

# Traffic Management

Using ADEC TDC Traffic Detectors



# Agenda

- About Us
- Traffic Management using TDC3
- Features of the TDC3 Traffic Detectors
- TDC3 Classification Capabilities
- Planning the Installation, Mounting
- Wiring
- References

# About Us



- ADEC founded in 2009
- ADEC designs and manufacturers
  - Single-lane traffic detectors
  - IoT-Gateways
  - Cloud-based queue zone management
- ADEC is
  - Privately held, owner-managed
  - ISO 9000 certified since 2010

# Reasons For Measuring Traffic (1/2)

Increased operational performance on inter-urban arteries

- Traffic management substantially increases roadway capacity
  - Prevents / delays stop-go-traffic when traffic volume increases
- Traffic detectors are input and thus key component for any traffic management solution

# Reasons For Measuring Traffic (2/2)

Valuable information about road usage

- Statistical information about road usage
  - For effectively allocating road construction and repair funds
  - For up-to-date traffic modeling

# Traffic Management System

What components does a traffic management system consist of?

- Network of evenly distributed measurement points along highways and on/off ramps (“sensor network”)
- Variable message signs (“VMS”) at key locations
- Traffic management center (“TMC”) with algorithms to determine speed-limits and routing information for each key location

# How does Traffic Management work?

Adding traffic management to highways yields the highest return

- Controls flow of traffic by
  - measuring traffic volume and speed via sensor network in real-time
  - calculating optimized speed limits to prevent, or at least delay, capacity-killing stop & go traffic when volume rises
  - updating speed limits or suggested routes to motorists via variable message signs

# Traffic Detectors

For traffic management, inter-urban sensor network

- TDC3 means three sensors in one device
  - Mounted above the center of the lane
  - For each vehicle: Speed, length, occupancy & time-gap
  - Vehicle class, such as
    - Car, truck, van, bus etc.
  - Serial interface for data transmission

