Multifunction Timer/Counter
User's Manual

Lafayette Instrument®

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Description

The Multifunction Timer/Counter Model 54035A is designed to time and count events with high accuracy and high resolution. It features millisecond timing up to 1000 seconds and counting up to 1000 counts. It can take the place of Lafayette's Stop Clock Model 54030 and Clock/Counter Model 54035 while improving on the functions of both. It can be set to acquire time and counts simultaneously on three separate channels or can record up to four split times on a single channel. Time and count data are displayed on a high-contrast back-lit display. Data can also be transferred to a computer via a standard serial port interface. The Multifunction Timer/Counter Model 54035A provides a row of (12) terminal blocks for easy connection to external devices. An optional banana plug interface is also available for connection using standard banana plugs. All timing functions are activated by external switch closures with built in capability to interface to normally open or normally closed switches. Timing functions are also available via front panel controls so that any function previously performed with a Lafayette's Stop Clock Model 54030 or Clock/Counter Model 54035 can be duplicated by the new Multifunction Timer/Counter Model 54035A.

Specifications

Power	12VDC wall mount transformer or battery power (4) "C" cells
Range	0 - 1000 seconds with millisecond resolution. (0 - 1000 counts)
Accuracy	0.005% +/- 1millisecond
Max count rate	40Hz
Battery life	approx. 30 hours
Serial communication protocol	4800 baud, no parity, 8 bit ASCII, 1 stop

Definition of Terms

For the purposes of understanding procedures and explanations in the manual it is important to recognize the differences in the following terms:

Timing: The timer is accumulating time in milliseconds after the start button is pressed. Timing will continue until a stop button is pressed.

Running: The timer is accumulating the total time in milliseconds that a button or external event is activated. Running will continue until the button or external event is released.

Counting: The timer is accumulating the total number of times a button or external event is activated. The timer will simultaneously accumulate running and counting of buttons or external events.

Timer Modes

The Multifunction Timer/Counter Model 54035A uses two separate timer modes. One is a single timer mode and the other is a multiple timer mode. The mode is selectable by pressing the mode button on the front panel or via instructions on the serial communication port (see *Communications* directions, pg. 9, for details). In order to enter the mode menu, the timer must be reset.

Single Mode

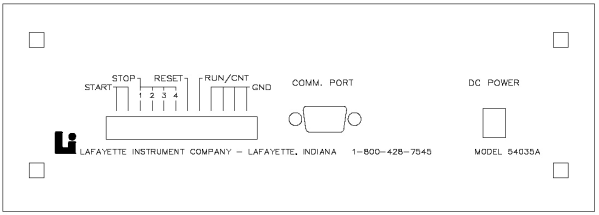
The single timer mode consists of a single master timer that can be programmed for up to four split times. The stop number (1-4) is reported on the display when a stop is pressed. Once the start button is pressed, each stop button can only be pressed once until all split times have been recorded. After the final stop, the start button can be pressed again, but the final split time will be overwritten by the new time. After a restart, any stop button can be used to stop the timer and the stop number will be updated as the new time is recorded.

Multiple Mode

The multiple timer mode consists of a single master timer and two independent run/count inputs that can time and count external events simultaneously. In multiple timer mode, the *stop1* and *stop2* inputs on the back panel become the *run1* and *run2* inputs. The *stop1* input on the front panel becomes the scroll control button. The scroll is only active in multiple timer mode. The *start* button can be used in multiple timer mode to start the master timer only. Any available stop button can be used to stop the master timer, but there is no stop identification number displayed in multiple timer mode. *Run1* and *Run2* inputs can not be activated with the start button, they are strictly run/count inputs.

