Thermal Test Report
Model : YY-W2XX/R5XX
Thermal Performance Contest

Date:Sep.15, 2004

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1. Introduction

The purpose of this evaluation is to find the best performance thermal solution by system operated as for Intel Xeon 3.2G processor .

2. References

ATX spec http://formfactors.org

3. Thermal Test

3.1 Test Configuration

Chassis	YY-W2XX/R5XX
Power Supply	EMACS PSM-6600P 600W, Seventeam ST-460EAD-05F 460W, Seventeam ST-550EAG-05F 550W
Chassis Fan	**Jamicon KF1225B1HS , Quantity:1** Speed:2200RPM (High Speed) **Jamicon JF1238B1HR , Quantity:1** Speed:2800RPM (High Speed) **Jamicon JF0625B1HS , Quantity:2** Speed:4500RPM (High Speed) **Delta FFB0612EHE , Quantity:2** Speed:8000RPM (High Speed) *System config. To be tested with various modes, please refer to table 4.1 & 4.2*
Processor	Intel Xeon (Nocona 800Mhz FSB) 3.2GHz, Quantity:2
Processor Thermal solution	Intel Boxed Heatsink
Motherboard	**ASUS NCCH-DR Rev1.03**
Memory	Kingston DDR400 512MB, Quantity: 2
Hard Drive	SEAGATE 40G, Quantity: 1
SCSI Drive	SEAGATE ST39102LC 8G, Quantity: 3
CD ROM	Cyber CD526D 52X, Quantity: 1
Floppy Drive	Mitsumi D359M3, Quantity: 1
AGP Card	Albatron FX5200, Quantity: 1
SCSI Card	Adaptec 39320D Ultra 320 , Quantity: 1

3.2 Test Equipment Used

FULL SYSTEM OPERATION
Fluke Hydra 2635A
Software: 1. Intel Nocona MAXPOWER (100%)
2. Winthrax

3.3 Test Process

The peripherals listed in section 1 were installed in the chassis and thermocouples were attached at the points designated in section 4. The chassis was tested in a controlled temperature held at a constant 35°C. The thermal readings communicated from the sensors on the test board to the test software. The system was exercised until the initial thermal gradient reached a consistent level with a slope-nearing zero. During testing, the ambient temperature was monitored approximately 2” from the front bezel of the chassis.

3.4 Data Recorded

Temperature readings are measured at the following location(s):

- Ambient -- Hotbox ambient temperature (2” from the front center of the chassis)
- Tinlet1 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the rear port)
- Tinlet2 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the PSU)
- Tinlet3 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the DIMM slot)
- Tinlet4 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the chipset)
- Tcase -- Processor case temperature

4. Test Result (see table 4.1), & Test mode details (Table 4.2)

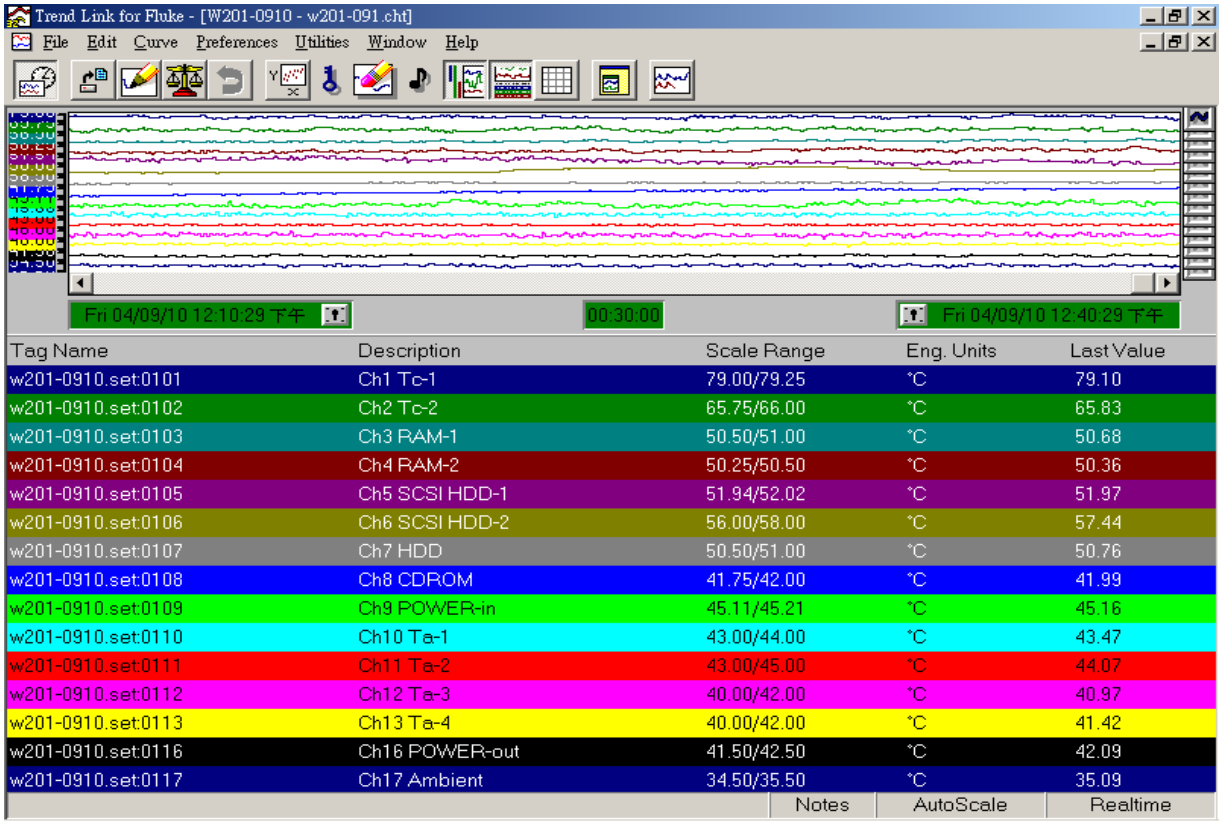
5. Summary : PASS with conditions of:

The chassis must go engineering change for adding air guide as test mode 6. In the meanwhile, the system must install a hi-efficiency cooling fan in the rear side.

