

Welcome to RelayRUNNER

Documentation (How To USE the Software)

About RelayRUNNER

RelayRUNNER is available “Stand-A-Lone” and bundled with several systems that are supplied as kits. These kits may, depending on the specific kit, include the interface-card, cabling, and 1 to 32 remotely switched power outlets, wiring layouts and schematics as appropriate. Therefore, this document contains only information that relates directly to RelayRUNNER. Information relating to kit components is provided in the documentation appropriate to that Kit or component.

Other versions of RelayRUNNER are available with enhanced capabilities.

What RelayRUNNER is

RelayRUNNER is a powerful tool for controlling industry standard digital switching cards and relay cards such as;
Standard Edition

- PDISO08 (with 8 INPUTS) from Computer boards, Inc (www.computerboards.com) and others
- Relay08 (NO INPUTS) from Computer boards, Inc (www.computerboards.com) and others
- DIY K74 Parallel Port 8-Relay from DIY Electronics Ltd (<http://www.kitsrus.com>) and others
- Kit-74 Parallel Port 8-Relay from Circuit Specialists, Inc (<http://www.web-tronics.com>)
- 8255 Interface from BoonDog Automation (www.boondog.com)
- KV-3590 Parallel Port 8-Relay from Jaycar Electronics (<http://www.jaycar.com.au>)
- X10 – Firecracker from X10.com (<http://www.x10.com>)
- And many other industry standard cards and devices.

Enhanced Edition

- All Standard Edition cards in multiples and
- PDSIO16 (with 16 INPUTS) from Computer boards, Inc (www.computerboards.com) and others
- Relay16 (NO INPUTS) also from Computer boards, Inc (www.computerboards.com) and others
- And many other industry standard cards.

What RelayRUNNER does

RelayRUNNER provides easy timing control for home automation, irrigation control, hydroponics, security lighting, indoor gardens and lighting displays. In fact anything you can imagine. RelayRunner enables your PC to connect to the outside world using industry standard interface cards as well as less expensive printer port relay cards connecting to relays, sensors, switches and solenoids to control hydroponics, security lighting, gardening and home automation. The ever popular X10-FireCracker transmitter/receiver system is also supported, although with limited features and less precise timing.

Some uses have been complex watering systems, timed ventilation, agricultural systems, automated feeding, watering etc, including Hydroponics systems requiring complex time dependent configurations. Other uses include Lighting systems for apartment complexes, burn-in testing, stress-testing, failure analysis testing, product reliability testing, home lighting, watering and fountains. One person, even setup his barn to entertain the cows with music and mood lighting before he arrived for the morning milking. One woman used RelayRUNNER to automate her landscape watering. (Got the husband coming in real late).

The uses are limited only by your imagination.

RelayRUNNER includes an “Auto-Restart” feature, which will automatically restart RelayRUNNER running the same time schedule, following a power failure (as long as windows is able to restart).

Registering RelayRUNNER

If you received RelayRUNNER as part of one of our kits

Please register at NO COST, using the “Proof of Purchase” included with your kit.

If you received RelayRUNNER other than by Direct Purchase or in a kit

Please Register RelayRUNNER

Upon registration, you will be sent a “KEY code” to unlock the RelayRUNNER program. An unregistered copy will run for about 60 days from first installation, Please Register.

Benefits of registering RelayRUNNER

Upon registration, you will be sent a “KEY code” to unlock the RelayRUNNER program. An unregistered copy will run for about 90 days from first installation, Please Register.

Registered users will receive product support available by e-mail for a period of one year. Registered users will also be notified by email of new versions, as they become available. Registered users, have access to other versions of RelayRUNNER that allow using up to Four interface boards, or 32 outputs and 32 inputs.

Minimum System Requirements to use RelayRUNNER

Operating System: Windows 95 or above including WinNT, Win2000, WinXP-Home and WinXP-Pro

Memory: 32 meg

CPU: 486/66 or better depending on operating system

Screen resolution: For One board option 640 X 480 or higher
For multiple boards 1024 X 768 or higher

Kits Available with RelayRUNNER

The full kit contains RelayRUNNER, internal interface card, and external connectors, connecting cable to remote panel, remote panel; hook-up wire and 8 relay controlled duplex outlets. Connections between your computer and the remote panel are ALL low-voltage and use a standard 9-conductor cable. ProKit RelayRUNNER is also available with 32 relay controlled duplex outlets.

Other kits are available including one that contains RelayRUNNER and complete wiring diagrams for several popular interface boards but no parts. Another kit contains RelayRUNNER and only the remote outlet modules with wiring diagrams for several popular interface cards. Kits range from 8 to 32 controlled outlet modules.

Copyright information

RelayRUNNER, the software, documentation and all other related materials are the exclusive property of E. McArthur & Associates. All other product names, trademarks, insignias and names are the property of the respective owners.

Installing Updates

Make a backup copy of your Time Schedule Files. The Time Schedules files are stored in the same directory that you installed RelayRUNNER in, or the directory that you specified when you save them. If the upgrade package included a “File Format Conversion” program, you will use that to convert your Time Schedule files to the new format, otherwise you should print each Time Schedule file from the Time Schedule Screen (USING YOUR CURRENT/OLD VERSION) so you will be able to re-enter each of your schedules. For further information and instructions, see the documentation that you received with your update. If the file formats have changed and you load an old format, you will receive errors and the program will not run correctly.

Getting Started

If you started RelayRUNNER before reading this (and even if you didn't)...Don't worry, it is ok. Because RelayRUNNER has so many combinable features, RelayRUNNER can be just a little intimidating at first glance. Please take time to read through this document so you will have an idea of what it does and how to control it. This will help you get the most from using RelayRUNNER.