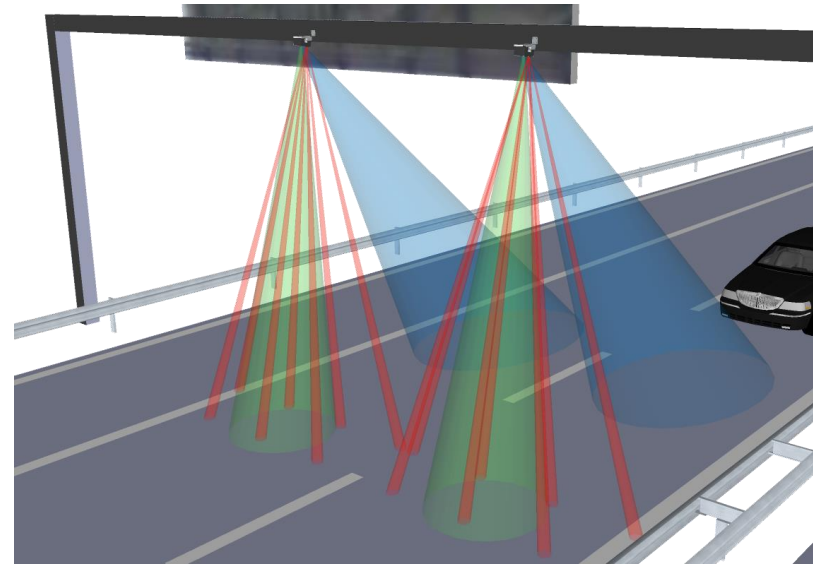




# Three Sensing Technologies

Working together for superior detection performance

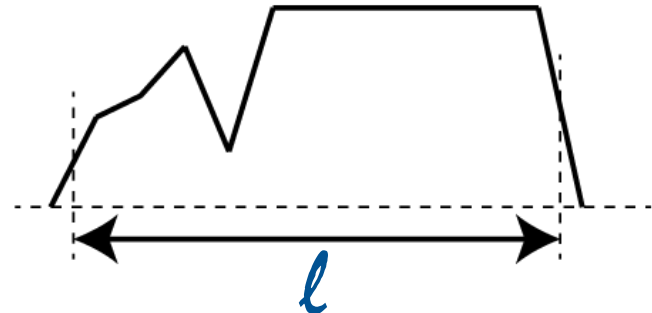
- Doppler radar
  - Vehicle speed
- Ultrasound
  - Vehicle height profile
- PIR motion sensor curtain
  - Vehicle width & lane position
- Combined: speed, length, vehicle class



# Vehicle Classification

Assigns each vehicle to standardized vehicle class

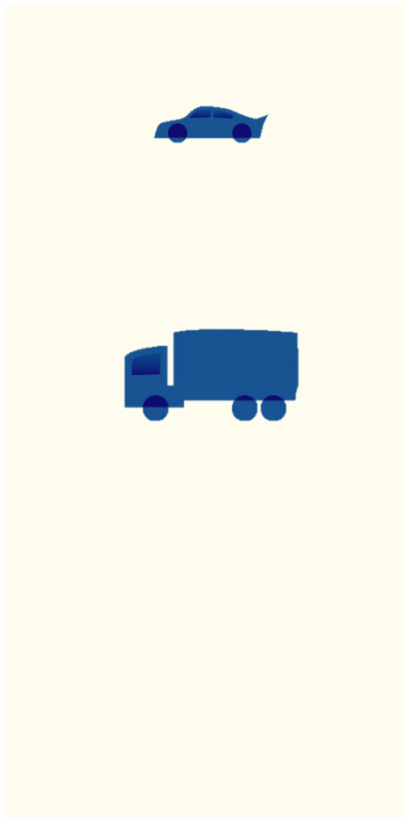
- Common classification into 2, 2+1, 5+1 or 8+1 vehicle classes (+1 for “unknown”)
  - Based on standardized German TLS classes
  - Custom classification available for classes that have distinguishable height profile



