DATA FROM SKY

TrafficEmbedded

TrafficEmbedded is a video analytics embedded unit designed for real-time detection tasks for dynamic control of traffic light signaling and the collection of traffic data from IP cameras. It comes in the form of a small IP66-rated box designed for easy outdoor installation on light poles. It has an industrial NVIDIA NX processor that runs the AI-based detection and tracking algorithm which turns any video stream into high quality trajectory data about each road user. TrafficEmbedded is essentially our product TrafficXRoads inside an anti-vandal cabinet with the possibility of installing additional accessories and modules. The system is powerful enough to analyze data from up to 6 connected cameras in real-time with an operating range of up to 120 meters. The highly optimized and fully configurable trajectory processing engine is able to evaluate dozens of detection tasks in each camera view in parallel.

The configuration of detection tasks is performed using the visual programming language called FLOW, specifically by parallel or serial connection of spatial, temporal or attribution filters or other operators. For example the emulaction of an inductive loop at any location in the camera view is a matter of just a few clicks and it is the same for more complex scenarios such as U-turn detection, blocking vehicle detection, queue detection or average speed measuring.

The system is fully interactive and responds live to new settings configurations. The system is also able to provide statistical data about the events in different aggregation modes such as whole history, time blocks, floating window or defined time interval. This data can be visualized on a user defined dashboard using interactive widgets for heatmap data, tables, trajectories, statistical values etc. The historical data together with the real-time detected events are available via open APIs for 3rd parties or can be exported in various formats.

The unit has multiple connectivity options including data communication (UDP/REST/webhook), I/O or SDLC expander and also supports LTE/5G and LORA/IoT. The actions/outputs are scriptable and can react to any single detected event in the video or user-defined performance metrics. Furthermore, the unit can be equipped with a V2X module or local data storage. The operating temperature is from -20°C to 65°C. 8x PoE ports allow it to easily connect enough cameras to cover any area no matter its shape. The system supports remote configuration if the internet connection is available including over-the-air updates. TrafficEmbedded is a multifunction traffic analyzer prepared for the new era of smart traffic management.

Dynamic control
- Vehicle presence
- Speed data, level of service
- Queue length & occupancy
- Distances - time & space

Traffic violations
- U-turn detection
- Wrong-way detection
- Illegal lane change
- Red-light violation

Vulnerable road user protection
- Pedestrian/cyclist presence
- Conflict detections
- Jaywalking

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Powered by FLOW, the most powerful traffic framework

FLOW is a fully interactive video analytical traffic framework designed for real-time driven applications. It is the fastest and the most efficient way to transform any video stream into a stream of actionable insights. The first tool ever which visualizes traffic data live right at your fingertips and communicates with the other parts of your smart infrastructure using open APIs. FLOW is built for all thinkable traffic scenarios thanks to the powerful combination of unique visual traffic programming language, trajectory-driven design and AI-based image processing. Take the advantage of the one unified solution for smart traffic, parking, retail and security, which runs everywhere.

Video detection features
FLOW is powered by a proprietary developed and globally trusted video analytical engine utilizing deep-learning. This engine is capable of detecting and tracking hundreds of objects in multi-camera environments simultaneously.

Interactive data visualization
FLOW allows you to visualize the extracted information and analyses using interactive widgets on the customizable dashboards. Create a beautiful and live visualization of the current traffic situation.

Traffic analysis functions
FLOW supports various traffic analytic functions and operators that can be combined into a comprehensive traffic analysis running in real-time. Thanks to the unique visual traffic programming language, you will be a designer of a monitoring solution tailored to your specific needs.

Data interfaces
FLOW was born for integration with other parts of smart infrastructure. Any type of extracted traffic insights can be continuously delivered to 3rd party systems using an open API which supports multiple communication protocols including UDP and REST.
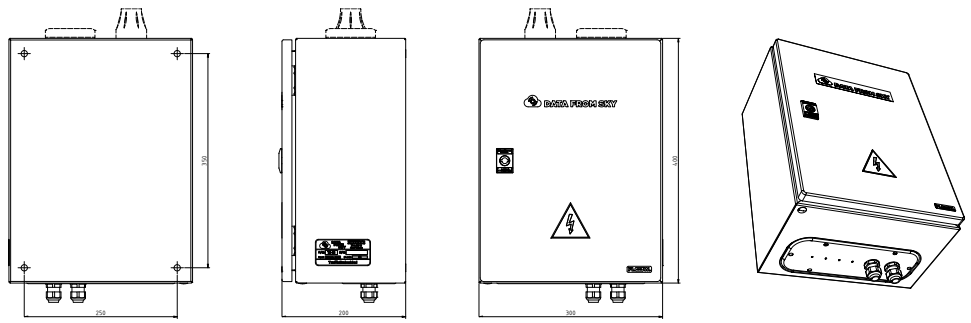