If you have not installed your interface card, now is a good time (see installing your interface card). If you do not yet have your interface card, you can continue, BUT until you have installed your interface card, you will need to always select "Emulation Mode" under the "Tools" menu or on the CONFIGURATION screen. Once you have installed your interface card, "Emulation Mode" becomes a convenient way to test schedules without actually turning anything on and off.

PLEASE print this file.

The first best thing to do is to print this file for easy reference (remember when you are installing your card, you will not be able to print or view anything).

Before Installing RelayRUNNER

For Win NT, 2000 and XP you must log in as an "Administrator" or other user with **Administrative Privileges** to install RelayRUNNER.

For Win95 and 98, no special login or privilege is required.

Installing RelayRUNNER

Simply run the "Setup" program. If a shortcut was not created in your "Start" Button, then do so. Next, create a shortcut in the "Startup" group of your "Start" button. This will enable "Auto Restart, (just in case you have a power failure).

NOTE: You may want to wait until everything is setup and your circuits are working before adding RelayRUNNER to your "Startup" group.

RelayRUNNER can only be run from User Accounts having Administrative privilege

For Win NT, 2000 and XP, ONLY Users with Administrative privileges can run RelayRUNNER. Attempting to run from another type of account will not work correctly. While RelayRUNNER can be run from multiple User accounts, only one can do so at a time. This is not relevant for users of Win 9x.

If RelayRUNNER will be run from more than one account in Win NT, 2000 or XP

In Win NT, 2000 and XP, RelayRUNNER must be installed by each User **AND** each install **MUST** be to the **SAME** Program Directory. This is not relevant for users of Win 9x.

A little early,....But.....

REMEMBER: If you have anything connected to your output lines, it will work, move, switch and do what ever it should when you enter times or set manuals, inverts, etc., after you have configured both your interface card and RelayRUNNER, even if you are not ready for it to happen . SO USE CAUTION.

The First Time

The first time you run RelayRUNNER, it will not find its configuration file and will ask if you want to “Configure Now?”. Of course you do. The following information will help you do configure RelayRUNNER.

If you have installed your interface cards, please SKIP to “The Configuration Screen”

If you have not installed your interface card(s) yet, you have two options.

OPTION 1: If you have no idea what the address of your card is, you can simply select “Save”. Until your interface card is installed and configured, (both on the card and within RelayRUNNER) you should leave emulation mode enabled. After your card(s) are installed and configured, you may change “Emulation Mode” to “Active Mode”. You can do this either by going to the Configuration option under “File” or by selecting “Tools” then “Emulation Mode” as needed. Emulation Mode allows each Card Group to respond as although a card is installed.

OPTION 2: Alternately, you may configure RelayRUNNER as though your interface card(s) have been installed (even though they are not) and then (Always until the card(s) are present) select “Tools” then select “Emulation Mode”. This will allow you to model your time schedule and see what will happen when you have installed your card(s) and “Go Live”.

The configuration screen

What's in an address and why is it important

Computers are just dumb tools. They must be told everything. Sometimes they are told by software, other-times they are told by people. In the case of A/D Cards, Relay cards and the like, A jumper or dipswitch setting on each card most often tells them. The location and meaning of these jumpers vary from manufacturer to manufacturer and from board to board. RelayRUNNER needs to know where (the address) to set the relays on/off. Plug-N-Play(Pray) cards are a bit different, your computers Bios will set the cards address. RelayRUNNER will still need to be informed of this address by your manual entry on the configuration screen.

Finding your Address

Your interface card should have arrived with a manual. In the manual will be a section that talks about the cards base address. This address will be in hexadecimal also called hex. Most interface card manuals just say something like “the input register is base + 1” or “the control address is base +3”, what this means is, if your Hex base address is H300, then your input address is H301 and your control address is H303 (H stands for Hex). Some interface cards will also need to be configured by putting a special value into the “Control address” this value will be indicated (if needed) in the manual, it will be a Hex Value.

Also see “PCI and/or PLUG & PLAY” below.

Printer Port relay cards see “Printer Port & LPT1 Relay Cards” below

X10-FireCracker see “X10-FireCracker” below.

Board name

You can enter anything you want, this is just an informational except for printer port relay cards and for FireCracker transmitters.

Note: Some older cards are so slow that you may want to use “SlowCard1” or “SlowCard2”, “SlowCard3”, “SlowCard4” and “SlowCard5”, each of these increases the cycle delay to allow the card to respond. Using this for one or more cards will degrade the performance of all cards in the system.

Printer Port relay cards see “Printer Port & LPT1 Relay Cards” below

X10-FireCracker see “X10-FireCracker”.

Base Address (Hex)

This is the address that you set your interface board to. If possible, avoid using base address that do not end in “0” or “4”, a good address would be H280 or H300 if available on your card. Addresses to avoid would include H288 or H308. These addresses may be valid, but contribute to address confusion (for people).

Input Address (Hex)

This is the address where the input states are read from. This should be explained in the manual that came with your card. The input address is usually stated as “base address + 1” or “base address +2). If you can not find the information in the manual, call your interface card vendor for this information.

Control Address (Hex)

Not All interface cards need this.

This is the address where the configuration value will be written. This address can be more difficult to find then the base or input addresses. PDSIO08, PDSIO16 Relay08 and Relay16 from Computer Boards do not use this, The RelayRUNNER interface card does and it is “Base address + 3”. Other interface cards use other addresses.

If you cannot find it in the manual that came with your card, call the vendor or manufacturer to get it.

Control/Configuration value (Hex)

Not All interface cards need this.

This is the value used to set the interface cards registers to the correct configuration. This information is contained in the manual that came with your interface card. PDISO08, PDISO16, Relay08 and Relay16 from Computer Boards and other manufacturers do not use this.

