

Importance of DPF Monitoring Systems

CPK Automotive GmbH & Co. KG

Timur Aslantas (M.Sc.), CPK Automotive, Germany

January 23rd, 2018

AQM 2018, VERT - Workshop

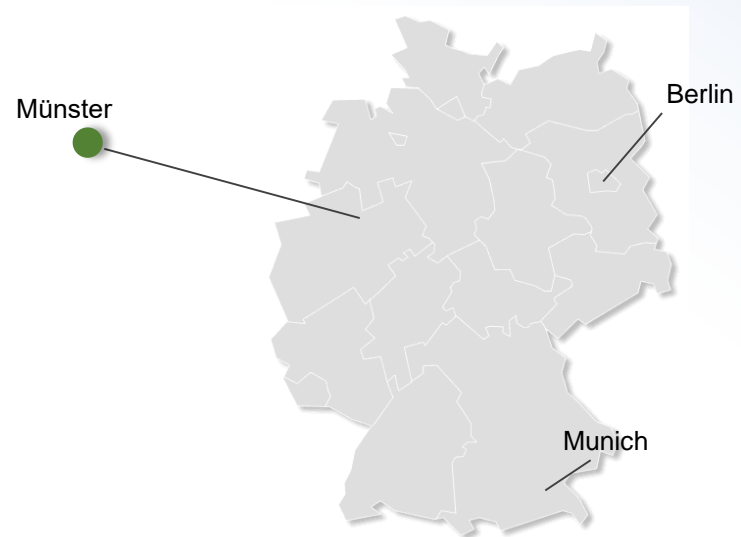
Tehran, IRAN

Agenda

- Company Information
- Basics about the DPF-Monitoring
- Retrofit Situation in IRAN
- Projects and Best Available Technologies in DPF-Monitoring
- Conclusions

About CPK Automotive

- Founded in 1966 in Muenster, northern Germany
- Since 1999: development and sales of systems and components for diesel exhaust aftertreatment
- Experience in DPF-Monitoring: more than 200.000 Dataloggers & related products in the OEM and Retrofit Applications worldwide



- Since October 2013 member of the HEINZMANN Group
- **Market Leader in DPF-monitoring → global presence: EUROPE, IRAN, CHINA, SE Asia, AUSTRALIA, USA; Canada, South America**



Monitoring, Logging and Controlling of Exhaust Gas aftertreatment systems



Why DPF-Monitoring Systems?

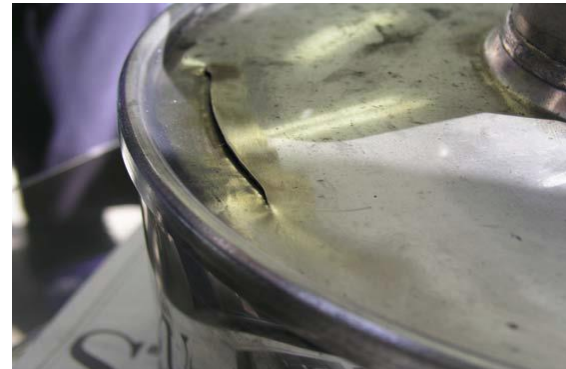
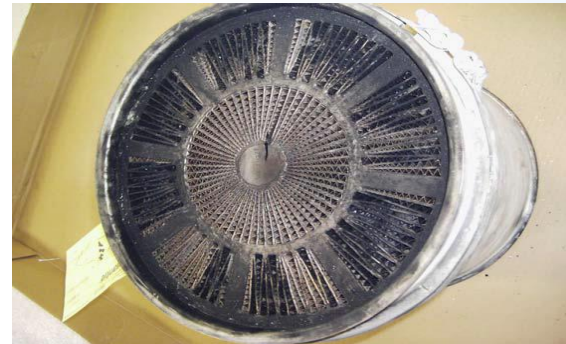
- Mostly required by law
- To avoid damages of the DPF/SCR System
- To avoid damages to the engine
- To assure the availability of the retrofitted machine
- To gather maintenance information
- To get data for (warranty) claims

In addition:

- To measure the raw exhaust data for the research purposes

Why DPF-Monitoring Systems?