Table 4.1
Date:Sep.15.2004

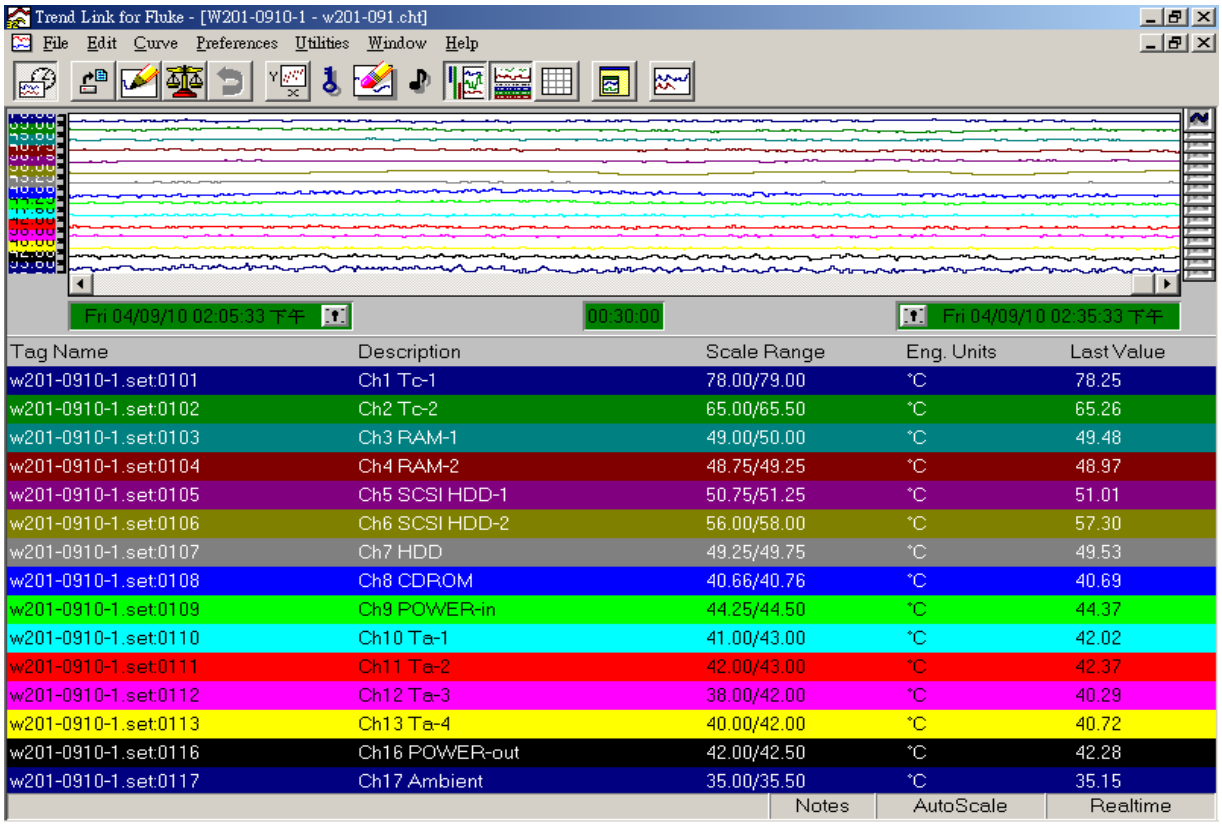
Mode Introductions	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6
Power Model	EMACS PSM-6600P (with 8cm Fan for airflow out, vents for air flow out)					
System Fan-12 cm in rear of chassis	Yes	Yes-1238mm	Yes-1238mm	Yes-1238mm	Yes-1238mm	Yes-1238mm
System Fan-6 cm *2 in rear of chassis	No	No	Yes	Yes-6038 mm RPM 8000	Yes-6038 mm RPM 8000	Yes-6038 mm RPM 8000
Front vents	No	No	No	No	Yes	CAG1.1
Run the test under the software on 100% level	100%	100%	100%	100%	100%	100%
Test Result (values was according to the screens of Fluke monitor)						
DIMM-1	50.7	49.5	51.5	48.5	46	43.9
DIMM-2	50.4	49	49.4	47.2	45.8	43.6
SCSI HDD-1	52	51	50	48.8	49.3	50
SCSI HDD-2	57.4	57.3	55.9	54.8	54.1	55.4
HDD-3	50.8	49.5	48.7	46.9	47.4	45.1
CD ROM	42	40.7	39.2	37	38.6	38.6
POWER-in	45.2	44.4	44.3	44.1	42.8	41.9
POWER-out	42.1	42.3	42.2	42.8	42.4	42.5
T-inlet 1	43.5	42	42	41.7	41.2	36.9
T-inlet 2	44.1	42.4	41.9	41.5	41.6	35.2
T-inlets average Tambient(1~2)	43.8	42.2	42	41.6	41.4	36.1
T-case-1	79.1	78.3	78.8	77.8	77.9	76.2
T-inlet 3	41	40.3	40.5	41.5	38.4	36.1
T-inlet 4	41.4	40.7	40.4	38.9	40.3	37.4
T-inlets average Tambient(3~4)	41.2	40.5	40.5	40.2	39.4	36.8
T-case-2	65.8	65.3	64.9	64.2	63.8	62.4
Ambient(case outside)	35.1	35.2	35.1	35.1	35.1	35.2

Mode Introductions	Mode 7	Mode 8	Mode 9	Mode 10
Power Model	EMACS PSM-6600P		Seventeam ST-460EAD-05F	Seventeam ST-550EAG-05F
System Fan-12 cm in rear of chassis	Yes-1238mm	Yes-1238mm	Yes-1238mm	Yes-1238mm
System Fan-6 cm *2 in rear of chassis	Yes-6038 mm RPM 8000	Yes-6038 mm RPM 8000	Yes-6038 mm RPM 8000	Yes-6038 mm RPM 8000
Front vents	CAG1.1	CAG1.1+Fan Airguide	No	No
Run the test under the software on 100% level	100%	100%	100%	100%
Test Result (values was according to the screens of Fluke monitor)				
DIMM-1	39.1	45.2	49	49.1
DIMM-2	39	44.3	47.6	48.1
SCSI HDD-1	44.9	49.2	49.4	48.9
SCSI HDD-2	50.5	54.4	57.4	56
HDD-3	39.4	41.5	48.1	48.8
CD ROM	33.4	34.8	37.7	37.6
POWER-in	37.3	42	48.7	45.3
POWER-out	37.8	41.8	52.8	44.1
T-inlet 1	31.9	37.4	41.8	40.7
T-inlet 2	30.3	37.7	41.7	41.4
T-inlets average Tambient(1~2)	31.1	37.6	41.8	41.1
T-case-1	74.2	76.9	78.6	78.3
T-inlet 3	31.3	36.4	41.5	41.8
T-inlet 4	33.1	37.9	40.6	41.6
T-inlets average Tambient(3~4)	32.2	37.2	41.1	41.7
T-case-2	59	62.9	65	65.4
Ambient(case outside)	30.1	35.3	35.1	35



