Advanced Electronic Toll Collection System
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About eToll

eToll is an electronic toll collection system brought to you by Highways and Traffic Systems Division of TechSture Technologies, one of the highly established IT Services & Automation Company. Our firm carries credentials of having over 1 million man hours of experience and over 900 clients which makes us among the top 5 IT Services and Solution companies in the state of Gujarat and among the top 5 players in Electronic Toll Collection System in India.

Our Electronic Toll Collection System boasts superior quality, cost effectiveness and proven methodologies that maximize your toll collection and productivity.

- Domain Expertise of 8 years in Toll Collection System
- All projects delivered highly successful
- Strong R&D department to support innovation, new technologies in Electronic Toll Collection System
- Very high quality equipments and robust manufacturing employed for long life of the system
- Software features more control and analytics that any in the competition

Quality Consciousness

When there are equipments that are sourced, manufactured, assembled and integrated with a software system, quality of each of its entities ensures overall success and reliability of the system. For our eToll system we employ:

- The best of the sourced parts from reputed manufactures only
- A very high quality precision manufacturing
- Strong engineering approach (Quality By Design)
- Matured software development practice
e-Toll System | Components

Our Semi Automatic Electronic Toll Collection System comprises of Lane System and Plaza System, integrated in an architecture that facilitates easy and accurate toll collection.

Our Lane System Equipment Installation Layout:

Lane Equipment List

Booth Equipments
1. Toll Lane Controller
2. Operator Terminal Screen
3. Receipt Printer
4. Barcode Reader
5. Barrier Manual Controller
6. Siren/Alarm
7. Document Viewer
8. WIM Indicator

Lane Equipments
9. OHLS
10. User Fare Display
11. Incident Capture Camera
12. Barrier Gate
13. Traffic Light
14. AVCC
15. Vehicle Entry Loop
16. Vehicle Exit Loop
17. CCTV Surveillance
18. Outdoor Smart Card Reader
19. WIM Platform

The above layout is of a Pre-Classification System. eToll has both Pre-Classification and Post-Classification System
Our Plaza System Equipment Installation Layout:

**Plaza Equipment List**

1. Central Database Server  
2. Audit Workstation  
3. POS Workstation  
4. CCTV Surveillance Display Unit  
5. Report Printer  
6. SMS Notification Unit  
7. Network Switch  
8. Intercom Master Unit  
9. UPS Conditioned Power Supply
Cutting Edge Tolling Technology

Years of hard work, dedication, focus on R&D efforts and understanding unique Indian tolling needs had enable us to evolve a tolling system that is smarter, advanced and most importantly effectively prevents revenue leakages.

**Multiple Intelligence for Fraud Prevention**

Multiple Intelligence based on *Electronic + Vision + Software* Intelligence that effectively captures many modes of fraud and helps minimize revenue leakage.

**Strong and Robust Architecture**

A very robust architecture of the system that ensure over 99% availability of the system with software engineering on *Smart Client* architecture.

**Truly VLSI Electronics Architecture**

The entire electronics is based on Very Large Scale Integration (VLSI) architecture and uses advanced Microprocessors from Philips, Samsung, and Intel.

**Intelligent Reporting and Analytics**

Our built in business intelligence tool embed artificial intelligence models to deliver performance scorecards & trends that truly gives you visibility of your toll collection.

- Graphical reports that makes report easy to read and understand
- Analytics that identifies and analyses trends in Traffic, Revenue Collection, Booth Utilization
- Workforce Analytics that tracks and reports overall productivity of toll operators, their role in prevention/involvement of fraud
Industry Best Fraud Prevention System

A major challenge faced by any concessionaire in operating toll roads in India is prevention of revenue leakage which goes very high like 20% of daily collection in situation of unmonitored systems. While all the systems available in India focus on fraud prevention/capture based on AVCC classification, it is not enough considering enough gaps existing to capture fraud.

At eToll we have innovated technologies that delivers the industry best fraud prevention mechanism (under patent process now) ensuring of a system that very strongly captures fraud and reduces revenue leakage to near zero level.

Control on Barrier Operation

- Disable barrier manual operation when software is ON. This way barrier cannot be operated manually to pass any vehicle.
- Any vehicle that passes from the lane when lane is closed is auto captured and presented for fraud
- Captures vehicle even if barrier power is off or arm is detached
Vision Based Intelligence

- Sensors scan return ticket holder vehicles and ensure it’s the same vehicle. Same goes for pass holder vehicles. This way tickets and pass cannot be exchanged between vehicles as well as operator cannot do fraud.
- Multiple image processing and algorithm techniques aids in vehicle classification, identification

Electronic sensing to capture vehicles

- In any event of system down or lane not operational, any vehicle that is passed from that lane is captured with date, time, classification, and photo. A built in memory and power backup system ensures data capture of over 30,000 vehicles. And as soon as server connectivity is established this database is pulled and presented for fraud analysis.

Software Intelligence to keep watch on Auditors and Toll Collectors

- While systems out in the market present class mismatch for auditing none have a check on auditor performance and toll operator fraud involvement. eToll system has a built in psycho-metric based analytic system that intelligently keep watch on audit pattern of auditor for an operator, vehicle type and vehicle numbers, identification its linkage with operators. This evolves a strong view based on factual analysis of operator fraud linkages as well as auditor performance.

