



HYPER
MICRON

Electronic Toll Collection System



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Efficient

Intelligent

Integrated

The Hypermicron Electronic Toll Collection System is a unified, modular platform engineered to streamline vehicle recognition, payment processing, lane control, and back-office management. Our cutting-edge solution harnesses advanced AI-driven license plate recognition combined with RFID technology to deliver unmatched speed, accuracy, and security for modern parking and tolling environments.

Key Features



Real-Time Data & Automated Processes

- Instant tracking of vehicle entries and exits
- Immediate fee calculation with central record updates
- Automated reporting tools that provide operational insights



Multiple Payment Options

- Accepts cash, cards, contactless apps, and fully automated ETC
- Supports dynamic pricing, tiered subscriptions, and discount models



Seamless Integration

- Open API design for effortless connectivity with billing systems and government databases
- Centralized dashboards that consolidate multi-site data into a single view



Advanced Security & Compliance

- AI-enhanced license plate recognition ensures reliable vehicle identification
- Role-based access control, encrypted data, and comprehensive audit trails secure every transaction

Modular Solution Architecture

Our solution is composed of four primary software components, each designed to fulfill a specific role within the overall ecosystem:

1 Toll Management Software

2 Lane Transaction Management & Control Software

3 Central Monitoring Software

4 License Plate Recognition Software

Detailed System Software Functionalities

1. Toll Management Software

User Administration:

- Manage roles, permissions, and user records.

Accounting Module:

- **System Catalogs:** Maintain and synchronize reference data (toll classes, fee tables, subscriptions, discounts).
- **Transaction Registers:** Log ETC transactions (with RFID, plate, time, fee) and manual payments.
- **Financial Reports:** Generate ETC and manual revenue summaries with customizable dashboards.

Monitoring & Post-Audit:

- Real-time lane monitoring, data export, error alerts, audit tools, and fraud prevention.

Data Sync & Database Management:

- Real-time synchronization, offline fallback, automated backups, and bulk import/export.

Operational Reporting & Corporate

Integration:

- Traffic flow, maintenance, management reporting, and integration with centralized corporate platforms.



2. Lane Transaction Management & Control Software

1 | Core Functions:

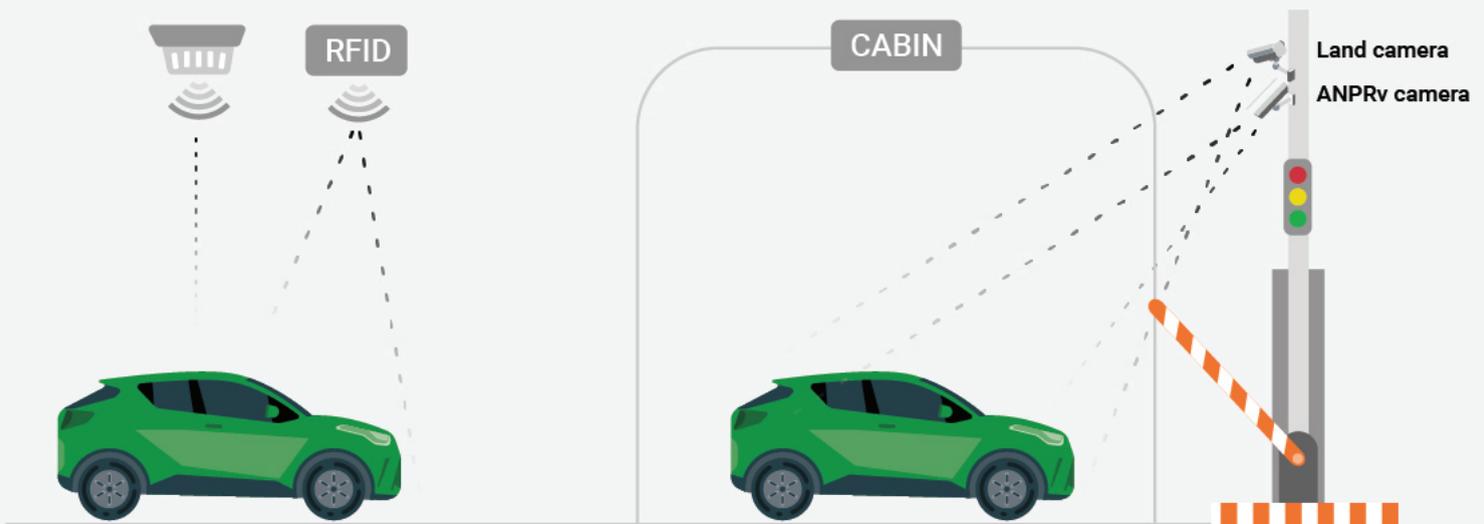
Control barrier movements, signage, and camera triggers with programmable logic; enforce user authentication.

2 | RFID & Plate Recognition:

Validate RFID tags, process plate recognition requests, and log device status.

3 | Collection Modes:

Support both automated toll collection (local/remote validations) and manual POS processing, including VIP overrides.



3. Central Monitoring Software

1 | Centralized Management:

Merge user accounts, enable granular auditing, and track real-time revenue and operational metrics across sites.

2 | Data Aggregation:

Synchronize lane transactions and external ETC data for comprehensive oversight.

4. License Plate Recognition Software

1 | Continuous Feed:

Receives images or video streams from cameras at each lane to ensure immediate or near-immediate plate recognition.

2 | AI-Driven Analytics:

Vehicle Attribute Detection
Image Preprocessing

Use Cases & Application Scenarios



Major Airport

An international airport experiences a massive inflow of vehicles—from taxis and rideshares to private cars and maintenance fleets.

- Real-Time Update
- Regulatory Compliance
- Performance Monitoring



Corporate Holdings with Large-Scale Facilities

For a holding company overseeing multiple properties—ranging from commercial developments to industrial or public-use facilities—this system:

- Enforces Unified Standards
- Enterprise Analytics



City Toll Road (Highway ETC & MTC)

- RFID-Driven Throughput
- Lane Congestion Reduction
- Central Oversight



Commercial Mall Complex (Premium Parking)

- Dynamic Pricing
- Marketing & Promotion
- VIP Features



Industrial Park (Heavy Fleets & Deliveries)

- Vehicle-Type Differentiation
- Scheduled Access Windows
- Enhanced Security

Extended Benefits & Differentiators

Operational Cost Savings

- Lower staffing requirements through fully automated ETC lanes.
- Reduced error rates via automated license plate recognition and direct RFID validations.

Enhanced User Satisfaction

- Faster entry and exit with automated lane barriers that alleviate congestion.
- Clear electronic signage and real-time instructions reduce visitor confusion.

Future-Proof Modularity

- Scalable architecture grows with your enterprise—supporting more lanes, properties, or new payment technologies.
- Regular software updates ensure enhanced security and feature expansion as market demands evolve.





For more information or to schedule a demonstration, please contact our sales team or visit our integration solutions page.

Sales & Inquiries: admins@hypermicronsg.com