PDetector

Handheld Partial Discharge Detector

Advanced Handheld Partial Discharge Detector for Electric Power Equipment with Multi-Sensor and Data Management Software
Our Mission
Utilize the latest hardware and software technologies to the operation and maintenance of electric power equipment.

Our Vision
Provide customers with cost-effective testing instruments and monitoring systems, and always lead in the field of intelligent operation and maintenance of power equipment globally.

Global Application
Our products and services have been widely adopted by major electric utilities and industrial end users in the United States, Canada, Germany, Switzerland, United Kingdom, France, Poland, Australia, Mexico, Bolivia, Colombia, Uruguay, Saudi Arabia, Oman, South Africa, Egypt, Singapore, India, Malaysia, Indonesia, Vietnam, Sri Lanka, South Korea, Philippines, Pakistan, Thailand, Bangladesh, Turkmenistan, China, Hong Kong, Taiwan, and more.

Our proven, high-quality products and complete solutions have been adopted by customers in various industries including oil & gas, metals & metallurgy, chemical, industrial manufacturing, commercial building maintenance, government and more.

Customer Oriented
Customer satisfaction is of the utmost importance to PMDT. We strive to provide increased operational reliability and safety of power systems and are devoted to providing superior user experiences and consistently reliable customer support.

We aim to pursue long-term strategic partnerships with our customers and to create added value for them now and into the future.

About PMDT
PMDT provides solutions worldwide for condition-based maintenance to the power industry. Our company has knowledgeable and experienced personnel that utilize the most advanced resources for online testing. Over 25 years of ongoing research and development into power asset condition assessment aids for our wide array of diagnostic and monitoring systems for medium and high voltage substations.

Our headquarters and manufacturing facility is located in San Jose, CA, US, which provides local access to high quality American-made components. We provide reliable and robust equipment with state-of-the-art capabilities for online testing of energized power equipment.

PMDT meets ISO9001: 2015 Quality Management System requirements and our products have passed laboratory tests and possess CE certifications.

PMDT continuously puts forth an abundant R&D investment to provide perpetually better solutions for condition-based maintenance programs.
The PDetecter is an ideal device for On-Line Partial Discharge (OLPD) testing of MV and HV equipment which employs all 5 types of OLPD sensor technology: Ultra-High Frequency (UHF), Acoustic Emissions (AE), Ultrasonic, High Frequency Current Transformer (HFCT), and Transient Earth Voltage (TEV). The information from multiple sensors gives the PDetecter the versatility to detect all types of PD in all types of substation apparatus. The exact type of PD activity can be determined effectively using multiple on-screen data spectrum analysis. The PDetecter greatly simplifies and standardizes the routine OLPD testing procedure by using the Intelligent Patrol function and RFID asset tagging. It is a very powerful and helpful tool for substation operators to conduct routine testing in a substation quickly, to determine what the issue is and where it is located.

Applications
- MV & HV Switchgear
- Transformers
- Power Cables
- Gas Insulated Switchgear (GIS)
- And Other Equipment

Main Features
- Employs 5 types of online PD sensor technologies
- PRPD, PRPS, Single-Cycle, Phase, Waveform, and Amplitude spectrums to determine PD types
- Wireless connection to UHF and HFCT sensors
- Power/Light frequency synchronization
- Intelligent Patrol Function to create a test task with a set standard test procedure to improve test efficiency
- RFID asset tagging on power equipment to standardize the field OLPD testing procedure to greatly improve test efficiency and achieve asset management
- One-key data saving and simple operation, ideal for quick PD testing for a whole substation

Certifications
- Records up to 5 minutes of video while in the PRPS/PRPD Detection Modes of the UHF/HFCT Sensors
- PC-based data management software with automatic report generation function in JPEG/MS Word/PDF formats
- On-board data storage
- Environmentally friendly and supports paperless testing
Multiple Detection Modes and Data Spectrums Used to Determine the PD Type

The core issue for analyzing the severity of the PD signal is to first determine what type of PD signal is present. PMDT utilizes PD type determination technique based on time domain characteristics of signals together with frequency domain analysis. Each PD type has a typical characteristic which is useful in determining the PD’s developing progress and critical level. The PDetector provides multiple kinds of data spectrums which are useful for data analysis and determining PD types.
Data Management Software

The PDetector data management software is a powerful, PC-based tool that stores, manages, analyzes the test data, and manages the test jobs.

Main Features

- Test File Management: Manages the online testing data files of the power equipment and substations.
- Test Job Management: Creates, assigns, manages test jobs and archives the test data.
- Test Data Management: Stores and manages the test data spectrums collected by the PDetector and provide trend analysis. There are 12 kinds of PD test data including spectrums and video.
- Intelligent Patrol Function: Create a new test job on software and download it to the PDetector main unit. Patrol the substation and test for PD efficiently.