Example Addresses (All addresses and Control Values are Hex)

For 8255Kit, PDISO08, PDISO16, Relay08 and Relay16

Card Name 8255 Kit

Base Address	280	or	284	or	288
Input Address	281	or	285	or	289
Control Address	283	or	287	or	28B
Control Value	80	or	80	or	80

Card Name PDSIO08

Base Address	300	or	304	or	308
Input Address	301	or	305	or	309
Control Address	blank	or	blank	or	blank
Control Value	blank	or	blank	or	blank

Card Name PDSIO16 A/B

Base Address	300/304	or	308/30C
Input Address	301/305	or	309/30D
Control Address	blank/blank	or	blank/blank
Control Value	blank/blank	or	blank/blank

Card Name Relay08 (Card has No Inputs)

Base Address	300	or	304	or	308
Input Address	blank	or	blank	or	blank
Control Address	blank	or	blank	or	blank
Control Value	blank	or	blank	or	blank

Card Name Relay16 A/B (Card has No Inputs)

Base Address	300/304	or	308/30C
Input Address	blank/blank	or	blank/blank
Control Address	blank/blank	or	blank/blank
Control Value	blank/blank	or	blank/blank

Log this Board

Check the box for each board's relay states and input states that you want to log, when you turn Logging ON in the tools menu.

Reset On Exit/Change

Check the box for each board that you want to reset all of its outputs/relays when you exit RelayRUNNER, Select NEW under file, or Load another Time Schedule File.

(Most people prefer to not reset everything, and will simply make it a point to turn things off before exiting.)

Default Relay Names

Enter the name you wish to display for each relay when creating New Time Schedules. It can be anything you like, but it must be short. Remember that you can always change a relay's name on the main schedule screen at any time.

Relay Background colors

If you do not like the current background colors, you can select one that you like the look of on your monitor. Not all colors look good everywhere.

Action/State colors

If you do not like the current Action/State colors, simply select those you do. Remember that not all colors will look the same everywhere. Some color combinations are simply unreadable. These selections will also be effected by changes you make to your display appearance within windows control panel.

Warn on Overlap

Check this box if you want to be warned of overlapping time entries for each relay.

Emulation

Check this box if you want this board to operate in emulation mode by default. Checking this box will cause this board to NOT actuate the relays UNLESS you change "Tools > Emulate to Active". Setting "Tools > Emulate to Active" is only in effect while RelayRUNNER is loaded, it will reset when you exit. Uncheck this box to operate this board in active mode by default. This means that the relays will actuate unless you set "Tools > Emulate to emulate".

Read/Write

Some cards, particularly very old cards do not support the Read State capability. That this means is that every time a relay is turned On or Off all but the one turned on will turn off. To correct this behavior, Check this box. Use this only if necessary. This will cause RelayRUNNER to carry the states in a virtual mode allowing use of these very old cards. Again this is not recommended unless absolutely necessary.

Kill Options (Optional)

Method

Make no selections (or clear any previous selections) if you do not wish to use the Kill Option.

Button

Check this box to display the Kill window with a Kill Button. If you click on this button, the selected action will occur. If you do not select an action, RelayRUNNER will end without resetting any relays and without shutting your computer off.

Signal

Check this box if you want RelayRUNNER to react to a change in one of the input signals. If the Signal goes HIGH or Goes LOW the selected action will occur. If you do not select an action, RelayRUNNER will end without resetting any relays and without shutting your computer off.

Note: This option is only useful if your card supports inputs and is configured correctly.

Note: This option can be very tricky to setup. The external circuitry stability and timing is critical.

Note: This option is not practical when using FireCracker, unless the signal will remain in the new state for at least 1 full minute.

Source

Enter the Board number that has the input signal to monitor.

Note: RelayRUNNER will not validate this, but will react as you select, based on what it "Sees".

Enter the Input number of the signal to monitor.

Note: RelayRUNNER will not validate this, but will react as you select, based on what it "Sees".

When

Check type of Signal Change that RelayRUNNER will react to.

Note: This option can be very tricky to setup. The external circuitry stability and timing is critical.

Action

Alln off

Check this box to reset all Relays when specified signal change is detected.

Note: This option is not practical with FireCracker, but you can try.

Exit Relay

Check this box to exit RelayRUNNER..

Shut Down

Check this box to turn your computer Off when specified signal change is detected

Note: Mother Board, Bios and Operating System support required.

Miscellaneous

Text to Display on the Kill Button

Enter the text you want to display on the kill button

On Top?

Check this box to hold the kill button on top of all other windows.

Delay

Enter the number of seconds to wait before the kill by signal becomes active. This is most useful

If your input circuit requires a while to stabilize, such as something needs to be activated before the signal will go High.

The Configuration screen (Problems caused by incorrect values)

Incorrect Base Address will prevent relays from turning on/off.

Incorrect Input Address will prevent input states from being displayed.

Incorrect Control Address (if needed) will prevent everything anything from working.

Incorrect Control Value (if needed) will prevent everything/anything from working

Poor choice of colors can make the screen unreadable.

Inappropriate Kill settings can cause the program to repeatedly exit or the computer to repeatedly shutdown/reboot, this is where the delay setting for Kill by signal comes in handy.

The Configuration screen (changing values while running)

Changing anything, other then a Relay Name will take effect immediately on return to the main screen.

Changing Default Relay Names will not show until you select File, NEW.

