

What does it take to upgrade?

Typical System Upgrade kit consists of:

- S&A 250B Network Analyzer
- S&A 2451 Switch Controller
- S&A PCI TTL I/O Card
- Minimum 500 MHz Pentium III with:
 - * One full PCI slot
 - * +3.3V and +5V power
 - * *Windows 98*®
- Printer



Why upgrade?

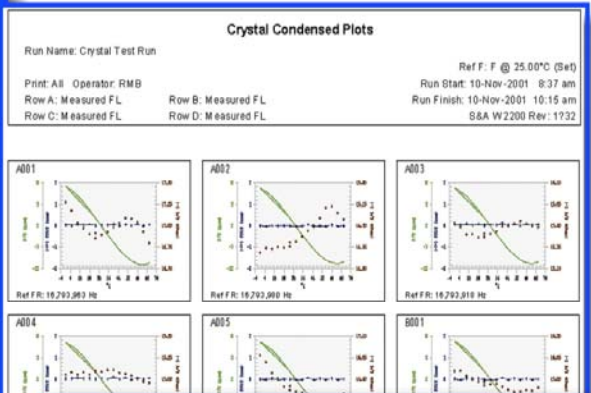
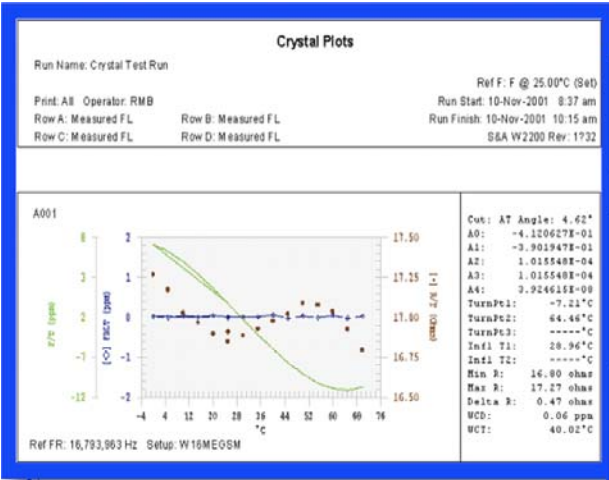
- 1 Measurement speed is about 4 times faster
- 2 Extensive graphing, grouping, QC, and printout capabilities
- 3 User-friendly *Windows*® system software
- 4 DLD can be measured and graphed as a function of temperature
- 5 Crystals in each vertical test wheel column are measured before incrementing the wheel, reducing the number of wheel rotations by 50%
- 6 Uses existing crystal test wheels and measurement test head
- 7 All data is published in *Microsoft Access*™ compatible data base in real time
- 8 Data can be automatically exported to *Microsoft Excel*™ for custom data analysis
- 9 Continuous software support and development

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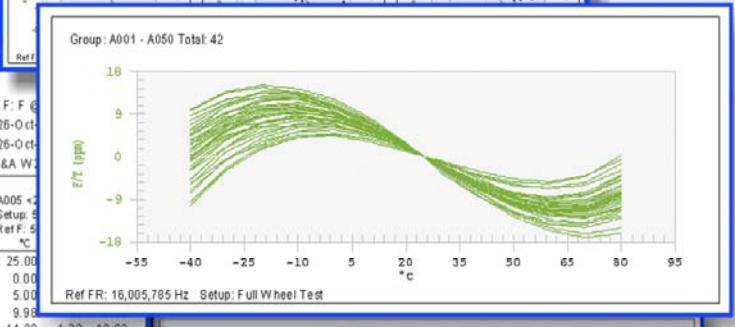
SAMPLE REPORTS



Crystal Tabular

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

A001 <2a001>	A002 <2a002>	A003 <2a003>	A004 <2a004>	A005 <2a005>										
Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 12megw2										
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: 12,795,917 Hz										
°C	FR ppm	R	°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	0.00	12.39
0.01	0.01	5.13	0.01	8.08	21.44	0.00	3.28	12.96	-0.01	3.74	12.49	0.00	0.00	0.00
5.02	0.33	4.98	5.00	6.79	20.77	4.98	3.16	12.82	4.99	3.52	12.38	5.00	0.00	0.00
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00	2.94	12.39	9.98	0.00	0.00
15.02	0.50	5.03	15.01	3.80	10.81	15.00	3.07	13.58	14.00	3.33	13.32	14.00	0.00	0.00
20.00	0.36	5.02	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.09	5.05	25.01	-0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30.02	-0.12	5.04	30.01	-2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34.99	-0.39	5.03	35.00	-3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.02	-0.55	5.04	40.02	-5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.03	-0.52	5.06	45.02	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
49.99	-0.20	5.00	49.99	-8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54.99	0.33	4.98	55.00	-9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.99	1.33	5.05	59.99	-9.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Crystal Curvet Tabular

