

SWARCO ITS

Smart AI

Self-learning traffic control for smarter intersections



Less waiting. Better flow.
A controller that learns.

Optimise every 100 milliseconds - based on real traffic demand. SMART-AI adds reinforcement-learning intelligence to the proven ITC-3 traffic controller. It continuously evaluates traffic conditions and selects the best available signal action - locally, safely and in real time.

Our integrated solution



Traffic detection

Live detector and signal-state data describe current demand.



Smart-AI CPU

A second dedicated CPU inside the ITC-3 controller evaluates the traffic state every 100 ms.



Safe action

A second dedicated CPU inside the ITC-3 controller evaluates the traffic state every 100 ms.



Better flow

Signal timing adapts continuously to actual demand at the intersection.

Designed for real traffic

- Self-learning optimisation: Learns from traffic and improves control without relying on fixed timing plans.
- Real-time decisions: Evaluates the intersection and selects an action every 100 milliseconds.
- Local edge operation: Runs inside the ITC-3 controller; no cloud connection or internet is required.
- Controlled deployment: Enable or disable SMART-AI by plan change and retain standard safe modes.

How Smart AI works

- 1. Observe:** Read detector inputs, signal states and demand.
- 2. Evaluate:** Compare permitted actions using its learned policy.
- 3. Act:** Apply the selected action through the ITC-3 controller.
- 4. Learn:** Use the result to continuously improve traffic flow.

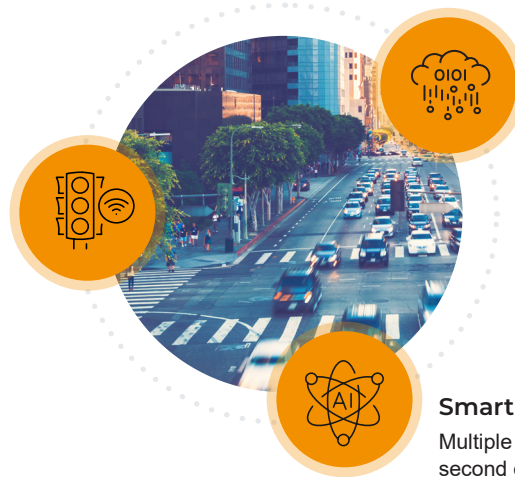
Proven across markets

More than 30 systems installed in Denmark, Finland, Iceland, Norway and Sweden - with further deployments being prepared internationally.

Technical overview

Adaptive intelligence built into the ITC-3 controller

ITC-3 control
Only configured and permitted signal actions are executed.



Detection inputs

Live traffic demand and signal-state information.

Smart AI engine

Multiple specialised AI models run on a second dedicated CPU inside ITC-3.

Multiple ai models - one optimised decision

SMART-AI combines multiple specialised AI models, each designed for a specific traffic-engineering task. The models continuously exchange information to optimise traffic operation in real time.

All models exchange data and update their predictions every 100 ms.



Incoming traffic prediction

Predicts approaching demand before vehicles reach the intersection.



Dynamic traffic cost

Assigns different costs to moving and stationary vehicles to optimise overall flow.



Turning-movement prediction

Predicts the percentage turning left, right or continuing straight.



Signal switch-point optimisation

Selects the optimal moment to change stages while balancing efficiency, delay and safety.



Lane-geometry modelling

Uses lane layout and permitted movements to improve decisions.



Platoon speed estimation

Estimates platoon speed and arrival time to support coordinated progression.

Local, safe and operationally transparent



Local operation

Runs inside ITC-3 without an internet dependency.



Safe integration

Operates within configured controller logic, safe modes and national requirements.



Dashboard & logs

Dedicated dashboards support monitoring; logs follow the standard ITC-3 approach.



Plan-based control

SMART-AI can be enabled or disabled through normal plan changes.

The perfect fit for smart lidar

SMART LiDAR provides continuous object coordinates, direction and speed. Smart AI turns this advanced detection input into adaptive signal decisions - creating a complete SWARCO solution from perception to control.

Ready to optimise your intersection? Contact us for a demonstration!