# Model Designation for Classification

Every vehicle is assigned to any of the available vehicle classes

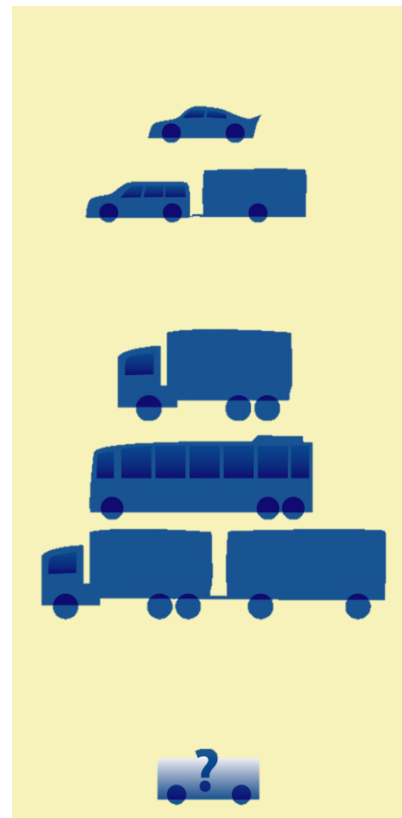
**TDC3-2**



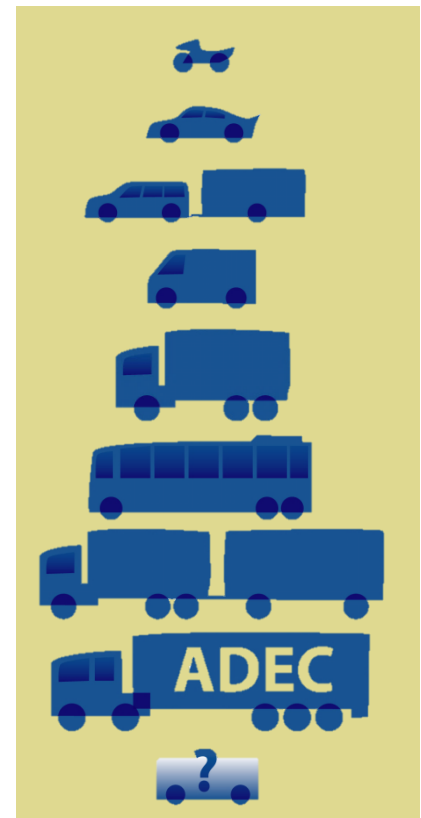
**TDC3-3**



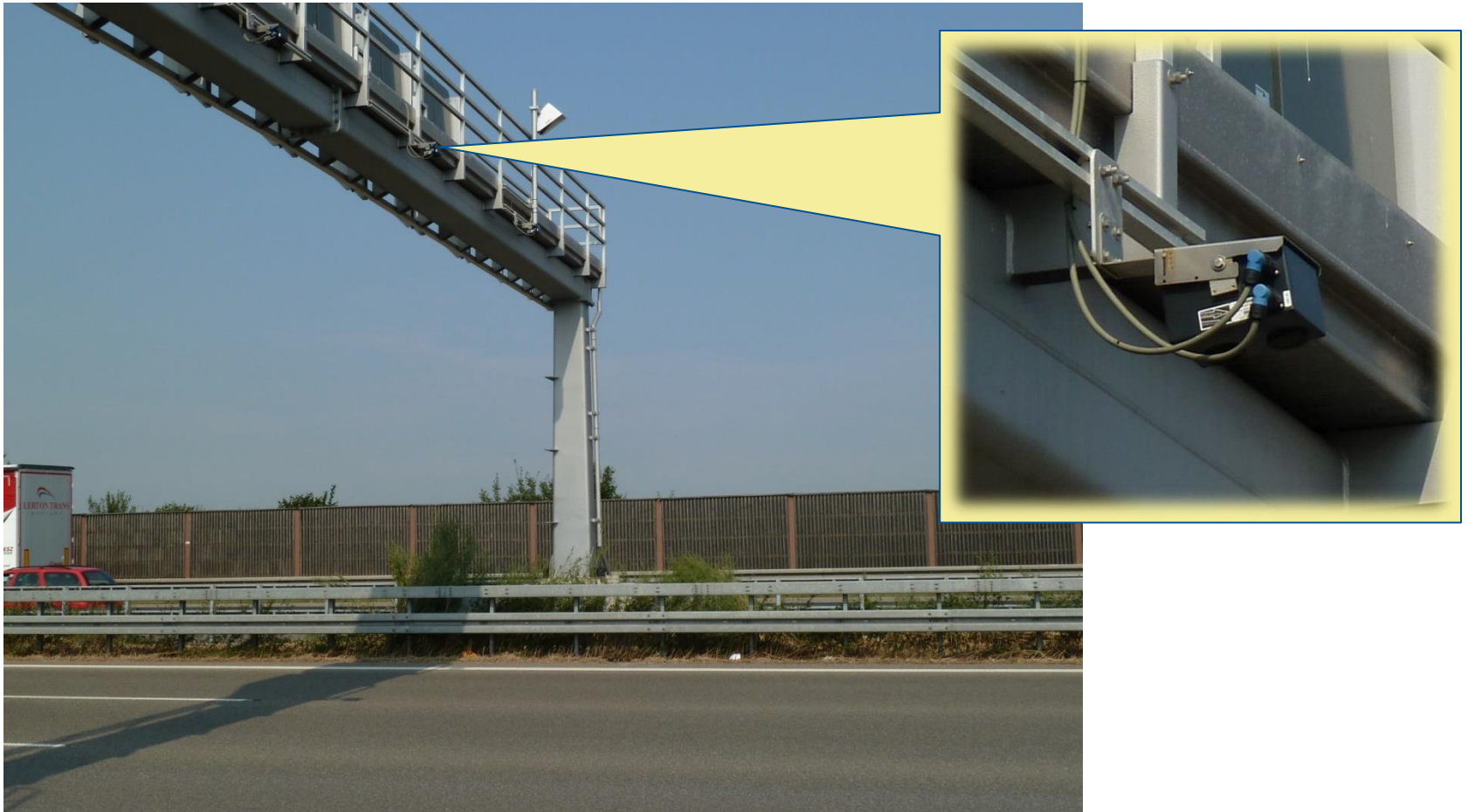
**TDC3-5**



**TDC3-8**



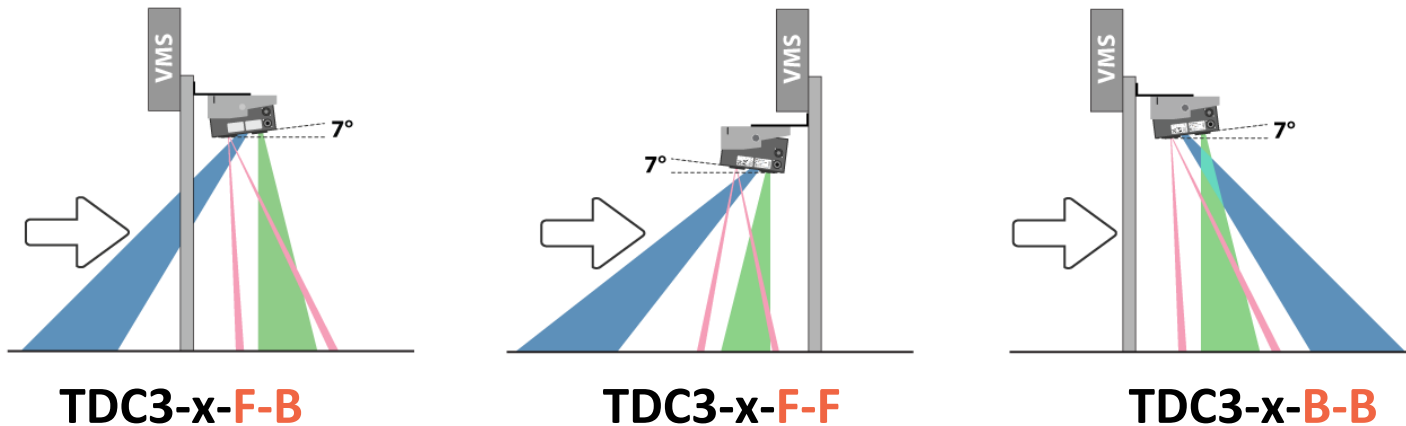
# Mounting



# Mounting Options

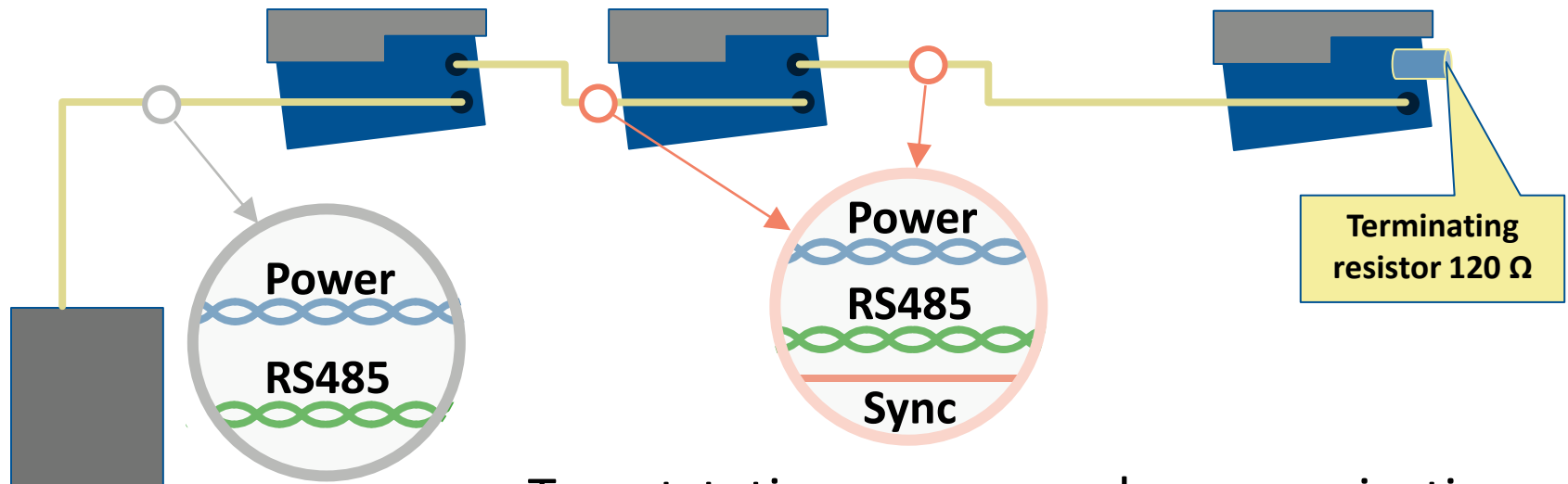
Options to accommodate mounting constraints

- All systems (radar, ultrasound and PIR) must have unobstructed view onto lane
  - Different detector hardware models to accommodate mounting constraints



# Wiring

Devices fit with male and female device connectors



## Outstation

- Traffic Data Collector
- BS2
- RS485 – TCP/IP Interface
- ...

- To outstation: power and communication
- Between detectors: extra SYNC(hronization)
- Last detector on bus: apply 120Ω terminating resistor (TDC-C-TR)

# Comparison

- Vehicle speed
