

TAXIMETER

User Guide

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Android Companion App + Android Auto

For driver & operator use

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1. GETTING STARTED

TaxiMeter is a companion-first Android taximeter platform. It tracks fares automatically using GPS and lets you add manual charges, switch tariff areas, and view trip history - all from your phone or Android Auto display.

What the app does

- **Fare tracking:** Live accumulation from GPS distance, waiting time, and slow-traffic time.
- **Tariff areas:** T1 In City, T2 Outer City, T3 Night - switchable mid-trip.
- **Manual fees:** Extras, Luggage, Toll, Airport and separate Flat register increments.
- **Configuration:** Fully JSON-driven tariff, language pack, and UI theme.
- **Sync:** Completed trips are uploaded to backend; offline trips are queued.
- **Android Auto:** Full dashboard and controls on the car screen.

First-Launch Permissions

The app requests the following on first run. Granting all items is required before starting a trip.

- **Location:** Fine or Coarse permission - used to compute distance and speed.
- **Notifications:** Required on Android 13+ for foreground service notification.
- **GPS / Location Services:** Must be enabled in device settings; the app will redirect you if off.

TIP After granting permissions, the main dashboard loads with the bundled default tariff active and the meter in IDLE state.

Default Configuration on First Run

Setting	Bundled Default
Tariff	thessaloniki-v1
Currency	EUR
Timezone	Europe/Athens
Language	English
Theme	Standard Mono (black/white/red segments)
Tariff Area	T1 – In City

2. MAIN DASHBOARD OVERVIEW

Core Meter Controls

Button	Function
Start Trip	Starts live GPS tracking and fare accumulation.
Stop Trip	Halts tracking and finalises the current fare.
Clear Meter	Resets display to 0.00 after stop; returns meter to IDLE.
Undo Last Fee	Removes the most recently applied manual fee.

Tariff Area Buttons

Button	Code	Behaviour
In City Tariff	T1	Inner-city distance / wait / slow-traffic rates.
Outer City Tariff	T2	Higher outer-city rates; exits manual T3 mode.
Night Tariff	T3	Manually forces night rates, overrides time-window.

TIP Selecting T1 or T2 exits manual T3 mode. The temporal surcharge window can still auto-apply T3 rates when the current time falls within the configured start/end window, unless the user has manually locked T3.

Element	Description
Fare Amount	Main digital readout in seven-segment font.
Currency	ISO code from active tariff (e.g., EUR).
Tariff Code	T1 / T2 / T3 indicator.
Extras Register	Total of manually applied fixed extras.
Flat Register	Separate flat-rate counter (Flat +1 / +5).
Meter State	IDLE · HIRED · WAITING · STOPPED · CLEARED · SYNC_PENDING · SYNCED
Trip ID	First 8 characters of active trip UUID.
TAR	Active tariff version ID.
ARE	Current tariff area.
DST	Accumulated trip distance (metres).
WAI	Cumulative waiting time (seconds).
SPD	Current GPS speed (km/h).

Utility Buttons

- **Trip History:** Opens recent trips list (last 100).
- **Tariff JSON Settings:** Opens the full configuration screen.
- **Sync Pending Trips:** Manually triggers retry of unsynced trips.

3. TYPICAL OPERATING WORKFLOW

Starting a Trip

1. Tap Start Trip on the main dashboard.
2. Grant location permission and enable GPS if prompted.
3. The meter state changes to HIRED and fare accumulation begins.
4. The trip ID appears in the top display area.

During a Trip

Fare accumulates automatically based on GPS movement. You can adjust the tariff area and add manual fees at any point.

1. Use In City / Outer City / Night buttons to set tariff area.
2. Add manual extras as needed (Luggage, Toll, Airport, Extra +1/+5).
3. Use Flat +1 / Flat +5 to increment the separate flat register.
4. Tap Undo Last Fee immediately after any mis-applied extra.

Stopping and Clearing

1. Tap Stop Trip. The meter halts and state changes to STOPPED.
2. The display shows the final fare, extras, flat total, and total due.
3. Tap the stop/clear button again - it becomes Clear Meter.
4. Meter resets to 0.00 and returns to IDLE, ready for the next trip.

TIP A hint is shown on the info panel when the meter is in CLEARED state: "Press CLEAR METER to reset the fare display to 0.00."

Meter State Transitions

From	Action	To
IDLE	Tap Start Trip	HIRED
HIRED	Speed < threshold	WAITING
WAITING	Speed > threshold	HIRED
HIRED/WAITING	Tap Stop Trip	STOPPED
STOPPED	Tap Clear Meter	CLEARED
STOPPED	Sync success	SYNCED
CLEARED	Tap Start Trip	HIRED

4. MANUAL FEES & EXTRAS

Fixed Extra Buttons

These buttons apply a preset amount to the Extras register and push the entry onto an undo stack. The amount is read from the active tariff's manual_extra_presets section.

