RUGGED MONITORING

MONITORING SIMPLIFIED

PT Siemens

PROPOSAL

Client

P.T. Siemens Energy Indonesia (SEI)

Address: Arkadia Green Park Tower F,
Jl. TB Simatupang no. Kav. 88,
RT.1/RW.2, Kebagusan,
Ps. Minggu, kota Jakarta Selatan,
Jakarta DKI 12520,
Indonesia

RUGGED MONITORING
MONITORING SIMPLIFIED

Quotation #
Q92259_V1

Reference #

Quotation Date
25th August 2025

Project Name
PT Siemens_TANGGUH UGG GIS Monitoring System

Quotation Expire Date
31st August 2025

RM Contact
sales@ruggedmonitoring.com

Sold to
P.T. Siemens Energy Indonesia (SEI)
Address: Arkadia Green Park Tower F,
Jl. TB Simatupang no. Kav. 88,
RT.1/RW.2, Kebagusan,
Ps. Minggu, kota Jakarta Selatan,
Jakarta DKI 12520,
Indonesia

Ship to
P.T. Siemens Energy Indonesia (SEI)
Address: Arkadia Green Park Tower F,
Jl. TB Simatupang no. Kav. 88,
RT.1/RW.2, Kebagusan,
Ps. Minggu, kota Jakarta Selatan,
Jakarta DKI 12520,
Indonesia

Project and Solution Introduction

Rugged Monitoring is pleased to provide Siemens with this proposal for GIS PD & SF6 Monitoring system for 66KV GIS at CCPP Substation (SHVS-705742-PE-Drawing-20250726), EGR Substation (SHVS-705743-PE-Drawing-20250814), HCC Substation (SHVS-705744-SLD_0_2).

Rugged Monitoring provides condition monitoring solutions for high voltage assets such as Transformers, Switchgears, Breakers, Cables, Motors, and Generators. The condition monitoring solution includes rugged sensors, advanced monitors & state-of-the-art software analytics. In addition, we offer on-site commissioning services, maintenance contracts and technical support to all customers worldwide.

We are an industry-leading team of experts with 100+ years of combined experience in partial discharge and fiber optic monitoring. Our team of experts leads through product innovation to deliver best in class reliability. We deliver reliable, high performance, precision sensors and monitoring solutions.

Rugged Monitoring has 10+ years of average experience in partial discharge monitoring in transformers, switchgears, and cables. We have designed the most advanced and accurate partial discharge sensors and monitoring systems. Our major products for the energy sector are:

- Partial Discharge Monitoring System for GIS, Transformers, and Cables
- SF6 Leakage and Humidity Monitoring Systems
- Breaker Condition Monitoring System
- Temperature Monitoring System for Transformers, Switchgears and Cable Terminations

We are ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certified company and put highest emphasis on the quality of our products. Rugged Monitoring has been selected for key major projects by our customers. We have global contracts signed with major asset manufacturers, GE, ABB, Siemens, Koncar and MR/MESSKO. We have been approved by the major power utilities for their condition monitoring projects.
We are delighted to work with Siemens and committed to providing the right solution for the GIS PD & SF6 monitoring system.

GIS Partial Discharge Monitoring

In this project, Rugged Monitoring shall provide the PD monitoring system that supports the UHF PD sensors located internal to the GIS for 66KV GIS at CCPP Substation (SHVS-705742-PE-Drawing-20250726), EGR Substation (SHVS-705743-PE-Drawing-20250814), HCC Substation (SHVS-705744-SLD_0_2).

The complete solution involves a PD211 PD Monitoring device and sending the data to Central Station.

