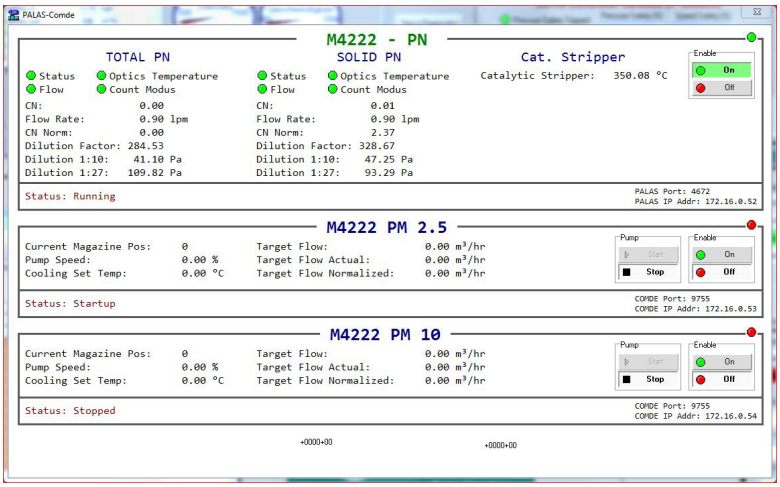
Model 4222

Brake Emissions Particle Measuring System

Automated $PM_{2.5}$ Solid and Total PN Automated PM_{10}



Model 4222 Brake Emissions **Particle Measuring System**

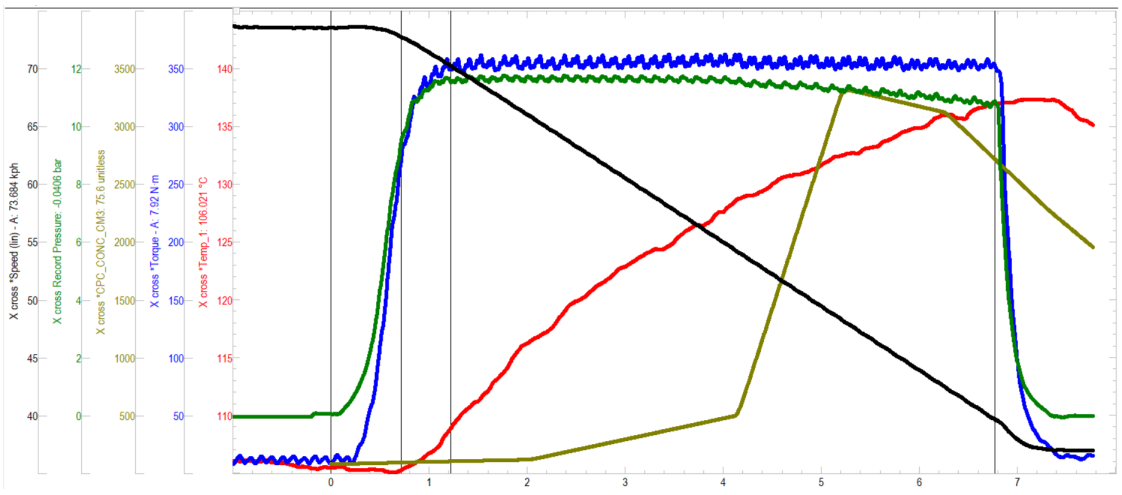
Product **Overview**

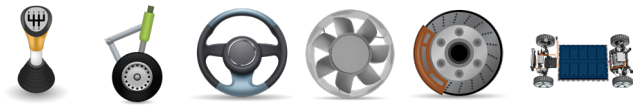
LINK's M4222 Brake Emissions Particle Measuring System is designed to accurately measure and report particle mass (PM10 and PM2.5) and particle number (Solid and Total). The M4222 system enables the operator to automate filter changing (via filter tracking with an RFID) and have the system provide real-time monitoring and operation. Additional instruments can measure particle size distribution and real-time mass measurement.

