

- Automated, software based quartz crystal temperature test system for low frequency crystals
- Up to 2 disc pallets can be stacked
- Standard sizes available include:

TYPE	DISC CAPACITY	TOTAL CAPACITY/ PER CHAMBER
DST-520, DST-621	160	320
DMX-26, DMX-26-S	160	320
DMX-38	100	200
SM-26F-A, SM-26F-B	160	320
SM-14-J	160	320
Leaded	100	200

- Custom sizes available
- Typical watch crystal measurement time of only 2 seconds
- Measures over 75 different parameters



- Parameter and curve fit characteristics are checked against easy to define QC limits
- Crystals of different frequencies can be tested in a single temperature run
- All data is published in a *Microsoft Access*™ data base
- Data can be exported to *Microsoft Excel*™ for custom data analysis
- Printouts are generated using *Crystal Reports*™
- Dual chamber configuration available

SPECIFICATIONS

**150K Ohm Test Head
Frequency Range:**

10 KHz to 400 KHz

Frequency Correlation:

± 1 ppm* at series (typical)

Crystal Power:

1 nW to 1 uW into 20,000 Ohms

Temperature Stability:

± 0.1° C

* Proprietary measurement and calibration algorithms provide correlation to industry standard crystal measurement equipment.

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SYSTEM CONFIGURATION

- S&A 250B Network Analyzer
- S&A 2451 Switch controller (only required in dual chamber configuration)
- S&A 4220 Temperature Test Chamber (optional LCO₂ LN₂ or Mechanical Refrigeration Cooling)
- S&A 150K Ohm Test Head
- Computer Requirements: Minimum 500 MHz Pentium III, one full PCI slot with +5V & 3.3V power, and Windows 98
- Windows® System Software
- Printer (Optional)

SAMPLE REPORTS

Crystal Plots

Run Name: Crystal Test Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator: RMB
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 10-Nov-2001 8:37 am
 Run Finish: 10-Nov-2001 10:15 am
 S&A W2200 Rev: 1732

Crystal Condensed Plots

Run Name: Crystal Test Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator: RMB
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 10-Nov-2001 8:37 am
 Run Finish: 10-Nov-2001 10:15 am
 S&A W2200 Rev: 1732

Crystal Tabular

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 26-Oct-2001 4:51 pm
 Run Finish: 26-Oct-2001 6:34 pm
 S&A W2200 Rev: 1725

A001 <2a001> Setup: 12megw2 Ref F: 12,795,174 Hz		A002 <2a002> Setup: 12megw2 Ref F: 12,795,955 Hz		A003 <2a003> Setup: 12megw2 Ref F: 12,795,917 Hz		A004 <2a004> Setup: 12megw2 Ref F: 12,795,942 Hz		A005 <2a005> Setup: 12megw2 Ref F: 12,795,942 Hz			
°C	FR ppm	R	°C	FR ppm	R	°C	FR ppm	R	°C	FR ppm	R
25.01	0.00	4.92	25.03	0.00	18.71	25.02	0.00	12.39	25.01	0.00	11.97
0.01	0.01	5.13	0.01	8.08	21.44	0.00	3.28	12.96	-0.01	3.74	12.49
5.02	0.33	4.98	5.00	6.79	20.77	4.98	3.16	12.82	4.99	3.52	12.38
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00	2.94	12.39
15.02	0.50	5.03	15.01	3.80	19.81	15.00	3.07	13.68	15.00	3.33	13.33
20.00	0.36	5.02	20.00								
25.00	0.09	5.05	25.01	-0.01							
30.02	-0.12	5.04	30.01	-2.01							
34.99	-0.39	5.03	35.00	-3.01							
40.02	-0.55	5.04	40.02	-5.01							
45.03	-0.52	5.06	45.02	-7.01							
49.99	-0.20	5.00	49.99	-8.01							
54.99	0.33	4.98	55.00	-9.01							
59.99	1.33	5.05	59.99	-9.01							

Crystal Curvfit Summary

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 26-Oct-2001 4:51 pm
 Run Finish: 26-Oct-2001 6:34 pm
 S&A W2200 Rev: 1725

Crystal Curvfit Tabular

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 26-Oct-2001 4:51 pm
 Run Finish: 26-Oct-2001 6:34 pm
 S&A W2200 Rev: 1725

°C	FR ppm	Curve	Delta	°C	FR ppm	Curve	Delta
25.03	0.00	0.00	0.00	18.71	25.02	0.00	0.00
0.01	0.08	8.23	-0.16	21.44	0.00	3.28	3.14
5.00	6.79	6.98	-0.19	20.77	4.98	3.16	2.98
10.00	5.24	5.45	-0.22	20.39	10.00	2.69	2.54
15.00	3.80	3.74	-0.14	19.81	15.00	2.67	1.86
20.00	1.88	1.81	-0.23	19.39	20.00	1.16	0.99
25.01	-0.23	0.01	-0.24	19.12	25.01	0.17	0.00
30.01	-2.04	-1.98	-0.16	18.87	30.01	-0.83	-1.05
35.00	-3.89	-3.89	-0.21	18.70	35.01	-1.93	-2.11
40.02	-5.61	-5.68	-0.23	18.62	40.01	-2.94	-3.09
45.02	-7.04	-6.86	-0.18	18.66	45.00	-3.78	-3.93
49.99	-8.22	-8.09	-0.13	18.50	50.01	-4.94	-4.56
55.00	-9.15	-9.01	-0.14	18.25	55.01	-4.73	-4.80
59.99	1.33	1.24	0.09	5.05	59.99	-8.78	-8.56

Crystal Setup File Parameters

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Row A: Measured FL
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 Run Start: 26-Oct-2001 6:34 pm
 Run Finish: 26-Oct-2001 6:34 pm
 S&A W2200 Rev: 1725

Setup: 12megw2
 Reference F: 12,795,900 Hz
 CL: 0.00 pF
 Power: 100.00 mW
 Intra: 12.00 Ohms
 Measure: FR/T

STATUS	FR	CO	DR	Q	CL	L	PWR	TEMP	FR/T
10.0	3.0	25.0		13.0	13.00				
-10.0	2.8			12.0	11.00				

Delta	WCD	WCT	ANG1	ANG2
Ohms	ppm	Ohms	°	°
25.0				

A001	<2a001>	Pass	FR	Lo	Hi	AT	AT	AT	AT
0.2	-9.3	5.1	AT	0.60					
A002	<2a002>	Pass	4.3	2.7	16.7	54	12.3	12.55	134
3.5	0.2	21.4	AT	4.47					
A003	<2a003>	Pass	1.3	2.6	12.4	82	12.2	12.65	122
1.2	-0.2	11.9	AT	2.84					
A004	<2a004>	Pass	3.3	2.7	12.0	85	12.1	12.73	121
1.6	-0.2	11.0	AT	2.66					

Crystal Failures Only

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Row A: Measured FL
 Row B: Measured FL
 Row C: Measured FL
 Row D: Measured FL
 Run Start: 26-Oct-2001 6:34 pm
 Run Finish: 26-Oct-2001 6:34 pm
 S&A W2200 Rev: 1725

Crystal#	Serial#	Setup File Parameters	Crystal Data	Curvfit Parameter
A001	<2a001>	Full FR Low		

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