- Failures of overheating (lack of monitoring)

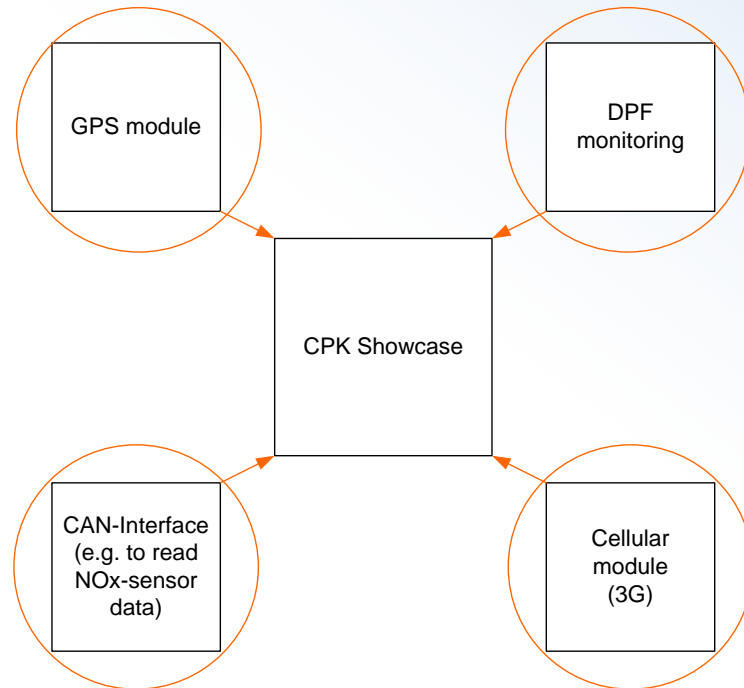


1. Type Approval to achieve a regulation minimum
2. OBD (Monitoring) → data logging & data handling
3. Manufacturing Conformity
4. In use compliance
5. Periodic Testing Intervals (PTI)

Datalogging and Datahandling

The purpose of a datalogger/remote control system

- Measuring and logging:
 - - Temperature upstream DPF
 - - Pressure upstream DPF
 - - RPM
- ➔ In order to detect filter blockings !
- Logging GPS position
- Data-upload via cellular module
- Send alarm SMS



- Professional installation for efficiently working DPF/SCR solutions with project partners

- System functionalities:
 - Backpressure
 - Exhaust Temperature
 - Vehicle's status
 - RPM
 - Vehicle's position via GPS
 - NOx- emission values (optional)
 - Online-Data at any time
 - Real-time reporting, if needed

- Certificate requirements!



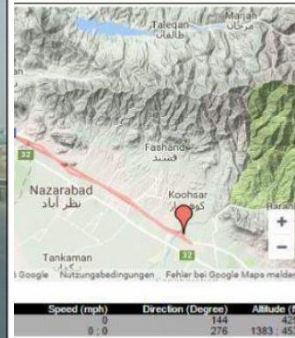
- DPF Feasability Project in progress (Tehran) from 2014-presence
- 1st DPF Retrofit Project in Iran (150x OM 547 Mercedes Benz Engines) in progress
- Durability test for OEM Section
 - Saipa Diesel
 - Iran Khodro (planned)
 - Mitsubishi Mayan Fuso MD (PEMS)



Retrofit Experiences in IRAN



1st DPF Retrofit Feasibility Study Project Tehran Bus Company



- Mitsubishi Mayan Fuso MD (PEMS)



Future Pilot Projects (e.g. Isfahan)



- RemCo II pilot installation Off-Road

Our Worldwide Emission Monitoring Experiences

- **IRAN:** more than 6.000 vehicles monitored (mostly OEM), CPK works together with the ASA Co. in advisory role for the Teheran Retrofit Projects
- **CHINA:** Particulate control evaluation on retrofitted buses & HD trucks in Xiamen, Nanjing, Beijing, Langfang, Shenzhen, Shanghai...
- **USA / Canada:**
 - in total more than 20.000 CPK-Systems installed
 - California: CARB Non-Road “Showcase installation”: several 100 vehicles
- **Europe:** many projects in several countries (in total more than 60.000 CPK-Systems installed)
- **Australia:** several hundred installations in the underground mining business
- **South America:** several pilot test projects in Colombia, Peru, Chile...



