TrafiCam X·STREAM

TrafiCam x-stream is an integrated solution for vehicle detection.

KEY FUNCTIONALITIES

» VEHICLE PRESENCE DETECTION AT SIGNALIZED INTERSECTIONS
» STOP BAR AND ADVANCE DETECTION
» STREAMING VIDEO

KEY BENEFITS

» ALL-IN-ONE SENSOR (CAMERA + DETECTOR)
» ABOVE-GROUND SENSOR
» MPEG-4 IMAGE COMPRESSION
» IP-ADDRESSABILITY
» REAL-TIME VERIFICATION AND MONITORING
» EASY INSTALLATION AND QUICK CONFIGURATION
» LOW POWER CONSUMPTION
» UP TO 24 'VIRTUAL' DETECTION ZONES
» RELIABLE DETECTION 24/7
» FIELD-PROVEN TRAFICON DETECTION ALGORITHMS
» AESTHETICAL DESIGN, USING DURABLE MATERIALS

TrafiCam x-stream is an integrated camera and detector offering **vehicle presence detection** and **MPEG-4 image compression**.

This intelligent system provides **detection and monitoring** of moving and stationary vehicles at signalized intersections**.** Via detection outputs, vehicle presence information is transmitted to the traffic controller so that signal timing can be adjusted dynamically, resulting in **reduced waiting time,** improved traffic flow and less pollution.

TrafiCam x-stream is an **IP-addressable** video detection sensor. **Streaming video** at full frame rate is available for system and traffic monitoring. Users can configure, view and control the system both on-site and remotely.

The system **setup is quick-and-easy**: a user-friendly PC tool allows connecting to all TrafiCam x-stream devices on the network. A camera image is available for accurate and fast positioning of the 'virtual' presence detection zones. Making the system operational is done in only a few minutes.

TrafiCam x-stream is a **cost-effective and reliable** solution that offers all benefits of video detection. This is an above-ground system without expensive installation and maintenance costs, typical for traditional inductive loops.

TrafiCam x-stream is based on **field-proven** video detection technology and is part of the **Traficon** product range. Traficon is worldwide recognized as the market leader in traffic video detection.

This above-ground sensor allows quick and flexible installation.

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MINIMISING VEHICLE WAITING TIME AND REDUCING CO_2 EMISSIONS

The main goal of TrafiCam x-stream is to reduce vehicle waiting time and to create smoother flowing traffic in cities. This also brings **additional benefits to the environment** as sitting at traffic lights is a major cause of – avoidable – vehicle emissions.

Verification and viewing of the vehicle presence detection zones can be done from the TMC.

GREEN ON DEMAND

A typical TrafiCam x-stream application is direct replacement of inductive loops to do **stop bar detection** at intersections with traffic lights.

Both moving and stationary vehicles (including bicycles and motorcycles) can be detected, from an overhead or a side-fire position.

A common application is green on demand. If there is no vehicle present, there will be no green for that particular phase.

LENGTHENING THE GREEN TIME

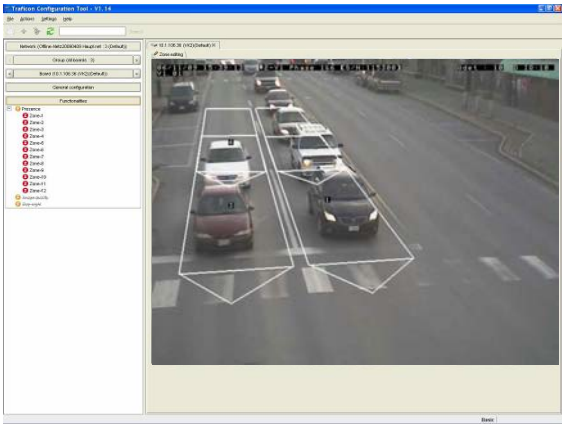
TrafiCam x-stream can also be used for **advance detection**: detection of traffic approaching an intersection. It can replace inductive loops and radars. A common application is lengthening the green time. If there is a vehicle in the dilemma zone - the zone where the driver can hesitate between stopping or driving in case the traffic light turns to amber - the green time can be extended until the vehicle has left the area.

FAST & EASY SYSTEM SETUP

TrafiCam x-stream is easy to install. It can simply be mounted on existing infrastructure. A flexible bracket allows horizontal and vertical mounting.

Configuration of the sensor is done on site via portable PC with pre-installed **user-friendly** software.

Using camera images (JPEG snapshot), virtual presence detection zones can be positioned accurately. Verification and viewing of the detection is possible via **MPEG-4 streaming video**.



User-friendly TrafiCam x-stream configuration PC software.