Front Panel Controls

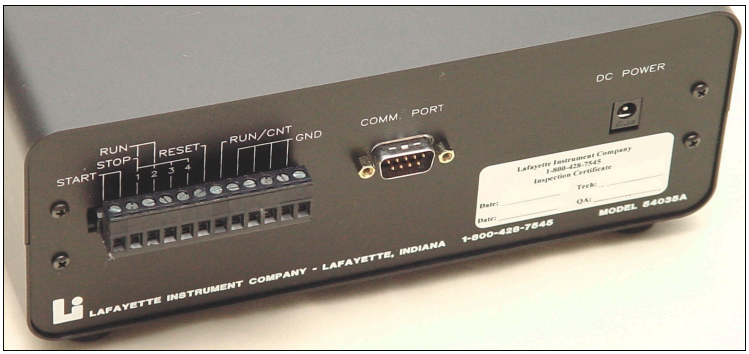
1. **Power switch:** Turns on the timer. When in the on position, the display backlight will come on and the company, model identification, and version number will appear on the display for four seconds.
2. **Start:** Starts timing in both single and multiple timer mode. Can also be used to restart the timer after the last split time has ended in single timer mode.
3. **Stop 1-4:** Stops timing in all modes. In single timer mode, the stop button pushed will be identified on the display. If split times are being used, a stop button can only be pressed once per time cycle. This is to prevent loss of split time data. Once the final split time is recorded (master time stopped), then the start button can be used to restart the timer and any stop can be used any number of times. The split times will remain on the screen with only the final time being updated.
4. **Scroll:** Active in multiple timer mode only. It will shift the display from showing the *master time* and *run/count1* to showing *run/count2*. Also note that since scroll is enabled, the *stop1* button on the front panel can not be used to stop the master timer in multiple timer mode.
5. **Mode:** Sets up the timer for single timer operation or multiple timer operation. To prevent accidental loss of data, the timer must be reset before the mode menu can be entered. If single timer operation is selected, the timer will give a prompt for the desired number of split times. This prompt will be skipped if multiple timer operation is selected because split timing is not available in multiple timer mode. The timer will also configure the back panel inputs to sense normally open (NO) or normally closed (NC) switches. The menu will step through all seven inputs, but can be ended at any time by selecting *end* from the menu. All back panel inputs default to normally open when the timer is turned on. However, the inputs are not reset to default when changing modes. Also note that when in multiple timer mode, the settings for *stop1* and *stop2*, become *run1* and *run2*.
6. **Reset:** Clears all time registers to zero and sets display to its initial state. To prevent accidental loss of data, the master timer must be stopped before a reset can occur. If the timer is timing, the reset button will function as *stop3*.
7. **Run/Cnt:** Activates running for as long as the button is held down. Also increments counter by one for each time the button is pushed. This button can be used in either mode to run the master timer and accumulate counts. If the master timer is timing (start button pushed) then the *run/count* on the front panel will function as *stop4*. After a stop button is pushed, the timer can not run or count until reset is pressed. However, the timer can be started at any time even if run times or counts have been accumulated.



Back Panel Controls

Back panel functions are activated by opening or closing external switches. All inputs are independently programmable from the mode menu to sense a normally open (NO) or normally closed (NC) switch. In all cases, one side of the switch is tied to the appropriate input and the other side is tied to one of the four ground inputs. Any switch can use any of the ground inputs and any ground input can be tied to more than one switch. Do not apply voltage to any input. Doing so may damage the equipment and void the warranty.

1. **Start:** Starts timing in both modes. The two start inputs provided are tied together so that multiple timers can be linked together with a common start signal.
2. **Stop1/Run1:** In single timer mode, this input is for stop1, in multiple timer mode, it is for run/count1. This external input is the only way to activate run1/count1.
3. **Stop2/Run2:** In single timer mode, this input is for stop2, in multiple timer mode, it is for run/count2. This external input is the only way to activate run/count2.
4. **Stop3:** Stops the timer in any mode. Designated as Stop3 when in single timer mode and as a generic stop when in multiple timer mode.
5. **Stop4:** Stops the timer in any mode. Designated as Stop4 when in single timer mode and as a generic stop when in multiple timer mode.
6. **Reset:** Clears all time registers to zero and resets the display to its initial state. To prevent accidental loss of data, the master timer must be stopped before a reset can occur.
7. **Run/Cnt:** Will simultaneously track how long an external button (or input) is held down and how many times the button has been pressed. This input can also be used to count events while the timer is timing. Note that in single timer mode, the counter can not be used if more than two split times are selected. Also note that no counts can be accumulated after the timer has stopped. In multiple mode, this input controls the main timer and counter.



