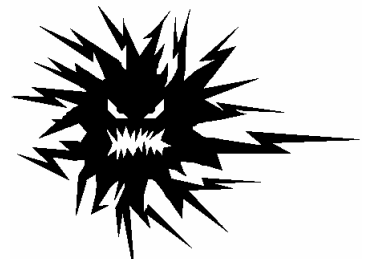


DEMO VERSION

Angry Spark Series

E-MATCH CONTROLLER SYSTEM

OWNER'S MANUAL
DEMO VERSION



NichroPulse LLC.

Important Safety Instructions

1. Read and keep these instructions.
2. Heed all warnings.
3. Follow all instructions.
4. Do not use this device near water.
5. Clean only with dry cloth.
6. Do not defeat any safety features incorporated into this device.
7. Remove batteries when storing for long periods of time.
8. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as liquid has been spilled or the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



**Always turn off key-switch
before removing the cover**

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Don't forget to visit our website at www.nichropulse.com for more information about this and other NichroPulse products.

Introduction

Congratulations on the purchase of your new Angry Spark initiation system. Please read this manual to familiarize yourself with the features of this product.

The Angry Spark series controllers are designed to provide reliable, efficient and flexible ignition of electric matches (e-matches) and igniters made with nickel-chromium bridge wire. The high output voltage is capable of overcoming long wire resistance and producing consistent, reliable electric match ignition with minimal battery usage.

The Angry Spark systems have two operation modes, allowing the user to manually arm and fire (push-to-fire) or set a timed initiation.

An LED display and crystal oscillator allows the timer to operate reliably and accurately in a wide temperature range.

An onboard beeper indicates when: seconds are passing, the system is in the ready mode and the system is firing.

The system's microprocessor gives the user control over the LED display and beeper.

Safety features include a key lock switch, a 10 second minimum set time, any-button abort, and an energy discharge circuit that disables the output at all times except when firing. Please see application note AN1001 on our website for more information on this systems safety features.

The Angry Spark series initiation systems come in durable enclosures, resistant to breaking, burning and of course, dropping.

Please write your serial number here for future reference (i.e., tech support, return authorization, etc.)

Purchased at:

Date of purchase:

FEATURES

- Up to 20 minutes of count down
- Push-to-Fire initiation mode
- Ignition over 500ft paired cable*
- Three AA Battery operation
- Bright 6-digit LED display
- Key-lock power switch
- Easy abort
- Hold feature
- Warning beeper
- Durable aluminum enclosure
- Banana and bare-wire output binding posts
- DC power jack
- Long battery life
- Small size
- -35°C to +85°C operation

* Using 40 AWG Nichrome bridge wire with Skylighter GN5051 Dip Kit pyrogen.

Getting Started

The following steps will help you set up your initiation system, and customize the system to your preferences.

1. BATTERY INSTALLATION:

- Turn off key-switch and remove the key.
- Remove the four screws on the top panel with a cross-tip screw driver. Be sure to use a proper fitting tip that will not strip out the screw heads.
- Slowly pull the top panel away from the enclosure and flip it out of the way. Be aware of electro-static discharge hazards and do not touch the circuit board or its components.
- Insert three AA 1.3V or 1.5V Alkaline, Ni-MH or Li batteries into the battery clips on the bottom of the enclosure.
- Make sure that the three PCB interface connectors P1, P2 and P3 are securely connected to the controller board. (see appendix B, page 11) P1= batteries, P2= output and P3= key switch. If the connectors are swapped, the system will not turn on, but no damage will be done to the system.
- Replace top panel and screws.

2. OUTPUT WIRE CONNECTION:



Always position the igniter and connect the output wire to the igniter BEFORE connecting to the Angry Spark system

Always use a long wire length (30ft or longer) to ensure your safety as well as others if the e-match fires while you are still holding the Angry Spark system.

The output binding posts accept striped bare wire or standard banana jack termination of the extension wire.


- If banana jacks are used, simply insert the banana jack into the end of the binding post.

- If bare-wire is used, strip extension wire insulation approximately ½ inch from the end, loosen the binding post to uncover the through-hole, insert the bare wire end into the through-hole and tighten the binding post back down.

3. TIMED INITIATION:

- Insert key into the key switch and turn 90° to the right.
- Set the timer minutes, and seconds to the desired count down time using the + and – scroll buttons for each set of digits. A minimum of 10 seconds is necessary to operate the system timer.

NOTE: Seconds will roll over at 59, and minutes at 20.

