

the
MIRTM
MirC
RELAY PAIR series

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NOTICE: Portions of this Manual REQUIRE Internet Access

This manual will guide you through the setup and use of all MirC Series relay controllers. Following this manual in the sequence outlined is absolutely essential to proper understanding and use of MirC Series Controllers. Please review the entire manual BEFORE contacting NCD technical support. NCD technical support staff will direct your questions to this manual when applicable.

INTRODUCTION

The MirC Series relay controllers represent a significant advancement in the evolution of the NCD product line. The MirC Series controllers represent a new form of products for our customers who are not electronic engineers but still have Electronic applications they would like to complete. These controllers are the Simplest controllers we have ever developed. They are as easy as wiring up the devices and pushing a button. No programming or configuring is required. However you can extend the functionality of these controllers by using them in conjunction with our Reactor, Key Fob, and Taralist series controllers. In this way MirC controllers can be used to trigger other functions. It may also be triggered by sensory input when used in conjunction with a Reactor or Key Fob controller.

The MirC Series are our third line of controllers to offer Autonomous Relay Control (logical control based on inputs without a computer). This new architecture allows remote control of relays without writing a single line of code. The MirC Series are manufactured using Surface Mount Technology. A Break-Away design has been implemented to service the needs of customers who need an enclosure AND to customers who need the smallest possible size. Break Away tabs allow the user to “break” off the outer edges of the circuit board for a smaller profile. The MirC Series relay controllers represent the future direction of the NCD product line.

WHO'S QUALIFIED TO USE THE MIRC SERIES?

Anyone. The MirC Series Controllers are the most consumer friendly devices we have ever manufactured. Whether you are an electronics engineer or home hobbyist, anyone is qualified to use the MirC Series controller provided this manual is carefully studied.

HOW DO THE MIRC SERIES CONTROLLERS WORK?

MirC controllers are sold in pairs. Contact closure devices such as buttons and switches attached to inputs on the first controller will trigger relays on the second controller. One Controller is the Sender and the other is the Receiver. The Sender has inputs while the Receiver has relays. When an input on the sender is tripped by a contact closure the corresponding relay on the receiver board is energized. Communication between the Sender and Receiver is Wireless.

WHAT TYPE OF RANGE CAN USERS EXPECT?

There are three range options with the MirC controllers:
300 Feet (Short Range)
1 Mile (Medium Range)
15 Miles (Long Range)

These ranges are based on a clear line of sight between MirC controllers/antennas, meaning obstacles such as trees, buildings and walls may limit these ranges slightly.

EXTENDING RANGE.

Because MirC devices do not interfere with other MirC devices it is possible to link multiple MirC devices in a chain configuration to cover long distances.

MULTIPLE MIRC PAIRS?

Multiple MirC Controllers can be used in one locations. One Pair of MirC controllers will not interfere with another MirC pair as they are isolated through the way we designed them. MirC Devices are paired together before shipment and will only communicate to each other, for this reason they will not interfere with other MirC controllers.

ORDER OF OPERATIONS

Contact closures are read on one controller, data is sent to other controller wirelessly to turn on or off relays, remote device replies back, busy light flashes to confirm data was received at the other end.

LEARNING CYCLE

- 1) Hardware Reference (getting to know the hardware)
- 2) Understanding Relay Control
- 3) Connecting Contact Closure devices to a MirC Sender
- 4) Controlling Devices with a MirC
- 5) Troubleshooting a MirC Controller

USAGE CYCLE

- 1) Attach Power
- 2) Input Connection
- 3) External Device connection to Relay
- 4) Test Range and Functionality in your Environment.

GETTING STARTED

There is no better place to start than from the beginning. This manual will lead you through the understanding and use of your MirC Series relay controllers in a sequence that will help get you started from the ground up.

Please refrain from contacting NCD technical support unless it is absolutely necessary. Most questions will be covered in this manual and NCD technical support staff has been instructed to direct your questions to this manual when appropriate. Please take advantage of the efforts we have invested in building a complete and comprehensive product manual. This will save you time and allow our technical support engineers to focus on product development.

HARDWARE REFERENCE

There are many versions of the MirC Series relay controllers. It is not practical to photograph and outline every version in this manual. But there are many common elements that are shared among controllers. Most notably, the MirC CPU is identical whether you are using 1-Channel Long Range MirC controllers or 8-Channel Short Range MirC controllers. All MirC controllers share the exact same firmware with absolutely NO differences in firmware revisions. This greatly reduces manufacturing time and troubleshooting while allowing our customers a migration path to different communication range technologies as required.

MirC controllers use different Communication Technologies giving them ranges of 300 Feet (Short Range), 1 Mile, and up to 15 Miles (Long Range)!