RELIABLE DETECTION 24/7

Based on field-proven Traficon video detection technology, detection performance is highly reliable for any road surface, day and night. Advanced filters in combination with **smart detection algorithms** allow TrafiCam x-stream to be used for vehicle detection at night (detection on headlights or taillights when no/poor public illumination) and to suppress unwanted detections that can be caused by e.g. vehicle shadows or headlight reflections.

A fail-safe mode is integrated into the TrafiCam firmware just in case accurate detection is not possible due to power failure, dense fog or when the lens is covered by snow or dirt.

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TECHNICAL SPECIFICATIONS TRAFICAM X-STREAM

HARDWARE:

- **In General:**
  - Camera & detector board integrated in compact, esthetical housing
  - Material:
    - Housing:
      - Aluminum, with integrated rain/sun shield (optional: additional sunshield)
      - Window in glass
      - Screw Connectors:
        - BPL version: 3-pins for Broadband over Power Line (BPL)
        - ETH version: 3-pins for power supply, 8-pins for Ethernet (4) and outputs (4)
    - Mounting Bracket: Aluminum tube; L = 25cm, Ø = 13mm
    - Mounting Piece:
      - U-profile, L = 18cm, glass fiber reinforced polyamide
      - Attached to mounting bracket
      - Retaining straps or bolts to be used for fixation
  - Mass ≈ 880 g (excl. cable)
  - Height x Width x Depth (max. dimensions, housing + mounting bracket):
    - Vertically mounted about 45 cm x 16 cm x 12 cm
    - Horizontally mounted about 41 cm x 18 cm x 12 cm
  - Diameter: about 12 cm
  - Temperature Range: from -34°C to +80°C
  - Humidity: up to 95% non-condensing

- **Camera Details:**
  - Camera type:
    - Technology: Color CMOS
    - Sensor Size: 1/4 ”
    - Resolution: 640 x 480 pixels (VGA)
    - Frame Rate: 25 FPS
  - Lens types:
    - Wide Angle: Focal Distance 2,1mm
    - Narrow Angle: Focal Distance 6,0mm
    - ZOOM:
      - Focal Distance: 5mm to 15mm
      - Motorized zoom, zoom control via Traficon Configuration Tool (TCT)

- **Power Supply, Outputs & Communications:**
  - BPL version:
    - Broadband over Power Line (BPL) for power supply, communication of output status, configuration & monitoring (streaming video) via interface
    - Input Power 20VDC via interface
    - Current Consumption < 165mA @ 24VDC (< 205mA @ 24VDC peak at start-up)
    - Power Consumption ≤ 4,0W (≤ 5W peak at start-up)
  - ETH version:
    - Power supply separately and Ethernet for communication of output status, configuration & monitoring (streaming video), 3 optical coupled dry contacts also possible
    - Input Power 12-48VAC/DC direct
    - Current Consumption < 125mA @ 24VDC (< 165mA @ 24VDC peak at start-up)
    - Power Consumption ≤ 3,0W (≤ 4W peak at start-up)

- **Video Compression:**
  - Type: MPEG-4
  - Frame Rate: up to 25FPS
  - Resolution: VGA (640x480)
  - Quality: up to 4Mbit/s

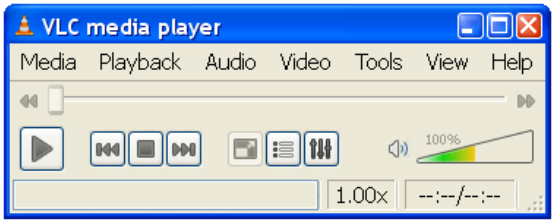
- **IP-addressable**

REGULATORY ISSUES:

- **EMC:** Electromagnetic Compatibility - 2004/108/EG
- **FCC:** FCC Part 15 class A
- **Shock & Vibration NEMA II specs**
- **Materials:** all weatherproof (UV-resistant)
- **Protection Grades:** Housing = IP68, Connectors = IP67

SOFTWARE:

- **TCT (Traficon Configuration Tool) on PC with LAN connection:**
  - In case ZOOM lens: Zoom in, zoom out
  - Configuration via JPEG Snapshot
    - Detection Zones:
      - Max. 24 “virtual loops” per TrafiCam x-stream for vehicle presence
      - Optional: Max. 8 “virtual loops” per TrafiCam x-stream for traffic data
      - Virtual loops can be made direction sensitive
    - Output assignment:
      - Max. 16 detection outputs available per TrafiCam x-stream
      - An output can be assigned to multiple zones (logical functions: and, or)
      - Select “close on event” (= default setting) or “open on event”
      - BPL version: output generation via interface
      - ETH version: output generation direct (max. 3 outputs) and/or via TCP/IP
  - View detection via MPEG-4 streaming video



- **VLC or QuickTime Media Player on PC with LAN connection:**
  - View MPEG-4 streaming video
  - Record MPEG-4 streaming video
  - Playback MPEG-4 streaming video

