

WCC III

13. WCC III - MCD Installation Guide

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SECTION 13: WCC III - MCD INSTALLATION GUIDE

WCC III System Requirements

To accomplish remote communications via the internet, the following items are needed in addition to the WCC III system in order to control the building mechanical systems. The WCC III system is not to be used in any application where Fire/Life/Safety is an issue.

WCC III – MCD System Requirements (On-Site WCC III – MCD Computer):

- DSL or a Cable router/switch that connects to the internet. Or, as an alternative, an internal jobsite IP network that does not connect to the internet, but when using this internal jobsite IP network, the external internet Email of alarms from the WCC III-MCD will not be possible. Also, external access via the internet may not be possible. An ethernet crossover cable is supplied for stand alone non-network applications.
- A fixed static IP address or a fixed IP domain host name from the ISP along with a provisioning sheet that contains other pertinent IP setup information.
- Minimum hardware specification for the Microsoft Windows XP / Vista / 7 based computer is a Pentium IV running at 2.4 Giga Hertz with at least 1 GB of RAM, and 10 GB of spare hard drive space. A CDROM/DVD drive is also required for software installation.
- Enabled port forwarding on the Firewall of the router/switch. This is only if a firewall is used.
- An Email address that supports a SMTP server for SENDING with a pop server for RECEIVING Emails, and it must have “auth login” authentication. TLS or SSL modes are not supported. WattMaster Controls can provide an Email address with these requirements.
- An Uninterruptible Power Supply (UPS) – 750-Watt minimum
- A wall mounting surface is preferred.
- A dedicated 120VAC power circuit is required.

Front End Software Requirements (Operator Console Software):

- A Microsoft Windows XP /Vista/Windows 7-based computer.
- Minimum hardware specification for the Microsoft Windows XP / Vista based computer is a Pentium IV running at 2.4 Giga Hertz with at least 1 GB of RAM, and 10 GB of spare hard drive space. A CDROM/DVD drive is also required for software installation.
- WCC III software package – Provided on a CDROM, or is available via a download on the WCC Controls website: www.wcc-controls.com. The installation CDROM contains the following programs:

WCC III.exe (SS5021)
 WCCUTILITY.exe (SS5023)
 SCUSCR.exe (SS5026)
 WCC3Trendlog.exe (SS5028)
 TenantReport.exe (SS5025)
 TenantOverride.exe* (SS5024)
 WCC3Download.exe (SS5030)
 WCC3Guest.exe (SS5022)

- WCC III Controls website: www.wcc-controls.com
- The CDROM part number (WattMaster Part # DM1WC011-01X, where “X” = revision level)
- A DSL or Cable router/switch that connects to the internet, or access to the internet via some other method. Or, as an alternative, an internal jobsite IP network that does not connect to the internet, but when using this internal jobsite IP network, the external internet Email of alarms from the WCC III - MCD may not be possible.

* NOTE: The TenantOverride.exe program is also available as a single program installation for the end users that are using the simplistic graphical interface of the TenantOverride.exe screen to locally turn on and off specific control points that are applicable to the end user.

Basic Operating Conditions

The WCC III – MCD Basic Operating Conditions

The WCC III - MCD must be kept in a clean and dry area in the building. The ambient temperature must be between 50 and 100 °F, and the relative humidity must be kept between 0 and 90% (non-condensing). The interior components are cooled by ventilation fans within the WCC III – MCD unit, and therefore the unit should not be kept in tightly confined or enclosed areas. The WCC III - MCD is primarily designed to mount on a wall with the supplied brackets.

The WCC III – MCD computer requires 115 VAC power and must remain powered at all times for proper operation and control. The 115 VAC power circuit must be separate and dedicated exclusively to the WCC III – MCD computer.

A dedicated Network IP Address or Domain Name is required.

Uninterruptable Power Supply

The WCC III - MCD system is designed to automatically restart after a power failure. However, the industrial computer which acts as the WCC III Master Communications Device will not automatically reboot unless the power is shut off cleanly and then restored cleanly. During most power outages, the incoming 115 AC voltage could have great fluctuations before the power finally fails. In a like manner, brownouts will usually cause the industrial computer to “lock-up.” That is to say, the screen will continue to display on the monitor, but the cursor will not respond to the keyboard commands. To prevent this “lock-up” issue from happening to the WCC III – MCD, an Uninterruptible Power Supply (UPS) is required on each and every WCC III – MCD computer.

An Uninterruptible Power Supply (UPS) provides emergency power to keep the WCC III Master Communications Device (personal computer) on-line for several minutes after a primary power failure. The UPS regulates the incoming power to the computer and shuts the power off cleanly several seconds after the power outage, or brownout. When the primary power is restored, the UPS brings the MCD back on-line automatically. The WCC III system does not lose any information since all of the programs and user entered data are stored on either a disk in the MCD, on firmware, or on battery backed memory in the satellite controllers.

MCD (Master Communications Device)

The MCD has the following specifications:

- A PCI Slot type Single Board Computer in a wall mounted case
- Processor - Pentium M processor running at 1.3 Ghz
- Memory – 1 GB SODIMM
- Hard Drive – Solid State 8 GB Hard Drive.
- 2 line by 20 character Dot Matrix LCD display
- Backplane – A passive 5 slot PCI backplane
- Required I/O
 - 1 - External RS232 port (9 Pin connector)
 - 2 - External USB ports
 - 2 - Internal USB ports
 - 1 - Ethernet Port

Software Updates

WCC III-MCD program updates will be made available using USB “jump” drives and/or internet uploading.

NOTE: As of September 1, 2009 all WCC III - MCDs will only be shipped with the Linux operating system installed. Older Windows XP-based WCC III - MCDs should be upgraded for any future support issues from WattMaster. The Windows XP operating system is at the end of long term support with Microsoft. Microsoft’s main issues are with continuous updates, and the multitude of viruses that are written for Windows XP are also of concern. The Linux operating system software on the WCC III - MCD must be maintained and updated periodically. WattMaster Controls, Inc. can do these software updates and upgrades remotely via the internet only if the WCC III - MCD is connected to the internet. This is why internet access to the WCC III - MCD is so important. Failure to keep the operating system updated could result in a WCC III - MCD system malfunction. WattMaster Controls, Inc. is not responsible for a system failure that is so generated due to lack of upgrading or updating because the end customer does not provide a static IP connection for the WCC III - MCD to the internet for WattMaster Controls to connect to.

NOTE: For Windows users, the end users are responsible for maintaining their system's antivirus software. The discontinued use or non-renewal of the antivirus software that is furnished with the WCC III system may result in system malfunction. WattMaster Controls, Inc. is not responsible for a system failure so generated.

WCC III – MCD Internet Access

The most common question asked is: Why does the WCC III – MCD computer need to have Internet access?

If WattMaster Controls factory assistance or troubleshooting is required for a WCC III system, a representative from the factory can access the system with a remote computer and view the same WCC III Screens as the end user or contractor in the building. This allows the end user or the contractor for the building installation to talk to the factory representative while they are both viewing the same screens.

The Emailing of important alarm notifications for up to 60 Email Addresses is provided for from the WCC III – MCD.

The ability to send alarm notification via a text message to a cellular phone.

Secure Remote communications package (WCC III software) is provided for FREE. A CD-ROM is supplied for installation.

World-wide, multiple remote connections (up to 255 simultaneous connections possible)

On earlier versions, antivirus software is initially provided by WattMaster Controls, with Norton antivirus software for a period of 1 year. The customer must maintain the antivirus software after this 1-year period. Later versions are shipped with Linux as the operating system and do not require anti-virus software.

The ability for internet based tenant override requires internet access.

Custom remote WCC III system programming or analyzing of the existing WCC III program is also available for a nominal charge.

Some cable modem devices may incorporate a router along with the cable modem functionality, to provide the LAN with its own IP network addressing. From a data forwarding and network topology perspective, this router functionality is typically kept distinct from the cable modem functionality (at least logically) even though the two may share a single enclosure and appear as one unit. So, the cable modem function will have its own IP address and MAC address as will the router.

WCC III – MCD Cable Modem/Router Technical Considerations

The WCC III-MCD uses internet access to e-mail alarms and to provide remote IP access for multiple remote WCC III operator programs.

The DSL / Cable modem USB connection should not be connected to any of the USB ports on the WCC III – MCD. The DSL / Cable modem Ethernet connection should only be connected to the Ethernet port on the WCC III – MCD if the DSL / Cable modem has a built-in internal router with Ethernet switch.

The use of a DSL / Cable modem with an external router that is then connected to the WCC III - MCD is also a recommended way to connect the internet to the WCC III – MCD. The use of only a plain DSL / Cable modem without an internal router with a built-in switch is not currently recommended by WattMaster Controls.

It is recommended that the WCC III-MCD computer be connected to the internet via a high-speed cable modem or NAT enabled router.

This is best accomplished by what is called Port Forwarding (also sometimes referred to as tunneling) and is the act of forwarding a network port (located External on the internet) to another network node (located Internal on the LAN). This technique can allow an external user (The WCC III program) to reach a port that is on a private LAN (Local Area Network) IP address (The WCC III - MCD) from the outside via a NAT enabled router. This external port number that is used for the WCC III – MCD computer is port 39289.



