

Summit Systems

SRT500 and SRT 1000



Manual

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Specifications

Networking:

Timers network up to 4,000 feet apart.
Timers network using RS485 cable.
Timers connect to a single serial port on a notebook computer.
There is no practical limit to the number of timers that can be linked together.

9 Channels of Input

Storage:

Stores 10,000 events with up to 6 digit bib numbers.
Stores 4,000 events with 16 characters per event.
Storage of 50,000 events is available as an upgrade option.

LCD Display: 4x16 character display

Connects to Computer using RS232 Serial Cable

Timer Resolution: The SRT 1000 always stores times internally to a resolution of 1 millisecond (0.001).
The SRT 500 to hundredths of a second (0.01).
The user can set the resolution displayed to be 0.1, 0.01, or 0.001 (SRT 1000 only).

Temperature: -20° to 70° Centigrade (-4° to 158° Fahrenheit).
The display works down to -20°C, everything else is good down to -40°C
[Note: The minimum temperature for USSA-FIS Cross Country competitions is -20°C (-4°F)]

Accuracy:

0° to 40° Centigrade: +/- 0.16 seconds per day, or +/- 2 parts per million (PPM)
-40° to 85° Centigrade: +/- 0.66 seconds per day, or +/- 7.5 parts per million (PPM)

Size: 7.5 inches (19cm) by 4 inches (10cm)

Weight: .82 lbs. (13 oz.) (11 oz without batteries)

Battery Life: Timer operates up to 150 hours on two AA batteries, or up to 300 hours on four AA batteries tested at room temperature. A low battery warning is given when 20% of the battery life remains.

Note: Rechargeable batteries do **not** do well in cold temperatures.

Wireless Battery Life: Up to 8 hours with two AA batteries.

Wireless Frequency: 900 Mega hertz. Seven different networks (i.e.- channels) are available to use.

Wireless Transmission Distance: Up to 7 miles line of sight. Directional antennas are also available to extend this distance.

Auxiliary Serial Port: Auxiliary RS232 port with Tx, Rx, CTS, and RTS. Will Interface with a standard serial bar code scanner. Can potentially interface with other devices, such as transponder decoders or scoreboards. Timer can supply power to the bar code scanner.

Guarantee: 2 Year

Timer Layout



Layout of Timer (See Diagram for Numbered referrals)

- A. Input for channels 2 and 6
- B. Input for channels 1 and 5
- C. [See very bottom for C & D](#)
- D. (“)
- E. Line 2 of LCD Display: shows the last external input
- F. Line 3 of LCD Display: shows the last entry typed in on the timer
- G. Line 4 of LCD Display: shows the entry you are currently typing
- H. **Post Bib:** To designate a specific bib number a “posting bib” enter the bib number of the racer, and press this key. The next entry will register as a posting bib. To learn how you can use this feature to your advantage, see Strategies and Tips.
- I. **Ch:** Channel Selector. This button is only needed if using multiple channels for different types of data entry. For example, using one channel for starts, one for laps, and two for finishes. Pressing this button allows you to signify that certain bib entries go along with certain channels. To change the channel that bib entries are associated with, continue pressing **Ch** until it shows the channel you want. (Only works for channels 1-4)
- J. **Bksp** (Backspace): deletes the number or symbol entered most recently
[Anything for ESC?](#)
- K. **Ctrl** (Control): Operates as a help key. When you press this button, you will find the following options: (These options can be found by holding down control and pressing the number key indicated next to each option)
 - 0) **Totals:** Tells how many times an impulse has been sent from each channel and how many bibs have been entered
 - 1) **History:** This feature allows you to see a list of times and bibs for each channel.
 - 2) **Reprint:** reprints data
 - 3) **Results:** Prints unofficial results by matching up bib order with plunger impulses
 - 4) **Event:** Allows you to select an event number. For more information on events, see tips and strategies
 - 5) **Synch:** Re-Synchs the timer
 - 6) **Config:** Reconfigures Timer. This function allows the user to add a printer or change the number of timers being used. **Beware**, choosing this option will reset the timer and destroy all data
 - 7) **More:**
 - 8) **retx:** Retransmits data
 - 9 **version**
 - * **Bib Entry:** Switches viewer mode from Time and last Bib entered to last 3 bibs entered
 - .f **keys:** Reminds you what the functions of all of the function buttons are
- L. ‘0’ and ‘No’ – [any description?](#)
- M. Lanyard Ring
- N. Connector for Antenna
- O. Connector to Other Timers: Here you attach cable to communicate between more than one Timer
- P. Right side of Line 1 of LCD Display: Shows the current time, either counting from zero when the timer was synched, or the time according to the PC clock.
- Q. ?
- R. ?
- S. **On Switch (Note:** There is no “Off” Switch. To turn off, hit Ctrl & Del simultaneously, and follow prompts: Enter “yes”, then “1-2-3-Enter”)
- T. Block Inputs.
 - Pressing this once “blocks keys”. This tells the timer to ignore input from any key on the keypad, avoiding false entries.
 - Pressing a second time “blocks Switches”. Press if connecting or disconnecting from the inputs on the side of timer to avoid false signals.