100% Vehicle Data Capture

- Captures vehicle data even if lane is closed
- Captures and counts convoys like military vehicles, vip passages and associate each vehicle with photo/video and profile detail for audit purpose.
Intelligent Sensory System to Counteract Mischievous Behaviors

Toll system always faces challenges of being tampered at toll plazas so that system can be compromised and fraud can happen. Our patent pending technologies counteract these mischievous behaviors to ensure such behaviors are captured and tampering is controlled.

- Instantly notifies via SMS for any tamper attempt to monitoring and control station, management

- A cut to barrier cable triggers an alarm and immediately start vehicle fraud capture mode to capture each and every vehicle passing from there

- A very common method to manipulate AVCC classification is blocking sensors to wrongly classify a vehicle. Any such attempt here will result in alarm and notification with date, time and lane details for CCTV footage running to identify the culprit.
What Makes Us Distinct

- **R&D based organization** focused on highways and traffic systems with many patents on filing. Our solution arrays covers broad spectrum of solutions & systems for traffic management and that also includes tolling systems. We are a serious player in this segment.

- **Unique Pre Classification and Audit systems**: It is a state of the art Pre-Classification cum Pre Audit system i.e. that there is very little time and manpower required to do a post audit job thus resulting in huge savings in manpower as well as revenue. Techsture is also firm in India providing Pre Classification, Post Classification or a hybrid system comprising of Pre Classification and Post Audit System.

- **Accuracy**: Our Pre-Classification cum Pre Audit System gives an incremental accuracy of more than 98.5% within 4 weeks of operation, and is 100% auditable.

- **Two Tier Auditing**: The system is such that it has 2 tier auditing system on the main GUI.
  1) First one is the photograph captured by incident detection camera
  2) Second is the Infrared image generated by Transmitter and Receiver Infrared towers

- **Remote Monitoring Facility**: With remote monitoring software you have access to your toll plaza being anywhere and the activities can be monitored by you at the head quarter level. This also provides the facility to monitor real time cash position remotely at any of the toll plaza.

- **In house Software and hardware development centre**: Our in-house engineering and Software Development Centre strengthens our role as an integrator. The capabilities of having in-house software development team, enables us to integrate our system with products of many vendors and hence give us flexibility to choose the most effective and economical system for you.

- **Minimized Downtime**: As the complete system is developed in India, including hardware and software, you do not get dependent on a foreign company but you get all the services within India.
Treadle versus IR Based AVCC

Treadle System auto vehicle classification system uses a combination of vehicle magnetic loop, height sensors and piezo electric axle sensors. Whereas IR based auto vehicle classifiers scans the vehicle generating 2D profile and applies software processing to classify the vehicle. This new technology offers various advantages over traditional treadle based system:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Traditional Treadle Based AVCC System</th>
<th>eToll - IR Based AVCC System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portability</td>
<td>Not portable, permanently installed on ground.</td>
<td>Portable, they are bolted roadside and can be easily shifted</td>
</tr>
<tr>
<td>Civil work and installation procedure</td>
<td>Installation requires lots of time consuming civil work and sufficient manpower</td>
<td>Easily installed over foundation and fastened using bolts</td>
</tr>
<tr>
<td>AVCC Accuracy</td>
<td>Difficult to achieve high degree of accuracy - Practically they provide classification accuracy of up to 90%.</td>
<td>Comfortably achieves accuracy of over 95% in Indian Conditions.</td>
</tr>
<tr>
<td>AVCC Validation</td>
<td>Results from AVCC provide no evidence to support classification results obtained. One needs to look at video source to validate. If Camera is down there is no way to validate transactions.</td>
<td>Provides 2D profile of the vehicle to easily judge vehicle type &amp; axles. So here you have dual source of validation. A plus point when either of the equipment gets down, you still can validate and monitor fraud.</td>
</tr>
<tr>
<td>Technical Limitations</td>
<td>Multi Axle vehicles especially with heightened axles (long trailers) causes loop to generate inaccurate pulses thus dropping the accuracy. Classification is also based on axle spacing and is measured by counting speed of the vehicle. This technique based on vehicle detection over loop gets many a times inaccurate especially when loop is influenced by next trailing vehicle.</td>
<td>No such technical limitation. Classification is based on multiple parameters such identification of tyres, vehicle height at various points, front axle undercarriage height etc.- all obtained from 2D profile plot and no such dependency on loop detectors.</td>
</tr>
<tr>
<td></td>
<td>Cannot differentiate between Bus &amp; Truck, Truck &amp; Trailers. Likewise even using height sensors cannot differentiate heightened LCV and such commercial vehicles</td>
<td>– An image processing applied over the 2D plot reveals true vehicle type even if its modified</td>
</tr>
<tr>
<td>Equipment Life</td>
<td>Equipment life gets seriously shortened due to wear and tear, excessive axle pressure applied sometimes due to vehicle breaking over them</td>
<td>Long life with over 100,000 hrs of operation (Calculated based on life of IR LED lamps) Non Contact, No wear and tear and related damages</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Maintenance is costly and time consuming with many a times requires civil work. Also to carry out maintenance lanes needs to be closed</td>
<td>Being installed road side, they are easy to maintain and doesn’t require lane closure</td>
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Traditional System versus e-Toll System

A) Technically Advanced

eToll System is engineered with most modern technologies that incorporate:

Advanced Microprocessor Based Electronics + Machine Vision + Smart Clients Based
Robust software Architecture

B) No Relay Based Switching

While tolling systems provider incorporates mechanical relay switches to control
operations, our system incorporates digital switching that does way need of mechanical
relays, improving life of the equipment and makes more fail safe.

