GEN7

Serial Timer
User Guide

Manufacturer:
Colorado Time Systems
1551 East 11th Street
Loveland, CO 80537 USA

Sales: 1-800-279-0111 or +1 970-667-1000
Service: 1-800-287-0653 or +1 970-667-1000
Service Fax: 970-667-1032

Web: www.coloradotime.com
Email: support@coloradotime.com

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Introduction

Welcome to Gen7 timing. The Gen7 platform provides you long-lasting technology that will save you time and money. The software interface puts intuitive control of all levels of competition at your fingertips. This software combined with the distributed intelligence of our proprietary serial bus communication system gives you the flexibility to run your meets your way.
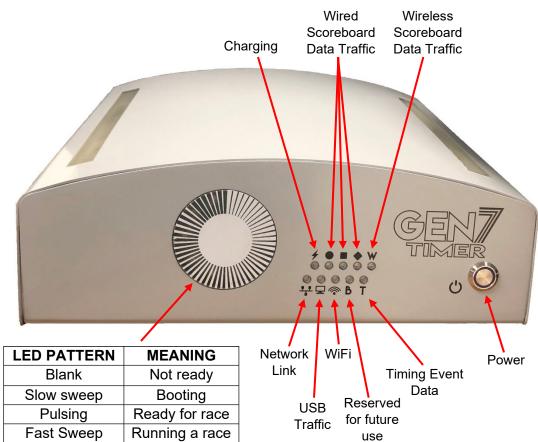
Gen7 exceeds current standards by offering you cutting-edge technology with unrivaled precision and an all-new software-driven experience to run your meets flawlessly.

Various sections of this manual contain QR codes linked to accompanying tutorial videos. Click or scan the QR codes to see the Gen7 in action.

Sample

Hardware

Charging

Wired
Scoreboard
Data Traffic

Wireless
Scoreboard
Data Traffic

Network
Link

WiFi

USB
Traffic

Reserved
for future
use

Timing Event
Data

Power

LED PATTERN	MEANING
Blank	Not ready
Slow sweep	Booting
Pulsing	Ready for race
Fast Sweep	Running a race

The LEDs on the front of the timer indicate data traffic and the state of the timer, as described above.

Charging status LED

- When the device is plugged in to power and the battery is charging correctly the LED is blue.
- When the device is plugged in and the battery is not charging, because the charging was completed or the battery is full, the LED is dark.
- When the device is not plugged in the LED is dark.

The Gen7 Timer utilizes a battery charging chip. When the battery charging chip analyzes the status of the battery before and during charging and finds a fault the LED is red.

Note: When the battery is quite full and the device gets plugged in the charging chip can erroneously detect a battery fault. In the case of a red LED, disconnect the device from power, and then reconnect to power to see if the status changes.
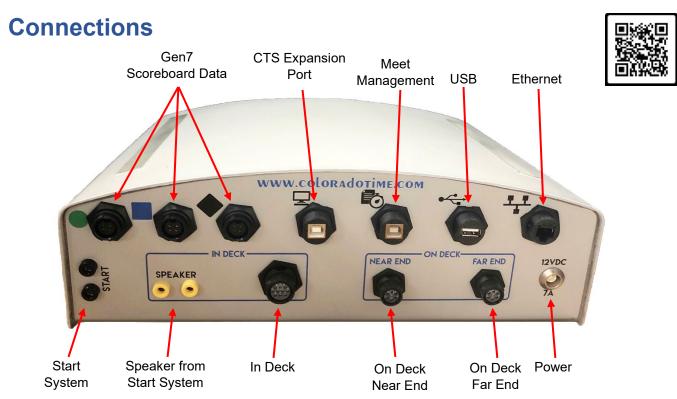
Power Supply

Important Safety Instructions

When using electrical products, basic precautions should always be practiced including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.
Read and follow all instructions that are on the product or provided with the product. Do not use an extension cord with the Gen7 power supply.

WARNING: Risk of Electric Shock. When used outdoors, install only to a covered Class A GFCI protected receptacle that is weatherproof with the power unit connected to the receptacle. If one is not provided, contact a qualified electrician for proper installation. Ensure that the power unit and cord do not interfere with completely closing the receptacle cover.

SAVE THESE INSTRUCTIONS– This manual contains important safety and operating instructions for power units.

Connections

Gen7 Scoreboard Data · CTS Expansion Port · Meet Management · USB · Ethernet

Start System · Speaker from Start System · In Deck · On Deck Near End · On Deck Far End · Power

Power Connection: To connect the power supply to the Gen7 timer, line up the red dot on the power receptacle with the red dot on the connector on the power cord. Push in until it clicks in place. To disconnect the power cable, pull back on the sleeve on the connector (shown in red below) to unlock the connector from the receptacle then disconnect the power cord from the timer.
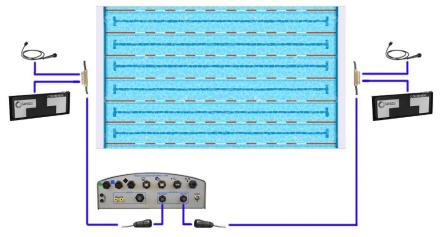

For in-deck systems: you only need the R-015-715-xx cable. Plug the black end of the cable into the timer. Plug the white end (with the red keyway) into a "Timer" node in your wallplate or your deck.
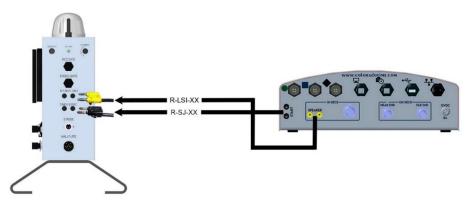

R-015-715-XX

For on-deck systems: there are separate connectors for near end and far end serial cable harnesses. Serial cable harnesses may be chained together to support a primary and a backup harness for up to 20 lanes.

Connecting the Start System
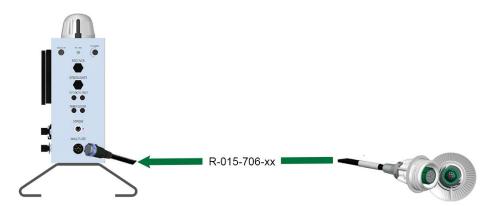
The start system can be connected to the Gen7 timer in two different ways:

- 1Connect the start system directly to the timer using one R-LSI-xx cable for the speaker signal and one R-SJ-xx cable for the start signal.

- Connect the start system to a start node in the wall or deck using an R-015-706-xx color-coded cable with the green keyway.

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Connect Interface Computer to Timer

The Gen7 timer requires a laptop (or desktop) PC to run the control interface. The interface computer and timer must be connected to the same network. The Gen7 Timer supports an Ethernet connection. The interface computer can be connected to the network via a cabled Ethernet connection or Wi-Fi. The timer and interface computer can also be directly connected with a single Ethernet cable.

Ethernet

Other Connections

Connect other equipment such as touchpads, pushbuttons and relay judging platforms to the deckplates at each lane. Use the Diagnostics function (see page 21) to quickly confirm that all equipment is in the correct location and plugged in.

Software

Power On Sequence

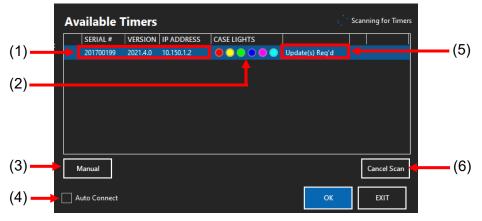With your equipment connected to the timer, you can now begin the power up sequence.

1. Power on the interface computer and let it boot completely.
2. Press the power button on the Gen7 timer
3. Wait until all LEDs in the CTS logo sweep show a slow pulse (about 30 seconds).
4. Start the Gen7 Swimming Software on the interface computer.

CTS sweep   Power

Note: If Gen7 Swimming Software is not installed, see
https://www.coloradotime.com/sware.htm
Click the Gen7 tab then select the latest Gen7 Swimming Software.

When the software starts, it will attempt to find the timer automatically. If the timer is not found, an IP address can be specified manually.

Timer Selection

When the software opens the Available Timers window will pop up. Here is where available timers are shown.

1: Serial number, version number, and IP address
Displays each available timer's serial number, firmware version number and IP address.

2: Case lights
If there are multiple Gen7 timers on the network, the case lights option can be used to easily distinguish each timer. With the timer highlighted, click any of the colored dots to change the case lights on the top of the timer to the color selected.

3: Manual

If a selected Gen7 timer has a static IP address, click the **Manual** button. A text box will appear where a static IP address can be typed in for the timer.

4: Auto Connect

Click the **Auto Connect** check box to connect to the selected timer automatically when the software is started and bypass the Timer Selection screen.

5: Updates Required Alert

If updates are available for a listed timer, Update(s) Req'd will display in the Updates Required Alert field. If no updates are needed the field will remain blank.

6: Cancel Scan

Click the **Cancel Scan** button to stop the software from scanning for additional Gen7 timers.

Set Up

Each time you open the Gen7 Swimming software, you need to either create a new meet or open an existing meet.

Pool Selection

In multi-pool facilities, select which pool will be used for the meet. In single pool facilities, this window will not appear.

Create a New Meet

1. Select **New Meet**
2. Enter a name for the meet
3. Choose Start and End dates for the meet
4. Select the governing body

Open an Existing Meet

1. Select **Existing Meet**
2. Select desired meet from previously created meets

Create a New Session

1. Select **New Session**
2. Choose the session number
3. Select pool length
4. Choose the sessions start time.
5. A tag can be added to the session if desired. A tag is extra text that is added to the session name (e.g., Friday Prelims)
6. Select Default Event Sequence if you wish to automatically add events
7. Use **Timing Hardware Selection** to select the course configuration. Course setup options are configured at the time of installation. If additional course setups are required, please contact CTS support.
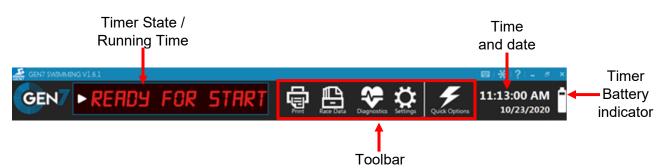
Open an Existing Session

1. Select **Existing Session**
2. Choose a session from previously created sessions
3. Use **Timing Hardware Selection** to select the course configuration

Main Screen

The Main screen is where current event and heat information is displayed.

Running Time and Toolbar

The Running Time and Toolbar portion of the Main screen is where the Timer State / Running Time, and Toolbar are displayed.

Timer State /
Running Time

Time
and date

Timer
Battery
indicator

Toolbar

Timer State/Running Time

When **READY FOR START** is displayed, the system is in the reset state and is ready for a race to be started.