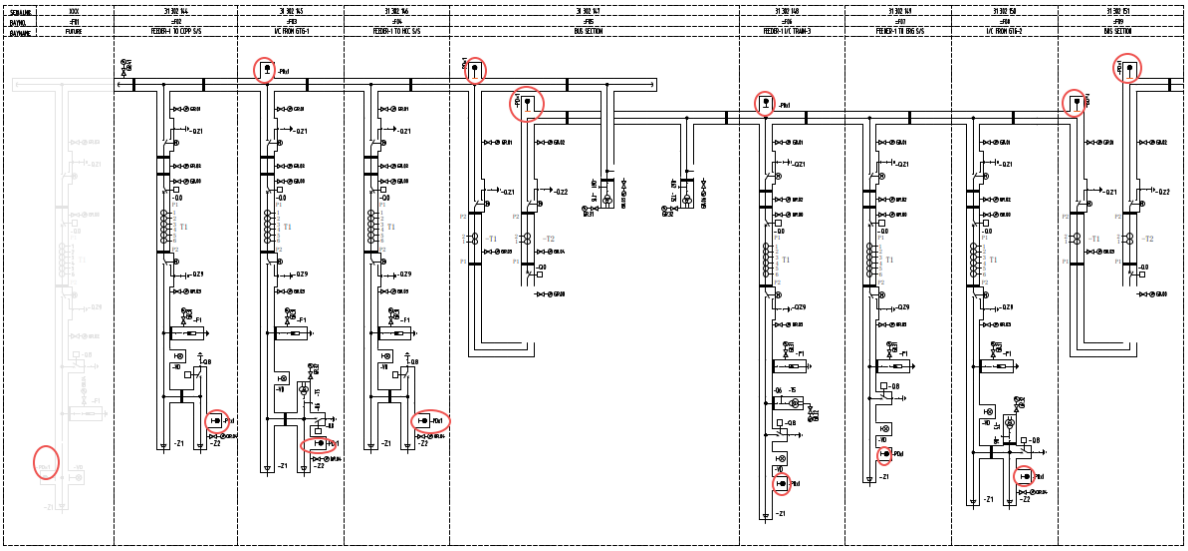
Rugged Monitoring shall design the solution keeping customer centricity in mind and that meets the requirement (as indicated in the SLD in the document “CCPP SUBSTATION – SLD”, “EGR SUBSTATION – SLD”, “HCC SUBSTATION – SLD”) for GIS Monitoring System.

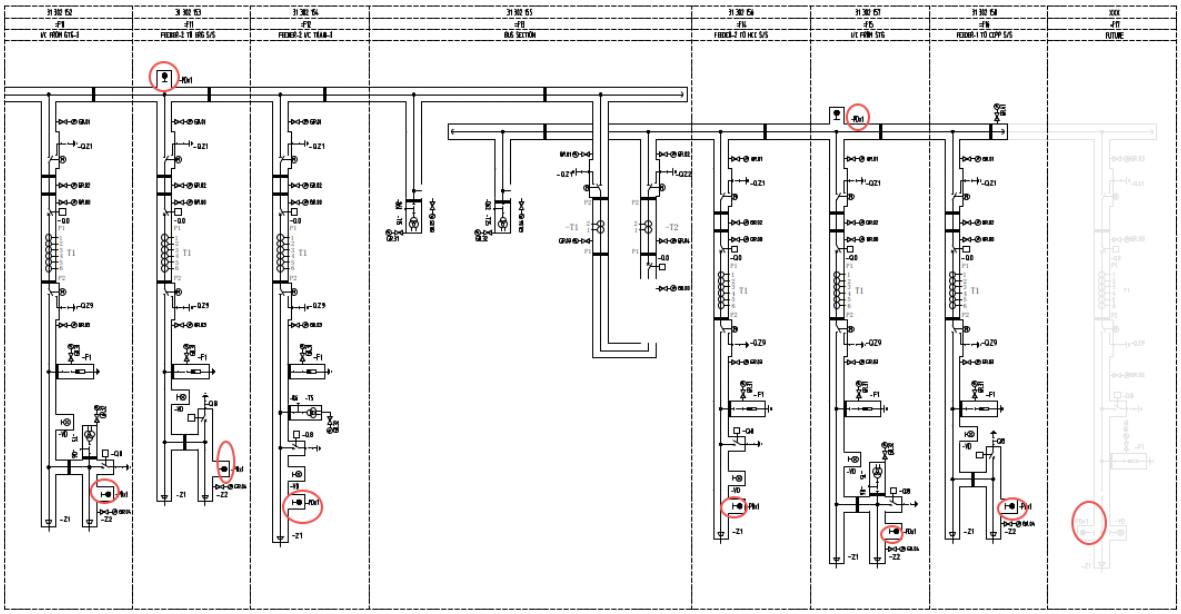
The Internal UHF PD sensors are connected to PD211 monitors. The PD211 monitors can collect and analyze data from up to 08 sensors. The PD211 monitor has Ethernet output that shall be connected to the PDM Server in the local substations CCPP, EGR and HCC respectively.