Wireless Sensor Connections and Frequency Synchronization

Wireless Sensor Connection

The most convenient feature of the PDetector is the wireless connectivity of the UHF and HFCT sensors. The sensors are equipped with wireless signal processors that transmit the test data wirelessly to the PDetector main unit.

Light Frequency Synchronization

Not only do the signal processors allow for wireless transmission of the UHF and HFCT sensor signals to the PDetector, but they can also reference the frequency of the power supply through a light sensor on the signal processors. This allows you to synchronize your signals up to the actual frequency, instead of having it fixed at either 50 or 60Hz.

Wireless Power Frequency Synchronization

Additionally, the USB charger also functions as a wireless transmitter of the local power frequency to the main handheld unit. Simply plug the charger into an outlet which is fed by one phase of the power system under test. The PDetector automatically detects and synchronizes the UHF/HFCT Single-Cycle, PRPD, and PRPS spectrums with the referenced local power frequency.

The frequency synchronization functions have enhanced the resolution of the PDetector and given us the ability to determine the exact type of PD activity.
Improve Test Efficiency and Condition-Based Asset Management with the Intelligent Patrol Function

Are you still performing OLPD testing the traditional way? Spending an extensive amount of time testing all the power equipment in the substations and recording the data by pen and paper? PMDT presents new, intelligent OLPD testing methods that will truly simplify your testing process!

**Routine Patrol - Efficient OLPD Testing**

Create Test Jobs
Create a new test job with all test points in a list on the PC-Based software and download it to the PDetector main unit.

Patrol the Substation and Test for PD Efficiently
Patrol the substation and test each programmed test point for the power equipment; the test data is then stored in the onboard memory.

Data Management, Analysis, and Report
Upload the test data to the PC-Based software after all tests are completed for data management and personal analysis.
RFID Patrol - The Most Accomplished OLPD Testing and Asset Management Technique

The PDetector provides an innovative PD asset management solution via RFID tagging based on the Internet of Things. With the RFID Patrol program, the OLPD testing procedure is standardized; thus, PD testing efficiency is greatly improved, data flow and accuracy are ensured, and your power assets are better managed.

Create Electronic IDs for Your Power Assets via RFID Tagging

The RFID tags can be affixed to your power assets and store the power equipment information such as asset name, asset ID #, substation name, and provides prompts for the appropriate tests for that asset. Each test is recorded with a unique test ID number and date/time stamp to ensure reliability, consistency, and credibility.

RFID Patrol Function - Provides Efficiency by Utilizing the Internet of Things

Following the routine patrol procedure to perform field testing will vastly improve the testing efficiency. Use the PDetector to scan the RFID tags and it will obtain the asset's information automatically. All the test data will then be imbedded with the asset’s information after the scan is complete. This allows the system to automatically identify and link the data to each specific asset.

Dedicated to Asset Management

Achieves accurate management of the asset’s ID, physical status, and test point information. Standardizes the field OLPD testing procedure and retains the PD test data accurately, consistently, and comparably.

Test PD Environmentally-Friendly

Eliminates the need to write down all the asset information and test data with the paperless OLPD testing realized with PMDT’s innovative RFID function.

* Note: The Intelligent Patrol function is supplied with the PDetector. The RFID tags are additionally priced and programmed for your custom application. Please inquire for more information.
# Configurations

## Hardware & Software Configurations
- Main Unit
- Internal TEV Sensor
- Internal Ultrasonic Sensor
- UHF Sensor with Wireless Signal Processor
- HFCT Sensor with Wireless Signal Processor
- AE Contact Sensor
- Ultrasonic Parabolic Dish with Laser Sight
- Ultrasonic Extension Wand
- Ultrasonic Contact Sensor
- PDetector Software

## Standard Accessories
- TEV Function Checker
- Vacuum Grease for the AE Contact Sensor
- Magnetic Holder for the AE Contact Sensor
- Basic Headphones
- Battery Charger with Sync.
- Mini USB Cable
- Coaxial Cables for UHF and HFCT Sensors
- Carrying Case

---

## Eight Recommended Kits Configured with Optional Combinations of TEV, Ultrasonic, AE, UHF, and HFCT Sensors

<table>
<thead>
<tr>
<th>Kit No</th>
<th>Application</th>
<th>Sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Internal TEV</td>
</tr>
<tr>
<td>Kit 1</td>
<td>Multi-Function, Seven-in-One, for GIS, MV Switchgear, Power Cables, and Transformers</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 2</td>
<td>TEV/Ultrasonic, Two-in-One, for MV Switchgear</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 3</td>
<td>TEV/Ultrasonic/AE, Three-in-One, for GIS, MV Switchgear, Cable Accessories, and Transformers</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 4</td>
<td>TEV/Ultrasonic/UHF, Three-in-One, for MV Switchgear</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 5</td>
<td>TEV/Ultrasonic/HFCT, Three-in-One, for MV Switchgear and Power Cables</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 6</td>
<td>TEV/Ultrasonic/AE/UHF, Four-in-One, for GIS</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 7</td>
<td>TEV/Ultrasonic/AE/HFCT, Four-in-One, for Transformers</td>
<td>✓</td>
</tr>
<tr>
<td>Kit 8</td>
<td>TEV/Ultrasonic/UHF/HFCT, Four-In-One, for MV Switchgear and Power Cables</td>
<td>✓</td>
</tr>
</tbody>
</table>
### Main Unit

