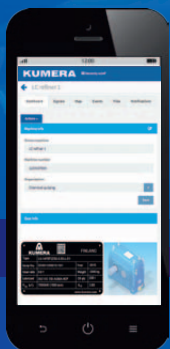




**KUMERA**  
*SERVICE*

# Gearbox Monitoring Guard Gear 4.0



# Service

# Lifecycle Management

Industrial lifecycle management is evolving rapidly. To answer the demand, Kumera has developed Guard Gear 4.0 for making sure that the downtime of the most critical processes is minimized.

## Spare parts

- Original spare parts, custom made spare parts and spare parts for all brands.

## Repairs and overhauls

- Global Kumera Service Center network, manufacturing and service facilities all around the world.
- Multi brand overhauling, all brands can be repaired.

## On-site services

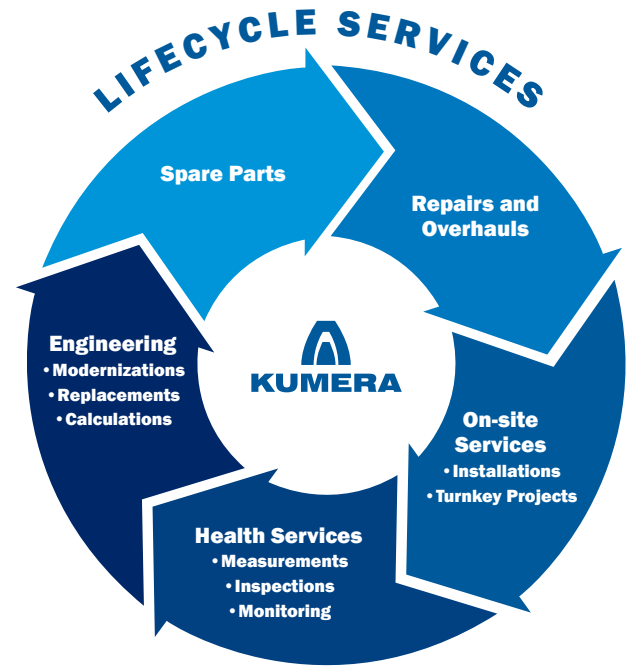
- Repairs and overhauls, installation supervising, machine installations and turnkey projects.

## Health services

- Essential measurements, inspections and/or online monitoring for analysing power transmission condition.

## Engineering

- Upgrading, modernization and replacements of all brands.
- Professional services, lifetime calculating and engineering.