Other Features

1. **Battery Saver:** If batteries are being used to power the 54035A, the battery saver mode will be enabled. The battery saver mode will turn off the LCD backlight if there is no activity on the timer for 30 seconds. Any button press or external input activity will turn the light back on. The front panel buttons will turn the light on without performing the actual function of the button. The external inputs or serial commands will perform the designated function in addition to turning on the backlight. Plugging in the DC power supply will automatically disable the battery saver feature.
2. **Low Battery Detect:** If the 54035A is operated on the batteries for an extended period on time, they will eventually become too weak to provide the necessary power to the timer. When this happens, the timer will turn off the backlight to reserve the remaining power. It will also display the message "low batt" on the display (this message is not displayed in multiple timer mode, so check the status in single timer mode if the light goes off and battery saver mode is not active). The timer will function normally in "low batt" mode until the batteries are completely dead. The only problem with operation on low batteries is that the display contrast will become poor (see the section on changing the contrast to improve this situation). The timer will continue to function for several hours with low batteries, giving ample time to finish timing tasks or testing procedures and change the batteries.
3. **Computer Interface:** The 54035A can connect to a computer's serial port via a standard nine pin cable. This allows computer control of the timer and allows the computer to upload time and count data for display and storage. Refer to the section on Communications for serial protocols and command codes.

Special Operations

1. **Changing the Batteries:** Access to the batteries is provided on the bottom of the 54035A. Using a screwdriver or coin, turn each of the thumbscrews and remove the battery cover plate. The batteries are provided with two ribbon loops to aid in removal. When inserting the batteries, place each pair of side by side batteries through a loop and insert. Each ribbon should then be under a pair of batteries. Failure to use the ribbon may result in difficulty in removing the batteries (ie. they will have to be pried out). Also note each battery polarity as imprinted on each battery holder. Replace cover after batteries are in place and turn the thumbscrews down to secure the cover.
2. **Selecting NO/NC switch type:** When in the mode menu, the timer will prompt the user to configure each input on the back panel as Normally Open (NO) or Normally Closed (NC). Normally open can be thought as a "Press to Activate" setting and normally closed can be thought as a "Release to Activate" setting. A majority of all applications and switches will be normally open. This is the default setting on all external inputs. Unless it is known for sure that an application calls for a normally closed switch, the settings will probably not need to be reset. If a switch is set up wrong, unexpected results may occur. If more than one switch is set up wrong, the timer may go into a state where it times at random and the controls become ineffective. In this case, the only solution is to turn the timer off and redo the setup.
3. **Contrast Adjust:** As the batteries on the 54035A become weak, the numbers on the display will become noticeably dim. This will occur to some degree even before the low battery message is displayed. If this condition becomes a problem, the user can adjust the contrast on the display. The contrast is adjusted by removing the battery door and turning the small white dial located just above the batteries with a small screwdriver. The dial will only need to be turned a very small amount in the counterclockwise direction. Note that when fresh batteries are inserted or the DC power is plugged in, the display will have too much contrast (the background will turn dark) and will have to be adjusted in the clockwise direction.

Optional Accessories

The 54035A currently has two accessory items that may be useful in some applications
Banana Plug Interface: Provides a way to connect standard banana plugs to the external input terminal blocks.

Timer Control Software: Provides a software program to control the timing and counting functions of the timer via the computer. Also provides data storage capability so that timing data can be stored in a file and analyzed at a later date.

Contact Lafayette Instrument about pricing and availability of these products.

Communications

The 54035A provides a communications port so that it can be connected through a computer via a standard serial port. The main purpose of this function is to provide a way to get the data collected by the timer into the computer for storage and analysis. An effort was made to keep the communication protocol and commands simple enough so that the user could easily write their own timer control application. In the event that resources are unavailable for writing applications, a ready made software program is available from Lafayette Instrument. The serial port on the computer should be set as shown below:

Serial communication protocol: 4800 baud, no parity, 8 bit ASCII, 1 stop bit or (4800,N,8,1).

The 54035A sends and receives only ASCII characters. Each control is activated by sending a single ASCII character (the timer is case sensitive):

ASCII	Function
S	- Start
1	- Stop1
2	- Stop2
3	- Stop3
4	- Stop4
C	- Begin run/count
E	- End run/count
M	- Mode
R	- Reset
D	- Upload data

When the "Upload Data" command is issued, the timer will respond by sending all time and count data (even if it is zero). The data is sent as seven ASCII bytes per data value in this order: Count1, Time1, Time2, Time3, Time4, Count2, Count3. The serial buffer, therefore, should be set up to receive 49 bytes with the length set to 7. Once the data is received, it can be broken up into its seven character data sets.