Figure 13-1: Typical small business type routers—a Broadband Firewall Router, and a Cable/DSL VPN Router

WCC III - MCD Internet Access

In a typical WCC III - MCD networking setup, internet access is through a DSL or Cable modem. This modem may then be connected to a router with a built in switch, (or typically the router with switch is also built-in to the modem) which is then connected to the internal LAN of networked computers by Ethernet cabling. The NAT enabled router is the only device that the Internet sees as it holds the public IP address. On the other hand, the WCC III - MCD, located behind the NAT enabled router, is invisible to the Internet as it holds a local IP address on the NAT enabled router. Port forwarding is necessary in the NAT enabled router because computers that are running the WCC III program will send information that is directed to the public IP address and the NAT enabled router needs to know where to send and then redirect that information to the WCC III - MCD.

Supported Networks

Only IP-based networks are currently supported by the WCC III system. The slower the network, the slower the data returned from the WCC III - MCD will be displayed, and the faster speed is always better.

Also, network “hub” devices are not recommended because “hub” devices increase the chances of dropped data packets. A 10/100 base T network switch is the recommended connection to the WCC III - MCD device.

Benefits of Using a Separate DSL / Cable Modem Internet connection for the WCC III-MCD

1. It provides a layer of network isolation. A connection to the building’s internal computer network may not be desirable to the IT department. If the WCC III - MCD is connected to the building’s internal computer network an additional firewall into the building’s internal computer network may be required.

2. A dedicated high speed internet connection is a faster connection. WCC III displayed data will be displayed quicker and updated faster.

3. Network outages should be less frequent, due to the fact that there is no overhead of a pre-existing internal computer network. A pre-existing internal computer network will always require periodic “downing of the network servers” to do maintenance work to the existing computer network regardless of having the WCC III-MCD connected to the pre-existing internal computer network.

4. The need for having an onsite IT person to setup, and then administer the WCC III-MCD will be reduced.

5. Setup and maintenance of e-mail accounts would be easier, because they would be automatically provided by the Internet Service Provider.

Wall Mounting of the WCC III - MCD

It is strongly suggested that the WCC III - MCD is mounted on the wall. General guidelines are as follows:

Always install the supplied six screws for the two supplied wall mounting brackets for the WCC III - MCD Computer as shown in **Figure 13-2**. Be sure to tighten the six screws so that they do not loosen over time.

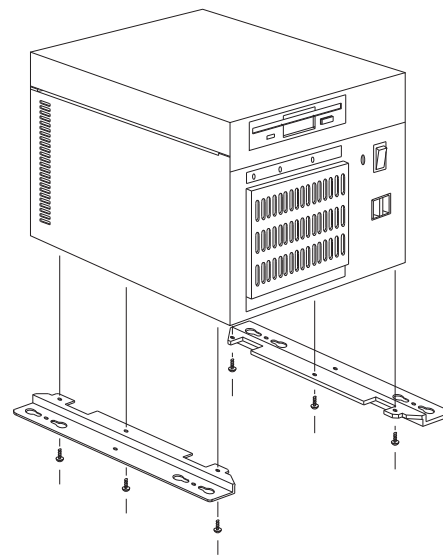


Figure 13-2: Installing the six screws for the two wall mounting brackets of the WCC III - MCD Computer

Do not mount the WCC III - MCD computer straight into the drywall. The use of a 3/4-inch plywood “Backer Plate Board” is required. You may want to paint this plywood “Backer Plate Board” to match the color of the wall before mounting to the wall. See **Figure 13-3** for further application.

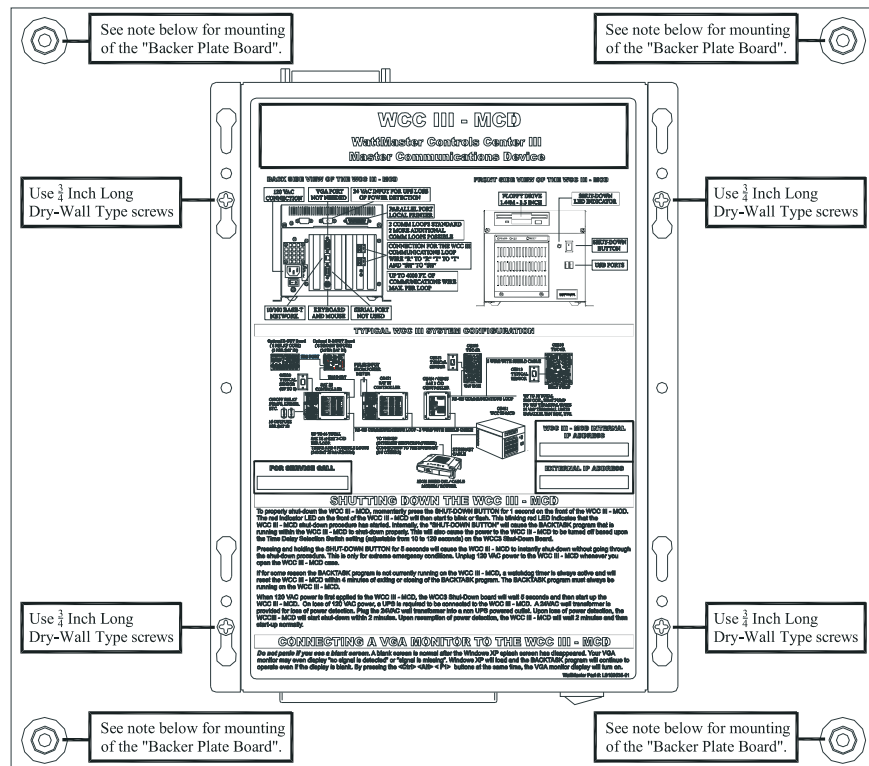
Backer Plate Mounting Notes:

Use correct type of wall mounting anchors for mounting on a concrete wall for the mounting of the “Backer Plate Board” if and when mounting the Backer Plate Board to a concrete wall. Use at least 2-inch dry wall type screws if mounting the Backer Plate Board to a “Dry-Wall” type wall. Mount the “Backer Plate Board” so that the screws that are holding the “Backer Plate Board” are on the 16-inch centers of the wall studs where applicable.

Mount the WCC III - MCD 4-½ to 5-½ feet off of the ground on a suitable wall, in an air conditioned space. This area should not have any radio transmitting or telephone switching gear in the space, or near the space, or located on the back side of the adjacent wall.

Do not block the airflow vents that are coming out of the WCC III-MCD. Do not apply paint to the WCC III-MCD enclosure. Do not cover the WCC III-MCD with any protective plastic while painting with the WCC III-MCD turned on. The UPS battery backup unit should be located within 3 or 4 feet of this WCC III – MCD.

Wall Mounting of the WCC III - MCD Front view with wall mounting brackets



Use 3/4 inch plywood for the backer plate board
(supplied by others)

Figure 13-3: Wall mounting instructions for the WCC III - MCD

WCC III - MCD Internet Access

System Setup

You must follow the directions in the order they are given.

Set-Up Cable Modem/Router

The WCC III-MCD uses internet access to e-mail alarms and to provide remote access for multiple remote WCC III operator programs. It is recommended that the WCC III-MCD computer be connected to the internet via a high-speed cable modem router.

Step 1: You will need a high-speed cable or DSL modem/router that is NAT enabled and it must be setup by the ISP, or by IT (Information Technology) knowledgeable personnel, and it must also be connected to the Internet.

Step 2: The following items are needed from your ISP (Internet Service Provider) in order to set up the Cable / DSL modem/router for stand alone internet access. The ISP should have already supplied a sheet of paper that has this important information on it.

WCC III-MCD IP Address: _____

WCC III-MCD Subnet Mask: _____

WCC III-MCD Default Gateway: _____

WCC III-MCD Preferred DNS Server:

WCC III-MCD Alternate DNS Server:

The default IP addresses that the WCC III – MCD is shipped with are:

WCC III-MCD IP Address: 192.168.100.100

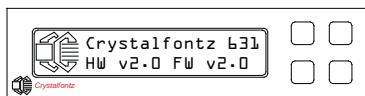
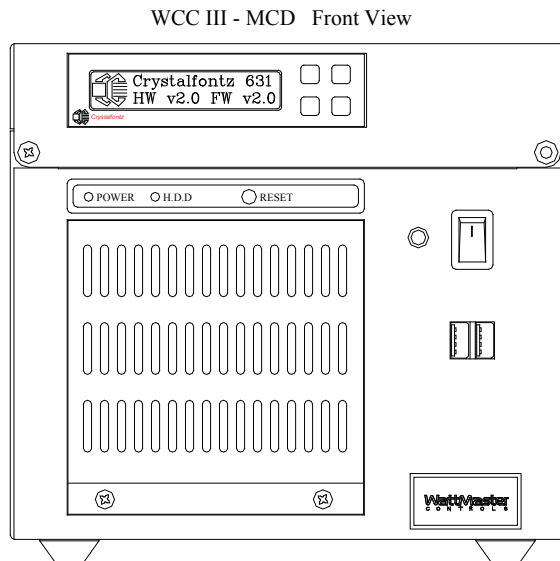
WCC III-MCD Subnet Mask: 255.255.255.0

WCC III-MCD Default Gateway: 192.168.100.1

WCC III-MCD Preferred DNS Server: 208.67.222.222

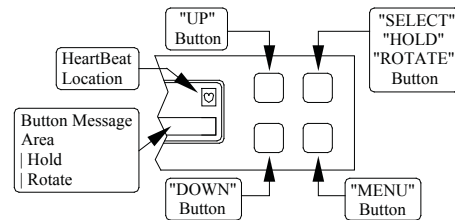
WCC III-MCD Alternate DNS Server: 208.67.220.220

WCC III - MCD Display



The WCC III – MCD now has a 2 line by 20 character dot matrix liquid crystal display. This LCD displays the following information: IP ADDRESS, MCD UPTIME, RX, TX, Down, Up, User %, System %, Nice %, Idle %.