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

A002 <2a002>	A003 <2a003>								
Setup: 12megw2	Setup: 12megw2								
Ref F: 12,795,955 Hz	Ref F: 12,795,917 Hz								
°C	FR ppm	Curve	Delta	R	°C	FR ppm	Curve	Delta	R
25.01	0.00	0.00	0.00	18.71	25.02	0.00	0.00	0.00	12.39
0.01	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	2.98	12.82
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00
15.02	0.50	5.03	15.01	3.80	10.81	15.00	3.07	13.58	14.00
20.00	0.36	5.02	20.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.09	5.05	25.01	-0.00	0.00	0.00	0.00	0.00	0.00
30.02	-0.12	5.04	30.01	-2.00	0.00	0.00	0.00	0.00	0.00
34.99	-0.39	5.03	35.00	-3.00	0.00	0.00	0.00	0.00	0.00
40.02	-0.55	5.04	40.02	-5.00	0.00	0.00	0.00	0.00	0.00
45.03	-0.52	5.06	45.02	-7.00	0.00	0.00	0.00	0.00	0.00
49.99	-0.20	5.00	49.99	-8.00	0.00	0.00	0.00	0.00	0.00
54.99	0.33	4.98	55.00	-9.00	0.00	0.00	0.00	0.00	0.00
59.99	1.33	5.05	59.99	-9.00	0.00	0.00	0.00	0.00	0.00

Crystal Setup File Parameters

Run Name: Example Run
 Ref F: F @ 25.00°C (Set)
 Print: All Operator:
 Run Start: 26-Oct-2001 4:51 pm
 Row A: Measured FL
 Row B: Measured FL
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 Row D: Measured FL
 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 uW into 12.00 Ohms Measure: FR/T

STATUS	FR	CO	DR	Q	CL	L	PWR	TEMP	F/T
	ppm	pF	Ohms	k	fF	nH	uW	°C	ppa
	10.0	3.0	25.0		13.0	13.00			
	-10.0	2.5			12.0	11.00			
DLTR	WCD	F/T	CUT	ANG1					
Ohms	ppm	Ohms	*	*					

A001 <2a001>	Fail	FR Lo	-56.7%	4.6%	4.9	119	21.3%	7.26%	77	25.01	4.0
		0.2	-0.1	5.1	AT	0.60					
A002 <2a002>	Pass	4.3	2.7	18.7	54	12.3	12.55	134	25.03	-9.0	
		3.5	0.2	21.4	AT	4.47					
A003 <2a003>	Pass	1.3	2.6	12.4	82	12.2	12.65	122	25.02	-4.0	
		1.2	-0.2	11.8	AT	2.51					
A004 <2a004>	Pass	3.3	2.7	12.0	85	12.1	12.73	121	25.01	-5.0	
		1.5	-0.2	11.0	AT	2.66					

Crystal Failures Only

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

A003 <2a003>	A004 <2a004>								
Setup: 12megw2	Setup: 12megw2								
Ref F: 12,795,917 Hz	Ref F: 12,795,917 Hz								
°C	FR ppm	Curve	Delta	R	°C	FR ppm	Curve	Delta	R
25.01	0.00	0.00	0.00	18.71	25.02	0.00	0.00	0.00	12.39
0.01	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	2.98	12.82
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00
15.02	0.50	5.03	15.01	3.80	10.81	15.00	3.07	13.58	14.00
20.00	0.36	5.02	20.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.09	5.05	25.01	-0.00	0.00	0.00	0.00	0.00	0.00
30.02	-0.12	5.04	30.01	-2.00	0.00	0.00	0.00	0.00	0.00
34.99	-0.39	5.03	35.00	-3.00	0.00	0.00	0.00	0.00	0.00
40.02	-0.55	5.04	40.02	-5.00	0.00	0.00	0.00	0.00	0.00
45.03	-0.52	5.06	45.02	-7.00	0.00	0.00	0.00	0.00	0.00
49.99	-0.20	5.00	49.99	-8.00	0.00	0.00	0.00	0.00	0.00
54.99	0.33	4.98	55.00	-9.00	0.00	0.00	0.00	0.00	0.00
59.99	1.33	5.05	59.99	-9.00	0.00	0.00	0.00	0.00	0.00

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