



Measurement & Testing Services

imc Test & Measurement

When Partnership Drives Innovation



imc MTP-NT-XS Telemetry System in a road test, installed on a wheel set ©TÜV SÜD Rail

When downtime during homologation testing costs thousands a day, the packaging of your telemetry system matters as much as its performance.

Unplanned downtime during train homologation is a costly problem, as when test programmes stall, instrumented trains sit idle and bills mount up.

[TÜV SÜD Rail](#)'s test centre in Berlin is where wheel-rail force measurement underpins the safety certification of new vehicles entering service. The measuring wheelset system at the heart of that process needs to work every time.

The challenge begins with the measurement itself. There's no way to instrument the wheel-rail contact zone directly, so the wheelset is used as a force transducer: strain gauges measure its deformation, from which the acting forces are calculated. A rotating wheelset

can't be cabled, so telemetry is the only solution, and it's an unforgiving environment: dust, moisture and the extreme accelerations of steel wheels on rail tolerate nothing less than purpose-built equipment.

In such an environment, failures of electronics happen. The duration of the downtime however, must be kept low to minimise testing costs.



imc MTP-NT-XS housing variants for transmission and amplifier modules; © imc Test & Measurement

The downtime TÜV SÜD Rail was experiencing wasn't caused by the quality of its imc Test & Measurement telemetry components, but how they were packaged.

Earlier systems, including Caemax's P-32, required drilling through the axle, adding significant preparation time before a single measurement run could begin.

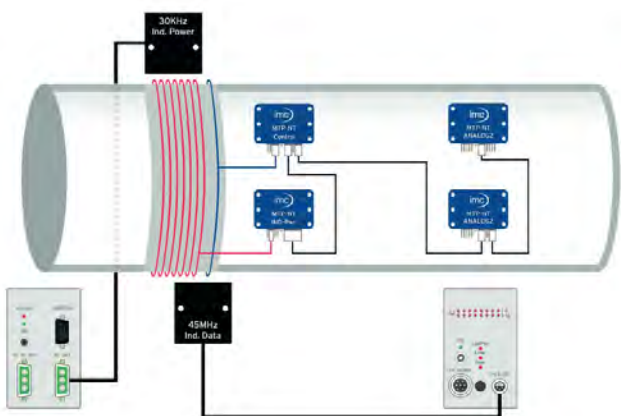
Later radially mounted discrete solutions addressed that but brought their own difficulties: bespoke enclosures built from scratch for every project, with limited accessibility that complicated maintenance mid-programme. If anything needed changing out, recovery meant bringing the train to a pit, desoldering and resoldering connections, and recommissioning before testing could resume.

A co-development project produced a solution: standardised, field-swappable housing for imc's MTP-NT-XS modular telemetry platform, designed specifically for the rail test environment and proven in deployment.

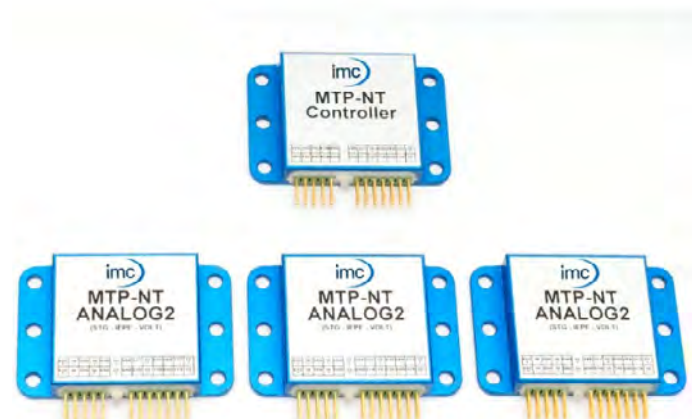
A Partnership Built on Precision

TÜV SÜD Rail's relationship with imc dates back to the 1990s, evolving through successive generations of hardware. When imc acquired specialist telemetry manufacturer KMT Kraus Messtechnik, with whom TÜV SÜD Rail had also worked closely, the different strands of the relationship came under one roof.

MTP-NT platform is designed for flexibility, supplying high-quality components that customers integrate into their own housings, but for TÜV SÜD Rail, that flexibility was a burden. What the centre needed was a standardised housing, rapid to deploy and built for the rail environment, and crucially, something like it had existed before.



*Installation Principle for imc MTP-NT Modules on a Shaft, Inductive Power Supply, and Data Transmission
© imc Test & Measurement*



*imc MTP-NT Telemetry Modules
© imc Test & Measurement*

Before imc acquired KMT, the later used compact housing, packaging the telemetry electronics onto a dedicated PCB with integrated connectors, small enough to mount directly to a wheelset and fast enough to swap out when needed. *"It was just screwing eight screws and detaching eight connectors,"* says André Rohrbeck, Team Lead Measuring Wheelsets at TÜV SÜD Rail. *"Then you have the whole amplifier in your hands, you could simply swap something out and continue the measuring runs."*

That housing wasn't carried forward when imc took over KMT's product line. *"We wanted the good old days back,"* says Rohrbeck, *"but with imc technology."* imc responded by inviting TÜV SÜD Rail into a co-development project to do exactly that.

The result is a compact, ruggedised enclosure built around the MTP-NT platform. The BASE unit powers the system, manages data exchange, and accepts up to two measurement modules; EXT extension units each accommodate up to four further amplifier modules. The housing is rated to IP68, operates across -40°C to 85°C, and is built to withstand the accelerations generated by steel-on-steel contact at speed.

Put to the Test

TÜV SÜD Rail put the new housing to the test last autumn on a customer project that had previously seen reliability issues with earlier KMT-era telemetry. *"We were quietly confident,"* says Rohrbeck. *"We mounted the telemetry systems in the new housing and it worked really well. There were no failures during the whole run."*

For imc, the demanding nature of the rail environment is itself part of the point. Wheelset measurement subjects equipment to extreme shock and acceleration loads, with no suspension or damping between wheel and rail, combined with spray water at speeds of up to 400 km/h and ballast impact from track debris.

"If a telemetry solution performs reliably in this kind of railway environment," Florian Sailer, Strategic Product Manager Telemetry and Sensors at imc notes, *"it's well prepared for demanding applications in many other industries as well."*

Benefits of Collaboration

For TÜV SÜD Rail, the new housing represents a transition in how the centre deploys and maintains its telemetry rather than a change in underlying technology. The MTP-NT platform remains the same; what's changed is how it's packaged and managed in the field.

For imc, the collaboration illustrates the value of its customer-led approach: the platform's modularity – scalable from a two-module BASE unit through multiple EXT extensions, configurable for strain gauges, voltage, IEPE or potentiometer inputs – gives it the flexibility to serve demanding, application-specific deployments without sacrificing the standardisation that keeps costs manageable.

Homologation testing sits at the foundation of rail safety, and the data underpinning it must be gathered in some of the industry's most demanding conditions. The partnership between imc and TÜV SÜD Rail, built over more than two decades, is a working illustration of what that standard requires.

"They're focusing on bringing a good product to market," says Rohrbeck, *"and that, in the end, also helps us."*

To find out more about imc's solutions please visit the company's [Railway-News profile page](#) or get in touch via their [contact form](#).

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