This display is very helpful to determine if the WCC III – MCD is functioning correctly.



The LCD Display Buttons

There are four buttons on the front of the LCD display on the WCC III - MCD.

The Upper Left button is the “UP” menu navigation button.

The Lower Left button is the “DOWN” menu navigation button.

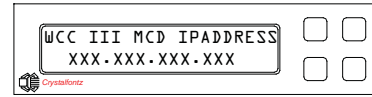
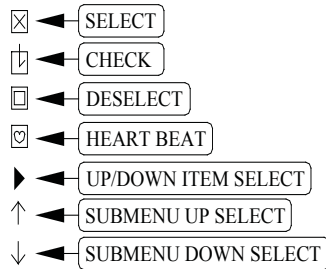
The Upper Right button works as a “SELECT” button under the MENU option or else it operates as a “HOLD” or “ROTATE” button for the information screens.

Also the “BUTTON MESSAGE” area will momentarily display either “HOLD” or “ROTATE” when the Upper Right button is depressed.

The Lower Right button is the “MENU” button. It also serves as a “HOME” button to return to the main menu when in any of the sub-menus.

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WCCIII - MCD Local 2 by 20 Line Display



WCC III - MCD IP Address

This screen shows the actual IP address of the WCC III – MCD.

An Internet Protocol (IP) address is a numerical identification and logical address that is assigned to the WCC III – MCD that is participating in a computer network that is then utilizing the Internet Protocol for communication between its nodes. The WCC III - MCD is configured to use the same IP address each time it powers up - this is known as a Static IP address. In contrast, in situations when the other computer’s IP address is assigned automatically, it is known as a Dynamic IP address. The Static IP addresses are manually assigned to the WCC III - MCD by an administrator.

The LCD Character Boxes

The Select box, Check box, and Deselect-box icons are displayed on the LCD as a visual aid to selecting or deselecting an item.

The difference between the Select box and the Check box is that the Select box icon is the default setting and the Check box icon is a change to the setpoint that the user has initiated.

The Deselect box turns the selected item “OFF”.

The Heart Beat icon is to be used as a watchdog to make sure that this Linux-based LCD program is still running and is not “Locked Up”.

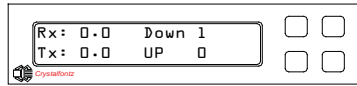
The Up/Down Item Select icon is used to display which of the currently selected menu items is currently selected for viewing and/or change.

The submenu Up/Down icons are a reminder to use the Upper Left or Lower Left buttons (UP/DOWN) to affect the changes to the user-desired “Adjustable” settings and are used for “CONTRAST”, “ON BRIGHTNESS”, and “OFF BRIGHTNESS” adjustments.



MCD UPTIME D - Days, H - Hours, m - Min

This is the displayed run time total since the last reset or startup of the WCC III – MCD. It is often used as a measure of computer operating system reliability and stability, in that this time represents the time that a computer can be left unattended without crashing or needing to be rebooted for any administrative or maintenance purposes.



IP Packet

An IP packet is the formatted unit of data that is carried by a packet mode computer network. When the data is formatted into IP packets, the bit rate of the communication medium (Ethernet) can better be shared among users than if the network were circuit switched.

Rx: Displays the number of IP Packets that are currently being received on the network card right now.

Tx: Displays the number of IP Packets that are currently being transmitted on the network card right now.

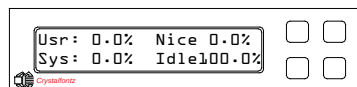
Down: Total IP Packets that have been received on the network card since the last bootup.

Up: Total IP Packets that have been transmitted on the network card since the last bootup.

Nice becomes useful when there are several processes that are demanding more resources than the WCC III – MCD CPU can provide. In this state, a higher priority process will get a larger chunk of the WCC III – MCD CPU time than a lower priority process. If the WCC III – MCD CPU can deliver more resources than the processes are requesting, then even the lowest priority process can get up to 99% of the WCC III - MCD CPU. Only the superuser (root) may set the niceness to a smaller (higher priority) value. On Linux it is possible to change `"/etc/security/limits.conf"` to allow other users or groups to set a low nice value.

Idle: Percentage of the WCC III – MCD CPU’s time that the CPU were idle and the system did not do an outstanding disk I/O request. A computer processor is described as idle when it is not being used by any program.

Programs which make little use of the CPU Idle Time mean that they run at a low priority so as not to impact programs that run at normal priority like BackTask.exe. Many programs that use the WCC III – MCD CPU idle time can cause the WCC III - MCD CPU to always be 100% utilized, so that the time spent where the WCC III – MCD CPU would have been idle is instead spent performing useful computations. This generally causes the WCC III – MCD CPU to consume more power as most modern computer’s CPUs can enter power-save modes when they are idle.



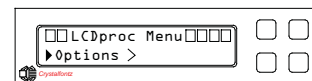
CPU Usage Percentages

Ustr: Percentage of the WCC III – MCD CPU’s utilization that occurred while executing at the user level (application). BackTask.exe is an application.

Sys: Percentage of the WCC III – MCD CPU’s utilization that occurred while executing at the system level (kernel). The Linux operating system is system level.

Nice: Percentage of the WCC III – MCD CPU’s utilization that occurred while executing at the user level.

Nice (pronounced /na is/) is a program that’s found within Linux. Nice directly maps to a kernel call of the same name. For any given process, it changes the priority in the kernel’s scheduler. A niceness of -20 is the highest priority and 19 is the lowest priority. The default niceness for any process is inherited from its parent process, usually 0.



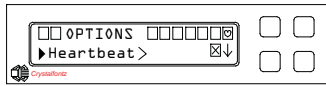
Options Menu

Press the Lower Right button (MENU) to select the “LCDproc Menu” selection.

Press the Upper Right button (SELECT) to select the “Option” selection.

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WCCIII - MCD Local 2 by 20 Line Display



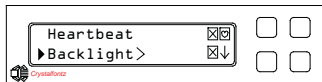
Options Menu – Heart Beat Selection

Press either the Upper Left or Lower Left buttons (UP/DOWN) to select the following user settable options: “Heart Beat”, “Backlight”, or “CFontzPacket”.

Press the Upper Right button (SELECT) to select or toggle the “Heartbeat” selection setting ON or OFF with either the X box, Check box or No box icon.

Or press the Lower Left button (DOWN) to select the “Backlight” selection.

Or press the Lower Left button (DOWN) twice to select the “CFontzPacket” selection.

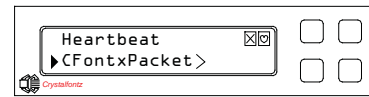


Options Menu – Backlight Selection

Press the Upper Right button (SELECT) to select or toggle the “Backlight” selection setting ON or OFF with either the X box, Check box or No box icon.

Or press the Upper Left button (UP) to select the “Heartbeat” selection.

Or press the Lower Left button (DOWN) to select the “CFontzPacket” selection.

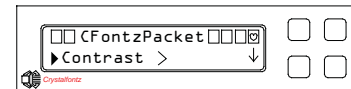


Options Menu – CfontzPacket Submenu

Press either the Upper Left or Lower Left buttons (UP/DOWN) to select the following user settable options: “Contrast”, “On Brightness”, or “Off Brightness”.

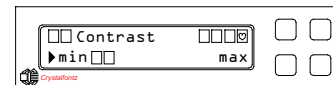
Or press the Upper Left button (UP) to select the “HEART BEAT” selection.

Or press the Upper Left button (UP) twice to select the “BACKLIGHT” selection.



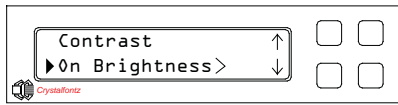
Options Menu – CfontzPacket Submenu – Contrast Selection

Press the Upper Right button (SELECT) to select the “Contrast” selection setting.