- Vehicle count / volume
- Classification by length
- Classification up to 8+1 classes
- Queue detection
- Wrong-way driver detection
- Works inside tunnels
- Non-intrusive technology
- Maintenance-free longevity

| <i>TDC3</i> | <i>Inductive loops</i> | <i>Front-Radar</i> | <i>Side-Radar</i> | <i>Video</i> |
|-------------|------------------------|--------------------|-------------------|--------------|
| ✓✓          | ✓✓                     | ✓                  | ✓                 | ✓            |
| ✓✓          | ✓✓                     | ✓                  | ✓                 | ✓            |
| ✓           | ✓                      | ✓                  | ✓                 | ✓            |
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| ✓✓          |                        | ✓✓                 | ✓✓                |              |

# Installations

Short excerpt from installations worldwide

| Country / Region | Project  |
|------------------|--|
| Austria          | A1/A10, A14, A2/A9, VBA Linz, A01/A21 and since 2017 nationwide  |
| Azerbaijan       | TDC3, 77 pcs   |
| Brazil           | TDC3, 139 pcs  |
| Estonia          | TDC3, >200 pcs, with custom classification   |
| Germany          | A5 (Zeppelinheim), BAB 1, A81, A3, A7, A8, A9 Nürnberg-München, Aubing, A14 Halle, A40/43, Emstunnel, A73, Stellingen, Schnelsen (Hamburg) |
| Netherlands      | TDC3 in high-accuracy classification stations (CSC)  |
| Italy            | Catania, Monza-Meda, Lombardy, A32   |
| Mexico           | TDC3, 24 pcs   |
| Poland           | Urban, inter-urban, custom classification  |
| Switzerland      | VBA SO/AG, Bern-Thun, Zug, Zurich Ring Nord, Effretikon, Basel   |
| Taiwan           | Sohuo Highway  |
| Slovenia         | A1, Ring Ljubljana   |



# Thank you!

If you have any questions, please contact us at:

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