Fare Collection, Simplified.

Rethinking the All-in-One Farebox for Modern Transit

kontron
The Power of IoT

eBook

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A New Role for The Farebox

Transit agencies are under pressure to modernize, but modernizing shouldn't mean paying for more than you need.

Today's riders expect flexible, seamless ways to pay. Agencies need better data, stronger financial controls, greater visibility, and technology that can adapt as their networks evolve.

But does every vehicle need a $20,000+ all-in-one farebox to deliver that experience?

A radically simpler approach

A modular approach can deliver the functionality agencies need without the cost and complexity of an all-in-one farebox.

The result? Up to 70% low cost, all in.

By separating digital validation, operator functions, and cash collection into purpose-built components, agencies can avoid paying for sophisticated functionality they don't need on every vehicle.

Adjust the architecture. Reduce complexity. Less cost.

For decades, fareboxes have been designed to do it all: process fares, handle cash, calculate transactions, manage transfers, communicate with the back office, support operators, and more — all packed into one sophisticated system.

That approach made sense when the farebox was at the center of the entire fare-collection ecosystem.

Today, it may be creating more complexity, more cost than necessary.

With account-based ticketing and digital payments shifting more intelligence to the back office, agencies can rethink what actually needs to happen onboard. Instead of buying one expensive system loaded with capabilities, agencies can take a more targeted approach:

Choose what you need.

Simplify what you don't.

Pay for the functionality that delivers value.

What if the next farebox didn't have to do everything?

That question is at the heart of a more modular approach from Kontron and Diamond Manufacturing.

Instead of asking one device to handle every fare-collection function, the architecture separates the job into three purpose-built components:

1

Kontron S900 Electronic Validator

Handles mobile, smart card, and supported contactless fare media

2

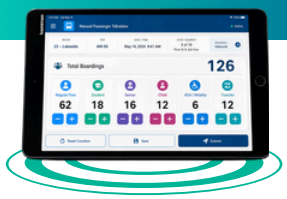
Diamond Manufacturing Farebox

Focuses on secure cash collection

3

Kontron Operator Fare Collection Assistant (OFCA)

Provides interface, fare data, and controlled cash-to-digital top-ups



This isn't about doing less.

It's about removing unnecessary complexity.

And that distinction matters.

The All-in-One Farebox Was Built for a Different Era

The traditional electronic farebox was designed around a simple reality: cash was the fare. That meant the onboard machine needed to do almost everything.

Today, the fare ecosystem looks very different.

Account-based ticketing can move fare products, account management, transaction history, and much of the fare intelligence into the back office. Digital payment options can be handled through dedicated validators. Operators increasingly need information and controls, not a computer that performs every fare-collection function.

Yet agencies can still find themselves purchasing highly integrated fareboxes that combine sophisticated electronics, software, communications, fare logic, reporting, and mechanical cash-processing technology into a single solution—designed to collect a declining volume of cash .

Why continue paying for complexity that no longer needs to live in one box?

A modular architecture takes a different approach:

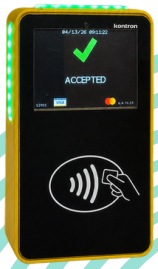
Keep the cash. Separate the functions.

That creates an architecture in which each component does what it is best suited to do — and can be maintained or replaced without automatically replacing everything else.

Three Components.
One Connected Fare Ecosystem.

1 Digital Fare Acceptance

Kontron S900 Electronic Validator



The S900 handles interaction with mobile devices, smart cards, and contactless fare media.

The digital transaction connects to the account-based ticketing environment, where account management, fare products, and transaction intelligence can remain centralized. The validator doesn't need to be a cash machine.

2 Secure Cash Collection

Diamond Manufacturing Farebox

The Diamond farebox does one thing exceptionally well: collect cash securely.

By removing the need to duplicate digital processing, fare calculation, reporting, and sophisticated electronic cash registration inside the farebox, the design can focus the hardware on its core job.

Fewer functions can mean fewer specialized components. And fewer specialized components can mean fewer things to maintain.