Button	Default Amount	Notes
Extra +1	1 unit	Generic tariff-configured extra.
Extra +5	5 units	Generic tariff-configured extra.
Add Luggage Fee	2.00	From manual_extra_presets if configured.
Add Toll Fee	3.50	From manual_extra_presets if configured.
Add Airport Fee	5.00	From manual_extra_presets if configured.

Flat Register Buttons

The Flat register is separate from the metered fare and extras. It persists throughout the trip and contributes to the total due shown when the trip is stopped or cleared. When a flat amount is present, it overrides the metered total in the cleared display.

Button	Effect
Flat +1	Adds 1 unit to the Flat register.
Flat +5	Adds 5 units to the Flat register.

Undo Behavior

TIP Undo Last Fee removes only the most recent entry from the manual extras undo stack. It works for Extras and Flat increments. Metered fare (distance / waiting / slow-traffic) and auto-applied temporal surcharges cannot be undone.

Tariff Switching Mid-Trip

You may switch tariff area freely during a trip. The new rates apply from the moment you tap the button.

- **T1 or T2:** Exits manual T3 mode; time-window auto-T3 may still apply.
- **T3 (Night):** Locks manual T3 rates regardless of clock time.

5. TRIP SYNC & OFFLINE BEHAVIOR

All completed trips are first stored locally in SQLite. A background WorkManager job then attempts to POST the trip payload to the backend. If the device is offline or the backend is unreachable, the trip is stored as SYNC_PENDING.

Sync States

State	Meaning
SYNC_PENDING	Trip saved locally, upload has not yet succeeded.
SYNCED	Trip successfully received by backend.

Manual Sync

Tap Sync Pending Trips on the main dashboard to immediately enqueue a WorkManager task for all unsynced trips. The app will retry automatically in the background as well.

TIP If trips remain in SYNC_PENDING, check network connectivity and that the backend sync URL is correctly configured in the app via the sync credentials store.

6. TRIP HISTORY & DETAILS

Trip History Screen

Tap Trip History from the main dashboard to view the last 100 completed trips. Each row shows:

- **Trip ID:** First 8 characters of the trip UUID.
- **Sync Status:** "synced" or "pending".
- **Timestamp:** Creation date/time of the trip.

Trip Detail Screen

Tap any trip row to open its full detail view, which shows:

- **Full Trip ID:** Complete UUID.
- **Created:** Full ISO timestamp.
- **Synced:** Boolean sync flag.
- **Checksum:** SHA-256 hex string for data integrity.
- **Payload JSON:** Full raw trip event serialisation.

7. TARIFF CONFIGURATION

Open the Tariff JSON Settings screen from the main dashboard. The screen is divided into collapsible sections: Meter status, Tariff, Language, and Theme.

Tariff Catalog Management

Action	How
Select	Pick from the spinner dropdown.
Import	Tap Import → choose a .json file via document picker.
Remove	Tap Remove (not available for bundled default).
Export	Tap Export → choose save location via CreateDocument.
Share	Tap Copy → Android share sheet (email, messaging, etc.).

TIP The bundled default tariff cannot be removed. Use Reset To Bundled Default to restore factory settings at any time.

Tariff Quick-Edit Fields

The quick-edit form gives direct access to common tariff fields without editing raw JSON. Tap Apply Tariff Fields to commit changes or Reload Tariff Fields to restore values from the current JSON.

Field	Example Value	Notes
Tariff Version ID	athens-v1	Unique identifier for this tariff.
Currency Code	EUR	ISO 4217, 3 characters.
Timezone	Europe/Athens	Java TimeZone ID.
Distance Unit	KILOMETERS	KILOMETERS or MILES (uppercase).
Base Fare	190	Minor units (190 = EUR 1.90).
Minimum Fare	400	Minor units (400 = EUR 4.00).
Dual Tariff Mode	HIGHER_OF_BOTH	HIGHER_OF_BOTH or DISTANCE_ONLY.
T1 Distance Rate	90	Per km/mi, minor units.
T1 Waiting Rate	25	Per minute, minor units.
T1 Slow-Traffic Rate	25	Per minute, minor units.
T2 Distance Rate	125	Outer city; higher typical value.
T2 Waiting Rate	35	Per minute, minor units.
T2 Slow-Traffic Rate	35	Per minute, minor units.
Waiting Threshold	1.0	km/h; speed below → WAITING.
Slow-Traffic Threshold	16.67	km/h; speed below → slow-traffic.
Temporal Name	T3 Night	First temporal surcharge entry.
T3 Start / End	00:00 / 05:00	HH:MM format.
Luggage Amount	100	Minor units (100 = EUR 1.00).
Toll Amount	350	Minor units.
Airport Amount	500	Minor units.

