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Welcome to Gen7 timing. The software interface puts intuitive control of all levels of competition at your fingertips. A Windows laptop or tablet is the primary user interface with connectivity to the timer via Ethernet or wireless.

The LEDs on the front of the timer indicate data traffic and the state of the timer, as described above.
Gen7 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.
The in-deck and on-deck connections are different from each other on the serial timer.

**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.

**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. When the software starts, it will ask which of the pre-configured course setup options you wish to use. Course setup options are configured at the time of installation. If additional course setups are required, please contact CTS support.

Connect the start system directly to the timer or to a start node in the wall or deck using the color-coded cable with the green keyway.

Connect other equipment such as touchpads, pushbuttons and relay judging platforms to the deckplates at each lane. Use the Diagnostics function (“Settings- Diagnostics” starting on page 20) to quickly confirm that all equipment is in the correct location and plugged in.
The legacy timer supports in-deck and on-deck systems via 50-pin (and 14-pin) connectors labelled for near end and far end. These are the same as the System 6, System 5 and System 4000; the Gen7 legacy timer is a direct replacement for any existing CTS timing console. It allows you to fully utilize your existing CTS equipment.

For on-deck systems: plug your cable harness directly into either connector for the appropriate end on the timer. If you are using a primary and backup harness, you’ll need to use both connectors for the appropriate end.

For in-deck systems: connect the near end and far end connectors on your timing wallplate to the back of the timer using a CHI-xx-CPUA cable. If you have a 12-lane pool, you will also need to connect the CHI12-xx cable.

Use the Diagnostics function (starting on page 20) to quickly confirm that the touchpads are plugged in at the correct locations.
Software Interface

Connect Interface Computer to Timer
The Gen7 Timer supports network connections via Ethernet. The PC or Windows Tablet needs to be connected to the same network as the Gen7 Timer. The connection on the interface side can be done via Ethernet or WiFi. When the software starts, it will attempt to find the timer automatically. If that fails, you can specify an IP address manually.

If there is a network failure during operation, the software will automatically try to reconnect to the timer. If that fails, it will notify you so that additional troubleshooting steps may be taken.

Regular Operation
Each time you open Gen7 Swimming software, you need to either create a new meet or open an existing one (see "Create or Select Meet" on page 6). The first time you open Swimming, create a sample meet.

During an event, you will focus on the Main screen (see "Main Screen" on page 9) for the current event and heat, and on the Race Data screen (see page 12) for completed events and heats. You can use the Quick Options tab (see page 10) to quickly change settings that many users may want to change during a meet.

The area at the top of the screen immediately to the right of the Gen7 logo displays running time during an event. Click in that area to start the process of resetting the timer for the next race.

Event Setup
Before an event, and certainly before the first event, open the sample meet and enter the settings (starting on page 13) for your facility.

On the Session Settings tab: click the “Set These as Session Defaults” to save the pool configuration choices for future meets.

When you set up a new meet, go to the Settings screen and adjust for any variables that apply to that meet.
Create a new meet or select an existing one.

**New Meet:** If creating a new meet, you must enter a meet name.

**Dates:** The start and end dates will default to today; you can change those if necessary.

**Governing Body:** (optional) Select the governing body whose rules this meet will follow.
Create New Session

If you create a new meet, you will also need to create a new session.

**Session Number:** (required) You cannot re-use an existing session number. To edit the **start time**, double-click on the text or click the calendar icon.

You may **tag** this session with a text string. This will be used on-screen and on printouts (e.g., you can designate Semifinal A and Semifinal B)
If you have a serial timer, select the **pool setup** based on the connect nodes that are plugged in. This is not available on the legacy timers.
Main Screen

Change current Event/Heat: Select current event and heat, add heats. You can also adjust race distance here when the Event Navigation Mode is set in the Quick Options menu.

Records and Time Standards for Current Heat: Displays records and time standards for the current event. Enter records and time standards in Settings -> Session. Choose Edit Record Tags on the right side of the screen under pool options.