CCPP Substation:

As per the latest **SHVS-705742-PE-Drawing-20250726** Provided by Siemens to RM, the location of PD sensors are marked. Based on the location of sensors shown in the figure below, the number of PD sensors are identified, and subsequent monitors needed is as mentioned below considering all the phases are in single tube.

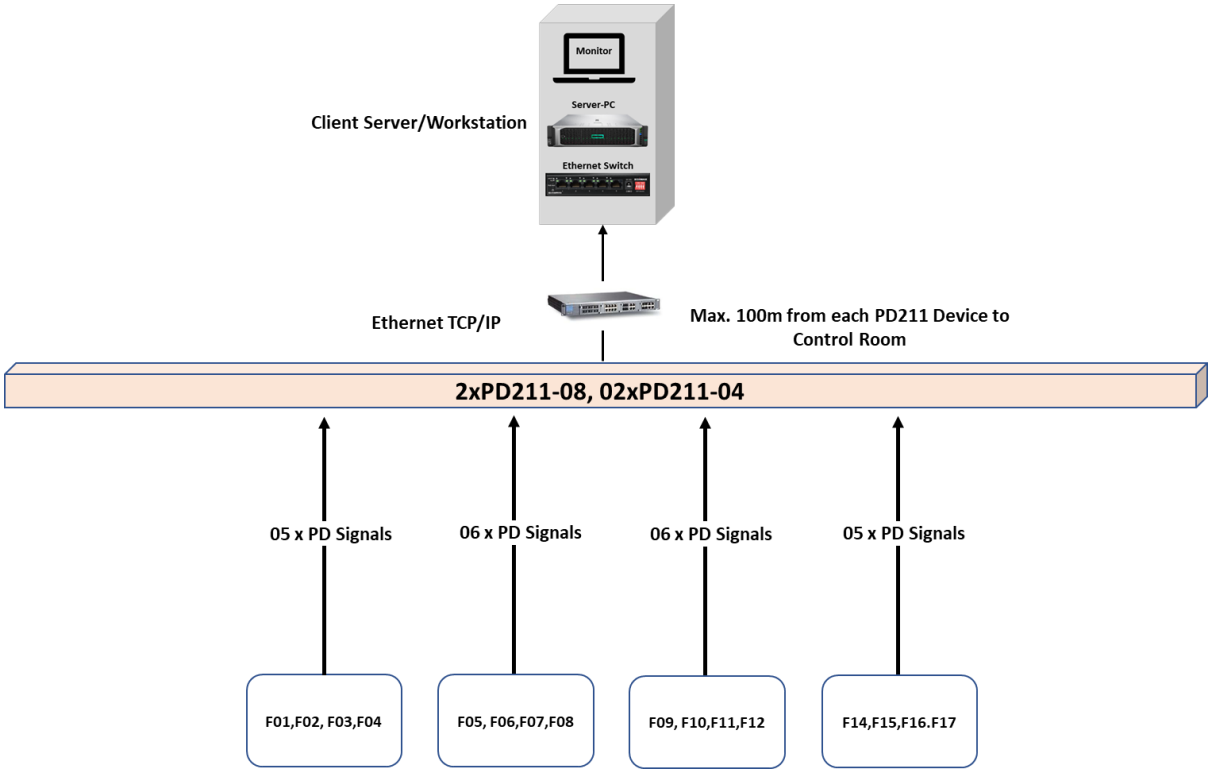
- 22 x PD sensors internal to the GIS, fitted on the GIS flange for existing & Future Bays/feeders to be **supplied by the customer/GIS OEM.**
- 02 x PD211, 08-Channel PD monitor to collect data from the sensors and to perform analysis.
- 02 x PD211, 04-Channel PD monitor to collect data from the sensors and to perform analysis.
- 01 x PD Analytics software (RM Enterprise Software- RMEYE)





Location of PD Sensors for 66 kV GIS at CCPP Substation

Typical architecture for GIS partial discharge monitoring for CCPP Substation is as shown in the figure below.