During a race the Running Time will be displayed here

After finish times have been registered for all lanes, **FINISHED** will be displayed

Click **FINISHED** and then Click **Save and Reset** to store the race results and put the timer back into the reset state.

Toolbar

The toolbar contains the Print, Race Data, Diagnostics, Settings, and Quick Options buttons.
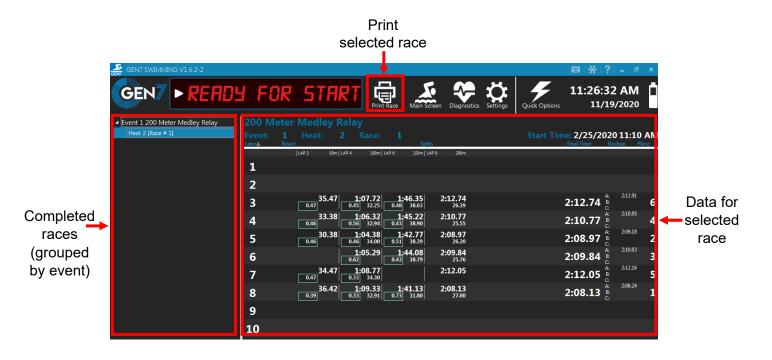
Print

The 🖨 button will open a dialog box where the current completed event results can be printed or exported to PDF. (See page 49 for printer settings)

Race Data

The 🖳 button navigates to the Race Data Screen. Here the results of all previously run races of the session can be viewed and printed.

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Diagnostics

Click [icon] to open the Diagnostics Screen. The Diagnostics Screen is designed to help find problems with in-deck and on-deck connections such as shorts (water inside electrically sensitive components) and corrosion (oxide buildup on conductors that creates a resistance which diminishes electrical current flow). See page 71 for details on how to test components using the **Diagnostic** tool.

Settings

The [icon] button will navigate to the Settings screen where General, Timing, Scoreboard, Printing, and Session settings can be adjusted. For details of these settings, see page 26.

Quick Options

Click to open a menu on the right side of the Main screen.

1: Backstroke Start Reaction

Toggles backstroke start reaction on or off. See page 38 for information on adjusting backstroke start reaction settings.

2: Scoreboard State

Here the scoreboard state can be toggled between On, Blank with Time of Day displayed, or Totally Blank. When "Blank with Time of Day" is selected, the time of day will appear on modules 03, 0F and 16.

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3: Event/Heat – Home/Guest Swap

Sets what appears on modules 0C and 0D. Normal is Event/Heat on 0C and Home/Guest scores on 0D. This is designed to work with the LED6 series numeric boards.

EV/HT - H/G: Normal
EV/HT - H/G: Swapped

4: On-Screen Lane Order

Changes the order in which lanes are displayed on the main screen. This has no effect on actual lane mappings.

On-Screen Lane Order
Normal ⬤ Reversed

5: Cycle MM Port

Click to cycle the connection to the meet management software to re-establish a connection.

Cycle MM Port

6: Load Scoreboard Names

Allows selection of a folder containing Scoreboard Name (SCB) files. Names are displayed on screen and transmitted to the scoreboard (via RS-485). For more information, see Appendix C

Load Scoreboard Names

7: Clear Scoreboard Names

Clears any previously loaded scoreboard names.

Clear Scoreboard Names
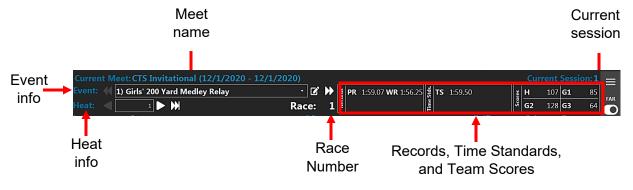
8: New Session or Meet

Click New Session or Meet to open a dialog box where a new session or meet can be created. See page 16 for details on creating a meet or session.
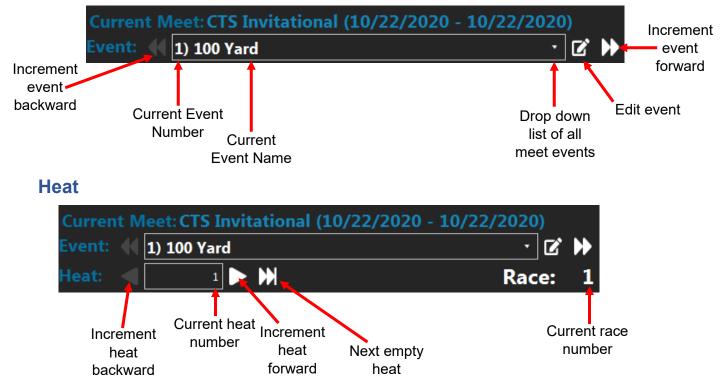
New Session Or Meet

Event Info

The Event Info section is where current event and heat selection are managed, and where records, time standards, and team scores are displayed.

Meet name

Current session

Event info

Current Meet: CTS Invitational (12/1/2020 - 12/1/2020)   Current Session: 1

Event: ◀◀ 1) Girls' 200 Yard Medley Relay   ▶▶   PR 1:59.07 WR 1:56.25   TS 1:59.50   H   107 G1   85
Heat: 1 ▶ ▶▶   Race: 1   G2 128 G3   64   FAR

Heat info

Race Number

Records, Time Standards, and Team Scores

Event

Increment event backward — Current Event Number — Current Event Name — Drop down list of all meet events — Edit event — **Increment event forward**

Heat

Increment heat backward — Current heat number — **Increment heat forward** — Next empty heat — Current race number

In both the **Event** and **Heat** sections, the number of the event or heat desired can be typed and the software will go to the defined event or heat. If an event number is typed in that is not already defined, the software will create a new event which can be edited by clicking the edit event button.

Records, Time Standards, and Team Scores

Records: When a record has been defined in **Session Settings** (see page 53) the record tag(s) and record time(s) will be displayed here. Only a race winner can beat a record.

Time Standards: When a time standard is specified in **Session Settings** (see page 57), the time standard tag(s) and time(s) will be displayed here.

Team Scores: Scores for home and guest(s) are displayed here. Click here to edit team scores.

Lane Data

The Lane Data section of the screen is where the current race data will be displayed and where basic operations take place during an event (see page 59).

Lane State

To turn a lane that is not in use off, click on the lane number. No data for this lane will be displayed. Click the lane number again to turn the lane back on. In the event a lane is accidentally turned off during an event, the software will continue to record timing inputs registered in the lane. Turn the lane on during the race or before saving race results and the lane results will be placed and saved.
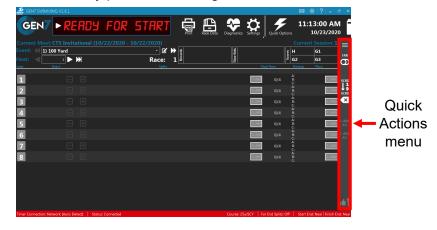
Status Bar

The status bar located at the bottom of the screen displays the timer connection network setting, timer connection status, and the current course settings. The status bar is red if the timer is running on battery.

Quick Actions

The Quick Action menu is located on the right side of the Main screen. This menu gives access to actions that are commonly performed throughout a meet.

Quick Actions menu

Click the [icon] button to expand the menu. **Note:** Quick Action menu options can be adjusted using the displayed icons without the need to expand the menu.

1: Far End Splits

Quickly turn far end splits on or off during an event.

2: Post by Place

Posts the race results in place order to the scoreboard after an event has finished.

Post by Place | SCBD 1 9

3: Clear Lanes

Clears lane data from the scoreboard.

Clear Lanes | SCBD X

4: Split Arm All

Click to arm all active lanes for split times. **Note:** Only available while an event is running.

Split Arm All | S. ARM ALL

5: Finish Arm All

Arms all active lanes to accept a finish input. **Note:** Only available while an event is running. Will not affect already finished lanes.

Finish Arm All | F. ARM ALL

6: Accept All Flagged Backups

Click to accept all backup times for flagged times. **Note:** Only available after at least one lane has finished with a backup discrepancy and before the event is saved.

Accept All Flagged Backups

Race Data

The race data screen is where data from all completed races is accessed. When a race is selected, the lanes can be marked as DQ/NS/EX, and the official times can be edited (backup times promoted, Original pad time restored).

Race Data Quick Options

Click while in the **Race Data** screen to access Race Data Quick Options for the selected race.

1: Mark as False Start?

Click to mark the selected race as a false start. Races marked as False Start will not be available to Meet Management software.
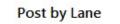
2: Post by Place

Click to post the results of the selected race by place to the scoreboard.

Post by Place

3: Post by Lane

Click to post the results of the selected race by lane to the scoreboard.

Post by Lane

4: Review Race Log

Click to review the race log for the selected race. The race log screen shows all timing events including any touches registered that are ignored due to settings such as pad delays or far end splits settings. This means it can be used to recover times that might otherwise be lost. The race log data can be exported to MS Excel.

Review Race Log

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Settings

To access the Gen7 Software settings, click the **Settings** button located in the toolbar at the top of the Main screen.
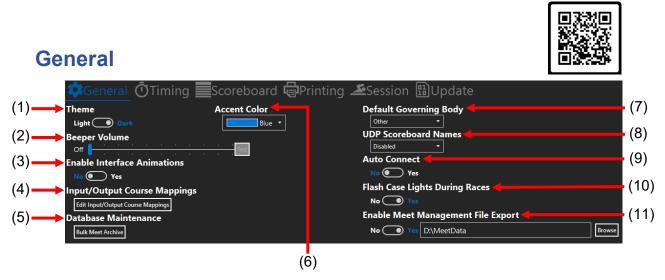
Note: After a new session is created, the Gen7 software will automatically navigate to the **Session** tab in the **Settings** screen (see page 51).

Settings Tabs and Toolbar

The top portion of the **Settings** screen is present through all sub menus. Each of the settings tabs will navigate to a separate submenu where various settings can be changed. Use the Toolbar to save changes, return to the **Main Screen** without saving, or restore the settings to factory or user defaults.

General

1: Theme

Select between a Light or Dark theme. The higher contrast in the Light theme helps with outdoor viewing.

2: Beeper Volume

The slider adjusts the volume of beeps from the timer when there is a timing input registered.
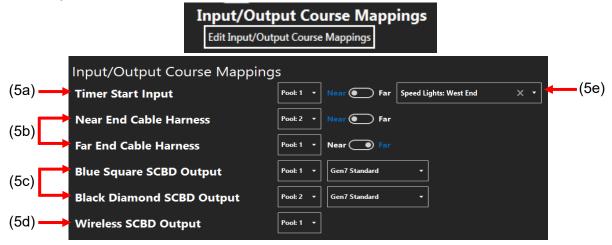
3: Enable Interface Animations

Select to have screen transition animations enabled or disabled. By default, screen transitions have an appear/disappear effect. Turn them off for faster navigation.

