



SWITCHGEAR MONITOR

COMPREHENSIVE SWITCHGEAR MONITORING



RESPONSIVE

ASSET HEALTH SOLUTIONS



PQE
POWER SYSTEM
SDN BHD

COMPREHENSIVE MONITORING USING SMART CAPTURE

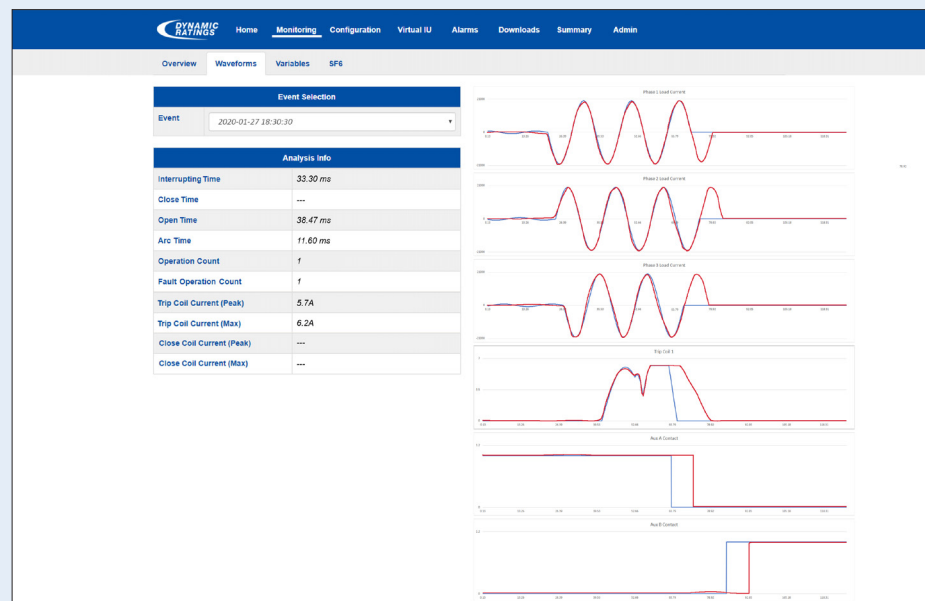
TAKE CONTROL OF YOUR ASSETS

Medium voltage switchgear is critical to the design of a safe and reliable electrical power system. This equipment provides overcurrent protection for critical power systems and acts as an isolation point for electrical equipment maintenance. Switchgear is critical to the performance of the whole power system and must be maintained in an optimal state of performance.

Slow switchgear operation can cause increased aging rate for other critical assets such as power transformers. The failure of any critical asset will lead to unplanned outages, loss of revenue and potential worker safety concerns. Due to the high investment in power transformers, they are typically viewed as ideal candidates for condition-based monitoring. Medium voltage switchgear and circuit breakers are by far the largest contributor to the occurrence of substation events, and switchgear mis-operation is often identified as the root cause of transformer and other equipment failure. Without an electronic monitoring system in place, equipment operators are forced to rely on cyclic maintenance and offline testing to determine switchgear condition. Due to aging infrastructure, decreasing operating budgets and a decline in craft specialists, the ability to properly maintain switchgear performance through the sole use of time-based inspections is becoming increasingly less effective, reducing both the reliability and safety of the power system.

The Dynamic Ratings Switchgear Monitor (SWGM) is the most comprehensive switchgear monitoring solution available. With the inclusion of high-speed waveform capture, the SWGM combines the most effective offline and online testing methods into a highly customizable online monitoring package, resulting in a monitor capable of performing the advanced analytics required to detect operating deficiencies well in advance of switchgear failure. The SWGM can monitor up to six bays of switchgear using a single monitor. In this configuration, the monitor performs waveform capture for each individual bay's trip and close coils, providing open, close, arcing, and interrupting times. Motor starts, currents and runtimes are also monitored individually.

The switchgear monitor configuration may also be combined with Dynamic Ratings SCM to provide partial charge monitoring of the switchgear bus and connectors, allowing tracking or faulty connections to be detected.