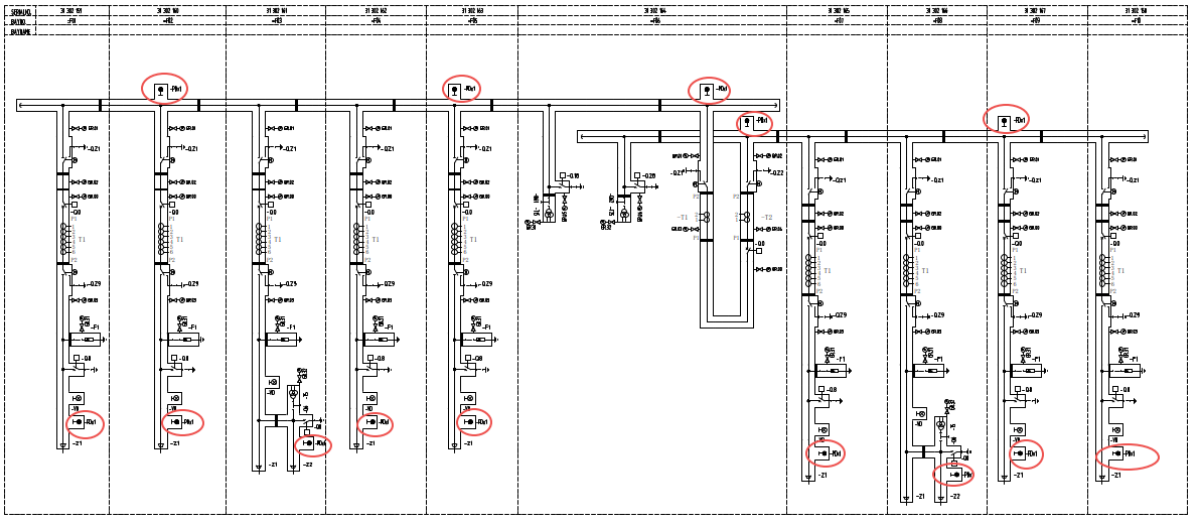


Reference Architecture for GIS Partial Discharge Monitoring System for CCPP Substation

EGR Substation:

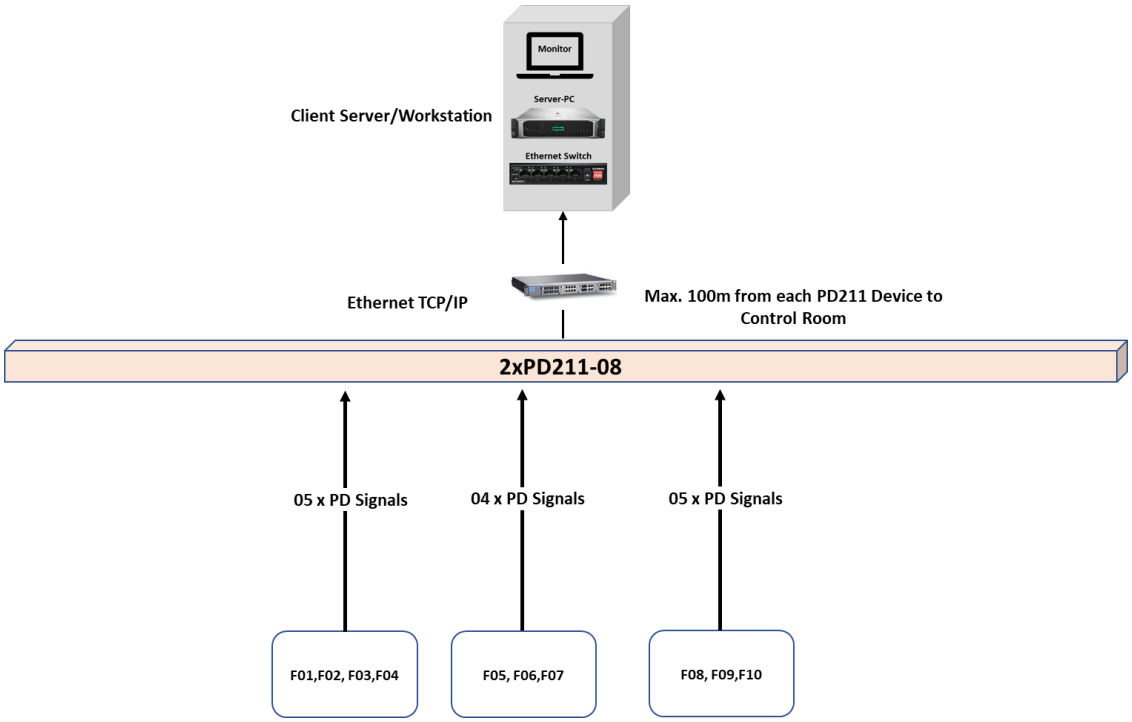
As per the latest **SHVS-705743-PE-Drawing-20250814** Provided by customer to RM, the location of PD sensors are marked. Based on the location of sensors shown in the figure below, the number of PD sensors are identified, and subsequent monitors needed is as mentioned below considering all the phases are in single tube.

