

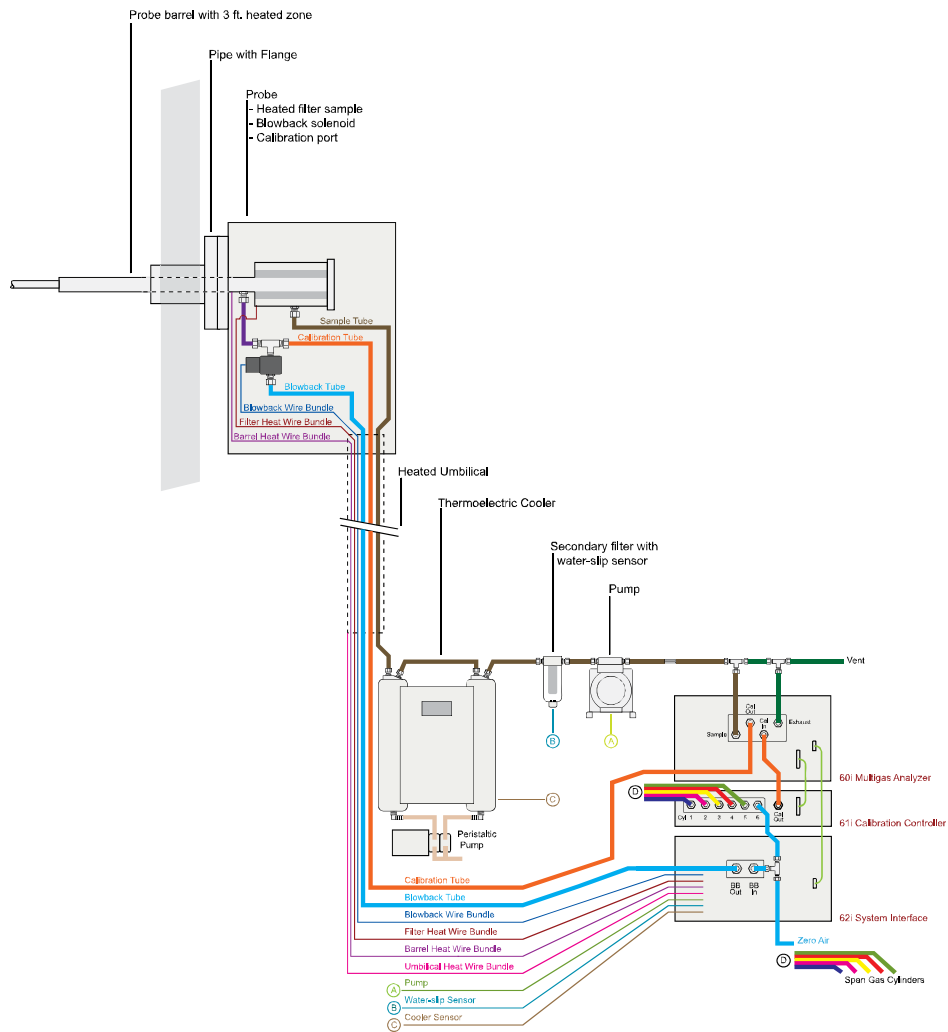
Model 60i

Quick Start Guide

Multi-Gas Analyzer

Part Number 106474-00

23Jul2009



Example of a Direct Extractive Continuous Emissions Monitoring System (CEMS)

Unpacking and Inspection

Carefully unpack and inspect the instrument in a non-condensing environment (20-30 °C). Check for possible damage during shipment. Remove packing material and any shipping screws. Remove any protective plastic material from the case exterior. Check that all connectors and circuit boards are firmly attached.

Setup

Setting up the analyzer includes connecting gas lines, making the data and I/O connections, and making the power connections. Refer to Figure 1 through Figure 4 and Table 1.