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4: Input / Output Course Mappings

Click **Input / Output Course Mappings** to open a dialog box with options for controlling the various connectors on the back of the timer.

5a: Timer Start Input

Sets which pool the Timer Start Input is mapped to as well sets whether is on the near or far end.

5b: Near and Far End Cable Harnesses

Allows the near and far end cable harness inputs on the timer (see page 11) to be mapped to a specific pool and to set whether they are near end or far end.

5c: Blue Square SCBD and Black Diamond SCBD outputs

Controls which pool maps to the blue and black scoreboard connectors on the back of the timer (see page 11).

5d: Wireless SCBD Output

Controls which pool maps to the primary wireless data stream. This will control which pool appears on a wireless scoreboard (Otter or LED-R via WA-2 or WA-3). If receiving wirelessly (via WA-2 or WA-3) into DisplayLink, data from both pools will be available.

5e: Speed Lights

Sets which end of the pool speedlights are triggered when a start input is registered on the Timer Start Input.
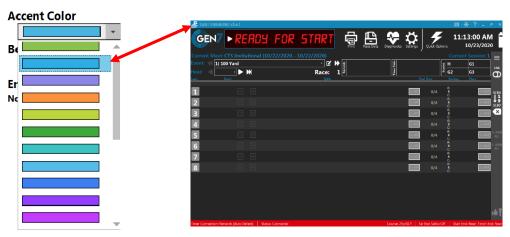
5: Database Maintenance

Click **Database Maintenance** to open a window within the software where multiple meets can be archived or unarchived.

6: Accent Color

Choose accent color displayed on all screens.

7: Default Governing Body

This sets the default governing body that is selected when a new meet is created. The governing body for an existing meet can be changed in the **Sessions** screen. (See page 55)

8: UDP Scoreboard Names

Used for systems where the Gen7 timer sends the names directly to the scoreboard which generally requires special licensed features. This creates a UDP server where Meet Management software can send start lists via a network connection.

If the "Timer" option is selected, the timer and the meet management computer must be on the same subnet.

If the "This Computer" option is selected, the Gen7 interface computer and the meet management computer must be on the same subnet.

More information is available in Appendix C: Athlete Name Integration**.**

9: Auto Connect

If this option is enabled, the Gen7 software will automatically connect to the first timer it finds when searching. In most cases, this should be enabled. The one major exception would be a facility with multiple timers on the same network (e.g., North pool and South pool).

10: Flash Case Lights During Races

Sets the case lights on the Gen7 timer to either flash or not flash when a timing input is received. The case lights are set to flash by default.
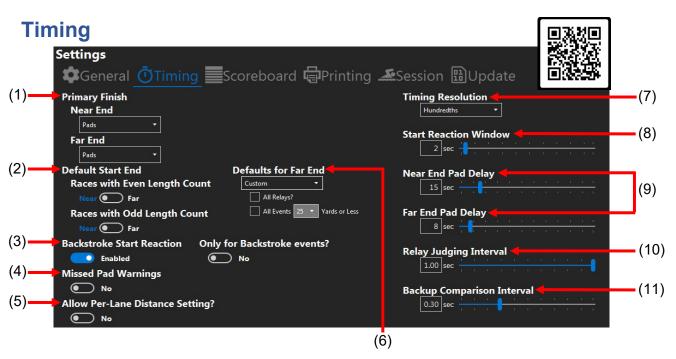
11: Enable Meet Management File Export

When enabled, Gen7 Swimming will automatically save a .gen file in the specified location. These .gen files contain complete race results (including splits, backup buttons, and relay exchange times) and can be imported into many Meet Management software systems.
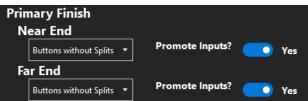
This option can be used if your Meet Management software does not support a USB connection to Gen7 or if you are using a network share-based Meet Management interface.

Timing

1: Primary Finish

Primary Finish sets whether the system will use touchpads or pushbuttons as the primary mode to finish a race. The near and far ends can be set independently. If pushbuttons are selected as the primary mode of finish, you can promote the inputs so that Pad becomes Button A, Button A becomes Button B and Button B becomes Button C. This will allow a 2 Button finish with a single cable harness.

2: Default Start End

In the Default Start End section even and odd length races can be set to accept a start input on either the near or far end of the pool. Single events can be altered in the **Session** screen if needed (see page 53).

Changing this option will not automatically change the start end for events already listed in the event sequence. There will be an option to apply the new start end settings to existing events when the settings are saved.

3: Backstroke Start Reaction

Backstroke start reaction is measured with touchpads. The backstroke start reaction can be set to be enabled for all events or only for backstroke events.

If Backstroke Start Devices are being used or if performing flyover starts, disable backstroke start reaction to reduce extra touchpad hits being registered at the start which may skew the data.

4: Missed Pad Warnings

Enabling the Missed Pad Warning will notify the operator of potential missed touches or that an athlete may be taking a long time or be off course.
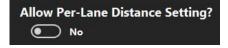
In the event of a missed pad touch and with Missed Pad Warnings enabled, a "Missed Touch?" message will display for about one second in the **Lane Data** portion of the **Main** screen for the affected lane.

After the message fades the lane number of the affected lane will be displayed as yellow alerting the operator that action is required. (see Basic Operations on page 59).

5: Allow Per-Lane Distance Settings

This option is designed to facilitate Time Trial events. It allows for one or more lanes to be configured with fewer required lengths than the entire race. For example, to run a 50yd race in Lane 1 and have the rest of the pool swimming a 100yd race, set Lane 1 to finish at 50yds. This change must be made while the race is running and before the race is reset

6: Defaults for Far End

Sets the default parameters for registering far end timing inputs. This affects newly created events as well as event sequences loaded from Meet Management software. Select between Always On, Always Off, or Custom. When set to Custom the far end can be set to be on for all relay events and/or be set to be on for all events that are a specific distance or less. (Ex: set to

Defaults for Far End

Custom ▼

☐ All Relays?

☐ All Events 25 ▼ Yards or Less

on for all events 100 meters or less.)

7: Timing Resolution

Timing resolution is where the number of places after the decimal that times are recorded is set. Select between seconds, tenths, hundredths, or thousandths. If the timing resolution is changed, only races that have not been run will be affected. Times for completed races are truncated according to the setting at the time of the race.

Timing Resolution

Hundredths ▼

Note: Most governing bodies require the timing resolution to be set to Hundredths.
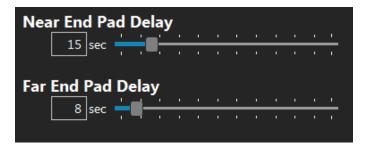
8: Start Reaction Window

Adjusts the time window to record start reaction times using RJPs for starting block starts and touchpads for in-water starts.

Start Reaction Window

2 sec
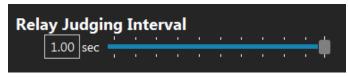
9: Pad Delay

Sets the near end and far end pad delays. After a touch, the pad will not register another touch during the delay period specified. With Gen7, unlike previous CTS timers, the scoreboard split delay is a separate setting in the **Scoreboard** screen and is NOT connected to the pad delay.

Near End Pad Delay

15 sec

Far End Pad Delay

8 sec

10: Relay Judging Interval

The relay judging interval sets the amount of time before and after a touchpad hit during which the Gen7 Timer will mark a relay input as valid. Relay inputs that occur outside this window are silently ignored.

11: Backup Comparison Interval

This is where the acceptable range between pad and backup times to be considered valid is set. Any difference in the times outside of the set range will be considered suspect and flagged as such in the **Lane Data** section of the **Main** screen. (see Promoting Backups on page 64).

Scoreboard

1: Split Display

Split Display is where the split time is set to show cumulative splits, subtractive splits, or a combination of both. If a combination of both is selected, the mode listed first will display first followed by mode listed second.

2: Split Display Time

This adjusts the amount of time the split times are visible on the scoreboard.
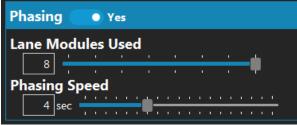
When a combination of both split display modes is selected, a second slider will become available and the display time for each mode can be set independently.

3: Phasing

When enabled, Phasing allows for specific modules of the scoreboard to be set to display race data.

Lane Modules Used

The lane Modules Used adjustment sets how many modules of the scoreboard will be utilized for race data. If the number of modules is set to a number less than the number of lanes in the pool, for example 4 modules in an 8-lane pool, the scoreboard will show the data in phases beginning with lanes 1-4 followed by lanes 5-8.

Phasing Speed

Sets the duration that each phase of data will be displayed.

4: Two Digit Lane and Place Display

For pools with more than 9 lanes, Two Digit Lane and Place Display adjusts how the lanes above 9 are displayed on the scoreboard.

For scoreboards that only have 1 digit for lane and 1 digit for place, you can select if lanes above 9 are displayed as single digit numeric, or as letters.

Letters   Numeric

On scoreboards capable of displaying both digits such as 10 Digit Per Line Boards or video boards, set the Two Digit Lane and Place Display setting to A,B,C to display both digits of lanes above 9.

5: Clear Lanes on Next Race

When Clear Lanes on Next Race is selected, places and times will automatically clear from the scoreboard when the event or heat are changed while the timer is in the reset state (see Timer State/ on page 19).

6: Post Places

The Post Places option selects whether places are posted at each split or only at the final time.

7: Record Breaker Action

Set the Record Breaker Action to blink to set the scoreboard to blink the time when a record is broken.

8: Display on Missed Finish

This option controls what is shown in the time digits for a given lane if that lane has recorded backup buttons but no touchpad finish.

- Blank will hide the running time and show nothing in the 6 time digits
- Dashes will hide the running time and show 6 dashes (------)
- Keep running will leave the running time active in that lane

9: Show Reaction Times

Enable Show Start Reaction to display start reaction times for both RJP and backstroke take-offs with touchpads for each lane at the start of the race. Even if this option is turned off, start reaction times can still be recorded by the Gen7.

10: Lengths Count Direction

The Lengths Count Direction toggles the direction the lengths counter on the scoreboard will count to be either up or down.

11: Configure Name Formatting

These options control the format for names that are sent directly from the Gen7 to the scoreboard. There are a variety of options for how the athlete's last name and first name are formatted.

12: Lane Module Order

Set whether the scoreboard displays in lane order (line 1 shows lane 1) or place order (line 1 shows first place).

