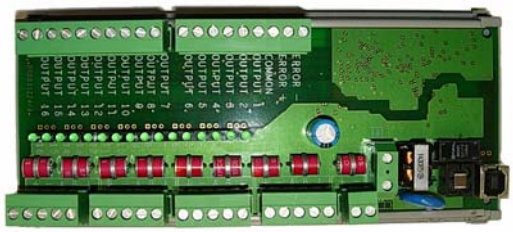
TRAFICON®
Video Detection Field proven. Easy to install.

Installation manual

draft version



Product reference number TrafiCam®: 10-6034 - Revision R6.01
4TI: 10-6027 - Revision R4.01

draft version

TrafiCam® with a 4TI interface

Draft manual: July 2007

Safety warning

EN55022
FCC Part 15

Warning
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

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1. Introduction

This manual describes the **hardware and installation** of a wireless TrafiCam® system with the **4TI** as the **interface** between the TrafiCam® sensor, PC and traffic controller.

Functional characteristics of TrafiCam®

- Presence detection at the stop bar on intersections
- Advance detection of vehicles approaching the intersection

on up to 8 zones over different lanes.

The user can make these zones direction sensitive.
Via its digital outputs, TrafiCam® provides an input to the traffic controller upon presence detection.

Functional characteristics of 4TI

- Serves as the interface for up to 4 TrafiCam® sensors
- Provides up to 16 outputs (maximum 4 per TrafiCam®) to the traffic controller

Figure 1: TrafiCam® installed at an intersection

The user configures TrafiCam® and the 4TI via TrafiCam® PC Tool. This tool allows to:

For TrafiCam®

- place the presence detection zones on an image from TrafiCam®
- assign the hardware outputs to the presence zones
- activate and verify the configuration

For 4TI

- link the outputs of TrafiCam® sensors and 4TI
- activate the system configuration

2. Hardware

2.1. The TrafiCam® system items

The TrafiCam® system has the following items.

Figure 2: Items of the TrafiCam® system

1 = The TrafiCam® sensor
2 = The mounting accessories
3 = The installation CD (with the PC Tool and the manuals)
4 = Tools (hex keys and cable tags)
5 = The 4TI interface

In addition, the installation requires:

* retaining straps
* connection cables (see The cables for connection)
* PSU (12-26 V AC/DC)

Note: Traficon does not supply the retaining straps or the PSU.

The scheme below illustrates the architecture of the system.