PCI and/or PLUG & PLAY (NOT ISA)

Fortunately Plug-and-Play has advanced since the dark ages. Most modern interface cards are Plug-and-Play, however "Almost Play" is many times more accurate. Since interface cards likely to be used with RelayRUNNER come from many sources, some with proprietary software interfaces, RelayRUNNER simply uses the Base Address and related offsets to access these cards. What all this means is we need a specific address for the configuration. Most card vendors provide a utility with the card to display the address that the card installed at as well as to do rudimentary testing. If you do not have such a utility, try contacting the manufacturer for one. Another option to find the base address is using a general purpose PCI or ISA Bus scanning utility. (see below)

Altitech provides a PCI bus scanning program, which is provided for your convenience. This program is NOT part of RelayRunner. This program is "Freeware" and may be downloaded directly from the internet. Having disclaimed any rights, authorship or any connection with Altitech, it is the best PCI bus scanning program we have found. Please use it as appropriate and support the author. Complete documentation is included in the zip file provided.

Printer Port & LPT1 Relay Cards

As you would expect these cards connect to the printer port of your computer. Most computers come with a single printer port known as LPT1. One or two additional printer ports can usually be added. Most likely you will be using this port for the relay card rather than a printer. If you will also need to connect a printer, you will need to add one or two additional printer ports and these would be named LPT2 and LPT3 respectively. Port addresses are also assigned to printer ports.

Usually the first printer port will have a port address of 0378Hex, the second port an address of 0278Hex and the third port, if present an address of 3BCHex. (Hexadecimal is just a different way of counting, base 16 rather than Decimal which is base 10, you do not need to know much more than that there is a difference, and to find and enter the correct one). In any case, printer port relay cards present a unique situation for the Windows operating system and as such RelayRUNNER requires a very specific configuration to control them.

(Printer Port & LPT Relay Cards DO NOT SUPPORT ALL RelayRUNNER capabilities)

Printer Ports are a standard specification that will not vary even with any of the "Printer Port Relay" cards attached.

For these cards, the "Card Name" **MUST** be "LPT1", "LPT2", "LPT3" or "LPT4".

Also the "Base Address" must be one of the following **Hexadecimal** Values

	<u>Hexadecimal</u>	<u>Decimal</u>
Lpt1	0378H	888
Lpt2	0278H	632
Lpt3	3BCH	956
Lpt4	2BCH	700

Example using two printer ports

	<u>Board 1</u>	<u>Board 2</u>
Card Name	LPT1	LPT2
Base Address	378	278
Input Address	379	279
Control Address	37A(N/U)	27A(N/U)
Control Value	0	0

How to Determine the Printer Port Address?

In the Windows **Start** menu, choose **Settings** then **Control Panel**. Double-click on the **System** Icon. Select the tab **Device Manager**. Double-click on **Ports (COM&LPT1)** then on **Printer Port (LPT1)**. Finally, select the tab **Resources**. Notice the **first Input/Output Range**. You will find for example: 0378-037F. The address is, here, **378** in hexadecimal, or **888** in decimal. It is easy to convert the values in hexadecimal and in decimal using the windows Calculator (sub-menu **Accessories** of **Start** menu).

X10-FireCracker

The FireCracker is an even stranger beast. FireCracker is truly the poor mans X10 and its true performance shows this. RelayRUNNER supports 8,16 or 32 addressable units. Using FireCracker you must not use a time resolution below 1 minute (60 seconds). It is also recommended that a maximum of 4 devices be switched on or off within the same minute. These limitations are a result of the FireCracker Transmitters timing requirements.

(FireCracker,CM17 DOES NOT SUPPORT all RelayRUNNER capabilities) The FireCracker connects to a serial port. While the manufacturer claims that you can connect to com1 and use the pass-thru to connect a mouse or other peripheral, WE RECOMMEND AGAINST USING THE PASS-THROUGH FEATURE.

We have found this to destabilize most computers especially the mouse and printer. We recommend that the FireCracker be the only device on a given serial port. Serial/COMM Ports are a standard specification that will not vary even with the FireCracker Transmitter attached, however RelayRUNNER requires very specific configuration settings to successfully control FireCracker.

For FireCracker the "Card Name" **MUST** be "FireCracker"

Also the "Base Address" **MUST** be one of the following

"FireCOMM1"	Comm Port 1	
"FireCOMM2"	Comm Port 2	(Recommended)
"FireCOMM3"	Comm Port 3	
"FireCOMM4"	Comm Port 4	(COMM5, 6, 7, 8 if present)

Also the "Input Address" is always **0** since FireCracker does not support Inputs

Also the "Control Address" **MUST** be one of the following

House Code	Module Numbers	House Code	Module Numbers
FireHouse A	1 - 8	FireHouse a	9 - 16
FireHouse B	1 - 8	FireHouse b	9 - 16
FireHouse C	1 - 8	FireHouse c	9 - 16
FireHouse D	1 - 8	FireHouse d	9 - 16
FireHouse E	1 - 8	FireHouse e	9 - 16
(House codes up to "P" and "p" are valid)			

Also the "Control Value" is always 0 since FireCracker is not configurable.

Example: ONE FireCracker and Device Modules 1 – 8 on One House Code (Standard)

	<u>Board 1</u>	<u>Board 2</u>
Card Name	FireCracker	blank
Base Address	FireCOMM2	0
Input Address	0	0
Control Address	FireHouseA	0
Control Value	0	0

Example: ONE FireCracker and Device Modules 1 – 16 on One House Code (w/Optional Upgrade)

	<u>Board 1</u>	<u>Board 2</u>
Card Name	FireCracker	FireCracker
Base Address	FireCOMM2	FireCOMM2
Input Address	0	0
Control Address	FireHouseA	FireHousea
Control Value	0	0

Example: ONE FireCracker and TWO HouseCodes , All Device Modules 1-8 (w/Optional Upgrade)

	<u>Board 1</u>	<u>Board 2</u>
Card Name	FireCracker	FireCracker
Base Address	FireCOMM2	FireCOMM2
Input Address	0	0
Control Address	FireHouseA	FireHouseB
Control Value	0	0