Waveform Capture Analytics

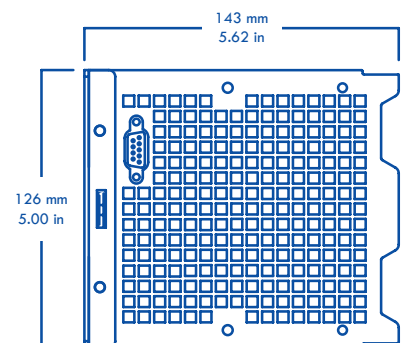
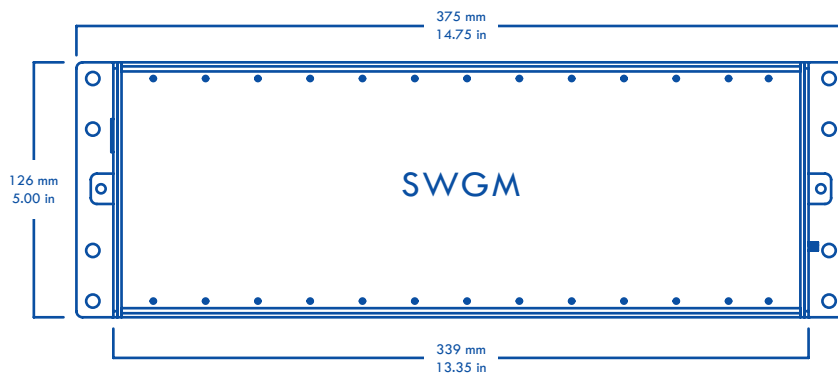
FEATURES & BENEFITS

Product Features

Smart Capture	Complete diagnosis of the breakers' mechanical and electrical systems with every operation. Smart Capture uses a waveform analysis for automated graphical comparison of breaker operations, providing a detailed analysis of first trip open and close times, identification of latch and bearing performance, lubrication issues, auxiliary contact condition and fault current values.
Gas monitoring for SF6 and dry air	Multi-parameter sensors monitor density, temperature and humidity in insulating gasses. Alarms alert asset owners of leakage rates, trending of time till lock out and mass gas loss.
Trip coil integrity monitoring	Monitoring of trip coil integrity provides the ability to detect changes in the trip circuit resistance, indicative to the condition of the trip coil and related components.
Interrupter condition	Precise cumulative I ² T calculations allow internal inspections to be scheduled on an as needed basis. Reducing both the cost and manpower associated with time based cyclic maintenance schedule.
Cabinet heater monitoring and environmental conditions monitoring	Current and voltage monitoring of heaters to detect failures which can often occur between maintenance cycles, leading to condensation in control cabinets which causes corrosion of control wiring, short circuits, and premature aging of electrical components.
Charging motor starts, currents and runtimes	Provides data concerning the condition of the stored energy system.
Environmental	Provides temperature for ambient, control cabinets and SF6 gas.
Modular construction	Monitor is configured with only those modules required for the application.
Multiple communication options	DNP, Modbus or IEC 61850 using Ethernet (Fiber & Copper). (Optional) Serial Fiber, RS485 & RS232 ports.

Product Specifications

Parameter	Specification
Power Supply:	110 - 240 VAC (50 – 60 Hz), 110 - 250 VDC
Temperature Range:	-40°C to 70°C (-40°F to 158°F)
Communications:	DNP3, Modbus, IEC 61850



How To Order

SWGM - - - - -

Switchgear Monitor Application

- 1 One Switching Bay
- 2 Two Switching Bays
- 3 Three Switching Bays
- 4 Four Switching Bays
- 5 Five Switching Bays
- 6 Six Switching Bays

1
2
3
4
5
6

Serial Communications Options (One RS-485 Port Reserved for SF6 Sensors if Equipped)

- 0 Two RS-485 Ports
- 1 Two RS-485 Ports and Fiber Optic Serial
- 2 Two RS-485 Ports and RS-232
- 4 Three RS-485 Ports

0
1
2
4

Switchgear Type

- 0 Not Gas Insulated System (GIS)
- 2 Two SF6 Systems (Operating Bus + One Switching Bay)
- 3 Three SF6 Systems (Operating Bus + Switching Bays)
- 4 Four SF6 Systems (Operating Bus + Switching Bays)
- 5 Five SF6 Systems (Operating Bus + Switching Bays)
- 6 Six SF6 Systems (Operating Bus + Switching Bays)
- 7 Seven SF6 Systems (Operating Bus + Switching Bays)
- 8 Dual Insulated Operating Bus Plus Six GIS Switching Bays

0
2
3
4
5
6
7
8

Trip Coil Integrity Monitoring

- 1 One Trip Coil Integrity Monitoring
- 2 Two Trip Coil Integrity Monitoring
- 3 Three Trip Coil Integrity Monitoring
- 4 Four Trip Coil Integrity Monitoring
- 5 Five Trip Coil Integrity Monitoring
- 6 Six Trip Coil Integrity Monitoring

1
2
3
4
5
6

Cabinet Heating Monitoring

- 1 One Cabinet Heater Monitor
- 2 Two Cabinet Heater Monitors
- 3 Three Cabinet Heater Monitors
- 4 Four Cabinet Heater Monitors
- 5 Five Cabinet Heater Monitors
- 6 Six Cabinet Heater Monitors

1
2
3
4
5
6



Local Contact:



**PQE
POWER SYSTEM
SDN BHD**

+603 7733 6433
info@PQE.com.my
www.PQE.com.my