

**Passenger car cabin air vent [NO]
measurements with a fast response CLD**

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Cambustion Summary

Powertrain Engineering Services

- Emissions calibration
- Engine and after-treatment systems evaluation
- Using dyno simulation of vehicle drive cycles, and vehicle chassis rolls



Products Division

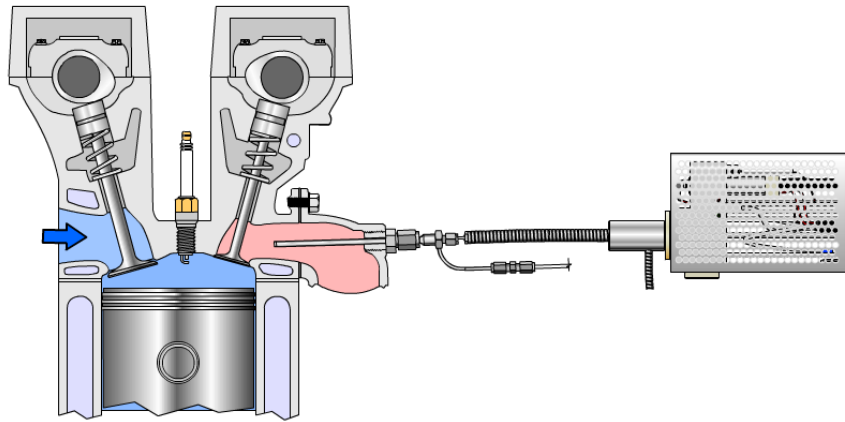
- Develop, manufacture and support specialised fast response analyzers and other emissions-related equipment
- Gaseous pollutants (HC, NOx, COx)
- Particulates
- DPF & GPF testing system



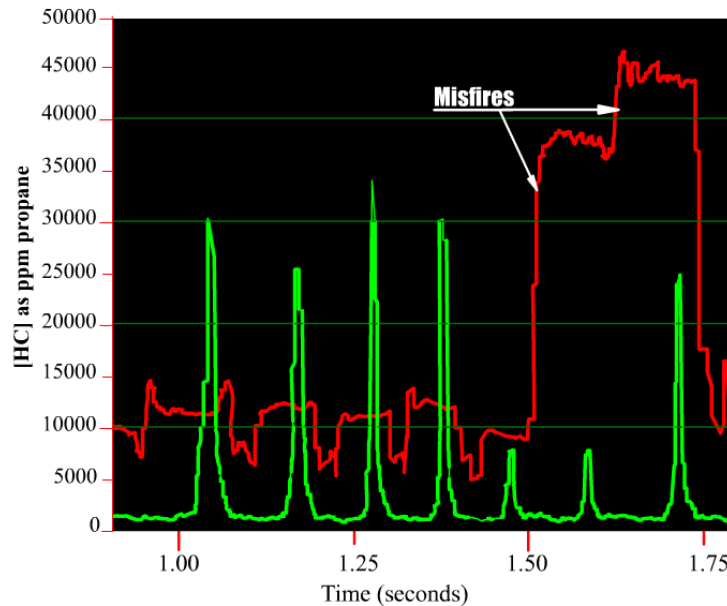
Fast Gas Analyzers



Fast Gas Analyzers for Cycle-by-Cycle Measurements



HFR500 Fast FID
Suggested application:
Cold start fuelling
strategy development



Fast FID Measurement of
Exhaust Port Cold Start
HC Emissions

Highlight notes on HC trace for further explanation



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Real World Driving NOx Emissions over Speed Bump