POWER REQUIREMENTS

MirC controllers require a 12VAC or 12VDC power supply to power the logic and relays of the controller. The [PWR12](#) is our stock power supply suitable for use with ALL MirC Series controllers. While it is possible to operate from an automotive 13.8V power supply, higher voltages are not recommended. Additional power filtering may be required for proper operation in automotive electrical systems. The absolute minimum recommended operating voltage is 11VAC or 11VDC. MirC controllers require approximately 100ma for standby and 60ma for each activated relay. Communication Modules may require up to an additional 240 ma, this is documented on the Electrical Specifications Page.

Power polarity is not important on the MirC Series controllers. There is no positive and negative terminal. Simply apply power to the controller as it is convenient to make wired connections. The MirC controller will rectify your power supply and attempt to filter noise to safe levels for proper operation.

TEMPERATURE REQUIREMENTS

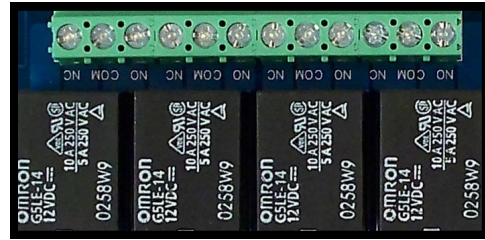
Certain components of a MirC controller may run at temperatures exceeding 120° Degrees Fahrenheit. This is normal for a MirC controller and does not indicate a defect.

The recommended operating temperature for all MirC controllers is -25 to 80° C. This temperature rating is based on temperature specifications of the components used to build a MirC controller, and is not based on actual testing. We have speculated that MirC controllers may be able to withstand lower temperatures due to the fact that MirC controllers tend to have hot components in critical areas of the design.

HARDWARE REFERENCE: ANATOMY OF A MIRC

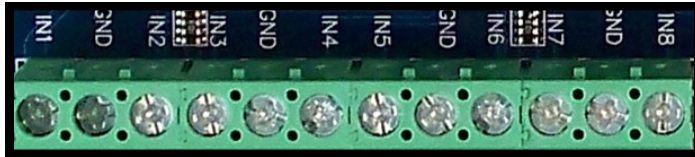


Status LEDs indicate which relays are currently active.

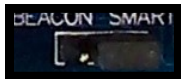


MirC Controllers are equipped with 1, 2, 4, or 8 Relay Outputs. Relays are simply switches. They DO NOT provide a voltage output, but they will switch the voltage you apply to the relay connections. Please [Click Here](#) to see a list of relays and ratings that are commonly supported by the NCD product line (note: not all relays may be supported at this time, relay support will grow as the MirC product line grows).

Relays have 2, 3, or 6 connections per relay depending on configuration. SPST, SPDT, and DPDT relays will be supported. Please see the [following article](#) for a detailed explanation of these relay types.



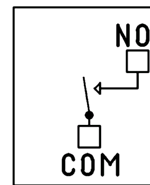
Inputs on MirC Sender are capable of reading switches, buttons and other contact closure devices such as many motion detectors.. These input serve as the command points for the remote MirC Receiver controller.



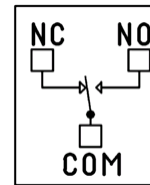
Beacon/Smart Mode Jumper. Used to switch the controllers from Beacon Mode (good for range testing) to Smart Mode (recommended for day to day function)



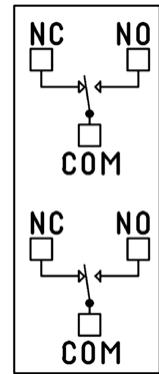
The BUSY/READY LEDs indicate CPU activity. Flashing Busy LED signifies VALID data has been received from the Remote MirC controller. If busy light never flashes check remote device and range abilities of devices.



SPST Relay



SPDT Relay

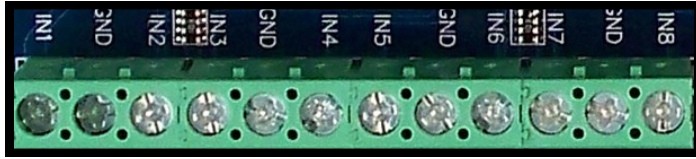


DPDT Relay



MirC Controllers include a 2.1mm Barrel Connector AND a 2-Position Screw Terminal. Use either connector to provide 12V power to the MirC Controller. MirC controllers are compatible with 12V AC or DC power supplies with an actual voltage output of 11 to 13.8V. Polarity is corrected by the MirC controller, therefore a Positive and Negative terminal are NOT labeled on the board (it is not possible to connect power backwards to MirC controllers, the MirC controllers will automatically correct polarity).

HARDWARE REFERENCE: UNDERSTANDING INPUTS



Inputs are capable of reading Contact Closure generating devices such as buttons and switches. A wire connected from the ground terminal to the input terminal would trigger the input, as this would be considered a contact closure.

MirC Inputs play a vital role in the use of a MirC controller. Before we begin using the controller, it is essential that users understand the role of these inputs. Improper use of these inputs can cause **Irreparable Damage** to the MirC controller, so a firm understanding of these inputs is critical to the longevity of the controller.

Users must NEVER apply any voltage to an input on the MirC Sender controller, these inputs are for Contact Closure connection only.

