



QTRON
SCHOOL BELL BLE

Product manual

Offline bell automation. Simple phone control.

A reliable school day, from the first bell.

Your guide to secure pairing, weekly bell times, holidays, Exam Mode and firmware updates.

Works offline after setup

Saved schedules run on the bell controller. A phone is needed to configure or control the device, not to keep each scheduled bell running.



For app and firmware 1.2.1
Edition: 22 October 2026

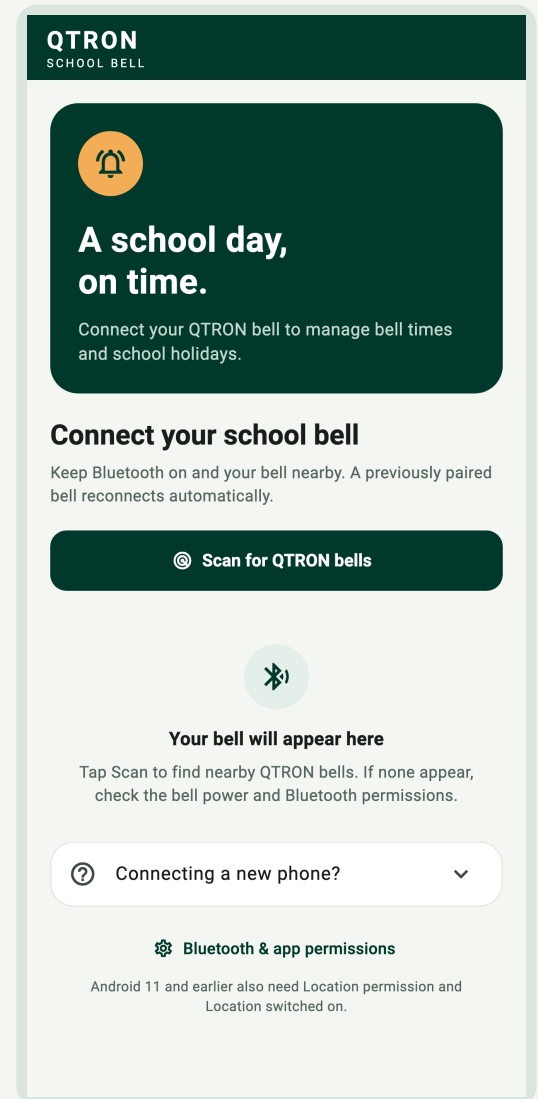
Product image is illustrative; enclosure details may vary. Screen examples use demonstration data.

Quick start 02 | Controls 03 | Weekly schedule 04 | Exams 05
Holidays & clock 06 | Save & updates 07 | Help 08 | Reference 09

Connect your phone

Complete setup near the bell controller. No Wi-Fi or internet clock is required.

- 1 Power and permissions**
Use the supplied or installer-approved power arrangement. Open the QTRON app and allow Bluetooth / Nearby Devices access. Older Android versions also require Location permission and Location service.
- 2 Open physical pairing**
Hold STOP for about **5 seconds** until a four-digit PIN appears. The BLE LED blinks quickly. Release STOP. Pair within **60 seconds**.
- 3 Select your bell**
Tap **Scan for QTRON bells**, then choose your QTRON_BELL_XXXX device. Enter the four digits shown on the controller.
- 4 Confirm the system prompt**
The app prefixes **00** and copies the six-digit passkey. Example: 4826 becomes 004826. Paste it into the phone Bluetooth prompt and confirm Pair.
- 5 Check connection and time**
After secure pairing, the PIN disappears, the clock returns and the LED stays ON. Wait for device settings to load. In Settings, tap **Sync time from phone**.
- 6 Create and save bell times**
Set schedules, holidays and durations, then save. Wait for saved-and-verified confirmation before leaving the app.



Connection screen - illustrative UI

Already paired?

Opening the app reconnects to the last verified bell when Bluetooth and permissions are available. Manual Disconnect / Cancel stops automatic connection for that app session.

Everyday controls

Automatic bells keep running from saved settings after your phone disconnects.

On the controller

SHORT bell

Press MANUAL and release before about 1 second.

LONG bell

Hold MANUAL for about 1 second. LONG starts while held; release does not ring again.

Stop immediately

Press STOP. Holding STOP keeps the relay inhibited. Release it to allow future bell commands.