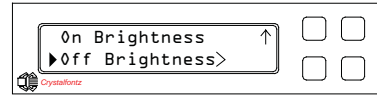
Options Menu – CfontzPacket Submenu – Contrast Selection – Contrast Setting

Press either the Upper Left or Lower Left buttons (UP/DOWN) to affect the change to the user desired “Contrast” setting.



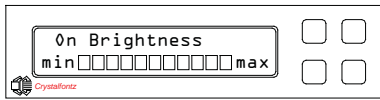
Options Menu – CfontzPacket Submenu – On Brightness Selection

Press the Upper Right button (SELECT) to select the “On Brightness” selection setting.



Options Menu – CfontzPacket Submenu – Off Brightness Selection

Press the Upper Right button (SELECT) to select the “Off Brightness” selection setting.



Options Menu – CfontzPacket Submenu – On Brightness Selection – On Brightness Setting

Press either the Upper Left or Lower Left buttons (UP/DOWN) to affect the change to the user desired “On Brightness” setting.



Options Menu – CfontzPacket Submenu – Off Brightness Selection – Off Brightness Setting

Press either the Upper Left or Lower Left buttons (UP/DOWN) to affect the change to the user desired “Off Brightness” setting.

13. WCC III - MCD INSTALLATION GUIDE

RS-485 Communication Wiring

The WCC III System RS-485 Communication Wiring

The WCC III - MCD can communicate with up to 239 satellite controllers via a two-wire RS-485 communication loop. On the back of the WCC III – MCD there are two RS-485 communication loop ports that come as standard. Each one of these communications loop ports can communicate with up to 60 satellites for a total of 120 satellites.

Two more additional RS-485 communication loop ports can be added at an additional cost for any WCC III system that has more than 120 satellites. The two-wire RS-485 communication loop should be stranded 2 wire twisted pair of 18-gauge wire with a shield wire, and it also must be plenum rated were applicable.

The use of stranded wire is mandatory to ensure a good connection with the ¼ inch Sta-Con connectors which are used to terminate the wires at the satellite controllers. The RS-485 communication wire does not have to be run from each satellite controller back to the WCC III – MCD, but rather the RS-485 communication wire can be “daisy-chained,” which means that only one twisted pair of wires is connected to each of the WCC III - MCD communications loops. The maximum allowable length of wire from the WCC III - MCD to the farthest satellite is 4000 feet per RS-485 communications loop.

NOTE: A length greater than 4000 feet is allowed under certain circumstances. Consult the factory for assistance if the communications loop required for your application will exceed 4000 feet.

The RS-485 wire specifications are generally a stranded 18-gauge - 2 wire twisted pair with shield. 18-gauge stranded wire is mandatory to ensure a good connection with the ¼ inch Sta-Con connectors, which are used to terminate the wires at the WCC III - MCD and at the satellite controllers. The old SAT II Manchester communications loop was supposed to have used a 2-wire twisted pair with shield, but this was not used in every installation. This old SAT II communications loop should not be used for the new SAT III communications loop. A new RS-485 communications loop should be ran to each new replacement SAT III controller. The shield wire must be used on the new SAT III controller, as it provides a “ground” reference for the RS-485 communication loop. WattMaster Controls sells two versions of 18-gauge - 2-wire twisted pair with shield communications wire— (1) WattMaster part #WR-NL-WR-18 which is marked “Network Loop” with a red stripe for rapid identification. This connection is intended to run from the WCC III – MCD to the SAT III, SAT 3C/D/F, SAT 3P, and then to the next SAT 3 type controllers. (2) WattMaster part # WR-LL-WG-18 which is marked “Local Loop” with a green stripe for rapid identification for the TUC loops that run from the SAT 3C/D/F controllers out to the TUC controllers.

“Wire Nuts” on the RS-485 communications loop should be avoided at all costs. As an alternative to the “Wire Nuts”, WattMaster Controls has a Power and Switchable RS-485 communications board, and the WattMaster part number is PL102224. This Power and Switchable RS-485 communications board can be thought of as a 24-VAC power and communication distribution system for the SAT III communications loop, and this board will aid in initial startup and future troubleshooting of the SAT III communications loop. These boards should be used on a floor-by-floor basis. This Power and Switchable RS-485 communications board is also available in a small metal electrical enclosure.

The wire that makes up the communication loop should be shielded. Shielded cable has an aluminum jacket over the wires that could act as an “antenna” to carry away any “stray” electrical signals that could interfere with the communication process. The shield should be grounded throughout the SAT Loop.

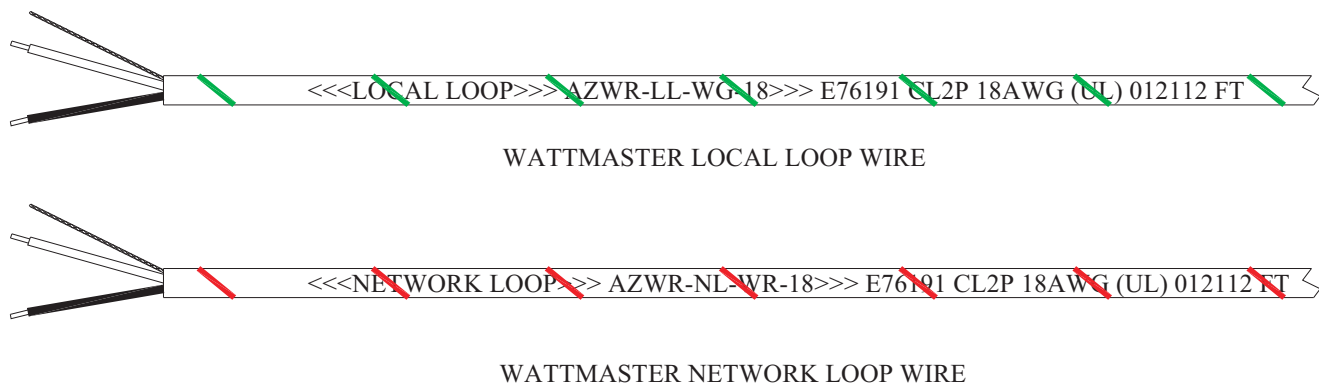


Figure 13-4 WattMaster Controls various communications loop wire

13. WCC III - MCD INSTALLATION GUIDE

WCC III - MCD Typical System Architecture

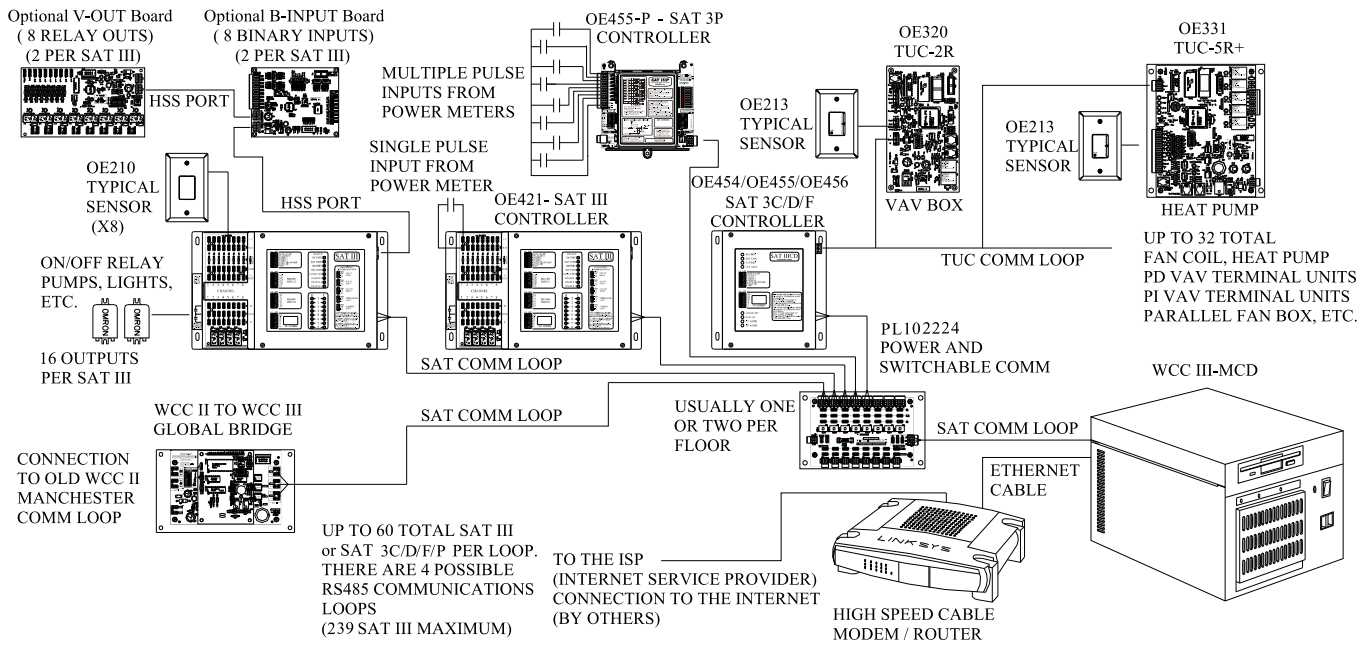


Figure 13-5: The WCC III typical system architecture with POWER and SWITCHABLE COMM boards