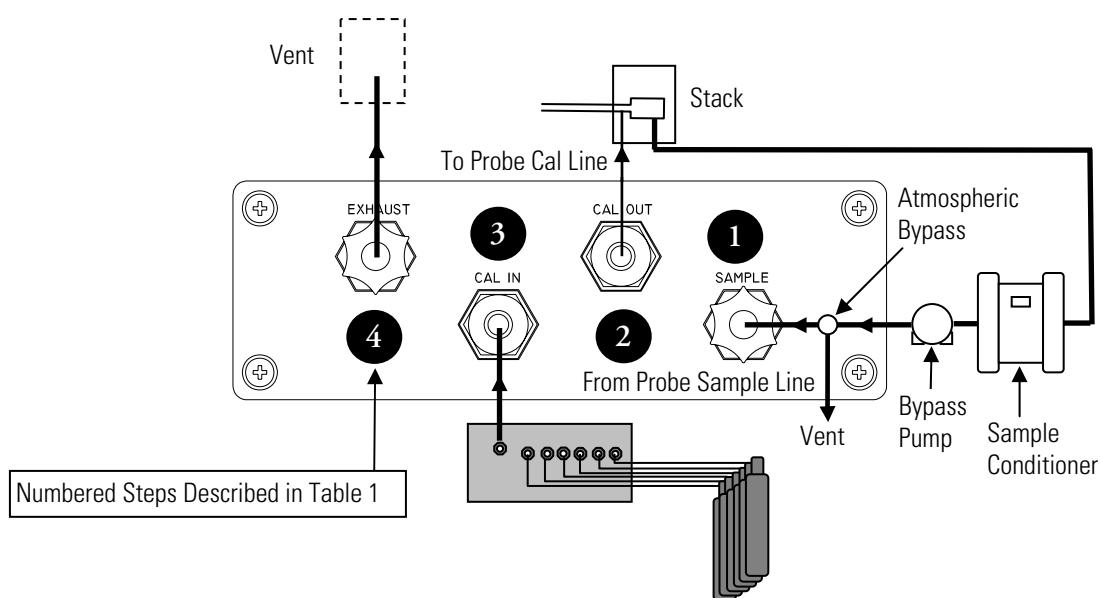


Figure 1. Rear Panel Plumbing Connections for 60i Analyzer and 61i Calibrator

Table 1. Connecting Gas Lines

Step	Action
1	<p>Connect the sample line from the chiller/bypass pump to the SAMPLE bulkhead on the rear panel. Ensure that the sample line is not contaminated by dirty, wet, or incompatible materials. All tubing should be constructed of FEP Teflon® with an OD of 1/4-inch.</p> <p>Note Sample gas must be filtered and dried when delivered to the analyzer. The filter should have a nominal pore size of 1 micron or less and the dew point must be 2 °C to 8 °C. ▲</p> <p>Note Gas must be delivered to the instrument at atmospheric pressure. Use an atmospheric bypass plumbing arrangement if gas pressure is greater than atmospheric pressure. ▲</p>

Step	Action
2	Connect umbilical calibration gas line to CAL OUT.
3	Connect the output from the 61i calibration manifold (span gases and zero air) to CAL IN via ¼-inch tubing.
4	Connect the EXHAUST bulkhead to a suitable vent. The exhaust line should be ¼-inch OD with an ID of 1/8-inch or greater. The length of the exhaust line should be less than 10 feet. Verify that there is no restriction in this line.

Note If calibration gases will not be introduced through the sample probe, see the “Calibration” chapter in the “Model 60i Instruction Manual” for alternative plumbing arrangement. ▲