3 Operator Assistant

Kontron Operator Fare Collection Assistant (OFCA)

The operator still needs visibility and control.

OFCA provides the interface for structured fare data and controlled cash-to-digital top-ups while capturing operating context such as time, vehicle, route, and location.

The goal is to give operators the information they need without making them manage the technology behind it.

Cash Doesn't Have to Mean Disconnected

Keeping cash in the system doesn't mean keeping cash riders outside the digital fare ecosystem.

With an operator-confirmed cash-to-digital top-up, a rider can deposit cash and add value to a mobi.fare account during the journey.

The experience can be straightforward, with hardening, and application-level security controls.

Cash in → account identified → amount confirmed → value credited → transaction recorded.

That creates a bridge between two worlds that are often treated separately: cash and account-based transit.

For riders who rely on cash, that can mean access to digital account functionality without requiring a smartphone, banking relationship, or separate retail visit.

For agencies, it creates a transaction that can be controlled, recorded, reconciled, and audited.

Of course, financial transactions require discipline. Agencies must establish transaction limits, operator permissions, correction procedures, offline processes, rider confirmation, and complete audit trails.

Modernizing fare collection should never mean weakening revenue control.

Complexity Has a Cost

The price of a farebox isn't just the price on the purchase order.

Every additional mechanism, software layer, specialized component, and proprietary system creates another potential lifecycle cost.

Traditional electronic registering fareboxes can contain mechanical coin and bill counting and recognition assemblies with sensors, motors, transport paths, calibration requirements, and electronic controls.

Those components operate in one of the least forgiving environments imaginable: a vehicle moving through daily service, exposed to dirt, vibration, liquids, foreign objects, and constant use.

Then there is everything surrounding the hardware:

- **Preventive maintenance**
- **Corrective repairs**
- **Specialized parts**
- **Technician training**
- **Bench repair**
- **Software updates**
- **Cybersecurity**
- **Licensing and support**
- **Obsolescence**
- **Vehicle downtime**

Complexity doesn't stop costing money when the farebox leaves the purchasing department.

It can continue costing money for years.

Make Maintenance Simpler

A modular architecture changes the maintenance equation.

If the validator fails, technicians can swap a validator in seconds.

If the operator interface requires replacement, it can be addressed independently.

If the cash component reaches the end of its useful life, the agency doesn't necessarily need to replace the digital infrastructure around it.

That is the promise of modularity ❯ Replace the layer that failed, not the not the singular all-in-one service disrupting device.

For maintenance teams, that can mean simpler fault isolation, more targeted spares strategies, and less dependence on specialized cash-processing expertise.

But the objective is clear ❯ Make the system easier to understand, easier to maintain, and easier to evolve.

The Business Case Goes Beyond Unit Price

The most interesting question isn't simply, **"How much does the farebox cost?"**

It is something more like, **"How much does this fare-collection architecture cost to own?"**

A meaningful comparison should look beyond acquisition price and consider the entire lifecycle.

That includes:

CAPITAL

- Equipment and installation
- Spare assemblies
- Training
- Maintenance tooling

SOFTWARE & SUPPORT

- Licensing
- Software maintenance
- Device management
- Vendor support

OPERATIONS

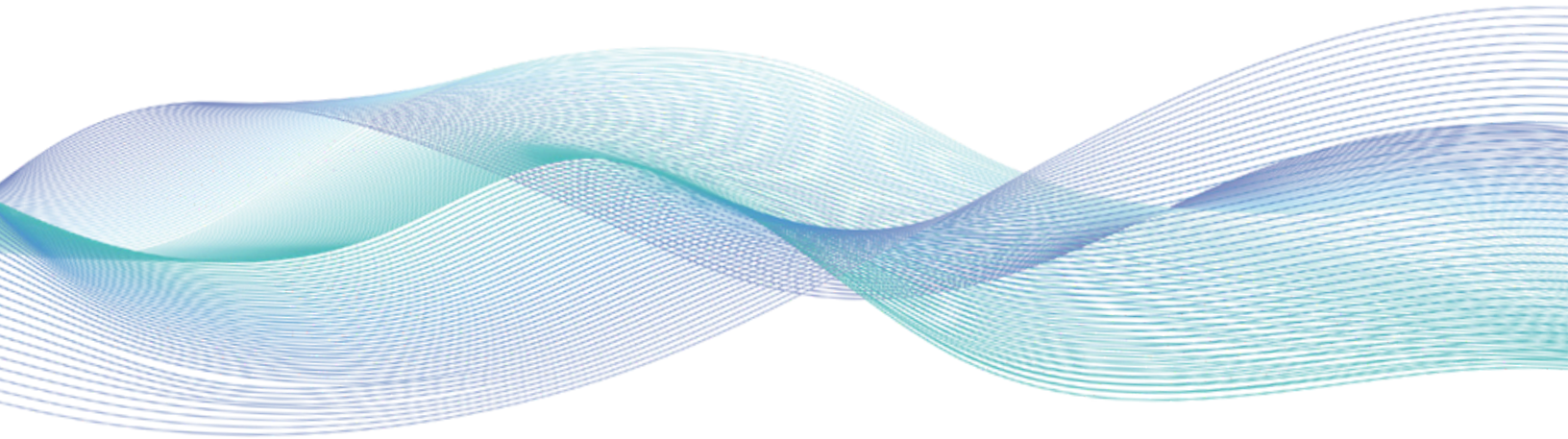
- Preventive maintenance
- Corrective labor
- Bench repair
- Vehicle downtime

LONG-TERM

- Obsolescence
- Midlife upgrades
- Component replacement
- Technology refresh

The modular approach is designed around a simple proposition. Don't buy computing, software, mechanical complexity, and functionality you don't need in every component.

Separate cash collection from digital validation and invest only in the technology you need.



Modernization Shouldn't Mean Leaving Riders Behind

There is another reason cash still matters, and that is access.

Not every rider has a smartphone. Not every rider has a bank account. Not every rider is ready, or able to move entirely into a digital fare ecosystem.

A modular architecture can preserve cash while connecting cash-paying riders to the same account-based environment used by digital riders.

That can create opportunities for reusable value, account-based products, transaction history, and fare benefits, while maintaining alternatives that don't depend on a smartphone.

The goal isn't to force riders into one payment method, but to give agencies more ways to serve them.

Putting the Model to the Test

A new fare-collection architecture should earn its place in the fleet.

A controlled pilot can put the concept to the test across the metrics that matter most:

Can riders board quickly?

Measure transaction and top-up times under real-world passenger loads.

Can operators use it confidently?

Measure interactions, training requirements, errors, corrections, and operator feedback.

Can finance reconcile every dollar?

Compare physical cash, account credits, reversals, OFCA records, and end-of-shift reporting.

Can the system keep working when things go wrong?

Test network outages, device failures, software updates, recovery events, and offline scenarios.

Can maintenance teams fix problems faster?

Measure fault isolation, replacement time, parts consumption, preventive labor, and support requirements.

Does the experience work for riders?

Measure successful transactions, comprehension, accessibility, and customer feedback.

The pilot should not simply prove that the technology works. It should prove that the architecture makes financial and operational sense.

The Bigger Question for Transit Leaders

Fare collection is changing.

Digital payments are expanding. Account-based ticketing is moving intelligence into centralized platforms. Riders expect more payment choices. Agencies are under constant pressure to control capital and operating costs.

In that environment, the farebox doesn't necessarily need to become smarter.

It may need to become simpler.

The electronic farebox earned its place by bringing everything together in one machine.

The next generation may take the opposite approach.

Separate the functions. Connect the system. Simplify the hardware.

Cash isn't going away. But the complexity built around it doesn't have to stay either.

We're Not Eliminating the Farebox.

We're Redefining Its Role.

Kontron and Diamond Manufacturing are rethinking onboard fare collection around a simple principle: every component should have a purpose, every dollar spent should have a reason, and every part of the system should deliver value.

The result is a modular approach designed to preserve cash access, connect riders to digital account value, reduce onboard complexity, and give agencies greater flexibility over how their fare-collection systems evolve over time.

Fare Collection, Simplified.

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