- 14 x PD sensors internal to the GIS, fitted on the GIS flange for existing & Future Bays/feeders to be **supplied by the customer/GIS OEM.**
- 02 x PD211, 08-Channel PD monitor to collect data from the sensors and to perform analysis.
- 01 x PD Analytics software (RM Enterprise Software- RMEYE)



Location of PD Sensors for 66 kV GIS at EGR Substation

Typical architecture for GIS partial discharge monitoring for EGR Substation is as shown in the figure below.

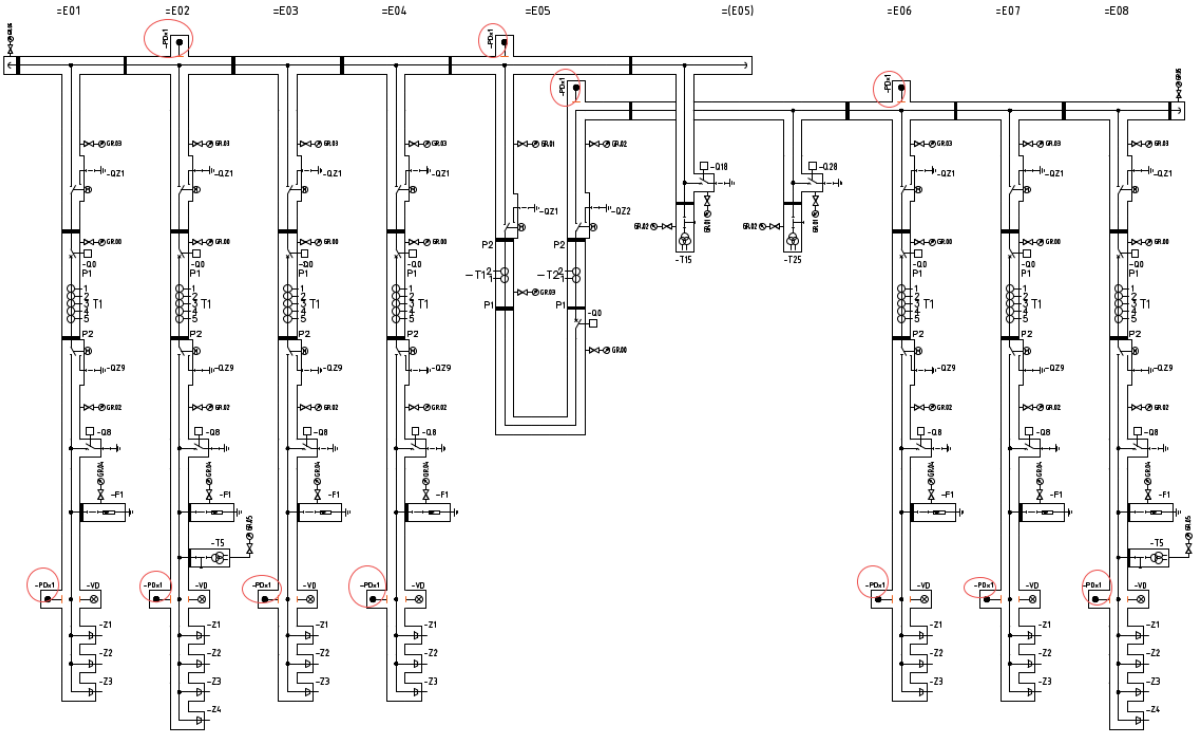


Typical Architecture for GIS Partial Discharge Monitoring System for EGR Substation

HCC Substation:

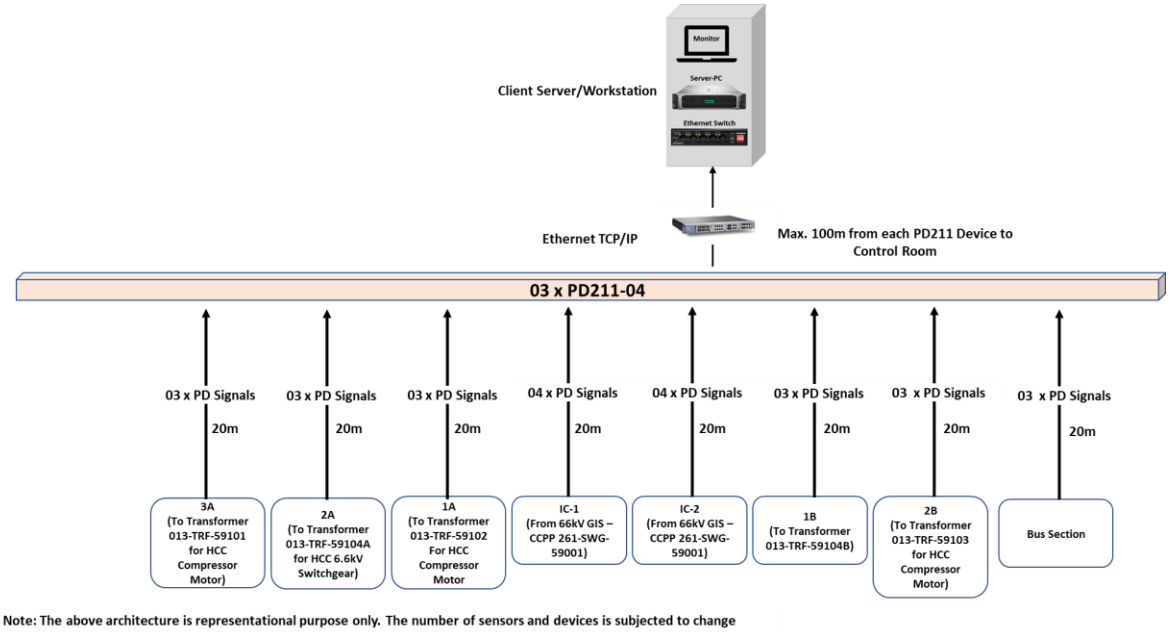
As per the latest **SHVS-705744-SLD_0_2** Provided by customer to RM, the location of PD sensors are marked. Based on the location of sensors shown in the figure below, the number of PD sensors are identified, and subsequent monitors needed is as mentioned below considering all the phases are in single tube.

- 11 x PD sensors internal to the GIS, fitted on the GIS flange for existing & Future Bays/feeders to be **supplied by the customer/GIS OEM.**
- 03 x PD211, 04-Channel PD monitor to collect data from the sensors and to perform analysis.
- 01 x PD Analytics software (RM Enterprise Software- RMEYE)



Location of PD Sensors for 66 kV GIS at HCC Substation

Typical architecture for GIS partial discharge monitoring for HCC Substation is as shown in the figure below.



Note: The above architecture is representational purpose only. The number of sensors and devices is subjected to change

Typical Architecture for GIS Partial Discharge Monitoring System for HCC Substation

PD Monitor: PD 211 04 or 08 Channels

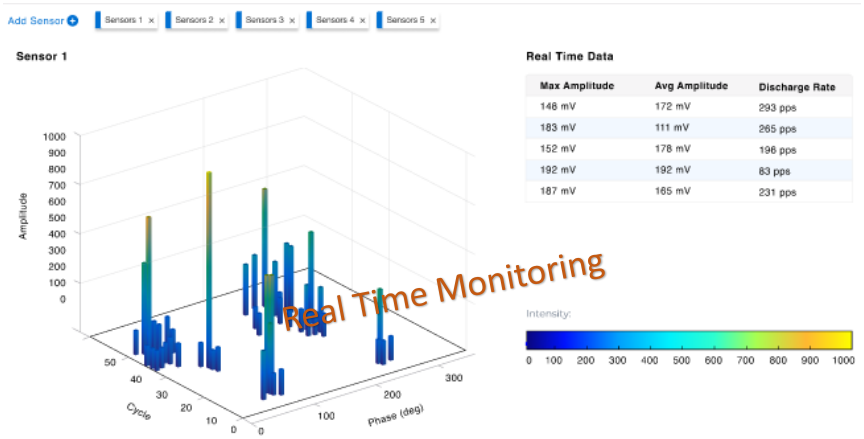
PD211 is based on the UHF (Ultra High Frequency) technology for PD signal acquisition and analysis. The Monitor is a combination of reliability and user-friendly configuration software. It has two variants with 04 channel and 08 channels, that can connect to 4 and 8 UHF-PD sensors respectively. The system can be integrated with any UHF PD sensors that have response between 100MHz to 2000MHz.