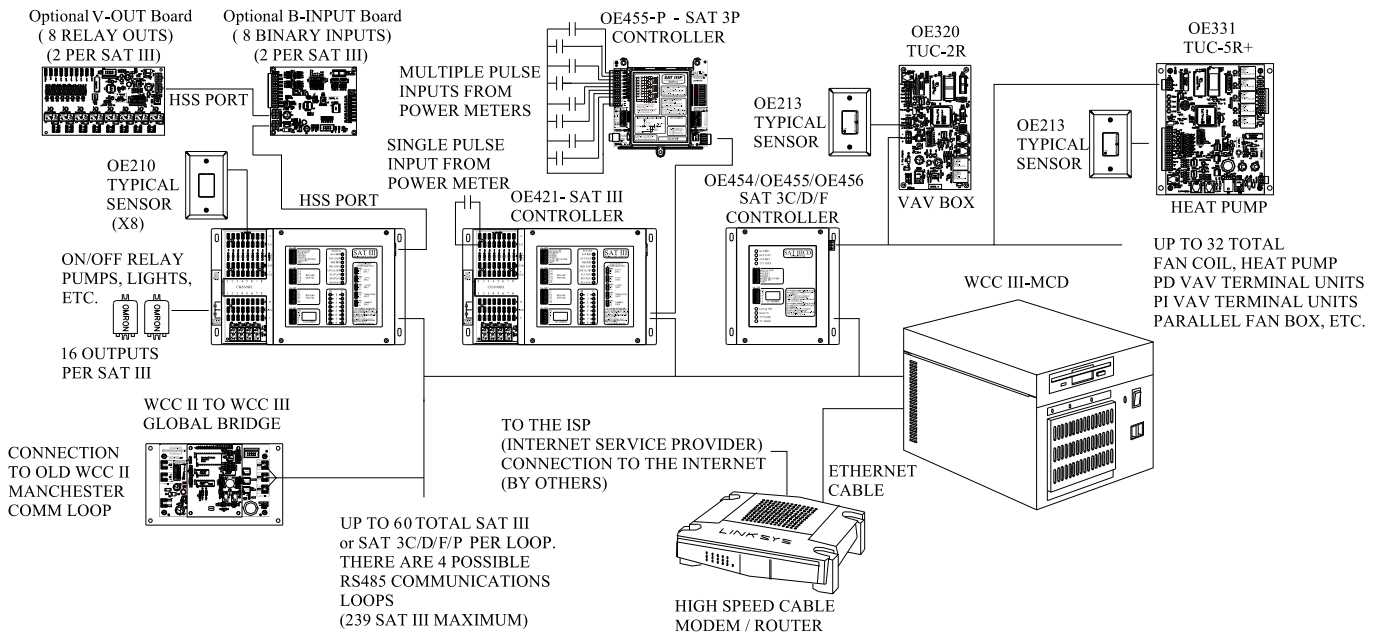


Figure 13-6: WCC III typical system architecture without the POWER and SWITCHABLE COMM boards

Initiating the System

The SAT RS-485 communication loop wires are connected to the “R” and “T” and shield terminals on the satellite controllers using ¼-inch Sta-Con connectors. Make sure the polarity is correct. That is to say, the wire connected to the “R” and “T” terminal on the MCD must be connected to the “R” and “T” terminal on the satellite controllers. If the “R” and “T” and shield wires are crossed, the WCC III system will not communicate. The shield should be connected together when the cable is cut in order to terminate the wires at the satellite controller.

The communication loop wire from the WCC III - MCD is connected to one of the “R” and one of the “T” terminals on the satellite controller, which is physically located nearest the WCC III - MCD. The other “R” and “T” terminals located on the satellite controller can be used to extend the two-wire loop to the next satellite controller, or the wires can branch off of a two-wire loop running through the center of a building as shown in **Figure 13-6**.

NOTE: The shield wire must be connected at each and every Satellite Controller also.

INITIATING THE SYSTEM

After the satellite controllers have been installed and powered up, the WCC III - MCD set up, and the 2-wire communications line connected between all of the satellite controllers and also connected to the WCC III - MCD, then the WCC III data files need to be loaded into the WCC III - MCD. This is best accomplished by using the WCC “mcd-menu” batch file, remotely with the Webmin program, or by directly using the Linux command prompt on the WCC III - MCD.

NOTE: When converting the WCC II data files to WCC III type data files. The WCC II data files have to be converted to the new WCC III type data files using the WCCUtilities.exe program. Then these new WCC III data files need to be installed on the WCC III - MCD. This is best accomplished by using the WCC “mcd-menu” batch file, remotely with the Webmin program, or by directly using the Linux command prompt on the WCC III - MCD.

The WCC III – MCD has two solid state hard drives, one that has the Linux operating system along with the backtask program, and one that has the daily/monthly WCC III backup data files on it.

A USB thumb drive can be used to shuffle the data in and out of the WCC III – MCD. Another program called “Webmin” is primarily used to administer the more advanced setup features on the WCC III –MCD. This “Webmin” program requires an internet browser, such as Mozilla, or Microsoft Internet Explorer to function. This “Webmin” program can be used over the internet/intranet or locally with a network crossover cable. The “Webmin” program is pre-installed on the Linux OS hard drive on the WCC III – MCD.

There are three password levels for the “Webmin” program, one for the simple user, one for the contractor level, and one for the WattMaster factory administrator.

MCD System Files

The Backtask program on the MCD is stored on the solid state hard disk, so after boot-up, the system start up files will cause the *Backtask Program* to run.

CAUTION: The MCD will not communicate with the satellite controllers while it is going through the “re-boot” process. If the satellite controllers do not communicate with the MCD for approximately three minutes, they will go into local set. The time it takes for the system to “re-boot” should not cause the satellite controllers to go into local set.

The hard disk can hold a vast amount of data which can accidentally be erased or lost due to system malfunction, operator error, etc. Therefore it is extremely important to make a back-up copy of the data on the hard disk. As you program a system to control a building, information is written on the disks. Therefore, back-up copies of programming data files on the hard disk should be made after the system has been programmed to control the building. This can be done remotely through the WCC Utility program.

The WCC III - MCD

Overview

The WCC III – MCD was converted from the Windows XP operating system over to the Ubuntu version of Linux using the command line interface only and was then released by WattMaster Controls in October of 2009. The main function of the WCC III – MCD is to provide a hardware and software platform for a program that WattMaster Controls has developed that is called “BACKTASK.exe”. The BACKTASK.exe program is a multiple BACKGROUND TASKING application program.

BACKTASK.EXE (SS5009)

The BACKTASK.exe program performs many functions such as:

- USB communications to the internal MCOMM board
- Time clock functions
- Analog/binary global processing
- Overrides of control points
- Holiday scheduling
- Optimal starts
- PID programs
- Shed /Restore programs
- Duty cycle programs
- Proportional Programs
- Tenant Overrides
- Emailing of alarms

The BACKTASK.exe program also provides for remote IP connection to a set of windows-based programs generally referred to as the WCC III programs. This WCC III – MCD also has hardware (WCCIII MCOMM board) that interfaces to a RS-485 communications loop that connects to SAT III type controllers for building automation controls.

Watchdog Circuit/Power Fail

If the BACKTASK.exe program is not running on the WCCIII - MCD, there is a watchdog circuit that will restart the WCCIII – MCD. This watchdog circuit may interfere with the installation of new BACKTASK.exe software. There is a way to disable this watchdog circuit. Please contact WattMaster Controls for further information on temporarily disabling this watchdog circuit. In addition to this watchdog circuit, there is a small wall wart 24vac transformer that must be connected to 120VAC or else the WCCIII - MCD will restart every two minutes. This is part of the power fail design circuit of the WCC III – MCD. This transformer is meant to

be plugged into a (NON – UPS) 120VAC outlet. The power cord for the WCC III – MCD is to be connected to a dedicated UPS (Uninterruptible Power Supply) outlet so that the MCD will keep running during a minor power outage. The Cable/DSL modem/router should also be plugged into one of these dedicated UPS (Uninterruptible Power Supply) outlets.

MCD-Menu Program Overview

WattMaster Controls has developed a simple setup installation program for the Linux command line interface, and this program is called mcd-menu. Prior knowledge of Linux is not required, but would be helpful. This mcd-menu program has eleven subprograms incorporated into it that will allow for the following operations to be preformed:

- The setup of the Network IP Configuration of the WCC III – MCD network card interface
- Copying of the BackTask specific data files to the root of the USB Drive
- Restoring of the BackTask specific data files from the root of the USB Drive
- The resetting of the WCC III - MCD IP address back to the WattMaster factory Default IP Address settings
- The resetting of the WCC III - MCD DNS settings back to the WattMaster factory default DNS settings
- The restarting of the 2 by 20 line LCD Driver that is located on the front of the WCC III - MCD
- The restarting of the 2 by 20 line LCD Display that is located on the front of the WCC III - MCD
- The testing of the Internet Connection, from the WCC III - MCD to the internet
- The testing of DNS Settings, from the WCCIII - MCD to the internet
- The shutdown of the WCC III - MCD – properly closing down
- The shutdown and restart of the WCC III - MCD

The Webmin access method can also accomplish all of these same tasks, but is a little bit harder to use and is meant to be more of an “off site” management tool for the WCC III - MCD. The mcd-menu program is meant to be used as the initial IP setting tool and BACKTASK data file loading tool for the WCC III - MCD. For this a monitor and keyboard needs to be connected temporarily just for the initial IP setup and BACKTASK data file loading.

