MC100 for Internet

OPERATOR'S MANUAL

MC100 for Internet

1. What is MC100 for internet?

MC100 for Internet (MC100 for Windows Version 4.xx) is designed for plant wide monitoring and programming of MasterTrace heat tracing controllers using a standard PC running Windows 95, 98, NT4, 2000, XP, Vista, and Windows 7, 8, 10 operating systems. It communicates with control modules through RS485 serial link with facilities for bringing data on any part of network to the desk top and controlling the operation of heat tracing controllers remotely. With its server/client Internet communication capability, cross continent control and maintenance of heat tracing systems are realities. It provides a graphical user interface to allow the operator to easily and quickly interpret the data collected from the field and program the controllers as required.

2. Technical support

There are two ways to get help. (1) Read this manual which is also embedded in the MC100 software. (2) Phone Nextron personnel to get help. Yuming Zeng is the engineer manager in charge of the development of MC100 for Internet. He can be reached at (403) 735-9555 Ext. 241.

3. MC100 Screen Structure

A typical MC100 screen is shown in Figure 1. It consists of 4 major parts. They are: (1) **System pull-up menu**; (2) **Speed bar**; (3) **Function window**; (4) **Status bar**.
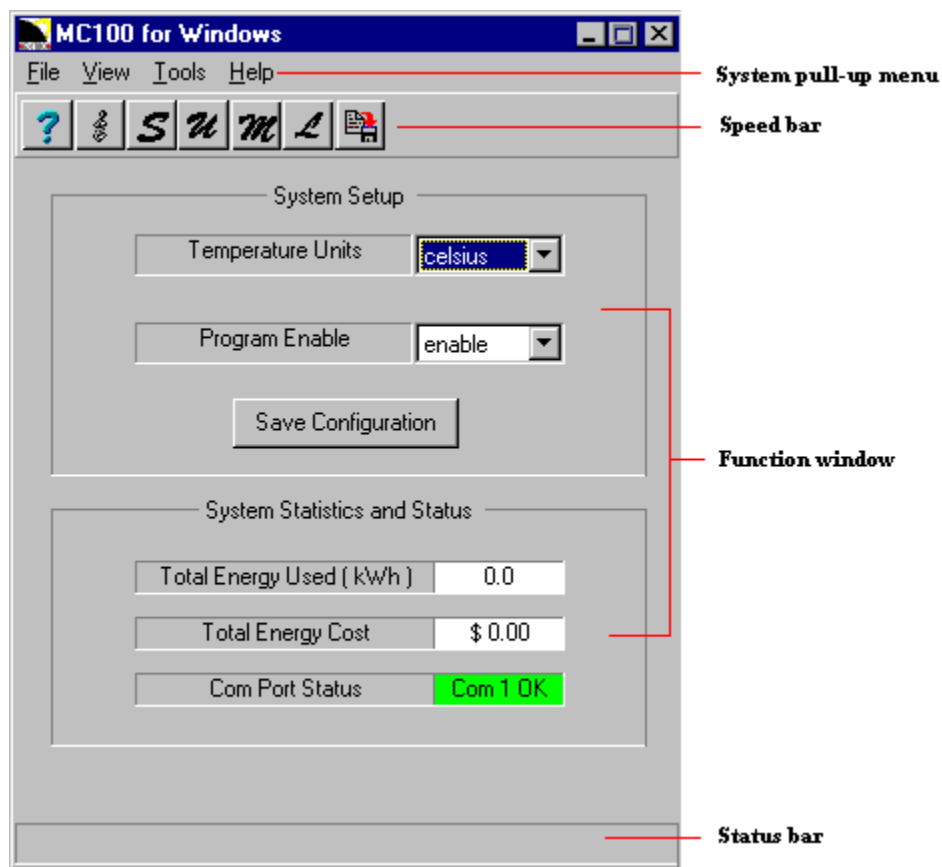
Figure 1 – MC100 screen

Although **System pull-up menu** provides the complete access to any **Function window**, the speed button on the **Speed bar** offers one-click access to some often-used **Function windows** and tasks. **Function window** is MC100's primary working area. It displays all kinds of information which MC100 gathers from each heat-tracing controller in the network. It also provides a graphical-user-interface system for user to interface with controllers and setup tasks. **Status bar** is used to display hint message whenever the mouse cursor is placed over an object.

4. System Function Window

        System Function Window, as shown in Figure 2, is the first function window appearing on the screen immediately after the launch of MC100. Later, it can also be opened via **View|System** menu. There are two panels on the window. One is **System Setup** and the other is **System Statistics and Status**.
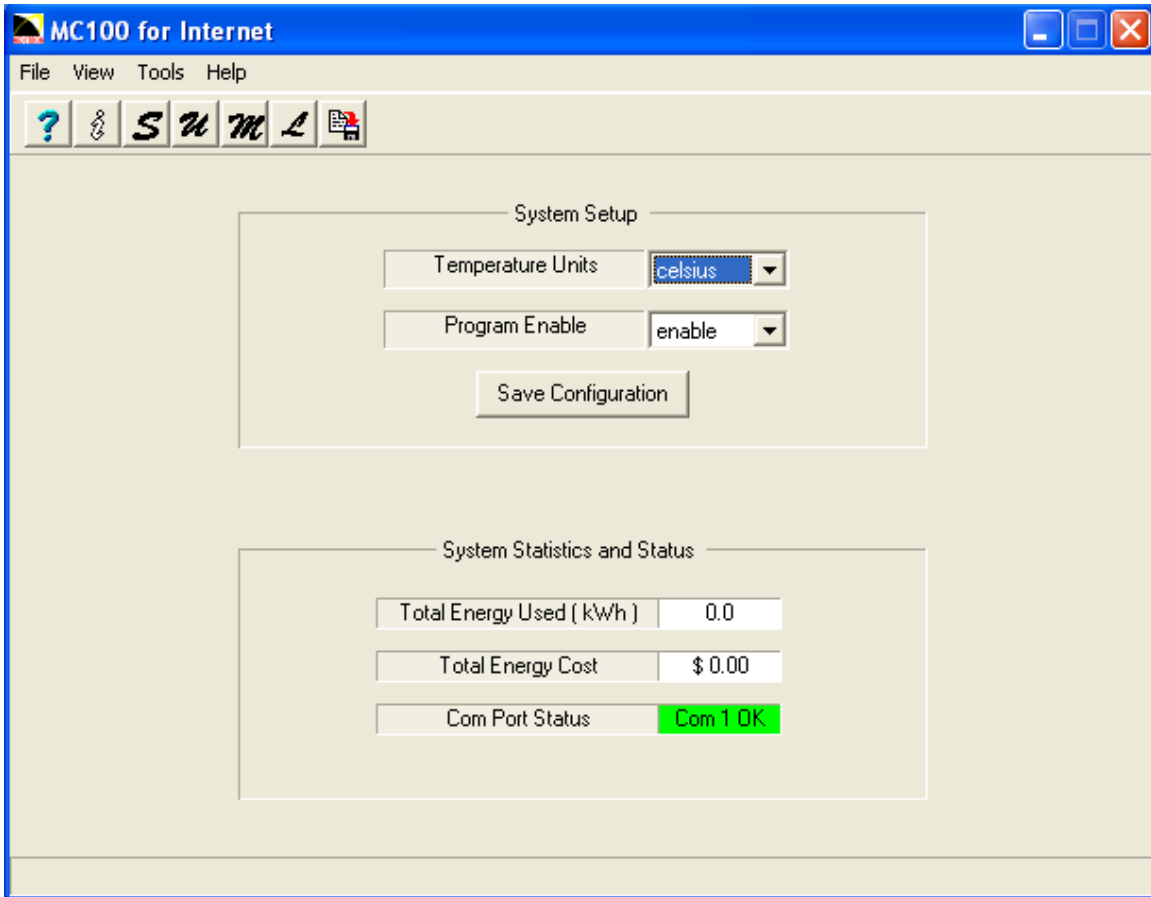

Figure 2 – System Function Window

        On the **System Setup** panel, there are two drop-down edit boxes and one button. The **Temperature Units** edit box is used to define whether the temperature-related variables are displayed in the units of Celsius or Fahrenheit degree. The **Program Enable** edit box allows user to enable or disable programming in MC100. Once it is disabled, MC100 will become a pure monitoring system and nothing can be changed by user. Since this is a very important feature, password is needed if change is to be made. Many configuration parameters, such as baud rate, protocol, temperature units, etc., need to be adjusted in order to properly run MC100. The **Save Configuration** button is used to save all the configuration

parameters to the file **mcconfig.txt** so the user does not have to re-adjust next time. There is a **Save Configuration** speed button on the speed bar to allow user to save the configuration parameters at anytime and anywhere. Also, a popup box will be displayed to ask user to save the changed configuration parameters before MC100 is to be closed.

On the **System Statistics and Status** panel, there are three data boxes. The **Total Energy Used** and **Total Energy Cost** data boxes displays energy total and energy cost total of all heaters on the network, respectively. The **Com Port Status** data box shows the status of each com port in use. If the communication via com port n is OK, it will show **Com n OK** in green. Otherwise, **Com n Error** will be displayed in red. Communication error usually occurs when something is wrong with the com port's setup & RS232/RS485 converter, or there exist mismatches in baud rates among the com port, the controller, and the RS232/RS485 converter.