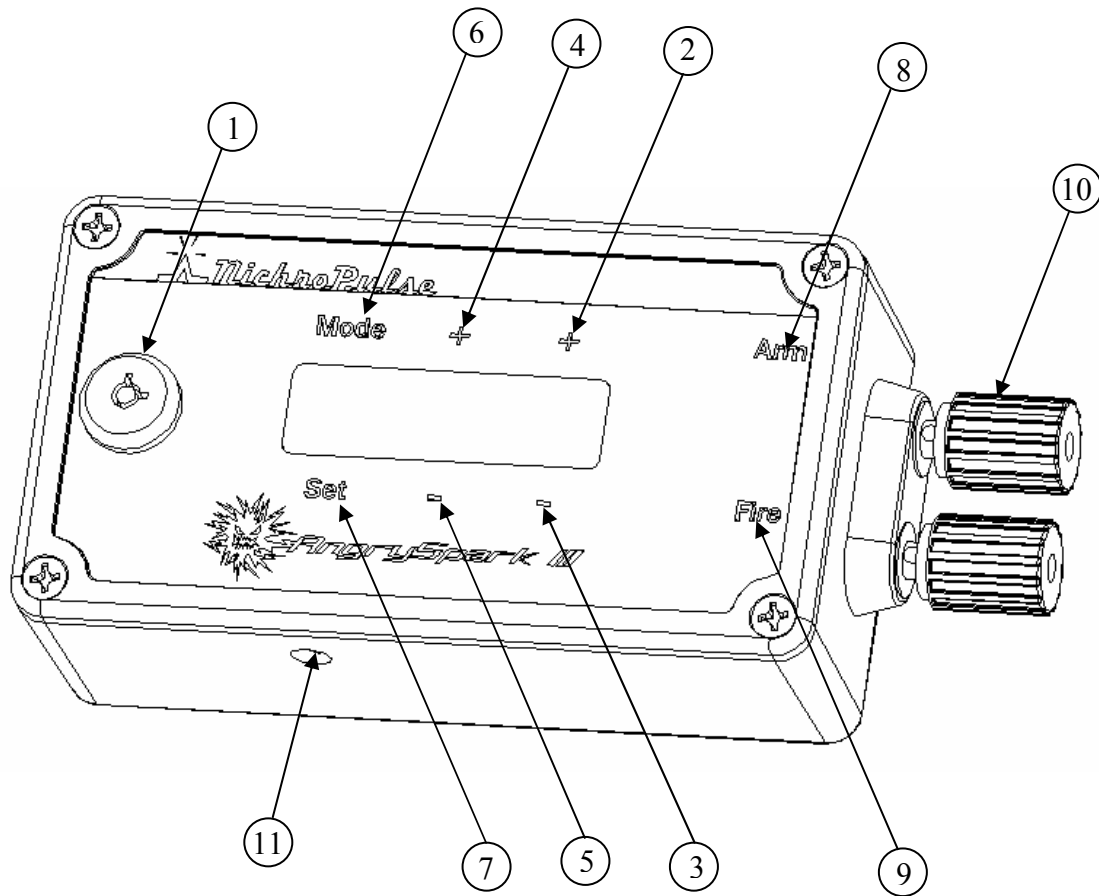
- Press and hold the ARM button for 5 seconds to begin the count down. The set clock time will flash and beep three times, indication the system is armed. After the count down has completed, the display will flash  and the beeper will beep solid for 2 seconds. After 2 seconds, the system will reset and display the previous time and will be ready for a new initiation sequence.
- If the MODE button is press while counting down, and the time left is greater than 10 seconds, the system will enter a Hold mode. In this mode, it will hold the time until the ARM button is held for 5 seconds, after which it will commence counting down.
- All other buttons or combination of buttons will abort and reset the timed initiation. If the MODE button is pressed with less than 10 seconds remaining, the system will also abort and reset.

4. MANUAL INITIATION (Push-to-Fire):

- Turn key switch to the ON position.
- Set the timer to zero.
- Press and hold the ARM button for 5 seconds.
The display will show **READY** when in the ready state, and the beeper will beep slowly.
- Press the FIRE button. In the FIRE state, the display will flash **FIRE** and the beeper will beep solid for 2 seconds. After 2 seconds, the system will be ready for a new initiation sequence.

NOTE: The system will not remain in the READY state for more than 30 seconds. After 30 seconds, the system will self discharge, reset and be awaiting input for a new initiation sequence.

Function Diagram



- 1: Main power key switch
- 2: Seconds scroll-up
- 3: Seconds scroll-down
- 4: Minutes scroll-up
- 5: Minutes scroll-down
- 6: Mode select
- 7: Mode set
- 8: Arm button
- 9: Fire button
- 10: Output jack posts
- 11: DC power input (3-5VDC)

Custom Settings


In order to conserve battery power during long timing sequences, the Angry Spark systems give the user control over the LED display and the count down beeper.