Using the MCD-Menu Program

Using the MCD-Menu Program

Overview

The default administration username is wcciii and the password is wt@@58. This user name and password are both CAP sensitive, and should be entered in lower case letters only.

1. Type “mcd-menu” at the wcciii@wcciii-mcd:~\$ prompt (view only – restricted access). You can perform very few functions as “View only restricted access”, such as Copy/restore WCCIII data files.

2. To do the root level tasks like configure IP address, shutdown the WCC III - MCD, reboot the WCC III - MCD, reset the WCC III – MCD IP addresses and DNS settings to DEFAULT configurations, and of course, copy/restore WCCIII data files, you must be signed in as a “root” user. You must be very careful signed in as a root user, because you can render your WCC III - MCD system unable to communicate with the outside world if improperly used.

If you have selected a command and you are not signed in as a root user, it will give you a warning message as listed below:

```
*****  
*                                                                 *  
*   Warning: The program is not running as root.                 *  
*   Interface configurations or saving may fail!                 *  
*                                                                 *  
*****
```

The mcd-menu is straight forward. You can select the desired function by number (1 to 11) and hit the enter key to execute the desire function. You can quit this mcd-menu program at any time by hitting the “q” and then the enter key to quit. Then type “exit” at the wcciii-mcd:~\$prompt.

Helpful hint: While at the wcciii@wcciii-mcd:~\$ prompt you can select/toggle through previously entered commands with the “UP” arrow key.

The new files are rolled into the installation files so they will be available on new systems. They can also be pushed or updated to older systems via secure ftp and then run from the shell. Alternatively, they can also be upload to the WCC III – MCD from inside the WebMin program and then run from the command line from within the browser. This mcd-menu program may be run remotely from PuTTY which is a terminal emulator application program, provided that this program is installed and properly setup on your computer.

NOTE: DO NOT run the mcd-menu program from inside WebMin’s Command Shell. It will not work there. This mcd-menu program is meant to work only from the telnet/ssh session or from the actual console (i.e. keyboard and monitor that is connected to the WCC III - MCD).

Running the mcd-menu program

Step 1: Using the default low level, the username is wcciii and the password is wt@@58. Type mcd-menu at the prompt (view only – restricted access).

Step 2: The following first main menu screen should appear:

Please Pick a Function:

1. Setup Network Configuration
2. Copy BackTask Files to USB Drive
3. Restore BackTask Files from USB Drive
4. Reset MCD to Default IP Address
5. Reset MCD to Default DNS Settings
6. Restart LCD Driver
7. Restart LCD Display
8. Test Internet Connection
9. Test DNS Settings
10. Shutdown MCD

11 Total Choices

Press ENTER (or “d”) to scroll downward
OR “u” to scroll upward (Press “q” to quit)

PLEASE ENTER A CHOICE: ____

Step 3: Pressing the “enter” key or the “d” key will result in the next (second) menu screen appearing. The following second main menu screen should appear:

Please Pick a Function:

- 11. Shutdown and Reboot MCD
- 11 Total Choices

Press ENTER (or “d”) to scroll downward
OR “u” to scroll upward (Press “q” to quit)

PLEASE ENTER A CHOICE: __

Helpful hint: You do not have to use the “u” or “d” keys and then the “enter” to toggle between the first and second menus. By using the just “enter” key you can toggle between the first menu screen with selections of 1 to 10 and the second menu screen that has selection 11 only.

Setup Network Configuration (Choice #1)

This sub program will allow you to set the IP configuration of the WCC III – MCD. You will be prompted to enter a IP Address in the XXX.XXX.XXX.XXX format. If you do not have all of the following information, then you should not proceed any further. The values should be written below for future reference.

Static IP address ____ . ____ . ____ . ____ . ____ . ____
____ . ____ . ____ . ____ Must be static.

Subnet mask ____ . ____ . ____ . ____ . ____ . ____
____ . ____ . ____ . ____

Gateway ____ . ____ . ____ . ____ . ____ . ____
____ . ____ . ____ . ____

Nameserver ____ . ____ . ____ . ____ . ____ . ____
. ____ . ____ . ____ . ____

Nameserver ____ . ____ . ____ . ____ . ____ . ____
. ____ . ____ . ____ . ____ Optional

Nameserver ____ . ____ . ____ . ____ . ____ . ____
. ____ . ____ . ____ . ____ Optional

You will be now be prompted to enter the following data, and if you do not want to change the address listed within the listed brackets [] then just press the enter key and the value in the brackets [] will not change.

Enter interface configuration data:

Interface to configure: [eth0] __

IP address: [192.168.100.100] __

Netmask: [255.255.255.0] __

Gateway (none for no gateway): [192.168.100.1] __

Nameservers (blank separate list):

[208.67.222.222_208.67.220.220] __

Interface to configure: [eth0] __ There are two possible entries here “eth0” and “eth0:0”

eth0 is the default main IP address for the WCC III – MCD. eth0:0 is the secondary IP address for the WCC III – MCD and it is meant for direct connection from the WCC III – MCD to a local computer (Laptop) via a Ethernet crossover cable.

IP address: [192.168.100.100] __ This IP address must be supplied by your internet provider or by your network IT personnel. It must be a “static” as in not changing.

Netmask: [255.255.255.0] __ This IP address must be supplied by your internet provider or by your network IT personnel.

Gateway (none for no gateway): [192.168.100.1] __ This IP address must be supplied by your internet provider or by your network IT personnel.

Nameservers (blank separate list):

[208.67.222.222_208.67.220.220] __ This is the actual IP address for a DNS server.

Some internet service providers do not have a static IP address. They use what is called static host names, which correspond to a actual static IP address. You can enter more than one IP address here, a primary and a secondary, and please note that they must be separated by a space.

For example, on the Internet there exists a special case of nameservers lookup sites, the so called Domain Name System (DNS) servers, which are used to translate a static hostname or a domain name (for example, ‘WCC-CONTROLS.com’) to its corresponding binary identifier (the IP address 76.12.37.232), or vice versa.

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Using the MCD-Menu Program

After you have entered in all of the required IP addresses, subnet masks, Gateways, and/or Nameservers, the program will now change the internal IP network configuration files within the Linux operating system of the WCC III – MCD. It will take a few seconds to do this function, and will display the following messages:

Configuring interface:

```
/sbin/ifconfig eth0 192.168.100.100 netmask 255.255.255.0  
broadcast 192.168.100.255
```

Deleting old interface route:

```
/sbin/route del -net 192.168.100.0 netmask 255.255.255.0 eth0
```

Setting interface route:

```
/sbin/route add -net 192.168.100.0 netmask 255.255.255.0  
eth0
```

Deleting old default route:

```
/sbin/route del default
```

Setting default route:

```
/sbin/route add default gw 192.168.100.1
```

Writing /etc/network/interfaces:

Writing /etc/resolv.conf:

When completed the following information will be displayed:

New netstat settings:

```
192.168.100.100 0.0.0.0 255.255.255.0 U 0 0 0 eth0  
192.168.200.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0  
0.0.0.0 192.168.100.1 0.0.0.0 UG 0 0 0 eth0
```

Network Configuration Done.

```
*****  
*                               *  
*           Exiting Program.     *  
*****
```

```
wcciii@wcciii-mcd:~$
```

The mcd-menu program, as part of the setup process for the IP connections, has on purpose exited the mcd-menu program. This is normal operation.

Copy BackTask data Files to USB Drive (Choice #2)

This sub program will copy all of the useful WCC III data files to a USB drive (User / Contractor provided), assuming that there is a USB drive plugged into the USB port on the WCC III – MCD. It will copy all of these files to the root of the USB drive.

If there is not a USB hard drive in the USB port on the front of the WCCIII – MCD, this program assumes that there is a USB drive there even if it is not there. It will not report that there is a drive reading or writing error or any other errors. So when backing up, make sure that there is a USB hard drive in the USB socket port on the front of the WCCIII – MCD, and also there should be a LED on this USB hard drive that should light up when data is written or read from it. Please verify that this LED operates when backing up data to this USB hard drive.

All WCC III jobsites have multiple specific custom data files that are the responsibility of the end user and/or mechanical contractor. Any loss or the retention of these jobsite specific custom data files are not within WattMaster Controls Inc. liabilities.

The following will be displayed on the screen:

Selecting Copy BackTask Files to USB Drive.