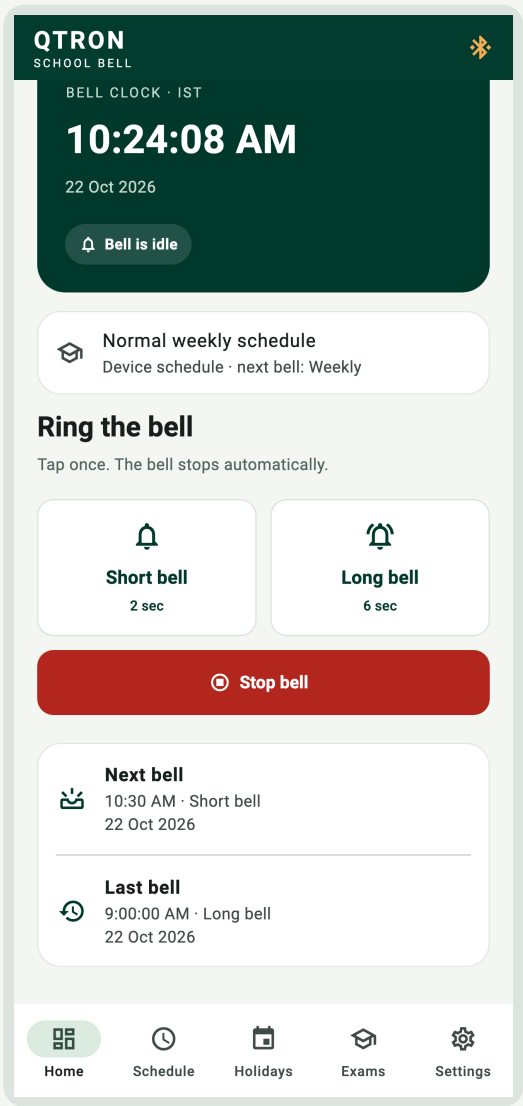
Pair a phone

Hold STOP for 5 seconds. Secure pairing closes the window immediately; otherwise it closes after 60 seconds.

In the app

Use **Short bell**, **Long bell** or the red **Stop bell** button on Home. One tap is enough. A second overlapping ring is rejected.

Default ring lengths: SHORT **2 seconds**, LONG **6 seconds**. Each ring stops automatically. The configured safety cap is at most 10 seconds.



Home controls and bell information

BLE LED	Meaning
OFF	No authenticated mobile connection
Steady ON	Mobile securely connected; normal mode
Fast blink	Physical pairing window is open

STOP does not permanently disable the schedule. Use Automatic bells OFF and save if you need an ongoing pause.

Set the weekly schedule

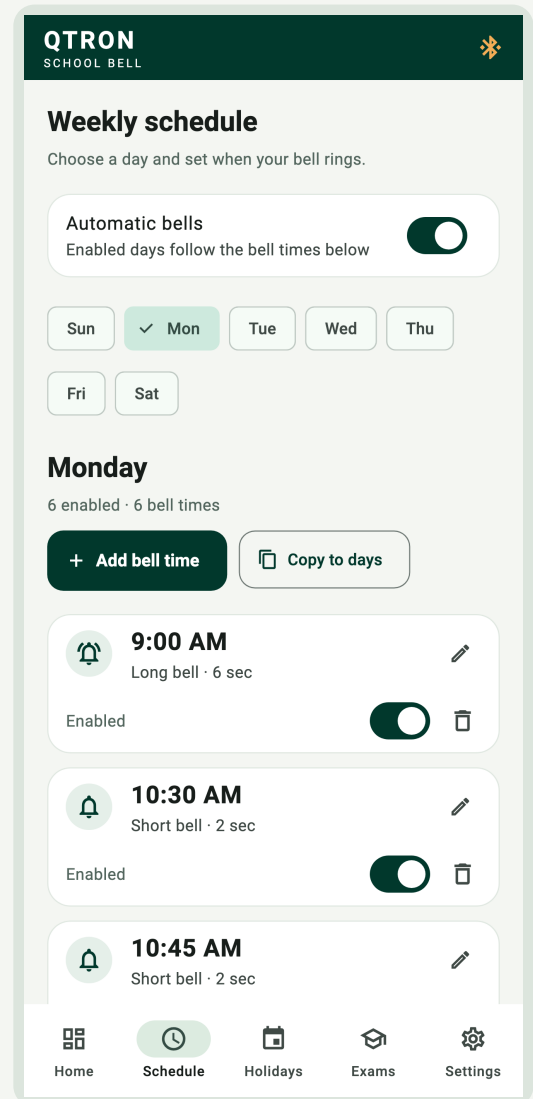
Choose times once, save to the bell, and let the RTC run the school day.