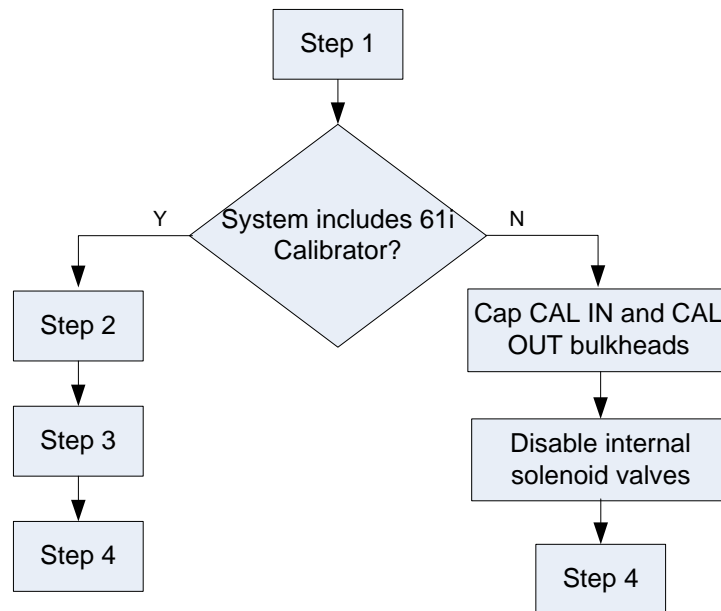


Figure 2. Flowchart of Setup for Systems with a 61i Calibrator

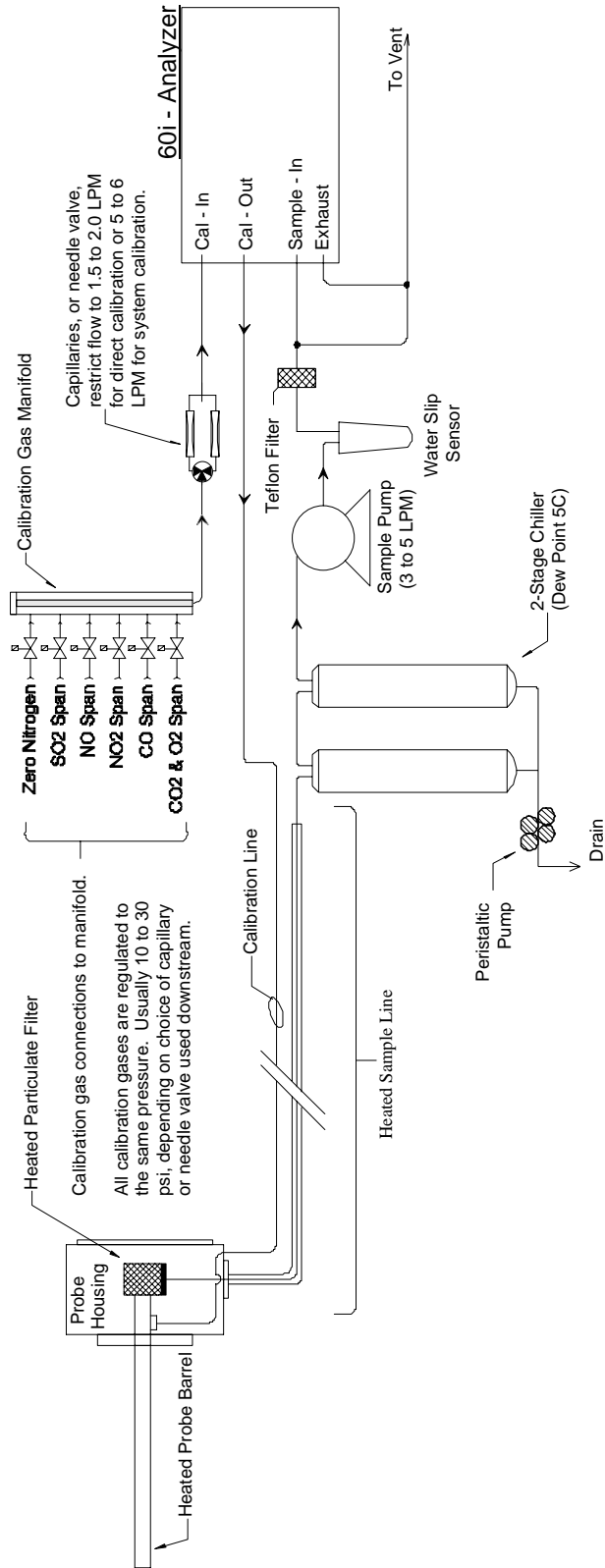


Figure 3. Model 60i Plumbing Configuration

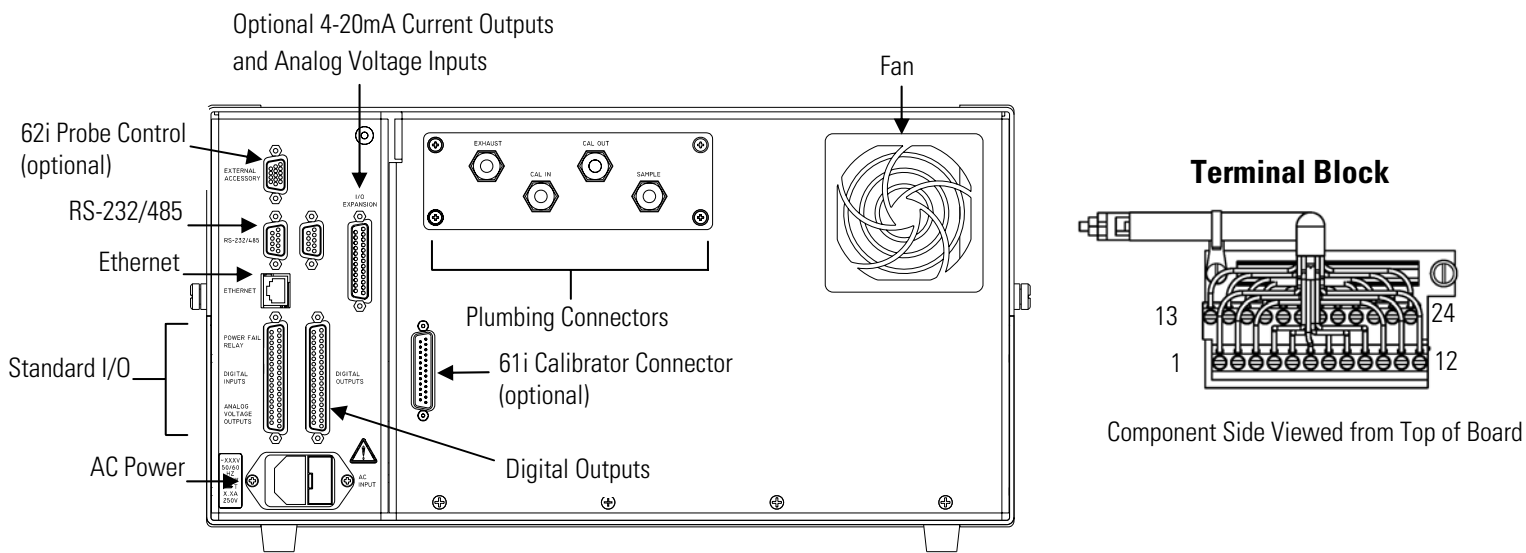


Figure 4. Rear Panel Connectors

Making Data and I/O Connections

Data acquisition and external control are implemented through Ethernet, RS-232 or a dedicated I/O system and analog outputs. If a dedicated I/O system will be used, connections are made through terminal block PCB assemblies with a D-Sub connector on one side and a series of screw terminals on the other. Refer to the “Installation” chapter in the “Model 60*i* Instruction Manual” for detailed information on I/O configuration. Refer to Figure 5 and Table 2 for information on analog outputs and the most commonly used digital inputs. Refer to Table 3 for information on optional analog current outputs and optional analog voltage outputs (I/O expansion board 25-pin connector.)

The following terminal block PCB assemblies are available for iSeries instruments:

- I/O terminal block PCB assembly, 37 pin (standard)
- D/O terminal block PCB assembly, 37 pin (standard)
- 25-pin terminal block PCB assembly (included with optional I/O Expansion Board)