A MirC Sender controller has as many inputs as its mating MirC Receiver has Relays. So a pair of 4 relay MirC controllers will have 4 relays on the Receiver board and 4 inputs on the Sender board which are used for controlling the relays on the Receiver board, the same holds true for 1, 2, and 8 relay versions.

BEACON/SMART MODE JUMPER

The Beacon/Smart Mode Jumper is used to change the way communications is handled by the MirC controllers.

Beacon Mode

In Beacon Mode communication is nearly constant which makes it a good choice for range testing. A controller can be placed in one location and the other MirC controller can be carried to other locations to test range. The busy Light flashes constantly if there is good communication between the two MirC controllers. If communication is lost in Beacon mode relays will remain in their current state and will not automatically turn off. If the busy light stops flashing the devices are out of range of each other and the distance should be shortened. While Beacon Mode is very good for range testing it does lengthen the amount of time it takes for an input on the Sender board to trigger a relay on the Receiver board. Beacon mode is not recommended for day to day use.

Smart Mode

In Smart mode communication is not as constant as in Beacon Mode, however Smart Mode does still check for communication with remote device periodically. For this reason inputs on the Sender MirC controller can trigger Relays on the Receiver MirC controller very fast because input changes are immediately sent to the remote device. If communication is lost in Smart mode for 10 to 15 seconds all relays will go off and communication streams will accelerate to attempt immediate recovery. If this happens check remote device and range abilities of your MirC controllers. Smart mode also consumes less power than Beacon mode, this along with fast relay triggering is why we recommend Smart mode for every day use.

Regardless of the Mode you choose, if the busy LED flashes the two devices are communicating properly. If the Busy LED does not flash at all the devices are unable to communicate.

Beacon Mode:

- Constant Communication.
- Good for range testing.
- Relays will not switch off if communication is lost.
- Higher power consumption.
- Relay Status will update slower to input changes on remote board.

Smart Mode:

- Fewer Communications between Devices
- Relays will switch off if Communication is lost.
- Lower Power consumption than Beacon Mode.
- Relay status Updates very fast to input changes on remote Board.

HARDWARE REFERENCE: UNDERSTANDING RELAYS

On the previous page, we introduced you the MirC Inputs and how Contact Closures play a key role in triggering Relays on the Remote MirC board. In this Section we will continue our focus on the Hardware portion of the MirC controller, which brings us to our next topic: Understanding how the Relays work.

MirC Controllers have 1, 2, 4, or 8 Relays integrated into the circuit board. A relay is similar to a switch. The only difference between a switch and a relay is the actual mechanism for changing the on/off status of the switch. On a switch, you manually push on a piece of metal or plastic to operate the switch. On a relay, an electric current is used to operate the switch. Though a relay resembles the characteristics of a switch, it cannot be controlled by touching it with your finger. So from now on, we will use the word “Relay” to indicate a switch that is controlled by the MirC controllers (instead of your finger).

Relays do NOT provide a voltage output. They provide a contact closure output, exactly like the terminals found on a light switch at your local hardware store. Wiring to a relay will be slightly different depending on the model of MirC controllers you choose.

Some relays, such as the 5A and 10A versions have screw terminals that can accept 12 Gauge or smaller wire. Other versions such as the 20A and 30A relays have a .250” Quick Connect terminal (the appropriate mating connector can be found at any hardware or automotive supply store).

Again, relays do not provide a voltage output. They ONLY switch whatever voltage you supply into the relay.

Relays are available in SPST, SPDT, and DPDT configurations. In addition, both Mechanical and Solid State relays will be supported by the MirC series controllers. If you are unfamiliar with the different versions of relays available, you can [review the following article](#), which explains these relay types in great detail.

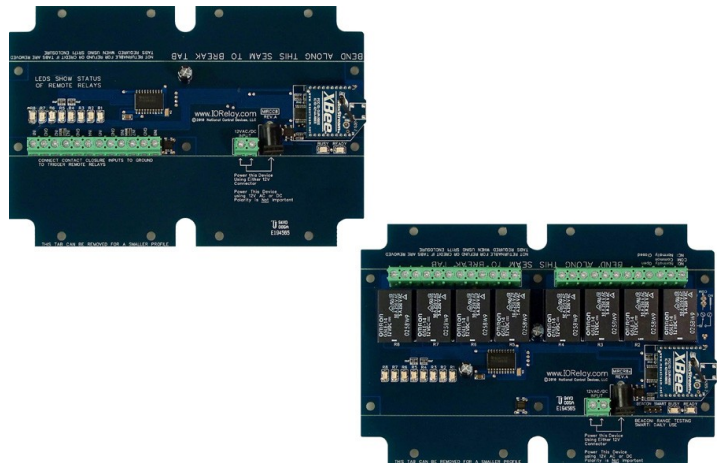
The above article will help you determine the best type of relay for your application, showing you the formulas for calculating relays sizes that are appropriate for your application.