C) Fail Safe Control Unit

In traditional systems with lane interface units, failure of any one component brings the
entire lane down. This also gives opportunity to fraud practices.

eToll System – Toll Lane Controller is engineered in such a way that failure of
components doesn’t bring down operation and ticket issue, fraud capture still occurs (by
way of capture of vehicle profile with date and time stamp inside AVCC, barrier date and
time stamp capture inside Barrier circuit)

D) Multiple Fraud Prevention Techniques

Traditional systems just capture violations but are incapable to address challenging
environments at India toll plaza conditions which are subject to human mischiefs and
manipulations.

e-Toll system addresses human mischiefs and manipulations by keeping electronic eye
over the entire systems and operations.

E) Cost Effective

We are very much market competitive, stand lowest in cost despite integrating best of
components, array of electronics and giving you the best of features.
F) Reliable & Robust, > 99% uptime performance

Reliability and robustness of a system increases when:

- You employ best of components, raw materials
- Apply stringent quality norms
- Engineer your solution for fail safe conditions (A concept Japanese have used since long to improve quality of their products)
- Do tight installation and commissioning

e-Toll system is created out of all these and delivers you a system which is reliable and robust, giving 99% uptime performance.

G) Distributed Architecture, Ensures System Operation Even In Case of Network Failure

Traditional Systems - Failure of network connectivity brings the lane down with operations such ticket issue, pass validation etc not possible

eToll System – Failure of LAN connectivity doesn’t impact lane operation. A distributed database architecture platform enables operations of ticket issue, validation possible.
Our Values Also Separates Ourselves from the Competition

Individual Approach
We simply listen to our clients. Our dedicated team is ensures that we deliver you the solution that best meets your expectations.

Delivering Value & Affordability
We are dedicated to deliver superior value at a cost that is affordable, fits your budget, and solutions that FULLY meet your business needs.

Service with a Smile
We are here for you 24X7. No customer is too small or large, and we give the same dedicated attention to everyone – a commitment that stems from our win-win approach

Strong Partnerships
We have built very strong business partnerships with some of the world’s leading technology firms. This enables us to provision industry leading solutions to our most important partners: our customers.

Experienced Staff
Nothing comes close to an experienced team. With many projects successfully completed we have the resources with the relevant experience to deliver on small, medium and large projects. No matter how big or small the project is, we can deliver on time and within budget every time.

Honesty and Integrity
The cornerstone of our success is the business honesty and integrity in which we work with clients and partners. We believe that our transparency with our clients is what sets us apart from our competition.
eToll Software Modules Architecture

Central Master Module
- Plaza, Lanes & Routes Management
- Email Management
- Vehicle Class Management
- AVCC Vehicle Profile Library
- SMS Communication
- System Global Configuration
- Shift Management
- Tariff Management
- Backup and Data Management
- Systems Health Module

Lane Systems Module
- Ticket Issue
- Exempt Function
- Military/VIP Passage
- Tow Vehicle
- Accounts Cash Withdraw Function
- Pass & Ticket Validation
- Leaves Request
- Lock Screen Function
- Shift Transfer
- Cancel & Regenerate Ticket

POS Module
- Pass Sale
- Bulk Coupons Sale
- Pass Management
- Smart Card Management
- POS Reports
- Monthly
- Local
- Debit Pass
- Exempt
- Exempt Function
- Pass Management
- POS Reports

HR Module
- Toll Collectors Management
- Plaza Staff Management
- Leaves & Payroll
- HR Reports
- Shift Scheduling
- Biometric Configuration
- HR Reports
- Shift Scheduling

Validation Module
- AVCC Mismatch Audit
- Exempt Vehicle Audit
- Skipped Vehicle Audit
- Barrier Manual Operation Audit
- Cancelled Tickets Audit
- Fraud Analytics System
- Unauthorized/Invalid Login Attempts
- Check Tickets, Pass
- Validation Reports
- System Tamper Audit
- Black List Vehicle

Reporting Module
- Traffic Reports
- Performance Report and Analytics
- MIS Reports
- Accident Reporting
- Revenue Reports
- Maintenance
- User Specific Reports
- eToll Support System

Accounts Module
- Daily Cash up
- Manual Declaration
- Transaction Management
- Accounts Reports
- Operators Petty Cash Management
- Accounts Reports

Materials Management Module
- Master Data Management
- Items Management
- Stock Inward/Outward
- Inventory Reports
- Vendor Master
What Sets Us Apart

We have been set apart by both our performance and innovations.

Our performance and commitment to excel has set us apart and we are proud to state:

› On time completion of project (100% for all the projects executed till date)

› 99% uptime performance for the electronic tolling system across all projects

Likewise when it comes to innovations we have been responsible for big inventions—and our goals are nothing short of inventing the future of the Toll Solutions and creating the next generation of businesses!