LINK's design meets the GRPE-87-40 testing procedure and can support future R&D to understand better the factors influencing your emissions. Integrating the M4222 system builds on our expertise in integrating measurement systems as part of standard dynamometer systems (e.g., noise and vibration analyzers, thermal imaging, capacitive sensors, and specialized torque measurement systems).

The LINK M4222 Brake Emissions Measuring System Provides:

- Self-contained, pre-calibrated, and fully integrated with our ProLINK controls and data acquisition systems
- The seamless testing process, from background checks to automated PM filter changes (to avoid downtime between cycles or during off-shift testing), to real-time monitoring and quality controls
- Ease of transport and connection (or disconnection for non-permanent installations) to the dyno controls and the sampling train—simplifying calibration and maintenance



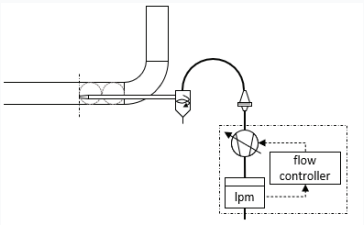


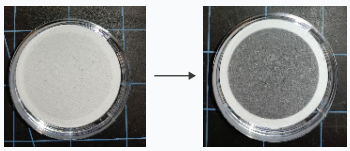
M4222

Equipped with everything needed for EURO 7

PM Sampling

- Individual sampling nozzle and system for PM10 and PM2.5
- Equipped with cyclones
- 47 mm filter holder
- Automatic filter changer for uninterrupted testing
- Real time automatic flow control adjustment with an accuracy of less than 2 percent deviation from setpoint



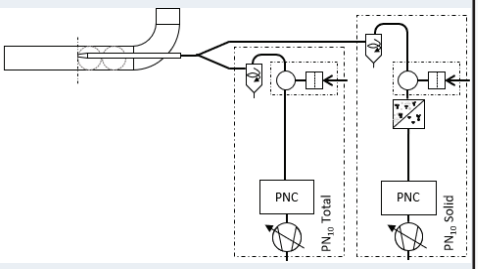


PN Sampling – Total Particle Number (TPN)

- Cyclone separation device
- Two dilution stages: 1:10 & 1:10 with an optional change of a 1:27 dilution stage
- Total particle concentration counter of ultrafine particles via condensation of 1-butanol

PN Sampling – Solid Particle Number (SPN)

- Cyclone separation device
- Catalytic stripper for volatile removal
- Two dilution stages: 1:10 & 1:10 with an optional change of a 1:27 dilution stage
- Total particle concentration counter of ultrafine particles via condensation of 1-butanol

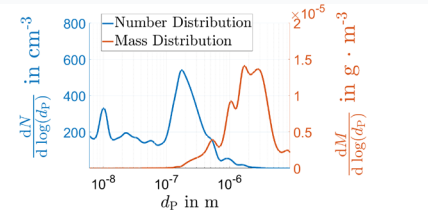


M4222+ Options

Equipped with everything needed for EURO 7 and R&D

Package with the following additions

- Size distribution cluster addition with the range of 5 nm up to 20 microns
- Real-time PM measurement
- Calculated PM generation over time



Model 4222 Brake Emissions **Particle Measuring System**

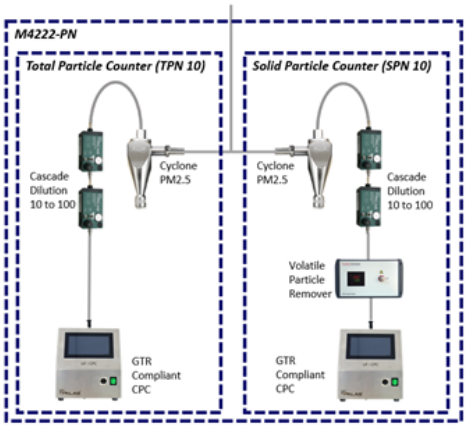
Key **Features**

M4222-PN Sampling

The TPN10 system for total particle number counting consists of the following devices and capabilities:

- Direct connection to sampling probe and isokinetic sampling nozzles
- Certified pre-classifier (cyclonic separator)
- Dilution system with real-time output
- Particle number counting unit (PNC or CPC) capable of 1,000,000 #/cm³ in single count mode
- Vacuum pump (with automatic real-time flow control, sensors, and outlet air filter)
- Automated output for normalized sampling flow, PCRF, and normalized-PCRF corrected concentration
- Above 50% of particles in size of 10 nm are detected and counted

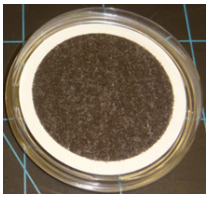
The SPN10 system for solid particle number counting consists of the same devices as the TPN10 with an addition of a volatile particle remover reaching temperatures up to 350 °C.



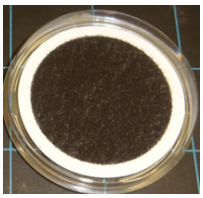
M4222-PM Sampling

Each system (PM2.5 and PM10) consists of the following devices and capabilities:

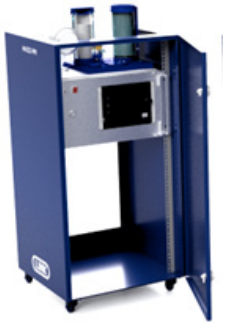
- Dedicated direct connection to sampling probe and isokinetic sampling nozzles with no bends
- Certified pre-classifier for PM2.5 and PM10 respectively (cyclonic separator)
- Integrated and automatic filter changer with double magazine slide-in module
- Vacuum pump with automatic real-time flow control and sensor



PM2.5



PM10



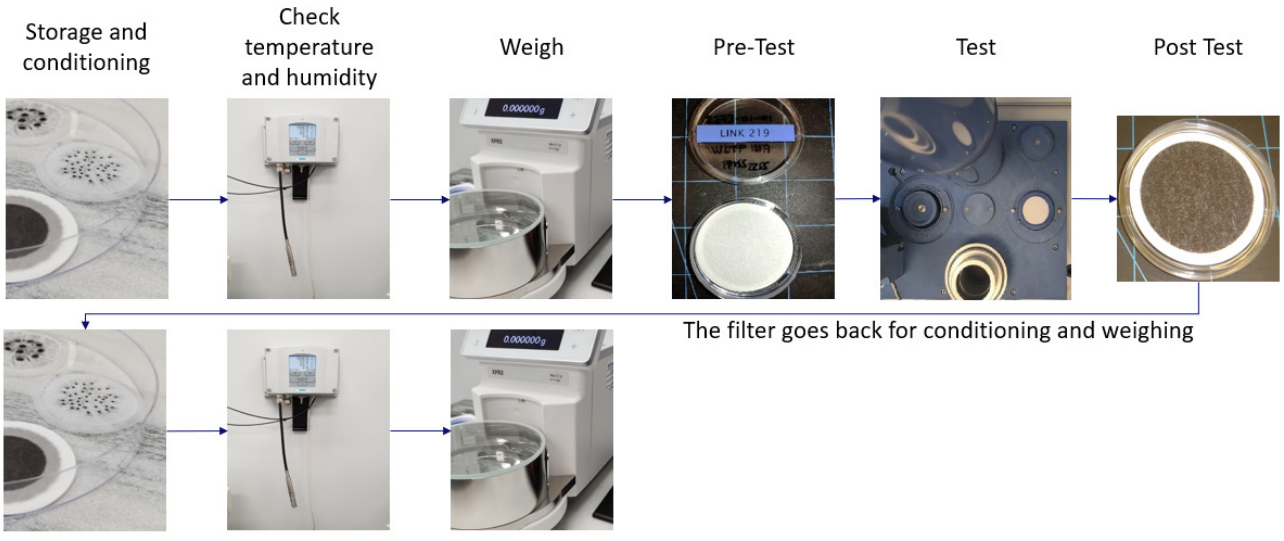
M4222-PM Sampling (Continued)