# Health Monitoring

**OIL**

- Quality
- Rel. Humidity
- Temperature

**VIBRATION**

- Velocity
- Acceleration
- Envelope
- Speed

**OPTIONS**

- Power
- Torque
- Pressure
- Flow
- Oil level
- Particles
- Cleanliness

**MOBILE DATA**

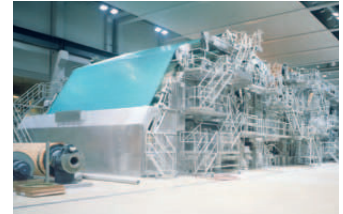
101001  
011101



Kumera Specialist



Equipment Manufacturer



101011

**Power-Plaza - Health Portal**

- Online Dashboards




Operators, Maintenance personnel



Process Control System

← - - - - - → Wireless  
 → Wired

# Health Portal



## Customizable web-based interface solution for customer needs

- Different dashboards depending on the user level



## Visual view with charts and graphs

- Scalable graphs on different screens



## Fleet, assets and signals controlling and monitoring



## Data storage and management

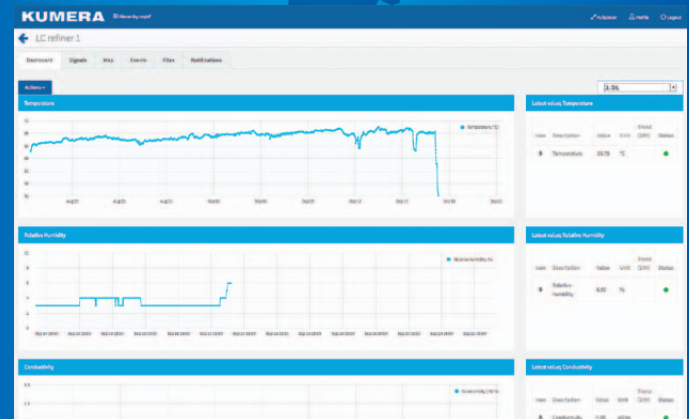
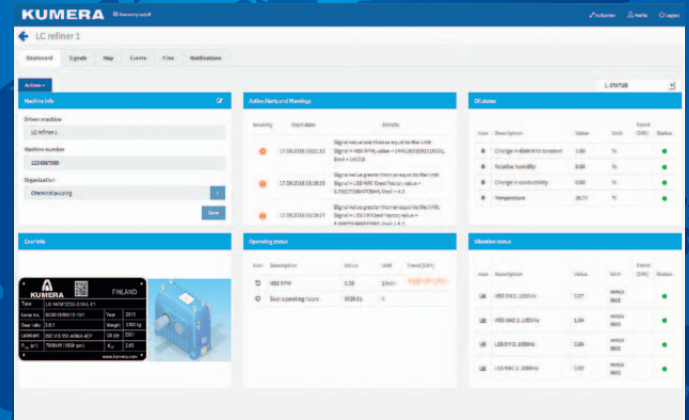


## Setting up warning and alarm limits

- Collecting, monitoring and transmitting warnings and alarms



## Remote software updates directly from the office



# Vibration Monitoring

Vibration monitoring is user friendly with preset configured parameters. Kumera specialists provide detailed remote analyzing and reporting with recommendations in failure cases.

## Vibration parameters

### Vibration velocity overall values:

- 2-1000 Hz, 2-40 Hz, 40-400 Hz, 400-1000 Hz

### Vibration acceleration overall value:

- 10-5000 Hz

### Envelope overall value:

- 0-1000 Hz (HP filter 500 Hz)

**Crest factor** (Waveform Peak value divided by Waveform RMS value)

### Rotational speed

# Oil Monitoring

On-line oil monitoring gives early-stage detection of upcoming failures and detailed information of the lubrication oil quality. Wear particle monitoring is an effective tool especially for low speed gearboxes which are difficult to monitor on their vibration analyses.

## Monitored parameters

### Lubrication oil:

- Relative Humidity
- Temperature
- Change of Dielectric constant
- Change of Conductivity

### Wear particles:

- Fe fine / coarse particles
- Fe / non-ferromagnetic particles in different size classes

### Cleanliness class:

- ISO 4406:1999, SAE AS 4059 (D)



# Technical Specification



## Main unit dimensions and mechanical properties

- Case material: steel
- Operating temperature: -30...+70 °C
- Protection: IP66
- Size (HxWxD): 250 x 200 x 150 mm
- Case mounting: 4 x 10 mm holes
- Weight: 4.5 kg



## Connectivity

- WWAN: 2G / 3G / 4G
- Communication protocol: OPC UA



## Power supply

- Input voltage: 24 V DC
- Max current: 1.6 A
- Connection: M12 x 1 - connector, 4-pin



## Vibration

- Measurement range:  $\pm 25$  g
- Frequency range: 0...6000 Hz
- Resolution: 16-bit
- Operation temperature: -30... 85 °C
- Protection: IP68 / IP 69K
- Type of mounting: M8 x 1.25
- Sensor cable: 3 m



## Lubrication oil

- Saturation level: 0...100 %
- Temperature: -25...+100 °C
- Dielectric constant: 1.5...10
- Change in dielectric constant: -30...+30 %
- Electrical conductivity: 0...100
- Change in electric conductivity: -100...+200 %
- Operating pressure: < 50 bar
- Viscosity range: 1 – 5000 cSt
- Fluid flow velocity: < 5 m/s
- Protection class: IP 67
- Mechanical fitting: G 3/4
- Sensor cable: 3 m



## Rotational speed

- Inductive proximity switch
- Sensing distance: 3 mm +10%
- Detection frequency: 2...500 Hz
- Operating temperature: 0 – 100 °C
- Protection class: IP67 / IP69K
- Mechanical fitting: M12x1
- Sensor cable: 3 m



## Options

- Load monitoring
- Wear particle monitoring
- Oil cleanliness monitoring
- Vibration sensors up to 4 pcs
- 4 – 20 mA transmitters
- GPS
- Ethernet, WLAN
- Power supply unit, input voltage 230 VAC