Our Research in Tolling Solutions has led us to design and develop:

1) Automatic Vehicle Identification and Classification (AVCC) System
2) Machine Vision Based Vehicle Surveillance System
3) Human Computer Interaction Models
4) Fraud and Theft Identification Technologies
5) Communication using GPRS, GSM and RFID Technologies
6) Traffic Display Technologies
7) Dynamic Image Processing

At our “Highways & Traffic Management R&D Division” we continue to find new technology innovations that enhance our products value and deliver cutting edge solutions. We are excited to be developing technologies that weave electronics, software, and services into every aspect of our tolling solutions.

We see a future in which tolling will be based on advanced technologies that integrates GPRS position of vehicles, Traffic Volumes on Roads & Carbon Emission data from individual vehicles—and we look forward for the breakthroughs we’ll make in the years ahead.
eToll Software & System Architecture

eToll Software provides comprehensive capabilities to manage toll collection operations under demanding and unique requirement of Indian toll plazas.

Created in a distributed architecture platform, eToll software is designed to run 24x7 for years, thus providing a robust uptime performance. The different layers on which the application is built embed controls and features to match vast requirements at Indian toll plazas. To this extent our eToll Software is layered as:

Central Administration Module
Facilitate entire operation of collection across toll plazas as a one centralized unit, generate consolidated reports and control configurations such as rates, operators, journey types etc.

Plaza Module
To configure, manage all plazas based toll collection operations, report toll collection in an audited manner.

Lanes Module
Running under plaza module, lanes module facilitates accurate toll collection for the vehicle passing from the toll plaza.
A) Electronic Toll Lane Controller (TLC)

**Make:** eToll (Techsture)  
**Model No:** eTLC V3

The toll lane controller (TLC) is mounted inside the toll collection booth. The primary function of TLC is to integrate all toll equipments, facilitates toll collection and communicates transaction data with plaza server. Toll lane controller is loaded with lane application for performing all operations as per requirements. TLC houses various electronics that communicates serially with onboard computer that in turn controls entire operations of the lane.

The AVC Analyzer card is also integrated with the TLC and sends data to the lane controller through a serial interface. The AVC analyzer interfaces to the following sensors:

- Vehicle Detection Loop
- AVCC Unit mounted on the lane

**Specification**

- **On board computer** (Industrial Grade, Intel Processor based Motherboard, Intel Core i3 Processor, 3.06GHz, 4 GB 1333 MHz RAM, 500GB SATA HDD)  
- SMPS power supply (12/24 VDC)  
- Vehicle Detection Loop Circuit  
- AVCC Analyzer Card  
- Barrier Controller Card  
- Dual TLC Fan for efficient cooling  
- Terminal and Surge Protection  
- Digital Display for equipment functioning status  
- Alarm buzzer  
- Temperature indicator  
- Power Supply

**Industrial Grade**

- 1.6 mm Steel Housing with IP 54 Protection  
- Redundant SMPS power supply for fail safe feature  
- Safety fuses to prevent circuits  
- MCB for electrical over-current protection  
- Hi Temperature Alarm along with display  
- Electronics that can work in sub zero and over 60 C temperatures  
- Digital logging of open/close of TLC
B) Auto Vehicle Classifier & Counter (Accuracy >98%)

**Make:** eToll (Techsture)
**Model No.** eAVC V3

The Auto Vehicle Classifier and Counter system offered is a product of R&D Lab of TechSture Technologies. A highly accurate system this AVCC is a complex assembly of high range sensors and electronics.

**Features:**
- Non Intrusive Infrared Based Technology
- The system can be configured to provide for detection of any or all of the following characteristics.
  - Length of the vehicle(s) and hitch location
  - Number of axles
  - Dual Tire detection
  - Relative position of the axles (Can accurately detect raised axles also)
  - Maximum height, average height and height variations of the vehicle.
- Array of **144 Sensors** arranged to accurately capture profile of the vehicle

**ADVANTAGES**
- Non intrusive, no wear and tear
- Ease of installation & maintenance.
- **High classification accuracy (>98%).**
- Adjustable scan rate
C) **Over Head Lane Signal (OHLS) (400 mm) (Techsture Manufactured)**

1) Consistent brightness and long life of the over head lane signal
2) Clearly visible over a distance of 300 meters
3) Auto dimming feature to reduce brightness at night thus saving power
4) Waterproof body

<table>
<thead>
<tr>
<th>Color</th>
<th>Luminous intensity (mcd)</th>
<th>Wavelength (nm)</th>
<th>Visual angle (°)</th>
<th>Power (w)</th>
<th>Operating temperature (°C)</th>
<th>Input voltage</th>
<th>Outside material</th>
<th>Outer size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;8000</td>
<td>630±5</td>
<td>30</td>
<td>30</td>
<td>≤20</td>
<td>-40 ~ +80</td>
<td>AC85V-265V</td>
<td>400<em>100</em>100</td>
</tr>
<tr>
<td></td>
<td>&gt;12000</td>
<td>505±5</td>
<td>30</td>
<td>30</td>
<td>≤20</td>
<td>60HZ/50HZ</td>
<td>Cold rolled plate</td>
<td></td>
</tr>
</tbody>
</table>
D) **Digital Boom Barrier**

**Main Features**

A) **High Speed Operation (0.8 Seconds)**
   Boom arm closes/opens in just 0.8 seconds. *A patented sine curve* mechanism ensures smooth landing of boom without shaking.