- 1 Choose a weekday**
Open **Schedule** and select Sun through Sat. Automatic bells is the global switch for both weekly and exam schedules.
- 2 Add or edit a bell**
Tap **Add bell time** or an existing event. Pick the local time, SHORT or LONG, and Enabled. Add / Update the bell.
- 3 Copy repeated days**
Tap **Copy to days**, select destination weekdays and confirm. Existing events on those days are replaced.
- 4 Review and save**
Check AM/PM and every day you changed. Tap Save changes / Save settings to bell. Wait for verified success.

Change ring duration

Settings > Short bell / Long bell opens duration editing in seconds. Minimum 0.1 second; maximum is the device limit (normally 10 seconds). SHORT must not exceed LONG. Save after editing.

An event toggle pauses one bell without deleting its time. Delete removes the event; weekly deletion offers Undo. Duplicate times on the same day are not allowed, including disabled events.



Weekly events - example Monday

Changes are not automatic saves

The unsaved-changes message means the bell is still using its previously saved configuration. Closing the app loses unsaved edits.

Plan exam days

One exam timetable replaces weekly bells only on your selected dates.

1 Enable Exam Mode

Open **Exams** and turn Exam Mode ON. The connected firmware must advertise support; a locked screen requires a bell firmware update.

2 Select all exam dates

Use **Add exam date** for each date. All selected dates share the same exam timetable. Remove a date with its chip close button.

3 Create the exam events

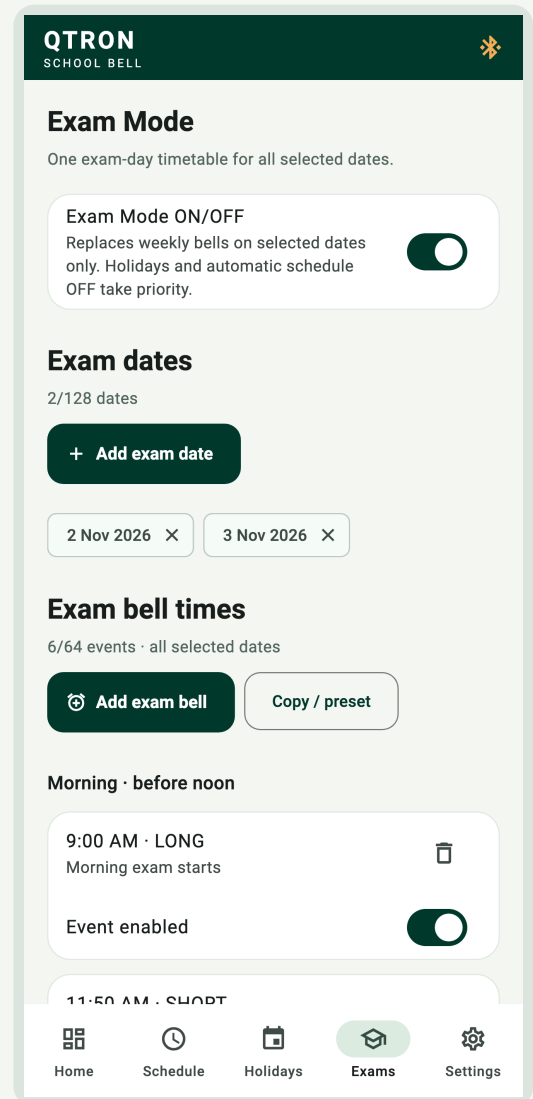
Tap **Add exam bell**. Choose a time and SHORT/LONG, add an optional label, and set Event enabled. Tap an existing event to edit it.

4 Use multiple sessions

Add morning and afternoon events to the same timetable. Copy / preset can replace exam events with a weekday or a morning + afternoon example. Review all times.

5 Save to Device

Save and wait for commit and readback verification. Home shows the effective saved mode for the controller date, not your unsaved phone edits.



