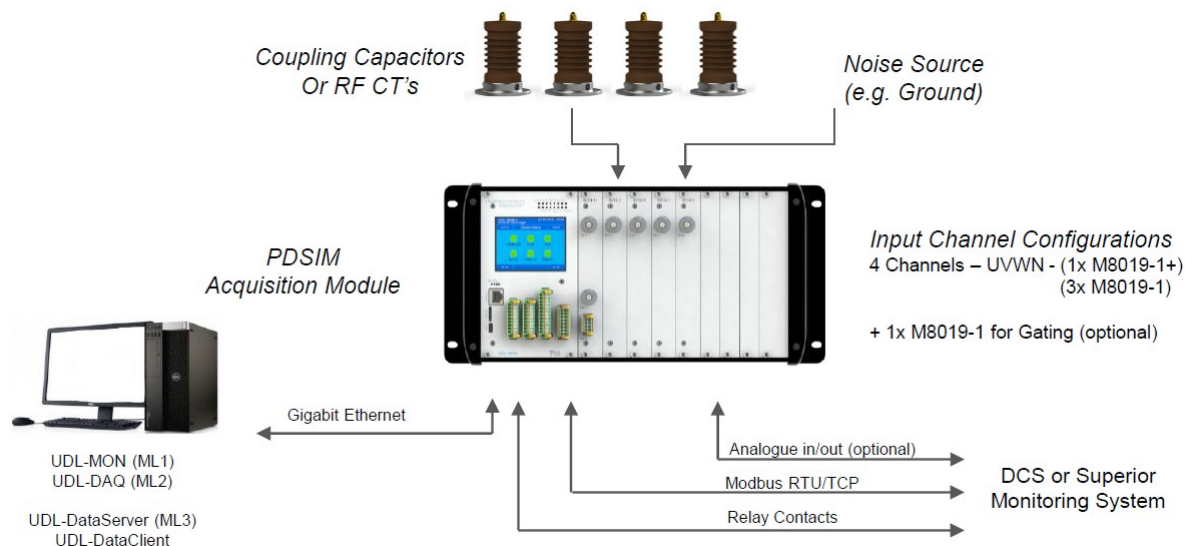


4-Channel Enhanced Partial Discharge Monitoring and Data Acquisition System



UDL-8000-PDSIM4G

Key Features

- Standalone Simultaneous & Continuous Data Acquisition
- Compatible with most PD Sensors as 80pF & 1000pF Coupling Capacitors and RF-CT's
- Local True Color Touch LCD
- Upgradable for Standalone Data Recording
- Support for UDL-DataServer for Long Term Data Storage

Application

- Rotating Machines
- Air Insulated Switchgears
- HV & MV Cables

Compliance

- IEC60270
- IEC60034-27-2
- IEC60034-27-1

General Description

The UDL-8000-PDSIM4G is used for online partial discharge monitoring of high voltage machines. The system acquires partial discharge signals simultaneously over 4 channels via a permanent installed PD sensors as coupling capacitors or RF CT's. Phase reference is measured either from the coupling capacitor or from multiple external sources via dedicated inputs. Partial discharge signals from all channels are acquired simultaneously typically in a continuous 30 second data stream and are presented as phase resolved partial discharge pattern (PRPD) and as a pulse height distribution diagram. Additionally the simultaneous acquired pd pulses are shown in the TR pattern, an additional graph indicating if discharges occur only at one channel or between channels.

The system calculates various parameters given by international standards which are used for trending and alarm handling. All calculated parameters are available on Modbus RTU/TCP and can be linked to optional 4-20mA output channels.

The 9bit high resolution PRPD patterns offering state of the art results and are in accordance to the sample catalogue shown in the annex of the IEC standards.

For the suppression of noise and disturbances, the system offers variable high and low pass filters and an optional noise gating channel, which is typically used for phase related disturbances as e.g from the static excitation system in large generators. Additionally the system offers CMR (common mode rejection) noise cancelling technique by suppressing disturbances which are present on all 3 phases at the same time.

The system can be extended with the data recording function for standalone event based recording of RAW data results (e.g. PRPD Patterns). Events can be freely programmed and restricted to operation conditions if needed.

For permanent long term data storage, the system can be integrated into the UDL-DataServer software, a centralized SQL database software supporting multiple devices and operation users.