If the mode menu is accessed via the serial port, the computer will need to send, in succession, the same ASCII value as the number requested on the timer display (if the choice is "1-single 2-multiple" send a "1" or a "2" and so on).

The data sent to computer is the same as displayed on the timer. For example, if stop1 is pressed on the front panel, that data will be placed in time1 on the serial communication. In multiple timer mode, the master time data will be placed in time1 no matter which stop is pressed. Likewise, the count data will be placed in count1, the data for run1 will be placed in time2 and count 2, and the data for run2 will be placed in time3 and count3. There will be no count2 or count3 data available in single timer mode. Also, run1 and run2 are not accessible through the computer, only through the back panel. However, the data for these inputs can be uploaded to the computer.

Timer Control Software Model 54035A-SF

The Multi-Function Timer/Counter is available with software that can be used to control the timer and collect and store data. The software interfaces to the timer via a standard serial connection. The software is built to send and receive data from the timer; no timing functions can be performed by the software itself. The software features a display that will show all time and count data gathered by the 54035A. It also has control buttons that mirror the buttons on the timer itself. In general, the software is designed to function exactly as the front panel control of the 54035A with the exception of it's data storage capabilities.

Installation

** Windows 95 or higher is required to run the 54035A software.

1. Insert Installation disk 1 into the A: floppy disk drive.
2. Go to "Start">>Run and type A:\setup.exe
3. Insert disk 2 into the A: disk drive when prompted.
4. Select a destination directory and click the computer icon to proceed with the installation.
5. Insert disk 3 into the A: disk drive when prompted.
6. To start the program, run 54035a.exe.

Software Functions

Comm port selection
On startup, the software will ask the user to designate which comm port to use with the 54035A. The selection will default to comm 2 as most computers use a mouse on comm 1. Selecting the comm port in use by the mouse will result in an error and/or disabling of the mouse. If the mouse is disabled, the computer will have to be restarted to restore function.

Timing functions
1. **Start:** Starts the timer.
2. **Stop1:** Stops the timer, records split time 1 and updates the screen.
3. **Stop2:** Stops the timer, records split time 2 and updates the screen.
4. **Stop3:** Stops the timer, records split time 3 and updates the screen.
5. **Stop4:** Stops the timer, records split time 4 and updates the screen.
6. **Reset:** Clears the display, and sets all time and count data to zero. Reset can not be executed while the timer is timing.
7. **Mode:** Enters the Mode menu on the timer and in the software. If the mode menu in entered from the software, all settings should be set changed from the software. If settings are entered manually on the timer while the mode menu is active on the software, errors in the settings may occur. The mode menu can not be entered unless the timer has been reset.
8. **Update Data:** Transfers all time and count data from the 54035A to the computer screen. This is used when the times are collected with the timer controls and the software is only used to display or store the data.
9. **Select File:** Allows the user to designate a file to store data gathered from the 54035A. All files are opened as "Append", so files may be opened multiple times without data being overwritten. Data from new trials is added to the preexisting data. After the file is selected, the user will be prompted to enter a subject name or trial description. This entry will be used to identify results in the storage file.

10. **Change Subject:** This button allows the user to perform multiple tests in the same storage file. The test data for each new subject is kept in a separate table inside the same storage file. The subject entry is used to identify each data table. This feature is useful for running multiple subjects on the same test.
11. **Save Data:** This button stores the time and count data on the screen into the file designated by the user. The user must designate a file and subject before data can be stored.
12. **Auto Store Data:** This selection will automatically store the present time and count data anytime the following buttons are pressed: Stop1, Stop2, Stop3, Stop4, Reset, and Update data. To activate this function, click the check box under the "Save Data" button. When the box is checked, the auto store function is in effect. Upon checking the box, the software will prompt the user to designate a storage file and subject name.

Notes

- If the timer is set to Multiple timer mode, all four stops will record on split time 1.
- If the computer is used to start and stop events, there will be a slight delay (a few milliseconds) between the pressing of the button, and the execution of the event on the LCD screen of the 54035A. This delay may or may not be noticeable to the user. It is due to the serial communication timing and can not be improved. For the most accurate timing results, start and stop the timer from the front or back panel on the 54035A and use the computer to upload the time data.