If you intend to use the MirC series relay controllers for inductive applications, [the following article MUST be reviewed](#). An example of an inductive application is any device that involves motion. For instance, using a MirC Controller to control a motor, a solenoid, or a valve. Other types of inductive applications include anything with a transformer such as a fluorescent light or a power transformer of any kind. Logic circuits (including those found on the MirC Controller) may malfunction in sever conditions. The above article will show you how to safely implement these kinds of loads which greatly reduces the chances of a malfunction. Some inductive applications generate excessive noise, and may not be suitable for use with the MirC Series Relay controllers. Solid State MirC Relay Controllers Should be considered for these high-noise applications.

CONTROLLING RELAYS

There is only one way to control the relays on MirC Series controllers. Relays are triggered by inputs on the opposite board. They may not be triggered in any other way.

Relay Logic may be used to complete more complex tasks. Please refer to our page on Relay Logic.



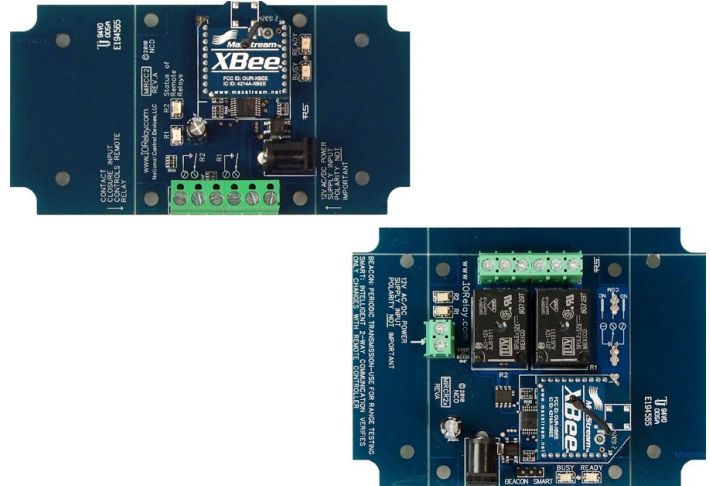
HARDWARE REFERENCE: BREAK-AWAY TABS

Physically, most MirC controllers are actually 2 sizes. When you receive your MirC, the unusual shape and size ensures the MirC can fit into a standard enclosure. Optionally, you can make the controller smaller by breaking away the outer tabs. Break-Away tabs are useful in applications where space may be a concern. This allows your MirC to offer the same functionality in the smallest possible profile. Break-Away tabs are unique to the NCD product line and are a standard option for most devices released in 2010 and later.

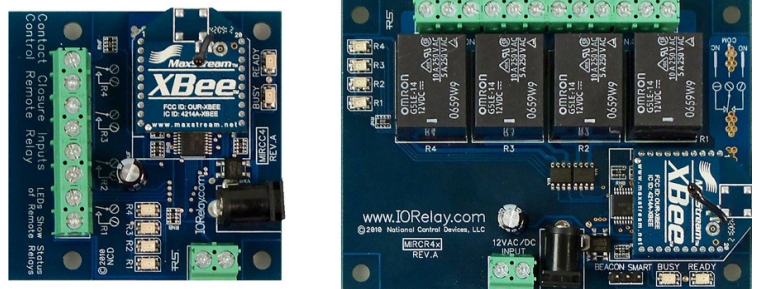
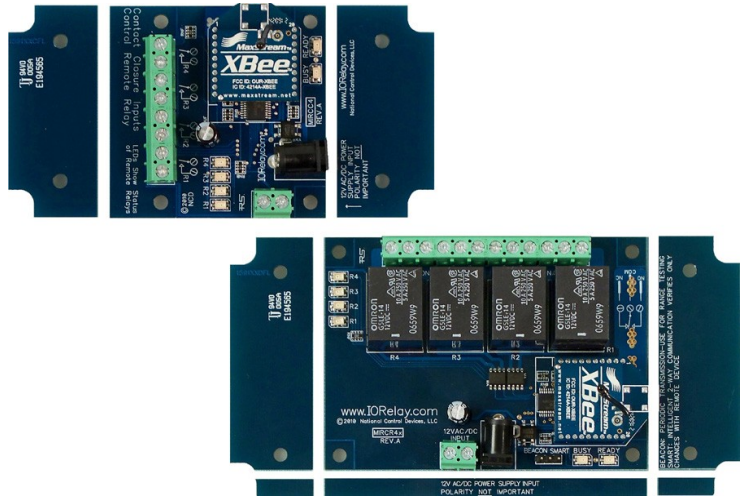
Before breaking the tabs on your controller, please be advised that your MirC controller will not be returnable for refund or credit if the Break-Away Tabs have been removed.

To break away the tabs, gently but firmly grab each break-away tab with a pair of pliers and bend the tab back and forth until it breaks away from the main circuit board. This will NOT damage the controller in any way.