CONNECTION TRAFICAM X-STREAM ZOOM BPL – INTERFACE:

- **Recommended type of cable:** power cable, signal cable or STP cable, UV resistant
- **Cable diameter*:** 4-8 mm
- **Maximum cable length**:** 300 m
- **Required number of wires: 3 (+, -, PE)**
- **Wire diameter***:**
  - Min. 0,64 mm (0,32 mm2, AWG22) for up to 120 m cable length
  - Min. 0,8 mm (0,50 mm2, AWG20) for up to 200 m cable length
  - Min. 1 mm (0,75 mm2, AWG18) for up to 300 m cable length
- **Note:** cable is not included

* Determined by the cable gland of the connector
** Highly depends on cable quality and local conditions, i.e. local sources of interference
*** Significant voltage drop possible. Resistance of wire may not be more than 15 ohm for DC.

CONNECTION TRAFICAM X-STREAM ZOOM ETH – POWER SUPPLY:

- **Recommended type of cable:** same as previous

CONNECTION TRAFICAM X-STREAM ZOOM ETH – PC:

- **Recommended type of cable:** Industrial CAT5e cable (SF/UTP)

YOUR CONTACT

Data subject to alternation without notice or obligation

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TECHNICAL SPECIFICATIONS

TI X-STREAM & TI XP.

TI x-stream

Name Interface	TrafiCam Interface x-stream
Abbreviation (short name)	TI x-stream
Product Reference Number	10-6045
Basic Functionality	- Connecting zone outputs from TrafiCams to controller - Providing power to TrafiCams - Connecting (portable) PC to TrafiCams for system configuration & viewing
# Cameras to Connect	1, 2, 3 or 4 TrafiCam x-stream BPL units *Note: max. 4 extra TrafiCam x-stream BPL units can be connected via TI xp.**
Power IN	24–48VAC/DC via clamps (back), power LED (front)
Power OUT	20VDC to up to 4 TrafiCams via clamps (back)
Port PC – Interface	2 RJ45 Ethernet connectors (each 10/100Mbit/s auto switching)
# Detection Outputs	- 16 optical coupled dry contacts via clamps (back) - P_{max} = 300mW, I_{max} = 50mA, U_{max} = 48VDC - close on event or open on event (setting in TCT**) - 16 output LEDS (green, front) - detection output 1-16 and common detection output *** *Note: max. 32 extra detection outputs can be added via max. 2 TI xp. units **
# Error Outputs	- 4 optical isolated switch components via clamps (back) - P_{max} = 300mW, I_{max} = 50mA, U_{max} = 48VDC - open on event (hardware output) - 4 output LEDS (red, front) - error output 1-4 and common error output *** *Note: max. 4 extra error outputs can be added via TI xp. **
Function of Error Outputs	- All error outputs active = error in TI x-stream or power supply down - One error output active = error in corresponding TrafiCam x-stream
Interface Firmware	Yes
Communications TrafiCam x-stream BPL – Interface	BPL, Traficon protocol (XML)
Cable TrafiCam x-stream BPL– Interface	3 wires via clamps (back): - 2 wires for DC power & communication: broadband over power line (BPL) - 1 wire for protective earth
Current Consumption	≤ 160mA @ 24VDC, ≤ 80mA @ 48VDC
Power Consumption	≤ 4 W (5W peak at start-up)
Mass	≈ 750 g
Physical Dimensions (H x W x D)	≈ 12,84 cm x 5,05 cm x 18,00 cm
Interface Mounting	BOX, EURO-rack mountable, DIN-rail clickable
Regulatory Issues	- EMC: Electromagnetic Compatibility - 2004/108/EG - FCC: FCC Part 15 class A - Shock & Vibration NEMA II specs

***** **TI xp. = TrafiCam Interface Expansion board**

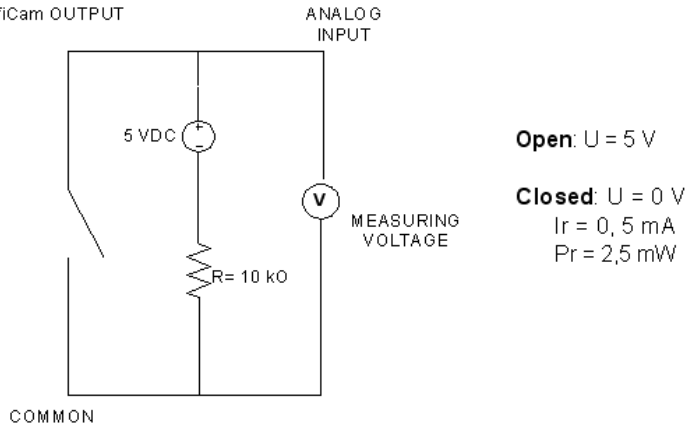
****** **TCT = Traficon Configuration Tool**

TI xp.