Example: ONE FireCracker and FOUR HouseCodes , and Device Modules 1-16 as coded
(NOT RECOMMENDED – FireCracker is really overloaded at this level)

	<u>Board 1</u>	<u>Board 2</u>	<u>Board 3</u>	<u>Board 4</u>
	Unit 1-8	Unit 1-8	Unit 9-16	Unit 1-8
Card Name	FireCracker	FireCracker	FireCracker	FireCracker
Base Address	FireCOMM2	FireCOMM2	FireCOMM2	FireCOMM2
Input Address	0	0	0	0
Control Address	FireHouseA	FireHouseB	FireHoused	FireHouseC
Control Value	0	0	0	0

Mixing FireCracker with other interfaces such as Internal relay cards and printer port cards will degrade the performance of all components other than FireCracker (but not features) to the timing capabilities of FireCracker, to about one cycle per minute.

FireCracker & X10 add a variety of complications particularly with reliability. FireCracker specifically and X10 in general are subject to interference from other nearby systems using the same house or unit codes. In addition common electrical appliances can affect the reliability. These include spurious or random on or off changes and are caused by things like HID lighting, florescent lighting, refrigerator compressors and almost anything containing an electric motor. Some transformers have been shown to interfere.

You may have received a small utility that cycles thru all available house codes and unit codes. This can be used to determine just how far your FireCracker can reach within your wiring (and possibly your eighbors). This utility is called “Mess With The Neighbors”. If installed, you can play with it at your own risk. “Mess With The Neighbors” is provided at no cost and with no warranty of any kind. It is an unsupported TOY. Be especially careful to select an existing ComPort, otherwise your computer may hang, forcing a reboot. Usage should be clear with no explanation.

Building your Time Schedules

Planning your collection of Time Schedule files.

If you have a project that has a sequence of schedules, such as for 3 weeks you want one schedule, then another schedule for 8 weeks followed by another for a week, you can create a set of Time Schedules files, and at the appropriate time, simply load the next schedule. Future releases will support automated loading of the next run file on a given date).

What are all the boxes are used for

Lets begin with some samples

Example files are located in the same directory as RelayRUNNER was installed.
(probably "c:\program files\RelayRUNNER\")

If RelayRUNNER is not running, start it now.

Example 1: Complex

You have a hothouse. You want the main lighting on for 12 hours, the cutting lights on for 18 hours. You want to water for 20 minutes at 6:00, 12:00 and 5:30. The cuttings will get root rot if watered too frequently, so they only need water 2 times a day, 3 days a week. Each afternoon you want to vent the house from 5:30 until 11:00pm. With all this watering, you need to refill your water tank at 3:17am.

Load "Example1.run" using "File" then "Open", and select Example1.run.

The screen shows how this would be setup.

Example 2: Simple

To keep things simple, this example controls only 1 relay, that relay is called.....

Load "Example2.run" using "File" then "Open", and select Example2.run.

The screen shows how this would be setup.

Example 3: Simple

To keep things simple, this example controls only 1 relay, that relay is called...

Load "Example2.run" using "File" then "Open", and select Example2.run.

The screen shows how this would be setup.

Example 4: Simple

To keep things simple, this example controls only 1 relay, that relay is called...

Load "Example2.run" using "File" then "Open", and select Example2.run.

The screen shows how this would be setup.

A description of fields and what you can put into each of them

RelayRUNNER offers a variety of control parameters. Using them will allow you to come up with an almost unlimited set of ON/OFF events to meet practically any need.

The main screen of RelayRUNNER has many fields that can be changed. These are: Relay Name, Icon, Start & End Time-pairs, Days of week and Even/Odd. The main screen also has buttons that control what is happening and Displayed. These are Manual Button, Invert Button, Counter and STOP.

Relay Name is just that and you change it to any short text you like. This name will be stored in the "Schedule" file.

Days-Of-Week box. Initially this box will contain "ALL Days".

The days of week box is used to limit the days of the week that time-pairs and Even/Odd can turn the associated relay ON. "**AllDays**" can be changed the numbers 1 to 7, each representing a day of the week. Sunday is 1, Monday is 2, Tuesday is 3, Wednesday is 4, Friday is 6, Saturday is 7.

Example: If days of week - 246 and on-time = 08:00 and off-time = 15:00 then the relay will be on Monday, Wednesday & Friday from 08:00 until 15:00(3:00pm)

Even/Odd box (initially this box will contain "EO")

The Even/Odd box can be changed to a variety of CODES.

Valid Codes are ED, OD, EH, OH, EM, OM, ES, OS, TH, MH, BH and blank.

ED, OD - Activate time-pairs on Even/Odd days only,

Example: If Even/Odd = ED and time-pairs are 09:30 & 14:00 and 15:00 & 19:00, relay will be on 09:30-14:00(2:00pm) and 15:00-19:00(7:00pm) on even numbered days of the month.

EH, OH - Activate relay Even/Odd Hours only, within time-pairs,

Example: If Even/Odd = EH and time-pairs are 09:30 & 13:00 and 15:00 & 19:00, relay will be on 10:30-11:00, 12:00-13:00 and 16:00-17:00 and 18:00-19:00(7:00pm).

EM, OM - Activate relay Even/Odd Minutes only within time-pairs,

Example: If Even/Odd = OM and time-pairs are 09:30 & 14:00 and 15:00 & 19:00, relay will be on 09:30-14:00(2:00pm) and 15:00-19:00(7:00pm) on Odd minutes ONLY.
(Do not use with FireCracker)

ES, OS - Activate relay Even/Odd Seconds only, within time-pairs.