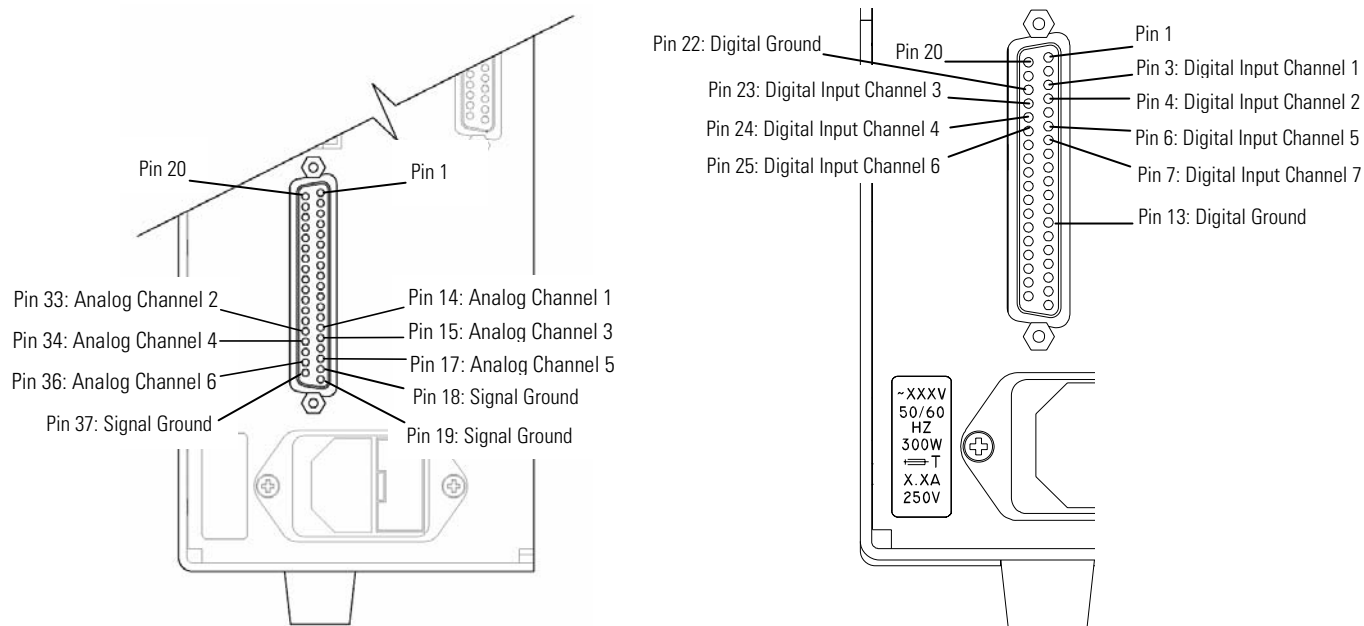


Figure 5. Pin Outs of Analog Voltage Outputs and Digital Inputs

Table 2. Default Analog Voltage Outputs and Digital Inputs (Left Side 37-Pin Connector)

Rear Panel Connector Pin	Terminal Block Screw Number	Description	Default Assignment*
14	1	Analog Out #1	O ₂ Conc.
33	3	Analog Out #2	CO ₂ Conc.
15	5	Analog Out #3	CO Conc.
34	7	Analog Out #4	NO _x Conc.
17	9	Analog Out #5	SO ₂ Conc.
36	11	Analog Out #6	None
16,18,19,35,37	2,4,6,8,10,12	Signal Grounds	NA
1	13	Power Fail (NC)	NA
20	14	Power Fail (Com)	NA
21	15	Power Fail (NO)	NA
3	16	TTL Input 1	Turn Pump Off
4	17	TTL Input 2	Trigger Blow Back

Rear Panel Connector Pin	Terminal Block Screw Number	Description	Default Assignment*
23	18	TTL Input 3	Zero IR Bench
24	19	TTL Input 4	Zero O ₂ Sensor
13, 22	20, 24	Digital Grounds	NA
6	21	TTL Input 5	Span Using Cyl 1
25	22	TTL Input 6	Span Using Cyl 2
7	23	TTL Input 7	Span Using Cyl 3

Note The pin numbers on the connector do not match the pin numbers on the terminal blocks. ▲

***Note** All channels are user definable. If any customization has been made to the analog output configuration or TTL inputs, the default selections may not apply. Defaults shown are for a fully-equipped analyzer. ▲

Table 3. Optional Analog Current Outputs and Analog Voltage Inputs (I/O Expansion Board 25-Pin Connector)

Rear Panel Connector Pin	Terminal Block Screw Number	Signal Description
15	1	IOut1
13	2	Isolated ground
17	3	IOut2
16	4	Isolated ground
19	5	IOut3
18	6	Isolated ground
21	7	IOut4
20	8	Isolated ground
23	9	IOut5
22	10	Isolated ground
25	11	IOut6
24	12	Isolated ground
1	13	Analog_In1
2	14	Analog_In2
3	15	Analog_In3
4	16	Ground

Rear Panel Connector Pin	Terminal Block Screw Number	Signal Description
5	17	Analog_In4
6	18	Analog_In5
7	19	Analog_In6
8	20	Ground
9	21	Analog_In7
10	22	Analog_In8
11	23	Ground
14	24	Ground

Power Connections

Before the power cord is connected, be sure that the front panel power switch is OFF and be sure to verify that the local power matches the label on the back of the analyzer.