Exam dates and timetable controls

Exam days do not merge with weekly bells

On a selected date, enabled Exam Mode uses only exam events. An empty exam timetable stays silent. Other dates return to the weekly schedule. Holidays and Automatic bells OFF suppress both modes.

Morning groups times before noon; Afternoon includes noon onwards. Labels describe events but do not affect timing. Limit: 128 unique exam dates and 64 unique exam times, subject to total storage size.

Holidays and the bell clock

All dates and schedules use India Standard Time (IST / UTC+05:30).

Give automatic bells a day off

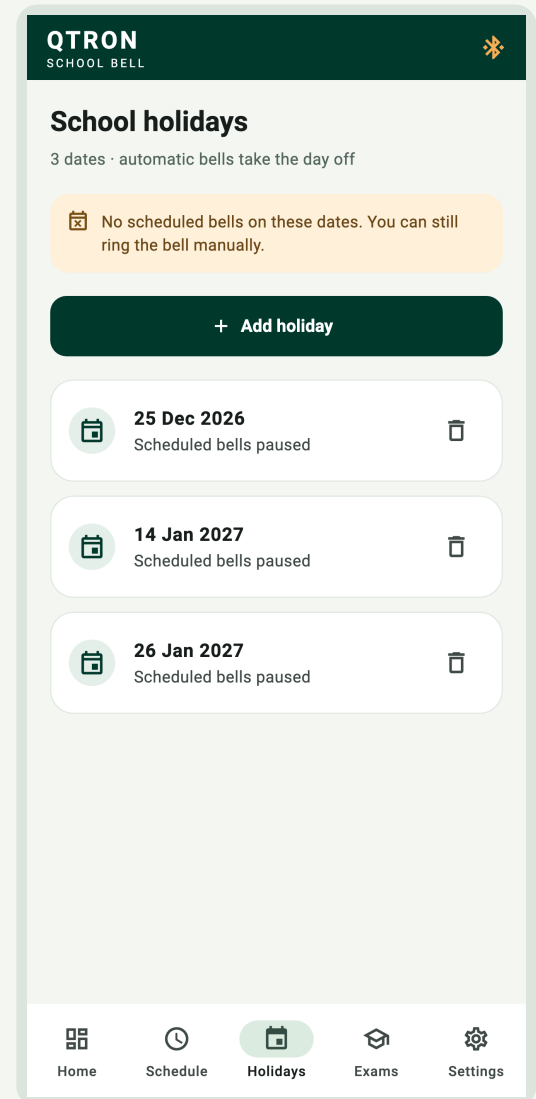
- 1 Add holidays**
Open **Holidays**, tap **Add holiday**, choose a date and repeat for other dates.
- 2 Save the date list**
Save changes and wait for verification. Saved holidays suppress automatic weekly and exam bells for the whole date.
- 3 Remove a holiday**
Tap its delete icon. Undo is available before saving. Review the list and save again.

Set or correct the clock

Open Settings and tap **Sync time from phone**. The app converts the phone instant to IST, even if the phone uses another timezone. Time sync is immediate; it is not a pending schedule edit.

The controller displays a 12-hour clock without an AM/PM indicator. The app includes AM/PM. A PIN is shown during pairing. ---- means the RTC is absent or invalid; automatic ringing is paused.

The DS3231 keeps local time with suitable backup power. After battery loss or an invalid clock, correct the hardware/backup issue and sync time. The system does not measure battery percentage.



Holiday management - example dates

Clock changes never catch up missed bells

After startup, time sync or a settings save, the current minute is skipped. Missed events are not replayed. Manual bells remain available on holidays or with Automatic bells OFF, subject to STOP and safety inhibits.

Save settings and update firmware

Keep the app open until the requested operation is verified.

Save means saved on the bell

Save changes / Save to Device / Save settings to bell sends the complete configuration. The device commits it, and the app reads it back to verify. Only then is the unsaved indicator cleared.

Load settings from bell reloads the stored device configuration and asks before replacing unsaved edits. A failed save is not a success: keep the error visible, reconnect if needed, then read and check settings.

Bluetooth firmware update

- 1 Check the included version**
Settings > Firmware update shows Installed and Included versions. Firmware is bundled inside the app; no separate file picker or download is needed.
- 2 Update deliberately**
Tap Update bell (or Reinstall firmware), read the confirmation and approve. Keep the phone nearby, Bluetooth ON, the screen open and the controller powered.
- 3 Wait through restart**
The bell stays OFF during update. Wait for reconnect and startup verification. Transfer progress or a reboot acknowledgement alone does not mean successful installation.