-Pressing a third time blocks both the keypad and the switches.

-Pressing a fourth time unblocks everything.

Caution: accidentally pressing this button during a race could cause you to block out necessary data.

- U. Impulse: if you do not have any finish buttons(*?which are what?*), but would like to distinguish between a bib entry and a finish time, you may use this key to send impulses, like a finish button would.
- V. *?*
- W. **(:) – any description?*
- X. **Space**: operates as the yes and the + key
- Y. **Enter**: The Enter key causes any data entry (time, bib number) to be accepted and saved
- Z. **.** (**Del**): Period and delete – *any description?*
- a. Connector for cable attaching Timer to PC/computer
- b. Connector to portable printer
- c. Insert for mounting to a waist lanyard or a post
- d. Upper Battery Compartment holds 2 AA batteries
- e. Lower Battery Compartment holds 2 AA batteries
- f. Serial Number
- g. Input for channels 3 and 7
- h. Input for channels 4 and 8
- i. Input for channel 9 and *?? (does it do something else)*

This description was used for C & D combined, if you can use.

13) At the right of Line 1 is a sign, either <, >, or = This will tell you how many bibs you have entered (any time you press Enter) compared to the number of switches (any external input or F4 key) for any channel. For example, if you see <, then you have entered fewer bibs than switches.

Timer Configuration

The configuration routine is designed to minimize the number of yes responses, so when in doubt, or when in a hurry, just say **NO!**

Some questions are only asked for wireless timers, or for timers with auxiliary serial ports. So if a particular question is not asked, you do not have to answer it.

To restore the default configuration, type **Ctrl-B** (that is, while holding down the **Ctrl** key, hit the **6** key).

To configure the timer, type **Ctrl-6** (that is, while holding down the **Ctrl** key, hit the **6** key)

Text that appears on the timer display is shown here in blue.

"Configuration Routine Here "

"Do You Need to Change Device # & Communication Method (y/n)?"

"Is this the only Timing Device (y/n)?"
"What is this Device Number?"
"Is this device wired directly to the computer (y/n)?"
"Is this device wireless (y/n)?"
"What is this Modem Network Num Usually 0?"

"Do you need Advanced Configuration (y/n)?"

"Do you want to Change Time Resolution (y/n)?"
"Do you want 0.1 second resolution (y/n)?"
"How about 0.01 seconds. (No for 0.001 seconds)

"Do you want to Change Max Bib Entry Length (y/n)?"
"Do you want full 16 Character Bib Entry (y/n)?"
"Do you want 6 Character Bib Entry (y/n)?"

