apna
technologies & solutions
A PATIL GROUP COMPANY

# Comprehensive Diagnostic Products for Monitoring Railway Assets

SCAN TO VIEW

MAKE IN INDIA

— Proudly Support —

#atmanirbharbharat


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# Wayside Systems

## Wheel Impact Load Detector (WILD)

Detects high Impact load caused by skidded or shelled wheels, out of roundness, long waveform irregularities in wheel, broken spring and uneven loading

- ApnaTech installed the 1st WILD system in India over a decade ago

- In benchmarking exercises it has proved to be superior to imported systems in terms of accurate fault detection
- More than 70% WILD systems in India are successfully installed and maintained by ApnaTech

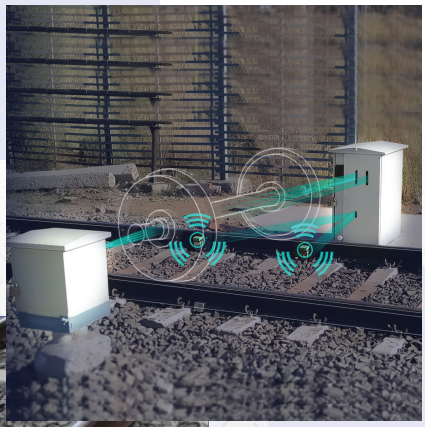
Made in India for Indian conditions:

- Lower power and power backup requirement
- Rugged system runs without air conditioning
- 16 hours backup with solar and battery
- Fastest installation times from order to prove out

## Hot Box Detector (HBD)

ApnaTech installed India's first HBD at Chunar in 2017

- Additional Systems installed at Kota and Dadri
- More than 50 hot boxes were detected by our systems since installation
- Measure the temperature of the axle box
- Can additionally measure Wheel Temperature
- Axle scanning speed upto 250 Kmph





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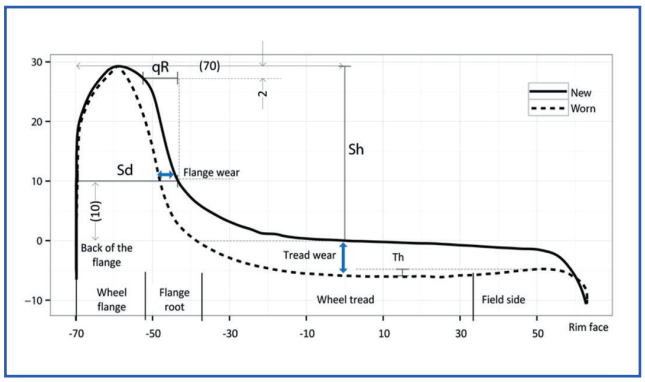
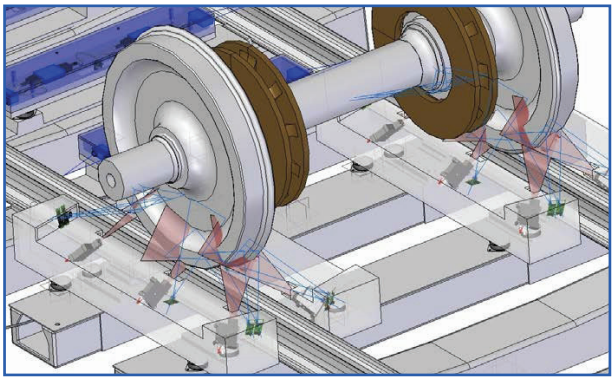
# Wayside Systems

## Wheel Profile Measurement System (WPMS)

Measure wheel profiles of moving trains

- Camera and Laser Combination for Accurate Measurement of:
  - Wheel profile
  - Wheel diameter
  - Wheel width
  - Back-to-back gauge
- Scanning speed upto 120 kms per hour
- Accurate, Rugged and Reliable



## Hanging Parts Detector System (HPDS)

ApnaTech installed India's 1st Hanging Parts Detector System at Chunar

- HPDS is a wayside system that detects any hanging part in a running train
- Consists of high speed camera with appropriate lighting to capture the images
- Automatically detect train and initiate the video recording.
- Captured images are then analyzed by AI/ML algorithms to detect hanging parts
- Generates XML reports and transfers to the central server for web-based publishing including SMS alerts
- The system can be easily integrated with other wayside systems