Team Scores: Displays team scores; click to edit.

Access Lane Operations: Click the lane number to access operations for that lane (on/off, DQ, split arm, etc.)

Final Time Adjustments: After a lane has finished, click the final time in that lane to make adjustments if necessary, including promotion of backup buttons in case of a missed touch.
Click the lightning bolt icon at the top of the screen to access the Quick Options tab. From here, you can quickly change settings that many users may want to change during a meet, including turning far end splits on or off and setting the scoreboard state.
About Screen

Click [GEN7] at the top of the screen to access software version information, open source license information, and user feedback form.

Use the **Send Feedback** button to share your ideas with us.

**Gather Logs:** This allows you to collect information to assist a CTS Customer Service Technician to troubleshoot any issues.
Race Data

Select Event and Heat: Click an event title to see heats for that event. Click a heat number to see the results from that heat.

Access Lane Operations: Click the lane number to access operations for that lane (DQ, no show, exhibition).

Final Time Adjustments: After a lane has finished, click the final time in that lane to make adjustments if necessary, including promotion of backup buttons in case of a missed touch.
Default Governing Body for New Meets: This is the default governing body that is selected when a new meet is created. If necessary, edit the governing body for existing meets in the session screen.

Enable/Disable User Interface Animations: By default, screen transitions have an appear/disappear effect. Turn them off for faster navigation.
Settings: General

You can choose the accent color for your screen.
**Settings: Timing**

**Primary Finish:** Sets whether the system will use touchpads as the primary mode of finish or only push buttons. When using only push buttons, the lanes will not record split times but only final times.

**Start End:** Sets which end to accept a start input for even length races and odd length races.

**Timing Resolution:** Sets the number of places after the decimal to which times are recorded. Most governing bodies require this to be set to hundredths. Changing this will only affect races that have not yet been run. Times for completed races have already been truncated according to the setting at the time of the race.

**Start Reaction:** Sets the time window in which to record start reaction times using RJP for starting block starts and touchpads for backstroke (in water) starts.

**Pad Delay:** Sets the near end and far end pad delays. After a touch, the pad will not register another touch during the delay.

**Relay Judging Interval:** Sets the window, positive and negative, around a touchpad signal that a relay judging platform signal is considered valid. This is the window of time in a relay between the incoming swimmer’s touch and the next swimmer’s departure.

**Backup Comparison Interval:** Sets the range outside of which the pad/backup differential is considered suspect.
Settings: Scoreboard

**Split Display Time**: Sets how long a split is visible on the scoreboard.

**Split Display Mode**: Selects whether to show cumulative or subtractive splits, or both. If both are shown, cumulative will show first followed by subtractive.

**Two Digit Lane/Place Numbers**: This setting only affects pools with 10 or more lanes.
For scoreboards that only have 1 digit for lane and 1 digit for place, use it to select whether lane and place numbers greater than or equal to 10 are displayed as 0, 1, 2 or as A/b/C.
To display both digits (10, 11, 12) on scoreboards capable of this (numeric boards with 10 digits per line or video boards), set this to A/b/C.

**Clear Lanes on Next Race**: When selected, places and times will automatically clear when you change the event or heat while the timer is reset for the next race.

**Show Start Reaction**: When enabled, start reaction times (both forward take-off with RJP’s and backstroke take-off with touchpads) will be displayed at the start of the race. NOTE: Backstroke start assist devices are likely to bump the touchpad when retracting, which will skew this data.

**Post Places**: Selects whether places are posted at each split or only at the final time.

**Record Breaker Action**: Selects whether the scoreboard blinks the time of the fastest swimmer to break a record.

**Lengths Count Direction**: Selects the direction for the length counter on the scoreboard.

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Wireless Settings: Set the Channel and PAN to match the values set on your wireless scoreboard or scoreboard adapter.