1. COUNT FLASH (CF):

CF MODES:

Off (default), Display on continuously during entire count down

On, Display briefly on for each second count, and continuously on during the last 10 seconds


- Press the mode button once.  will appear when the system is in CF Enable/Disable mode. Off is the default mode.
- Select which CF mode you prefer using the set button.
- Wait 2 seconds for the system to return to normal operation. Your settings are now in effect, and will be remembered even if power is removed.

2. COUNT BEEP (CB):

CB MODES:

On (default), beeps every second during entire count down, quickly during the last 10 seconds and on continuously when firing.

Off, beeps during the last 10 seconds and on continuously when firing.

- Press the mode button twice.  will appear when the system is in CB Enable/Disable mode. On is the default mode.
- Select which CB mode you prefer using the set button.
- Wait 2 seconds for the system to return to normal operation. Your settings are now in effect, and will be remembered even if power is removed.

NOTE: The display is default set to continuous on, and the beeper is default set to beep on each second count.

Precautions

Despite the safety features incorporated into the Angry Spark system, the user must also use common sense and adhere to other safe practices.

A FEW SPECIFIC PRECAUTIONS:

- Always use a long enough extension wire to keep yourself and the Angry Spark system out of harms way.
- Only arm the Angry Spark system when you are ready to fire. Treat the ARM button as if it were a FIRE button.
- Do not connect the Angry Spark system to an igniter or e-match any amount of time longer than is necessary.
- Keep the Angry Spark system away from moisture. Do not use it in the rain or snow. It is not waterproof.
- Do not touch the output connector when the system is armed or firing.
- Do not use the Angry Spark system around sensitive electronics.
- Never operate the system with the lid unsecured.

NOTE: The short duration of the pulse limits possibility of electrocution. Despite this, the output could potentially cause harmful muscle spasms especially in combination with moisture.

POWER REQUIREMENTS

BATTERIES

The Angry Spark system takes three AA batteries.

NOTE: If the batteries are installed backwards, internal circuitry will prevent damage and will not let the system turn on.

DC POWER JACK

The DC power jack is provided to operate the system when batteries are not available, or when batteries are only a backup. If the DC power jack is unplugged or fails during a countdown, the system will automatically resort to the batteries, and continue operation as normal. Use the DC power jack with a 300mA or greater step-down converter. The DC power jack accepts voltages from 3-5VDC. The center 1mm diameter pin is positive, and the outer negative terminal diameter of the jack is a standard 4.5mm. Converters for house-120V and automobile-12V can be purchased from our website: www.nichropulse.com

NOTE: If the DC jack is connected, any batteries installed will be switched out of the circuit. Applying voltages higher than 5VDC to the DC power jack will void the limited warranty, and will permanently damage the Angry Spark system.

MAINTENANCE

The Angry Spark system is designed to need very little maintenance.

Keep it clean and dry for maximum operation life. Occasionally check the battery clips for corrosion, and clean with cotton swabs and rubbing alcohol. Allow alcohol to dry before turning the system on.

Appendix A: Service Information

WARRANTY SERVICE

Details concerning Warranty Service are spelled out in the Warranty section on page 13.

If you think your system has a problem, please do everything you can to confirm it before emailing for service. Doing so might save you from the deprivation of your system.

NOTE: Removal and modification of circuit components on the PCB board will cause the Angry Spark system to fail as well as void its limited warranty.

TROUBLESHOOTING

System won't turn on

- Are GOOD batteries installed correctly?
Make sure that the batteries are charged and installed with the correct polarity
- Is the DC jack being used properly? Make sure that the center pin is positive, and not greater than 5VDC.
- Is the key switch turned 90° to the right?
- Are the PCB interface connectors secure and correct?

Make sure that the connectors P1, P2 and P3 are secure to the PCB. View CONNECTIONS Appendix B, page 11. Respective labels are printed on the PCB in white ink. P1=batteries, P2=output and P3=key switch. If the connectors are swapped, the system will not turn on, but no damage will be done.

If the system will not turn on after these checks, it will be necessary to have your system serviced. *There are no user serviceable parts on the PCB.* Refer to

“Repair” on this page to find out how to proceed.







System turns on, but LED display turns off and on during count down

- Set the count flash display CF to the required mode. This process is described in CUSTOM SETTINGS on page 8.

System takes a while to charge and displays in push-to-fire mode

- Batteries are low, replace batteries

System will not fire in timed initiation mode

- Disconnect any load from the output and place the system in manual arm mode. If the system takes more than 8 seconds to charge and displays      , replace the batteries.
- Make sure connector P2 is plugged in properly to the PCB. View CONNECTION Appendix B.