"Do you need Printer Configuration (y/n)?"
"Is Printer Attached (y/n)?"
"How Many Printer Lines per Record?"
"Does the Printer Need a Delay for Each Line (y/n)?"
"What is the Needed Printer Delay msec?"

"Do you need Super Expert Configuration (y/n)?"

"Do you want to Change Emulation Mode (y/n)?"
"Do you want to Emulate another Timer (y/n)?"
"Do you want to Emulate a Tag Heuer 505?"
"Do you want to Emulate a Tag Heuer 605?"

"Do you need to Change Baud Rate (y/n)?"
"What is the Baud Rate usually 9600?"

"Do you need to Change Token Delay (y/n)?"
"What is the Token Delay usually 500?"

"Do you want 24 hour clock (No for 99 hrs) (y/n)?"

"Do you want Start Impulse to Zero Timer (y/n)?"

"Do you need to Change Hold-offs (y/n)?"

"Do any switches Have Hold-offs (y/n)?"

"Do you need to Change Switch Closure Type (y/n)?"

"Are any Inputs Normally Closed (y/n)?"

"What is the Switch0 XOR Mask (usually 0)?"

"What is the Switch1 XOR Mask (usually 0)?"

"Is Auxiliary Power Required (y/n)?"

"Do you want to Change Bar Code Channel (y/n)?"

"Configuration Finished!"

Configuration Notes

If the device is wireless, you must answer NO to the question "Is this the only Timing Device (y/n)?"

Basic Configuration Parameters

Display Mode: The timer has two display modes. The operator can toggle between the two display modes by typing **Ctrl-***.

In the default display mode (see Figure ??) the operator sees the time of day, the time for the last switch impulse, the last bib number entered, and the time for the last bib number that was entered.

In the bib entry display mode, the operator sees the last three bibs that were entered, and the times that they were entered. This mode is much easier when entering a list of bib numbers.

Timer Device Number: Each timer should have a different device number, so the data can be handled properly in the race management software. Any number can be used as long as it is unique, but note that the software will process small numbers more quickly (i.e.-use 1, not 701).

Modem Network Number: The modem network number must be 0-6. Think of this as similar to a radio channel. If all radios are set to the same channel, then they can communicate. The modem network number should be set to 0, unless there is interference.

Advanced Configuration Parameters

Timer Resolution: The SRT 1000 times with 1 millisecond resolution (0.001), and the SRT 500 to hundredth resolution (0.01). The Timer Resolution function allows the operator to set the timer resolution to 0.1 seconds, where times are only displayed and reported with a resolution of 0.1 seconds. For most timing applications, resolution of 0.1 seconds is adequate. **Note:** For alpine skiing, it is required to time with a resolution of 1 millisecond.

Bib Entry Length: If the bib entry length is set to 16, then more information can be entered for a racer (such as a judging score), but only 4,000 records can be stored in the timer. If the bib entry length is set to 6, then 10,000 records can be stored. **Warning:** You Must Reset Timer After Changing Bib Entry Length!!

Printer Delay: Most serial printers allow for some type of busy signal (called flow control or hardware handshaking). If so, then there is no need for a delay after printing each line. If there is no hardware flow control, then it may be necessary to insert a delay after printing each line.

Super Expert Configuration Parameters

Emulation Mode: Sometimes it is desirable for the timer to emulate another standard timer. The SRT1000 can emulate a Tag Heuer 505™ or a Tag Heuer 605™.

Baud Rate: This is the communication frequency (bits per second). For almost all applications, the baud rate should be set to 9600 baud.

Token Delay: This sets how much time the computer spends polling each timer for data. This is set to 500 by default. This does not have to be changed!

24 Hour Clock: If the timer is set for a 24 hour clock, then the hours will increment as follows: 22, 23, 0, 1, 2 ...

Start Impulse Used to Zero Timer: If this option is enabled, then any impulse on channel 9 will re-zero the time. Then an impulse on any other channel will show the time that has elapsed since the start impulse. This feature is designed for swim meets or 100-yard dash heats.