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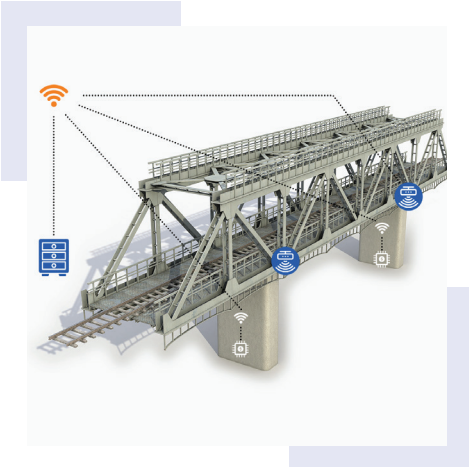
# Wayside Systems

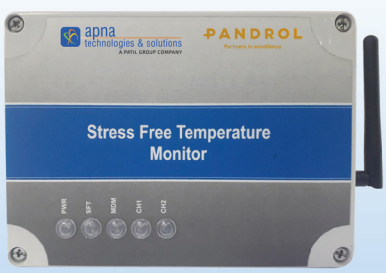
## Bridge Monitoring



- Proactively monitor structural performance under operational and environmental variation
- Extend the remaining life of bridge by reducing failures due to early detection
- Optimize inspection budgets with real-time condition data
- Reduce unnecessary maintenance and life-cycle costs
- Increase confidence in structural integrity and public safety
- Avoid closures and downtime for routine inspection
- Useful in identifying the internal defects in the structure, which may not be detected from outside after earthquakes & extreme loading

## Acoustic Bearing Detector (ABD)

- TADS® , the ABD technology invented by TTCI, US
  - Monitors Roller Bearings
  - Identifies internal defects prior to overheating, preventing train stops and ultimate bearing failure.
- Series of trackside microphones to capture, transmit and analyze acoustic data for defective bearings
- TADS® currently runs on 150 locations spanning global railway systems like QR National Coal, BNSF Railway, MOR China, Union Pacific Railroad, CSX Railway, Norfolk Southern Railway, Canadian Pacific Railway, Transnet Freight Rail, Deutsche Bahn, Canadian National Railway and RUMO, Brazil
- Exclusive Make in India agreement signed with ApnaTech for Railway Requirements in India




## Stress Free Temperature (SFT)

ApnaTech installed its 1st SFT system for Bane NOR (Norway)

- A measure of residual stress in the Railway Track
- Measures strain and temperature through an embedded sensor on the railway track
- Real-time monitoring with alerts to avoid Rail break due to stress build-up and Buckling of Track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# Onboard Systems

## Over Head Equipment Monitoring (OHE)


- An array of digital line scan cameras monitors the overhead catenary conditions and raises alerts to the control room in real time
- Height and stagger of the contact wire relative to the track
- Wear of the contact wire
- Changes in contact wire height
- Disconnection of Catenary wire & Pantograph
- Foreign objects and loose connections in OHE catenary system
- Dynamic forces and accelerations between the OHE and Pantograph
- Current Collection / Arcing
- Mast Detection and Implantation

## Third Rail Monitoring

- Based on a contactless optical technology
- Provides measurements of the power rail's gauge and height, evaluating its position relative to the running rails
- Can additionally measure the complete third rail profile
- Monitors the current collection performance through the onboard system

## Track Monitoring

- Our Track and Turnout Geometry measurement system combines rail profile and track geometry systems, efficiently and accurately recording both measurements with one instrument. Our designs are for longevity and low maintenance with compact dimensions for easy installation.
- Track Video Inspection automatically recognizes missing or misaligned track components including fasteners and bolts, damaged joint bars (fish plates), and more. Modular and flexible, the equipment can be configured to inspect the rail top, rail features, rail and track components, and other items specific to track infrastructure. Rear Window inspection can be an added feature.
- Can optionally measure MMD envelope and analyze track health based on onboard accelerometers


