

- Automated software based quartz crystal temperature test system
- 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 published in a *Microsoft Access*™ data base and can be exported to *Microsoft Excel*™ for custom data analysis
- Crystal part number can be used to set complete measurement parameters, QC limits, temperature test points, and data printouts
- Printouts are generated using *Crystal Reports*®



- Accommodates two dual row test wheels with extended life test head contacts
- Easily loaded S&A proprietary sockets accept HC-45, HC-49, HC-43, HC-49US, HC-18, SMD and tubular type packages
- Typically holds 1016 devices per run

### SPECIFICATIONS

**250B-1 Frequency Range:**  
**250C Frequency Range:**

15 KHz to 220 MHz  
15 KHz to 500 MHz

**Frequency Correlation:**

± 1 ppm\* at series (typical)

**Crystal Power:**

1 nW to 1000 uW (1 MHz to 50 MHz)  
1 nW to 500 uW (>50 MHz to 200 MHz)

**Temperature Stability:**

± 0.1°

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

## Roditi International Corp. Ltd,

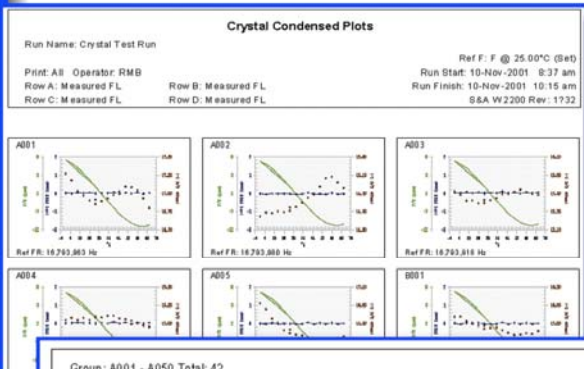
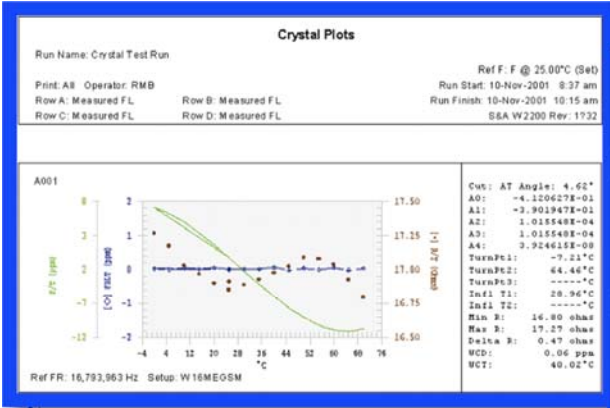
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# SYSTEM CONFIGURATION

- S&A 250B-1 or 250C Network Analyzer
- Two S&A 2451 Switch Controllers
- Two S&A 4220 Temperature Test Chambers (LCO<sub>2</sub>, LN<sub>2</sub>, or Mechanical Refrigeration Cooling)
- Two IEC-444 Pi-Network Test Heads

- **Windows<sup>®</sup>** based System Software
- **Printer (Optional)**
- **Computer Requirements:**  
Minimum 500 MHz Pentium III  
One full PCI slot with +3.3V & 5V power,  
**Windows 98<sup>®</sup>**

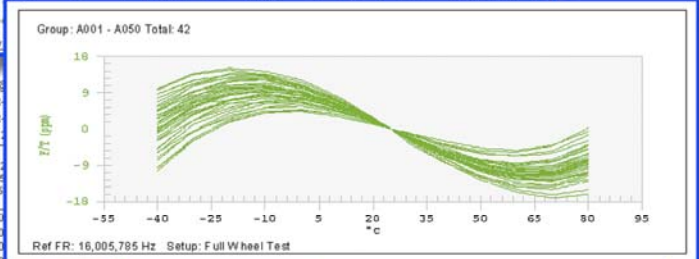
# SAMPLE REPORTS



Crystal Tabular

Run Name: Example Run	Ref F: F @ 25.00°C (Set)
Print: All Operator: RMB	Run Start: 26-Oct-2001 8:37 am
Row A: Measured FL	Run Finish: 26-Oct-2001 10:15 am
Row C: Measured FL	S&A W2200 Rev: 1732

A001 <2a001>	A002 <2a002>	A003 <2a003>	A004 <2a004>	A005 <2a005>								
Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 5								
Ref F: 12,795,174 Hz	Ref F: 12,795,955 Hz	Ref F: 12,795,917 Hz	Ref F: 12,795,942 Hz	Ref F: 5								
°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	25.00
0.01	0.01	5.13	0.01	0.00	21.44	0.00	3.28	12.96	-0.01	3.74	12.49	0.00
5.02	0.33	4.90	5.00	6.79	20.77	4.98	3.16	12.82	4.99	3.52	12.38	5.00
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00	2.94	12.39	9.99
15.02	0.50	5.03	15.01	3.60	10.81	15.00	3.07	13.68	14.99	3.33	13.33	14.99
20.00	0.36	5.02	20.00									
25.00	0.09	5.05	25.01	-0								
30.02	-0.12	5.04	30.01	-2								
34.99	-0.39	5.03	35.00	-3								
40.02	-0.55	5.04	40.02	-5								
45.03	-0.52	5.06	45.02	-7								
49.99	-0.20	5.00	49.99	-8								
54.99	0.33	4.98	55.00	-9								
59.99	1.33	5.05	59.99	-9								