Hold-off: A hold-off causes the timer to ignore additional impulses for a certain amount of time after receiving an initial impulse. For instance, suppose that you use a pressure switch for timing bicycles in a time trial. After an impulse is received from the front wheel, a hold-off of about 0.3 seconds should be set to insure that the impulse from the rear wheel is ignored. A hold-off time can be specified only for channels 1,2,3,4, and 9. Note that if the hold-off time is too large, then valid impulses may be missed.

Switch Closure Type: Most switches used in timing are normally open. When a normally open switch is activated, the contacts close. Sometimes it is necessary (or desirable) to use a normally closed switch.

Bar Code Channel: This sets the channel number for bib numbers that are “entered” via a bar code scanner.

Necessary Information

Turning Timer On & Off:

On: The 'On' switch is a red key in the center of the top row and is labeled.

Off: There is no 'Off' switch. To turn off, hit Ctrl & Del simultaneously, and follow prompts: Enter "yes", then "1-2-3-Enter"

Changing Batteries:

Note: While it is possible to use an AC adaptor as an accessory, using the adaptor does **not** charge the batteries.

How to insert and change batteries:

Batteries are located on the underside of the timer. As you hold the timer upside down, loosen the screw and lift the lid of the compartment off.

If you are using only 2 batteries:

When you place two batteries in the timer, make sure they are both situated either in the top two, or the bottom two places for batteries in the battery compartment.

When you change batteries, put two new batteries in the two empty places before taking out the two old batteries.

If you are using 4 batteries:

Make sure to take out no more than two batteries at a time, starting from either the top or the bottom. Replace those batteries before you insert new batteries.

Notes:

1. There is a sticker in the battery compartment indicating the correct placement of the batteries. Make sure the + and - signs are situated as the sticker directs.
2. Rechargeable batteries do not perform well in cold temperatures.
3. **Never** remove the batteries in the upper compartment during a race.
4. We suggest you put fresh batteries in the lower compartment for every race.

How to Synch From the Timer:

If you want to start the timer at a specific time, and you are not synching to your PC, you can press **Ctrl 5** on the timer. It will ask what time you want to synch the timer to. You can use this feature to synch the timer to the time of day, or to any arbitrary time that makes sense for your particular race. When you synch from the timer, any **Enter** or switch closure triggers the synch. So, if you are not dealing with multiple timers, you can use that first switch as your start to guarantee that you start at the synched time.

Notes:

It is possible to synch the timer to a negative time. For example, if you plan to start the race in exactly one hour and wish the timer to read 00:00:00.0 at the time of start, you can synch the timer to -1:00:00.0.

If you enter any incomplete time, (without entering hours, minutes, and seconds) it will register as the smallest possible time. For example, entering only 3:00 registers the same as 00:03:00.0.

Information to know while Using Plungers:

Before you start a race, plug in any plungers or sensors that will input race information. The first plunger should be plugged into Channel 1 (reference diagram, 'B'), the second into Channel 2 (see diagram, 'A'), and so on.

Important: When input devices are inserted or removed, they may accidentally send input, so the timer may receive irrelevant data. To avoid this, be sure to press down the **B** key when you plug or remove anything from any channel. Make sure to press the **B** key again to unblock inputs when you are ready to receive data.

All Data received in any Input for 2 channels will automatically be registered as an input from channels 1-4 unless the user is operating a double plunger, which allows him or her to access both channels

(See Timer Accessories)

Channels:

Every piece of data that comes into the timer is associated with a channel. When you hit a plunger, it is plugged into a channel, so the time associated with the hit goes into a certain channel. Also, when you enter a bib number, that piece of data goes into a channel. This allows you to understand which bib order goes with which times when you look at your data later. However, in order to keep your data organized, you need to always make sure the timer is set to the right channel when you are entering bibs. When you use a plunger, the data automatically goes into the channel that the plunger is plugged into, but when you enter bibs, or press the **IMPULSE** key, you have to manually select the desired channel. To do this, press the **CH** key until the right channel appears in the upper left of the LCD.