System will not enter push-to-fire mode

- Set clock to zero, hold ARM button for 5 seconds.

System resets after arm button is held for 5 seconds

- The ARM button must be released within 1.3 seconds after the armed mode has been entered, or the system will detect the ARM button as an abort command.

All other problems

- Other problems with your system will require servicing by our authorized service center.

REPAIR

Service for Angry Spark systems is available at the factory-authorized service center. If your system needs service, follow these instructions:

1. Review the preceding troubleshooting suggestions. Please.
2. Email Support at support@nichropulse.com, and explain the problem and request a Return Materials Authorization Number (RMA#). You must include your name, place of purchase and serial number in the email. You must have an RMA# before you can obtain warranty service.
3. Keep this owner's manual and any accessories purchased. We don't need them to repair the system.
4. Pack the system in its original packaging and box. This is VERY IMPORTANT. Angry Spark is not responsible for any damage that occurs due to non-factory packaging.
5. Include a legible note stating your name, shipping address (no P.O. boxes), daytime phone number, RMA#, and a detailed

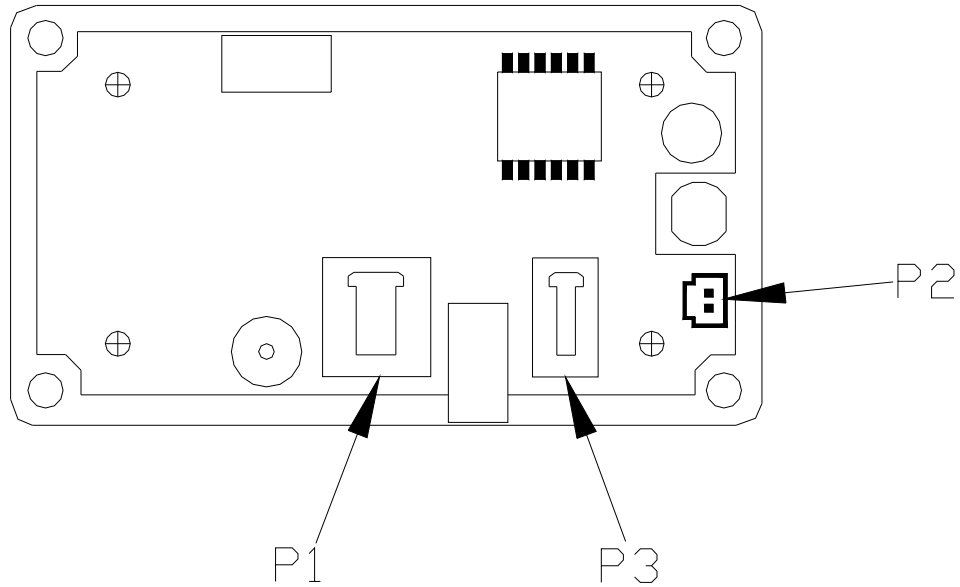
description of the problem, including how we can duplicate it.

6. Write the RMA# in BIG PRINT on top of the box, or on paperwork inside. Units sent without the RMA# will be refused.
7. Tech Support will tell you where to ship the system for repair. We suggest insurance for all forms of cartage.
8. You will need to contact the authorized service center for their latest turn-around times. Once it's repaired, the authorized service center will ship it back by ground shipping, pre-paid (if it was a warranty repair).

Note: Under the terms of the warranty, you must ship or drop-off the unit to an authorized service center. The return ground shipment is covered for those units deemed by us to be under warranty.

Note: You must have a sales receipt from an authorized Angry Spark dealer for your unit to be considered for warranty repair.