- Default functions to automate filter changing during or in-between testing to minimize downtime or collect multiple PM samples during the same test
- Radio Frequency Identification (RFID) to track and integrate the filter ID with the entire weighing process and ensure the traceability of filters during the test
- Possibility to integrate with LabLINK

M4222+ Options Sampling

Aside from the standard M4222 which allows measurements per the GTR, LINK can integrate and control a wide range of emissions equipment within ProLINK. This enables the M4222+ to measure not only TPN, SPN, PM2.5, and PM10 but also size distribution, measure real-time PM, or calculate PM over time.

LINK can integrate instruments from a wide range of manufacturers. Integration with an optional filter weighing system can be included to streamline filter weighing, conditioning, tracking, and reporting all within ProLINK.



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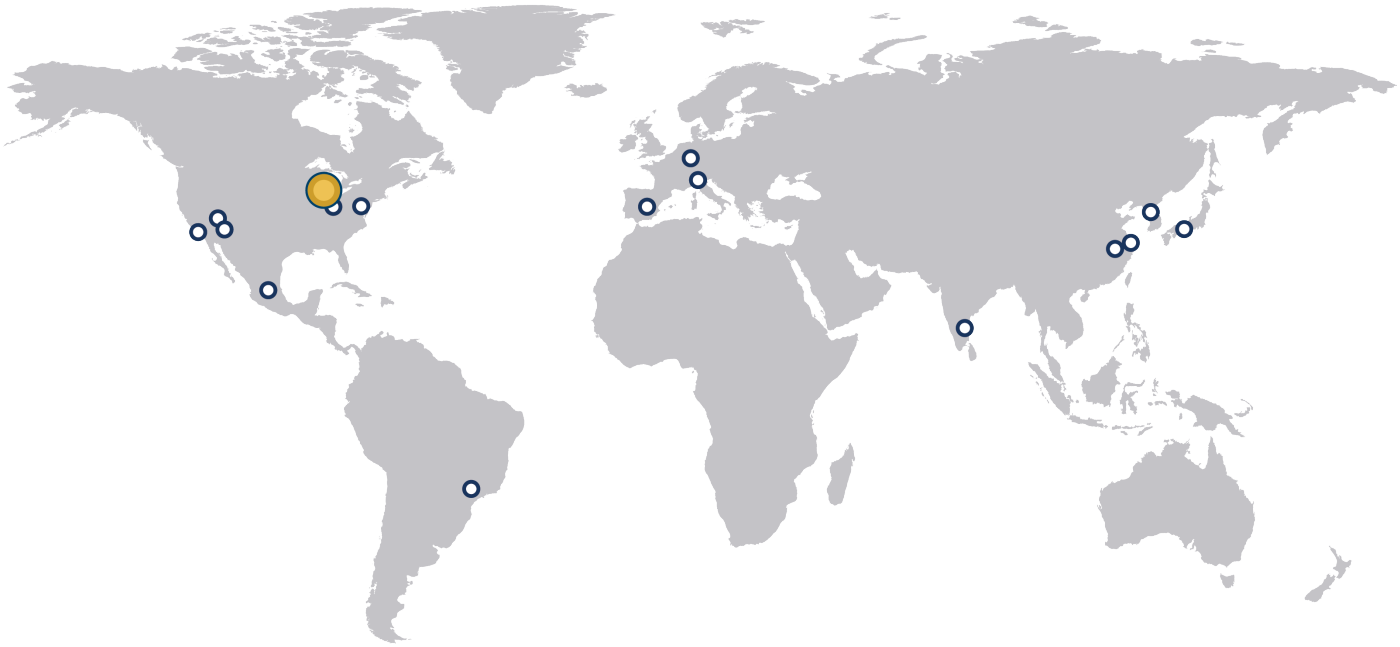

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