Tariff Raw JSON Editor

For advanced configuration not covered by quick-edit, use the JSON editor directly. The full schema is:

```
{
  "tariff_version_id": "athens-v1",
  "currency_code": "EUR",
  "timezone": "Europe/Athens",
  "distance_unit": "KILOMETERS",
```

```
"amount_minor_units": 190,  
"minimum_fare_minor_units": 400,  
"distance_rate_per_unit_minor_units": 90,  
"waiting_rate_per_minute_minor_units": 25,  
"slow_traffic_rate_per_minute_minor_units": 25,  
"outer_city_rates": {  
  "distance_rate_per_unit_minor_units": 125,  
  "waiting_rate_per_minute_minor_units": 35,  
  "slow_traffic_rate_per_minute_minor_units": 35  
},  
"waiting_speed_threshold_kph": 1.0,  
"slow_traffic_threshold_kph": 16.67,  
"dual_tariff_mode": "HIGHER_OF_BOTH",  
"temporal_surcharges": [  
  {  
    "name": "T3 Night",  
    "rates": { "distance_rate_per_unit_minor_units": 160, ... },  
    "start_time": "00:00",  
    "end_time": "05:00"  
  }  
],  
"manual_extra_presets": [  
  { "name": "Luggage", "amount_minor_units": 100 },  
  { "name": "Toll", "amount_minor_units": 350 },  
  { "name": "Airport", "amount_minor_units": 500 }  
]
```

TIP Minor units: multiply the displayed currency amount by 100. EUR 1.90 → 190, EUR 4.00 → 400.

8. LANGUAGE PACK MANAGEMENT

The Language section in Tariff Settings controls which UI language is active. Changing language takes effect immediately across all screens.

Bundled Languages

- **English:** Default language pack.
- **Greek (Ellenika):** Bundled second language.

Custom Language Packs

Any JSON language pack can be imported. The file must contain a flat key→value map matching the internal translation key set. See the bundled `ui_translations.json` for the full key list.

Action	How
Select	Pick from the language spinner.
Import	Tap Import Language → choose a .json file.
Remove	Tap Remove Language (custom packs only).
Export	Tap Export Language → save to file.
Share	Tap Copy Language → share sheet.

9. THEME MANAGEMENT

The Theme section in Tariff Settings lets you change the colour palette of the whole app, including the Android Auto dashboard.

Bundled Themes

Theme	Style
Standard Mono	Black background · white panels · red fare segments.
Harbor Ice	Dark blue palette.
Olive Signal	Olive/green palette.

Theme Quick-Edit Color Fields

Enter hex color values (`#RRGGBB`). A live color swatch updates beside each field while you type.

Field	Purpose
<code>body_background</code>	Main screen background.
<code>panel_fill</code>	Inner panel background.
<code>panel_edge</code>	Panel border color.
<code>segment_primary</code>	Fare/readout digit color (e.g., red <code>#CC1414</code>).
<code>segment_glow</code>	Digit glow/shadow color.
<code>label_color</code>	Text labels.
<code>button_fill</code>	Control button background.
<code>button_edge</code>	Control button border.
<code>button_text</code>	Control button label text.
<code>info_fill</code>	Info box background (forced black in dashboard).
<code>info_edge</code>	Info box border.
<code>info_text</code>	Info box text.

Theme JSON Schema

```
{
  "code": "my_theme",
```

```
"info_text": "My Custom Theme",  
"body_background": "#000000",  
"panel_fill": "#050505",  
"panel_edge": "#333333",  
"segment_primary": "#CC1414",  
"segment_glow": "#660000",  
"label_color": "#FFFFFF",  
"button_fill": "#555555",  
"button_edge": "#888888",  
"button_text": "#FFFFFF",  
"info_fill": "#000000",  
"info_edge": "#FFFFFF",  
"info_text": "#FFFFFF"  
}
```

10. ANDROID AUTO

TaxiMeter uses the Android Auto legacy projection path. When the phone is connected to an Android Auto head unit, the full meter dashboard and all controls are mirrored on the car screen.

Android Auto Dashboard Layout

The screen is divided into two main areas:

- **Left sidebar:** All control buttons arranged in a column.
- **Main area:** Digital fare display, fare-info panel, info box.

Displayed Information

Element	Description
Fare Amount	Seven-segment digit display of running fare.
Meter State	IDLE / HIRED / WAITING / STOPPED / CLEARED / SYNCED.
Tariff Area	IN CITY / OUTER CITY / NIGHT.
Tariff Code	T1 / T2 / T3.
GPS Quality	OK or degraded flags.
Speed	Current km/h from GPS.
Distance	Accumulated metres.
Wait Time	Cumulative seconds in waiting mode.
Extras	Manual fixed extras total.
Flat	Flat register total.