Crystal Curvfit Summary

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

Crystal Curvfit Tabular

A002 <2a002>	A003 <2a003>
Setup: 12megw2	Setup: 12megw2
Angle: AT(4.47°)	Angle: AT(2.51°)
A0: -5.417392E-01	A0: -4.797002E-02
A1: -3.795108E-01	A1: -2.088013E-01
A2: 4.165318E-04	A2: -1.032948E-03
A3: 8.540013E-05	A3: 8.513240E-05
A4: -9.575956E-08	A4: 2.246727E-07
TurnP1: 1: -12.98	TurnP1: 0: 0.12
TurnP2: 2: 63.94	TurnP2: 2: 57.04
TurnP3: 3: 29.96	TurnP3: 3: 29.96
InfT 1: 29.96	InfT 1: 29.96
InfT 2: 29.96	InfT 2: 29.96
Max R: 12.96	Max R: 12.96
Min R: 11.77	Min R: 11.77
WCD: -0.16 ppm	WCD: -0.16 ppm
Delta T: 25.02 °C	Delta T: 25.02 °C
25.03 0.00 0.00 0.00 18.71 25.02 0.00 0.00 12.39	25.02 0.00 0.00 0.00 12.39
0.01 0.01 0.01 0.01 21.44 0.00 3.28 12.96	0.01 0.01 0.01 0.01 21.44
5.02 0.33 4.90 5.00 6.79 20.77 4.98 3.16 12.82	5.00 6.79 20.77 4.98 3.16 12.82
9.98 0.44 5.03 10.00 5.24 20.39 10.00 2.68 12.83	10.00 5.24 20.39 10.00 2.68 12.83
15.02 0.50 5.03 15.01 3.60 10.81 15.00 3.07 13.68	14.99 3.33 13.33 14.99 3.33 13.33
20.00 0.36 5.02 20.00	
25.00 0.09 5.05 25.01 -0	
30.02 -0.12 5.04 30.01 -2	
34.99 -0.39 5.03 35.00 -3	
40.02 -0.55 5.04 40.02 -5	
45.03 -0.52 5.06 45.02 -7	
49.99 -0.20 5.00 49.99 -8	
54.99 0.33 4.98 55.00 -9	
59.99 1.33 5.05 59.99 -9	

Crystal Setup File Parameters

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

STATUS	FR	CO	DR	Q	CL	L	PWR	TEMP	F/T
ppm	pF	Ohms	k	Ω	nH	nW	nW	°C	ppm
10.0	3.0	25.0		13.0	13.00				
-10.0	2.8			12.0	11.00				

Delta	WCD	K/F	CUT	ANG	Delta
ppm	ppm	Ohms		°	ppm
		25.0			

A001 <2a001>	Pass	FR	Lo	Hi	AT	Delta	WCD	K/F	CUT	ANG	Delta	
A001	Pass	12.795174	-56.74	4.44	4.47	4.9	11.9	21.3	7.26	77	25.01	-4
A002 <2a002> <th>Pass</th> <th>FR</th> <th>Lo</th> <th>Hi</th> <th>AT</th> <th>Delta</th> <th>WCD</th> <th>K/F</th> <th>CUT</th> <th>ANG</th> <th>Delta</th>	Pass	FR	Lo	Hi	AT	Delta	WCD	K/F	CUT	ANG	Delta	
A002	Pass	12.795955	4.3	2.7	16.7	54	12.3	12.55	134	25.03	-9	
A003 <2a003> <th>Pass</th> <th>FR</th> <th>Lo</th> <th>Hi</th> <th>AT</th> <th>Delta</th> <th>WCD</th> <th>K/F</th> <th>CUT</th> <th>ANG</th> <th>Delta</th>	Pass	FR	Lo	Hi	AT	Delta	WCD	K/F	CUT	ANG	Delta	
A003	Pass	12.795917	1.3	2.6	12.4	82	12.2	12.65	122	25.02	-4	
A004 <2a004> <th>Pass</th> <th>FR</th> <th>Lo</th> <th>Hi</th> <th>AT</th> <th>Delta</th> <th>WCD</th> <th>K/F</th> <th>CUT</th> <th>ANG</th> <th>Delta</th>	Pass	FR	Lo	Hi	AT	Delta	WCD	K/F	CUT	ANG	Delta	
A004	Pass	12.795942	1.6	-0.2	11.0	AT: 2.66	12.1	12.73	121	25.01	-5	

Crystal Failures Only

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

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

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