The partial discharge monitoring system can be extended with other monitoring functions such as endwinding vibration, rotor flux, shaft voltage/current, power measurement or temperature monitoring.

4-Channel Enhanced Partial Discharge Monitoring and Data Acquisition System



Product Variants

UDL-8000-PDSIM4G



P1063-PDSIM4G0-A3

The P1063 enclosure is a 2/3 19" enclosure with 4HU height and is generally mounted on a mounting plate by four M6 screws within a cabinet. This package variant offers 3 additional slots for data acquisition and I/O Modules such as 4-20mA input or outputs. The system contains a dedicated slot for the noise gating channel and is powered by 24VDC.

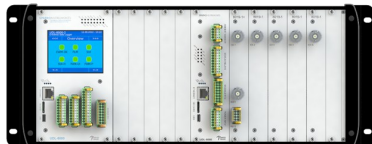
Dimensions (w x h x d): 378 x 189 x 176mm Weight: 3kg IP55
Power Requirements: 24VDC, ~800mA (without additional modules)



P1063-PDSIM3G0-A3

For applications where only 3 channels are acquired, the system is available without the 4th PD channel.

Dimensions (w x h x d): 378 x 189 x 176mm Weight: 3kg IP55
Power Requirements: 24VDC, ~700mA (without additional modules)



P1280-A5-PDSIM4G0-B1

The P1280 enclosure is based on 19" enclosure with 4HU height and is generally mounted on a mounting plate by four M6 screws within a cabinet. This package variant is generally used for multi parameter monitoring with 2 CPU's, one dedicated for the enhanced partial discharge monitoring and one for maximum 5 other data acquisition modules such as endwinding vibration, rotor flux, shaft voltage/ current, power measurement or temperature monitoring. The system contains a dedicated slot for the noise gating channel and is powered by 24VDC.

Dimensions (w x h x d): 465 x 189 x 176mm Weight: 3.5kg IP55
Power Requirements: 24VDC, ~900mA (without additional modules)



RP2084-AC-PDSIM4G0-A3

The UDL-8000 Pro „All-in-one“ solution offers a complete monitoring solution including the UDL-DataServer for long term data storage, running on a 10" windows based touch panel PC. The UDL-8000 Pro is based on a 19" 6HU Rack ideally suited to be installed in a 19" Cabinet. 3 slots for acquisition and I/O modules are available for an extension of other monitoring parameters. The system contains a dedicated slot for the noise gating channel and is commonly powered by an universal power of 85-264VAC, 50/60Hz

Dimensions (w x h x d): 450 x 266 x 246mm Weight: 4kg IP55
Power Requirements: 85-264VAC, ~250mA (without additional modules)



C2050-AC-PDSIM4G0-A1

For periodic online measurements, the C2050 variant is integrated in a rugged plastic carrying case. The Case includes a storage compartment in the base and in the lid for accessories as cables and connectors.

The system contains a dedicated slot for the noise gating channel and is commonly powered by an universal power of 85-264VAC, 50/60Hz

Dimensions (w x h x d): 505 x 409 x 256mm Weight: 12kg IP67
Power Requirements: 85-264VAC, ~100mA (without additional modules)



CP2050-AC-PDSIM4G0-A1

The CP2050 variant extends the online partial discharge analyzer with a touch panel PC running the data acquisition software. The remote control of the partial discharge analyzer with an external portable laptop is offered via remote desktop software, allowing to operate the device without the need of any additional installed applications on the user's laptop.

The system contains a dedicated slot for the noise gating channel and is commonly powered by an universal power of 85-264VAC, 50/60Hz

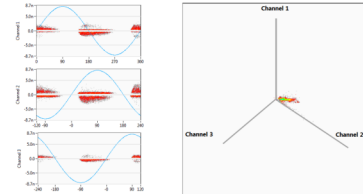
Dimensions (w x h x d): 505 x 409 x 256mm Weight: 15kg IP67
Power Requirements: 85-264VAC, ~100mA (without additional modules)