5. Communication Port Setup Function Window

Communication Port Setup Function Window, as shown in Figure. 3, is designed to setup the RS485 communication between MC100 and the heat-tracing controllers, and the internet communication between server and clients. It can be opened via **View|Port** menu. On this function window, there are one com port drop-down box and six panels, i.e. **Baud Rate**, **Protocol, Module Range**, **Alarm Contact**, **Communication Map**, and **Internet Setup**.
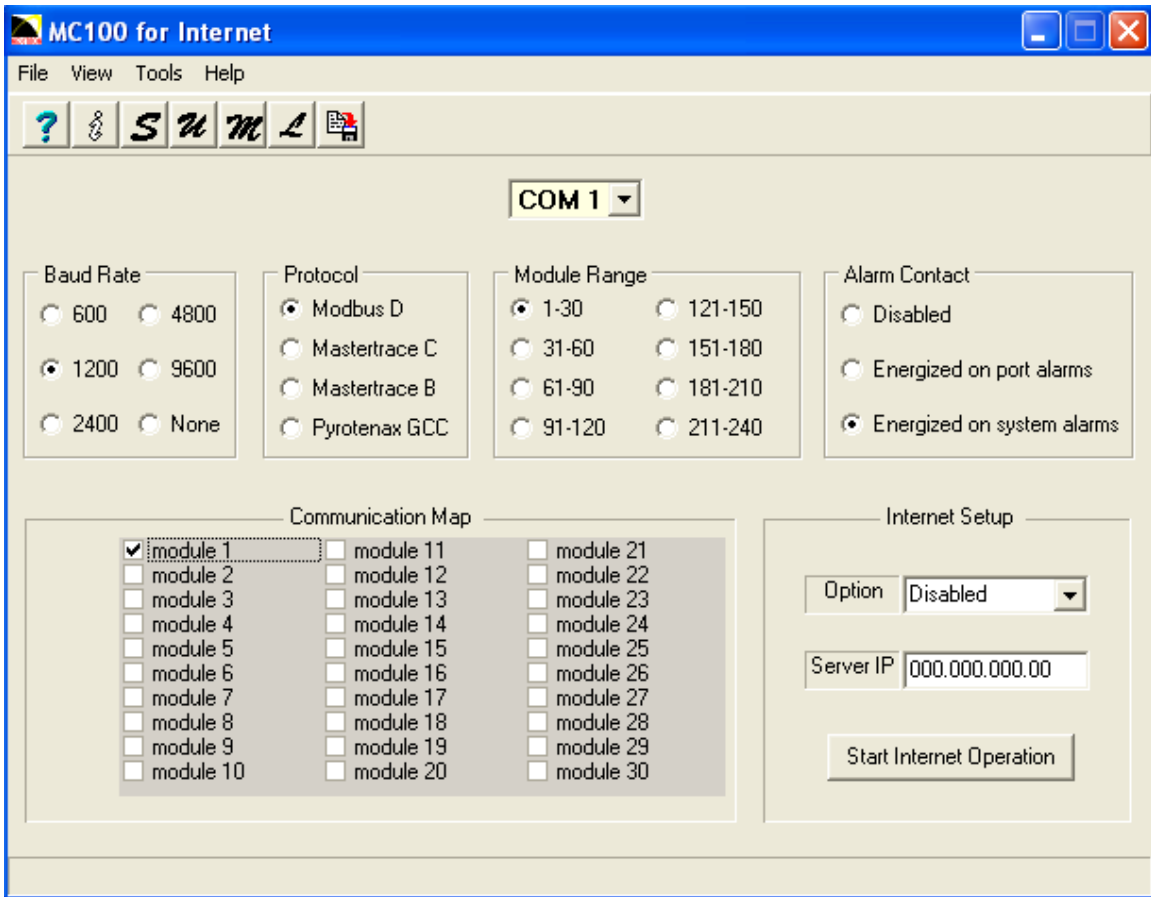

Figure 3 – Communication Port Setup Function Window

There are up to eight com ports (COM 1-8) possible being used by MC100 to communicate with heat-tracing controllers. To properly setup a com port, follow these procedures:

(1) A com port usually is a RS232 serial communication port physically installed on a PC, and the communication activities are through the DB9 connector mounted on the PC.

If there is no RS232 serial communication port on a PC, a USB serial port must be used. A USB serial com port is built when the USB-to-Serial driver is installed onto a PC to cause a USB port on the PC to appear as an additional com port. Under the USB serial port environment, the communication activities are through the DB9 connector on the USB/RS232 adapter and one end of the adapter must be plugged into the PC's USB port.

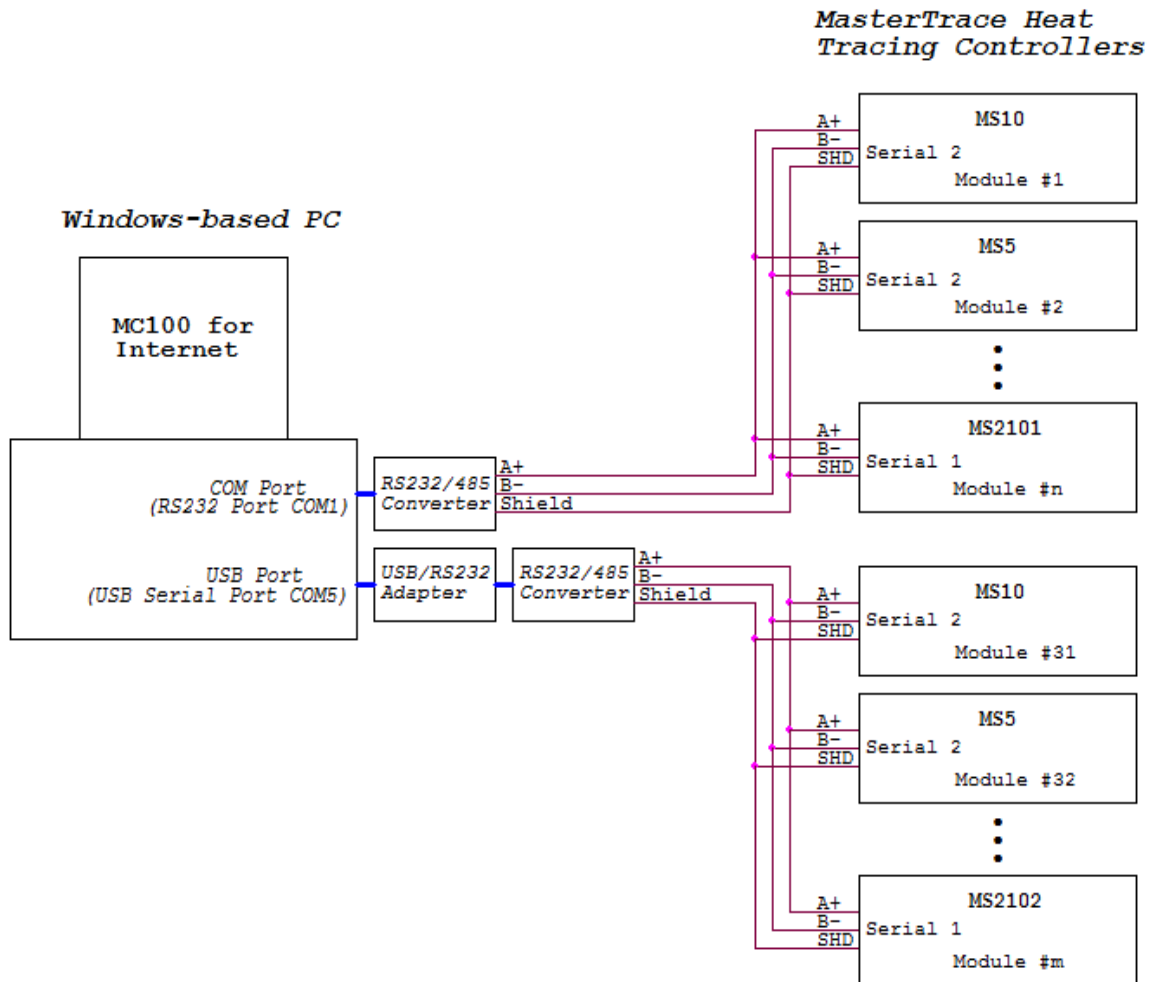Figure 4 is the MC100 overall system communication wiring diagram.

Figure 4 – MC100 Overall System Communication Wiring Diagram

(2) A RS232/RS485 converter is needed for communication signal conversion between each com port on the PC and the heat-tracing controllers. Make sure the wire connection is correct. Figure 5 is the wiring diagram for the RS232/RS485 converters from WIZ-TEC Computing Technologies Inc.
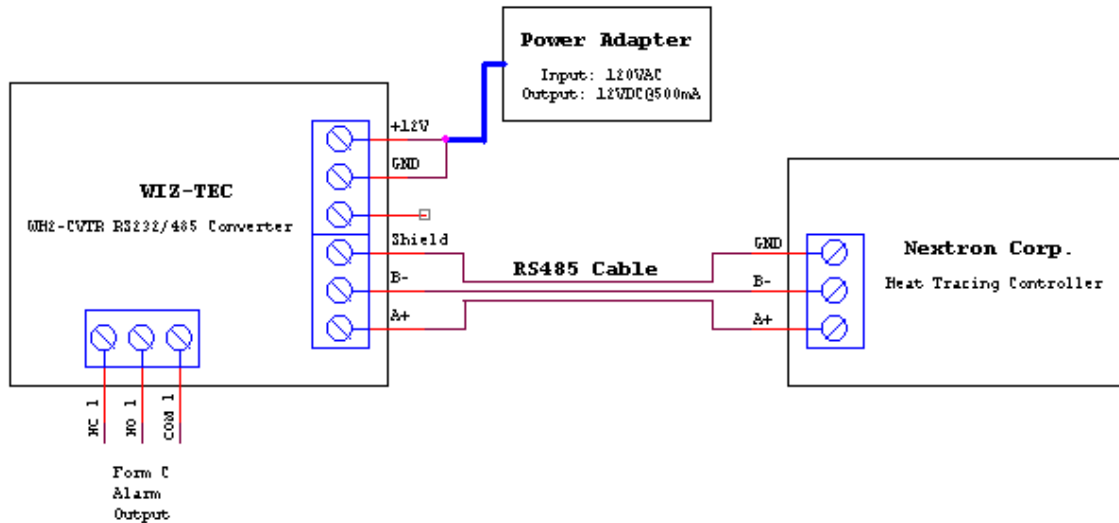
Figure 5 – **RS232/RS485 Converter Wiring Diagram**

(3) Select the desired com port from the com port drop-down box.

(4) Select the proper baud rate. For a com port which is not connecting to any controllers, its baud rate should be set to **None**.

(5) Select the proper protocol. If a com port is connected to the controllers with Modbus protocol (firmware MSxx.Dxx), choose **Modbus D**. If a com port is connected to the controllers with MasterTrace protocol (firmware MS10.Cxx, MS10.Bxx, RS10.Bxx, RS10TC.Bxx), choose **MasterTrace C** or **MasterTrace B**.

(6) Select the proper module/heater range. For a particular com port, all the controllers to which it is connected should have their module numbers (Modbus D protocol) or heater addresses (MaterTrace protocol) falling into one module/heater range.

(7) Select all the modules for communication. For each com port, there are 30 module boxes within the **Communication Map** panel. If the heaters on a controller module are to be communicated with MC100, their corresponding module box must be checked. On the other hand, if a controller module does not exist or it is power down, selecting the module for communication will generate **NO RESPONSE** alarm. To get rid of the alarm de-select the module by un-checking the module box.

(8) Save the configuration.

Alarm Contact panel is designed to program how the alarm contact on the RS232/RS485 converter reacts to the alarm situation in MC100. Some RS232/RS485 converters have alarm contact, some of them don't. For those RS232/RS485 converters with alarm contact, such as **WH2-CVTR** from WIZ-TEC Computing Technologies Inc., the alarm contact can be programmed to one of the following 3 ways to react to the alarm situation in MC100:

 (1) Disabled.

The alarm contact will not react to the alarm situation in MC100.

(2) Energized on port alarms.

The alarm contact will be energized if there is at least one alarm among all heat-tracing modules communicating to the selected com port, and de-energized otherwise.

(3) Energized on system alarms.

The alarm contact will be energized if there is at least one alarm among all heat-tracing modules communicating to the MC100, and de-energized otherwise.

Internet Setup panel is designed to setup the internet communication network. MC100 internet communication network consists of one server (**MC100 server**) and one or more clients (**MC100 client**).

A MC100 server must be the PC which is the master in the RS485 communication network. Its functionalities are two-folded. First, it has the physical links with all heat-tracing controllers and uses these links to query data from the controllers in the RS485 communication network. Secondly, it is the server in the internet communication network, and upon request, it will pass all the information obtained from the RS485 communication network to its clients over the world.