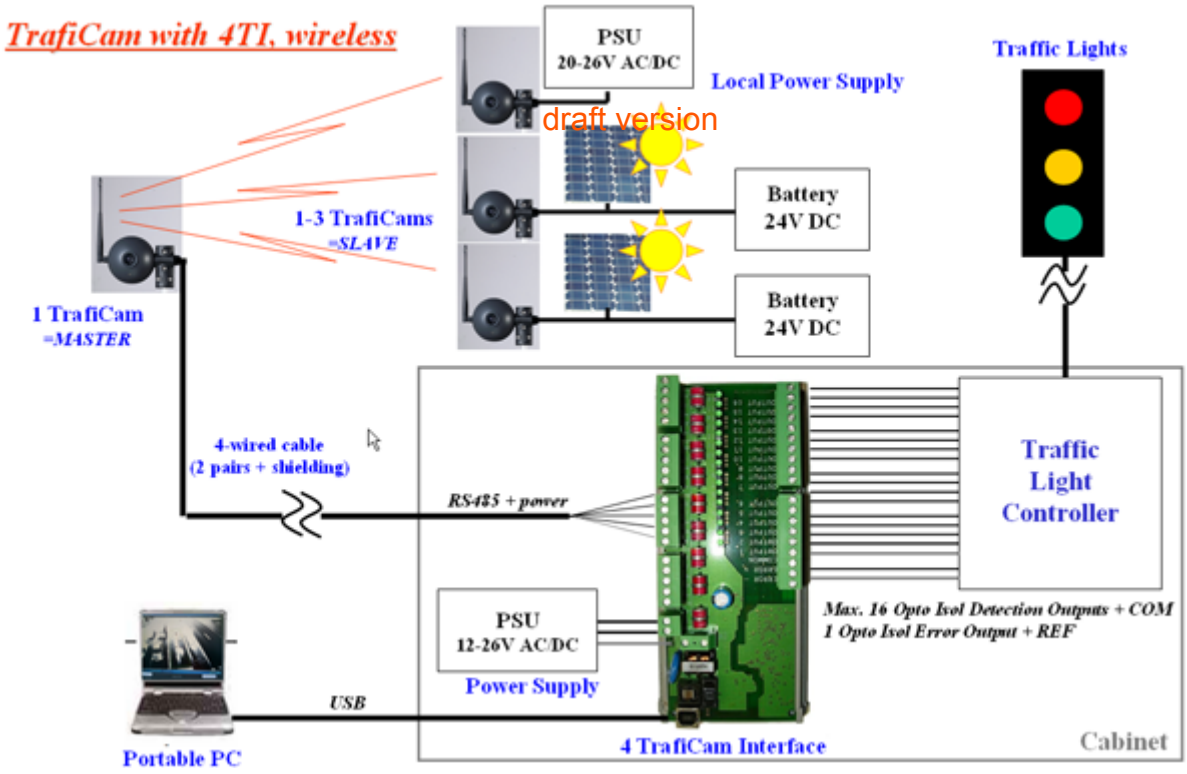


Figure 3: Architecture of the TrafiCam® system

2.2. The TrafiCam® sensor

A = The lens

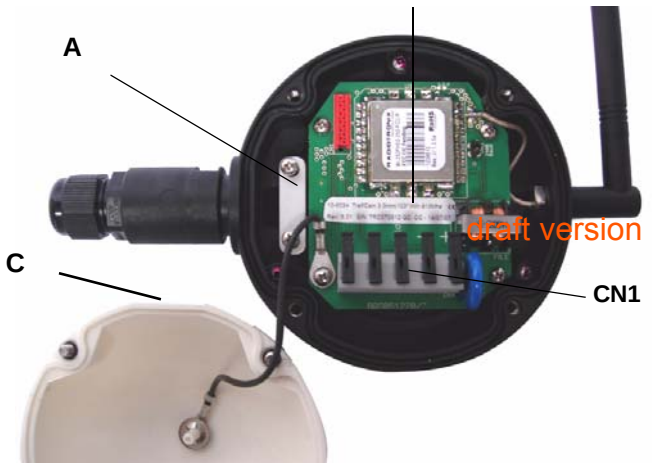
B = The gland to insert the cable for connection between sensor and interface

C = The LED (will light upon presence detection)

D = The screws on the rear shell (to open the sensor)

E = The rotating point to fix the mounting bracket

Figure 4: Front and side view of the TrafiCam® sensor



CN1 = The connector to the 4TI CN1 pinout: see below.

A = The fixation plate (to keep the connection cable in place)