B) **Heavy Duty Cabinet**
   The cabinet adopts 2 mm precise machining cold rolled plate and static electricity sprayed anti UV surface which is non scale and unfading, confirmed to the IP54 dustproof and waterproof.

C) **Anti Collision Protects Boom Arm**
   Anti Collision protects the boom arm not to be damaged once boom arm was collided by a vehicle.

D) **Anti Hit - Prior to Closing**
   If a vehicle is coming while boom arm is moving down, it will automatically retract to open position upon contact with a vehicle.

E) **Boom to open up fully or close down in case of power failure**
   If power is suddenly off while boom closing, boom will automatically close down fully if the angle between boom and vertical plane beyond 45 degrees. If power failure occurs during boom arm opening, boom will automatically continue to open up fully if the angle between boom and level surface beyond 45 degrees.

**Special Features**

- Barrier operation achieved digitally
- **No gears/mechanical assemblies with virtually zero failure rates**
- **No limit switch used.** This does away position setting for boom arm frequently
- Exceptional long life for the barrier (6-7 million cycle’s approx)
F) **Maintenance free torque motor with 100% duty cycle**
Integrated decelerating torque motor is environmental friendly, energy saving and maintenance free. No current shock and overheating while working.

G) **Automatically error self check and report**
Automatically checks the operation status and report errors accordingly

### Technical Specifications

<table>
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<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>AC 220±10%, 50/60HZ, Max.0.5A</td>
</tr>
<tr>
<td>Boom arm length</td>
<td>3m</td>
</tr>
<tr>
<td>Boom opening/closing speed</td>
<td>0.8 Seconds</td>
</tr>
<tr>
<td>Motor (AC 220±10%)</td>
<td>70W BLDC torque motor</td>
</tr>
<tr>
<td>Control unit</td>
<td>Intel 80C51 MCU, 40Mhz basic frequency, controlled silicon motor control, multiplexing 0~5V switch input, multi relay output; RS485 interface, Watchdog shut down protect.</td>
</tr>
<tr>
<td>Working Environment Temp.</td>
<td>-25℃~ +60℃</td>
</tr>
<tr>
<td>Working Relative Humidity</td>
<td>Relative humidity ≤ 95 % No condensation</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>100%</td>
</tr>
<tr>
<td>Spring</td>
<td>Multi Spring Balance</td>
</tr>
<tr>
<td>Loop detector input</td>
<td>Either active or passive input; 0<del>0.5V or short as logic 0, 3V</del>24V or open as logic 1. The input has RC hardware filter and 10 ms software filter, the width of pulse required to be over 100 ms, 1 fall to 0 trig to protect from crash to obstructor, and 0 to 1 trig barrier boom to move up.</td>
</tr>
<tr>
<td>Up &amp; Down input</td>
<td>Either active or passive input, 0<del>0.5V or short as logic 0, 3V</del>24V or open as logic 1. The input has RC hardware filter and 10 ms software filter, the width of pulse required to be over 100 ms, 1 fall to 0 trig to protect from crash to obstructor, and 0 to 1 trig barrier boom to move up.</td>
</tr>
<tr>
<td>Traffic light output</td>
<td>AC 220V traffic power output, maximum current 0.5A. Barrier boom move &gt;2/3 relay works and &lt;2/3 release.</td>
</tr>
<tr>
<td>Loop detector Syn.output</td>
<td>Relay NO output, AC 220V/0.5A, DV 12/1A</td>
</tr>
<tr>
<td>RS 485 Communication interface</td>
<td>Semi-duplex RS485 interface, switch time 10 ms, 8 data bits, 1 stop bit, no checksum, 9600 bps, ASCII decimal code.</td>
</tr>
<tr>
<td>Communicating range</td>
<td>≤ 1200 M</td>
</tr>
</tbody>
</table>
E) **Monitor**

Make: Viewsonic

Large Screen Size (18.5 Inches) with built in Speakers (to create alarms and warnings)

Type: LED Monitor with speakers

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F) **Keyboard**

Rugged TVSE Gold Keyboard that can withstand tough conditions at toll plazas
G) Photo/Video and Incident Capture Camera

High Resolution High Range Vari-Focal Array Traffic Camera

Main Features

› German Origin, specially designed for Traffic surveillance
› 1/3" Sony Super HAD II CCD
› High Resolution of 600 TVL
› Vehicle Head Light Compression
› 3 Units of Dot Matrix Array LED
› Array Range of 50 meters
› 9~22mm Iris Lens
› With OSD, D-WDR

Incident camera has to capture the digital image of the vehicle while exiting the lane. It captures the image of the exiting vehicle from the lane in the following conditions i.e.