13: Single Line (0F)

For scoreboards with only one line, this module allows the display of different information, depending on the status of the race.

13a: Time per Item

Sets the amount of time the finish time and each scrolling sequence item will be displayed on the scoreboard.

13b: Scroll Finish Times

If **Scroll Finish Times** is enabled, then while the race is running, the scoreboard will display the running time. When the lead swimmer completes a lap/length, their split time will be displayed. As the swimmers all finish the race, their final times will be displayed in the order in which they finished. This allows a single line scoreboard to effectively give athletes, coaches, and spectators all the information necessary for a successful meet.

Additional information can be shown sequentially when the timer is in reset (see Edit Sequence Items below).

13c: Times to Loop

Sets the number of times the finish time and scrolling sequence items will be displayed on the scoreboard.

13d: Edit Sequence Items

Click the **Edit Sequence Items** button to open a dialog box where the post-race sequence can be adjusted. Highlight sequence item(s) in the left portion of the dialog box and use to move them to the display box on the right portion of the screen. Unwanted sequence items can be removed from the display box by highlighting the item(s) and using . Sequence items in the display box can be re-ordered using and located to the right of the display box.

14: Wireless Settings

If enabled, Wireless Settings are where the Channel and PAN of your Gen7 Timer are set to match the Channel and PAN set on your wireless scoreboard or scoreboard adapter.
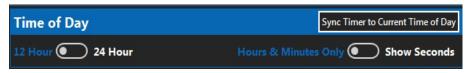
Wireless RSSI

To test the wireless signal strength between the timer and a wireless capable scoreboard, turn on Wireless Scoreboard RSSI. When enabled, the scoreboard enters a special test mode and will display the signal strength of the incoming wireless signal on the scoreboard. The higher the number, the poorer the signal.

15: Time of Day options

Time of day is where the options are set for the time of day that is displayed on the scoreboard. Select between 12 or 24 hour formats and set whether to display only hours and minutes or

include seconds. Time of Day is automatically synced when the Gen7 software starts up. Click **Sync timer to current time of day** to manually set the time displayed on the scoreboard to the current time.

16: Self-Test Mode

Test scoreboard digit functionality by enabling the Scoreboard Self-Test. When enabled, the scoreboard displays a pattern designed to test each numeric digit.

17: Scoreboard Intensity

Scoreboard intensity is where the brightness of the digits on numeric scoreboards is set. Choose between 7 intensity settings, or if connected to a numeric scoreboard equipped with an ambient light sensor, select Auto to set the scoreboard to adjust brightness based on surrounding light. This option has no effect on video boards.

18: Scoreboard Definitions

Like previous CTS timers, Gen7 allows the location of scoreboard information to be changed without making physical changes to the scoreboard itself. Click the **Scoreboard Definitions** button to open a screen where a module on which a given data item will appear can be selected.

If a data item is changed to appear on a different module and that module number is already assigned to a different data item, the modules numbers will effectively swap places.

Use to display the relationship between physical modules and mapped channels on the scoreboard.

The physical module number will appear on the left-hand side of each module. This number corresponds to the switch setting on the control card inside the scoreboard.

The channel number will appear on the right side of each module. This number corresponds to the channel number listed in the scoreboard definitions screen.

To blank a module, click the in the module dropdown and make sure to not assign that module to another channel.

NOTE: if using an LED video board with DisplayLink software, leave all definitions at their default values.

19: Keep Finish Times if Lane Turned Off in Reset

When set to Yes, if a lane is turned off while the timer is in the Reset state the last final time for that lane will remain on the scoreboard until the start of the next race.

20: Blank Running Time

Controls what happens to the running time on the scoreboard (video displays only) at the end of a race. Choose to never blank the running time or blank the running time either after all the lanes have finished or after the timer has been reset.

Printing

1: Paper Size

Select the paper size that race results will be printed on.

2: Print Button Action

The Print Button Action sets to show a preview before race results are printed or sets to print directly without showing a preview first.

3: Default Printer
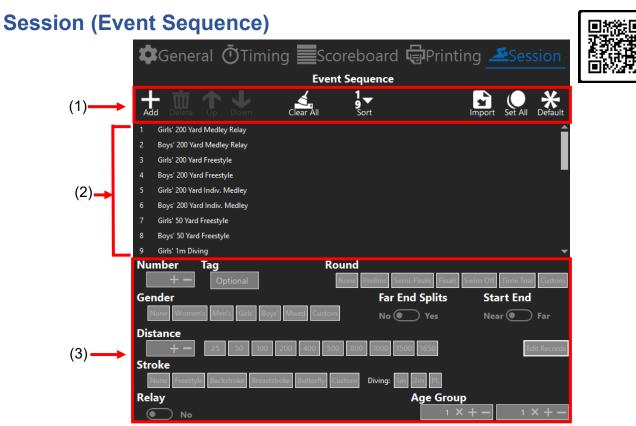
Sets the default printer that results will print to. You can override the default printer from the print preview screen.

4: Auto Print on Reset

Use Auto Print on Reset to enable the system to automatically print race results every time an event is finished, and the timer is put back into the reset state.

Session (Event Sequence)

1: Event Sequence Toolbar

The Event Sequence Toolbar is used to new events, an existing event, move an event or in the sequence of events, and events from the sequence.

Sort

Click to sort the list of events from lowest to highest.

Import

Click to import a .sch file that was exported from your Meet Management software. This option can be used if your Meet Management software does not support a USB connection to Gen7 or if you are using a network share-based Meet Management interface.

Set All
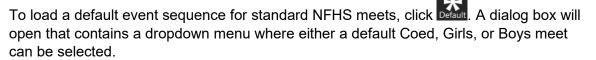
Click to open the **Set property of multiple events** dialog box where settings can be applied to multiple events that meet designated conditions.

Examples: To set all 25-yard events to start at the far end, use the Set Start End line of drop-down menus to set **For All Events** to <= 25yds and **Set Start End** to Far.
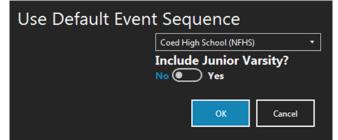
To set all relay events to have splits on the far end, click the **Only Relay** check box in the Set Far End line of options and **Set Far End** to On.

Default

To load a default event sequence for standard NFHS meets, click . A dialog box will open that contains a dropdown menu where either a default Coed, Girls, or Boys meet can be selected.
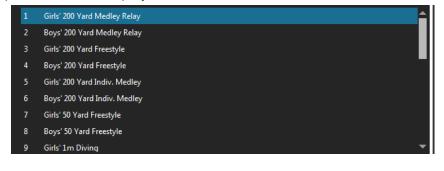
Click **OK** and the Gen7 software will generate a standard NFHS event sequence. If needed, the events can be edited just like any other event.

When the event sequence has been populated. Click save and go back to be taken to the main screen.
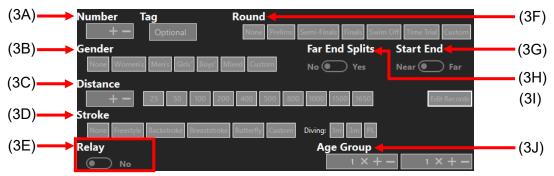
2: Sequence of Events

The Event Sequence section display all loaded/created events for the current session.

3: Event Settings

3A: Number
Adjusts a selected event's number. Use the plus or minus button or type an event number to edit an event's number in the event sequence. This only changes the number; it does not alter the order of events.

3B: Gender
Sets who will be competing. Women's, Men's, Girls', Boys', Mixed, or None to leave it blank. Click custom to enter a custom gender tag.

3C: Distance
Sets the race distance with either the quick select options or the plus and minus buttons. The race distance can also be typed.

3D: Stroke
Sets the stroke type(s) for the selected event. Click custom to enter a custom gender tag.

3E: Relay
Sets if the event is a relay and how many relay swimmers there will be.

3F: Round
Set the type of round for the event, prelims, semi-finals, finals, swim off, time trial, or None to leave it blank. Click custom to enter a custom gender tag.

3G: Start End
Choose which end of the pool the event will start on.

3H: Far End Splits
Select if far end splits are enabled for the event.
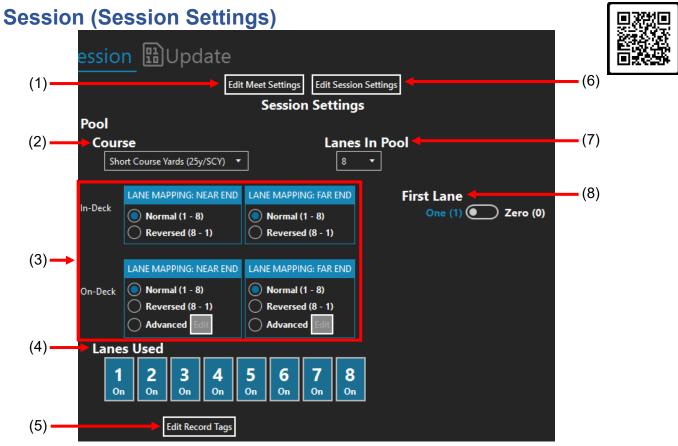
3I: Edit Records
Opens a dialog box where event specific records can be assigned in conjunction with Record Tags (see page 57).

3J: Age Group
Sets the age group that will be competing in the event.

Session (Session Settings)

1: Edit Meet Settings

Click the **Edit Meet Settings** button to open a dialog box that allows the settings for the current meet to be adjusted.

In the Edit Meet Settings dialog box, the meet name, start and end dates, and governing body of the meet can be changed, or you can select to archive the meet. By default, archived meets do not appear in the Create or Select Meet screen when the program starts up.
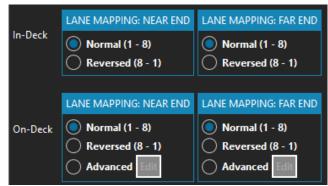
2: Course

Sets the desired course for the session. The drop down contains options for a 25-yard short course, 25-meter short course, or a 50-meter-long course. **Note:** Changing this option may change the number of lengths required to complete a race.

Course

Short Course Yards (25y/SCY) ▼
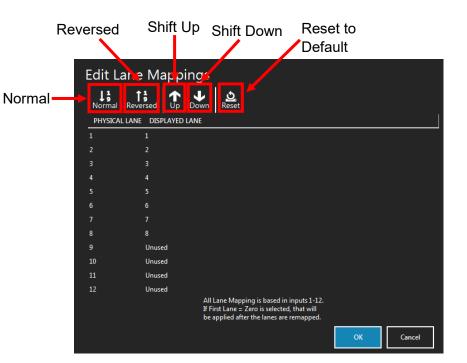
3: Lane Mapping

Lane mapping near end and **lane mapping far end** for both In-Deck (deckplates) and On-Deck (cable harnesses) determines how the lanes are mapped to the timer. **Normal** will map the lanes so that each lane number is displayed as that same lane number. **Reversed** maps the lanes in reverse order. For example: an 8-lane pool mapped in reverse order would display lane 8 as lane 1.