Available Controls on Android Auto

Button
Start Trip
Stop Trip / Clear Meter
In City (T1)
Outer City (T2)
Night (T3)
Extra +1
Extra +5
Add Luggage Fee
Add Toll Fee
Add Airport Fee
Flat +1
Flat +5
Undo Last Fee
Sync Pending Trips

TIP Buttons on Android Auto flash on press to provide visual feedback. Location permission for Android Auto requires FINE or COARSE foreground permission - background location is not needed.

11. ERROR MESSAGES & TROUBLESHOOTING

Permission & GPS Errors

Message	Cause	Fix
Grant location and notification permissions...	Missing FINE/COARSE or POST_NOTIFICATIONS	Open app settings and grant both permissions.
Enable GPS or device location...	Location services are off.	Enable in device Settings → Location.

Configuration Errors

Message	Cause
Invalid tariff JSON: Tariff version	tariff_version_id missing or empty.
Invalid tariff JSON: Currency	currency_code missing or not 3 chars.
Invalid tariff JSON: Timezone	timezone not a valid Java TimeZone ID.
Invalid tariff JSON: Distance unit	Must be KILOMETERS or MILES (uppercase).
Invalid tariff JSON: Base fare	base_fare_minor_units not a valid number.
Invalid tariff JSON: {field}	Numeric field failed to parse.
Invalid theme JSON: {error}	Theme JSON failed schema validation.

Sync Issues

Symptom	Likely Cause	Fix
Trips stay SYNC_PENDING	No network / backend down.	Check connectivity; tap Sync Pending Trips.
Sync succeeds but state unchanged	App not in foreground.	Restart app and allow background jobs.

GPS Quality Issues

If the GPS QUALITY field shows a degraded or error flag:

- **GPS_DEGRADED:** Move to an open area with clear sky view.
- **GPS_DRIFT_DETECTED:** Kalman filter rejected a noisy fix; fare continues from last good sample.
- **OFFLINE_CAPTURE:** Location stored without real-time network - normal indoors.

12. CONFIGURATION TIPS

TIP Always export a backup of your working tariff/theme/language before making changes. Use the Share/Copy button to send the file to cloud storage or email as a backup.

- **Minor units:** All fare/rate amounts are stored as integers × 100 (EUR 1.90 = 190).
- **Quick-edit first:** Use quick-edit for routine changes; switch to raw JSON only for advanced options.
- **Validation feedback:** Errors appear immediately in the status text; fix reported fields one at a time.
- **Reset safely:** Reset To Bundled Default restores the factory tariff only - it does not affect language or theme.
- **Temporal windows:** Surcharge start/end times use HH:MM 24-hour format in the configured timezone.
- **T3 manual lock:** Once T3 is manually activated, time-window auto-switching is suppressed until T1 or T2 is pressed.
- **Dual tariff mode:** HIGHER_OF_BOTH compares T1 distance vs. T2 waiting and bills the higher; DISTANCE_ONLY always uses distance rate.
- **Custom imports:** Custom tariff/language/theme files are stored in a local registry; they persist across app restarts.

NOTE If behaviour looks incorrect after edits, reset to bundled defaults, confirm basic operation, then re-apply changes one field at a time.

13. QUICK REFERENCE

Meter States

State	Meaning
IDLE	No active trip; meter ready to start.
HIRED	Trip active; fare accumulating normally.
WAITING	Trip active; vehicle stationary or very slow.
STOPPED	Trip halted; final fare shown.
CLEARED	Display reset to 0.00 after stop.
SYNC_PENDING	Trip completed; upload queued.
SYNCED	Trip uploaded to backend successfully.

Tariff Areas

Code	Name	Rate Set
T1	In City	Base inner-city distance / wait / slow-traffic rates.
T2	Outer City	Higher outer-city distance / wait / slow-traffic rates.
T3	Night	Manual temporal rates; overrides time-window auto-selection.

Fee Logic Summary

Component	Auto / Manual	Undoable
Distance fare	Auto	No
Waiting fare	Auto	No
Slow-traffic fare	Auto	No
Temporal surcharge	Auto	No
Extra +1 / +5	Manual	Yes (last only)
Luggage / Toll / Airport	Manual	Yes (last only)
Flat +1 / +5	Manual	Yes (last only)

JSON Key: Minor Units Conversion

Displayed Fare	minor_units value
EUR 0.50	50
EUR 1.00	100
EUR 1.90	190
EUR 4.00	400
EUR 5.00	500

Telemetry Flag Reference

Flag	Meaning
GPS_DEGRADED	Signal quality below threshold.
GPS_DRIFT_DETECTED	Kalman filter rejected noisy fix.
OFFLINE_CAPTURE	No real-time network during capture.
CLOCK_SKEW_DETECTED	Device clock appears out of sync.
AUDIT_INTEGRITY_FAILURE	Trip audit log checksum mismatch.