Example: If Even/Odd = ES and time-pairs are 09:30 & 14:00 and 15:00 & 19:00, relay will be on 09:30-14:00(2:00pm) and 15:00-19:00(7:00pm) on Even seconds ONLY.
(Do not use with FireCracker)

NOTE: Using ES and OS (Even/Odd Seconds) can be fun, but are only as accurate as the motherboards internal clock, and should be regarded more as a toy than a tool

NOTE: When using TH, MH, BH the first Time-pair is special purpose, the remaining time-pairs will behave just as though Even/Odd is blank or empty.

- TH** - Activate relay for minutes at beginning of the hour
Example: If Even/Odd = TO and the FIRST time-pair is 09:10 & 18:00 relay will be on from the hour until 10 minutes past, (08:00-08:10, 09:00-09:10, 10:00-10:10 etc..)
- MH** - Activate relay for minutes in middle of the hour
Example: If Even/Odd = MH and the FIRST time-pair is 09:15 & 18:25 the relay will be on from 15 minutes after the hour until 25 minutes past the hour, (09:15-09:25, 10:15-10:25, 11:15-11:25 etc..)
- BH** - Activate relay for minutes at end of hour
Example: If Even/Odd = BH and the first time-pair is 09:50 & 18:00 the relay will be on the last 10 minutes before the hour until the hour from 09:00 to 18:00(6:00pm), (9:50am-10:00am & 10:50-11:00am & 11:50-12:00pm, etc).
- 3H** - Activate relay for minutes at beginning, middle and end of hour
Example: If Even/Odd = 3H and the first time-pair is 09:10 & 18:00 and the second time pair is 09:25 & 18:35 and the third time pair is 09:50 & 18:00, the relay will be on the first 10 minutes of the hour, from 25 minutes past the hour to 35 minutes past the hour and then again the last 10 minutes before the hour until the hour, from 09:00 to 18:00(6:00pm),
(09:00am - 09:10am & 09:25am - 09:35am & 09:50am-10:00am & 10:00am - 10:10am & 10:25am - 10:35am & 10:50am -11:00am & 11:00am - 11:10am & 11:25am - 11:35am & 11:50am - 12:00pm, etc).
- ##** - Cycle relay On and Off for ## minutes each cycle
Example: If Even/Odd = 26 and the first time-pair is 09:00 & 18:00 the relay will be on for 26 minutes and then off for 26 minutes then on again for 26 minutes Beginning at 09:00am and ending at 18:00(06:00pm).
- Manual** is an ON/OFF toggle. It is Manual ON or not. It CANNOT be used to force a relay to be OFF. It does, however ,override all other settings.
- Invert** Inverts ALL settings except “Days of Week” and “Minutes Cyclic “
- Time-Pairs** (six of them), The top Time box is the ON time and the lower is the OFF time. Times can overlap.
- Counter** Counts the number of times that the input signal turns ON, Left-click to turn On/Off toggle, Right-click to zero individual counters.
NOTE: What and how you wire/set-up your system will have a huge effect on what you are counting. For example: if you are using a solar-cell to indicate a light is on and its output voltage is marginal to the “trip voltage” of your interface card, the counter may show a large number of on inputs even though the light has been on continuously. This is caused by the input going low when the voltage goes below the threshold voltage and then increases above the threshold voltage.
- STOP** Turns the relay OFF and will hold it off until undone or RelayRUNNER is restarted.
- Indicators** Relay ON/OFF Lights reflect register settings (Actual state of the Relay)

Input ON/OFF Lights reflect register settings (Actual state of the Input)

Time-pair lights, Manual lights, Day-of-week lights, Even/Odd lights ONLY reflect intent, (for Actual relay & Input state refer to Relay ON/OFF and Input ON/OFF).

Going Live, the real thing

Miscellaneous

Requests for enhancements, option requests, comments and feedback in general can be sent to edm@adnc.com

Files created by RelayRUNNER

Your Time Schedule files (“____.run”) are saved wherever you choose

The Restart file is created in the root of your C drive (C:\RelayRUNNER_Restart.txt)

Log files are created by default in the root directory, however in the configuration; you may select any directory you wish.

No other files are created.

Run On Boot

If you have selected ‘Run On Boot / Always” or “Next Time” and it fails, then you can use an equivalent of “Run On Boot / Always”. To do this you must create a shortcut to RelayRunner in the Startup group of your start button.

Power Failures ATX

While we all hope to have clean dependable power, life is not always so accommodating. To this end, RelayRunner incorporates a “Resume” feature. Success with this feature is dependent on a variety of settings. Both in your BIOS and Windows. Unfortunately even the version of Windows plays a part here. First, if your motherboard supports ATX power features, in the BIOS you need to find the setting for what action to perform following power failure and power resumption. In recent Phoenix/Award Bios, under “Integrated Peripherals” group it is labeled “PWRON After PWR-FAIL”, options are “Former-STS”, “ON”, “OFF”. For RelayRUNNER, “FORMER-STS” is recommended. This will restart your computer ONLY if it was already on. Since there is a vast assortment of motherboards and bios that can be used with RelayRUNNER, we cannot address all situations. You will need to experiment until you have your machine booting when expected. Once Windows begins loading, RelayRUNNER has control.

Power Failures AT (Not ATX)

Generally no special setting are needed.

Testing “Auto Resume” with Windows NT, 2K and XP

If you wish to do some confidence testing with these versions of Windows, remember that pressing the switch of an ATX is not the same as un-plugging the power cord. If you use the power switch, usually mounted on the front of the cabinet, this can behave just as though you exited RelayRUNNER. This is not a power failure situation.