4-Channel Enhanced Partial Discharge Monitoring and Data Acquisition System

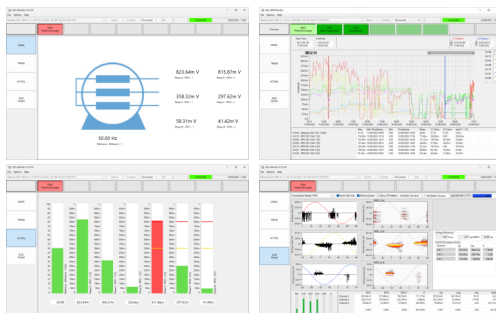


Enhanced Partial Discharge Measurement

The simultaneous partial discharge measurement offers additional information by comparing the measured partial discharge pulses between the channels. This is especially helpful for partial discharge measurement on rotating machines (to identify phase to ground and phase to phase discharges) or when measuring on 3 high voltage cables with RF CT's where partial discharges from one phase might couple into another phase. The Data is presented as high resolution PRPD Patterns, Pulse Height Distribution plots and Time Relation (TR) Pattern.



Monitoring Level 1



UDL-MON Software

The monitoring Level 1 offers continuous standalone monitoring and visualisation of real-time partial discharge activities.

2 alarm thresholds can be configured on every available parameter and can be delayed if needed.

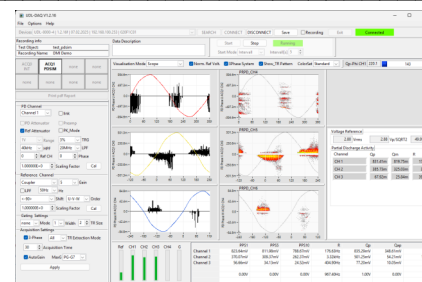
The included UDL-MON software allows to visualize the actual acquired data as mimics, trend, bargraph and PRPD Data on a windows PC on a temporary basis.

The measurement results can be exported into a pdf document for archiving.

Monitoring Level 2

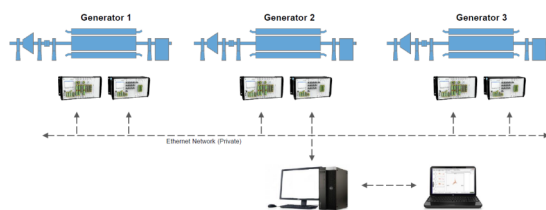
The recording option extends the monitoring level 1 and offers standalone event based data recording, e.g. after alarm state or at specific time intervals. The data will be stored within the device until it is manually downloaded by the operator.

Additionally the recording option offers manual data acquisition function via the UDL-DAQ software. This software includes a file management system used to handle manual and automatic recorded data on a windows PC.



UDL-DAQ Software

Monitoring Level 3



Example of an Centralized DataServer within the same Powerplant

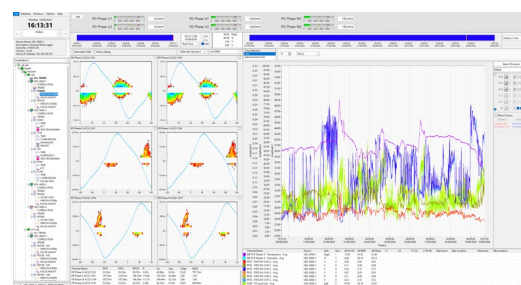
The UDL-DataServer option extends the monitoring level 2 and allows to connect the UDL-8000 system(s) to the centralized UDL-DataServer software for continuous long term data storage in a centralized database software. The UDL-DataServer offers state of the art monitoring functions including machine mimics and data correlation of all acquired parameters.

All devices are connected to a common Ethernet network and are registered at the UDL-DataServer within the same powerplant or within the same corporate network. Once the devices are connected to the server, all acquired data is automatically stored within the SQL Database.

The acquired data is then further visualized via the windows based UDL-DataClient. When running the UDL-DataServer Pro, all acquired data can be visualised simultaneously thanks to the multi-window function.

Data can either be presented simultaneously between different monitoring parameters or between different instruments / monitoring objects.

All data stored within the SQL database can also be visualized via a Web-Dashboard.