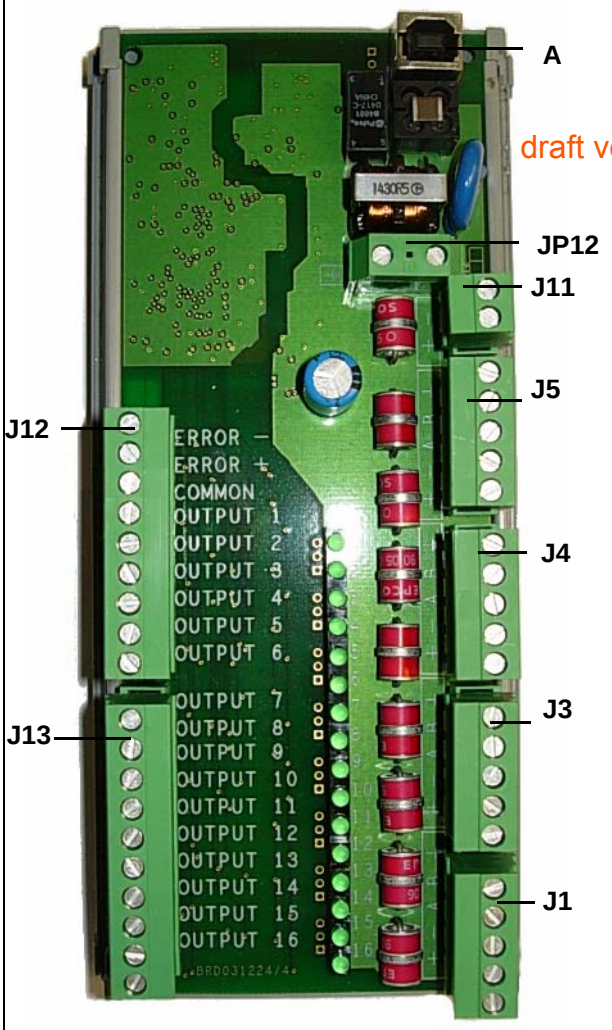
B = The product label

C = Flattened side of the rear shell (as an aid to close the sensor)

Figure 5: The TrafiCam® sensor opened

Pinout of connector CN1	
Pin	**Description**
+	+ Power supply
-	- Power supply
⏚	Grounding
A	RS-485A
B	RS-485B

2.3. The 4TI interface



A
The USB/B connector (to connect to the PC)

JP12
The grounding

J11
The PSU connector for power supply to the 4TI interface

4TI can also feed the TrafiCam® sensors.

J1, J3, J4 or J5
The connector to the TrafiCam® master sensor

J12, J13
The output connectors to the traffic controller

The tables below provide the pinout scheme of connector J1 to J5, J12 and J13.

Figure 6: The 4TI interface

Pinout of connector J1 (same for connector J3, J4, J5)	
Pin	**Description**
+	+ Power supply
-	- Power supply
A	RS-485A
B	RS-485B
⏚	Grounding

Pinout of connector J12 and J13	
Pin	**Description**
Error -	- Error output
Error +	+ Error output
Common	Common output (for output 1 to 16)
Output 1 to 16	Output 1 to 16

2.4. The cables for connection

The table below gives an overview of the cables used for connecting the TrafiCam® sensor, the 4TI interface and the PC.

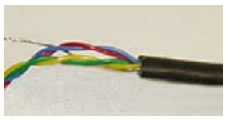
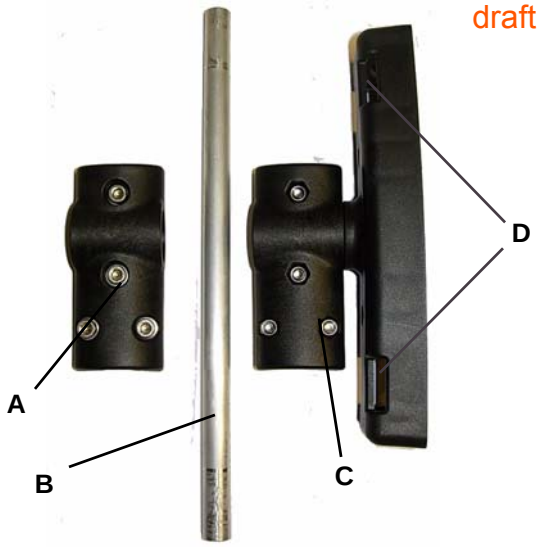
Connection	Cable	Illustration
Sensor to interface	draft version Shielded twisted pair cable, UV-resistant, 4 wires + shielding STP, d. 5-10 mm, min 2x2 + shield	
Interface to PC	USB cable type USB/A - USB/B	

Figure 7: The cables for connection

2.5. The accessories for mounting

There is a mounting bracket for the TrafiCam® sensor and a mounting bracket to the pole.
The tube connects both brackets.



