; 25 MHz → 65.500 samples</b>            With a sampling frequency of 25 MHz, the maximum range is 2620 us (~786 mm in air)            With a sampling frequency of 20 MHz, the maximum range is 3275 us (~982 mm in air)            With a sampling frequency of 3 MHz, the maximum range is 21833 us (~6.5 m in air)</p> <p><b>2. With EMI Filter or Average → 20.480 samples with any sampling frequency</b></p>	
Start Delay (Inhibition Time)	Programmable up to 26 ms, with 100 ns of resolution	
Attenuator	Programmable 0 dB / - 20 dB	
Channel Cross-Talk	< -60 dB	

<b>Filters</b>		
Anti-aliasing Low-Pass Filter (2.5 MHz)		
Band-Pass Digital Filter (see section 7)		

## 7 SIGNAL PROCESSING

<b>Signal processing</b>	Real-time signal processing of acquired scan lines (Hardware Implemented)	
Band-Pass filter with programmable cutoff frequencies 64 coefficients FIR implementation. <ul style="list-style-type: none"> <li>- Constant response in the pass band (ripple &lt; 0.1 dB)</li> <li>- High attenuation in the stop band (typ. &gt; -50 dB)</li> </ul>	(1)	
Signed 16 bits format data		
Acquisition information data in real-time: A-scan, B-scan, peak position and amplitude (gates), encoders count		
3 hardware gates for the peak detection (Independent or linked): <ul style="list-style-type: none"> <li>- gate type → Detection of the maximum, the minimum, the positive edge or negative edge.</li> <li>- start / end gate → Programmable from the first acquired sample to the last acquired sample.</li> <li>- threshold gate → Programmable (0 to 100 % screen)</li> </ul>	(2)	
3 software for the peak detection (Independent or linked): <ul style="list-style-type: none"> <li>- gate type → Detection of the maximum, the minimum, the first peak over the threshold, the positive edge or negative edge.</li> <li>- start / end gate → Programmable from the first acquired sample to the last acquired sample.</li> <li>- threshold gate → Programmable (0 to 100 % screen)</li> </ul>	(3)	
Scan compression with Non-Peak-Loss compression algorithm, up to 128:1 compression rate.		
Programmable down-sampling factor from 1 to 1024 (equivalent sampling frequencies between 24.4 MHz and 25 MHz)		
Digital Envelope detection, implemented by Hilbert Transform.		
EMI Filter, 2 to 5 A-Scan signals <ul style="list-style-type: none"> <li>- <b>Removes, in real-time, the impulsive noise</b></li> <li>- <b>Improves flaw detection and reduces the production of false alarms</b></li> <li>- <b>Keeps a high dynamic range in noisy environments for C and D-scans</b></li> </ul>		
Average (2, 4, 8, 16, 32, 64, 128, 256)		

(1) The cut-off frequency resolution depends of the sampling frequency.

(2) When the gates are linked, the start time of the gates 2 and 3 depends on the peak detected by the gate 1.

(3) Software processing

## 8 OTHER SPECIFICATIONS

<b>Power consumption</b>	7 W max = 1100 mA (6 V), Loaded 50 Ω, PRF=5 KHz, pulse amplitude -400 V.	
<b>Power supply</b>	100 - 220 Volt 47- 63 Hz	
<b>Temperature range</b>	0 °C to 50 °C (Ambient)	
<b>Operative system</b>	Microsoft Windows 32/64 bits 7, VISTA / XP / 2000 / 98SE	
<b>Communication</b>	Ethernet 100 Mbit/s. TCP/IP y UDP/IP. Data Rate: >7 MBytes/s.	
<b>Internal Memory</b>	48 MB (24 Mega-Samples)	

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## 9 SOFTWARE

DASEL provides the "**UTView**" application to configure all the acquisition parameters, as well to show, save and load the A-Scan signals acquired by the system. This application also allows getting B-Scan and C-Scan images triggering with an encoder or an external signal.

All the data acquired with the "**UTView**" application can be loaded from MatLab, to make a post processing.

DASEL also provides a programming library to operate the system from MatLab, LabView, Python, Visual Studio, Borland C++, etc.

This library offers the functions set to configure all the acquisition parameters, and get the acquisition data.

The "**UTView**" application and the programming library are available to run in Windows 32/64 bits 7 / VISTA / XP / 2000 / 98SE.