	LANE MAPPING: NEAR END	LANE MAPPING: FAR END
In-Deck	● Normal (1 - 8) ○ Reversed (8 - 1)	● Normal (1 - 8) ○ Reversed (8 - 1)
On-Deck	● Normal (1 - 8) ○ Reversed (8 - 1) ○ Advanced [Edit]	● Normal (1 - 8) ○ Reversed (8 - 1) ○ Advanced [Edit]

If using an On-Deck set up there are different mapping options available. Select **Advanced** and click the **Edit** button to open a dialog box where the lanes can be mapped so they are shifted as well as set to normal or reverse. For example, in an 8-lane pool running 6 lanes, the lanes can be shifted so that lane 2 displays as lane 1, or if also set to reversed, lane 7 would display as lane 1.

Normal   Reversed   Shift Up   Shift Down   Reset to Default

Edit Lane Mappings

Normal Reversed Up Down Reset

PHYSICAL LANE   DISPLAYED LANE

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	Unused
10	Unused
11	Unused
12	Unused

All Lane Mapping is based in inputs 1-12.
If First Lane = Zero is selected, that will
be applied after the lanes are remapped.

OK   Cancel

4: Lanes Used

Lanes for a session can be turned off or on. Click a lane number to toggle between on and off.
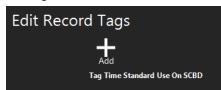
If a lane needs to be switched on or off for an event, it can be done by clicking the lane number on the main screen before the start of the event (see page 20).

5: Edit Record Tags

Click **Edit Record Tags** to open a dialog box where information is added for records that will be displayed in the Records, Time Standards, and Team Scores section of the Main Screen (see page 24).
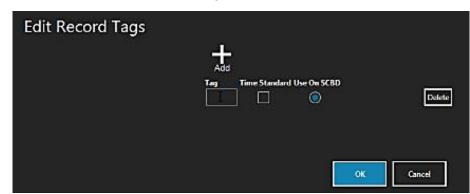
Click the to add a new record tag.

Enter a two letter tag in the **Tag** field for the record that will be displayed in Records section of the Main screen (see page 24) and on the scoreboard. For example: PR for pool record, or WR for world record. The record displayed on the scoreboard is used in conjunction with the Record Breaker Action option in the scoreboard settings screen (see page 43).

The Time Standard check box makes the tag a time standard instead of a record.

Input each events time data for records in the **Edit Records** section of the event settings on the left side of the session screen (see page 53).

6: Edit Session

Edit Session Settings opens a dialog box where the current session can be adjusted.

In the Edit Session Settings dialog box the current session number, and session start time can be changed, and a custom tag assigned to the session can be added or changed.

7: Lanes in Pool

Use the **Lanes in Pool** drop down to select how many lanes there are in the pool for the course that will be used.

8: First Lane

The First Lane setting toggles between the first lane being numbered as 1 or 0 with all subsequent lanes being in sequence corresponding to the selection.

Basic Operation

This section will walk through a tutorial using a sample race to illustrate the basic operation of the Gen7 software and how to address common occurrences that arise during meets.

Tutorial

Our sample race is Event 1, Heat 2, a 200-meter medley relay. Our pool is 10 lanes, 25 meters. This heat only has six teams, so lanes 1, 2, 9, and 10 will be turned off (see page 22), and there will be no far end splits.

Starting the Race

Gen7 Swimming is in the reset state and is ready to begin timing a race (see page 19). The starting official starts the race with the start system, which sounds the horn, lights the strobe and sends the start signal to the timer.

The race can also be started manually clicking the button on the left side of the Timer State section. **ONLY** use this if the timer did not start when the starting official signaled the start.

The touchpads are inactive for a user-defined number of seconds after the start (see page 39). As soon as the touchpads are ready to receive a touch, "ARMED" will be indicated in the Lane Data section (see page 22) for each lane. "N: ARMED" indicates near end touchpads are ready, and "F: ARMED" indicates far end touchpads are ready.

Times Registered

The swimmers have made their turns at the far end of the pool and come in to touch at the near end. The swimmer in lane 5 touches first. The timer beeps at the touch (see page 32) and the number of completed lengths for that lane is displayed. The pad status indicator for lane 5 goes blank and the pad will not accept another touch. The timer beeps as each swimmer touches a pad.

Missed touch (Using +Touch)

The second swimmer in lane 6 has started but the software does not show that the previous swimmer touched the pad. In this situation, the number of completed lengths displayed for lane 6 is 0/8.

As sometimes happens, the first swimmer touched the wall beside the pad, which does not register as a touch.
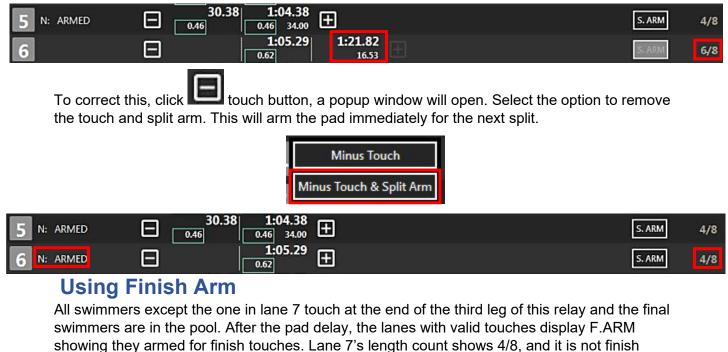
To correct the missed pad touch, press the ⊞ touch button for lane 6. Lane 6 now shows that 2/8 lengths have been completed. The split time will be missing, but subsequent split times and finish time can be recorded.

5		⊟	30.38	⊞		S. ARM	2/8
			0.46				
6	N: ARMED	⊟		⊞		S. ARM	2/8

Note: It is not possible to finish a race using +Touch; races must be finished from the touchpads or backup buttons.

Extra touch (Using − Touch and Split Arm)

The swimmers complete another length. Imagine that the second swimmer in lane 6 is slow getting out of the pool and steps on the touchpad after the pad delay time is up. The pad is armed at this point and the timer registers this as a touch. Lane 6 now shows incorrectly that 6/8 lengths have been completed and that it is on the finish lap.

5	N: ARMED	⊟	30.38	1:04.38	⊞		S. ARM	4/8
			0.46	0.46 34.00				
6		⊟	1:05.29	1:21.82	⊞		S. ARM	6/8
			0.62	16.53				

To correct this, click ⊟ touch button, a popup window will open. Select the option to remove the touch and split arm. This will arm the pad immediately for the next split.

Minus Touch
Minus Touch & Split Arm

5	N: ARMED	⊟	30.38	1:04.38	⊞		S. ARM	4/8
			0.46	0.46 34.00				
6	N: ARMED	⊟	1:05.29		⊞		S. ARM	4/8
			0.62					

Using Finish Arm

All swimmers except the one in lane 7 touch at the end of the third leg of this relay and the final swimmers are in the pool. After the pad delay, the lanes with valid touches display F.ARM showing they armed for finish touches. Lane 7's length count shows 4/8, and it is not finish armed.

7	N: ARMED	⊟	34.47	1:08.77	⊞		S. ARM	4/8	A: B: C:	6	F. ARM
			0.47	0.33 34.30							
8	N: F.ARM	⊟	36.42	1:09.33	1:41.13		S. ARM	6/8	A: B: C:	1	F. ARM
			0.39	0.33 32.91	0.73 31.80						

To prepare the lane for the upcoming finish touch, click the F. ARM button. The length counter still displays 4/8 but pad status display indicates that the pad is armed for the finish. The finish time and place pick will be accurate.

7	N: F.ARM	⊟	34.47	1:08.77	⊞		S. ARM	4/8	A: B: C:	6	F. ARM
			0.47	0.33 34.30							
8	N: F.ARM	⊟	36.42	1:09.33	1:41.13		S. ARM	6/8	A: B: C:	1	F. ARM
			0.39	0.33 32.91	0.73 31.80						

Finishing the race

All swimmers touch their pads successfully at the finish. The timer beeps as each swimmer finishes and displays the place picks in each lane.

3		35.47	1:07.72	1:46.35	2:12.74	S. ARM	2:12.74	A: 2:12.91 B: C:	**6** F. ARM
		0.47	0.45 32.25	0.48 38.63	26.39				
4		33.38	1:06.32	1:45.22	2:10.77	S. ARM	2:10.77	A: 2:10.95 B: C:	**4** F. ARM
		0.46	0.56 32.94	0.43 38.90	25.55				
5		30.38	1:04.38	1:42.77	2:08.97	S. ARM	2:08.97	A: 2:09.18 B: C:	**2** F. ARM
		0.46	0.46 34.00	0.51 38.39	26.20				
6			1:05.29	1:44.08	2:09.84	S. ARM	2:09.84	A: 2:10.03 B: C:	**3** F. ARM
			0.62	0.43 38.79	25.76				
7		34.47	1:08.77		2:12.05	S. ARM	2:12.05	A: 2:12.16 B: C:	**5** F. ARM
		0.47	0.33 34.30		1:03.28				
8		36.42	1:09.33	1:41.13	2:08.13	S. ARM	2:08.13	A: 2:08.24 B: C:	**1** F. ARM
		0.39	0.33 32.91	0.73 31.80	27.00				

As soon as the race is over, click Finished and then Save and Reset. This stores the race results in memory.

After the race, if you wish to post the race results on the scoreboard in place order, go to the Quick Actions menu and select the Post by Place option (see page 27).

Press next heat or next event to prepare the timer for the next race.

Handling Exceptions

Whether a swimmer has failed to touch at the end of a race, or there is a no show to an event, Gen7 makes it easy to handle exceptions that arise during a swim meet. In this section we will look at common exceptions and go over how to handle them.

No Show

If a swimmer is a no show for an event, set the lane to display as a "no show". After the race has started, right click on the lane number you want to update and then click **No Show**.

No show will be displayed next to the lane number.

After the race data has been saved, NS will appear in the "place" column for that lane.

If No Show is accidentally clicked for a lane with a swimmer in it. The Gen7 Timer will still record splits and finishes. Turn the lane back on before saving the event and all the data will be there.

