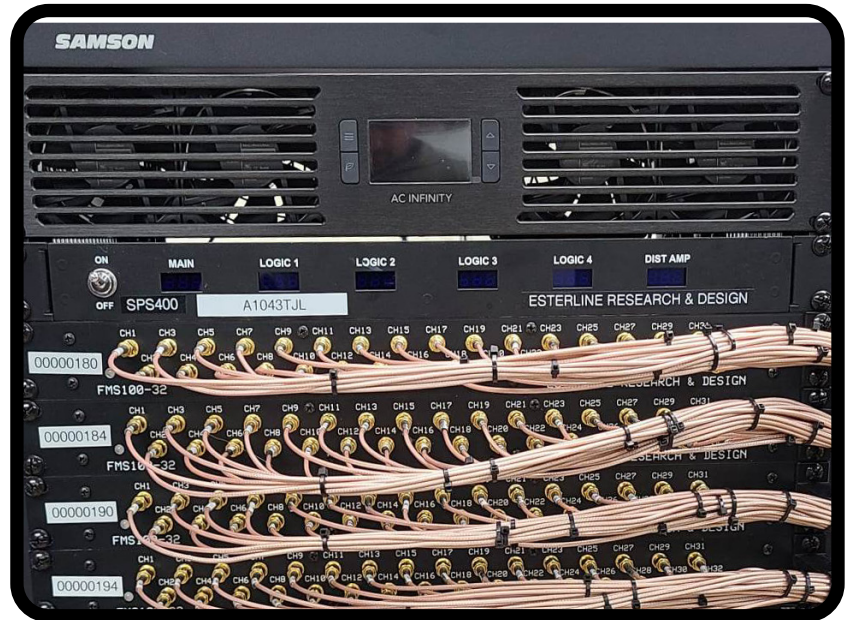


## FAS100 Frequency Acquisition System

Simultaneous data collection from all channels

### Key Features

- Simultaneous frequency acquisition across many channels
- Zero dead time readings
- Gate times of 10ms - 24 hours
- High channel-to-channel isolation
- Independent counter per channel
- Daisy-chainable up to thousands of channels
- Bandwidth up to 100 MHz
- DB25 digital I/O expansion port



### Applications

- Frequency acquisition for the characterization of system-level timebases such as: XO's, VCXO's, TCXO's, OCXO's, and Rubidium Frequency Standards
- Enables qualification of system clocks for timing applications including: GPS, Radar, Radios, Guided Munitions, SATCOM, Cellular Infrastructure, Stratum-Compliant Devices, SARSAT, Test Instrumentation, etc.
- Ideal for oscillator manufacturers to test frequency-based parameters at production volumes

### Functional Description

The FAS100 utilizes one or more FMS100-32 modules to perform parallel frequency measurements simultaneously and continuously. System power and data transmission are managed by an SPS400 module (master controller). Each SPS400 can manage up to four FMS100-32s. Multiple SPS400/FMS100-32 configurations can be daisy-chained for a substantial increase in overall system size.

The FMS module uses 32 independent reciprocal counters operating at 80MHz giving a native resolution of 12.5ppB per second. To increase measurement resolution and isolation, the module down-converts the inputs to provide an intermediate frequency (I.F.) to the counters. This method improves the resolution by the down-conversion factor.

The FMS100-32 contains a buffer that can temporarily store 128-1024 measurements per channel (depending on configuration) until retrieved by the PC. For aging systems that typically use 1-hour gate times, this is more than 5 days of readings. For short gate times, the PC must retrieve the measurements before the buffer fills, or measurements will be overwritten.

Each sequential group of four channels can be configured with a different gate time if desired. For example, in an aging system you might use 1-hour gate times for most units, but may want more data for experimental units, so you could configure those channels to take readings at a shorter gate time.

### Configurations

FAS100 test systems can be configured in a variety of permutations. Options for each system element are explained in detail below:

### Channel Count

- Each FMS module includes 32 channels and the total number can be increased in 32-channel increments.
- Each 128-channel increment necessitates an additional SPS400 master controller.

Channels	
DASH #	# of FMS100 Modules
32	1
64	2
96	3
128	4
160	5
192	6

Numbering continues in 32-channel increments.

The channel count in an FAS100 is tied to the number of FMS100 modules included in the system.

### RFS100 Rubidium Standard

Customers can choose to utilize their own 10MHz lab standard; however, ERD offers their own 2U RFS100 rubidium standard module.

For general purpose measurements, option B is likely sufficient.

For measurements requiring tighter ADEV constraints, we offer a more stable configuration in option C.

Inclusion of RFS100 rubidium standard	
DASH #	ADEV
A	NONE
B	$2 \cdot 10^{-11}$
C	$1 \cdot 10^{-12}$

### DFS100 Synthesizer Module

A DFS100 synthesizer provides an ultra-low-noise signal to mix against for measurements requiring a low noise floor.