A word about various Interface cards (they are not created equal)

While most relay or A/D interface cards with switchable outputs can be adapted to a variety of similar uses it should be noted that OLDER interface cards are NOT as reliable as newer versions, even of the same card. Some Interface cards do not respond as fast to setting the registers as is needed for RelayRUNNER.

While these older cards can be used, you should not expect the accuracy from them that you would from a newer interface card. Some cards that have known problems are Advantech PCL-725 and Adlink ACL-7125. Samples of both these cards manufactured in 1995 will not perform at the same levels as Computer Boards PDSIO08, PDSIO16, Relay08 and Relay16, which were also manufactured in 1995.

Anomalies related to OLDER (slower) Interface Cards

Among the various things that may behave differently or with no apparent reason are things like, logging may show a relay on only when paired with an adjacent relay (on the same card) or a failure to reset on program exit or selecting New Time Schedule. As to the logging, the displayed state is correct.

General Information about Relay and A/D interface cards

The most common method of interfacing a microcomputer system, such as the PC, is through the use of programmable digital input and output registers. It is the purpose of RelayRUNNER to provide an easy way for you to control the input and output registers without needing to program.

With digital output registers, the computer can write data into the registers, treating the register as an I/O port. The output of these registers can then be wired to an interface device, such as a power-switching relay. Thus, by writing data to an output register, it would be possible to actuate and deactivate a relay. The relay could, in turn, control, for example, the power to a motor or a light or a solenoid, etc.

Digital input registers are similar but are used to sample the status of signals attached to their inputs. For example, if a program wants to determine if a switch is open or closed, the switch can be tied to the input of a digital input register. A digital input register can be thought of as an I/O port that has wires attached to individual bit locations. When read, the data results reflect the state of the signals on the wires.

Typically, the 8 on-board relays (or digital outputs) can serve as ON/OFF control devices or small (LOW) power switches. The Digital Input channels are ideal devices for collecting information about things that are OFF or ON.

NOTE: The pin-outs vary from one interface card to another, even if the plug or sockets “LOOK THE SAME”!

More variations of Interface cards (PCI and/or “PLUG & PLAY”)

With the advent of PCI and “Plug & Play” interface cards, some of the “OLD RELIABLES” are not so reliable any more. The long and short of this is that if the base address of your interface card is not “Hard Set” using dipswitch or jumper settings, then it is probably a “Plug & Play” interface card. Plug & play interface cards usually come packaged with an installation disk / program. Using this should show you the address that your interface is configured/installed at. The “Plug & Play” creates special considerations. These include the need to verify the address and reconfigure RelayRUNNER EACH TIME you add or change the interface cards installed in your computer. This is also necessary if your battery becomes completely discharged (runs-down).

A Word about System Capacities

RelayRUNNER is very demanding software. If you attempt to do too many things in addition to RelayRUNNER, it is very possible to hang your computer, resulting in having to reboot. It is reasonable to do several things at once but there is a limit. One way to test for this is to start RelayRUNNER, and one or two other programs. Then load a word or text processor, load a document (large), then make it less than full screen, then reposition the window from one spot to another RAPIDLY. If you can do this, fast enough to slow or stop the time update of seconds, then you are at risk of overloading your processor and experiencing a hung system. Otherwise you should be OK.

Frequently Asked Questions (FAQ) for RelayRUNNER (Software Only)

- Q. When setting colors, why does “Double-click” not work?
A. The active-x control for this does not support “Double-click” (aren’t you glad you asked?), We expect the control to be fixed soon and will incorporate it when available.
- Q. My friends monitor shows the colors different then mine, Why?
A. Each video card and monitor combination display colors just a bit different then any other combination. Just select colors that you like to work with or have a meaning to you.
- Q. The Icon looks really small, where is the rest of it?
A. Icons by their nature are small. Depending on how they were made or created by an “icon maker” they may or may not look like what you expected. Also, the box that icons are displayed in does not allow for variable size icons/pictures to be displayed. Only 32 x 32 pixels are shown.
- Q. Does the program timing stop when I am in the Configuration screen?
A. Yes, all timing is suspended until you exit the configuration screen.
- Q. Is there an “ALL STOP” function?
A. Yes, there are several ways to do this including the “Kill Button”, “Kill by Signal” as well as a menu option under “Tools” that will allow you to “Reset All Relays (with Pause)”, this will reset all relays and wait for your response to continue timings.
- Q. If I go on vacation, how can I check on my system?
A. Relay does not directly address this need, however you can use a remote access program such as “PC Anywhere”. Using this you should be able to check on your system as well as reconfigure your Timings from anywhere, Just as though you were sitting in front of your computer.
- Q. The relay group background colors change the icon background, why?
A. The Icons background was created as transparent meaning whatever color is behind it is the icons background color. If this is objectionable, use an icon with an opaque background.
- Q. I have 24 outputs on my card, can I run more than one copy of Relay?
A. No, however a version of relay is available that will run up to 32 outputs with 32 corresponding Inputs.
- Q. I got RelayRUNNER as shareware, Why should I pay you for RelayRUNNER?
A. Think about it. I have put many hours into creating RelayRunner and it will take more time to support and improve RelayRUNNER. If you don’t support it through payments, what motivation do I have to keep any of it available in the shareware arena? Also, the shareware version has several features limited. Everyone benefits if everyone shares. Also, if you read the license screen RelayRUNNER is released more as “Trial-Ware”, meaning try it, if you like it, support it by registering. Registered users have access to versions that will support up to 32 outputs and 32 inputs. The expanded Relay does require a high-resolution screen and video card as well as the interface cards. Registration also gets you the latest version with “Auto-Restart” feature.
- Q. Why are the fast timings (ES/OS) not quite right?
A. Timing accuracy is a direct function of your computers clock and windows internal event timer. If these have any deviations (and most do) then seconds will have a variance. Even/Odd Seconds are really more of a novelty than a useful tool. For most applications that RelayRUNNER will be used, seconds just do not matter.
- Q. Things don’t happen when I am in the Configuration Screen, Why?
A. Event checking is suspended while in the Configuration screen, after all if you are changing an address or configuration value, your card is probably not responding, or you just added a new card and have not started your control run yet.
(Note: When running a Time-Schedule, do not leave RelayRUNNER in the configuration screen)