A = The mounting bracket for the TrafiCam® sensor

B = The tube

C = The mounting bracket to the pole

D = The holes to put the retaining straps through

Figure 8: The mounting accessories (brackets and tube)

draft version

3. Installation

Do **not remove the lens cover** until the TrafiCam® is installed.

Ensure that **the system power is off** before starting the installation.

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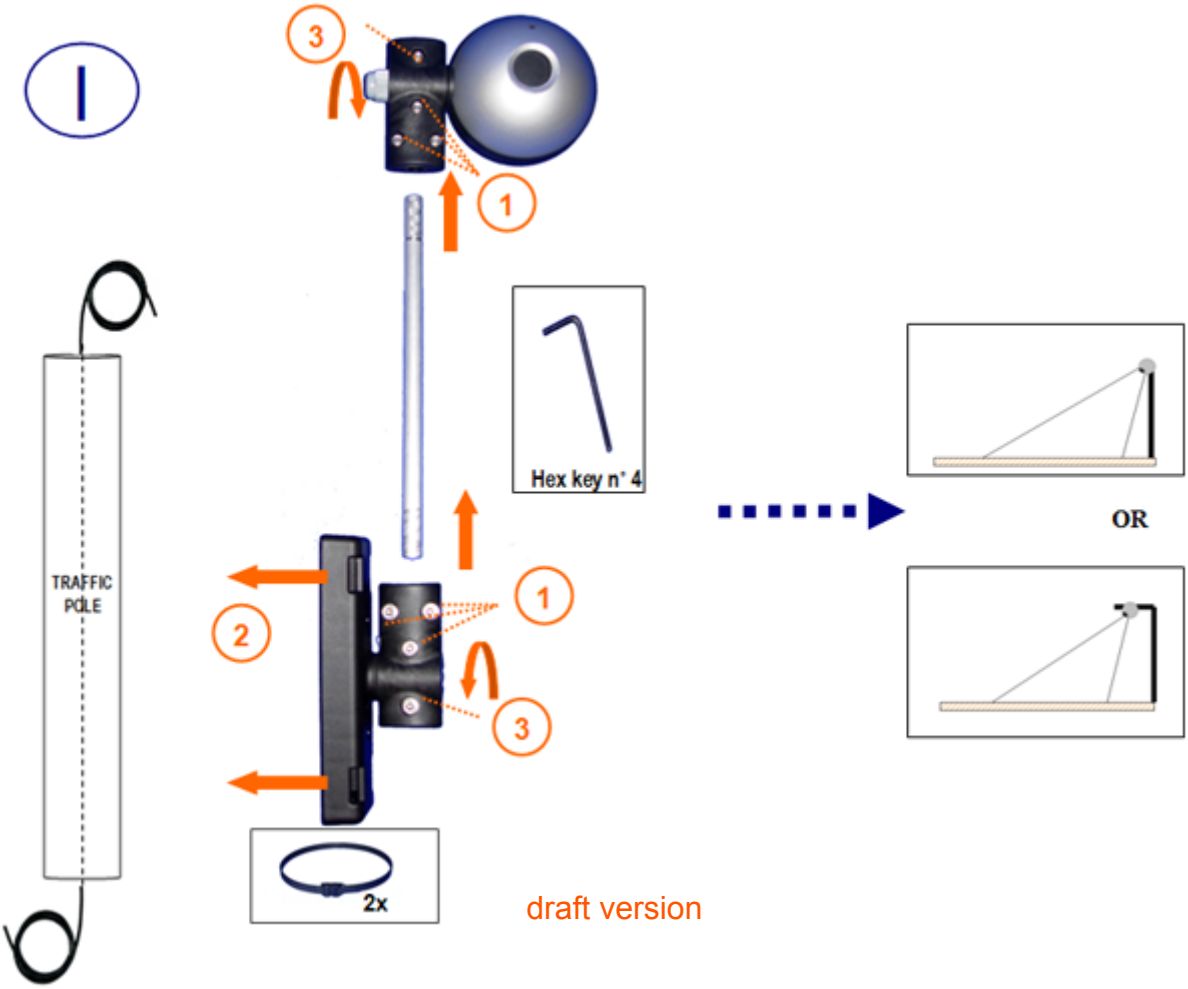
Step I: Mount the TrafiCam® on a stable pole.