# Health Products

	Health Device	Health Package	Health Warranty
■ Guard Gear 4.0 main device, installed on gearbox	✓	✓	✓
■ 1pcs inductive RPM sensor, installed on gearbox	✓	✓	✓
■ 1pcs Oil sensor, installed on gearbox	✓	✓	✓
■ 1pcs Vibration sensor, installed on gearbox	✓	✓	✓
■ System upholding and access rights to Health Portal	✓	✓	✓
■ Remote analysis and reporting tools	✓	✓	✓
■ Warning and alarm limits set by Kumera specialist		✓	✓
■ Kumera Health Report every 3rd month		✓	✓
■ Health support 24/7		✓	✓
■ Data roaming in Europe	✓	✓	✓
■ Gearbox warranty extended by 2 years			✓

# POWER-PLAZA.COM

Kumera Power-Plaza is the online marketplace for Kumera Power Transmissions and spare parts.

Use the Power-Plaza.com for

- Online gearbox configuration
- Creating 3D models and CAD drawings
- Identification of spare parts
- Online shopping cart including delivery times









# KUMERA

## POWER TRANSMISSIONS GROUP

### 24/7 CUSTOMER SUPPORT

#### **Service and Spare parts**

+358 400 300 644  
service@kumera.com

#### **Technical engineering support**

+358 20 7554 290  
drives@kumera.com

#### **Standard gearboxes**

+358 20 755 4200  
drives@kumera.com

#### **Marine Gearboxes**

+47 33 48 54 54  
sales@kumera.no

#### **Asia-Pacific area**

+86 512 503 61701  
kumerachina@kumera.com

#### **Central Europe & Customized gearboxes**

+43 316 471 524-0  
kumera.graz@kumera.com

Kumera Lifecycle Service at your disposal for retrofitting and condition monitoring of all brands and makers of industrial and marine gearboxes.

[www.kumera.com](http://www.kumera.com)

# Kumera Corporation

Kumera Corporation is a worldwide manufacturer of industrial machinery and engineering services. The corporation consists of four major operating divisions:

**Power Transmission Group** provides a comprehensive range of industrial and marine gearboxes for all major process industries. Kumera has more than 50 years of experience as manufacturer of mechanical power transmissions. There are more than 200.000 Kumera gear units in operation world-wide.

**Technology Division** specializes in state-of-the-art engineering and heavy process equipment for metallurgical and environmental industries. Kumera has successfully performed several modernization projects for metals industry and is a leading manufacturer of industrial steam dryers for copper and nickel smelters and lignite.

**Foundry Division** with **Peiron Oy** as the leading company produces all types of steel and iron castings, forming a link in the vertical refining chain of Kumera Corporation.

**Marine Division** produces propulsion gearboxes and propellers including control systems for any seafaring vessels.

## Kumera Corporation Ltd.

Kumerankatu 2  
FI-11100 Riihimäki, Finland  
Tel: +358 20 755 4200  
Email: kumera@kumera.com

## Sales

Please feel free to send your offer request to:  
**sales@kumera.com**  
Your message will be answered within the next business day.

## Technology Division

### HEADQUATERS

**Kumera Technology Center (KTC)**  
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### MACHINERY

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E-mail: info@peiron.com

## Power Transmissions Group

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### Sales Office

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Wusongjiang Development Zone  
Kunshan, China  
Tel: +86 (0) 512 503 617 01  
E-mail: kumerachina@kumera.com

## Emergency Repair Service & Maintenance 24/7

**- All major brands and manufacturers**

### EMERGENCY REPAIR SERVICE FOR INDUSTRIAL GEARBOXES

#### AUSTRIA

Phone: +43 316 47 15 24 - 0  
E-mail: service.graz@kumera.com

#### FINLAND

Phone: +358 400 300 644  
E-mail: service@kumera.com

#### GERMANY

Phone: +49 2241 988 - 0  
E-mail: service.germany@kumera.com

### EMERGENCY REPAIR SERVICE FOR MARINE GEARBOXES AND PROPELLERS

#### NORWAY

**Marine Gearbox Service**  
Phone: +47 952 46 460  
E-mail: service@kumera.no

#### Marine Propeller Service

Phone: +47 900 53418  
E-mail: helseth@kumera.com

### EMERGENCY REPAIR SERVICE FOR INDUSTRIAL AND MARINE GEARBOXES IN ASIA

#### CHINA

Phone: +86 137 7196 9428  
E-mail: kumerachina@kumera.com