CARB Remote Monitoring Project



- Showcase-Project to demonstrate retrofit performance and durability on off-road equipment in support of Diesel Risk Reduction Plan
- Hundreds of vehicles retrofitted with DPF exhaust after-treatment devices on full range of off-road vehicles
- Remote Data Loggers installed on off-road heavy duty construction equipment monitoring and recording multiple engine parameters from the engine's electronic control unit
- Data was transmitted directly to CARB staff in El Monte, CA

Successful Retrofit Program - Education and Record Keeping

- Before installation: Technical Workshop on DPF-Retrofit for on-road and off-road applications is highly recommended
- Instructions about the onboard control and monitoring
- The detailed test report for each vehicle at the end of project



	Document Number: DPF2015091/1 Date: 13/Aug/2015
---	--

Temperature, Pressure and Engine Speed Overview

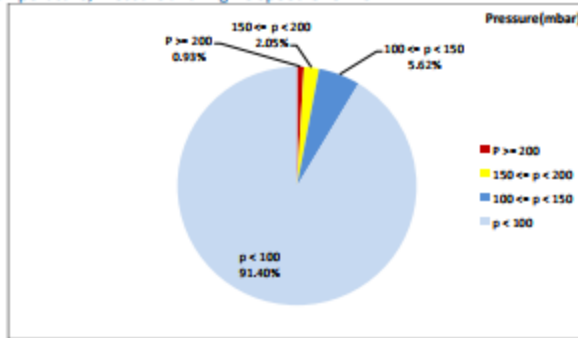


Figure 1- Pressure distribution over the working hours

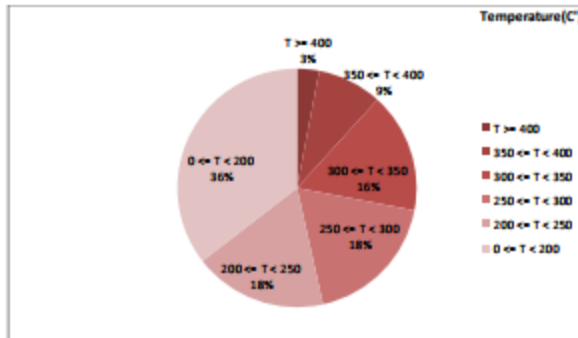


Figure 2-Temperature distribution over the working hours

	Document Number: DPF2015091/1 Date: 13/Aug/2015
---	--

Detailed Pressure Analysis

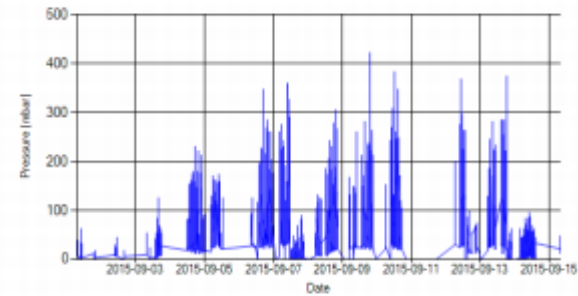


Figure 4- Pressure distribution over the period

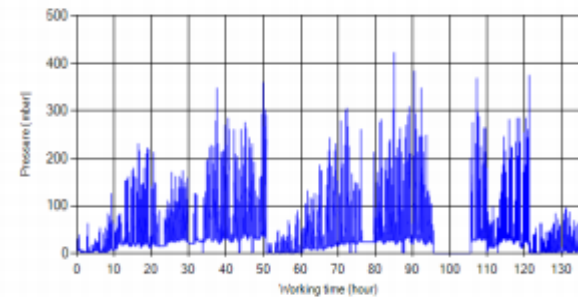
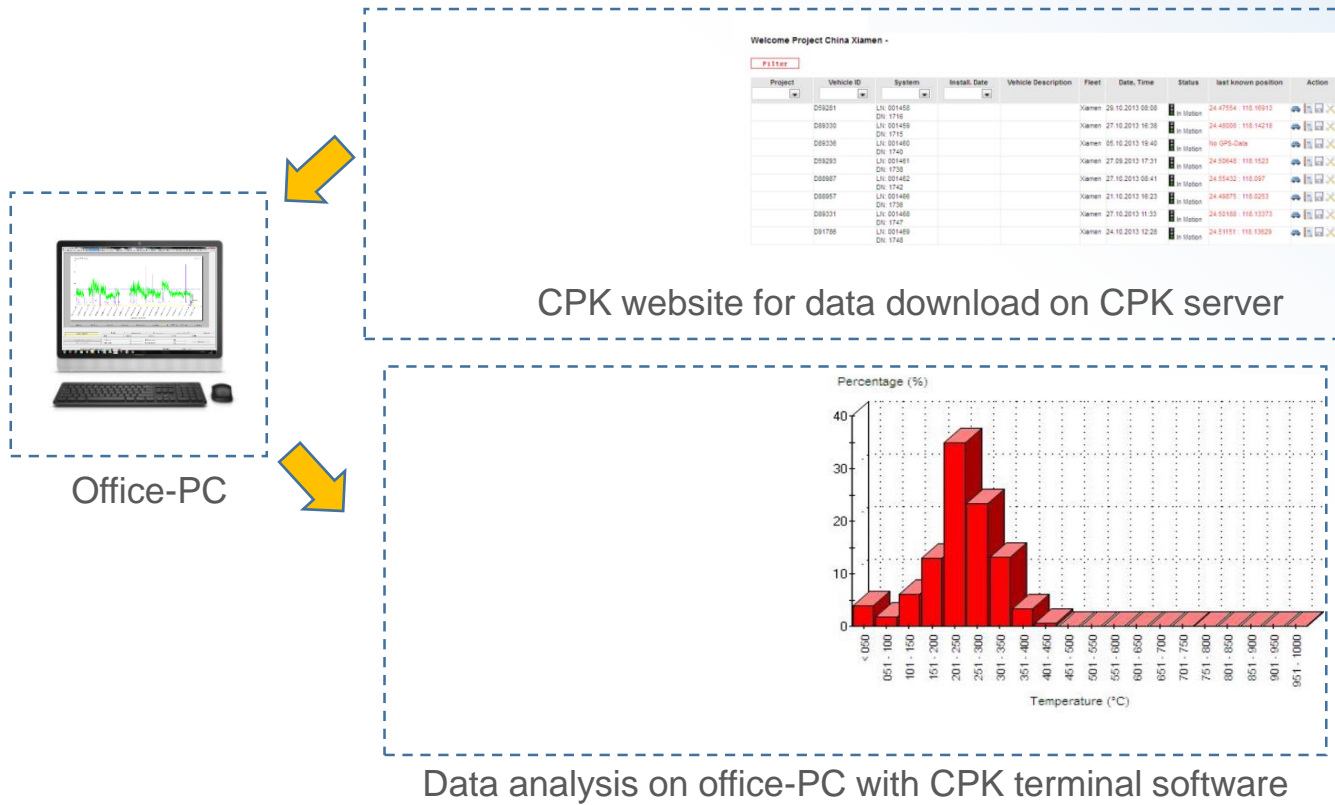