1. Fix the mounting tube to the brackets (Torque max = 1,3 Nm).

2. Fix the TrafiCam® to the pole using retaining straps.
Put the retaining straps through the holes in the bracket.

3. Position the TrafiCam® provisionally (Torque max = 1,3 Nm).
You can mount the TrafiCam® in a horizontal or vertical position.
TrafiCam® is a downward looking device.

Verify that there is no horizon in the image!



Step IIa: Connect the TrafiCam® master sensor to the 4TI interface.

Use a shielded twisted pair cable, UV-resistant, 4 wires+shield.

At the Traficam® side

1. Open the sensor.
2. Loosen the cable gland.
3. Insert the cable into TrafiCam® through the gland.
4. Strip the wires and fix the cable tags. Isolate the grounding wire.
5. connect the cable to CN1 and fix the cable plate.
6. Close the TrafiCam® (Torque max = 1,0 Nm).
7. Tighten the cable gland.

At the 4TI interface side

8. Connect the cable to the connector J1 (or J3, J4, J5).

Step IIb: Connect the TrafiCam® slave sensors to the local power supply.

Use a shielded twisted pair cable, UV-resistant, 2 wires +grounding.

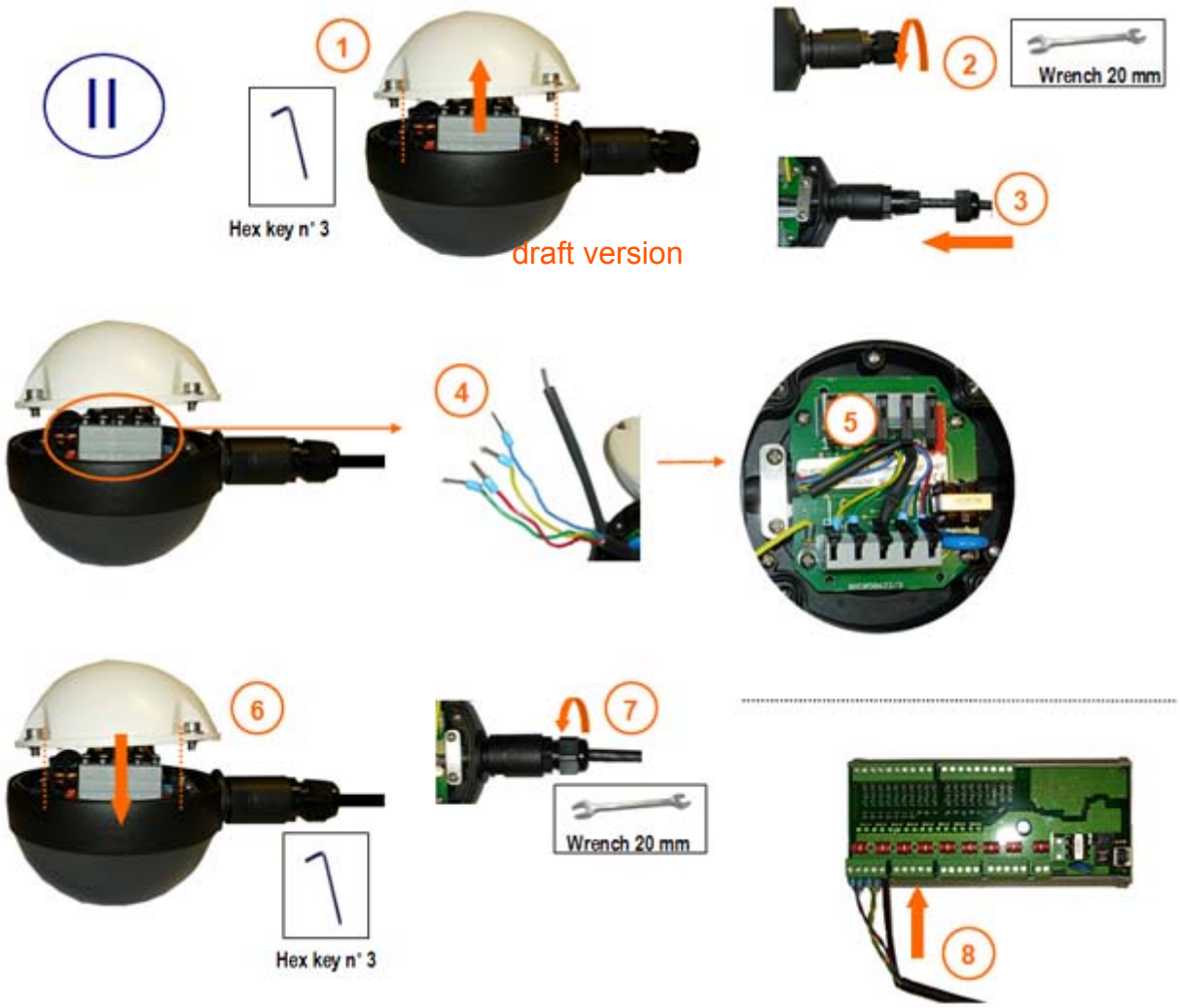
At the Traficam® side

1. Open the sensor.
2. Loosen the cable gland.
3. Insert the cable into TrafiCam® through the gland.
4. Strip the wires and fix the cable tags. Isolate the grounding wire.
5. connect the cable to CN1 (*power supply and grounding pins only*) and fix the cable plate.
6. Close the TrafiCam® (Torque max = 1,0 Nm).
7. Tighten the cable gland.

At the 4TI interface side

No connections

Note: *If you wish to supply power to the slave sensors via the 4TI interface you should connect only the pins of CN1 as described above. Do NOT connect the RS-485 wires.*



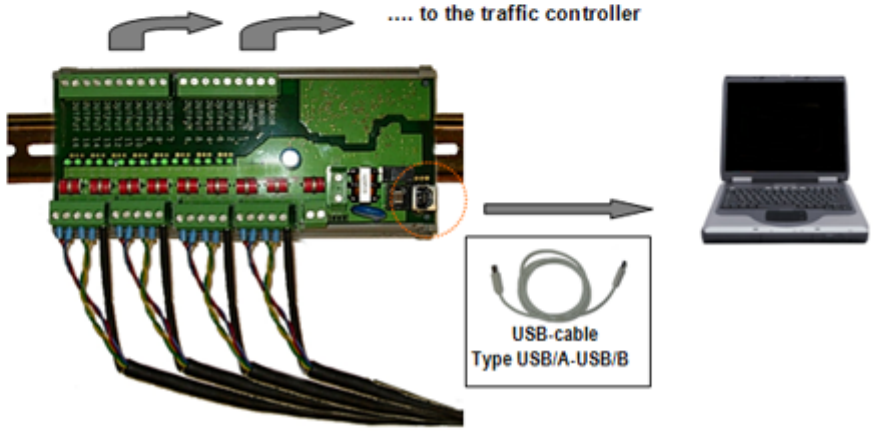
Step III: Mount the 4TI interface by clicking it on the DIN rail.

Step IV: Connect the interface to the traffic controller.

Step V: Connect the interface to the PC.
Use a USB cable type USB/A - USB/B.

III

IV-V



Finally connect the power supply.

The **configuration** manual (separate manual) describes how to **optimise the position** of the TrafiCam®.

Tighten all screws after optimising the position of the TrafiCam®.