Lanes marked as no show will not display on the scoreboard. When results are transmitted to meet management, the place for that lane will be marked as "NS"

Disqualifying a swimmer:

To disqualify a swimmer, either right click on the lane number of the swimmer who is being disqualified and click **DQ** or use the keyboard short cut "D" followed by the lane number. See page 67 for a list of keyboard shortcuts.

"Disqualification" will appear for about a second and "pending DQ" will appear in the "place" column for that lane.

  ←── Pending DQ

All of the swimmer's touches will be registered, however at the end of the race DQ will be displayed in the "place" column of the DQ'd lane.
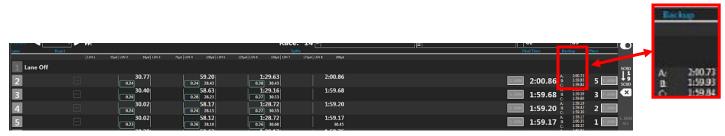
If the DQ was an error, remove the disqualification before the race results are saved by right clicking the lane number and selecting "remove disqualification" or by using the keyboard shortcut "D" followed by the lane number.

Promoting Backups:

Gen7 supports up to 3 backup buttons. The individual back up times are shown for each lane in the "Backup" column at the finish of the race. Displayed as A. B. and C.
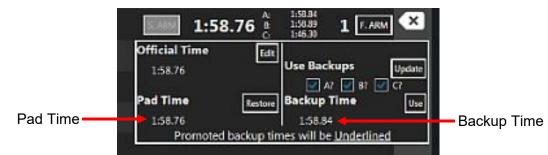
If running two backup buttons the official backup time will be an average of the two times. If running three backup buttons the official back up time will be the time in the middle of the three times.

In the event of a late touch or missed touch at the end of a race, back up times can be easily promoted in place of pad times.

For a late touch, click on the final time. A pop up will show the race time as well as the pad time and the backup time. Click the backup time to promote it. The final time and place columns will be updated as needed.

If the difference between the final time and the calculated backup time is greater than the comparison interval defined in Timing Settings (usually 0.30 seconds), the Final Time column for that lane will show red.
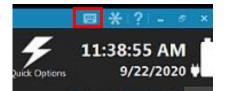
In this instance, click on the red highlighted area. When the pop up opens, click the backup time to promote it and the final time and place columns will be updated.

If no pad touch was registered and only backup times are present a icon will appear next to the registered backup times. Click the icon to quickly promote the backup time.

Keyboard Shortcuts

A list of available keyboard shortcuts can be found by clicking on the keyboard icon in the upper right of the screen.

Keyboard Shortcuts

Next Event	Ctrl + F5
Previous Event	Ctrl + F4
Next Heat	F5
Previous Heat	F4
Manual Start	Ctrl + Shift + Space
Reset Race (must press twice)	Ctrl + Shift + R
Finish Arm All	Ctrl + Shift + F
Clear Lanes	Ctrl + Delete

These shortcuts are a two key sequence: a command key followed by a number key:
   Number keys can be used for lanes 1 - 10 (0 for lane 10)
   For lane 11, use F11 or the 'B' key. For Lane 12, use F12 or the 'C' key

Lane On/Off	L, Num
DQ	D, Num
Split Arm	S, Num
Finish Arm	F, Num
Plus Touch	+, Num or P, Num
Minus Touch	-, Num or M, Num

CLOSE

Troubleshooting

Issue	Solutions
Touchpad, pushbutton or RJP times are not registering.	Use the Diagnostics function to troubleshoot (see **Diagnostics** on page 71)
The interface (tablet or laptop) lost connection with the timer.	The timer will continue running and will finish a race without the user interface. To reconnect, check cables. Restart the software if necessary.
Unexpected behavior in lanes (numbering, lanes off, etc.).	Verify that the settings are correct for your pool for this session (see **Session Settings** on page 51)
Event Sequence not received from meet management software.	1) Event sequences will not be received during a race. Wait until the race is finished and the timer is ready for a new race. 2) Make sure meet management cable is connected to both the meet management computer and the Meet Management port on the back of the Gen7 timer. 3) Refer to your meet management software manuals.
Start system does not start race time.	1) Make sure start system cable is properly attached. 2) Clean connectors. 3) Check cabling. 4) Check start system.
Finish system pad or finish button/backup button hits are not registering.	1) Swimming software must be ready for a pad hit. Ensure that the pad arm indicator is displayed in the appropriate lane(s). 2) Make sure touchpad and button cables are properly and securely connected. 3) Clean connectors 4) Check cabling. 5) Check touchpad(s) or buttons(s).
Scoreboard not working at all.	1) Make sure scoreboard has power and is turned on. 2) Make sure scoreboard is not blanked. 3) Make sure scoreboard cable is properly connected. 4) Check scoreboard cable connectors for corrosion and clean or replace as necessary.

Issue	Solutions
Scoreboard not showing expected results.	1) Make sure scoreboard cable is properly connected.
	2) Check scoreboard cable connectors for corrosion and clean or replace as necessary.
	3) Ensure that scoreboard DIP switches for each module are set to the proper physical address.
	4) Check logical addresses in the Swimming software.
Gen7 Software is unable to connect to Gen7 Timer.	1) Check that the ethernet cable is securely plugged in to both devices.
	2) If connecting via a switch or router, ensure that this device is powered on.
	3) Ensure that your Windows networking settings match your timer settings. For most users, this will be the "Automatic Private IP Address" setting under "Alternate Configuration" under the "TCP/IP v4" properties of your ethernet controller.
	4) Ask your local IT department if there is anything they need to do to get your Gen7 on to your facility network.

Diagnostic Testing

Start and
Stop test

Pre-Meet/ Real
Time drop down

Test Far End
Speed Lights

Detect
Inputs

Test Near End
Speed Lights

Status
key
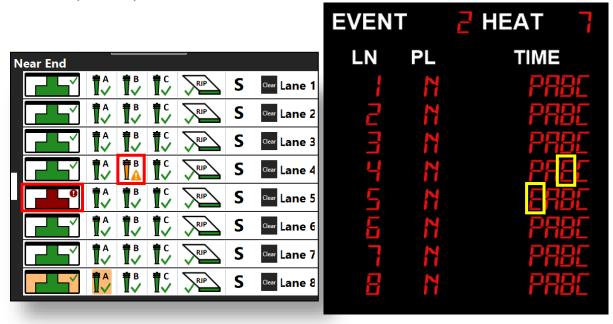
The Gen7 diagnostics helps find issues with both in-deck and on-deck wiring as well as with touchpads, pushbuttons and RJPs. Here are the steps to fully test the entire system:

1. Connect all the hardware that will be used:
   a. If using bulkheads or cable-harnesses, make sure those are plugged in to the appropriate deckplate, wallplate or timer connection.
   b. Touchpads, pushbuttons and RJPs should be plugged in to deckplates or cable harnesses.
2. When the pool is empty, start Real Time diagnostics.

   All inputs should show up as Open

   a. If you see any inputs register as Shorted ⛔, Corroded ⚠️, or Closed ✅, use the table below to determine next steps.
3. After ensuring that all inputs are registering as Open, stop the real-time test and run a pre-meet test.
4. Walk the pool deck and trigger each touchpad, pushbutton and RJP. Each input should show up as Closed.
   a. If any inputs register as Shorted, Corroded or Closed, use the table below to determine next steps.

5. While walking the pool deck the status of each input can be tracked using the scoreboard. Inputs at the far end will show "F" in the place column. Inputs at the near end will show "n" in the place column. Pads show as "P", pushbuttons show as "A", "B", or "C" and RJPs show as "r". If a component has an error, "E" will display in that components place on the scoreboard.

6. The start input can also be tested at the near and far ends, as well as the dedicated start input on the timer itself.
7. After all inputs have been verified, the system is ready to run a meet.

Diagnostic Table

During both pre-meet and real-time diagnostics, the Gen7 screen will show each input in one of 4 states:

	Open	This is the normal state for a touchpad or pushbutton that has not been pressed. If this is displayed after pressing a touchpad or pushbutton, the pad/button should be tested with a touchpad meter (TPM-D). If the pad/button registers as good with the meter, there may be an issue with the deckplate or cable-harness
	Shorted	If this is displayed before pressing a touchpad or pushbutton, it could be a sign that there is a short in the pad/button. If the pad/button is removed and the short goes away, replace the pad/button. Ensure that the deckplate/cable-harness pod is as dry as possible and retest. Test the pad/button with a touchpad meter (TPM-D) and replace if necessary.
	Corrosion	If this is shown after pressing a touchpad or pushbutton, it could be a sign that either the plug or jack is corroded. Examine the plug on the pad/button and clean with rubbing alcohol. Use a cotton-swab and rubbing alcohol to clean deckplate and cable-harness jacks. If this is present without pressing a touchpad or pushbutton, it could be a sign of a shorted input that is also corroded. If the corrosion indicator goes away after retesting with a known-good button, the issue is in the pad/button. If the issue persists, the issue is in the wiring.
	Closed	This is the normal state for a touchpad or pushbutton that has been pressed. If this is present without pressing a touchpad or pushbutton, the pad/button should be tested with a touchpad meter (TPM-D). If the pad/button registers as good with the meter, there may be an issue with the deckplate or cable-harness

Having a known-good pushbutton that is free of corrosion can make diagnosing pad/button issues much easier.

Speedlight Testing

If you are using speedlights, you can use the buttons at the top of the diagnostic view to trigger Near End and Far End speedlights without requiring a start signal.

Input Detection

Gen7 serial deckplates can detect what type of inputs are plugged in to each spot on the deckplate. This operation takes a few seconds to complete but can allow the operator to determine if all expected pads and buttons are plugged in. Missing inputs are given a gray background and mismatched inputs are given an orange background. This option is only available for in-deck systems. It will not function with cable-harnesses.

Routine Maintenance

Connectors

Inspect the cable connectors on the Gen7 back panel every time you plug a cable into the connector(s). Clean as necessary.

To clean cable connectors, put two or three drops of alcohol on a cleaning cotton swab available at almost any electrical supply store, or a folded soft pipe-cleaner, and insert the swab into the connector. **Pull the swab straight out**. Move the swab to the next section of the connector and repeat. **Do not slide the cotton swab along the inside of the connector**. Damage to the contacts could result. Rinse the connectors with a damp cotton swab, and then dry with a dry swab using the same motion. **Never use corrosive cleaners such as steel wool or corrosive chemicals such as Lime-A-Way® to clean these connectors!**

Note: In order to reduce corrosion on the touchpad connectors, it is advised that you power off the touchpads when they are not being used.