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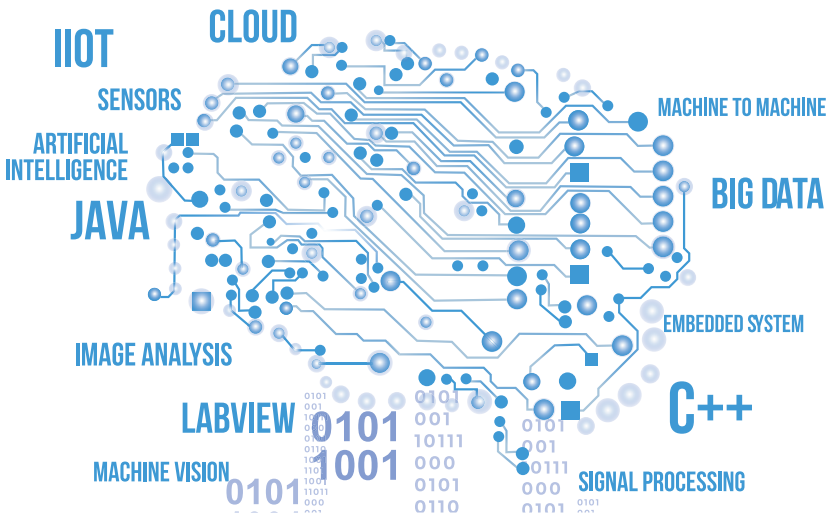
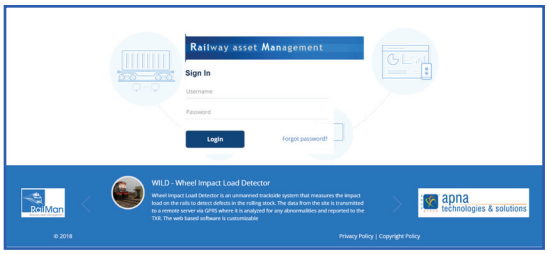
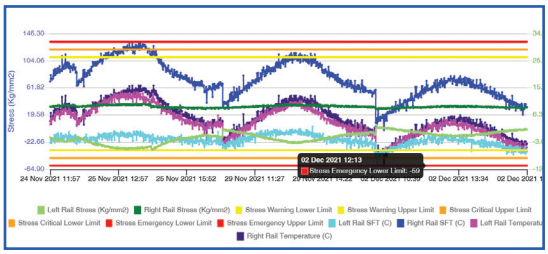
# RailMan

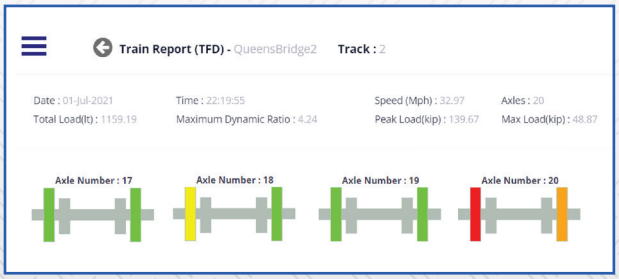
Machine to machine communication (via sensors and tracking systems) generates zillions of terabytes of data. However, big data is not useful without it being intelligently processed into actionable alerts. RailMan uses Machine Learning (ML) and Artificial Intelligence (AI) to analyze data, convert it into easy-to-digest information and make it available real-time to the right stakeholders. Thus, RailMan facilitates decision making for condition-based maintenance and enhancing the safety and efficiency of railway systems.



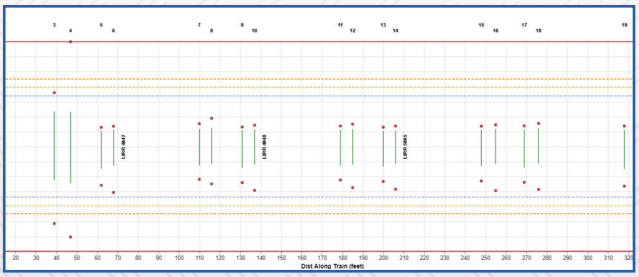



- RailMan (www.railman.in) is ApnaTech's Cloud based platform
- Collects data from all wayside and on-board diagnostic systems
- In use at over 50 locations like Depots, C&W Control Rooms, TXR points and zonal and divisional headquarters
- XML/JSON interface standard developed by ApnaTech has been adopted as a standard for way-side interface by Indian Railways
- Simplifies the maintenance and operation process through alarm logs shared between operation center and maintenance depot
- RailMan has been accepted and used by Indian Railways as a web-based IT platform for diagnostic systems
- Various Dashboards & Views accessible by Customer
- Traffic light Alerts can be set to suit Customer procedures
- Data Can be downloaded onto Excel or PDF




Detail of Each Rolling Stock, Axle and Wheel



Detailed View of a Specific Train