Copying file: /home/wcciii/.wine/drive_c/Backtask/
AlarmBits.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
AlarmMessage.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
DutyCycleSchedule.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
EnergyConsumption.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
GeneralMessage.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
GlobalAnalog.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
GlobalBinary.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
HolidaySchedule.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
LookUpTable.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
NetworkInformation.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
OperatorCode.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
OptimalSchedule.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
OverrideSchedule.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
PidProgram.dat

Copying file: /home/wcciii/.wine/drive_c/Backtask/
ProportionalReset.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
ShedRestoreSchedule.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
StatusMessage.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
SystemParameter.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/table.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
TenantEvent_001_2009_09.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
TenantEvent_004_2009_10.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
TenantOverride.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
TenantOverrideRecord.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
UnitMessage.dat
Copying file: /home/wcciii/.wine/drive_c/Backtask/
WeekSchedule.dat

Done copying .dat files.

Returning to Main Menu.

The screen should now take you back to the mcd-menu main screen after about a second or two.

Restore BackTask data Files to USB Drive (Choice #3)

This sub program will copy all of the useful WCC III data files from a USB drive (User/Contractor provided), assuming that there is a USB drive plugged into the USB port on the WCC III – MCD. It will copy all of these files to the //home/wcciii/.wine/drive_c/Backtask/ subdirectory of the WCC III – MCD solid state hard drive.

If there is not a USB hard drive in the USB port on the front of the WCCIII – MCD, this program assumes that there is a USB drive there even if it is not there. It will not report that there is a drive reading or writing error or any other errors. So when backing up, make sure that there is a USB hard drive in the USB socket port on the front of the WCCIII – MCD, and also there should be a LED on this USB hard drive that should light up when data is written or read from it. Please verify that this LED operates when restoring data from this USB hard drive.

All WCC III jobsites have multiple specific custom data files that are the responsibility of the end user and or mechanical contractor. Any loss or the retention of these jobsite specific custom data files are not with in WattMaster Controls Inc. liabilities.

The following will be displayed on the screen:

Selecting Restore BackTask Files from USB Drive.

Copying file: /home/wcciii/.wine/dosdevices/d:/AlarmBits.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
AlarmMessage.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
DutyCycleSchedule.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
EnergyConsumption.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
GeneralMessage.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/GlobalAnalog.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/GlobalBinary.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
HolidaySchedule.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/LookUpTable.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
NetworkInformation.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/OperatorCode.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
OptimalSchedule.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
OverrideSchedule.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/PidProgram.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
ProportionalReset.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
ShedRestoreSchedule.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
StatusMessage.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
SystemParameter.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/table.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
TenantEvent_001_2009_09.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
TenantEvent_004_2009_10.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
TenantOverride.dat

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Using the MCD-Menu Program

```
Copying file: /home/wcciii/.wine/dosdevices/d:/
TenantOverrideRecord.dat
Copying file: /home/wcciii/.wine/dosdevices/d:/UnitMessage.
dat
Copying file: /home/wcciii/.wine/dosdevices/d:/
WeekSchedule.dat
```

Done copying .dat files.

Returning to Main Menu.

The screen should now take you back to the mcd-menu main screen after about a second or two.

Reset MCD to Default IP Address (Choice #4)

There are times when you may want to reset the IP address back to WattMaster Control's factory default settings. This is primarily done at WattMaster on new systems before they are sent out to the end user/contractor/customer. It is a base known starting point. Please note that this choice will reset both of the eth0 and eth0:0 ethernet configurations. The following information will be displayed on the screen:

Selecting Reset MCD to Default IP Address.

IP Address restored to Default.

IP Address Configuration is:

```
# This file describes the network interfaces available on your
system
# and how to activate them. For more information, see
interfaces(5).
```

```
# The loopback network interface
auto lo eth0 eth0:0
iface lo inet loopback
```

```
# The primary network interface
iface eth0 inet static
    address 192.168.100.100
    netmask 255.255.255.0
    network 192.168.100.0
    broadcast 192.168.100.255
    gateway 192.168.100.1
```

```
post-up iptables-restore < /etc/iptables.up.rules
# dns-* options are implemented by the resolvconf
package, if installed
```

```
iface eth0:0 inet static
    address 192.168.200.200
    netmask 255.255.255.0
    broadcast 192.168.200.255
    network 192.168.200.0 * Reconfiguring network
interfaces... SIOCSIFFLAGS: Cannot assign requested
address
* Stopping NTP server ntpd
...done.
* Stopping NTP server ntpd
```

```
[ OK ]
...done.
* Starting NTP server ntpd
...done.
* Starting NTP server ntpd
...done.
```

The screen should now take you back to the mcd-menu main screen after about a second or two.

Reset MCD to Default DNS Settings (Choice #5)

There are times when you may want to reset the DNS settings back to WattMaster Control's factory default settings. This is primarily done at WattMaster on new systems before they are sent out to the end user /contractor/customer. It is a base known starting point. The following information will be displayed on the screen:

Selecting Reset MCD to Default DNS Settings.

DNS Settings restored to Default.

Contents of /etc/resolv.conf are:

```
search parkville.wattmaster.com
nameserver 208.67.222.222
nameserver 208.67.220.220
* Reconfiguring network interfaces...
SIOCSIFFLAGS: Cannot assign requested address
* Stopping NTP server ntpd
...done.
```

[OK]

```
* Stopping NTP server ntpd
...done.
* Starting NTP server ntpd
...done.
* Starting NTP server ntpd
...done.
```

The screen should now take you back to the mcd-menu main screen after about a second or two.

Restart LCD Driver (Choice #6)

On the front of the WCC III – MCD, there is a 2 by 20 line LCD display. This 2 by 20 line LCD display will display the following information:

```
WCCIII - MCD IP ADDRESS
WCCIII - MCD UPTIME
WCCIII - MCD IP RECEIVE AND TRANSMIT PACKETS
WCCIII - MCD CPU UTILIZATION
```

This will stop the LCD driver and then restart it. The reasons why you might want to restart the 2 by 20 line LCD driver are: There may have been a issue with a stuck or blanked out screen, or the USB connection to the 2 by 20 line LCD display might have been disconnected or locked up.

If you have selected to restart the LCD driver, then the following will be displayed on the screen:

Selecting Restart LCD Driver.

Restarting LCD Driver...

```
Restarting LCDd: Stopping LCDd: LCDd.
Starting LCDd: LCDd.
```

The screen should now take you back to the mcd-menu main screen after about a second or two.

Restart LCD Display (Choice #7)

On the front of the WCC III – MCD, there is a 2 by 20 line LCD display. This display will display the following information:

```
WCCIII - MCD IP ADDRESS
WCCIII - MCD UPTIME
WCCIII - MCD IP RECEIVE AND TRANSMIT PACKETS
WCCIII - MCD CPU UTILIZATION
```

This will stop the LCD display program and then restart it. The reasons why you might want to restart the 2 by 20 line LCD display are: There may have been a issue with a stuck or blanked out screen, or the USB connection to the 2 by 20 line LCD display might have been disconnected or locked up.

If you have selected to restart the LCD display, then the following will be displayed on the screen:

Selecting Restart LCD Display.

Restarting LCD Display...

Stopping LCD Display...

```
kill: 74: Usage: kill [-s sigspec | -signal | -sigspec] [pid |
job]... or
kill -l [exitstatus]
LCD Display is stopped
Starting LCD Display...
LCD Display is now started.
```

The screen should now take you back to the mcd-menu main screen after about a second or two.

Test Internet Connection (Choice 8)

If you have selected to Test the Internet Connection, then the following will be displayed on the screen:

Selecting Test Internet Connection.

```
*****
*                                     *
*                               Internet is online. *
*                                     *
*****
```

Test DNS Settings (Choice 9)

If you have selected to Test DNS Settings, then the following will be displayed on the screen:

Selecting Test DNS Settings.

Testing DNS Setting in /etc/resolv.conf...

```
www.google.com is online.
www.yahoo.com is online.
www.wcc-controls.com is online.
```

DNS is resolving correctly.

The screen should now take you back to the mcd-menu main screen after about a second or two.