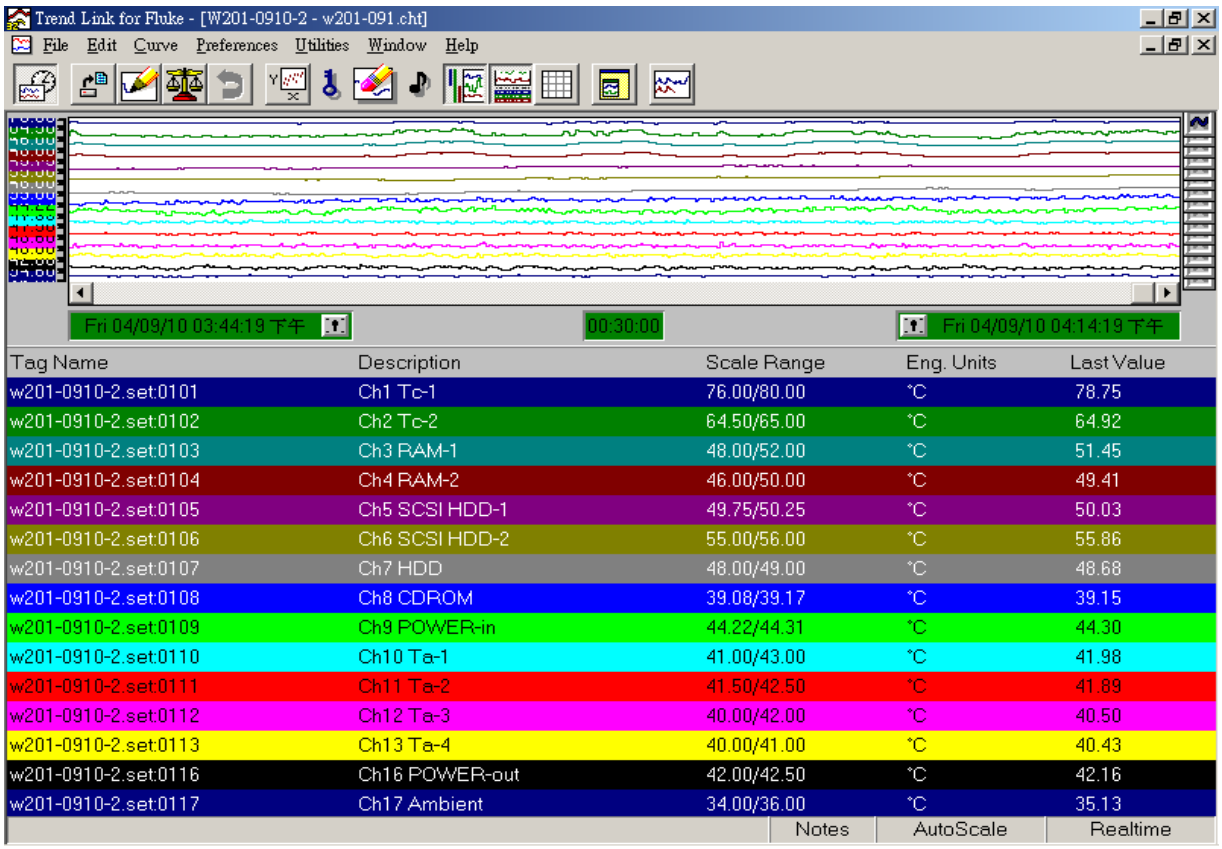
Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0910.set:0101	Ch1 Tc-1	79.00/79.25	°C	79.10
w201-0910.set:0102	Ch2 Tc-2	65.75/66.00	°C	65.83
w201-0910.set:0103	Ch3 RAM-1	50.50/51.00	°C	50.68
w201-0910.set:0104	Ch4 RAM-2	50.25/50.50	°C	50.36
w201-0910.set:0105	Ch5 SCSI HDD-1	51.94/52.02	°C	51.97
w201-0910.set:0106	Ch6 SCSI HDD-2	56.00/58.00	°C	57.44
w201-0910.set:0107	Ch7 HDD	50.50/51.00	°C	50.76
w201-0910.set:0108	Ch8 CDROM	41.75/42.00	°C	41.99
w201-0910.set:0109	Ch9 POWER-in	45.11/45.21	°C	45.16
w201-0910.set:0110	Ch10 Ta-1	43.00/44.00	°C	43.47
w201-0910.set:0111	Ch11 Ta-2	43.00/45.00	°C	44.07
w201-0910.set:0112	Ch12 Ta-3	40.00/42.00	°C	40.97
w201-0910.set:0113	Ch13 Ta-4	40.00/42.00	°C	41.42
w201-0910.set:0116	Ch16 POWER-out	41.50/42.50	°C	42.09
w201-0910.set:0117	Ch17 Ambient	34.50/35.50	°C	35.09

Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0910-1.set:0101	Ch1 Tc-1	78.00/79.00	°C	78.25
w201-0910-1.set:0102	Ch2 Tc-2	65.00/65.50	°C	65.26
w201-0910-1.set:0103	Ch3 RAM-1	49.00/50.00	°C	49.48
w201-0910-1.set:0104	Ch4 RAM-2	48.75/49.25	°C	48.97
w201-0910-1.set:0105	Ch5 SCSI HDD-1	50.75/51.25	°C	51.01
w201-0910-1.set:0106	Ch6 SCSI HDD-2	56.00/58.00	°C	57.30
w201-0910-1.set:0107	Ch7 HDD	49.25/49.75	°C	49.53
w201-0910-1.set:0108	Ch8 CDROM	40.66/40.76	°C	40.69
w201-0910-1.set:0109	Ch9 POWER-in	44.25/44.50	°C	44.37
w201-0910-1.set:0110	Ch10 Ta-1	41.00/43.00	°C	42.02
w201-0910-1.set:0111	Ch11 Ta-2	42.00/43.00	°C	42.37
w201-0910-1.set:0112	Ch12 Ta-3	38.00/42.00	°C	40.29
w201-0910-1.set:0113	Ch13 Ta-4	40.00/42.00	°C	40.72
w201-0910-1.set:0116	Ch16 POWER-out	42.00/42.50	°C	42.28
w201-0910-1.set:0117	Ch17 Ambient	35.00/35.50	°C	35.15