To setup a MC100 server, follow the following procedures:

(1) Select **Server** from the **Option** drop-down edit box.

(2) Enter the server computer's **IP Address** into the **Server IP** edit box.

(3) Start the MC100 server by clicking the **Start Internet Operation** button.

The **IP Address** may vary depending on the different network environment.

(1) If the MC100 server and clients are located in the same **LAN** (Local Area Network), the **IP Address** is the **LAN IP Address** of the MC100 server computer, normally in the format of 192.168.x.x. In Windows 95 & 98, the **IP Address** can be found out by running "**winipcfg**" from the **Start** menu. In Windows NT, 2000, it can be found out by running "**ipconfig**" from the DOS Prompt.

(2) If the MC100 server is a stand-alone computer which does not belong to any **LAN** and is not behind any router or firewall, the format of the **IP Address** could be anything other than 192.168.x.x. It can be found out using the same method above.

(3) If the MC100 server and clients are located in the separated **LAN**s, the **IP Address** is the **WAN IP Address** of the **LAN** which the server computer belongs to. In this case, since the MC100 server computer is connecting to the client computers through a router or firewall, users of the server computer must ask their network administrator to configure the **Port Forwarding** (to the MC100 server computer) function on **Port 5000** of the router.

A MC100 client is MC100 software installed on a computer and configured as a client in the MC100 internet communication network. Even though it has no physical links with any heat-tracing controllers, it can monitor and control the operation of any controllers through the MC100 server. Except that the MC100 client has fewer function windows than the MC100 server, the two are identical in terms of screen structure and operation.

Once the MC100 server is setup and running, a MC100 client can be setup by following these procedures:

(1) Select **Client** from the **Option** drop-down edit box.

(2) Enter the MC100 server computer's **IP Address** into the **Server IP** edit box.

(3) Start the MC100 client by clicking the **Start Internet Operation** button.

6. Heater Setpoint Function Window

Heater Setpoint Function Window, as shown in Figure 6, displays all setpoint values of a selected heater. It can be opened via **View|Heater Setpoint** menu or **Heater Setpoint** speed button on the speed bar. There are two panels on the window. One is **Heater Select** and the other is **Heater Setpoints**.
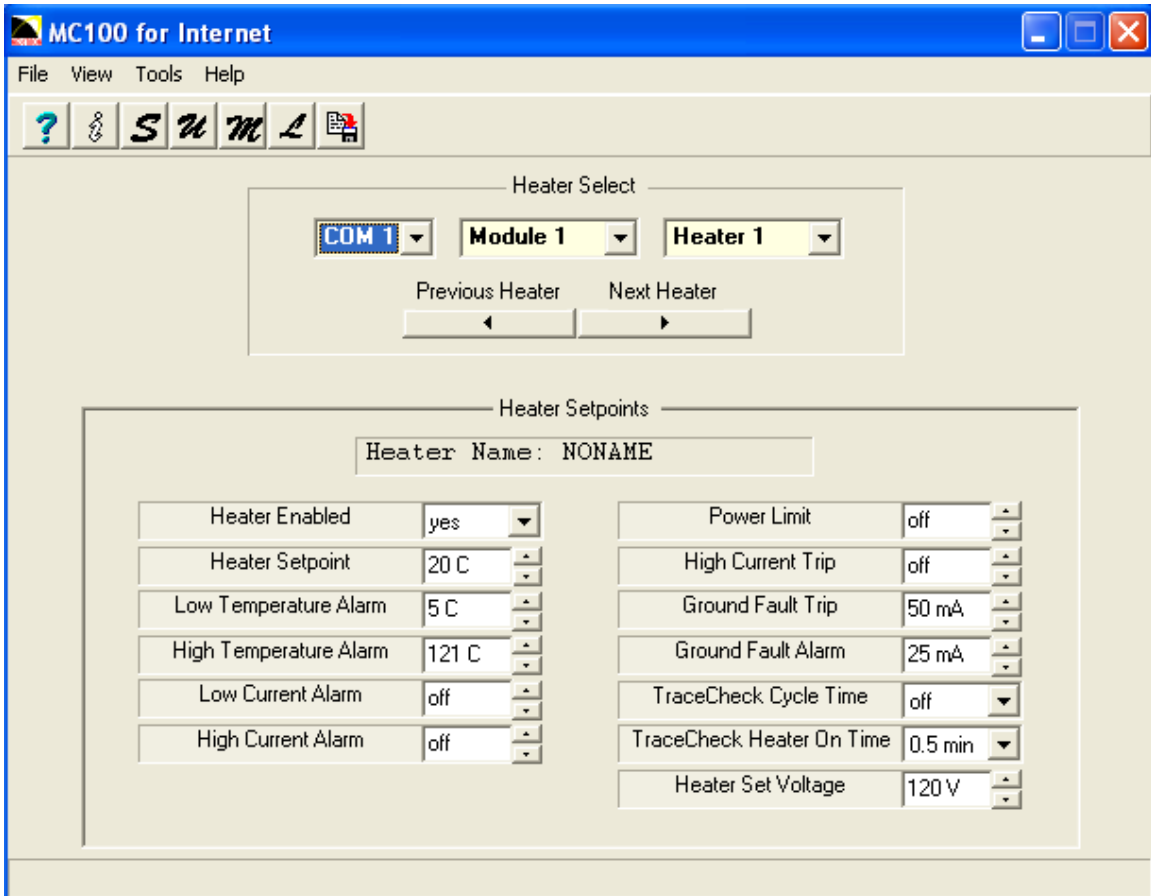

Figure 6 – **Heater Setpoint Function Window**

Heater Select panel is designed to allow user to select the desired heater to view or adjust its setpoints. There are two ways to select a heater. (1) Select a heater by using the three drop-down edit boxes (**com port**, **module number** and **heater number**) in combination. (2) Select a heater using the **previous heater** or **next heater** button.

Heater Setpoint panel lists all the necessary setpoint edit boxes related to the selected heater. Depending on the type of the controller module, the type of **Heater Setpoint** panel can change from fixed size panel (single phase MS10) to horizontal scrollable panel (three phase MSx), or to vertical scrollable panel (MS1). Some setpoint edit boxes are simply drop-down edit boxes. Some of them are the

combination of edit box and increment/decrement buttons. To change a setpoint using drop-down edit box or increment/decrement button, it is just a matter of mouse click. To change a setpoint using edit box, use mouse or Tab key to enter into the edit field first. Then, use keyboard to enter the setpoint value.

7. Heater Setup Function Window

Heater Setup Function Window, as shown in Figure 7, displays all setup parameters of a selected heater. It can be opened via **View|Heater Setup** menu or **Heater Setup** speed button on the speed bar. There are two panels on the window. One is **Heater Select** and the other is **Heater Setup**.
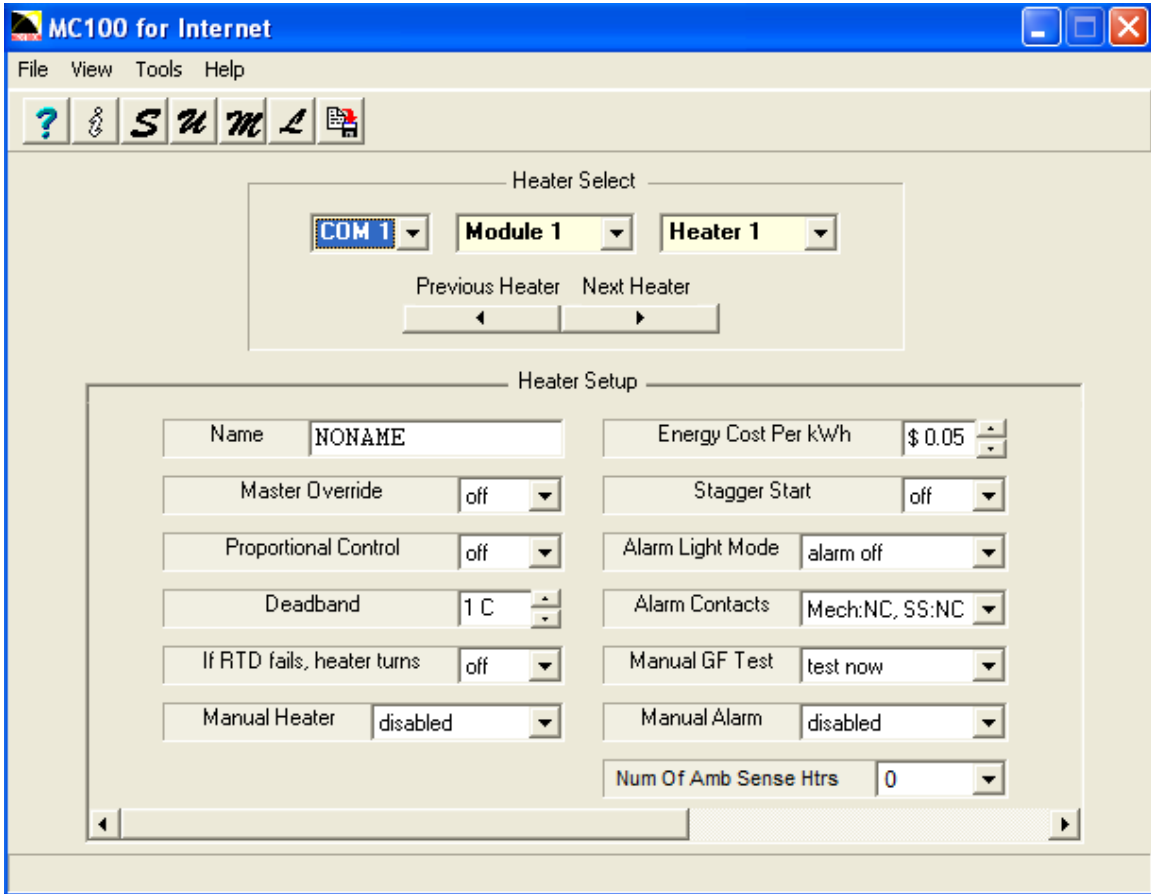

Figure 7 – **Heater Setup Function Window**

Heater Select panel is designed to allow user to select the desired heater to view or adjust its setup parameters. There are two ways to select a heater. (1) Select a heater by using the three drop-down edit boxes (**com port**, **module number** and **heater number**) in combination. (2) Select a heater using the **previous heater** or **next heater** button.

Heater Setup panel lists all the necessary setup edit boxes related to the selected heater. Depending on the type of the controller module, the type of **Heater Setup** panel can change from horizontal scrollable panel (MS10) to horizontal and vertical scrollable panel (MS1). Some setup edit boxes are simply drop-down edit boxes. Some of them are the combination of edit box and increment/decrement buttons. To change a setup parameter using drop-down edit box or increment/decrement button, it is just a

matter of mouse click. To change a setup parameter using edit box, use mouse or Tab key to enter into the edit field first. Then, use keyboard to enter the parameter value.

On the right-hand side of the **Heater Setup** panel, there is a small **Heater Notes** panel. It consists of a text editor and a save button. User can enter any text information regarding to the selected heater. Upon clicking the save button, all the information entered will be saved.