<table>
<thead>
<tr>
<th>Display</th>
<th>LCD screen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>7.3” x 4.3” x 1.4” 185mm x 110mm x 35mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1.05 lb / 0.48 kg</td>
</tr>
<tr>
<td>Communication</td>
<td>WI-FI/USB</td>
</tr>
</tbody>
</table>

### Internal TEV Sensor

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>3MHz ~ 100MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Range</td>
<td>0dB ~ 60dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>1dB</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1dB</td>
</tr>
<tr>
<td>Max Number of Pulses/Cycle</td>
<td>2000</td>
</tr>
<tr>
<td>Data Spectrum Types</td>
<td>Amplitude and Pulse Count Spectrums</td>
</tr>
</tbody>
</table>

### AE & Ultrasonic Sensors

<table>
<thead>
<tr>
<th>Bandwidth of the AE Contact Sensor</th>
<th>20kHz ~ 300kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Frequency of the Ultrasonic Sensors</td>
<td>40kHz</td>
</tr>
<tr>
<td>Measurement Range</td>
<td>-10dB ~ 70dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>1dB</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1dB</td>
</tr>
<tr>
<td>Data Spectrum Types</td>
<td>Amplitude, Phase, Waveform, and Fly Spectrums</td>
</tr>
</tbody>
</table>

### External UHF Sensor

<table>
<thead>
<tr>
<th>Bandwidth</th>
<th>300MHz ~ 1.5GHz (Customizable between 100MHz ~ 2.0GHz upon request)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Range</td>
<td>0dB ~ 70dB</td>
</tr>
<tr>
<td>Resolution</td>
<td>1dB</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1dB</td>
</tr>
<tr>
<td>Filters</td>
<td>All pass, low pass, and high pass</td>
</tr>
<tr>
<td>Communication</td>
<td>Wireless communication with the detection unit</td>
</tr>
<tr>
<td>Data Spectrum Types</td>
<td>Amplitude, Single-Cycle, PRPD, and PRPS spectrums</td>
</tr>
</tbody>
</table>

### Technical Specifications

#### HFCT Sensor

- **Bandwidth**: 3MHz ~ 50MHz (Customizable between 500kHz ~ 80MHz upon request)
- **Measurement Range**: 0dB ~ 80dB
- **Resolution**: 1dB
- **Accuracy**: ±1dB
- **Communication**: Wireless communication with the detection unit
- **Data Spectrum Types**: Amplitude, Single-Cycle, PRPD, and PRPS spectrums

#### Environmental

- **Operating Temperature**: 32°F ~ 131°F / 0°C ~ 55°C
- **Humidity**: 0-90% RH non-condensing
- **IP Rating**: 55
- **Certifications**: CE certified, IEC 62478 and EN 61010-1 compliance

#### Power Supply

- **Internal Battery**: Lithium-ion
- **Operating Time**: Approx. 6 hours

#### Battery Charger & Synchronizer

- **Input**: 85V ~ 264V AC, 50/60Hz
- **Output**: 5V DC 1A
Global Testing Experiences

PMDT’s unique experiences consist of over 25 years of R&D combined with many years of field testing for PD and Infrared for over 200,000 various power assets in thousands of substations globally for a variety of electric utilities, industrial end users, and power equipment manufacturers. PMDT has the expertise needed to provide the best Condition-Based Maintenance Programs for your power assets.
The PMDT Solution
Solutions for Condition-Based Maintenance

Intelligent Asset Data Management

Detection and Monitoring
- Online PD&IR Testing
- PMDTiSmart: Wireless Autonomous Online PD Testing
- PDMonitor: Permanent Online PD Monitoring

Diagnostic and Location
- Online PD Diagnostic and Location
- Online PD Expert Diagnostic and Location

PDExpert & Service
PDDiagnostic
PDDiagnosticM
PDStar
PDetector

HDCU (Handheld Data Collection Unit)
LDCU (Local Data Collection Unit)
Smart TUT Sensor
Smart UHF Sensor
Smart HFCT Sensor
DSU (Diagnostic Server Unit)
MEU (Monitoring Endpoint Unit)
Internal UHF Sensor
External UHF Sensor
HFCT Sensor
Solutions for
Condition-Based Maintenance