Notes AutoScale Realtime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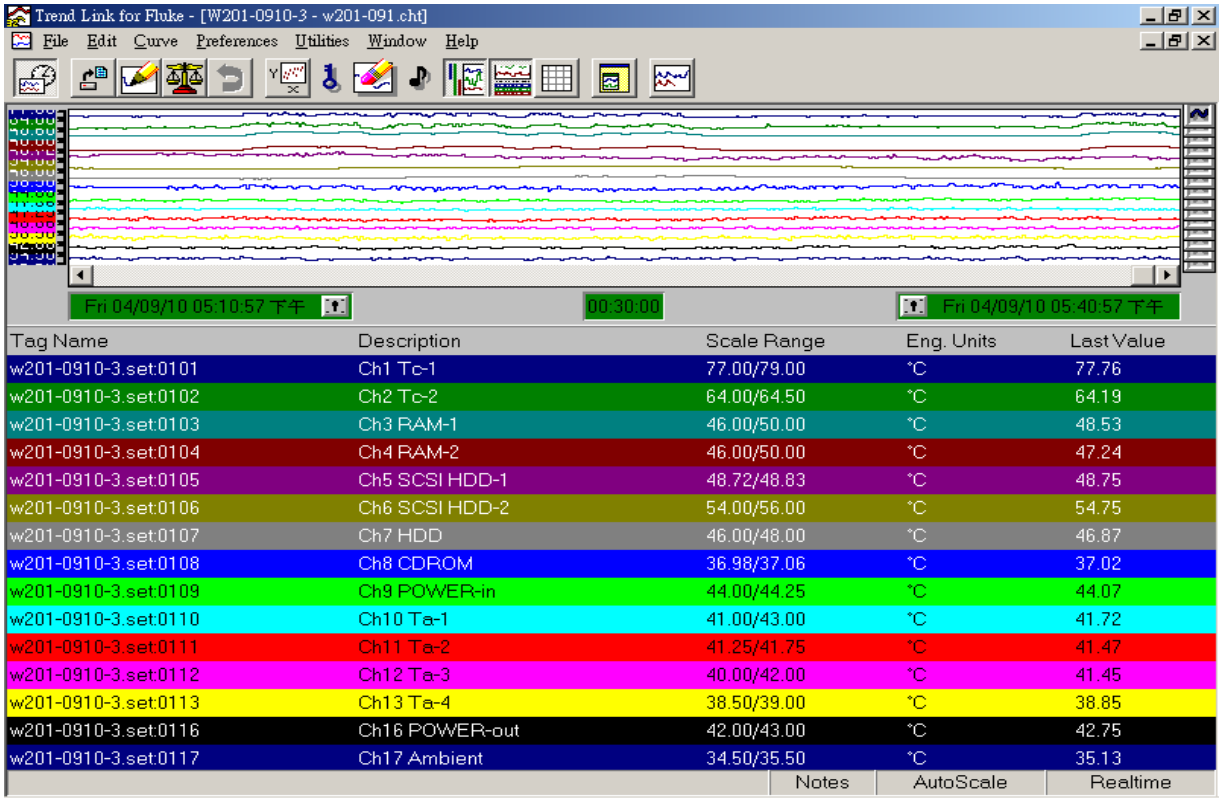
w201-0910-2.set:0101 Ch1 Tc-1 76.00/80.00 °C 78.75
w201-0910-2.set:0102 Ch2 Tc-2 64.50/65.00 °C 64.92
w201-0910-2.set:0103 Ch3 RAM-1 48.00/52.00 °C 51.45
w201-0910-2.set:0104 Ch4 RAM-2 46.00/50.00 °C 49.41
w201-0910-2.set:0105 Ch5 SCSI HDD-1 49.75/50.25 °C 50.03
w201-0910-2.set:0106 Ch6 SCSI HDD-2 55.00/56.00 °C 55.86
w201-0910-2.set:0107 Ch7 HDD 48.00/49.00 °C 48.68
w201-0910-2.set:0108 Ch8 CDROM 39.08/39.17 °C 39.15
w201-0910-2.set:0109 Ch9 POWER-in 44.22/44.31 °C 44.30
w201-0910-2.set:0110 Ch10 Ta-1 41.00/43.00 °C 41.98
w201-0910-2.set:0111 Ch11 Ta-2 41.50/42.50 °C 41.89
w201-0910-2.set:0112 Ch12 Ta-3 40.00/42.00 °C 40.50
w201-0910-2.set:0113 Ch13 Ta-4 40.00/41.00 °C 40.43
w201-0910-2.set:0116 Ch16 POWER-out 42.00/42.50 °C 42.16
w201-0910-2.set:0117 Ch17 Ambient 34.00/36.00 °C 35.13
Notes AutoScale Realtime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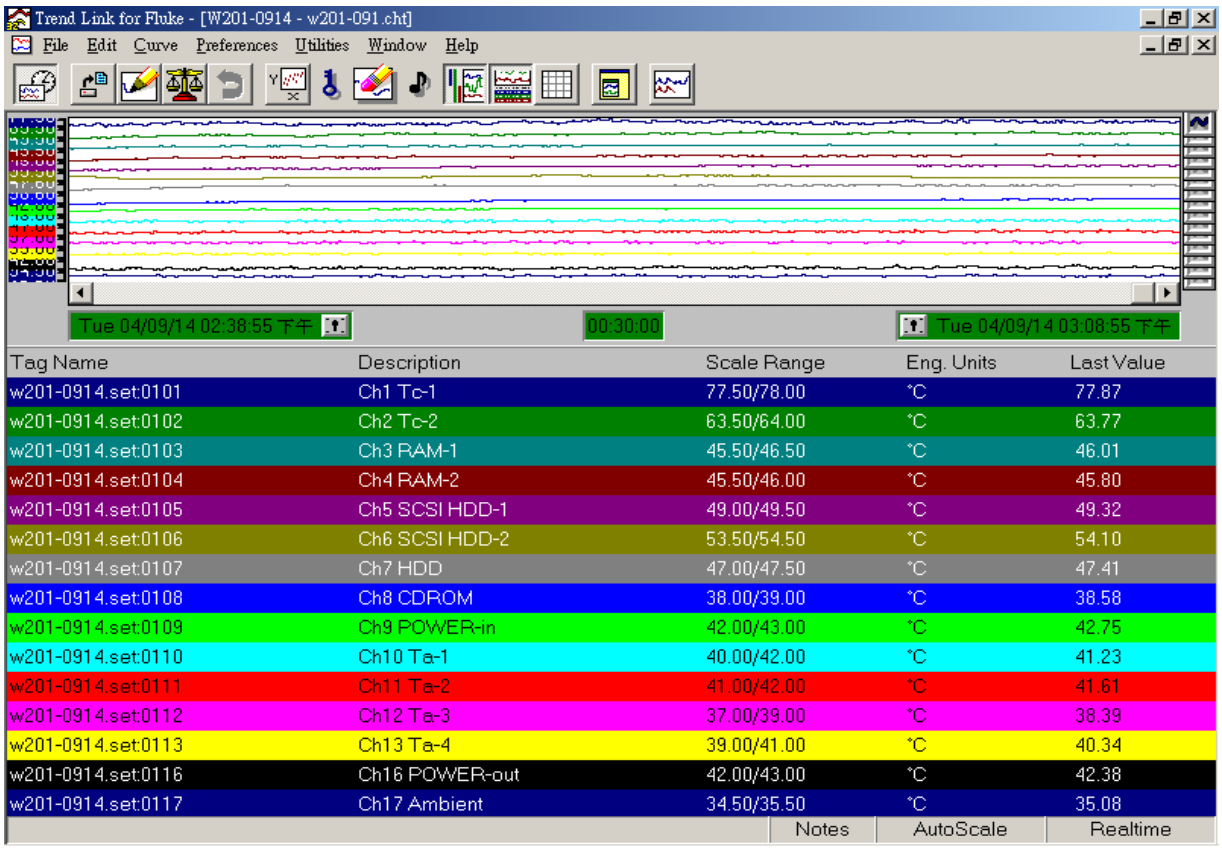
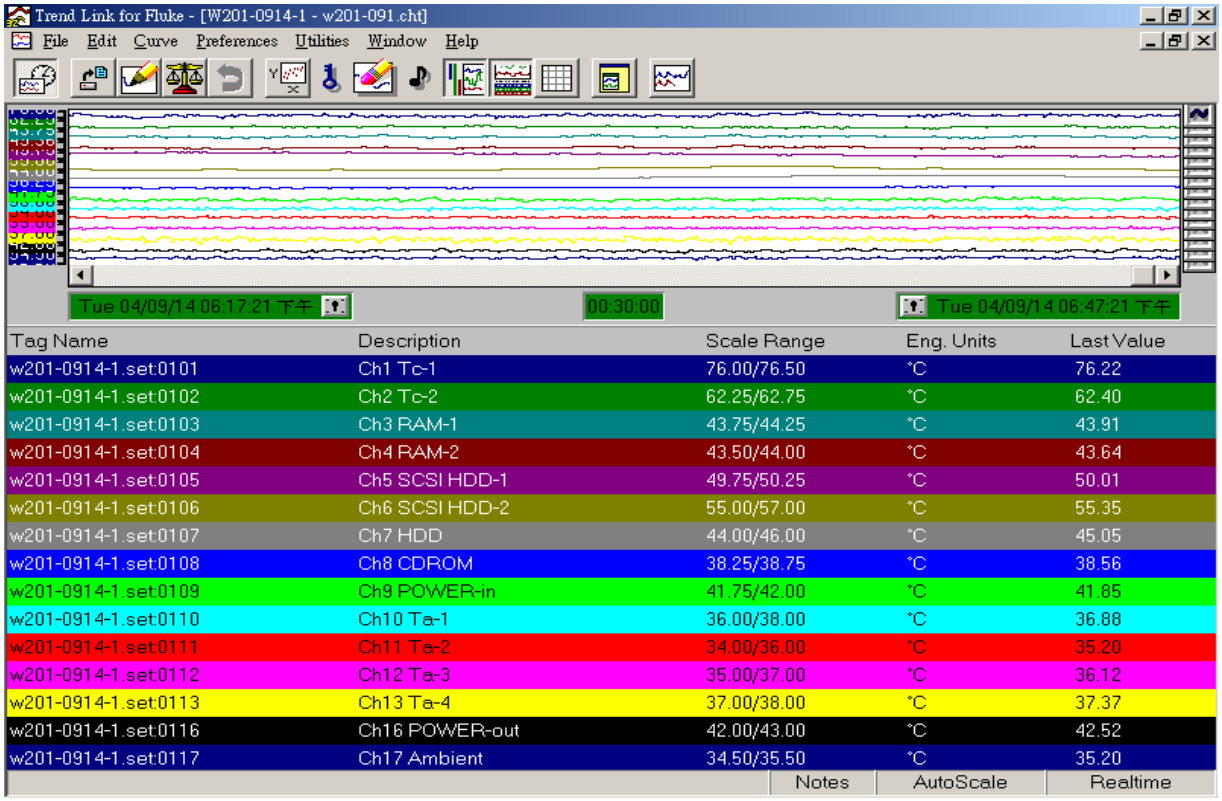
Tag Name Description Scale Range Eng. Units Last Value
w201-0910-3.set:0101 Ch1 Tc-1 77.00/79.00 °C 77.76
w201-0910-3.set:0102 Ch2 Tc-2 64.00/64.50 °C 64.19
w201-0910-3.set:0103 Ch3 RAM-1 46.00/50.00 °C 48.53
w201-0910-3.set:0104 Ch4 RAM-2 46.00/50.00 °C 47.24
w201-0910-3.set:0105 Ch5 SCSI HDD-1 48.72/48.83 °C 48.75