Results File Format

All time and count data is stored in an ASCII format. Any program capable of reading this format can be used to view the data (Excel, Notepad, Word etc.). Please note that if the 54035A software has opened a file, it may not be possible to view the file until the 54035A software is exited. Each set of data in the file has a header that includes the subject name and the time and date the file was created. Each time a "Save data" command or auto store command is given, a line is entered in the results table showing the time and count data present on the 54035A at the time of the command. An event column shows which command in the software triggered each line of data to be stored. A separate table is given for each different subject inside the storage file.

Applications

Directions in this section (next seven pages) detail setup procedures for interfacing the Multifunction Timer/Counter to specific Lafayette Instrument equipment. If the equipment being used does not appear on this list, contact Lafayette Instrument for application instructions.

Setting the Timer to Multiple time mode

Many applications in this section require the timer to be set up in "multiple" timer mode. To do this setup, simply press the mode button and select "2-multiple" by pressing "2". Make sure that the timer is stopped and reset before attempting to enter the mode menu. The mode menu will then prompt to set the switch types. Unless the application calls for normally closed switches, exit this portion of the menu by pressing "3" for "end".

Photoelectric Rotary Pursuit Model 30014

To set up the Photoelectric Rotary Pursuit, a single 54035A Multifunction Timer/Counter is needed.

1. Set the 54035A to "multiple" mode.
2. Connect the "RUN/CNT" input on the rear of the timer to the target time "ON" input on the front of the rotary pursuit.
3. Connect the "RUN1" input on the timer to target time "OFF" on the rotary pursuit.
4. Connect the target time "COM" to any "GND" input on the rear of the timer.
5. Connect the revolution counter red binding post to "RUN2" on the timer and the black binding post to any "GND" input on the timer.

The 54035A will display the time on target on the main timer, time off target on timer 1 and the revolution count on timer 2 (press scroll in multiple timer mode to view timer 2 data). If the rotary pursuit is being run in internal mode, the time off target will begin running immediately. To start a trial, press the reset button on the timer.

To run in external mode, connect a Lafayette Instrument 51013 Repeat Cycle Timer to the four pin plug on the front of the rotary pursuit (using Model 30107 connection cable).

1. Connect pins 1 and 3 (green and red) of the rotary pursuit to "C" (common connection) on the repeat cycle timer.
2. Connect pins 2 and 4 (white and black) to a "NO" contact on the repeat cycle timer.

Note: that the wiring diagram shows individual wires while actual patch cords may be grouped in pairs.

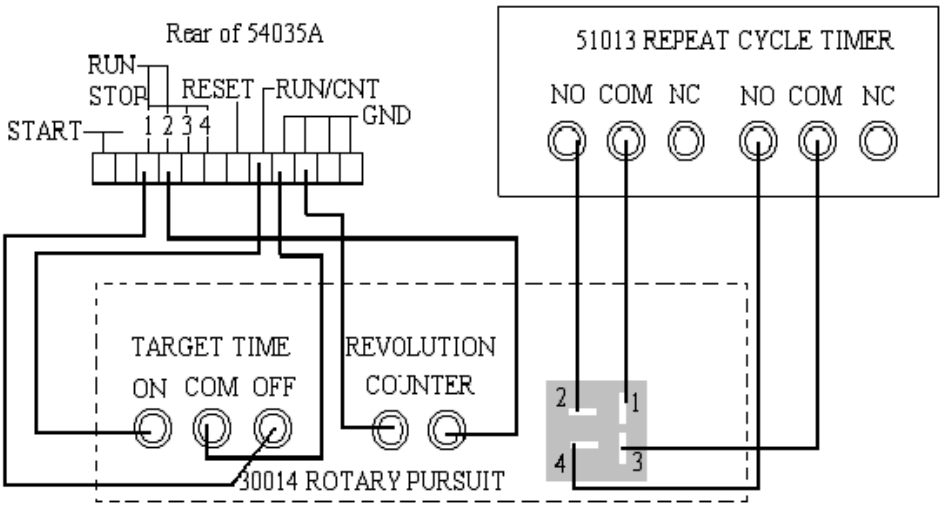


Figure 1: 54035A/30014/51013 hookup diagram.