PRO: Enables low-noise-floor measurements with orders of magnitude less jitter than the NCO

TRADEOFF: Unique mix-against frequencies are limited by the number of DFS100s in the system and can vary by no more than one synth per one 32-channel FMS100 module.

If no synthesizer is selected, the system utilizes the NCOs within the FMS module to generate the mix-against frequency.

PRO: enables a unique mix-against frequency for each set of 4 sequential channels.

TRADEOFF: Due to NCO jitter, this method is not sufficient for ADEV testing.

### Number of DFS100 modules

DASH #	Modules
00	0
01	1
02	2
03	3
04	4

Number of DFS100s cannot exceed number of FMS modules

### Fixturing Power Supply

ERD offers rack mount DC power supplies in a variety of output voltages and amperages.

Custom supply designs are available for those customer with specific requirements, including: voltage, current, connector type, front panel meters, etc.

The customer may choose to provide their own power supply and fixturing, using the FAS100 for frequency acquisition only.

### Fixturing Power Supply

DASH #	Configuration
A	NONE

Any letter other than A implies a customer-specific, custom power supply configuration specific to their application

### DUT Fixturing

The customer may choose to provide their own DUT fixturing, using the FAS100 for frequency acquisition only.

For customers who require DUT fixturing design, ERD offers options such as:

- Designed to meet customer package/pinout needs
- Channel Specific Programmable VCC
- Channel Specific Programmable EFC
- High resolution voltage/current measurements
- Programmable Power Supply Ramping
- Temperature sensors on each channel

DUT Fixturing	
DASH #	ppb/day
A	±1.0

Any number other than 00 implies a customer-specific, custom DUT fixturing platform specific to their application.

### Environmental Control Chamber

The customer may choose to provide their own environmental control chamber or forgo a chamber entirely for a room temperature test.

For applications requiring heat only, such as long-term aging, a burn-in chamber would be most appropriate.

For anything requiring cooling, such as frequency versus temperature testing, an environmental control chamber with a mechanical compressor is required.

Environmental Control Chamber	
DASH #	Type
A	NONE
B	Burn-In
C	Environmental

### Chamber Size

If the customer desires a chamber as part of the system, depending on number of channels and size of fixturing, ERD will select a chamber fit for purpose.

If the customer utilizes a particular brand or chamber that we do not support, ERD will still design the system to function with that particular chamber.

Chamber Size	
DASH #	CHAMBER
00	NONE

Any number other than 00 implies a customer-specific chamber size tailored to their specific application.

### Part Number Builder

**FMS100 - 32 - B - 01 - A - 00 - A - 0**

Channel Count	
DASH #	# of FMS100 Modules
32	1
64	2
96	3
128	4
160	5
192	6

Number of DFS100 modules	
DASH #	Modules
00	0
01	1
02	2
03	3
04	4

Inclusion of RFS100 rubidium standard	
DASH #	ADEV
A	NONE
B	$2 \times 10^{-11}$
C	$1 \times 10^{-12}$

Fixturing Power Supply	
DASH #	Configuration
A	NONE

Chamber Size	
DASH #	CHAMBER
00	NONE

Environmental Control Chamber	
DASH #	Type
A	NONE
B	Burn-In
C	Environmental

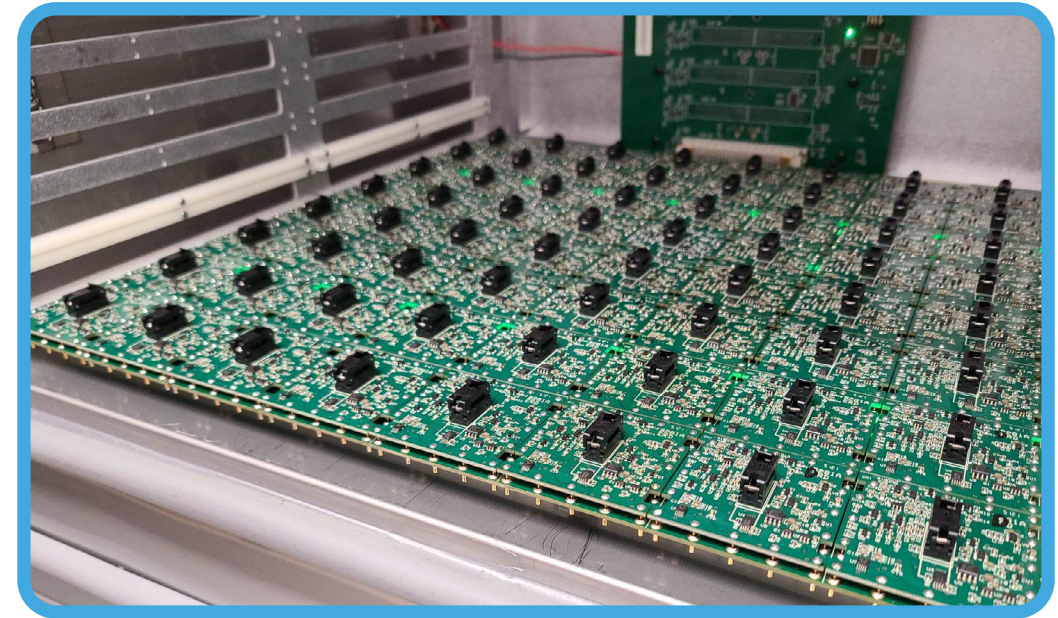
DUT Fixturing	
DASH #	Configuration
00	NONE