w201-0910-3.set:0106 Ch6 SCSI HDD-2 54.00/56.00 °C 54.75
w201-0910-3.set:0107 Ch7 HDD 46.00/48.00 °C 46.87
w201-0910-3.set:0108 Ch8 CDROM 36.98/37.06 °C 37.02
w201-0910-3.set:0109 Ch9 POWER-in 44.00/44.25 °C 44.07
w201-0910-3.set:0110 Ch10 Ta-1 41.00/43.00 °C 41.72
w201-0910-3.set:0111 Ch11 Ta-2 41.25/41.75 °C 41.47
w201-0910-3.set:0112 Ch12 Ta-3 40.00/42.00 °C 41.45
w201-0910-3.set:0113 Ch13 Ta-4 38.50/39.00 °C 38.85
w201-0910-3.set:0116 Ch16 POWER-out 42.00/43.00 °C 42.75
w201-0910-3.set:0117 Ch17 Ambient 34.50/35.50 °C 35.13
Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0914.set:0101	Ch1 Tc-1	77.50/78.00	°C	77.87
w201-0914.set:0102	Ch2 Tc-2	63.50/64.00	°C	63.77
w201-0914.set:0103	Ch3 RAM-1	45.50/46.50	°C	46.01
w201-0914.set:0104	Ch4 RAM-2	45.50/46.00	°C	45.80
w201-0914.set:0105	Ch5 SCSI HDD-1	49.00/49.50	°C	49.32
w201-0914.set:0106	Ch6 SCSI HDD-2	53.50/54.50	°C	54.10
w201-0914.set:0107	Ch7 HDD	47.00/47.50	°C	47.41
w201-0914.set:0108	Ch8 CDROM	38.00/39.00	°C	38.58
w201-0914.set:0109	Ch9 POWER-in	42.00/43.00	°C	42.75
w201-0914.set:0110	Ch10 Ta-1	40.00/42.00	°C	41.23
w201-0914.set:0111	Ch11 Ta-2	41.00/42.00	°C	41.61
w201-0914.set:0112	Ch12 Ta-3	37.00/39.00	°C	38.39
w201-0914.set:0113	Ch13 Ta-4	39.00/41.00	°C	40.34
w201-0914.set:0116	Ch16 POWER-out	42.00/43.00	°C	42.38
w201-0914.set:0117	Ch17 Ambient	34.50/35.50	°C	35.08