<https://youtu.be/y8M8JQ1FZF0>

CLD50 - Modifications for (Fast) Ambient Measurements

Raw engine exhaust configuration

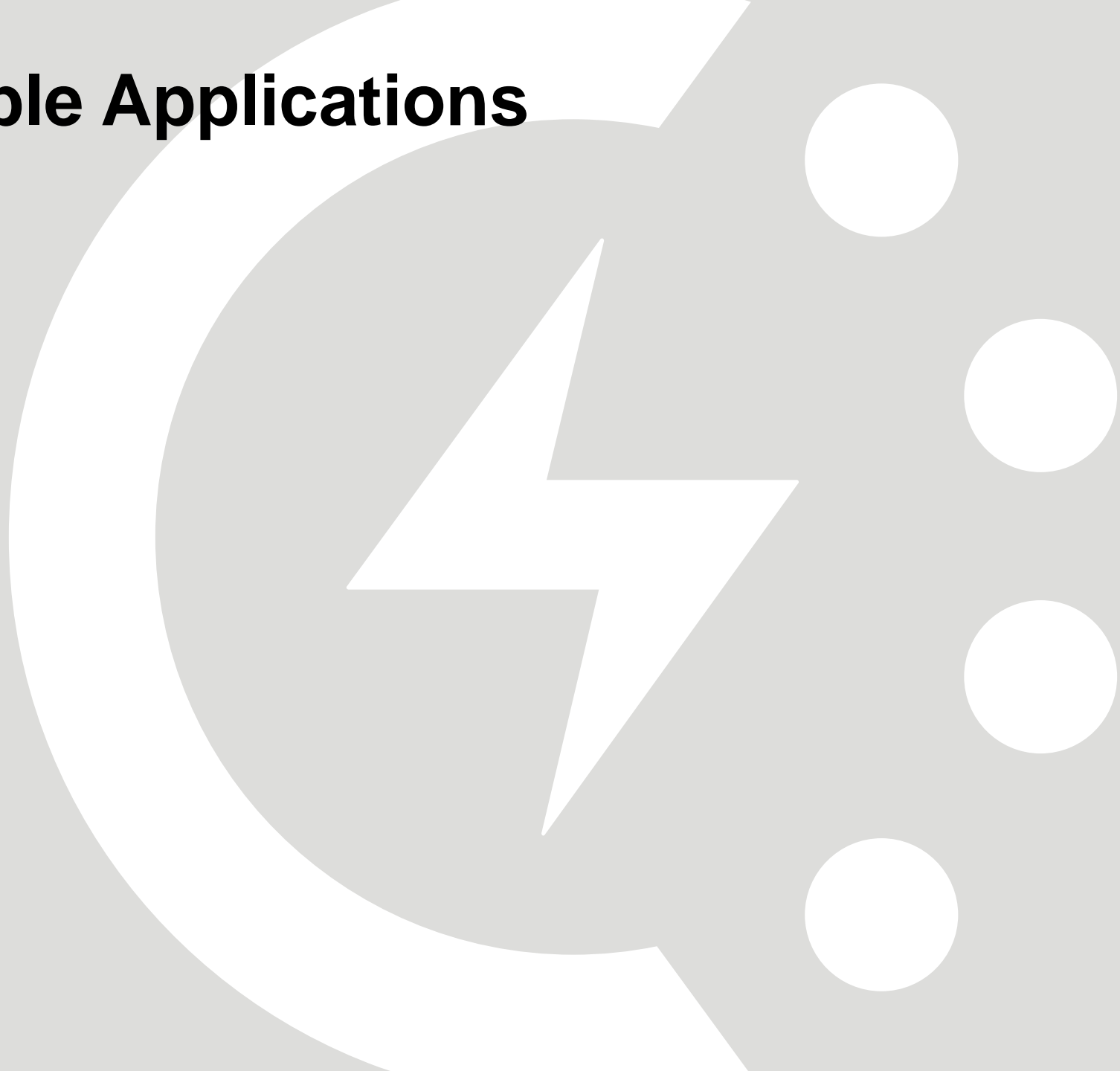
- $T_{10-90\%} \sim 10$ milliseconds
- Sensitivity down to 1 part-per-*million*
- 3m heated sample line (191°C)
- Autocalibration
- Remote control via AK protocol
- Power consumption $\sim 350W$

Ambient configuration

- $T_{10-90\%} \sim 100$ milliseconds
- Sensitivity to 5 parts-per-*billion*
- Simple PTFE 3 x 1mm sample tube
- Built-in 10Hz data logger
- Power consumption $\sim 200W$



Example Applications



Roadside measurements

<https://youtu.be/YmTkmFK2O2k>

In-car measurements (for “chase” and cabin air)



<https://youtu.be/Ds5QivyJxII>

Cabin Air Vent Sampling



Future Plans

- Add fast NO_2 to the same package
- Log local wind speed & direction (for roadside measurements)
- Add fast CO_2 (separate instrument based on NDIR)