Name Interface	TrafiCam Interface expansion
Abbreviation (short name)	TI xp.
Product Reference Number	10-6044
Basic Functionality	- Connecting zone outputs from extra TrafiCams to controller - Providing power to extra TrafiCams
# Cameras to Connect	1, 2, 3 or 4 extra TrafiCam x-stream BPL units
Power IN	24–48VAC/DC via clamps (back, loop, possible with TI x-stream), power LED (front)
Power OUT	20VDC to up to 4 TrafiCams via clamps (back)
Port PC – TI xp.	None
# Detection Outputs	- 16 extra optical coupled dry contacts via clamps (back) - P_{max} = 300mW, I_{max} = 50mA, U_{max} = 48VDC - close on event or open on event (setting in TCT**) - 16 output LEDS (green, front) - detection output 1-16 and common detection output *** Note: max. 16 extra detection outputs can be added via an additional TI xp. units
# Error Outputs	- 4 extra optical isolated switch components via clamps (back) - P_{max} = 300mW, I_{max} = 50mA, U_{max} = 48VDC - open on event (hardware output) - 4 output LEDS (red, front) - error output 1-4 and common error output ***
Function of Error Outputs	- All error outputs active = power supply TI xp. down - One error output active = error in corresponding TrafiCam x-stream
Interface Firmware	None
Communications TrafiCam x-stream BPL – TI xp.	BPL, Traficon protocol (XML)
Cables TI x-stream – TI xp.	RJ11 connector (back): communication of output states from TI x-stream to TI xp. 3 wires via clamps (back): - 2 wires for linking of TrafiCam x-streams of TI xp. with BPL network of TI x-stream - 1 wire for protective earth *See drawing below for visualization of system architecture*
Current Consumption	≤ 25mA @ 24VDC, ≤ 12,5mA @ 48VDC
Power Consumption	≤ 600 mW
Mass	≈ 400 g
Physical Dimensions (H x W x D)	≈ 12,84 cm x 5,05 cm x 18,00 cm
Interface Mounting	BOX, EURO-rack mountable, DIN-rail clickable
Regulatory Issues	- EMC: Electromagnetic Compatibility - 2004/108/EG - FCC: FCC Part 15 class A - Shock & Vibration NEMA II specs

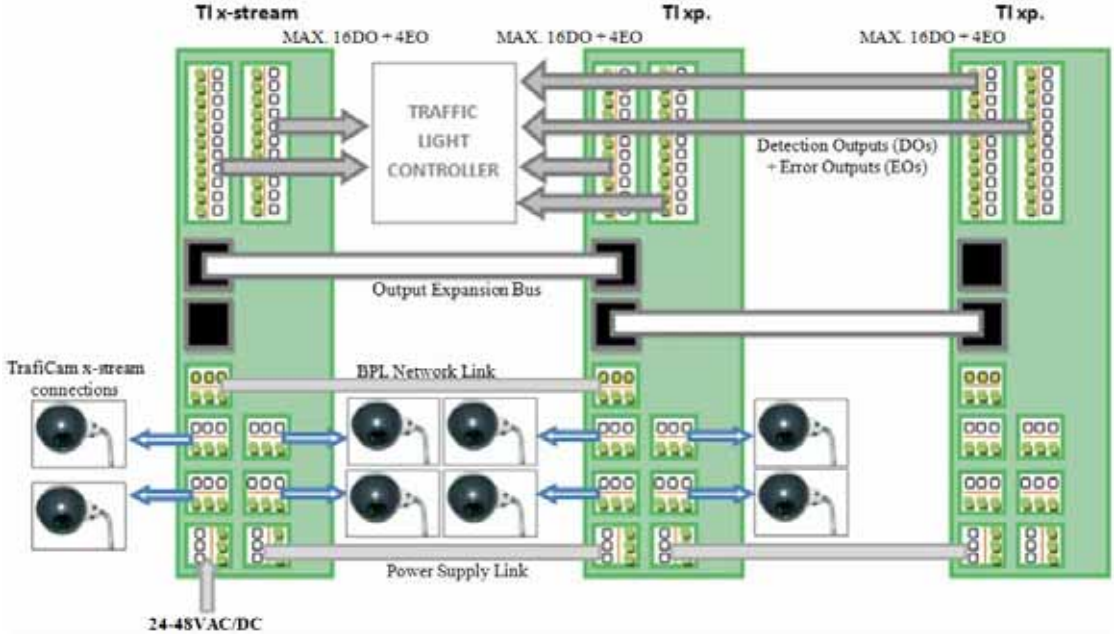
****** **TCT = Traficon Configuration Tool**

*** Example of output connection in traffic light controller via TI x-stream and TI xp.



TrafiCam output wiring diagram

System architecture TrafiCam x-stream BPL + TI x-stream + TI xp.:



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