- When the vehicle has passed without paying the toll fare
- During the class discrepancy
- In case of violation.
- Whenever there is an exempt transaction
- Record videos during emergency pass of VIP/Military vehicles

The Lane controller triggers the Incident camera to capture an image. The input to the lane controller is given by the AVC sensors placed in the lanes.
Camera Technical Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Image Sensor</strong></td>
<td>1/3” Sony Super HAD ‖ CCD</td>
</tr>
<tr>
<td><strong>Pixels</strong></td>
<td>PAL: 752 (H) × 582 (V) ; NTSC: 768 (H) × 494 (V)</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>600TVL</td>
</tr>
<tr>
<td><strong>Min. Illumination</strong></td>
<td>COLOR :0.3Lux(F1.2, 50IRE, AGC ON); B/W :0.005Lux(F1.2, 50IRE, AGC ON)</td>
</tr>
<tr>
<td><strong>S/N Ratio</strong></td>
<td>More than 50dB (AGC OFF)</td>
</tr>
<tr>
<td><strong>Electronic Shutter</strong></td>
<td>PAL: 1/50 ~ 1/100000s; NTSC: 1/60 ~ 1/100000s</td>
</tr>
<tr>
<td><strong>Iris Control</strong></td>
<td>Manual Iris</td>
</tr>
<tr>
<td><strong>White Balance (AWB)</strong></td>
<td>ATW1/ATW2/AWC / MANUAL</td>
</tr>
<tr>
<td><strong>Gain Control (AGC)</strong></td>
<td>Low/Middle/High choice</td>
</tr>
<tr>
<td><strong>Back Light Compensation</strong></td>
<td>on/off</td>
</tr>
<tr>
<td><strong>Day &amp; Night (ICR)</strong></td>
<td>Auto/Color/B/W/External Control</td>
</tr>
<tr>
<td><strong>IR</strong></td>
<td>3 units of Dot matrix Array LED</td>
</tr>
<tr>
<td><strong>WDR</strong></td>
<td>Digital WDR (Wide Dynamic Range)</td>
</tr>
<tr>
<td><strong>Protocol</strong></td>
<td>Pelco-D / Pelco-P / NEXTCHIP protocol</td>
</tr>
<tr>
<td><strong>Sync</strong></td>
<td>Power Synchronization / Internal Synchronization</td>
</tr>
<tr>
<td><strong>Video Output</strong></td>
<td>BNC Mode: twisted-pair method (built-in twisted pair transmission module)</td>
</tr>
<tr>
<td><strong>Special Functions</strong></td>
<td>OSD, Privacy Masking, Motion Detection</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>DC12V</td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>2.5W</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>38*38mm</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-20°C ~ +50°C</td>
</tr>
<tr>
<td><strong>Certifications</strong></td>
<td>CE, FCC &amp; ROHS</td>
</tr>
</tbody>
</table>
H) Barcode Reader

**Manufacturer:** Motorola

**Model:** Symbol LS1203 Laser Scanner

Durable, single-board construction: Meets 5 ft drop tests, significantly reducing downtime and repair costs.

Multiple interfaces: RS232, USB, keyboard wedge (KBW) in one scanner: Simplifies installation and integration, ensuring future compatibility.

Sleek, lightweight, ergonomic design: Maximizes comfort for all-day use.

Intuitive scanning and plug-and-play capability: Minimizes setup and training time.

Choice of triggered or continuous mode: Ensures versatile, accurate first-time scanning.
Symbol LS1203 Specifications

Physical Characteristics
- **Dimensions**: 2.4 in. H x 7.1 in. L x 2.4 in. W
- **Weight (w/o cable)**: Approximately 4.3 oz. (122 g)
- **Voltage & Current**: 5 +/-10%VDC @ 100 mA (Stand by: <35 mA)
- **Power Source**: Host power or external power supply
- **Color**: Cash Register White or Twilight Black

Performance Characteristics
- **Scanner Type**: Bi-directional
- **Light Source (Laser)**: 650nm laser diode
- **Scan Rate**: 100 scans per second
- **Typical Working Distance**: See chart below
- **Print Contrast Min.**: 30% minimum reflectance
- **Roll (Tilt):** \( \pm 30^\circ \) from normal
- **Pitch:** \( \pm 65^\circ \)
- **Skew (Yaw):** \( \pm 60^\circ \)

Interfaces Supported: RS-232, Keyboard Wedge; USB

User Environment
- **Operating Temp.**: 32°F to 122°F / 0°C to 50°C
- **Storage Temp.**: 40°F to 158°F / -20°C to 70°C
- **Humidity**: 5% to 95% relative humidity, non-condensing
- **Dust Specks**: Withstands multiple 5 ft/1.524m drops to concrete
- **Ambient Light Immunity**: Immune to direct exposure of normal office and factory lighting conditions, as well as direct exposure to sunlight
- **Beep Volume**: User-selectable: three levels
- **Beep Tone**: User-selectable: three tones
- **Electrostatic Discharge (ESD)**: Conforms to 16 kV air discharge and 8 kV of contact discharge

Regulatory
- **Electrical Safety**: UL1950, CSA C22.2 No. 950, EN60950/EC505
- **EMI/RFI**: FCC Part 15 Class B, ICES-003 Class B, European Union EMC Directive, Australian SMA, Taiwan EMC, Japan VCCI/MIIT/Dentori
- **Laser Safety**: IEC Class 1

Warranty
The Symbol LS1203 is warranted against defects in workmanship and materials for a period of 3 years (36 months) from date of shipment, provided that the product remains unmodified and is operated under normal and proper conditions. See full warranty for details.