Case
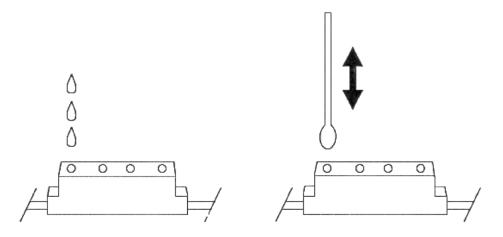
The Gen7 case is made of high-impact plastic. Use any neutral detergent to clean the case. Do not use alcohol, thinner or other solvents. These products can change the color or otherwise damage the case.

Cables

Inspect all cable and in-deck connectors for corrosion before use. All connectors must be corrosion-free for the timing system to operate properly.

To clean cable or in-deck connectors, rubbing alcohol, silicone grease and cotton swabs will be required. Follow the instructions below.
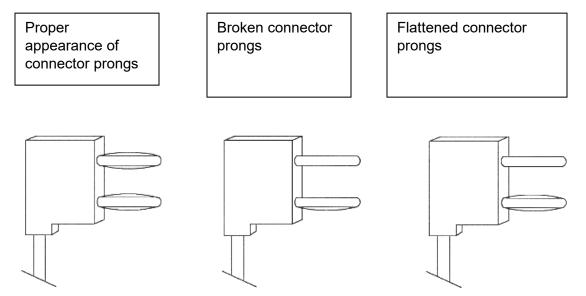
1. Pour a few drops of rubbing alcohol into the cable or deck plate jacks and let it sit for several minutes to dissolve corrosion.
2. Insert a cotton swab into the jack and use a plunging motion to clean the jack.

3. Rinse the jack with a damp cloth swab and dry it with a dry swab.
4. Apply a small amount of silicone grease to a clean cotton swab and insert into the jack.

Touchpads and Buttons

Make sure all connectors fit snugly into the cable harness. Connectors with broken prongs do not fit properly. Check connector prongs for corrosion and clean or replace connectors as necessary. Refer to the to your touchpad manual for detailed care instructions.

| Proper appearance of connector prongs | Broken connector prongs | Flattened connector prongs |

Start Systems

Make sure all connectors fit snugly into the cable. Connector prongs that are broken fit loosely.. Check connector prongs for corrosion and clean or replace connectors as necessary. Refer to your Start System user's manual for detail on its proper maintenance.

Scoreboard

Inspect the scoreboard data cable connectors for corrosion and broken or frayed wires. Clean or replace as necessary. Consult your scoreboard manual for any maintenance needed.

Appendix A: Specifications

Environmental

Operating temperature: 0°C - 45°C, storage temperature -20°C - 70°C
Humidity: 90% (non-condensing)
Altitude: 0 to 3000 m

Electrical

Use Class 2 power supply for the correct type of power outlet in your area: models R-920-055, R-920-056, R-920-057 or R-920-058 (12 VDC @ 7.5A) only.
Battery: NiMH, rechargeable, 7.2V nominal, 10,000 mAh.
Battery operating time: up to 6 hours of normal use with small 10 node in-deck system and/or cable harnesses; up to 3 hours of normal use with large 60 node in-deck system

Input and Output Connections (from top left to bottom right)

Scoreboard output ● RS-485, differential pair, 3V, 300 mA max. Power 12V@2.5A max, short cut protected.

Scoreboard output ■ RS-485, differential pair, 3V, 300 mA max. Power 12V@2.5A max, short cut protected.

Scoreboard output ◆ RS-485, differential pair, 3V, 300 mA max. Power 12V@2.5A max, short cut protected.
USB B to PC (CTS expansion port): Bidirectional, powered by PC
USB B to Meet Management PC: Bidirectional, powered by PC
USB A: Bidirectional, powered by device, 5V, 500mA
Ethernet port: 1GBit max, isolated
Start input: 3.3V @1.7mA
Speaker input/output: Only to be used with a Colorado Time Systems start system and speakers. Do not use other power amplifiers or speakers other than specified by Colorado Time Systems.
Timing connections: In-deck 12V@2.5A max, short cut protected. On-deck near and far end together 12V 200mA, short cut protected
Power input: 12V, 7A max. Powers device and charges battery.

Installation/Maintenance

This product is intended to be used in an indoor or outdoor swimming pool environment. When the timer is operated in the US it must be used in accordance with the National Electric Code. When the timer is operated elsewhere it must be used in accordance with all appropriate national and local electrical codes and regulations for the country of installation. Run the Gen7 Serial Timer in a safe distance from the pool where it won't be splashed. If the Gen7 Serial Timer has been in a cold location, allow it to come to room temperature in a non-humid area before use to prevent condensation in the unit.

Using the Gen7 Timer in a manner not specified by Colorado Time Systems may cause the protection provided by the equipment to be impaired. There are no user serviceable parts in the Gen7 Timer. Do not attempt to open the enclosure. Removing or tampering with the labels covering the screws on the bottom of the unit voids the warranty.

Warranty is void if the product is misused, altered, tampered with or is installed or used in a manner that is inconsistent with Colorado Time System's written recommendations, specifications and/or instructions, or fails to perform due to normal wear and tear.

Gen7 serielles Zeitmeßgerät

Umgebung

Betriebstemperatur: 0°C - 45°C. Lagertemperatur -20°C - 70°C
Luftfeuchtigkeit: 90% (nicht kondensierend)
Höhe: 0 bis 3000 m

Elektrische Daten

Nur mit Klasse 2 DC Stromversorgungs-Modellen R-920-056, R-920-057 oder R-920-058 (12 VDC @ 7.5A), passend für die korrekten Steckdosen Ihres Landes zu verwenden
Batterie: Nickelmetallhydrid, wiederaufladbar, 7,2V, 10.000 mAh
Betriebsdauer batteriebetrieben: bis zu 6 Stunden normalen Gebrauches mit einem kleinen eingebauten System (10 Deckverbindungen) und/oder Kabelsträngen, bis zu 3 Stunden mit einem großen eingebauten System (60 Deckverbindungen).

Eingänge und Ausgänge (von links oben nach rechts unten)

Anzeigetafelausgang 🟢 : RS-485, differenzielle Leitungen, 3V, 300 mA max. 12V, 2,5A Stromversorgung, kurzschlussgeschützt.

Anzeigetafelausgang 🟦 : RS-485, differenzielle Leitungen, 3V, 300 mA max. 12V, 2,5A Stromversorgung, kurzschlussgeschützt.

Anzeigetafelausgang ◆ : RS-485, differenzielle Leitungen, 3V, 300 mA max. 12V, 2,5A Stromversorgung, kurzschlussgeschützt.
USB B zu PC (CTS Expansionsport): Bidirektional, versorgt vom PC
USB B zu Wettkampf Management PC: Bidirektional, versorgt vom PC
USB A: Bidirektional, versorgt vom Zeitmeßgerät
Ethernet Verbindung: 1GBit max, isoliert
Start Eingang: 3.3V @1,7mA
Lautsprechereingang/ausgang: Nur mit einem Startsystem und Lautsprechern von Colorado Time Systems zu verwenden.
Zeitmeßverbindungen: Für eingebautes System (in-deck) 12V@2,5A max, kurzschlussgeschützt. Für nicht eingebautes System (on-deck) 12V@200mA max, kurzschlussgeschützt.
Stromversorgungseingang: 12V, 7A max. Versorgt das Gerät und lädt die Batterie, nur mit Klasse 2 Gleichstromstromversorgungs-Modell R-920-056, R-920-057 or R-920-058 (12 VDC @ 7,5A) zu verwenden

Bestimmungsgemäßer Gebrauch

Dieses Produkt ist für die Benutzung in Swimming Pools für innen und außen bestimmt. Die Installation und Verwendung des Gen7 Zeitmeßgerätes muß gemäß den landesüblichen Vorschriften erfolgen. Das Gen7 Zeitmeßgerätes sollte in einer sicheren Entfernung vom Pool verwendet werden damit es nicht angespritzt wird. Wenn das Gerät im Kalten gelagert war muss es vor Verwendung auf Raumtemperatur gebracht werden um Kondensation zu vermeiden.

Installation/Wartung

Wenn das Gen7 Zeitmeßgerät nicht so installiert und verwendet wird wie von CTS spezifiziert, können die Funktion und die Schutzvorrichtungen beeinträchtigt.werden. Es gibt keine weiteren notwendigen Service-Wartungsarbeiten für das Gen7 Zeitmeßgerät als die routinemäßigen Reinigungsarbeiten wie sie im Handbuch beschrieben werden. Versuchen Sie nicht, das Gerät zu öffnen. Wenn die Aufkleber die die Geräteschrauben abdecken entfernt oder verletzt werden, erlischt die Garantie.

Appendix B: Networking Information

This appendix is primarily intended for network administrators and users who need to configure specific network settings.

The Gen7 Timer and the control laptops need to sit on the same physical network. They do not necessarily need to all be on Ethernet. The laptops can be hooked up via Wi-Fi as long as the Wi-Fi for the laptops and the Ethernet for the timers share the same network. This is necessary to facilitate the auto-discovery protocol where the software on the laptops automatically finds the timer.

The timer has its Ethernet MAC address printed on a sticker on the bottom of the unit if this is necessary for DHCP registration.

If there is a DHCP server present on the network, the Gen7 timer will receive its IP configuration from that server. If no DHCP server is present, or if no address is returned, the timer will self-assign an Automatic Private IP Address in the 169.254.xxx.yyy range. This range coincides with the Automatic Private IP Address range that Windows uses.

Because both the laptop and the Gen7 Timer default to Automatic Private IP Address, you can plug an Ethernet cable directly between the two.

See below for information on configuring static IP addresses.

Firewall Exceptions

Here are the open TCP/UDP ports for the various services run by the timer:
> TCP 22: SSH (used for diagnostics and maintenance)
> TCP 7105: Primary Gen7 Control Service (Encrypted with authentication)
> UDP 5353: Zeroconf Networking (used for auto-discovery)

These ports need to be unblocked within the subnet but do not need to be routed beyond the subnet.

For security purposes, the SSH service does not allow a remote root login and the password for the user login is randomly assigned at the factory and is not shared by any other Gen7 device.

The Gen7 software installation package automatically enters firewall exceptions for the local Windows firewall.

Gen7 Network Config Utility

Starting with v1.3.0 (June 2019), CTS provides a Network Config Utility to set various network options for the Gen7 Timer. This program is installed when the main Gen7 Swimming installer is run. It requires a USB connection to the timer.