Breaking the Tabs from a controller DOES NOT VOID the 5-Year Warranty. Please see the [NCD return policy if you would like more information on the policies that apply to Surface Mount devices.](#)



MirCR25 Shown Above as shipped from National Control Devices. The unusual shape accommodates a standard enclosure. Bend the tabs to break them away from the board. Note that controllers with Broken Tabs are NOT Returnable for Refund or Credit, but are still covered under our 5-Year Limited Warranty.



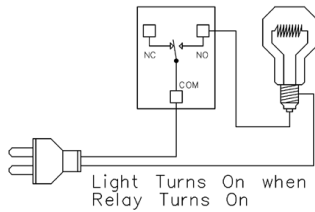
Shown above, the final controller with tabs removed is physically

RELAY LOGIC

This is why we recommend using MirC controllers with more relays than you may actually need...

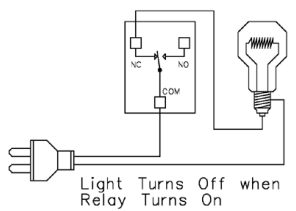
Using Relays to Create Logical Conditions

The MirC Series Relay Controllers offer a great balance of flexibility and easy configuration. However, complex decision making is sometimes outside the scope of a MirC controller. Relay Logic demonstrates easy ways to hard-wire your decisions using a MirC Controller.



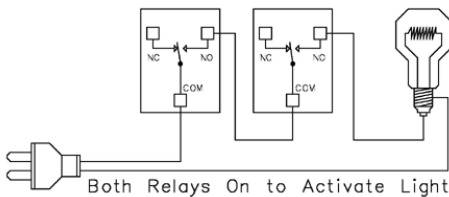
Sample 1

This sample demonstrates how a relay can be used to activate a light bulb. When the relay turns on, the light comes on. Only one power wire is switched with this sample using the COM (common) and NO (normally open) connections of a relay.



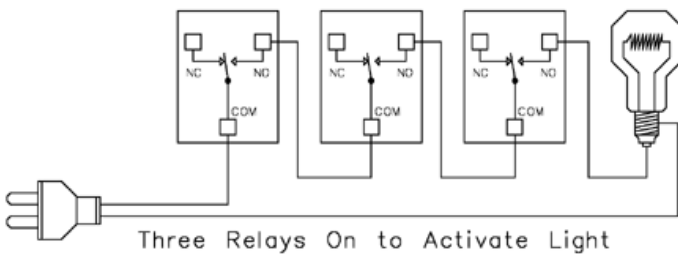
Sample 2

This sample demonstrates how a relay can be used to turn a light bulb OFF. When the relay turns off, the light will be ON. Only one power wire is switched in this sample using the COM (common) and NC (normally closed) connections of a relay.



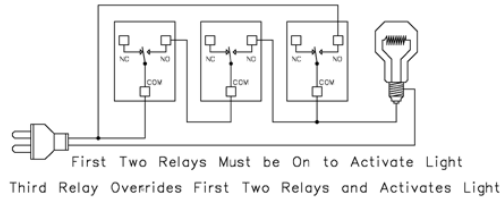
Sample 3

The sample above demonstrates how two activated relays are required to activate a light bulb. This is the same as a Logic AND function because Relay 1 AND Relay 2 MUST be on to activate the light.



Sample 4

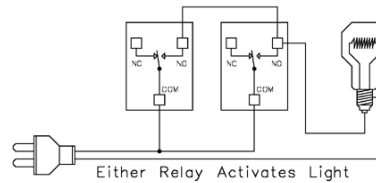
The sample above demonstrates how three activated lights are required to activate a light bulb. This is the same as a Logic AND function because Relay 1 AND Relay 2 AND Relay 3 MUST be on to activate the light.



Sample 5

This sample demonstrates the AND/OR function. The Light Bulb will be activated if Relay 1 AND Relay 2 are ON OR if Relay 3 is ON. This sample is perfect for

applications that may require a Logical condition of 2 relays PLUS an Override feature. For instance: Relay 1 is a Night/Day Sensor, Relay 2 is a Moisture Sensor. If its Dark AND the soil is Dry, Relays 1 and 2 can activate a Pump.

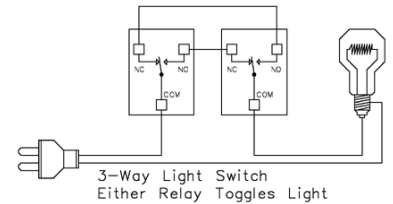


Sample 6

This sample demonstrates how either relay can be used to activate a light. In this sample, only one activated relay is required to activate the light. If both relays are activated, the light will be on.

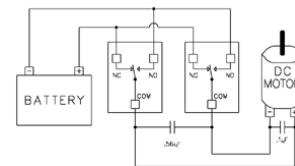
Sample 7

This sample demonstrates how a 3-way light switch can be used to activate a light. A 3-way light switch is often found in your house where two light switches can be used to activate a single light. This sample is exactly the same as a 3-way light switch, the only difference being each physical switch is replaced by a relay. Operationally, it works the same way. Each relay activation will cause the light to toggle. Switching two relays at one time is like flipping 2 switches at once...with the same result. This sample is particularly useful since you can replace one relay (as shown in the diagram) with a physical light switch. This will allow a computer/MirC to control a light as well as manual operation of a light. Properly used, this can be one of the most valuable diagrams we offer on this page.