8. Heater Measured Values Function Window

Heater Measured Values Function Window, as shown in Figure 8, displays all measured data values of a selected heater, such as heater current, ground fault current, temperature, etc. It can be opened via **View|Measured** menu or **Measured** speed button on the speed bar. There are two panels on the window. One is **Heater Select** and the other is **Heater Measured Values**.

Figure 8 – **Heater Measured Values Function Window**

Heater Select panel is designed to allow user to select the desired heater to view its measured data. There are two ways to select a heater. (1) Select a heater by using the three drop-down edit boxes (**com port**, **module number** and **heater number**) in combination. (2) Select a heater using the **previous heater** or **next heater** button.

All the measured data values related to the selected heater are displayed on the **Heater Measured Values** panel. MC100 will be constantly polling the selected heater to update those data. Depending on the type of the controller module, the type of **Heater Measured Values** panel can change from fixed size panel

(single phase MS10) to horizontal scrollable panel (three phase MSx), or to vertical scrollable panel (MSx with dual RTDs).

9. Heater Statistics Function Window

Heater Statistics Function Window, as shown in Figure 9, displays all statistic data values of a selected heater, such as heater maximum current, minimum temperature, etc. It can be opened via **View|Statistics** menu. There are two panels on the window. One is **Heater Select** and the other is **Statistics**.
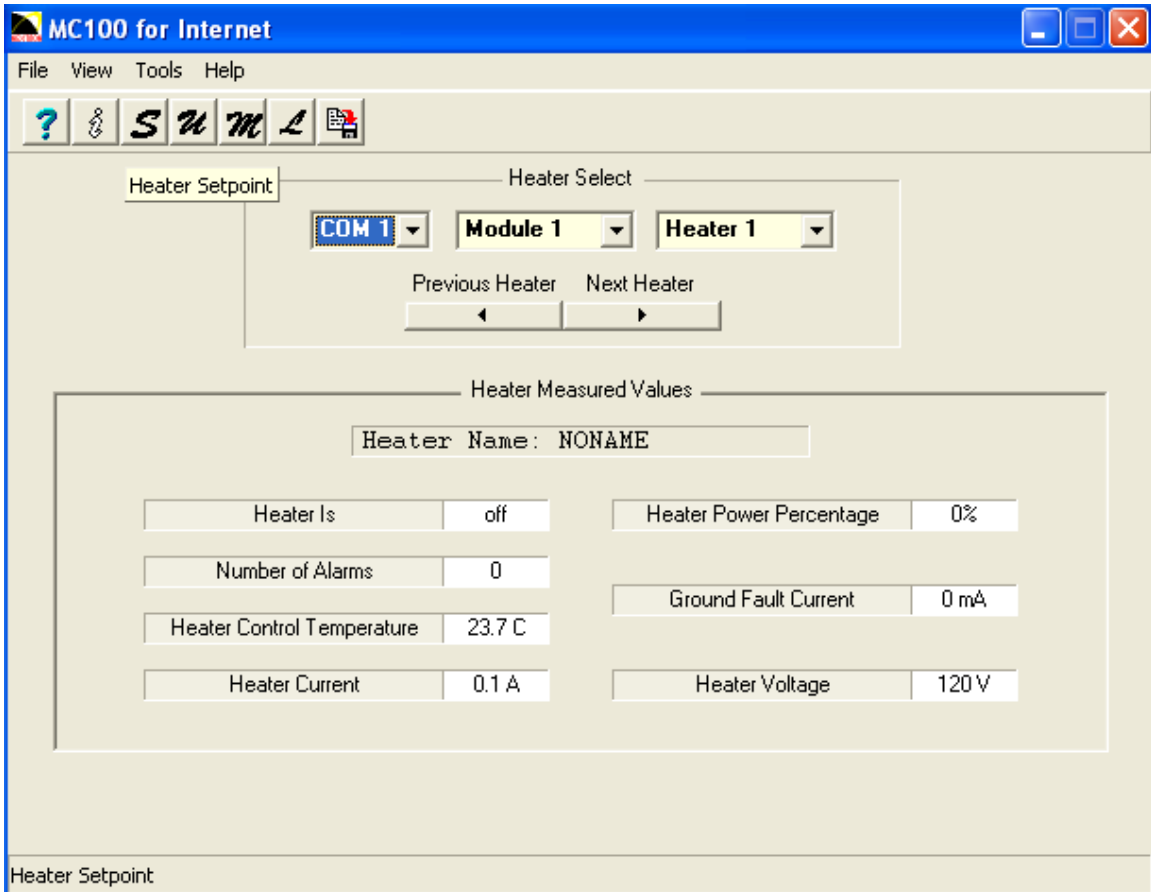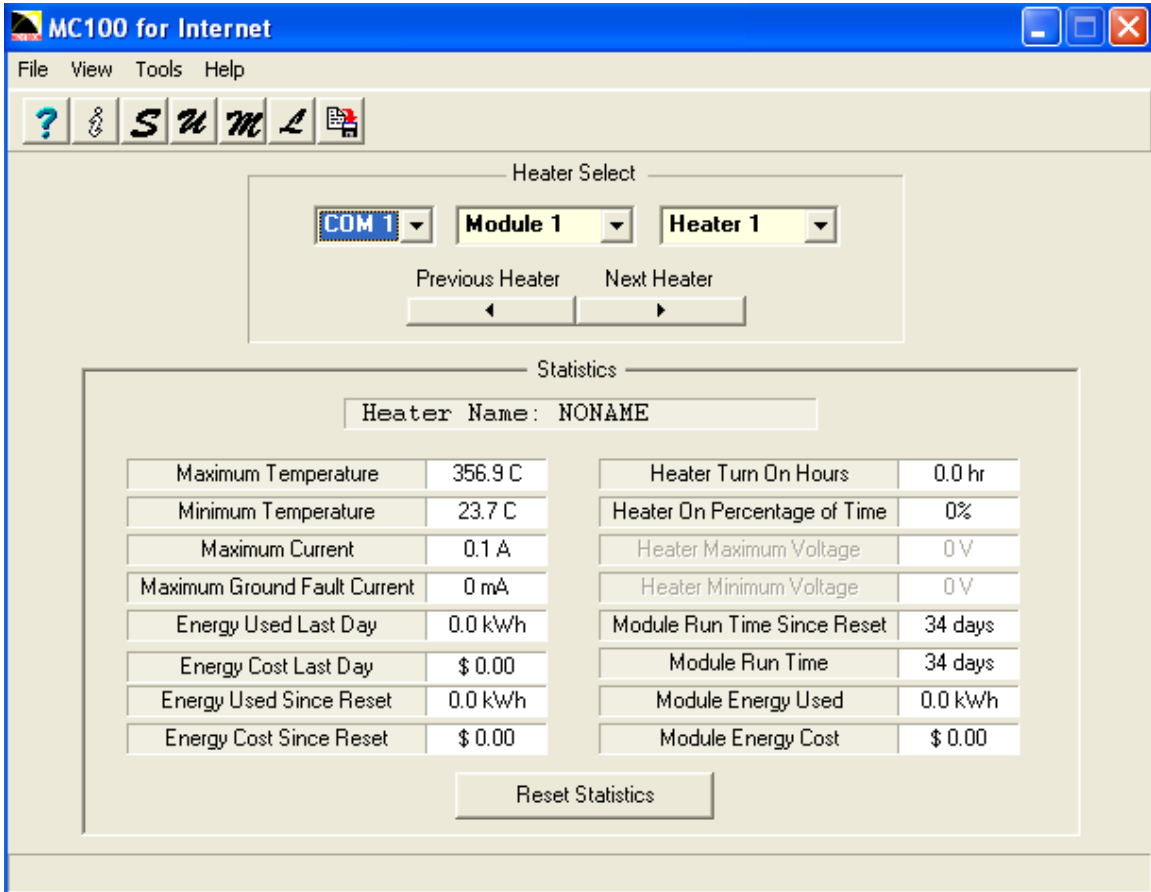

Figure 9 – Heater Statistics Function Window

Heater Select panel is designed to allow user to select the desired heater to view its statistic data. There are two ways to select a heater. (1) Select a heater by using the three drop-down edit boxes (**com port**, **module number** and **heater number**) in combination. (2) Select a heater using the **previous heater** or **next heater** button.

All the statistic data values related to the selected heater are displayed on the **Statistics** panel. MC100 will be constantly polling the selected heater to update those data. Depending on the type of the controller module, the type of **Statistics** panel can change from fixed size panel (single-phase MSx) to horizontal scrollable panel (three-phase MSx).

To reset a statistic data, one must follow these procedures:

(1) Move the mouse cursor to the statistic data box.

(2) Double click the left mouse button.

(3) Confirm/Cancel the reset action by clicking the **Yes/No** box on the confirmation box.

To reset all the statistic data of the selected heater, one must follow these procedures:

(1) Click the **Reset Statistics** button on the **Statistics** panel.

(2) Confirm/Cancel the reset action by clicking the **Yes/No** box on the confirmation box.

10. Alarm Status Function Window

Alarm Status Function Window, as shown in Figure 10, can be opened via **View|Alarm Status** menu. It can also be opened by clicking on the flashing red alarm button on the right-hand side of the speed bar. This alarm button only appears if there is at least one alarm in the network.

Figure 10 – **Alarm Status Function Window**

Alarm Status Function Window displays all the current alarm information in a tabular format. Each alarm occupies 1 row and 6 columns (Port, Heater #, Heater Name, Alarm Type, Setpoint, and Actual Value). The window can only display 20 alarms in a page. If there are more than 20 alarms in the network, use the **page up** and **page down** buttons located on the right-hand side of the table to view the alarms on the different pages.

Some alarms are latched alarms. To reset a latched alarm, one must follow these procedures:

(1) Move the mouse cursor to the alarm row.

(2) Double click the left mouse button.

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(3) Confirm/Cancel the reset action by clicking the **Yes/No** box on the confirmation box.

12. Change Password

Password, if there is one, is required if you want to change **Program Enable** or to perform **Controller Commissioning/Addressing**. The default password is no password after the MC100 is newly installed, which means that you don't need a password to perform the above tasks.

To change the password, you must follow these procedures:

(1) Start the task via **Tools|Change Password** menu.

(2) If currently the MC100 has a password, a **Password** box will be displayed asking for the old password. Enter the current password and click the **OK** button.

(3) At this moment, a **Confirm** box will be displayed asking if you want a password or not. If you don't want a password, click on the **No** button and the task is accomplished. If you want a password, click on the **Yes** button and a **Password** box will be displayed asking for the new password.

(4) Enter your new password and click on the **OK** button.