Notes AutoScale Realtime



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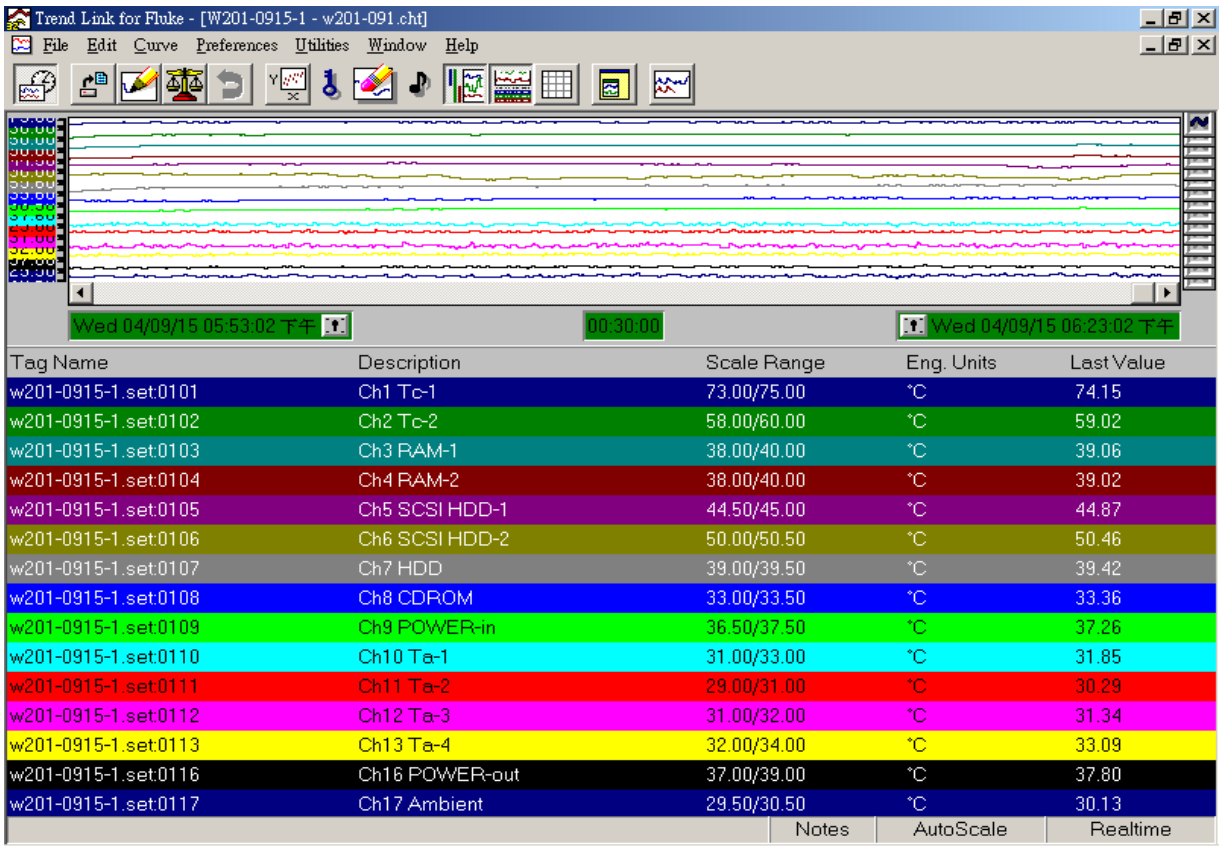
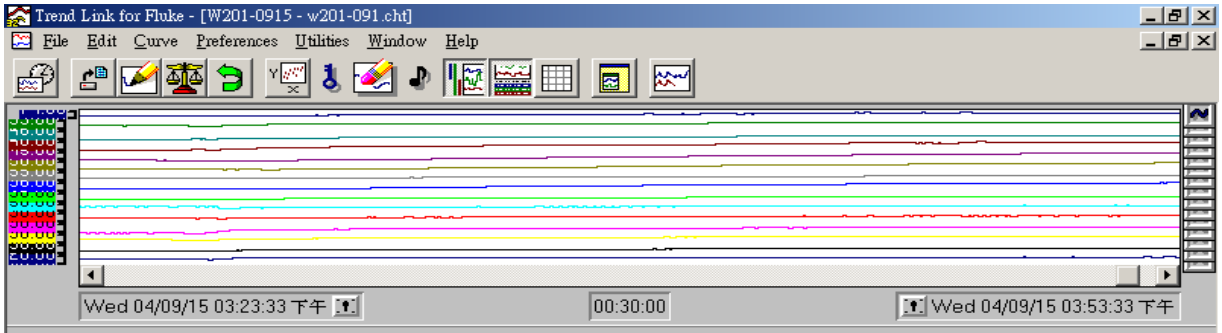
w201-0914-1.set:0101	Ch1 Tc-1	76.00/76.50	°C	76.22
w201-0914-1.set:0102	Ch2 Tc-2	62.25/62.75	°C	62.40
w201-0914-1.set:0103	Ch3 RAM-1	43.75/44.25	°C	43.91
w201-0914-1.set:0104	Ch4 RAM-2	43.50/44.00	°C	43.64
w201-0914-1.set:0105	Ch5 SCSI HDD-1	49.75/50.25	°C	50.01
w201-0914-1.set:0106	Ch6 SCSI HDD-2	55.00/57.00	°C	55.35
w201-0914-1.set:0107	Ch7 HDD	44.00/46.00	°C	45.05
w201-0914-1.set:0108	Ch8 CDROM	38.25/38.75	°C	38.56
w201-0914-1.set:0109	Ch9 POWER-in	41.75/42.00	°C	41.85
w201-0914-1.set:0110	Ch10 Ta-1	36.00/38.00	°C	36.88
w201-0914-1.set:0111	Ch11 Ta-2	34.00/36.00	°C	35.20
w201-0914-1.set:0112	Ch12 Ta-3	35.00/37.00	°C	36.12
w201-0914-1.set:0113	Ch13 Ta-4	37.00/38.00	°C	37.37
w201-0914-1.set:0116	Ch16 POWER-out	42.00/43.00	°C	42.52
w201-0914-1.set:0117	Ch17 Ambient	34.50/35.50	°C	35.20

Notes AutoScale Realtime



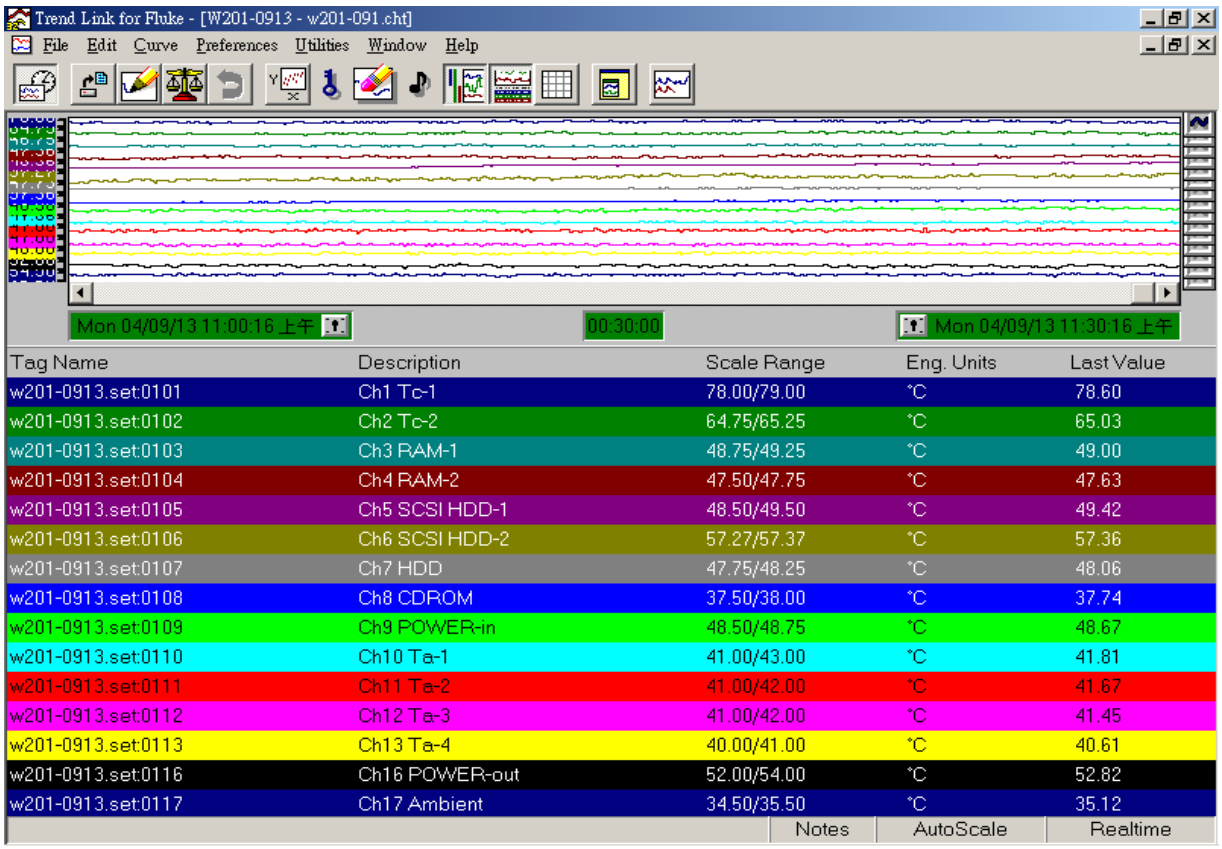
Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0915-1.set:0101	Ch1 Tc-1	73.00/75.00	°C	74.15
w201-0915-1.set:0102	Ch2 Tc-2	58.00/60.00	°C	59.02
w201-0915-1.set:0103	Ch3 RAM-1	38.00/40.00	°C	39.06
w201-0915-1.set:0104	Ch4 RAM-2	38.00/40.00	°C	39.02
w201-0915-1.set:0105	Ch5 SCSI HDD-1	44.50/45.00	°C	44.87
w201-0915-1.set:0106	Ch6 SCSI HDD-2	50.00/50.50	°C	50.46
w201-0915-1.set:0107	Ch7 HDD	39.00/39.50	°C	39.42
w201-0915-1.set:0108	Ch8 CDROM	33.00/33.50	°C	33.36
w201-0915-1.set:0109	Ch9 POWER-in	36.50/37.50	°C	37.26
w201-0915-1.set:0110	Ch10 Ta-1	31.00/33.00	°C	31.85
w201-0915-1.set:0111	Ch11 Ta-2	29.00/31.00	°C	30.29
w201-0915-1.set:0112	Ch12 Ta-3	31.00/32.00	°C	31.34
w201-0915-1.set:0113	Ch13 Ta-4	32.00/34.00	°C	33.09
w201-0915-1.set:0116	Ch16 POWER-out	37.00/39.00	°C	37.80
w201-0915-1.set:0117	Ch17 Ambient	29.50/30.50	°C	30.13