Scoreboard Self Test: When enabled, the scoreboard displays a pattern designed to test the functionality of each numeric digit.

Wireless RSSI: When enabled, the scoreboard enters a special test mode displaying the signal strength of the incoming wireless signal (the higher the number, the poorer the signal).

Time of Day Options: Various options for setting and displaying the time of day on the scoreboard.

Scoreboard Definitions: Edit which data are displayed on which line of the scoreboard (must be set to defaults for proper operation with DisplayLink Plus).
Settings: Printing

**Paper Size:** Options are Letter or A4.

**Print Button Action:** When you press the print button, you can either print directly or you can preview the report before printing it or saving it to a PDF.
**Sequence of Events for this Session:** Use to add, edit, delete, rearrange the event sequence for this session. NOTE: the actual event sequence is determined by the order of the events on this screen and not necessarily the numeric event numbers.

**Add Default Events:** Add events from one of the pre-defined event sequences.

**Edit Properties of the Selected Event:** Click to change properties of the selected event. If the event already has heats completed, those heats will NOT be modified.

**Pool Course Selection:** Select 25y, 25m, or 50m to match the pool setup for this session.

**Lanes in Pool:** How many lanes are in the pool?

**Lane Number:** Do the lane numbers start counting from 1 or 0?

**Lanes Used:** Are there lanes that should be turned off by default? Click a lane to toggle it on or off.
Settings - Diagnostics

Diagnostics screen before results

Diagnostics screen with results
The diagnostics screen is designed to help find problems in your in-deck and on-deck connections. Common problems detectable via the diagnostics screen include shorts (water inside electrically sensitive components) and corrosion (oxide buildup which prevents electrical current from flowing without impedance). You can also use the diagnostics screen to perform a “pre-meet” check without having to run a test race.

Pre-Meet Check
1. Select “Pre-Meet” from the drop-down
2. Press “Start Test”
3. Walk your pool deck triggering each input (touchpad, pushbutton, RJP)
   - RJPs in a legacy system are connected to the same input as push button A and do not register separately.
   - In a serial system, the inputs for RJP and button A are independent.
4. Check that each connected input shows a green checkmark.
5. Perform the required remedy for any shorted or corroded inputs

Real-Time Check
This mode allows you see the input status change in real time. It is particularly useful if you have an extra person available to help with diagnosis.
Follow the same basic steps listed above, focusing on shorted or corroded inputs

Remedies
No Signal: Check the cable and check that the device is firmly plugged in.

Shorted touchpad: Check the air with a touchpad meter (TPM-D).

Shorted pushbutton: Check for water in it by pushing the plunger. If has become full of water, replace it.

Corrosion: Clean the connector prongs using alcohol and a cotton pipe cleaner, and re-test. If it continues to show corrosion, replace the banana plug. At some point the touchpad, pushbutton or RJP may need to be replaced.
## Troubleshooting

<table>
<thead>
<tr>
<th>Issue</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touchpad, pushbutton or RJP times are not registering</td>
<td>Use the Diagnostics function to troubleshoot (see page &quot;Settings-Diagnostics&quot; on page 20)</td>
</tr>
<tr>
<td>The interface (tablet or laptop) lost connection with the timer</td>
<td>The timer will continue running and will finish a race without the user interface.</td>
</tr>
<tr>
<td></td>
<td>To reconnect, check cables. Restart the software if necessary.</td>
</tr>
<tr>
<td>Unexpected behavior in lanes (numbering, lanes off, etc)</td>
<td>Verify that the settings are correct for your pool for this session (see page “Settings: Session” on page 19)</td>
</tr>
<tr>
<td>Event Sequence not received from meet management software.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>3) Refer to your meet management software manuals.</td>
</tr>
</tbody>
</table>
Appendix A: Specifications

Serial Timer 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; model R-920-055 (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.
- USB B to PC (CTS expansion port): 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, 8A max. Powers device and charges battery, power supply model R-920-055 only

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.