<table>
<thead>
<tr>
<th>Depth of Field</th>
<th>Label Density</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Label</td>
<td>Code 39 - 5 mil</td>
<td>0.25” - 6.0”</td>
<td>0.5 - 12.6 cm</td>
</tr>
<tr>
<td>Code 39 - 7.5 mil</td>
<td>0 - 7.75”</td>
<td>0 - 19.68 cm</td>
<td></td>
</tr>
<tr>
<td>Code 39 - 10 mil</td>
<td>0 - 8.5”</td>
<td>0 - 21.5 cm</td>
<td></td>
</tr>
<tr>
<td>100% UPC - 13 mil</td>
<td>0 - 8.5”</td>
<td>0 - 21.5 cm</td>
<td></td>
</tr>
<tr>
<td>200% UPC - 26 mil</td>
<td>0 - 10.25”</td>
<td>0 - 26 cm</td>
<td></td>
</tr>
</tbody>
</table>
I) Point of Sale Printer

Manufacturer: EPSON

Model No.: TM-T88IV

The most durable and efficient thermal receipt printer
Expected lifespan of 50 million lines (MCFB), 360,000 hours (MTBF) and auto-cutter life of 1.5 million cuts

More savings with minimal paper usage
Adjustable margin settings reduce unnecessary paper wastage

Easy installation and usage in any retail environment
Windows Driver function makes the printer easy to install and use, and the wide angle of the top cover allows for quick roll replacement

Specifically designed with safety in mind
The circuit board is mounted upside down to protect it from accidental spillage
# Technical Specifications for Thermal Printer

## Print

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Buffer</td>
<td>4 Kbytes or 45 bytes, Flash memory 256 Kbytes</td>
</tr>
<tr>
<td>Characters Per Inch</td>
<td>25cpi / 18cpi</td>
</tr>
<tr>
<td>Paper Dimensions</td>
<td>Thermal roll paper: 79.5 +/- 0.5 x dia 83.0 mm</td>
</tr>
<tr>
<td>Character Size</td>
<td>0.99 W x 2.4 H / 1.41 W x 3.39 H mm</td>
</tr>
<tr>
<td>Paper Thickness</td>
<td>0.06 to 0.07</td>
</tr>
<tr>
<td>Print Speed</td>
<td>Standard: 200 mm / sec, Barcode printing: 100 mm/s, 2-colour printing: 150 mm/s</td>
</tr>
<tr>
<td>Interfaces</td>
<td>RS-232C / Bi-directional parallel / RS-485 / USB / 10 Base-T I/F</td>
</tr>
<tr>
<td>Bar Codes</td>
<td>UPC-A, UPC-E, JAN8 (EAN8), JAN13 (EAN13), CODE 39, CODE 93, CODE 128, ITF, CODABAR.</td>
</tr>
<tr>
<td>Print Fonts</td>
<td>9 x 17 / 12 x 24</td>
</tr>
<tr>
<td>Characters Set</td>
<td>95 Alphanumeric, 32 International, 128x7 graphics, Traditional/Simplified Chinese, Thai, Japanese, Korean</td>
</tr>
<tr>
<td>Paper Type</td>
<td>Thermal roll paper</td>
</tr>
</tbody>
</table>

## Power

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Consumption</td>
<td>24VDC +/- 7%</td>
</tr>
</tbody>
</table>

## General

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Approx 1.8 Kg</td>
</tr>
<tr>
<td>Dimensions</td>
<td>145 W x 195 D x 148 H mm</td>
</tr>
</tbody>
</table>

## Reliability

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability MCBF</td>
<td>37 x 106 lines</td>
</tr>
<tr>
<td>Reliability MTBF</td>
<td>18 x 104 hours</td>
</tr>
</tbody>
</table>
J) Plaza Server

IBM System x3100 M4

**Highlights**

- Delivers robust performance at a competitive entry-server price
- Offers flexibility in an optimised compact design
- Combines reliability and simple installation with innovative management technology

With support for the latest Intel Xeon and Core i3 processor technology, the IBM System x3100 M4 delivers strong performance for the price in a single-socket tower. Advanced features and functions, which come standard, include innovative integrated RAID capability, 1600 MHz dependable server-class memory, energy efficiency, low-cost tower-to-rack kit and high-capacity storage options for enhanced availability.