Using an External Printer:

Here are some things to know if you choose to attach a printer to SRT1000.

Configuration: Before you begin to use a printer, you must configure your timer properly.

Always turn printer off or offline before you plug it into anything, or plug anything into it.

If for any reason you ever get weird characters or question marks (this should not happen due to flow control or line feed delay, but it could conceivably happen) you must turn your printer off and back on again. You may want to check your configuration settings to help realize what went wrong.

Reprint: If you press **Ctrl 2**, you can reprint any data.

Results: The timer can generate very preliminary results for any channel when you press **Ctrl 3**. This simply matches up the bib numbers and switch closures for any particular channel. You should not accept these results as final, because you will need to check them against your backup and make sure you have no extra or missing racers, but this feature should be helpful in allowing you to see where you stand.

Networking Timers:

If you are networking, one of your timers should be connected directly to a computer using RS232 serial cable. This cable is differentiated from other cables because it has 2 female ends. One end goes into computer, and the other end goes into the left connector of the timer. This cable can be up to 100 feet long.

All other timers can be networked using RS485 cable, which has one male and one female end. The male end goes into the right side of one timer, and the female end goes into the left side of another timer. This cable can be up to 4,000 feet long, allowing you to network timers up to 4,000 feet apart. Timers do not necessarily need to be networked in a series.

You can network the timers after data has been received without worrying. Also, if your network cable were to come unplugged in the middle of a race, you can plug it back in and your data will come through fine.

Event/Lap:

You can use the event feature if you are running several races, and each one starts before the next one finishes. However, you do not want to reset the timer between each race because you do not want to lose your data. This may be particularly useful in sports such as track or swimming.

To use: before the first event starts, press **Ctrl 4**. You will be asked to name an event number. Number the first event 1, and go in order after that. Before each event starts, press **Ctrl 4** again to signify that a new event has started. Each time you start a new event will be recorded in your data, so any information between each time you start an event is the race information from that particular event.

User string:

Although many users may simply use the keypad to enter bibs, you have the option of recording different types of data other than time about individual racers into the timer. You do this by typing in each piece of data, separated by spaces, and followed by the racer's bib number, and then pressing enter. You must always type in the bib number last if you are using bibs.

Examples of when to use this:

Biathlon: In a biathlon race, you may choose to use the timer to record penalty laps and shooting results as well as finish times so that you can record a complete event using timers. To record shooting results, you can decide that a 0 is a miss, and a 1 is a hit. For example, if bib number 45 shoots at point 3 and makes his first three shots and misses his next two, you would enter "3 11100 45"

Quick Start Race Procedure:

This section is designed to tell you just enough about the SRT1000 that you could run a simple race without reading the rest of the manual.

Make sure fresh batteries are in timer

Turn Timer On

Configure Timer (**Ctrl 6**, then answer questions from then on)

Synch timer

Block Inputs

Plug in plungers (probably one plunger in **CH 1**, and one in **Ch 2**)

If you are using a printer, plug it in and turn it on

Unblock inputs

Make sure timer is set to channel 1. (Press **CH** until **CH1** appears in upper left)

If you have any more questions, press **Ctrl**. it operates as help menu

You are now prepared to start a race

For every start wave, press * **then** the wave number just before the wave starts. Exactly when the wave starts press **Enter**. As a backup you should also have someone plunge the start.

Each time a racer crosses the finish line, plunge them.

You should have two plungers, either connected to two different timers, or plugged into **Ch1** and **Ch 2**

Each time a racer crosses, whoever is holding the timer should press the racer's bib number, followed by **Enter** making sure to get the appropriate bib order of finish.