powered by FLOW. INSIGHTS

Model
TrafficEmbedded - NX-V008

Description
Real-time traffic analysis unit
Vandal-proof
On-Board processing

General properties

Processor	NVIDIA Jetson NX
Memory	8 GB 128-bit LPDDR4x, 16 GB eMMC 5.1
Expansion slots	internal HDD bay 1x2.5" SATA, Mini PCIe x 2 (full-size USB2.0 x 1, half-size USB2.0 x 1)
Ethernet	GbE port x1, PoE ports (10/100 MbE, total 75W): SKU1 x 8 PoE / 802.3 at and af
Video output	1x HDMI 2.0 a/b maximum 3840 x 2160; VGA x 1 (optional)
Power supply and consumption	230 V AC / 12 V DC; 150 W - depending on the configuration
Dimensions	L300mm x H400mm x D200mm (without connectors)
Gross weight	approx. 10.5 kg – whole outdoor design incl. the case
Operating / storage temperature	-20°C ~ 65°C (-4° ~ 149°F) / -20°C ~ 85°C (-40° ~ 185°F)
Operating/ Storage Humidity	20 – 90% RH (no condensation) / 10% ~ 95% (no condensation)
Certification	CE, additional certification for computational unit: MIL-STD-810G, FCC, E-Mark, EN50155, MIL-STD-810G
Designed for installation	Outdoor on traffic light poles or other poles

Video analytics

Video analytic engine	exact object traces, 14 categories, in-built ALPR for LP with alphanumeric characters (EU, USA, UK, RUS), traffic light state recognition, dynamic and static anonymization, georegistration, detection masks
Processing power in FPS (B/B+A/B+LP/B+LP+A)	@544x320: 151/112/64/58; @704x419: 100/83/53/48 (B = basic detection, A = add-ons img. processing modules, LP = license plate recognition)
Camera support	IP cameras with H.264 or H.265 codec and RTSP or ONVIF cameras / capable of processing at least 6 cameras in the real time / supporting narrow and wide angle cameras and cameras with motorized lens / detection range up to 120 meters

Traffic analytics

Multifunctional engine	fully configurable trajectory processing pipeline via visual programming language FLOW / ability to evaluate multiple detection tasks in parallel (100+)
Available filters	zone, gate, movement, duration, time of occurrence, class, LP, color (without a limit on the number)
Other operators	level of services, union, intersection, complement, volume
Data statistics	incremental / whole history, time blocks, floating window, fixed interval
Outputs	events, actions / commands, statistics, tables, histograms, images
Possible tasks	presence detection, u-turn detection, blocking vehicle detection, red light violation, average speed, detection of specific traffic events, OD matrix, conflict detection, traffic data collection

Interfaces

Data interfaces	UDP, REST, WEBHOOK, MJPEG, XProtect (VMS-Milestone), MJPEG
HW interfaces	support for IO expanders (relay outputs), SDLC expanders, V2X RSUs
Visual	fully configurable dashboards with interactive widgets

Accessories
- 12V fan for better airflow in the traffic cabinet
- SDLC expander
- IO expander - 4/8/16 relays
- WD 2.5" Blue SATA SSD 1TB
- 4G module; Gemalto 4G-EU with Packing
- GPS module package
- AC Wifi module package (EMV1200/800/400 WiFi AC 5G WiFi module)
- V2X RSU

Other features
- NTP time synchronization
- User management - admin, analyst, viewer
- Remote updates - over-the-air
- Data reduction profiles for remote configuration
- Autoreboot, Autosave and Autorecover settings
- Configuration export and import

Packing List
- 1x TrafficEmbedded unit (TrafficXRoads processing unit inside a box with power supply and a switch inside)
- Cable glands and blindfolds for waterproofing
- Opening handle

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All specifications are subject to change without notice.
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