WARNING The Model 60*i* is supplied with a three-wire grounded power cord. Under no circumstances should this grounding system be defeated. ▲

Startup

Use the following procedure when starting the instrument.

1. Turn the power ON and allow two hours for the instrument to stabilize.
2. Set instrument parameters such as operating ranges and averaging times to appropriate settings. For more information about instrument parameters, see the “Operation” chapter in the “Model 60*i* Instruction Manual.”
3. Before beginning the actual monitoring, perform a calibration as described in the “Calibration” chapter in the “Model 60*i* Instruction Manual.”

Shutdown

Use the following procedure when shutting down the instrument.

1. Connect a clean air source to the SAMPLE connection and allow the instrument to purge pollutants for at least 10 minutes.
2. Turn the power OFF.
3. Cover instrument gas ports when not in use.

IMPORTANT TIPS

DO NOT

- Do not pressurize the analyzer with sample.
- Do not allow liquids to enter the sample port.
- Do not expose the instrument to vibration or magnetic interference.
- Do not remove/adjust the small circular entrance or exit mirrors in the optical bench.

DO

- Use an external pump with atmospheric bypass dump to deliver the sample gas to the instrument.
- Filter/condition sample stream. Sample dew point must be between 2 °C and 8 °C.
- Operate the instrument in a climate controlled environment (15-30 °C).
- Set DHCP to OFF when changing the IP address. If DHCP is ON, the instrument will respond with “Not Settable if DHCP is ON.” For more information on DHCP, see the “Operation” chapter in the “Model 60i Instruction Manual.”

© 2008 Thermo Fisher Scientific Inc. All rights reserved.

Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

Thermo Fisher Scientific
Air Quality Instruments
27 Forge Parkway
Franklin, MA 02038
1-508-520-0430
www.thermo.com/aqi

Troubleshooting

The following table describes possible power-up failures and provides the recommended action to take to restore the system to normal operation.

Troubleshooting Power-Up Failures

Malfunction	Possible Cause	Action
Does not start - the light on the power switch does not come ON.	No power or wrong power configuration	Check the line to confirm that power is available and that it matches the voltage and frequency configuration of the instrument.
	Main fuse is blown or missing	Unplug the power cord, open the fuse drawer on the back panel, and check the fuses visually or with a multimeter. Replace fuses as necessary.
	Bad switch or wiring connection	Unplug the power cord, disconnect the switch and check operation with a multimeter. Replace switch as necessary.
Display does not come on - light on power switch does come ON.	DC power supply failure	Check the green LED on the back edge of the power supply. If the LED is off, the power supply failed.
	DC power distribution failure	Check surface mount LEDs labeled "24V PWR" on the motherboard and the interface board. If lit, the power is OK.
	Display failure	If possible, check instrument function through RS-232 or Ethernet. Reboot instrument.
	Ribbon cable disconnected	Check ribbon cable on side of display board.

The following table describes possible alarm messages that may be displayed during start up and provides the recommended action to take to restore the system to normal operation.

Troubleshooting Alarm Messages

Alarm Message	Possible Cause	Action
Sample Flow	Pump defective	Repair or replace pump.
	Pump disconnected	Connect pump.
	Defective or disconnected flow switch cable	Check flow switch cable.
	Improper alarm threshold setting Plumbing connection/configuration	Reset the alarm threshold. Check plumbing connections.
Bench Temp	Instrument not warmed up	Allow more time for instrument to reach proper operating temperature.
	Heater not plugged in	Plug in heater.
	Defective heater or defective heater wires	Check resistance of heater wires. Unplug heater connector and use an ohmmeter to measure resistance across pins 3 and 4. Normal resistance should be approx. 290 Ω. A higher resistance reading indicates that a heater is defective. Checking pins 1 and 2 should result in a 10K Ω reading. An open reading indicates a failed heater or wiring.
	Improper alarm threshold setting Overheating – fan problem	Reset the alarm threshold. Check fan operation.
Detector	Cable voltage	Check cable.
Board Status	Optical pickup not plugged in	Plug in optical pickup.

NOTE The following board related alarms only occur during power up or reboot.

Alarm - Interface Status	Internal cables not connected properly	Check that all internal cables are connected properly. Cycle AC power to instrument.
Alarm - I/O Exp Status	Defective board	If still alarming, change board.
Alarm - Motherboard Status		