Sample 8

This sample demonstrates how to control the direction of a DC motor using 2 relays. Braking is accomplished by connecting both motor terminals to a common power connection (Faraday's Law). The capacitors shown may not be required for small motors, but if you experience problems with relays shutting themselves off, the induction suppression capacitor will be required. The .1uF capacitor helps suppress electronic noise if the battery were to be used by sensitive devices (such as radios/amplifiers).



Relay 1 Off Relay 2 Off = Motor Brake to +
 Relay 1 On Relay 2 Off = Motor Forward
 Relay 1 Off Relay 2 On = Motor Backward
 Relay 1 On Relay 2 On = Motor Brake to -
 .56uF Induction Capacitor Should be Located Near Relays
 .1uF Filter Capacitor Should be Located Near Motor
 Additional Capacitors May be Desirable for Some Motors

ELECTRICAL SPECIFICATIONS

All Controllers Require 12 Volt Dc Power Source.

MirC Part # Controller	Min/Max. Current Consumption:		
	300 Ft Range	1 Mile Range	Long Range
MirCR15/R110	80ma-115ma	95ma-118ma	150ma-180ma
MirCR25/R210	80ma-140ma	95ma-145ma	150ma-195ma
MirCR45/R410	80ma-200ma	95ma-205ma	150ma-250ma
MirCR85/R810	80ma-370ma	95ma-380ma	150ma-430ma
MirCR8120/R130	80ma-150ma	95ma-155ma	150ma-220ma
MirCR220/R230	80ma-220ma	95ma-225ma	150ma-275ma
MirCR420/R430	80ma-385ma	95ma-390ma	150ma-450ma
MirCR820/R830	80ma-680ma	95ma-685ma	150ma-720ma
MirCSSR8x	80ma-390ma	95ma-395ma	150ma-445ma

Minimum Current consumption based on all relays off/Max consumption based on all relays on. Amperage consumption may fluctuate as much as 10 % Note: Long Range Modules may fluctuate in power consumption significantly from 80ma up to 150ma in all relays off mode.

	Maximum	Rated	Minimum
Temperature Ratings (Estimated)**	-25°C		80°C
Mechanical Relay Cycle Life (Non-DPDT Versions):		>10,000,000 Cycles	
Mechanical Relay Cycle Life (DPDT Versions):		>2,000,000 Cycles	
Typical Operational Cycles per Minute			1,800
Relay Activation Time:	>5ms		<15ms
Relay Deactivation Time:	>5ms		<20ms
Command Processing Time:	1ms	3ms	5ms

Relay Electrical Limits should be Determined by Reviewing Appropriate Relay Data Sheet:

5A Relays Data Sheet

10A Relays Data Sheet

20A Relays Data Sheet

30A Relays Data Sheet

Solid State Relays Sheet

** Ratings Based on Data Sheets of Component Used, Actual Tolerance May Exceed Ratings.

TROUBLESHOOTING

Problem: Busy LED is not Periodically Flashing/Remote Device is not responding.

The Busy LED Signifies **Successful** communication with remote device. If the Busy LED is not flashing the MirC is unable to communicate with the Remote Device. Possible Problems could be lack of sufficient power source at remote location, remote device is out of range, humidity can affect overall communication range (Dryer environments tend to have shorter ranges than wetter ones), damaged controller can prevent busy LED from flashing, if power is applied to inputs this will damage the controller.

Solution:

Check Power source for both Devices.

Place antennas or devices as high physically as possible.

If Humidity seems to be causing “Spotty” Reception contact us for a better antenna option.

If device seems to be damaged check to make sure you have NEVER attached voltage of any kind to the controllers inputs.

Problem: Controller is Running HOT

Solution: It is normal for some components run very hot on the MirC series relay controllers. This is not a concern as we have tested the design carefully and are operating our components well within the specified limits of the components we are using. It is NOT normal for the CPU to run hot at any time. The CPU should remain cool. If the CPU is running hot the CPU has been damaged.

Problem: Relays turn off unexpectedly:

This can happen if the devices loose communication with each other in smart mode. It can also happen when Inductive loads are attached to the relays (See page 6 Understanding Relays).

Solution:

Shorten the distance between controllers.

Carefully review the necessary steps for suppressing Induction in this

[Article](#).

Be sure to also check your power source.

Known Bugs:

At this time, the MirC Series Relay Controllers are not known to have any bugs in the firmware. There were 50 internal versions developed and tested over a span of 9 months to arrive at a Version 1.0 Firmware Release. If you experience a bug, please email us so we can examine the problem in more detail. Any known bugs will be posted in this section of the manual.