Stability Platform Models 16020, 16124

To operate the Stability Platform, a single 54035A Multifunction Timer/Counter is needed.

1. Set the 54035A to "multiple" mode.

   Using patch cords, connect each pair of binding posts on the Stability Platform to an input and ground on the 54035A.
2. Connect the "center" binding post to the RUN/CNT input
3. Connect the "right" binding post to RUN1 input.
4. Connect the "left" binding post to the RUN2 input.

Remember that RUN2 data can be viewed by pressing the SCROLL button in multiple timer mode. The 54035A will show both time and counts for each zone on the stability platform. To start a trial press the RESET button on the 54035A.

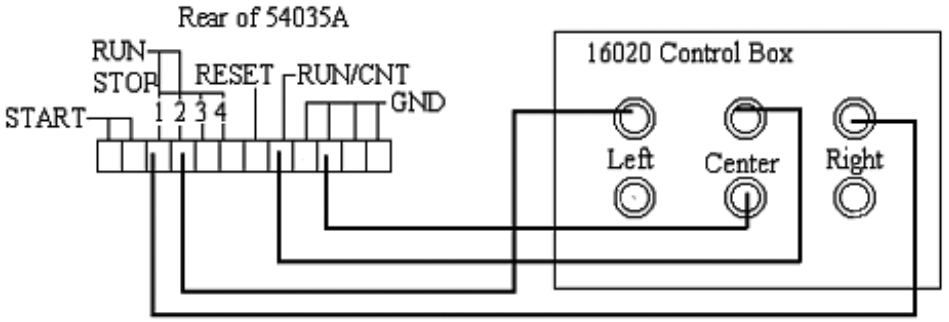


Figure 2: 54035A/16124 connection diagram

Stability Platform Model 16125

To operate the Stability Platform, a single 54035A Multifunction Timer/Counter is needed.

1. Set the 54035A to "multiple" mode.

   Using patch cords, connect each pair of binding posts on the Stability Platform to an input and ground on the 54035A.
2. Connect the "center" binding post to the RUN/CNT input
3. Connect the "right" binding post to RUN1 input.
4. Connect the "left" binding post to the RUN2 input.

Remember that RUN2 data can be viewed by pressing the SCROLL button in multiple timer mode. The 54035A will show both time and counts for each zone on the stability platform. To start a trial press the RESET button on the 54035A.

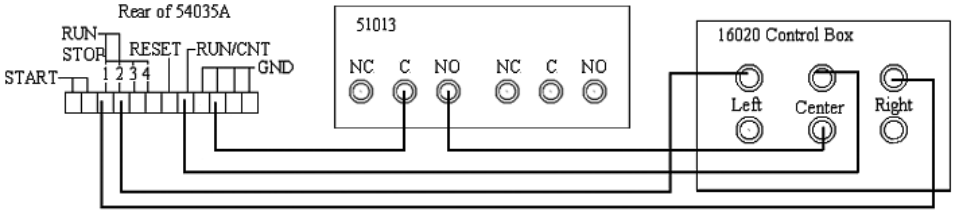


Figure 3: 54035A/16125 connection diagram

Automatic Tally Maze Model 20017

To operate the Auto Tally maze, a single 54035A Multifunction Timer/Counter is needed.

1. Set the 54035A to "multiple" timer mode.
2. Connect the start jack from the maze to the START input on the Multifunction Timer/Counter.
3. Connect the stop jack from the maze to STOP3 on the timer.
4. Connect the error jack on the maze to RUN1 on the timer.
5. Connect the stylus from the maze to any of the GND inputs on the timer.

With this setup, the main timer on the display will show the total time taken to complete the test, and timer1 will show both the total number of errors and the total time in the error zones.