- Q. There are more boards shown then I need. Can I give the next Board Panel the same address to get more ON/OFF time-pairs?
- A. This method is not recommended. However, it often will work when properly setup. To try doing so, use the same base address, and the same input address. **FOR THE SECOND BOARD PANEL, DO NOT** enter anything other than blank or 0 in the cntl address and cntl value fields. "Both Cards" will show the same relay state and input state and input counts.
- Q. My interface card or LPT card or FireCracker does not have any inputs, how can I use the counter?
- A. Simply use the Base Address as the Input Address also.
- Q. My interface card or LPT card or FireCracker does not have any inputs, how can I use the Kill Option?
- A. These cards do not support an input signal, therefore your only Kill option is the "Kill Button".
- Q. My board from Computer Boards came with a program called "CB Install", should I install it?
- A. RelayRUNNER does not need any software that did not come with it. RelayRUNNER interacts with the interface card directly, so you do not need to install anything else that came with your board. If you have some other reason to use them or CBW.DLL or "InstaCal", you can install them. They will not effect RelayRUNNER since it does not use them.
- Q. My Interface Card has switch settings for "Response Input Filter", Why should I set it or not?
- A. This is an interface card vendor specific option. You should contact the card vendor for information on using this feature. RelayRUNNER does not know about this filtering, however setting it or not may effect when an input signal is present.
- Q. I am using a "BoonDog" Interface card and I can't tell if anything works.
- A. There are several ways of looking at this question. If you bought the "BoonDog" kit already assembled, then the Led on the external card should be Green, if the card is correctly installed.
Once you are sure the card is correctly installed, the next question deals with the settings you have entered on the configuration screen. Dealing with only one board, i.e. the first set of 8 relays, if you toggle the "Manual" button by clicking on it, the ON/OFF status light will turn on and off in response, if your base address is correct. If they do not you can go to "Tools" menu and select "Emulation Mode (running with no boards)", then toggle the "Manual" Button. If the ON/OFF status light now turns on and off in response, then you can be certain that, you have not selected the correct "Base Address".
Note: Once you have selected "Emulation Mode" you will need to exit Relay and restart the program to begin looking for/at actual installed cards.
- Q. I Turned off the computer and installed the board. Does it work, how do I tell if it works? It just sits there and nothing happens.?
- A. Most vendors supply documentation with their products that cover selecting a base address, setting the card to that address and simple test to check it function. Once you have completed the installation and check of the card, the question moves to installing and configuring RelayRUNNER. Once the addresses and codes are entered in the Configuration screen, you can test the complete installation. If you are using a relay card (mechanical not solid-state), you will be able to hear the relays opening and closing when you toggle the manual and or Invert buttons. You can also turn them on using time-pairs and hear the relay. If you do not, then most likely the card is not at the address you entered in "Base Address". If you are using a solid-state card, then you will need to wire up a relay or what ever your design is with an indicator light or such. Then the manual and/or Invert buttons should cause your indicator to change state. If it does not, you have probably not entered the same base address as the card is set to. The input indicators can only be tested with an appropriate input signal. Do not worry about the inputs until you have the relays/outputs working correctly. We do offer pre-assembled kits comprised of internal card, short or long connecting cable, and remote-switched 120v module
- Q. My computer hangs-up or crashes occasionally, what going on?
- A. RelayRUNNER is very demanding software. If you attempt to do too many things in addition to RelayRUNNER, it is very possible to hang your computer, resulting in having to reboot. (this is less common with WinNT,2000 & XP) It is reasonable to do several things at once but there is a limit.

- Q. How can I determine if I am trying to run too many programs in addition to RelayRunner?
- A. One way to test for this is to start RelayRUNNER, and one or two other programs. Then load a word or text processor, load a document (large), then make it less than full screen, then reposition the window from one spot to another RAPIDLY. If you can do this fast enough to slow or stop the time update of seconds, then you are at risk of overloading your processor and experience system irregularities.

Direct Links to Vendors

PCI-PDSIO08 & PCI-PDSIO16 (PCI Bus)

Computer Boards

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=141&top_id=9&dept_name=Digital%20I/O

(1/2003)

Measurement and Computing

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=141&top_id=9&dept_name=Digital%20I/O

(1/2003)

CIO-PDSIO08 & CIO-PDSIO16 (ISA Bus)

Computer Boards

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=120&top_id=6&dept_name=Digital%20I/O

(1/2003)

Measurement and Computing

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=120&top_id=6&dept_name=Digital%20I/O

(1/2003)

CIO-Relay08 & CIO-Relay16 (ISA Bus)

Computer Boards

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=120&top_id=6&dept_name=Digital%20I/O

(1/2003)

Measurement and Computing

http://www.measurementcomputing.com/cbicatalog/directory.asp?dept_id=120&top_id=6&dept_name=Digital%20I/O

(1/2003)

Kit-74

Circuit Specialists, Inc. <http://www.web-tronics.com/pcprinporrel.html> (1/2003)

DIY Electronics (HK) Ltd <http://www.kitsrus.com> (1/2003)

8255 Interface

BoonDog www.boondog.com (1/2003)

X10-FireCracker

X10.com http://www.x10.com/products/firecracker_x10_tm751_br1ab.htm

This site changes frequently (1/2003)