ETHERNET MIRROR SETUP

How They Work

All Ethernet Mirror Modules work in pairs. Triggering the contact closure input on one board will turn on the relays on the remote board. The local relay status and remote relay status will be indicated on the board through LEDs. The Ethernet Mirror Modules will work on a local area network as well as across internet. There are redundant communication channels between the two boards, as long as one of them is able to make connection, the boards will work.

Jumper Settings

Beacon Mode

When the jumper is set to beacon mode, relays will not change status when connection is lost.

Smart Mode

When the jumper is set to smart mode, all relays will turn off when connection is lost.

Connection

Connect directly

When two modules are in the same local area network, they can communicate to each other directly without a Mirror Server. No Internet connection is required.

Connection through Mirror Server

When two mirror modules are located in different networks, they can talk to each other through the NCD Mirror Server. Mirror modules can connect to up to four servers at the same time. As long as one of the servers can be connected to, the mirror modules will work.

The server can be setup inside a local area network as long as both modules are able to access it.

Setup

Quick Setup

Equipment Required.

- A Router
- A computer connected on the router.
- Two mirror modules connected to the same router.

Steps:

- Connect the two Mirror modules that need to be paired to the LAN.
- Run ConfigureUtility.exe on computer connected to the same LAN.
- Select the two modules which appear in the list and click “Pair”

Once the two modules are paired, there will be a connected symbol in front of the items.

The two modules can communicate with each other directly over a LAN through this quick setup.

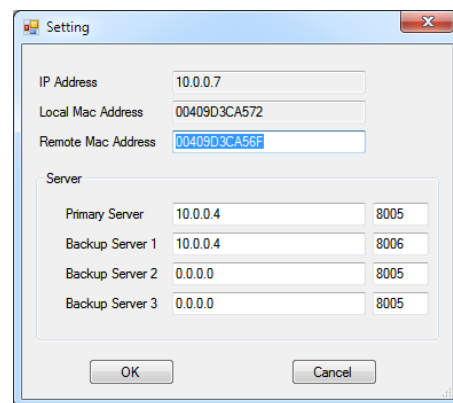
Advanced Setup

Equipment Required

- A Router
- A computer connected on the router.
- Two mirror modules connected to the same router.

Steps

- Connect the two Mirror modules that need to be paired to the Lan.
- Run ConfigureUtility.exe on computer connected to the same Lan.
- Select one module and click the “Edit” button.
- Input the server address and port number. The default port is 8005. Both modules need to be edited. Input 0.0.0.0 if there is no server. For example, if only one server is used, input 0.0.0.0 for the rest of the servers. The remote mac address can be setup in the next steps.
- Select the two modules in the list and click “Pair”
- Once the two modules are paired, there will be a connected symbol showed in front of the items.



The pair setup with servers can work through internet. It is not necessary to be in same local network.

Tips

Set the Remote Mac Address same as Local mac address. This can be used to test the device connection with the server. When the remote address is the same as the local address, it will loop back when an input is triggered, triggering a relay on the same board.