13. Controller Commissioning/Addressing Function Window

Controller Commissioning/Addressing Function Window, as shown in Figure 11, can be opened via **Tools|Controller Commissioning/Addressing** menu.
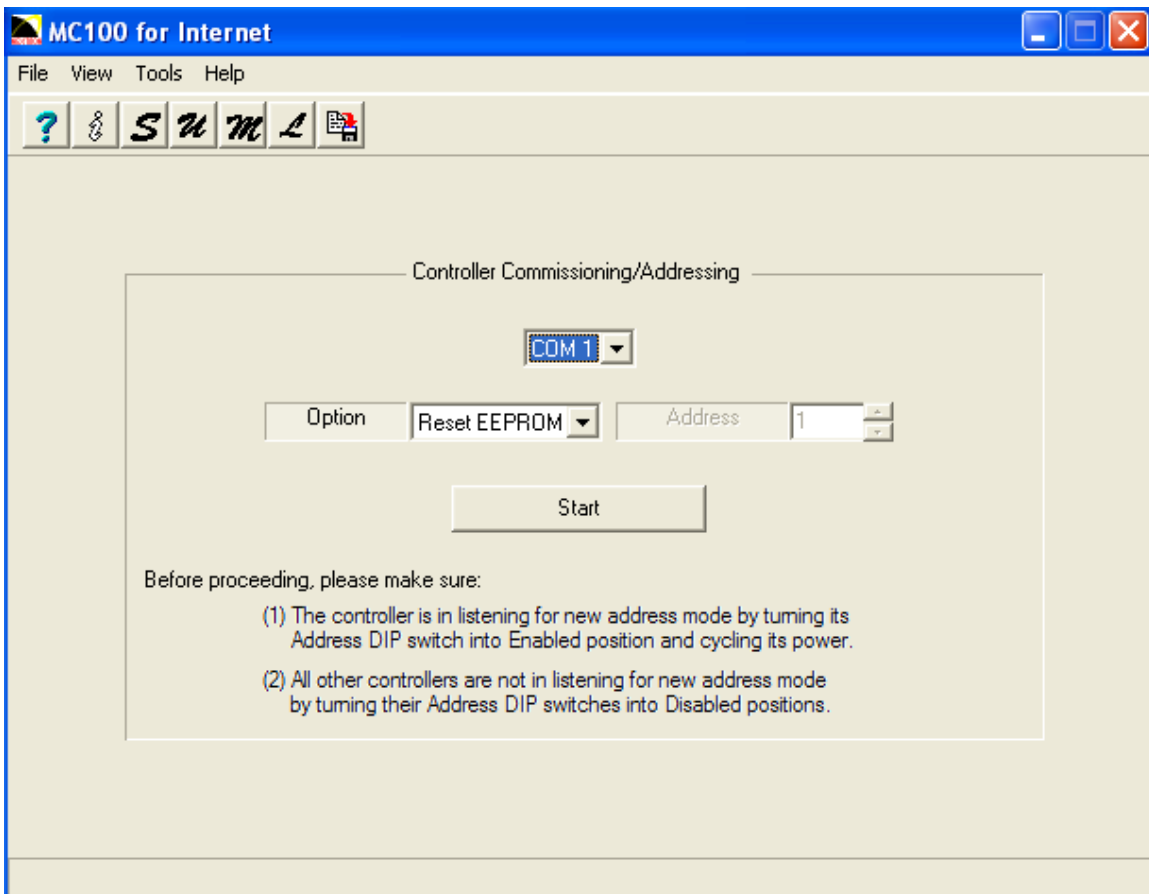

Figure 11 – **Controller Commissioning/Addressing Function Window**

Controller Commissioning/Addressing includes three operations. They are:

(1) **Reset EEPROM**. It is used to reset all the heater setpoints on a controller module to their default values.

(2) **Read address**. It is used to read the module number (Modbus Protocol) or the starting heater address (MasterTrace Protocol) of a controller module.

(3) **Assign address**. It is used to assign the module number (Modbus Protocol) or the starting heater address (MasterTrace Protocol) of a controller module.

Each operation can be carried out if the target controller module is the only one in listening new address mode and its Address DIP switch is in **Enable** position.

The **Controller Commissioning/Addressing** panel consists of 3 edit boxes and 1 button, i.e., **Com Port** drop-down edit box, **Option** drop-down edit box, **Address** edit box and **Start** button.

To perform one **Controller Commissioning/Addressing** operation, one must follow these procedures:

(1) Select the proper com port using the **Com Port** drop-down edit box.

(2) Select the desired operation using the **Option** drop-down edit box.

(3) If the operation is **Assign Address**, select the desired module number or starting heater address using increment/decrement button on the **Address** edit box.

(4) Clicking on the **Start** button.

(5) Start the operation by clicking on the **Yes** button on the popup **Confirmation Box**.

(6) It takes about 15 seconds for the target controller to accomplish the operation. During this period, the word "Start" on the **Start** button will be changed to "Wait ..."

(7) If the operation is successful, word "Done!" will appear on the **Start** button for a while. Otherwise, word "Failed!" will appear. For a successful **Read address** operation, the module number or the starting heater address will appear on the **Address** edit box.

(8) In the end, word "Start" will re-appear and a new operation can be started.

14. Data Logging Function Window

Data Logging Function Window, as shown in Figure 12, can be opened via **Tools|Data Logging** menu. It is designed to record the actual measured data such as temperature, current, ground fault current of any selected heaters at regular time interval within a specified period of time. Each selected heater will have its own data file saved in the **Log** sub-directory. For a heater with Modbus Protocol, its data file is named as mc**P**-**M**-**H**data.txt, where **P** is the port number, **M** is the module number and **H** is the heater number. For a heater with MasterTrace Protocol, its data file is named as mc**P**-**H**data.txt, where **P** is the port number and **H** is the heater address. If the size of the data file is too big to add more data, a new mc**P**-**M**-**H**data.txt or mc**P**-**H**data.txt will be created to record the new data. The old data will be kept in a file named mc**P**-**M**-**H**data.bak or mc**P**-**H**data.bak.

The **Data Logging Function Window** consists of 2 panels (**Log Options** panel and **Data Log Heater Map** panel) and 1 **Start logging** button. **Log Options** panel is used to define log options such as

Start Date, **Start Time**, **Interval** and **Duration**. **Data Log Heater Map** panel is used to select all the heaters to be logged.
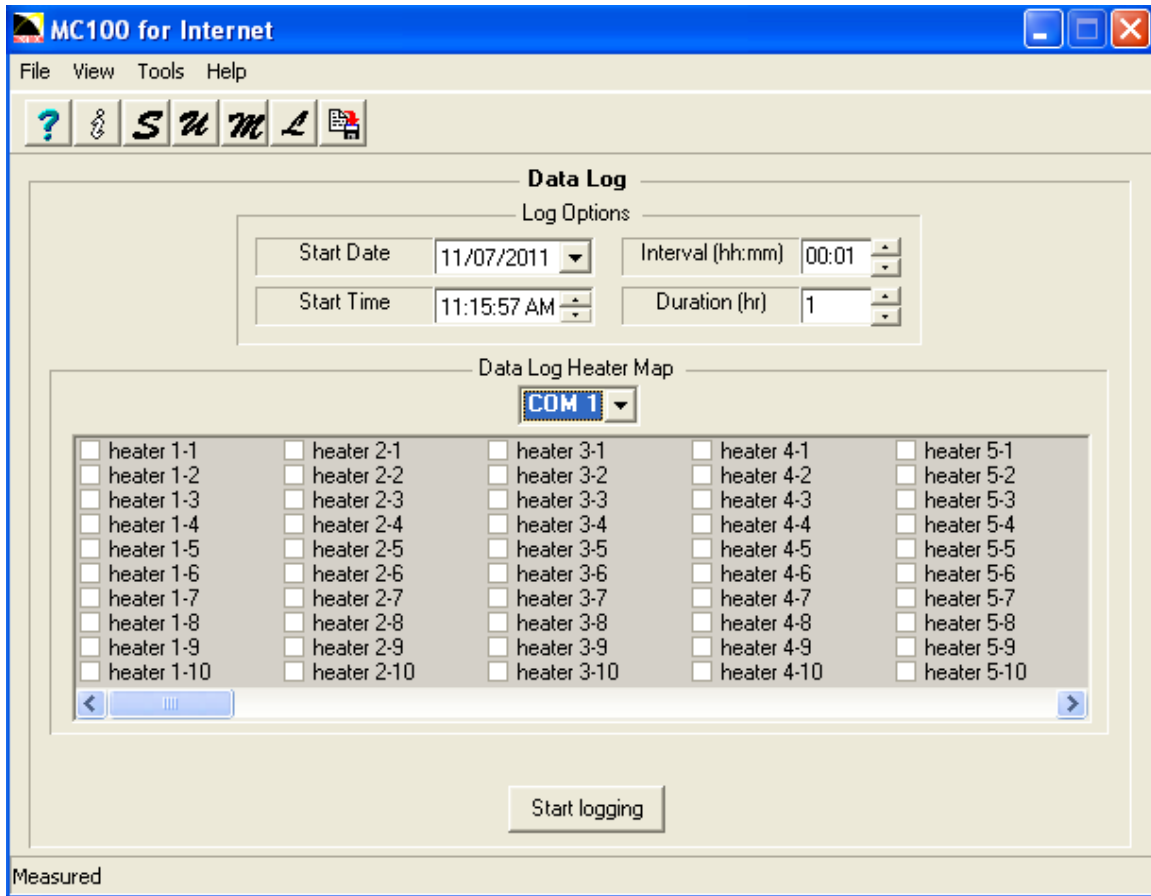

Figure 12 – **Data Logging Function Window**

To perform **Data Logging** operation, one must follow these procedures:

(1) Define the logging start date by using the **Start Date** drop-down edit box on the **Log Options** panel.

(2) Define the logging start time by using the **Start Time** edit box on the **Log Options** panel.

(3) Define the logging interval by using the **Interval** edit box on the **Log Options** panel.

(4) Define the logging duration by using the **Duration** edit box on the **Log Options** panel.

(5) Select the desired logging heater by choosing the correct com port and checking the heater box on the **Data Log Heater Map** panel.

(6) Start the data logging by clicking on the **Start logging** button.

(7) If the logging operation has been indeed started, a progress bar will appear and the word "Start logging" on the **Start logging** button will be changed to "Stop logging".

(8) Once the logging has been started, unless the **Stop logging** button is clicked, it will continue until its logging duration is expired.

(9) Save the configuration. This will continue the logging operation even if the MC100 is exited and re-launched.