Appendix B: Connections



P1: Battery Connector

P2: Output Connector

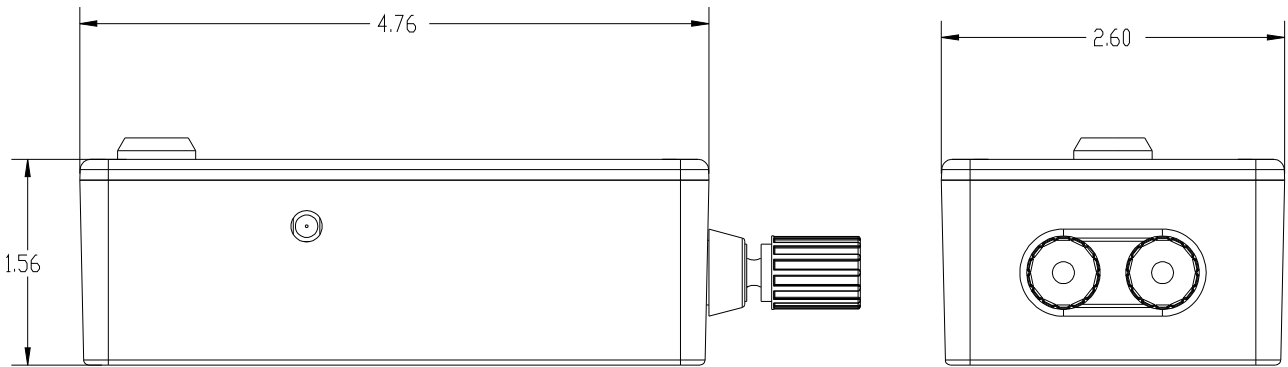
P3: Key Switch Connector

Appendix C: Technical Info

Specifications

- Maximum Timed Initiation Sequence.....20min
- Minimum Timed Initiation Sequence..... 10s
- Maximum Output Voltage.....60V
- Maximum Output Pulse Energy.....0.713J
- Minimum Output Pulse Energy.....0.514J
- Battery life (Display Count Flash off).....Awaiting tests
- Battery life (Display Count Flash on).....Awaiting tests
- DC Jack Input Voltage..... 3-5 VDC
- DC Jack Input Current..... 300mA

Dimensions



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Angry Spark Series Limited Warranty

PLEASE KEEP YOUR SALES RECEIPT IN A SAFE PLACE

A. NichroPulse LLC warrants all materials, workmanship and proper operation of this product for a period of **one year** from the original date of purchase. If any defects are found in the materials or workmanship or if the product fails to function properly during the applicable warranty period, NichroPulse, at its option, will repair or replace the product. **This warranty applies only to equipment sold and delivered within the U.S. by NichroPulse or its authorized dealers.**

B. Failure to register online or return the product registration card will not void the one-year warranty.

C. Service and repairs of NichroPulse products are to be performed **only** at a factory-authorized facility (see D below). Unauthorized service, repairs, or modification will void this warranty. To obtain repairs under warranty, you must have a copy of your sales receipt from the authorized NichroPulse dealer where you purchased the product. It is necessary to establish the purchase date and determine whether your NichroPulse product is within the warranty period.

D. To obtain factory-authorized service:

1. Email NichroPulse Technical Support at support@nichropulse.com to get a Service Request Number. Products returned without a Service Request Number will be refused.

2. Pack the product in its original shipping carton. Also include a note explaining exactly how to duplicate the problem, a copy of the sales receipt with price and date showing, and your return street address (no P.O. boxes or route numbers, please!). If we cannot duplicate the problem or establish the starting date of your Limited Warranty, we may, at our option, charge for service time.

3. Ship the product in its original shipping carton, **freight prepaid** to the authorized service center. The address of your closest authorized service center will be given to you by Technical Support, or from our website.

IMPORTANT: Make sure that the Service Request Number is plainly written on the shipping carton. No receipt, no warranty service.

E. NichroPulse reserves the right to inspect any products that may be the subject of any warranty claims before repair or replacement is carried out. NichroPulse may, at our option, require proof of the original date of purchase in the form of a dated copy of the original dealer's invoice or sales receipt. Final determination of warranty coverage lies solely with NichroPulse.

F. Any products returned to one of the NichroPulse factory-authorized service centers, and deemed eligible for repair or replacement under the terms of this warranty will be repaired or replaced within thirty days of receipt. NichroPulse and its authorized service centers may use refurbished parts for repair or replacement of any product. Products returned to NichroPulse that do not meet the terms of this Warranty will not be repaired unless payment is received for labor, materials, return freight, and insurance. Products repaired under warranty will be returned freight prepaid by NichroPulse to any location within the boundaries of the USA.

G. NichroPulse warrants all repairs performed for 365 days or for the remainder of the warranty period. This warranty does not extend to damage resulting from improper installation, misuse, neglect or abuse, or to exterior appearance. This warranty is recognized only if the inspection seals and serial number on the unit have not been defaced or removed.

H. NichroPulse assumes no responsibility for the quality or timeliness of repairs performed by an authorized service center.

I. This warranty is extended to the original purchaser and to anyone who may subsequently purchase this product within the applicable warranty period. A copy of the original sales receipt is required to obtain warranty repairs.

J. This is your sole warranty. NichroPulse does not authorize any third party, including any dealer or sales representative, to assume any liability on behalf of NichroPulse or to make any warranty for NichroPulse LLC.

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DEMO VERSION

NichroPulse LLC

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