ETHERNET MIRROR SETUP CONTINUED

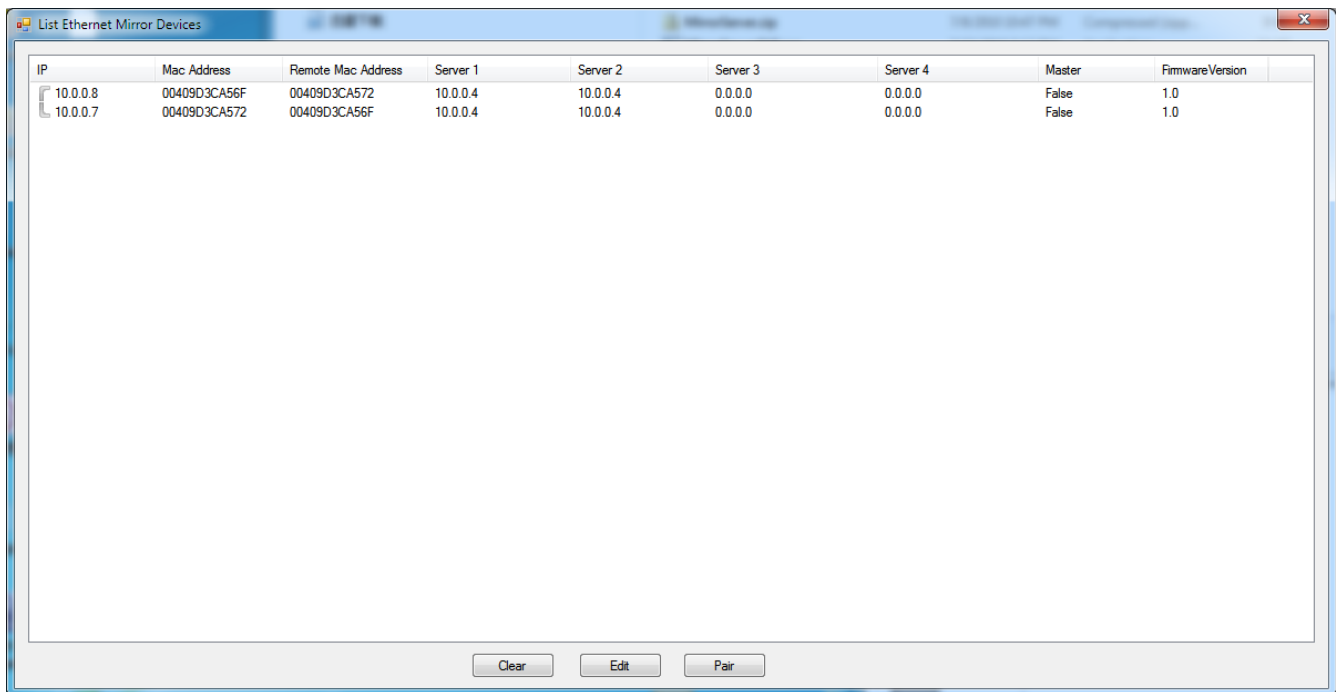
ConfigureUtility.exe

The “ConfigureUtility” is used to configure the mirror modules. This program can list all available modules in the same local area network. There is a connection symbol for paired devices.

Steps to pair devices.

- Select device and click “Edit” button, setup servers. Both devices have to be setup.
- Select both devices in list and click the “Pair” button. The connected symbols should show in front of the item once they are paired.

For each pair, one of the devices will be the master device. The other one will be the slave device.



The screenshot shows a window titled "List Ethernet Mirror Devices" with a table of device configurations. The table has columns for IP, Mac Address, Remote Mac Address, Server 1, Server 2, Server 3, Server 4, Master, and FirmwareVersion. There are two rows of data, both with a connection symbol in the IP column.

IP	Mac Address	Remote Mac Address	Server 1	Server 2	Server 3	Server 4	Master	FirmwareVersion
10.0.0.8	00409D3CA56F	00409D3CA572	10.0.0.4	10.0.0.4	0.0.0.0	0.0.0.0	False	1.0
10.0.0.7	00409D3CA572	00409D3CA56F	10.0.0.4	10.0.0.4	0.0.0.0	0.0.0.0	False	1.0

At the bottom of the window, there are three buttons: "Clear", "Edit", and "Pair".

ETHERNET MIRROR SETUP CONTINUED

Mirror Server

Mirror Server is a program that forwards messages between matched devices.

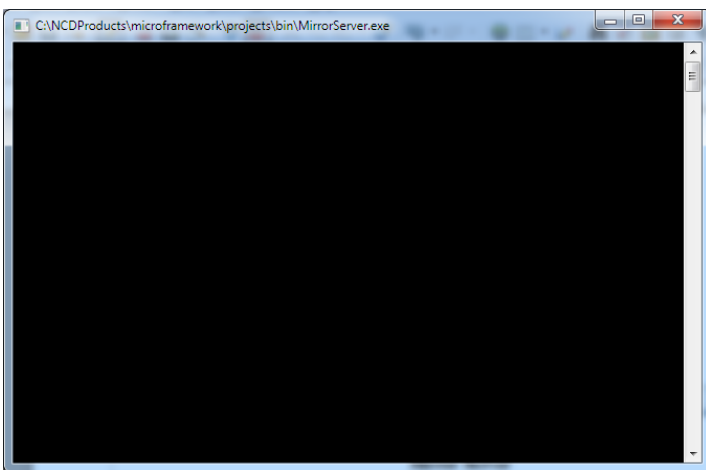
Setup Mirror Server on Microsoft Windows platform.

The Mirror Server can run as a windows console program or run as a windows service.

Run Mirror Server as a console program

Quick Setup

Double click the MirrorServer.exe. A console window will be opened.



Note:

Firewall setting.

The MirrorServer will listen on port 8005. The port has to be opened in windows Firewall setting. Or add this MirrorServer.exe to exception in Firewall.

Run Mirror Server as a service

Run "ServerManager.exe"

Run Mirror Server as a service

Run "ServerManager.exe"

The service needs to be installed first.

Click "Install Mirror Server Service" this will install the service to the computer. Click "Start" button to start the service.

The Server Manager needs to be run as Administrator. Firewall setting is required to run this program. NCDMirrorServerSvr.exe needs to be added to exception of the Windows firewall.

Suggestion:

It is strongly suggested to run console version server first to make sure everything is working before running as a service.

The advantage of running as a service is that the program will run in background and will be started automatically when the windows starts.

It is possible to setup a mirror server in other platforms other than Microsoft Windows. There is a mirror server written in Ruby. This program can run on all platforms that have Ruby installed. The Ruby version is supported in Windows, Linux, and Mac OS. It can be downloaded here.

<http://www.ruby-lang.org/en/>

The version we are using is 1.8.9.

To start the Mirror Server, type

`ruby /pathtomirrorserver/MirrorServer.rb`