# Example Configurations

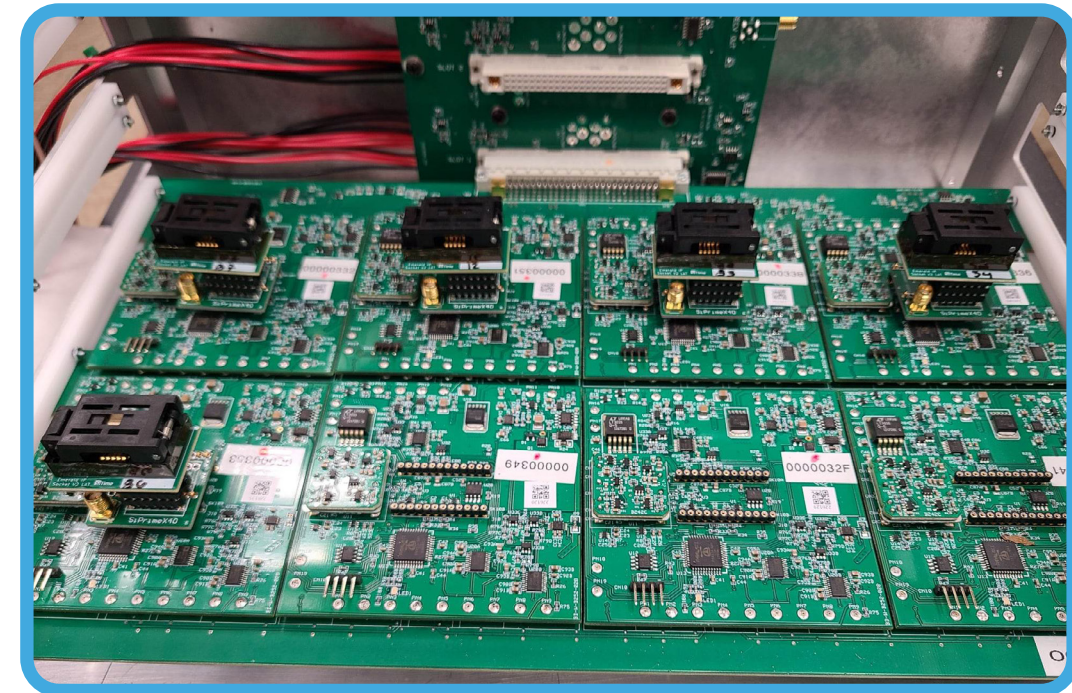
## 256-Channel TCXO Aging Systems:



## Custom DUT Fixturing:

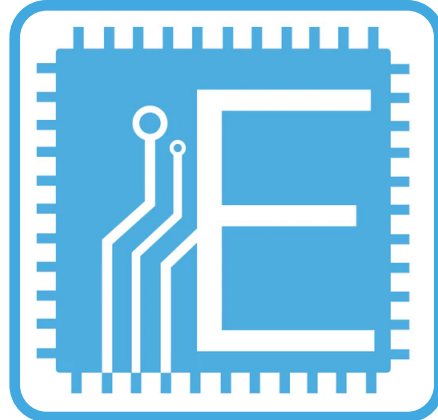
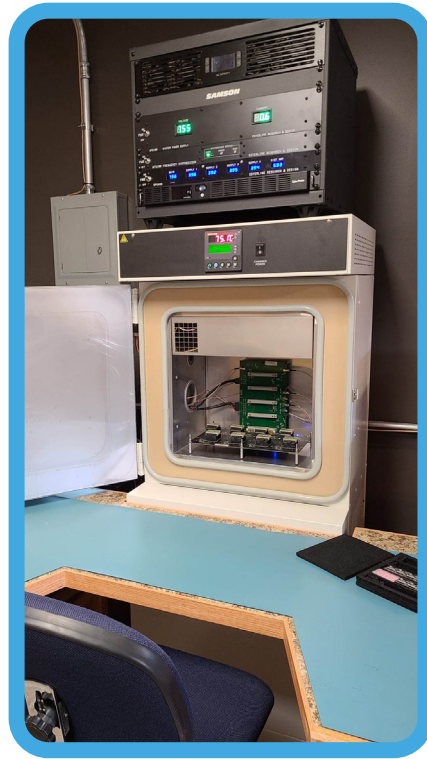


64-channel TCXO test card



8-channel OCXO test card

## Production Test System Examples:



**For sales inquiries, contact ERD at:**

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(717) 348-5326**