Here are the steps required:

1. Set up Gen7 Timer with nothing but the power cable connected
2. Turn on the timer and let it boot completely (to the pulsing sweep)
3. Connect the laptop and timer via USB connected to the monitor port on the timer (NOT THE MM PORT)

4. Start "Gen7 NetworkConfig" located in the "Gen7 Swimming" folder in the start menu

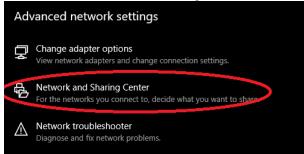5. Select **Static (Manual)** and enter the following values:

a. IP Address and Subnet Mask are required. Default Gateway and Name servers are not

6. Click **Save Settings to Timer**
7. Close the Gen7 Timer Network Configuration utility
8. Disconnect the USB cable
9. Connect the timer and laptop via Ethernet
10. If you need to set a static IP for the laptop, follow the steps outlined below.
11. If, after starting the Gen7 Swimming software, the timer is not automatically found, select **Manual** and enter the timer's assigned IP address

Below you'll find helpful information for changing Windows IP Settings. Please note, changing your network settings can prevent you from accessing the internet.

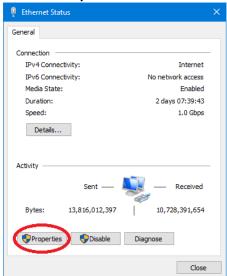# Settings Windows to use an Automatic Private IP Address

1. Open the Settings App (click the Gear Icon ⚙️ in the Start Menu)
2. Select "Network and Internet"
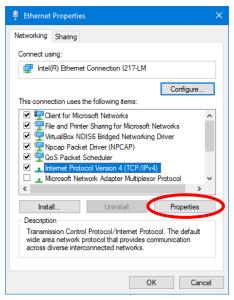3. Under "Advanced network settings" click **Network and Sharing Center**

4. In the **Network and Sharing Center** window, click the link that says "Ethernet"

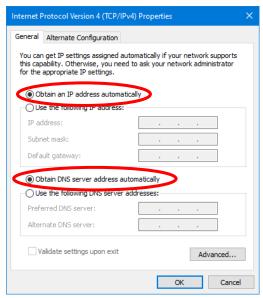5. Click the **Properties** button

6. Select the item named "Internet Protocol Version 4 (TCP/IPv4)

7. Click **Properties**

8. Make Sure "Obtain IP address automatically" and "Obtain DNS server address automatically" are both selected.

9. In the tab labeled "Alternate Configuration", make sure "Automatic private IP Address" is selected.

10. Click "OK" on all open windows.

support@coloradotime.com
+1 970-667-1000

Settings Windows to a Static IP

Static IP addresses can help increase the reliability of the network connectivity with your Gen7 Timer. When set to static IP addresses, both the timer and the laptop are immediately ready for connection (as opposed to needed 30+ second for the automatic private assignment to take place).

Generally, your IT department will provide you with IP addresses for both the timer and laptop. If you do not have an IT department, you should proceed with caution. Changing your network settings can prevent you from accessing the internet.

1. Follow steps 1-7 above
2. Make sure "Use the following IP address" is selected
3. Enter the IP address and Subnet mask provided by your IT department
   a. Default gateway and DNS servers are not required

4. Click "OK" on all open windows.

Recommended Addresses for a standalone Gen7 network

If you want to create a small network just for your Gen7 Timer and laptop, CTS recommends the following IP addresses:

- Gen7 Timer: 192.168.1.101
- Laptop: 192.168.1.102

Set both devices to use a subnet mask of 255.255.255.0.

Appendix C: Athlete Name Integration

Starting with v2023, Gen7 Swimming supports loading Swimmers' Names for display on both the operator's screen and transmission to an LED video board. This integration removes the need for a connection between meet management software and the DisplayLink Plus (DL+) computer. Support is offered both for pre-loaded names (via SCB files) and live names (via UDP network connections). This appendix will describe the operation of both options.

In addition to Gen7 Swimming v2023, you must be running DL+ v4.6.0 or greater and must be using an RS-485 connection between the Gen7 Timer and the DL+ Computer. Swimmers' Names Integration is not supported on RS-232 connections. If you would like more information about upgrading from RS-232 to RS-485 connections, please contact your CTS Sales Representative.

Pre-Loaded Names (SCB Files)

Swimmers' Names can be pre-loaded into the Gen7 Timer using the same SCB files that are used to pre-load names to DL+. In addition to sending the names to an LED video board, the names will display in the Gen7 software. This can be very helpful for the Gen7 operator to follow along with the meet.

The steps to load names are as follows:

1. Export the SCB files from the meet management software.
    a. Consult the documentation from your meet management vendor.
2. Copy the exported files to a USB Flash drive and insert that drive into the Gen7 computer.
3. Open the "Quick Options" menu in the Gen7 software.
4. Click "Load Scoreboard Names".

5. Navigate to the USB flash drive and click "Select Folder".
6. The Gen7 software will load all SCB files found in the selected folder.
7. Be sure to click "New Meet" in the Swimming Tab in DL+ to clear out any old data.

Names are stored on a per-session basis. If names need to be cleared from the session, click the "Clear Scoreboard Names" button.

Live Data (UDP Connection)

Gen7 Swimming can establish a UDP network connection with the meet management software. This allows Swimmers' Names to be transferred over your local network. For this to work, the computer running the meet management software must be attached to the same subnet as either the Gen7 Timer or the Gen7 computer. The UDP connection cannot be routed between subnets.

Gen7 Setup

1. Open the Settings Screen and navigate to the General Tab
2. Select the appropriate option in the drop-down labelled "UDP Scoreboard Names".

   a. If the Gen7 Timer and MM software are on the same subnet, select "Timer".
   b. If the Gen7 computer and mm software are on the same subnet, select "This Computer".
   c. If all three devices are on the same subnet, select either option; the end result will be the same.
3. Click "Save" to return to the main screen.

Meet Manager Setup

As of this writing, only Hy-Tek Meet Manager for Swimming supports UDP scoreboard data. Additionally, you must own the "Alpha Scoreboard" license option.

1. In the "Set-up" menu, click "Alpha Scoreboard Interface".
2. Select "Generic" and "UDP Ethernet" and click OK.

3. From the "Run" screen, open the "Interfaces" menu, and select "Set UDP Port and IP Address" from the "Scoreboard" sub-menu.

a. Enter port 60287 in the "Remote Scoreboard Port" box.
b. If you selected "Timer" in the "UDP Scoreboard Names" drop-down in your Gen7 Settings, enter the IP address of the timer. This can be found in the lower-left corner of the Gen7 software screen.
c. If you selected "This Computer" in the "UDP Scoreboard Names" drop-down in your Gen7 Settings, enter the IP address of your Gen7 Computer. Methods for finding this vary by Windows version.
4. Click OK.
5. Once your events are seeded, you will need to send an initial start list to Gen7. Press CTRL+F10 from the Run Screen to send the start list for the current heat.
a. After you have sent the initial start list, Gen7 will have a bi-directional connection to Meet Manager.
b. At this point, Gen7 will request a new start list every time the event and/or heat are changed.

Notes

As of v2023, Gen7 Swimming only supports Swimmers' Names via the UDP connection. If Event Results or Team Scores are needed, a serial connection between the meet management software and DL+ will be required
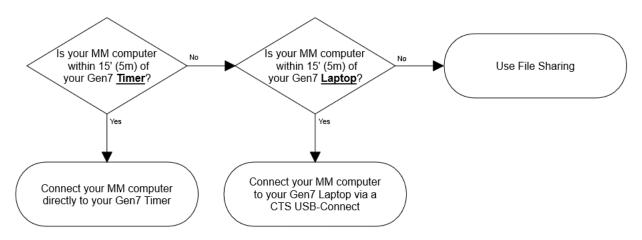
Appendix D: Meet Management Connectivity

Choosing your connection

The Gen7 Timer offers two primary methods for connecting with Meet Management software:

1) a USB connection between the meet management computer and the Gen7 system
2) network-based file sharing between the meet management computer and the Gen7 system

Both options provide for the same data to be exchanged between your meet management software and the Gen7 system. Which option you choose depends mostly on where you wish to set up your timer and your meet management computer.

USB Connection: General Information

The USB Connection option offers two different connection methods: USB to Timer and USB to Gen7 Laptop. More details on each are available below.

Regardless of which method you choose, the USB Connection option requires no additional setup within the Gen7 software. There are no settings that need to be enabled in order to activate the connection.

If you are experiencing issues, you can press the "Cycle MM Ports" button in the **Quick Options** menu to force the Gen7 Timer to reset the internal hardware.

Once the connection has been established, your meet management software can request race results from the Gen7 timer. Race results are made available to meet management as soon as you press "Save and Reset." You can also use your meet management software to download an event sequence to the Gen7 timer. This ensures that your timer is configured to match the event program that you have defined in your meet management software.

USB Connection: USB to Timer

You can connect a USB cable from your meet management computer directly to the Gen7 timer. On the back of the Gen7 timer, there is a USB port (Type B) with an icon depicting a stopwatch and report; this is the meet management port.

Your meet management computer will recognize the timer as a virtual COM port and assign it a port number. You can find this port number by running Device Manager on the meet management computer. You'll need to provide this port number to your meet management software.

USB Connection: USB to Gen7 Laptop

You can connect your meet management computer to your Gen7 interface laptop using the USB-Connect device offered by CTS. This device allows two computers to be connected via virtual COM ports. In effect, it simulates a 9-pin serial connection with a null modem except that it is entirely USB.

Your meet management computer will recognize the USB-Connect device as a virtual COM port and assign it a port number. You can find this port number by running Device Manager on the meet management computer. You'll need to provide this port number to your meet management software.

You must have the USB-Connect device plugged in to your Gen7 laptop before you start the Gen7 Swimming software.

File Sharing

You can exchange data between your meet mangement software and your Gen7 system using standard Windows® file-sharing. Both the Gen7 laptop and the meet management computer need to be connected to the same network. Both machines also need access to the same file share. This can either be a folder on one of the two machines that is shared with the other machine or it can be a file share on a third machine that both the Gen7 laptop and meet mangement computer have access to.

Once a race has been saved and the timer has been reset, the Gen7 software will save a copy of the race results to the specifed file share. Your meet management software will be able to import results directly from this file share.

You can also export the event sequence from your meet mangement software so that it can be imported in to your Gen7 timer. This ensures that your timer is configured to match the event program that you have defined in your meet management software.

You'll need to enable "Meet Management File Export" in the **General** tab of Gen7 Settings. You will also need to specify the location of the file share. Consult the documentation of your meet management software provider for more information on how to enable and use file sharing within your meet management software.

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Customer Service Department
www.coloradotime.com
Email: support@coloradotime.com
Phone: +1 970-667-1000
Toll Free U.S. and Canada 800-287-0653
Fax: +1 970-667-1032