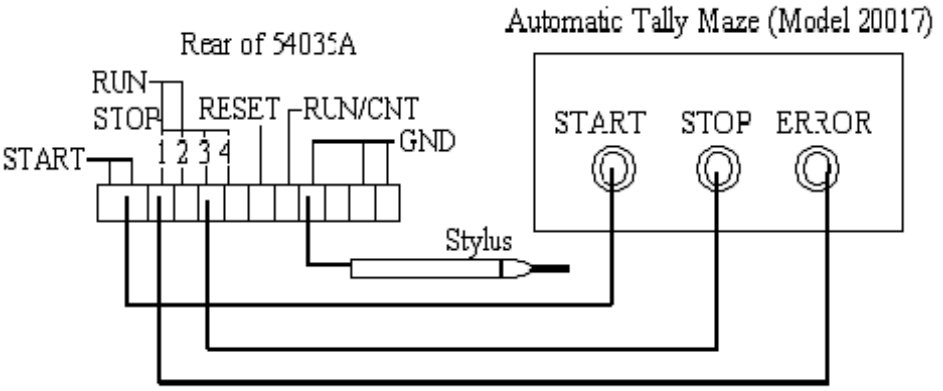


Figure 4: 54035A/20017 Connection diagram

Split Timing with Infrared Switches Model 63501IR

The 54035A Multifunction Timer/Counter can be used in many applications where split timing is required (i.e. track and field events). To set the 54035A for split timing, press the MODE button and select "1-single". The menu will ask for the desired number of split times (up to four). The menu will then ask to select either normally open (NO) or normally closed (NC) switch types. Since the infrared switches will be used, all switch types should be set to NO (this is the default setting for the switch types, so press "3-end" to skip the setup if no changes have been made).

To set up the switches

1. Set the 54035A to "single" mode with the desired number of split times.
2. Connect the red binding post of each switch to a stop input on the rear of the 54035A.
3. Connect the black binding post of each switch to the one of the four GND inputs on the rear of the 54035A.

To start an event, a remote pushbutton can be connected to the START input on the rear of the 54035A, or a trial can begin by pressing the START button on the front panel. The infrared switches should be positioned as desired to record events. The 54035A will automatically show the order in which the switches are triggered.

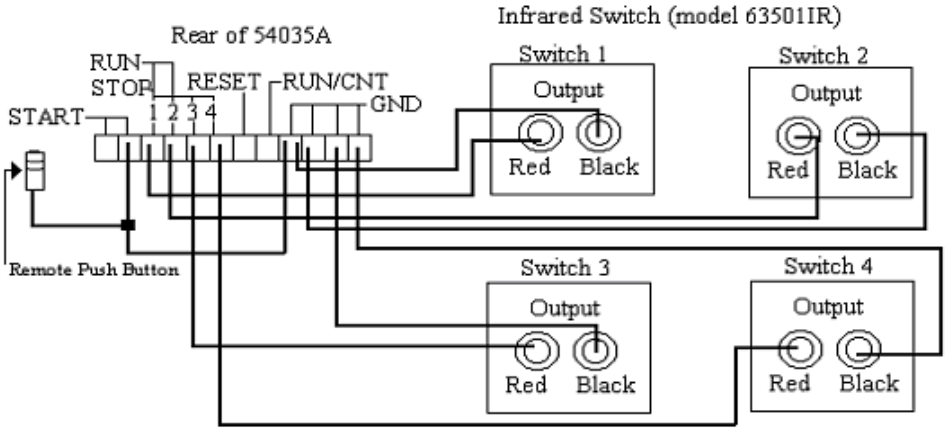


Figure 5: 63501IR/54035A Connection Diagram

Using the Timer for Over Four Split Times

If more than four split times are desired, a second 54035A can be added to the setup. Use the second START input on the first timer to connect to a START input on the second timer. Also be sure to connect one GND input from the first timer to a GND input on the second timer. Setup the second timer as the first with switches connected to the appropriate STOP and GND inputs. A single start button can then start both timers with each stop showing total elapsed time from the initial start. Any number of clocks can be added in this way as long as there is a common start signal and a common GND connection between all of the different clocks.

Standard Rotary Pursuit Model 30010A

The Standard Rotary Pursuit interfaces to the 54035A via the pair of binding posts marked "EXT. ON-TARGET TIMER". The red binding post should be connected to the RUN/CNT input on the 54035A and the black binding post should be connected to any of the GND inputs. When connected, the 54035A will show the time on target over the length of a trial. Since the 54035A also counts the switch closure, it will also show total number of times on target. Note that there will be a slight variance between the 54035A and the built-in 30010A timer due to the different resolutions of the timers. The 54035A can be set to either single or multiple timer mode for this test.