To post a racer, press their bib number, then **POST** before they cross the line. Then press the bib again, followed by **Enter**.

At the end of the race, print preliminary results from timer

Possible Uses for Timer:

General Uses:

- Finish Timing (electric eye/push button)
- Start Timing (Wand/push button)
- Backup timing
- Split/Lap timing
- Finish bib order
- General data input (registration)
- Course communications

Skiing

- Course controlling or gate checking

Biathlon

- Entering shots for each racer (1 timer for each lane, or one for entire range)
- Counting penalty laps

Swimming

Cross-country

Track

Trouble Shooting:

Problem:

I keep getting extra impulses that I can't account for

Block Impulses when you plug in accessories

Remember that you may have tested some impulses before starting the race

It is possible that you hit the plunger more than once for an individual racer, in this case, consult your bib order list, or look over your data to try to determine what the real times are

The computer is not recognizing the data that I send it

Is the timer configured properly?

If any of your problems are not addressed here, please email the Summit Systems at timers@summittiming.com or call us at (801) 278-7999.

Glossary:

Bib: A bib can be a physical thing that a racer wears over his or her chest displaying a number, but for the purposes of this timer a bib only needs to be some sort of number, which distinguishes each racer especially in races without lanes. A coach could choose to have racers write their numbers on their hands, or even remember them but most organizers of larger races will want to display the bib number prominently so that members of the race crew can see it from a distance.

Channel: A channel is a number that helps you separate your data and learn where it came from. You can change or select channels for plungers by plugging the plunger into the appropriate socket on either side of the timer. You can change channels for bibs or for the **IMPULSE** key by pressing **CH** until the desired channel appears.

Checksum (version Id): This is a 4-digit code (combination of letters and numbers) that identifies the version of software you have on your timer and verifies that everything is working.

CRC (cyclic redundancy check): This is a 4-digit (combination of letters and numbers) error checking mechanism that makes sure the data in any packet of information is good. You will see CRCs on the right side of the lower window of the timer application when your data is coming through. The CRC for each different packet of data is unique.

Hardware Flow Control: Hardware Flow control is a device within a printer that allows it to signal to the timer to slow the transmission of data. Because the timer can transmit data faster than the computer can print, this is necessary so that you can insure that you are able to print all of your data. If you do not have Hardware Flow Control in your printer you will need to program a printer delay into the timer when you configure.

Impulse: In the timing business, a switch closure is called an impulse.

Plunger: A plunger is made up of a cable, a handle, and a switch. It is used to record finish times. It is sometimes called a "button".

Post: to Post a bib is to designate it a "posting bib" in other words, to set that bib as an accurate reference point in your data. Often, when many racers come in at the same time, it is easy to accidentally record too many or too few racers. If you get one racer off, it is very difficult to scan your entire list of results to determine where the problem is. Therefore, you set posting bibs as reference points in your data that you know are correct. You determine that a bib is a posting bib if you can be sure that the bib and the time you enter corresponds almost exactly to the time the racer crosses the line. Usually this will be when a single racer crosses the line alone

Synch: Short for Synchronize. When you synch the timer(s) you make sure that all timers and the computer are running on the same time together.

WBU=Wireless Base Unit:

Accessories to Timer:

RS232 Cable to PC: This is a 9 Pin D cable, female on both ends, with Pins (2-3, 3-2, 5-5.) It allows user to communicate with the computer from the timer.

RS485 Cable to other timers: This is a 9 pin D cable with one female, and one male end with Pins (1-1,4-4,5-5,6-6,7-7,8-8,9-9) It allows user to connect two or more timers together

Portable Printer and printer attachment

Single plunger: allows user to connect a plunger into a single channel between 1-4 to input information

Double plunger: allows user to access more than 4 channels by connecting two plungers into the same input. For example, channels 1 and 5 share an input, so to access channel 5, the user would insert a double plunger into that input.

Speaker attachment for interval starts *

USB to RS232 Adaptor