15. Load Shedding Function Window

           Load Shedding Function Window, as shown in Figure 13, can be opened via **Tools|Load Shedding** menu or **Loadshed** speed button on the speed bar. It is designed to allow user to disable/enable a group of selected heaters manually or automatically on a certain condition. The **Load Shedding Function Window** consists of 2 panels (**Heater Loadshed** panel and **Loadshed Heater Map** panel) and 1 **Start loadshed** button. **Heater Loadshed** panel is used to define loadshed operation by choosing its **Mode** (manual or automatic), **Option** (disable heater or enable heater), **Temperature Setpoint** and **Ambient Temperature Heater** (for automatic mode only). **Loadshed Heater Map** panel is used to select all the heaters to be affected by loadshed operation. The **Start loadshed** button is used to start the loadshed operation.
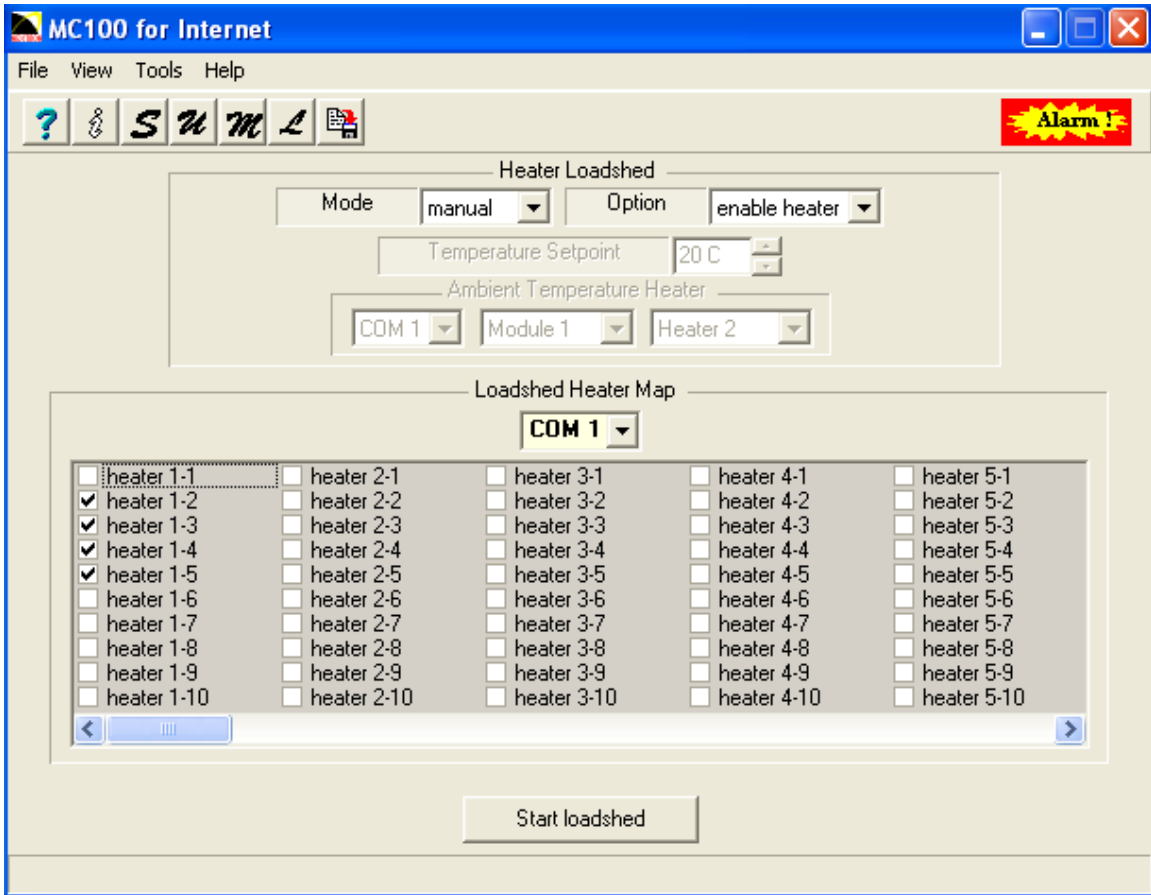

Figure 13 – **Load Shedding Function Window**

           There are two loadshed modes, manual mode and automatic mode.

           In manual mode, upon clicking on the **Start loadshed** button, all the selected heaters will be sequentially disabled or enabled depending on the **Option**. After the last selected heater is disabled or enabled, the operation will be stopped.

           In automatic mode, upon clicking on the **Start** button, MC100 will constantly monitor the temperature of the **Ambient Temperature Heater**. Once the temperature of the **Ambient Temperature Heater** is higher than the **Temperature Setpoint**, all the selected heaters will be sequentially disabled.

Unless stopped by user, the automatic loadshed operation will continue. Should the above condition become true again, another round of disabling heater will be automatically started.

To perform **Loadshed** operation, one must follow these procedures:

(1) Define the loadshed mode by using the **Mode** drop-down edit box on the **Heater Loadshed** panel.

(2) Define the loadshed option by using the **Option** drop-down edit box on the **Heater Loadshed** panel.

(3) If it's automatic mode, define the loadshed setpoint by using the **Temperature Setpoint** edit box on the **Heater Loadshed** panel. Also, select the ambient temperature heater by using the **Ambient Temperature Heater** selector.

(4) Select the desired loadshed heater by choosing the correct com port and checking the heater box on the **Loadshed Heater Map** panel.

(5) Start the loadshed operation by clicking on the **Start loadshed** button.

(6) If the loadshed operation has been started, a progress bar will appear and the word "Start loadshed" on the **Start loadshed** button will be changed to "Stop loadshed".

(7) An ongoing loadshed operation can be manually stopped by clicking on **Stop loadshed** button.

(8) Save the configuration. This will continue the automatic loadshed operation even if the MC100 is exited and re-launched.

16. Copy Heater/Module Function Window (master mode only)

Copy Heater/Module Function Window, as shown in Figure 14, can be opened via **Tools|Copy Heater/Module** menu. It is designed to allow user to copy all the setpoints and setups from one heater/module to another heater/module. The **Copy Heater/Module Function Window** consists of 3 panels (**Option**, **Source Heater/Module**, and **Destination Heater/Module** panel) and 1 **Start** button.

Copy Heater/Module operation can't be started unless the following conditions are met:

(1) The source heater/module and destination heater/module share the same protocol.

(2) The source and destination have different heater address or module number.

(3) Both the source and destination heaters/modules are communicating with MC100.

(4) Module to module copying is not between 2 modules with MasterTrace protocol.

(5) If it is module to module copying, both the source and destination modules must have the same numbers of heater, i.e., MS1 to MS1, MS5 to MS5, and MS10 to MS10.

To start a **Copy Heater/Module** operation, one must follow these procedures:

(1) Define the copying option by clicking on the desired radio button on the **Option** panel.

(2) Select the desired source heater/module by using the **Source Heater/Module** selector.

(3) Select the desired destination heater/module by using the **Destination Heater/Module** selector.

(4) Start the copying operation by clicking on the **Start** button.

(5) If the copying operation has been indeed started, a progress bar will appear and the word "Start" on the **Start** button will be changed to "Stop".

(6) Unless the copying operation is manually stopped by clicking on the **Stop** button, it will continue until the last parameter is copied.
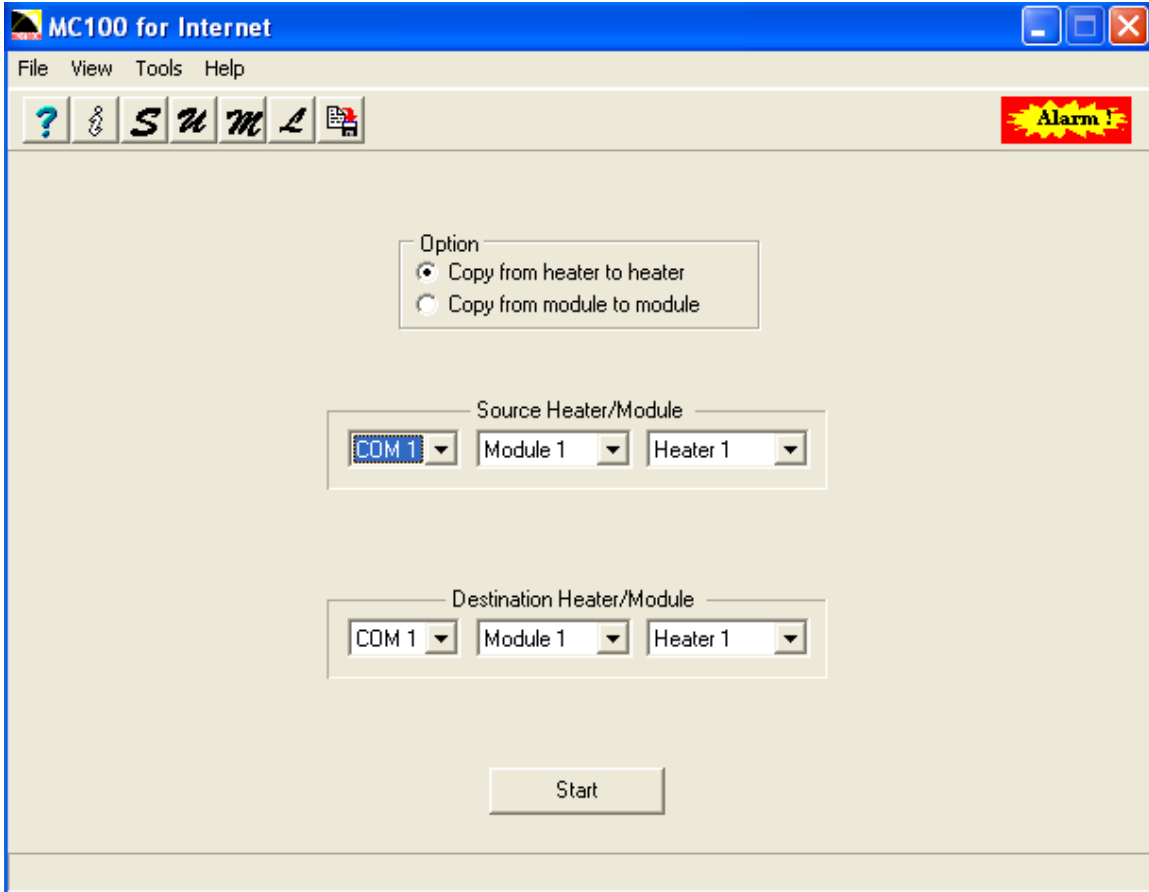

Figure 14 – Copy Heater/Module Function Window

Upon successful completion of **Copy Heater/Module** operation, these effects occur:

(1) If it is heater to heater copying, all the setpoints of the source heater will be copied to the destination heater. The copied setpoints are: heater enabled, heater setpoint, low & high temperature alarms, low & high current alarms, high current trips, power limit, ground fault trip, ground fault alarm, tracecheck cycle time, tracecheck htr on time, heater voltage, heater name, master override, proportional control, deadband, heater fail-safe state, manual heater, low & high voltage alarms, and soft start time.

(2) If it is module to module copying, all heaters' setpoints on the source module will be copied to all heaters on the destination module. The copied heaters' setpoints are: heater enabled, heater setpoint, low & high temperature alarms, low & high current alarms, high current trips, power limit, ground fault trip, ground fault alarm, tracecheck cycle time, tracecheck htr on time, heater voltage, heater name, master override, proportional control, deadband, heater fail-safe state, manual heater, low & high voltage alarms, and soft start time. Plus, all the module setups on the source module will be copied to the destination module. The copied module setups are: number of ambient sensing heaters, baud rate of serial port 1, baud

rate of serial port 2, alarm light mode, alarm contact mode, RTD definition, cost per kWh, stagger start, thermocouple type, manual alarm, gf test, and heat trace option.