BIOS Screen Setup Information for the Advantech SBC Model PCI-6881 (V1.20 & V1.21)

Standard CMOS Features

IDE Primary Master [TRANSCEND]
 IDE Primary Slave [NONE]
 IDE Secondary Master [TRANSCEND]
 IDE Secondary Slave [NONE]

Drive A [NONE]
 Drive B [NONE]

Video [EGA/VGA]
 Halt On [No Errors]

Base Memory 640K
 Extended Memory 1014784K
 Total Memory 1015808K

Advanced BIOS Features

CPU Feature [Press Enter]
 Virus Warning [Disabled]
 CPU L1 & L2 Cache [Enabled]
 CPU L3 Cache [Enabled]
 Quick Power On Self Test [Enabled]
 First Boot Device [USB-HDD]
 Second Boot Device [USB-CDROM]
 Third Boot Device [HDD-0]
 Boot Other Device [Disabled]
 Swap Floppy Drive [Disabled]
 Boot Up Floppy Seek [Disabled]
 Boot Up NumLock Status [Off]
 Gate A20 Option [Fast]
 Typematic Rate Setting [Disabled]
 Typematic Rate (Chars/Sec) 6
 Typematic Delay (Msec) 250
 Security Option [Setup]
 APIC Mode [Enabled]
 MPS Version Control For OS [1.4]
 OS Select For DRAM > 64MB [Non-OS2]
 Report No FDD For WIN95 [No]
 Small Logo (EPA) Show [Disabled]

Advanced Chipset Features

DRAM Timing Selectable [By SPD]
 CAS Latency Time 2.5
 Active to Precharge Delay 7
 DRAM RAS# to CAS# Delay 3
 DRAM RAS# 3
 DRAM Data Integrity Mode Non-ECC
 MGM Core Frequency [Auto Max 266MHz]
 System BIOS Cacheable [Enabled]
 Video BIOS Cacheable [Disable]
 Memory Hole At 15M-16M [Disable]
 Delayed Transaction [Enabled]
 Delay Prior to Thermal [16 Min]
 APG Aperture Size (MB) [64]

** On-Chip VGA Setting **

On-Chip VGA [Enabled]
 On-Chip Frame Buffer Size [32MB]
 Boot Display [VBIOS Default]
 Panel Number [1024X768]

Integrated Peripherals

OnChip IDE Device [Press Enter]
 OnBoard Device [Press Enter]
 SuperIO Device [Press Enter]
 OnBoard serial Port 1 [3F8]
 Serial Port 1 Use IRQ [IRQ4]
 OnBoard serial Port 2 [Disbaled]
 Serial Port 2 Use IRQ IRQ3
 OnBoard serial Port 3 [Disabled]
 Serial Port 3 Use IRQ IRQ5
 OnBoard serial Port 4 [Disabled]
 Serial Port 4 Use IRQ IRQ10
 Watch Dog mode Select [trigger reset]

BIOS Screen Setup Information

Power Management Setup

ACPI Function	[Enabled]
Power Management	[User Define]
Video Off Method	[DPMS]
Video Off In Suspend	[No]
Suspend Type	[Stop Grant]
Modem Use IRQ	[NA]
Suspend Mode	[Disabled]
HDD Power Down	[Disabled]
Soft-Off by PWR-BTTN	[Instant-Off]
CPU THRM-Throttling	[50.0%]
Wake-Up by lan card	[Enabled]
Power On By Ring	[Enabled]
Resume by Alarm	[Disabled]
Date (of Month) Alarm	0
Time (hh:mm:ss) Alarm	0: 0: 0

** Reload Global Timer Events **

Primary IDE 0	[Disabled]
Primary IDE 1	[Disabled]
Secondary IDE 0	[Disabled]
Secondary IDE 1	[Disabled]
FDD, COM, LPT Port	[Disabled]
PCI PirQ[A-D]#	[Disabled]
PWRON After PWR-Fail	[On]

PnP/PCI Configurations

PNP OS Installed	[Yes]
Reset Configuration Data	[Disabled]
Resources Controlled by	[Auto(ESCD)]
IRQ Resources	Press Enter
DMA Resources	Press Enter
PCI/VGA Palette Snoop	[Disabled]

PC Health Status

CPU Fan Off When S1	[Disabled]
Current CPU Temperature	44C/113F
Current CPUFAN Speed	0 RPM
VCCcore	1.31 V
VDDR	2.49 V
+3.3V	3.26 V
+ 5 V	5.02 V
VBAT(V)	3.15 V
5VSB(V)	4.67 V

Frequency/Voltage Control

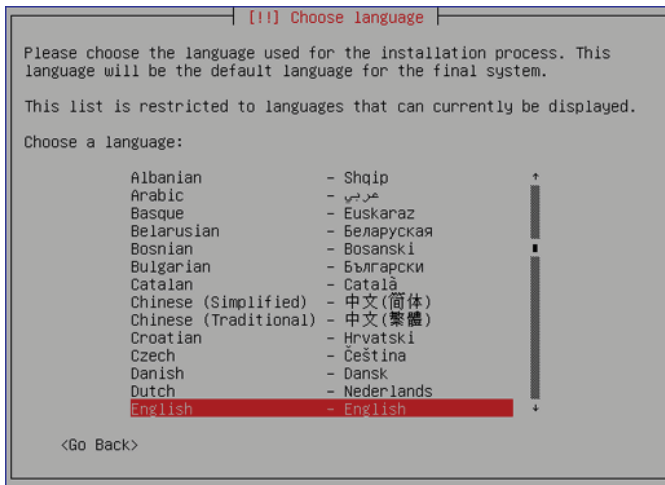
Auto Detect PCI Clk	[Enabled]
Spread Spectrum	[Disabled]
CPU Host/3V66/PCI Clock	[Default]

WCCIII – MCD Linux Base System Install (SS5019)

Install the Software

Step 1: Insert the WCCIII – MCD Ubuntu install CD (WM part # DM1WC014-XX) into your external USB CDROM drive and boot from it. (BIOs must be set to boot from USB device.)

Step 2: Select “**English.**”



Step 3: The main *WCC III MCD Installation Screen* will display and you will have the following options—Install WCCIII MCD, Rescue a broken system, Test memory, and Boot from first hard drive.

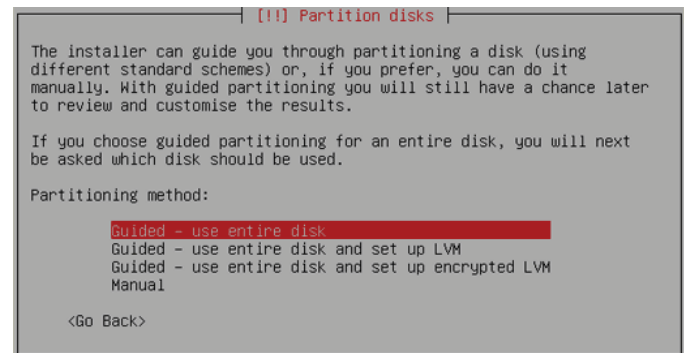
Normally, on a new installation, you would select Install WCCIII MCD and proceed through the rest of the installation software. This option will install all of the necessary software onto the WCC III MCD’s solid state hard drive.



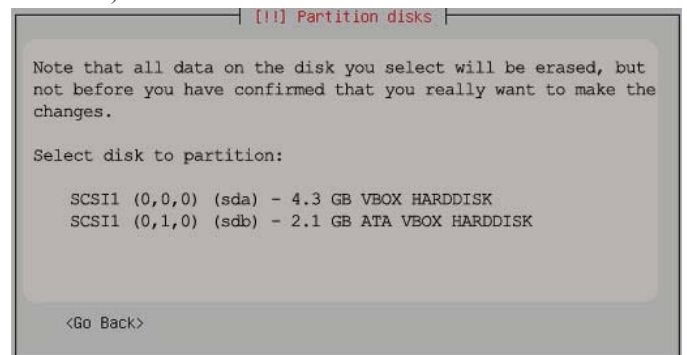
Step 4: You need to determine the end jobsite location where the WCC III -MCD is going to be shipped to. For the WCC III - MCD, it is usually one of five selections—Eastern, Central, Mountain, Pacific, or Arizona.



Step 5: Now you need to partition your solid state hard disk. You want to create one big partition (with the mount point /), so select Guided - use entire disk.



Step 6: Select the disk to partition. You should select the SCSIII (0,0,0) sda - 8.0GB ATA Transcend (image may be different, but select sda).



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WCC III - MCD Linux Base System Installation

Step 7: When prompted, you should highlight and select Yes when you're asked, "Write the changes to the disks?" Your new solid state hard disk partitions are now being created and formatted.

```

[!!!] Partition disks
-----
If you continue, the changes listed below will be written to the
disks. Otherwise, you will be able to make further changes manually.

WARNING: This will destroy all data on any partitions you have
removed as well as on the partitions that are going to be formatted.

The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)

The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext3
partition #5 of SCSI3 (0,0,0) (sda) as swap

Write the changes to disks?

<Go Back>                <Yes>                <No>

```

Step 8: Now the base Linux Ubuntu operating system is being installed, and the installation screen should be displaying the various different files' information in the middle of this screen. The installation process has been automated and there should not be any prompting for further information unless a problem occurs.

```

[!!!] Installing the base system
-----
Retrieving libtext-iconv-perl...

```

Step 9: The Linux operating system installation continues for 3-5 minutes at which point other non Linux operating system software is also installed such as the webmin interface.

```

[!!!] Select and install software
-----
Preparing webmin

```

Step 10: At this point, the Linux operating system for the WCC III - MCD is installed and is now creating the wcciii user account information, installing the backtask program, and installing other minor assorted files that are needed for proper operation of the WCC III - MCD.

Step 11: The base Linux operating system installation is now finished. You must now remove the USB key and press <Continue> to reboot the WCC III - MCD system.

```

[!!!] Finish the installation
-----
Installation complete
Installation is complete, so it is time to boot into your new system.
Make sure to remove the installation media (CD-ROM, floppies), so
that you boot into the new system rather than restarting the
installation.

<Go Back>                <Continue>

```