P/N: UDL8000-DS

4-Channel Enhanced Partial Discharge Monitoring and Data Acquisition System



Technical Data

Controller Specifications

CPU: 667 MHz, Dual Core Arm Cortex-A9
RAM / ROM: 512 MB Ram, 512 MB Flash
Data Storage: Industrial 8GB Micro SD Card, Ext4

Display: 3.5" Cap-Touch True Color
320 x 240 pxl
Operating System: RT Linux

Communication Interfaces

Ethernet Gigabit Ethernet 1000Base-TX via RJ45
Static IP or DHCP
USB-C: Virtual Ethernet via USB-C
Modbus RTU (Master/Slave): RS485 Optically Insulated
Max 115'200 Baud

Modbus TCP (Master/Slave): via Gigabit Ethernet
Digital Inputs: 5-48VDC, 20mA, optically insulated
Digital Outputs: 5-40VDC, Max 50mA, optically insulated
Relay Contacts: 0..220VDC, I_{max} see manual
0..240VAC, I_{max} 1A

Partial Discharge Measurement (PDSIM)

No of PD Channels: 4, Simultaneous Measurement
RF input impedance: 50 Ohm
Variable High Pass Filter: 0.04, 0.1, 0.5, 1, 2, 3, 5, 10MHz
Variable Low Pass Filter: 0.8, 5, 10, 20, 300MHz
Measurement Range: 5mV - 50Vp
Measurement Unit: mV / pC

PRPD Patterns: bipolar & unipolar, user selectable
PRPD Amplitude Windows: 2x256 or 512
PRPD Phase Windows: 512
Pulse Detection Rate: 50kHz
Pulse Detection: >2ns

Reference Measurement

Ref1 (From Coupler): 20mV .. 50V, 3..400Hz, 20kOhm
Ref2 (BNC): 30V, 3..400Hz, 100kOhm
Ref3: 0.1..30V, 3..400Hz, 100kOhm

Ref4: 10..300V, 3..400Hz, 100kOhm
Variable LP Filter: 12, 20, 30, 40, 50, 60, 100, 200Hz

Product Numbers & Ordering Codes

UDL-8000-P1063-PDSIM3G0-A3	UDL-8000 3-Channel Enhanced RF Partial Discharge Monitoring System (3 Slots)
UDL-8000-P1063-PDSIM4G0-A3	UDL-8000 4-Channel Enhanced RF Partial Discharge Monitoring System (3 Slots)
UDL-8000-P1280-A5-PDSIM3G0	UDL-8000 Dual CPU Multi-parameter Monitoring System (5 Slots) with 3 enhanced RF Partial Discharge Channels
UDL-8000-P1280-A5-PDSIM4G0	UDL-8000 Dual CPU Multi-parameter Monitoring System (5 Slots) with 4 enhanced RF Partial Discharge Channel
UDL-8000-RP2084-AC-PDSIM4G0-A3	UDL-8000 Pro – All-in-one 4-Channel RF Partial Discharge Monitoring System (1 Slots) with Integrated 10" Touch Panel PC
UDL-8000-RP2284-AC-A5-PDSIM4G0-A1	UDL-8000 Pro – All-in-one Dual CPU Multi-parameter Monitoring System (5 Slots) with 4-Channel RF Partial Discharge Monitoring (1 Slots) and Integrated 10" Touch Panel PC
UDL-8000-C2050-AC-PDSIM4G0-A1	UDL-8000 Case - Portable 4-Channel enhanced RF Partial Discharge Acquisition System (1 Slots) for online PD Measurement with Compartment for Accessories
UDL-8000-CP2050-AC-PDSIM4G0-A1	UDL-8000 Case Pro - Portable 4-Channel enhanced RF Partial Discharge Acquisition System (1 Slots) with integrated touchpanel PC
UDL-8000-M8019-1	Noise Gating Channel Module
UDL-8000-REC	Upgrade for Data Recording incl. UDL-DAQ Software (ML2)
UDL-8000-DS	Upgrade for UDL-DataServer Integration (ML3)
UDL-8000-AIS1 / AIS2	16x / 32x 4-20mA Input Channels
UDL-8000-AO1 / AO2	16x / 32x 4-20mA Output Channels
UDL-8000-DI1 / DI2	16x / 32x Digital Input Channels
UDL-8000-DO1 / DO2	16x / 32x Digital Output Channels
Additional Acquisition Modules please refer to the application specific datasheets	
WME-505030	Standard Wallmount Cabinet, 500 x 500 x 300mm (For e.g. P1063)
WME-606030	Standard Wallmount Cabinet, 600 x 600 x 300mm (For e.g. P1280)

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