Steadiness Testers, Groove and Hole Types Models 32010, 32011

Both types of steadiness testers can connect to the 54035A via the RUN/CNT input. Each tester has a binding post on the apparatus. This binding post should be connected to any GND input on the 54035A. The stylus for the device should be connected to the RUN/CNT input on the 54035A. The 54035A will show both the number of errors and the total time for the errors. The time value will help the tester know if a subject intentionally produces a continuous error in order to reduce the total number of counts. The 54035A can be set to either single or multiple timer mode for these tests.

Tapping Board Model 32012

The 54035A connects to the 32012 via the RUN/CNT input. The binding post on the board connects to any GND input on the 54035A. The stylus for the tapping board connects to the RUN/CNT input. The 54035A will show the number of counts or taps along with the contact time for each tap. The time reading for this experiment can be disregarded. The 54035A can be set to either single or multiple timer mode for this test.

Mirror Tracer/Two Arm Coordination tests Models 58024A, 32532

The 54035A can be used with both of these tests to time and count responses. The 58024A comes with its own counter, but the 54035A can be substituted if desired. To set up, connect the black binding post on the device to any GND input on the 54035A. Connect the red binding post to the RUN/CNT input. The 54035A will show total number of errors and the total time off target. The 54035A can be set to either single or multiple timer mode for these tests.

Visual Choice Reaction Timer Model 63035

The 54035A can be used with the 63035 to record response time. To set up, connect the black binding post on the side of the 63035 to any GND input on the rear of 54035A. Connect the red binding post to the RUN/CNT input on the 54035A. The 54035A will show the total time between the stimulus and response. The 54035A will also show counts, but they can be ignored. The 54035A can be set to either single or multiple timer mode for this test.

Linear Movement Apparatus Model 31202

The 54035A can be used with the Linear Movement Apparatus to show total movement time. To setup, program the timer for single timer mode with one split time (this is the default mode when the timer is turned on). Connect both black terminals to any GND input on the 54035A. Connect the green terminal to the START input and the red terminal to the STOP1 input.

Terms and Conditions

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export@lafayetteinstrument.com (Outside the USA)

Mailing Address:
Lafayette Instrument Company
PO Box 5729
Lafayette, IN 47903, USA

Lafayette Instrument Europe:
Phone: +44 1509 817700
Fax: +44 1509 817701
Email: eusales@lafayetteinstrument.com

Phone, Fax, Email or Mail-in Orders
All orders need to be accompanied by a hard copy of your purchase order. All orders must include the following information:

- Quantity
- Part Number
- Description
- Your purchase order number or method of pre-payment
- Your tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Signature and typed name of person authorized to order these products
- Your telephone number
- Your email address
- Your FAX number

Domestic Terms
There is a $50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

International Payment Information
There is a $50 minimum order. Payment must be made in advance by: draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

Exports
If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a "*C" suffix.

Quotations
Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

Cancellations
Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

Exchanges and Refunds
Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a Return Goods Authorization (RGA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well, insured for the full value and returned along with a cover letter explaining the reason for return. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Product must be returned in saleable condition, and credit is subject to inspection of the merchandise.

Repairs
Instrumentation may not be returned without first receiving a Return Goods Authorization Number (RGA). When returning instrumentation for service, please call Lafayette Instrument to receive a RGA number. Your RGA number will be good for 30 days. Address the shipment to:
Lafayette Instrument Company
3700 Sagamore Parkway North
Lafayette, IN 47904, USA.

Shipments cannot be received at the PO Box. The items should be packed well, insured for full value, and returned along with a cover letter explaining the malfunction. An estimate of repair will be given prior to completion ONLY if requested in your enclosed cover letter. We must have a hard copy of your purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

Damaged Goods
Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

Limited Warranty
Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation. All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

Limited Obligations Covered by this Warranty

1. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
7. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
8. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

Export License
The U.S. Department of Commerce requires an export license for any polygraph system shipment with an ULTIMATE destination other than: Australia, Japan, New Zealand or any NATO Member Countries. It is against U.S. law to ship a Polygraph system to any other country without an export license. If the ultimate destination is not one of the above listed countries, contact us for the required license application forms.