Firmware update

Keep your bell up to date

Installed on your bell: 1.2.1

 Included with this app

Firmware 1.2.1

Ready to send over Bluetooth. No separate file or download is needed.

Your bell is up to date. You can reinstall this version if needed.

 Reinstall firmware

Keep the bell powered and this screen open until it reconnects and confirms startup. Updating the app does not automatically update the bell.

Firmware details

STOP on the bell cancels an upload before restart is committed. If Bluetooth disconnects or an upload times out, the current firmware remains selected.

Bundled firmware - same-version example

Interruption and recovery

Cancel before restart is committed if necessary. Physical STOP cancels an uncommitted upload. Disconnect/timeout before commit keeps the current firmware selected. If OTA is unavailable, ask your installer about one-time USB setup. Updating the phone app never auto-flashes the bell.

Troubleshooting and recovery

Check the displayed state before changing the saved schedule.

What you see	What to do
Bell not found	Check controller power, phone Bluetooth and permissions. On older Android, enable Location service too. Move near the controller and scan again.
PIN / pairing fails	Hold STOP 5 seconds for a fresh PIN. Complete pairing within 60 seconds. Enter four digits in the app; paste the copied six-digit value into the system prompt.
Paired but no dashboard	Wait for status and configuration reads. Check the app error; reconnect or reopen it. Disconnect / Cancel suspends auto-connect for that session.
No automatic bell	Check valid IST time, Automatic bells ON, event enabled, holiday list and Exam Mode dates. Selected exam dates replace the weekly schedule completely. Check STOP is released and pairing/update is not active.
Save error or changes remain	Do not assume the settings reached the bell. Read the error, reconnect, load/check device settings and retry. Reduce dates/events/labels if the configuration is too large.
--- on the display	Check RTC connection/backup with your installer, then sync time. Automatic schedules stay paused until the clock is valid.
Firmware update interrupted	Read the update result. Reconnect and check the installed version before retrying. Keep power steady. Ask the installer for USB recovery if the bell cannot start.

Lost phone or unusable bond

Hold **MANUAL + STOP together for 10 seconds**, then release both. This deletes all BLE phone bonds and opens pairing while keeping RTC and saved schedules. Forget the old bell bond on the phone, then pair again with a fresh PIN.

Wrong future clock previously set?

The controller prevents replaying consumed bell events. A correction backwards can keep automatic bells suppressed until the saved event time is passed. Ask your installer to inspect this guard; do not repeatedly reset or erase settings.

Quick reference and safety

For school operators and the installer responsible for the supplied controller.

Feature	Current behavior / limit
Offline operation	DS3231 RTC; saved schedules and holidays remain on the controller after phone disconnection or power cycling.
Weekly / exam events	Up to 32 weekly times per day; 64 shared exam events; 128 exam dates; 128 holidays. Combined configuration must fit 12,000 JSON bytes.
Time and labels	IST; supported dates 2024-2099. Unique times within each daily schedule. Exam labels: optional, up to 64 UTF-8 bytes, no control characters.
SHORT / LONG	Defaults 2 s / 6 s. Range 0.1 s to device maximum (at most 10 s); SHORT must not exceed LONG.
Pairing / recovery	STOP 5 s opens a 60 s window; authenticated success closes it immediately. MANUAL + STOP 10 s removes bonds, preserving settings.
Software compatibility	This guide targets app/firmware 1.2.1. Exam Mode requires supported firmware; BLE firmware updates require an OTA-capable device setup.

Automatic schedule priority

Invalid RTC or global schedule OFF: silent. Holiday: silent. Otherwise, an enabled selected exam date uses Exam Mode; every other date uses the weekly timetable. Manual actions still obey STOP, pairing and firmware-update inhibits.

Electrical installation

The ESP32 operates only the low-voltage relay driver. The 230 V AC bell must be switched through correctly rated, physically isolated contacts. Mains wiring, protection and servicing must be performed by a qualified installer. Do not open the enclosure or touch mains wiring for app troubleshooting.

Before routine use

Have the installer verify startup/reset OFF, relay cutoff, STOP, backup timekeeping, the intended weekly/exam timetable and holiday suppression on the supplied hardware. Use only the specified power supply. Software relay state is not independent proof of contact position.