17. Setpoint List Function Window

Setpoint List Function Window, as shown in Figure 15, can be opened via **Tools|Setpoint List** menu. It is designed to record some major setpoints such as heater enable, temperature setpoint, low temperature alarm and high temperature alarm of any selected heater. All the recorded setpoints will be saved in a file named **mcsplist.txt** in the **Log** sub-directory. If the file **mcsplist.txt** exists before, it will be renamed to **mcsplistMM-DD-YY.txt**, where **MM** is the month, **DD** is the day and **YY** is the year.
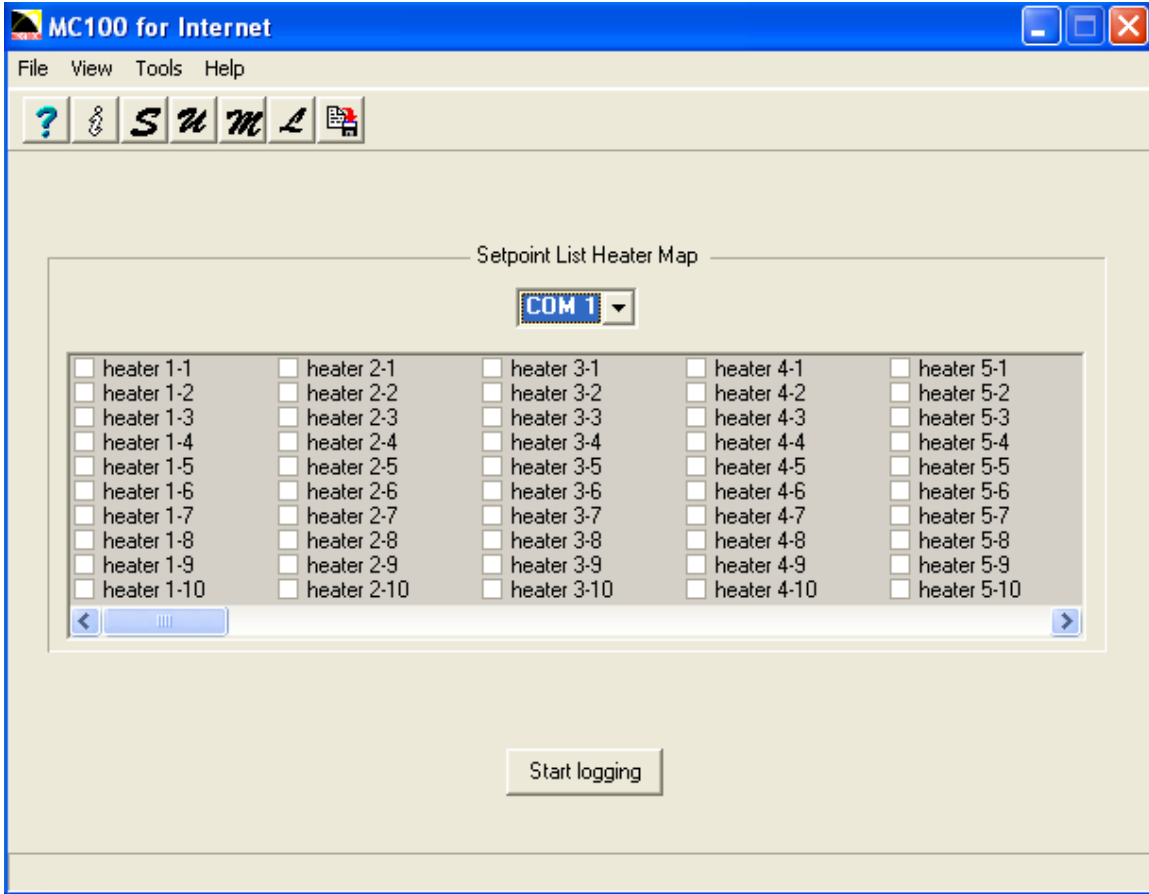

Figure 15 – **Setpoint List Function Window**

The **Setpoint List Function Window** consists of a **Setpoint List Heater Map** panel and a **Start logging** button.

To perform **Setpoint List** operation, one must follow these procedures:

(1) Select the desired logging heater by choosing the correct com port and checking the heater box on the **Setpoint List Heater Map** panel.

(2) Start the setpoint logging by clicking on the **Start logging** button.

(3) If the logging operation has been indeed started, a progress bar will appear and the word "Start logging" on the **Start logging** button will be changed to "Stop logging".

(4) Unless the logging operation is manually stopped by clicking on the **Stop logging** button, it will continue until the last heater is logged.

18. Alarm History Function Window

Alarm History Function Window, as shown in Figure 16, can be opened via **Tools|Alarm History** menu. It is designed to selectively record on/off status of system alarms. All the recorded alarm information will be saved in a file named **mcalarm.txt** in the **Log** sub-directory. If the size of the file is too big to add more alarm information, a new **mcalarm.txt** will be created and the old file will be renamed to **mcalarmMM-DD-YY.txt**, where **MM** is the month, **DD** is the day and **YY** is the year.
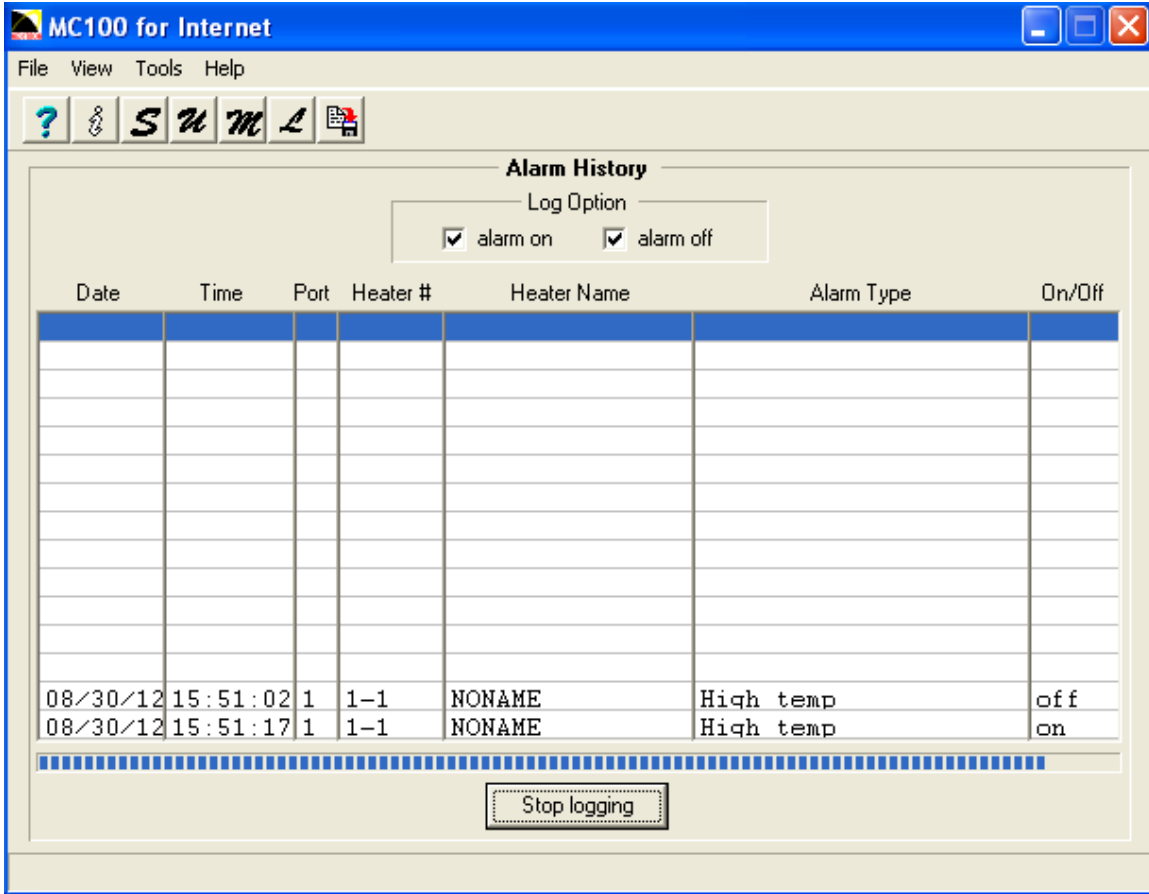

Figure 16 – **Alarm History Function Window**

The **Alarm History Function Window** consists of a **Log Option** panel, an **Alarm History Table** and a **Start logging** button. The **Alarm History Table** displays 15 most recently recorded alarms information in a format of Date, Time, Port, Heater #, Heater Name, Alarm Type and On/Off.

To setup an **Alarm History** Logging operation, one must follow these procedures:

(1) Select logging options by checking the **alarm on** and **alarm off** check boxes on the **Log Option** panel.

(2) Start the logging by clicking on the **Start logging** button.

(3) If the logging operation has been started, a progress bar will appear and the word "Start logging" on the **Start logging** button will be changed to "Stop logging".

(4) Once the logging has been started, it will continue until it's manually stopped by clicking on the **Stop logging** button.

(5) Save the configuration. This will continue the logging operation even if the MC100 is exited and re-launched.