Replacing of the fuse or similar servicing shall be performed only while the unit is disconnected from the source of supply. Using the Gen7 Serial Timer in a manner not specified by Colorado Time Systems may cause the protection provided by the equipment to be impaired. Other than routine cleaning, as described in the Gen7 Serial Timer user manual, there are no user serviceable parts in the Gen7 Serial Timer.
Legacy Timer Specifications

Environmental
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; model R-920-055 (12 VDC @ 7.5A) only.
Battery: NiMH, rechargeable, 7.2V nominal, 10,000 mAh.
Battery operating Time: Up to 6 hours of normal use

Input and Output Connections (from top left to bottom right)
Scoreboard output : RS-232, ±12V, 60mA max
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
Timing inputs: Primary/Backup/Near End / Far End: 98 inputs in 8 connectors, each 3.6V @1.8mA
Power input: 12V, 8A max. Powers device and charges battery, power supply model R-920-055 only

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 Legacy Timer a safe distance from the pool where it won’t be splashed. If the Gen7 Legacy 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.
Replacing of the fuse or similar servicing shall be performed only while the unit is disconnected from the source of supply. Using the Gen7 Legacy Timer in a manner not specified by Colorado Time Systems may cause the protection provided by the equipment to be impaired.
Other than routine cleaning, as described in the Gen7 Legacy Timer user manual, there are no user serviceable parts in the Gen7 Legacy Timer.
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 Stromversorgung Modell R-920-056 (12 VDC @ 7.5A) 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 Grünes LED: RS-485, differenzielle Leitungen, 3V, 300 mA max. 12V, 2,5A Stromversorgung, kurzschlussgeschützt.
Anzeigetafelausgang Blaues LED: RS-485, differenzielle Leitungen, 3V, 300 mA max. 12V, 2,5A Stromversorgung, kurzschlussgeschützt.
Anzeigetafelausgang Schwarzes LED: 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
Zeitmeßverbindungen: Für eingebautes System (in-deck) 12V@2,5A max, kurzschlussgeschützt. Für nicht eingebautes System (on-deck) 12V@200mA max, kurzschlussgeschützt.
Stromversorgungseingang: 12V, 8A max. Versorgt das Gerät und lädt die Batterie, nur mit Klasse 2 DC Stromversorgung Modell R-920-056 (12 VDC @ 7,5A) zu verwenden

Installation/Wartung

Wenn das Gen7 Zeitmeßgerät nicht so installiert und verwendet wird wie von CTS spezifiziert, kann die Funktion beeinträchtigt werden. Es gibt keine weiteren notwendigen Service-Wartungsarbeiten für das Gen7 Zeitmeßgerät als die routinemäßigen Reinigungsarbeiten wie sie im Handbuch beschrieben werden.
Gen7 Zeitmeßgerät für Vorgänger Systeme

**Umgebung**
Temperatur: 0°C - 45°C  
Luftfeuchtigkeit: 90% (nicht kondensierend)  
Höhe: 0 bis 3000 m

**Elektrische Daten**
Nur mit Klasse 2 DC Stromversorgung Modell R-920-056 (12 VDC @ 7,5A) zu verwenden  
Batterie: Nickelmetallhydrid, wiederaufladbar, 7,2V, 10.000 mAh  
Betriebsdauer batteriebetrieben: bis zu 6 Stunden normalen Gebrauches

**Eingänge und Ausgänge (von links oben nach rechts unten)**
Anzeigetafelausgang RS-232, ±12V, 60mA max  
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  
Zeitmeßeingänge: Primär/Backup/Wendeseite: 98 Eingänge in 8 Steckverbindungen, jeder 3,6V @ 1,8 mA  
Stromversorgungseingang: 12V, 8A max. Versorgt das Gerät und lädt die Batterie, nur mit Klasse 2 DC Stromversorgung Modell R-920-056 (12 VDC @ 7,5A) zu verwenden

**Installation/Wartung**