**Product features**

- Generous server-class memory offers greater performance per price point
- Support for up to four high-capacity, low-cost Serial ATA hard disk drives or up to eight hot swap 2.5” SAS/ SATA hard disk drives that optimise implementation flexibility
- PCI Gen 3-ready slot offer ample I/O speed and an easy upgrade path
- Integrated Management Module 2 and full IBM toolbox simplify systems management
- Embedded RAID support and optional advanced RAID upgrade facilitates enhanced availability and protection
- Dual integrated Gigabit Ethernet offers greater network bandwidth
Hardware summary

- Single-processor, 4U / 5U tower server (model dependent)
- Choice of processors—Intel Xeon E3-1200v2 series (quad-core) up to 3.6 GHz/8 MB/1333 MHz or Intel Core i3 2100 series (dual-core) up to 3.4 GHz/3 MB/1333 MHz
- DDR-3 ECC server-class memory, up to 1600 MHz; max 32 GB UDIMM
- Up to 12 TB via 4 × 3.5 in. simple-swap SATA HDDs or 8 TB via 2.5” SAS/SATA hot-swap HDDs
- Standard ServeRAID-C100 for IBM System x® supports RAID-0 or -1 or hardware RAID-0,-1 for 2.5” hot-swap HDDs, redundant PSU model (model dependent)
K) Cannon Network Laser Printer

**Make/Model No:** CANON - LASER SHOT LBP3300

 deliver outstanding print at speed of 21 pages per minute

Two groundbreaking technologies: CAPT 2.1 and Hi-SCoA redesign the printing process, allowing users to enjoy faster printouts

CAPT 2.1, or Canon Advanced Printing Technology, harnesses the power of the PC to speed up print jobs instead of loading up the printer with expensive memory upgrades

Superb print resolution of up to 2400 x 600 dpi equivalent

Quick Warm-Up Time, the LBP3300 starts printing immediately with no waiting time necessary

L) Uninterrupted Power Supply (UPS) (6KVA)

**Make:** American Power Corporation

APC Smart-UPS On-Line, 4200 Watts / 6000 VA, Input 230V / Output 230V, Interface Port DB-9 RS-232, RJ-45 10/100 Base-T, Smart-Slot, Extended runtime model, Rack Height 3 U

<table>
<thead>
<tr>
<th>Output</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Capacity</td>
<td>4200 Watts / 6000 VA</td>
</tr>
<tr>
<td>Max Configurable Power</td>
<td>4200 Watts / 6000 VA</td>
</tr>
<tr>
<td>Efficiency at Full Load</td>
<td>92%</td>
</tr>
<tr>
<td>Output Voltage Distortion</td>
<td>Less than 3%</td>
</tr>
<tr>
<td>Output Frequency (sync to mains)</td>
<td>50/60 Hz +/- 3 Hz user adjustable +/- 0.1</td>
</tr>
<tr>
<td>Waveform Type</td>
<td>Sine wave</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Input Voltage</td>
<td>230V</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>50/60 Hz +/- 5 Hz (auto sensing)</td>
</tr>
</tbody>
</table>

Input Connections:

Input voltage range for main operations: 160 - 280V
Input voltage adjustable range for mains operation: 100 - 280V
**Customers List (Projects Executed)**

<table>
<thead>
<tr>
<th>Customer:</th>
<th>GPJ OMT 2 Pvt Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Porbandar-Jetpur Section NHAI 8 (NH 27)</td>
</tr>
<tr>
<td>Client:</td>
<td>National Highways Authority of India</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>12, 2 Toll Plazas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>Chittorgarh Kota Tollways Pvt Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Chittorgarh-Kota NH 27 Segment</td>
</tr>
<tr>
<td>Client:</td>
<td>National Highways Authority of India</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>18, 3 Toll Plazas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>Kota Baran Tollways Pvt Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Kota-Baran NH 27 Segment</td>
</tr>
<tr>
<td>Client:</td>
<td>National Highways Authority of India</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>8, 2 Toll Plazas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>Welspun Infrastructure Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Kim-Mandvi Corridor, Surat</td>
</tr>
<tr>
<td>Client:</td>
<td>Gujarat State Road Development Corporation</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>8, Two Toll Plazas</td>
</tr>
<tr>
<td>Customer:</td>
<td>Welspun Infrastructure Ltd</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Project Location:</td>
<td>Himmatnagar Bypass, Himmatnagar</td>
</tr>
<tr>
<td>Client:</td>
<td>Gujarat State Road Development Corporation</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>4, One Toll Plaza</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>GHV India Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Shalumbar – Banaswara Road, State Highway, Rajasthan PWD</td>
</tr>
<tr>
<td>Client:</td>
<td>Rajasthan State Highway</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>12, 3 Toll Plazas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>Ranjit Toll Road Pvt Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Deesa-Pathawada Section, Deesa</td>
</tr>
<tr>
<td>Client:</td>
<td>Gujarat State Road Development Corporation</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>14, 2 Toll Plazas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>Ranjit Projects Pvt Limited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Channi Village, Baroda</td>
</tr>
<tr>
<td>Client:</td>
<td>Gujarat State Road Development Corporation</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>6, One Toll Plaza</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer:</th>
<th>MSK Engineering Pvt. Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Location:</td>
<td>Bhuj – Nakhatarana Section</td>
</tr>
<tr>
<td>Client:</td>
<td>Gujarat State Road Development Corporation</td>
</tr>
<tr>
<td>Number of Toll Lanes:</td>
<td>12, Two Toll Plazas</td>
</tr>
</tbody>
</table>
Contacts

Mr. Chetan Patel | CMD / CTO
+91 9825015623 | chetan@techsture.com

Mr. Rajesh Chopra | Director - Business Development
+91 9327011614 | rajeshchopra@techsture.com

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we deeply care for our clients,
firmly believe in our people and take pride in what we do.