19. Backup/Restore Function Window

Backup/Restore Function Window, as shown in Figure 17, can be opened via **Tools|Backup/Restore** menu. It is designed to backup/restore all the setpoints and setups of a group of selected heaters into/from files. Each selected heater will have its own setpoint backup file saved in the **Config** sub-directory. For a heater with Modbus Protocol, its data file is named as **mcP-M-Hsp.txt**, where **P** is the port number, **M** is the module number and **H** is the heater number. For a heater with MasterTrace Protocol, its data file is named as **mcP-Hsp.txt**, where **P** is the port number and **H** is the heater address. If the backup file exists before, a new backup file will be created and the old one will be renamed to **mcP-M-Hsp.bak** or **mcP-Hsp.bak**.
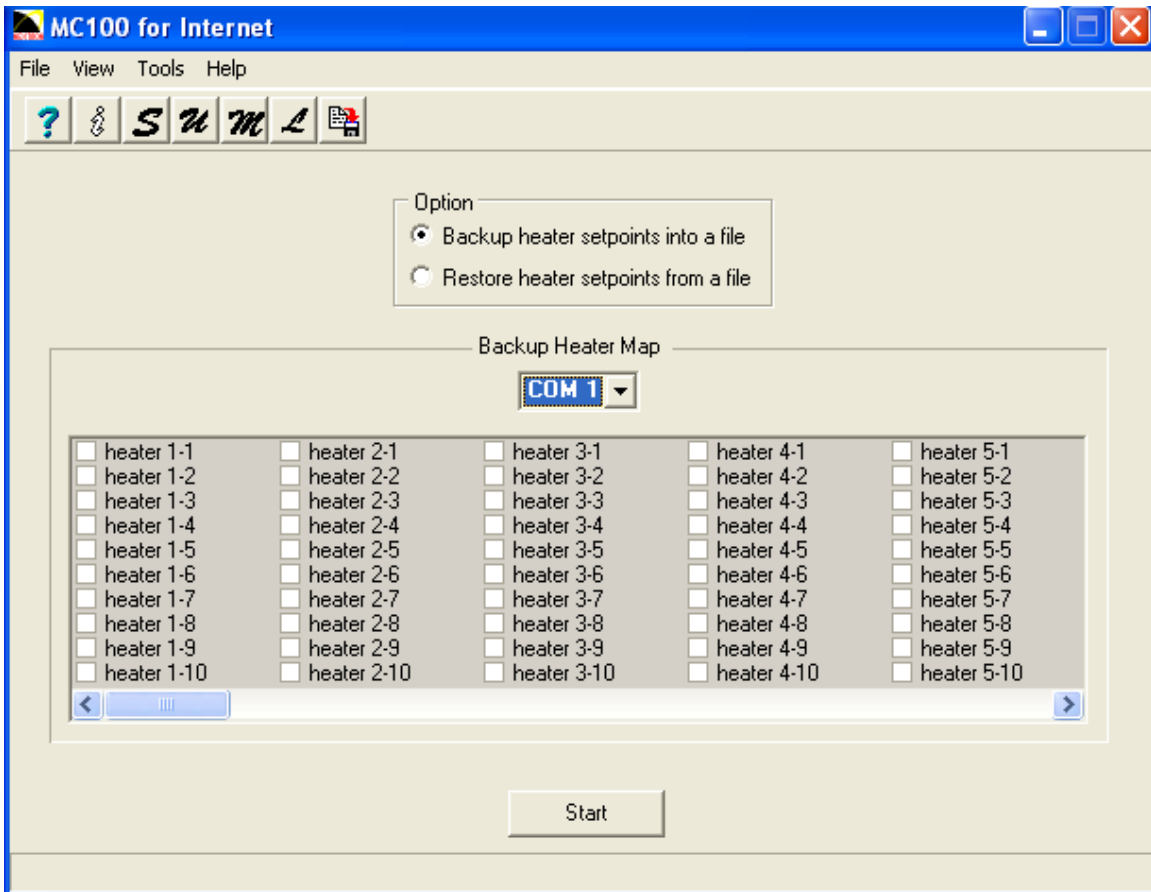

Figure 17 – **Backup/restore Function Window**

The **Backup/Restore Function Window** consists of 2 panels (**Option** panel and **Backup/Restore Heater Map** panel) and 1 **Start** button.

To perform **Backup/Restore** operation, one must follow these procedures:

(1) Select backup or restore operation by checking the radio buttons on the **Option** panel.

(2) Select the desired heater by choosing the correct com port and checking the heater box on the **Backup/Restore Heater Map** panel.

(3) Start the operation by clicking on the **Start** button.

(4) If the operation has been indeed started, a progress bar will appear and the word "Start" on the **Start** button will be changed to "Stop".

(5) Unless the operation is manually stopped by clicking on the **Stop** button, it will continue till the last heater.

The backup file, **mcP**-**M**-**Hsp.txt** or **mcP**-**Hsp.txt**, consists of 40 rows of setpoint data. These 40 *sequential* data are: (1) number of ambient sensing heaters; (2) baud rate of serial port 1; (3) baud rate of serial port 2; (4) alarm light mode; (5) alarm contact mode; (6) RTD mode; (7) cost per kWh; (8) stagger start; (9) thermocouple type; (10) manual alarm; (11) gf test; (12) heat trace option; (13) heater enabled; (14) heater setpoint; (15) low temperature alarm; (16) high temperature alarm; (17) phase A low current alarm; (18) phase B low current alarm; (19) phase C low current alarm; (20) phase A high current alarm; (21) phase A high current trip; (22) phase B high current alarm; (23) phase B high current trip; (24) phase C high current alarm; (25) phase C high current trip; (26) ground fault trip; (27) ground fault alarm; (28) power limit; (29) tracecheck cycle time; (30) heater voltage; (31) low voltage alarm; (32) proportional control; (33) heater RTD failure action; (34) manual heater; (35) master override; (36) control dead-band; (37) soft start time; (38) high voltage alarm; (39) tracecheck heater on time; (40) heater name.

Data (1) ~ (12) are 12 module setups. Their values in all backup files of a common module must be kept the same.

The backup file is simply a text file which can be read and modified by *Notepad* or any text editors such *Microsoft Word*. Customers can change any of the above 40 setpoint data to their desired values by following these data formats, value ranges, and restrictions *strictly*.

1) *number of ambient sensing heaters*

Data format & range: 0, •••, 10, 11, •••, 20, 21, •••, and 30 for *0*, •••, *10*, *Master 1*, •••, *Master 10*, *Remote 1*, •••, and *Remote 10*, respectively.

Restrictions: Don't need to change the data value for MS2101, MS2102, or MS5 & MS10 modules with non-freeze protection firmware.

2) *baud rates*

Data format & range: 0, 1, 2, 3, and 4 for *600*, *1200*, *2400*, *4800*, and *9600*, respectively.

Restrictions: Don't need to change the data value of serial port 2's baud rate for either MS2101 or MS2102 modules. This is because, currently, both MS2101 and MS2102 modules don't have a second serial port on board.

3) *alarm light mode*

Data format & range: 0, 1, 2, and 3 for *alarm on*, *alarm off*, *alarm flash on* and *alarm flash off*, respectively.

Restrictions: none

4) **alarm contact mode**

Data format & range: 0, 1, 2, and 3 for *MECH:NO SS:NO*, *MECH:NO SS:NC*, *MECH:NC SS:NO*, and *MECH:NC SS:NC*, respectively.

Restrictions: none

5) **RTD mode**

Data format & range: 0, 1, 2, 3, 4 and 5 for *2 RTDs backup*, *2 RTDs averaged*, *2 RTDs highest*, *2 RTDs lowest*, *RTD B HT cutoff*, and *1 RTD*, respectively.

Restrictions: Don't need to change the data value for modules with single RTD per heater.

6) **cost per kWh**

Data format & range: 1, 2, •••, 49, and 50 for *$0.01, $0.02, •••, $0.49*, and *$0.50 per kWh*, respectively.

Restrictions: none

7) **stagger start**

Data format & range: 0 and 1 for *off* and *on*.

Restrictions: none

8) **thermocouple type**

Data format & range: 0 and 1 for *J type* and *k type*.

Restrictions: Don't need to change the data value for RTD-based modules.

9) **manual alarm and manual heater**

Data format & range: 0, 1, •••, 24, and 25 for *disabled*, *on for 1 hour*, •••, *on for 24 hours*, and *on continuously*.

Restrictions: none.

10) **gf test**

Data format & range: 0, 1, •••, 24, and 25 for *disabled*, *1 hour*, •••, *24 hours*, and *test now*, respectively.

Restrictions: Don't need to change the data value for MS2101 or MS2102 modules.

11) **heat trace option**

Data format & range: 0, 1, •••, 23, and 24 for *LT3*, *LT5*, *LT8*, *LT10*, *HLT3*, *HLT5*, *HLT8*, *HLT10*, *HLT12*, *HLT15*, *HLT18*, *HLT20*, *3BTV*, *5BTV*, *8BTV*, *10BTV*, *10QTVR*, *15QTVR*, *20QTVR*, *5XTV*, *10XTV*, 15XTV, *20XTV*, *user*, and *disabled*, respectively.

Restrictions: Don't need to change the data value for modules other than CM-2001.

12) **heater enabled**

Data format & range: 0 and 1 for *no* and *yes*.

Restrictions: none

13) **heater setpoint**

Data format & range: 0, 10, •••, 4990, 5000, 5010, and 5020 for *0.0, 1.0, •••, 499.0, 500.0°C, off*, and *none*, respectively.

Restrictions: none

14) *heater low and high temperature alarms*

Data format & range: 0, 10, •••, 4990, 5000, and 5010 for *0.0*, *1.0*, •••, *499.0*, *500.0°C*, and *off*, respectively.

Restrictions: none

15) *heater low and high current alarms, high current trips, power limit*

Data format & range: 50, 100, •••, 9950, 10000, and 10050 for *0.50*, *1.00*, •••, *99.50*, *100.00 Amp*, and *off*, respectively.

Restrictions: none

16) *heater ground fault current and trip alarms*

Data format & range: 10, 15, •••, 995, 1000, and 1005 for *10*, *15*, •••, *995*, *1000 mA*, and *off*, respectively.

Restrictions: none

17) *heater tracecheck cycle time*

Data format & range: 1, 2, •••, 23, 24, and 25 for *1*, *2*, •••,*23, 24 hours*, and *off*, respectively.

Restrictions: none

18) *heater voltage*

Data format & range: 1, 2, •••, 599, 600, and 601 for *1*, *2*, •••, *599, 600 volt*, and *measured*, respectively.

Restrictions: data value 601 (measured) only applies to MS2101 & MS2102 modules with circuits at 300 V or less.

19) *heater low and high voltage alarms*

Data format & range: 85, 86, •••, 299, 300, and 301 for *85*, *86*, •••, *299, 300 volt*, and *off*, respectively.

Restrictions: Don't need to change the data value for a module which *heater voltage* isn't set to *measured*.

20) *heater proportional control*, *RTD failure action,* **and** *master override*

Data format & range: 0 ~ 1 for *off* and *on*.

Restrictions: none

21) *heater control dead-band*

Data format & range: 0, 10, •••, 490, and 500 for *0.0*, *1.0*, •••, *49.0,* and *50.0°C*, respectively.

Restrictions: none

22) *heater soft start time*

Data format & range: 10, 11, •••, 998, 999, and 1000 for *10*, *11*, •••, *998*, *999 seconds*, and *off*, respectively.

Restrictions: For MS2102, MS5, and MS10 modules, keep the data value as it is in the backup file. This is because *soft start time* only applies to the heater on MS2101.

23) heater tracecheck heater on time

Data format & range: 0, 1, •••, 27, 28, and 29 for *0.5*, *1.0*, •••, *14.0*, *14.5*, and *15.0 minutes*, respectively.

Restrictions: Only applies to MS5 and MS10 modules.

24) heater name

Data format & range: 16 alphanumeric characters

Restrictions: none

Note: For *MC100 for Internet Version 4.06*, the backup file, mcP-M-Hsp.txt or mcP-Hsp.txt, differs from its earlier versions in terms of size and structure of data rows. This means that *MC100 for Internet Version 4.06* can't use the backup file obtained through earlier versions of *MC100* software to restore heater setpoints.

20. Open and Print MC100 Files

As described in the above chapters, running MC100 will generate various files. User can open and print these files.

Five types of file can be opened and printed by MC100. They are:

(1) MC100 data log file.

(2) MC100 heater setpoint backup files.

(3) MC100 alarm files.

(4) MC100 setpoint list file.

(5) All text files.

To open and print a MC100 file, one must follow these procedures:

(1) Click on **File|Open** menu.

(2) A dialog box will appear. Select the desired file by choosing the right file folder and type.

(3) Click the **Open** button on the dialog box.

(4) After the file is opened, the contents of the file are displayed on the screen. Also, sub-menu **Close**, **Print** and **Print Setup...** become available on the **File** menu.

(5) Click **Print** to print the file.

(6) Click **Close** to close the file and return to the previous function window.