Figure 5- Pressure vs. working hours

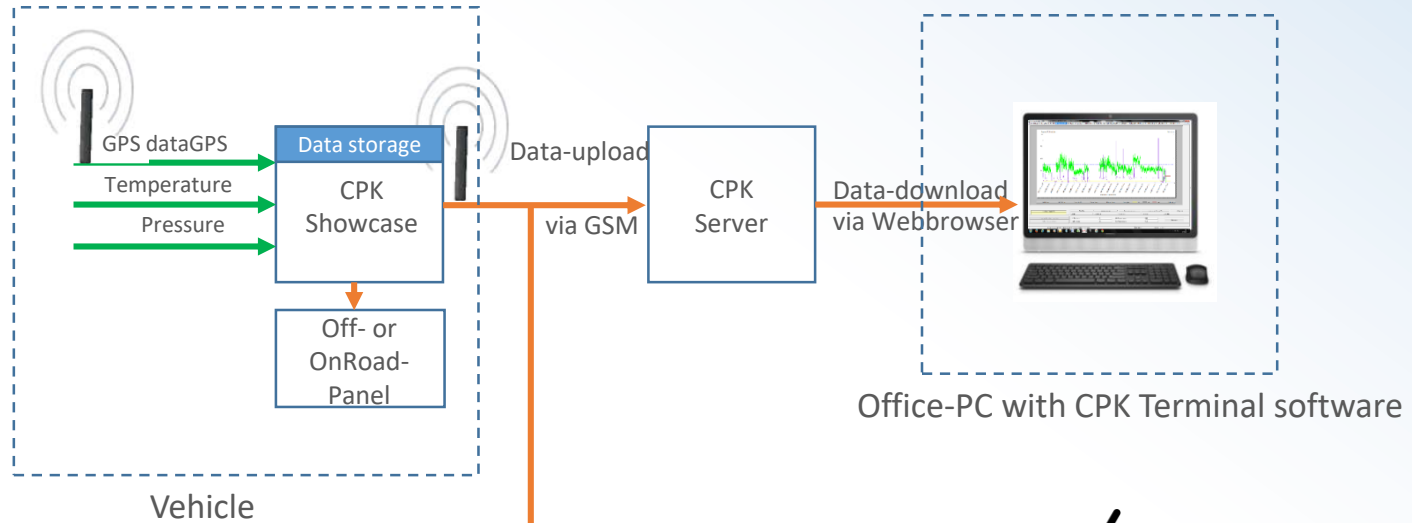
Data Analysis Overview



Overview data handling



CPK Showcase system with cellular module and SIM card



Off-Road Panel

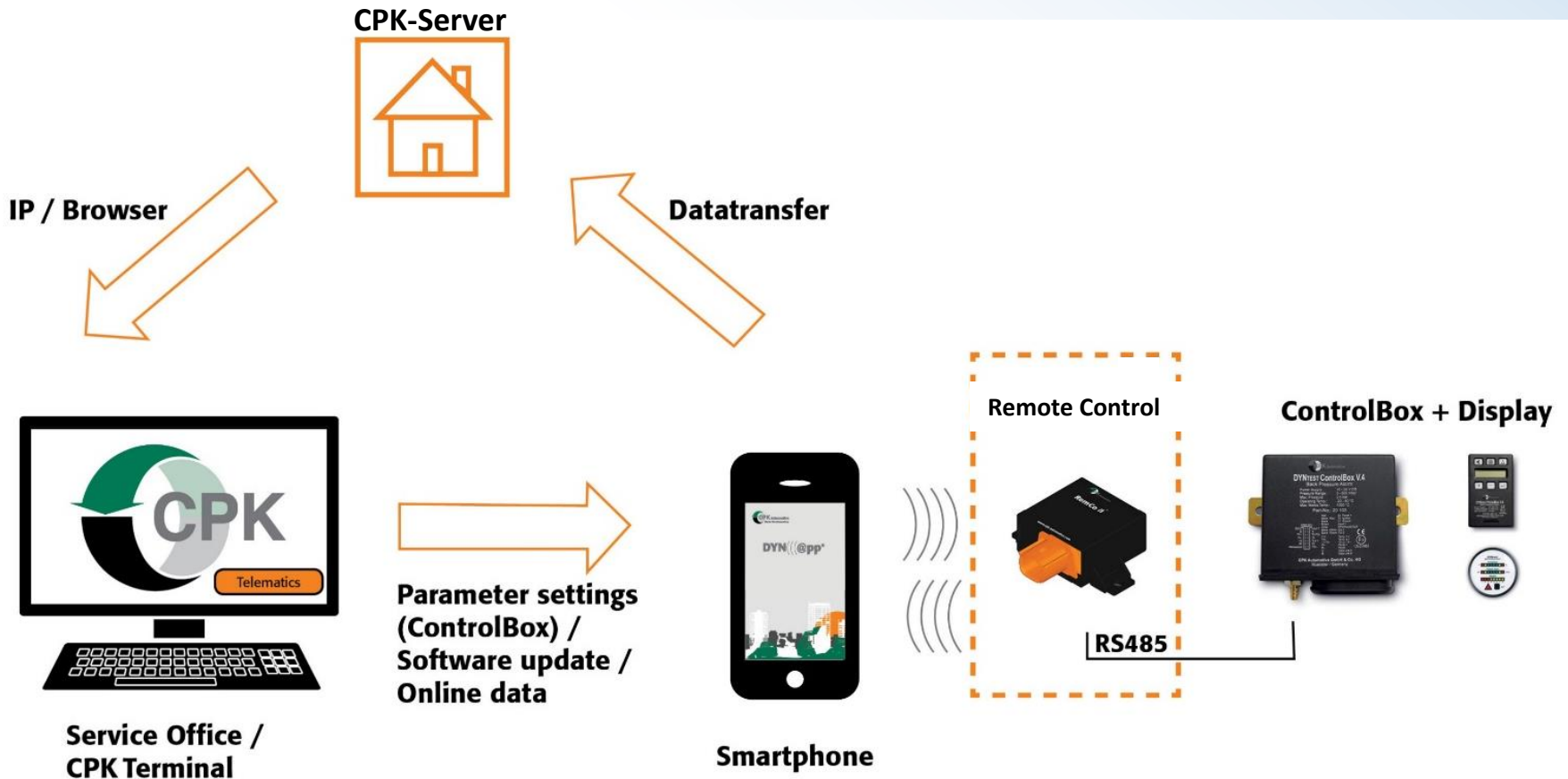


On-Road Panel



Predefined cellphone numbers

GSM LOGGER 1456
reports following errors D36
T:356C; P:201 mbar
GPS Pos 32052862N, 118490720E





Certificates & Approvals



10R-039953



THANK YOU FOR YOUR ATTENTION !

CPK Automotive GmbH & Co. KG
Muenster, Germany

Email: aslantas@cpk-automotive.com

Homepage: www.cpk-automotive.com