Notes | AutoScale | Realtime



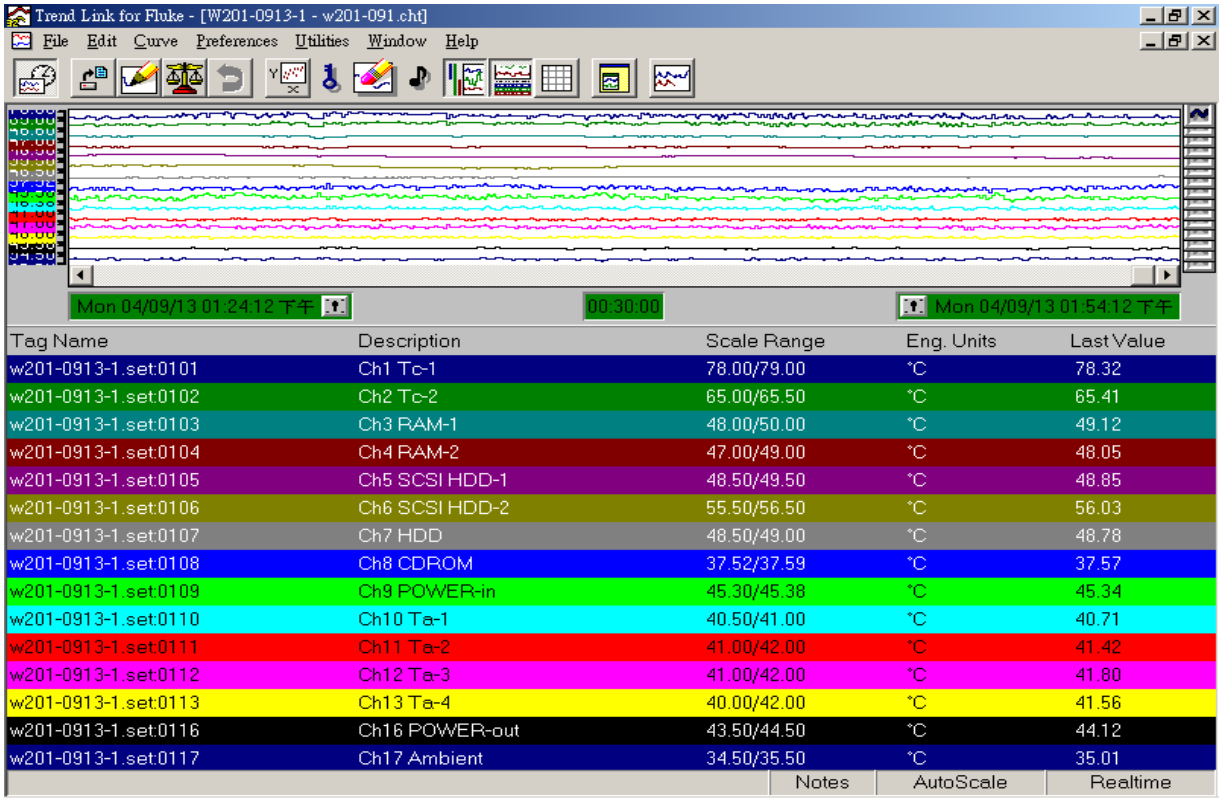
Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0915.set:0101	Ch1 Tc-1	74.00/78.00	°C	76.88
w201-0915.set:0102	Ch2 Tc-2	55.00/65.00	°C	62.90
w201-0915.set:0103	Ch3 RAM-1	40.00/50.00	°C	45.24
w201-0915.set:0104	Ch4 RAM-2	40.00/45.00	°C	44.25
w201-0915.set:0105	Ch5 SCSI HDD-1	45.00/50.00	°C	49.18
w201-0915.set:0106	Ch6 SCSI HDD-2	50.00/55.00	°C	54.44
w201-0915.set:0107	Ch7 HDD	35.00/45.00	°C	41.48
w201-0915.set:0108	Ch8 CDROM	30.00/35.00	°C	34.77
w201-0915.set:0109	Ch9 POWER-in	30.00/50.00	°C	41.95
w201-0915.set:0110	Ch10 Ta-1	30.00/40.00	°C	37.36
w201-0915.set:0111	Ch11 Ta-2	30.00/40.00	°C	37.66
w201-0915.set:0112	Ch12 Ta-3	30.00/40.00	°C	36.36
w201-0915.set:0113	Ch13 Ta-4	30.00/40.00	°C	37.92
w201-0915.set:0116	Ch16 POWER-out	30.00/50.00	°C	41.79
w201-0915.set:0117	Ch17 Ambient	20.00/40.00	°C	35.30

Notes | AutoScale | Historical



Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0913.set:0101	Ch1 Tc-1	78.00/79.00	°C	78.60
w201-0913.set:0102	Ch2 Tc-2	64.75/65.25	°C	65.03
w201-0913.set:0103	Ch3 RAM-1	48.75/49.25	°C	49.00
w201-0913.set:0104	Ch4 RAM-2	47.50/47.75	°C	47.63
w201-0913.set:0105	Ch5 SCSI HDD-1	48.50/49.50	°C	49.42
w201-0913.set:0106	Ch6 SCSI HDD-2	57.27/57.37	°C	57.36
w201-0913.set:0107	Ch7 HDD	47.75/48.25	°C	48.06
w201-0913.set:0108	Ch8 CDROM	37.50/38.00	°C	37.74
w201-0913.set:0109	Ch9 POWER-in	48.50/48.75	°C	48.67
w201-0913.set:0110	Ch10 Ta-1	41.00/43.00	°C	41.81
w201-0913.set:0111	Ch11 Ta-2	41.00/42.00	°C	41.67
w201-0913.set:0112	Ch12 Ta-3	41.00/42.00	°C	41.45
w201-0913.set:0113	Ch13 Ta-4	40.00/41.00	°C	40.61
w201-0913.set:0116	Ch16 POWER-out	52.00/54.00	°C	52.82
w201-0913.set:0117	Ch17 Ambient	34.50/35.50	°C	35.12

Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
w201-0913-1.set:0101	Ch1 Tc-1	78.00/79.00	°C	78.32
w201-0913-1.set:0102	Ch2 Tc-2	65.00/65.50	°C	65.41
w201-0913-1.set:0103	Ch3 RAM-1	48.00/50.00	°C	49.12
w201-0913-1.set:0104	Ch4 RAM-2	47.00/49.00	°C	48.05
w201-0913-1.set:0105	Ch5 SCSI HDD-1	48.50/49.50	°C	48.85
w201-0913-1.set:0106	Ch6 SCSI HDD-2	55.50/56.50	°C	56.03
w201-0913-1.set:0107	Ch7 HDD	48.50/49.00	°C	48.78
w201-0913-1.set:0108	Ch8 CDROM	37.52/37.59	°C	37.57
w201-0913-1.set:0109	Ch9 POWER-in	45.30/45.38	°C	45.34
w201-0913-1.set:0110	Ch10 Ta-1	40.50/41.00	°C	40.71
w201-0913-1.set:0111	Ch11 Ta-2	41.00/42.00	°C	41.42
w201-0913-1.set:0112	Ch12 Ta-3	41.00/42.00	°C	41.80
w201-0913-1.set:0113	Ch13 Ta-4	40.00/42.00	°C	41.56
w201-0913-1.set:0116	Ch16 POWER-out	43.50/44.50	°C	44.12
w201-0913-1.set:0117	Ch17 Ambient	34.50/35.50	°C	35.01

Notes AutoScale Realtime

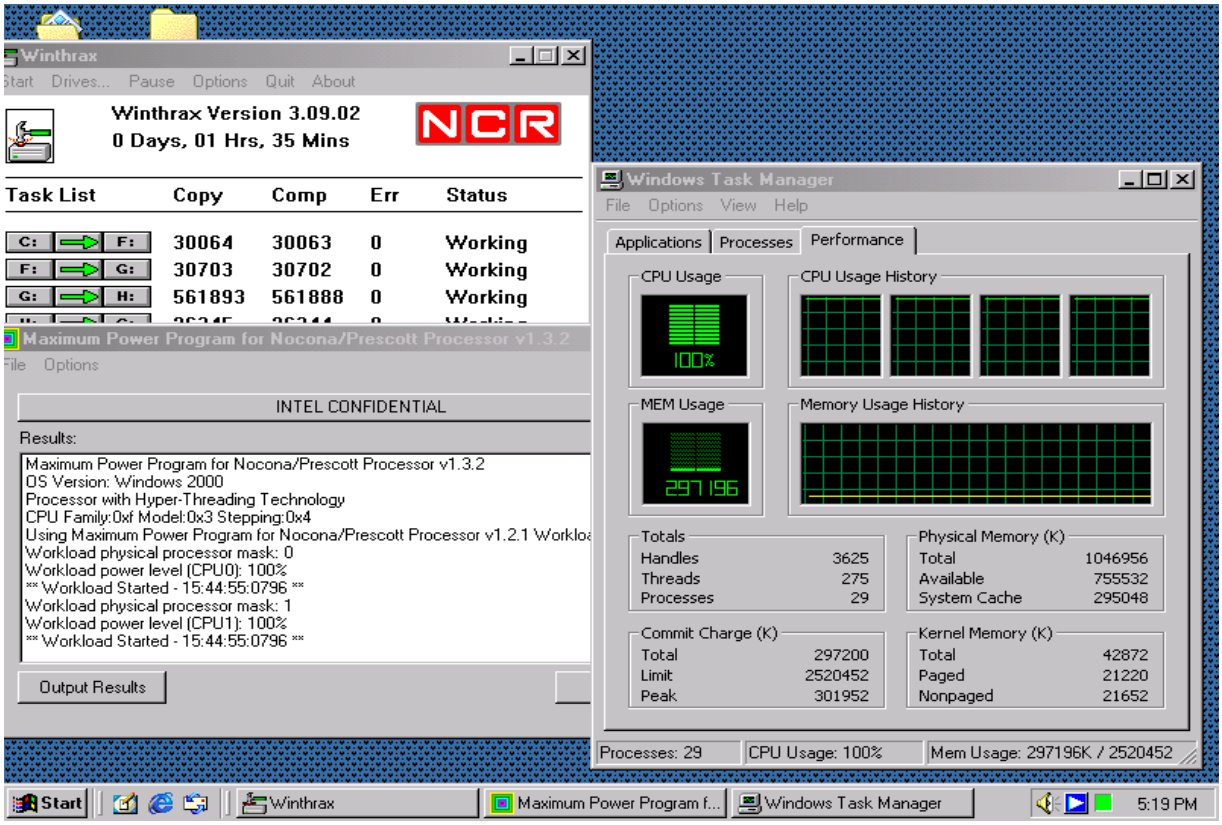

Winthrax
Start Drives... Pause Options Quit About
Winthrax Version 3.09.02
0 Days, 01 Hrs, 35 Mins
NCR
Task List Copy Comp Err Status
C: F: 30064 30063 0 Working
F: G: 30703 30702 0 Working
G: H: 561893 561888 0 Working
Maximum Power Program for Nocona/Prescott Processor v1.3.2
File Options
INTEL CONFIDENTIAL
Results:
Maximum Power Program for Nocona/Prescott Processor v1.3.2
OS Version: Windows 2000
Processor with Hyper-Threading Technology
CPU Family:0xf Model:0x3 Stepping:0x4
Using Maximum Power Program for Nocona/Prescott Processor v1.2.1 Workloa
Workload physical processor mask: 0
Workload power level (CPU0): 100%
** Workload Started - 15:44:55:0796 **
Workload physical processor mask: 1
Workload power level (CPU1): 100%
** Workload Started - 15:44:55:0796 **
Output Results
Windows Task Manager
File Options View Help
Applications Processes Performance
CPU Usage
100%
CPU Usage History
MEM Usage
297196
Memory Usage History
Totals
Handles 3625
Threads 275
Processes 29
Physical Memory (K)
Total 1046956
Available 755532
System Cache 295048
Commit Charge (K)
Total 297200
Limit 2520452
Peak 301952
Kernel Memory (K)
Total 42872
Paged 21220
Nonpaged 21652
Processes: 29
CPU Usage: 100%
Mem Usage: 297196K / 2520452
Start
Winthrax
Maximum Power Program f...
Windows Task Manager
5:19 PM

Table 4.2

	The view of the chassis front side-1.
	The view of the chassis front side-2.
	The view of the chassis right side.
	The view of the chassis left side.

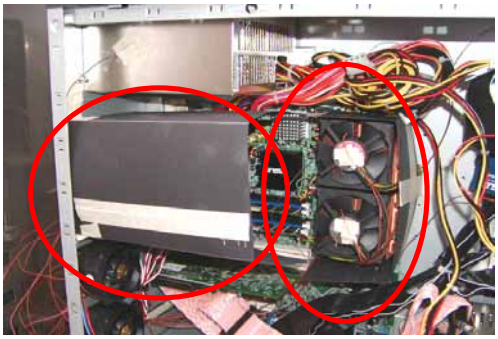
The view of the chassis back side.

The view of the thermocouples connections.

The view of 1238 mm Fan & 6038 mm Fan *2 .

The view of SCSI HDD Module.

The view of CAG1.1 (Mode 6&7).



The view of hand made air duct part 1 (Mode 8).

The view of hand made air duct part 2(Mode 8), the main purpose of this air duct, is to make sure the airflow passed CPU could be exhaust out directly.