4. Maintenance

The maintenance of the TrafiCam® can be done during the regular maintenance of the traffic lights and controller.

Instruction	Frequency	Tools	Remark
Clean the faceplate of the TrafiCam®.	Once per year	Soft cloth and mild detergent	Avoid movement of the TrafiCam®.
Check the camera image. Verify the configuration of the system.	Once per year	PC with TrafiCam® PC tool	Use the configuration manual for guidance.

Note: Depending on the on-site conditions, you may need to increase the frequency of maintenance.

5. Hardware specification - TrafiCam® sensor

CAMERA
CMOS, black&white, resolution 640x480, 1/3 “

LENS TYPE >	Wide angle	Narrow angle
Focal distance	3,0 mm	8,0 mm
Field of view - horizontal	95°	32°
Field of view - vertical	65°	22°
Field of view - diagonal	103°	39°

DIMENSIONS
L x H x W: 45 cm x 16 cm x 10 cm mounted vertically
41 cm x 18 cm x 10 cm mounted horizontally
Mass (including mounting bracket, excluding cable): 600 g
Sensor diameter: 10 cm

MATERIALS
Sensor
Front and back shell: polycarbonate
Mid section: fibre reinforced polyamide

Mounting bracket: fibre reinforced polyamide
Tube: aluminium

COMMUNICATION
RS485 service port for configuration

OUTPUTS
4 optically isolated digital outputs, Imax = 50 mA, Pmax = 300 mW

POWER SUPPLY VOLTAGE INPUT
+20V ...+26V AC/DC

POWER CONSUMPTION
85 mA @ +12 V DC (1,2 W)
50 mA @ +24 V DC (1,2 W)

ENVIRONMENTAL
Temperature range: between - 34°C and +80°C
0 to 95 % relative humidity, non-condensing
Housing: waterproof to IP67
Materials: weatherproof, UV-resistant

REGULATORY
EMC: CE Directive 89/336/EEC; product standard EN 55022 Class A
FCC: FCC part 15 Class A
NEMA: NEMA II Shock and vibration

6. Hardware specification - 4TI interface

DIMENSIONS
L x H x W: 18,5 cm x 8,5 cm x 5 cm; DIN-rail clickable
Mass: 250 g

COMMUNICATION
USB between 4TI and PC
RS-485 between 4TI and TrafiCam®

OUTPUTS
16 optically isolated digital outputs
1 optically isolated digital error output

POWER SUPPLY VOLTAGE INPUT
+12V ...+26V AC / DC

POWER CONSUMPTION
120 mA @ +12 V DC (1,5 W)
60 mA @ +24 V DC (1,5 W)

ENVIRONMENTAL
Temperature range: between - 34°C and +80°C

REGULATORY
EMC: CE Directive 89/336/EEC; product standard EN 55022 Class A
FCC: FCC part 15 Class A
NEMA: NEMA II Shock and vibration

7. Specification - wireless communication

Wireless 915MHz Frequency Band (USA, Mexico, …)

Technology: Frequency Hopping Spread Spectrum (FHSS)

Frequency Range: 902-928MHz
Available Hop Patterns: 6
Transmission power (ERP): 250mW

Max. communications distance: max. 400m* with omni-directional antenna *(to be confirmed)*
Effective bandwidth: 115,2kbaud netto*

Input Voltage: 20-26V AC/DC
Current Consumption: 85mA @ 24V
Power Consumption: Peak 2,0W *(to be confirmed),* Average 1,5W *(to be confirmed)*

Certification:
FCC chapter 47 part 15
.207/209/249
FCC equipment autorisation: pending
FCC ID: VE7-10-6034-6035

* In ideal conditions: direct line of sight, no fixed objects in ellipse (trees/leafs, power lines, buildings, etc..), no moving objects in ellipse (buses, trucks, trams, etc..), good weather, normal traffic environment, no interference, 25mW transmission power, higher than 6m above the ground's surface

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