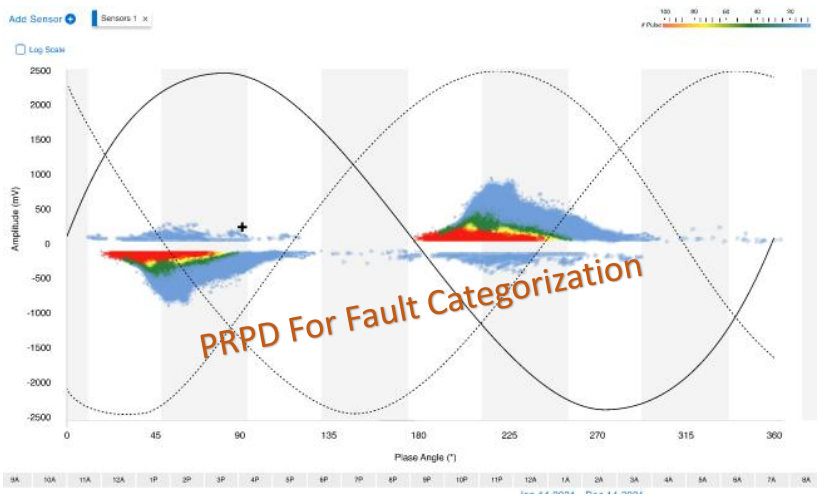
The PD211 connects to the UHF PD sensors installed at the MV/HV assets. It measures the Ultra High Frequency (UHF) signals emitted by the PD Faults in HV/MV assets. The UHF signals are then analyzed for PD activity and categorization of Internal PD, External PD and Noise Signals. Internal PD signals are captured and stored for further analysis such as PRPD, PD Amplitude, Discharge Rate, and trending. The PD amplitude, discharge rate and PRPD file can be sent to the third-party system via Modbus TCP/IP.

PD Monitor: PD 211 04 or 08 Channel

RM Enterprise Software: PD Module

The RM Enterprise Software for PD Module can be installed on the customer's server or PC. The RM Enterprise software for PD Analysis will provide the end customer with detailed analysis of PD signals, fault categorization, localization, alarm notifications, and reporting. Below are the sample Images of our PD System.





Important Note:

- The number of PD Modules/ Devices may be subject to change if there are sensors outside the GIS Hall, based on the further information received. The quoted PD Modules/Devices are with the assumption that everything (all sensors) is inside the GIS Hall.
- Since it Is 66 KV GIS substation, we have considered all the phases are in a single tube
- The number of sensors for the respective substations are as per the mail dated 26th December 2024 for HCC and EGR and CCPP as per 22nd August 2025.

GIS SF6 Monitoring

The SF6 Gas Density Monitoring system helps customers in tracking SF6 gas density in real time basis and perform the following analysis for GIS by:

- Measure the real time SF6 leak rate and calculate % change of SF6 leakage and alarm the customer if required density is not maintained to ensure the safe operation of the SF6 GIS bays.
- Identify the highest leaking chambers, bays, and GIS. This allows customers to optimize the maintenance and efficiently manage prevention of SF6 emissions (if applicable).
- Generate the most accurate SF6 emission reports for regulators and senior management in a faster way (if applicable).

The SF6 Gas Density monitoring system proposed for this project is a system that collect data from gas density sensors (on MODBUS RTU). A typical architecture of the integrated system is provided in the below figure. The proposed data acquisition system, DIN-R501-CPU (din rail based) acts as a monitoring platform for monitoring multiple asset types.

The major components that are required as per the SLD (shared) for GIS SF6 monitoring are as mentioned below.

CCPP Substation:

97 X SF6 sensors – Sensors for monitoring the gas density shall be provided by the customer.

- 06 X Din-R501-CPU to collect data from the SF6 sensors through MODBUS RTU over serial network and perform analysis.

EGR Substation:

54 X SF6 sensors – Sensors for monitoring the gas density shall be provided by the customer.

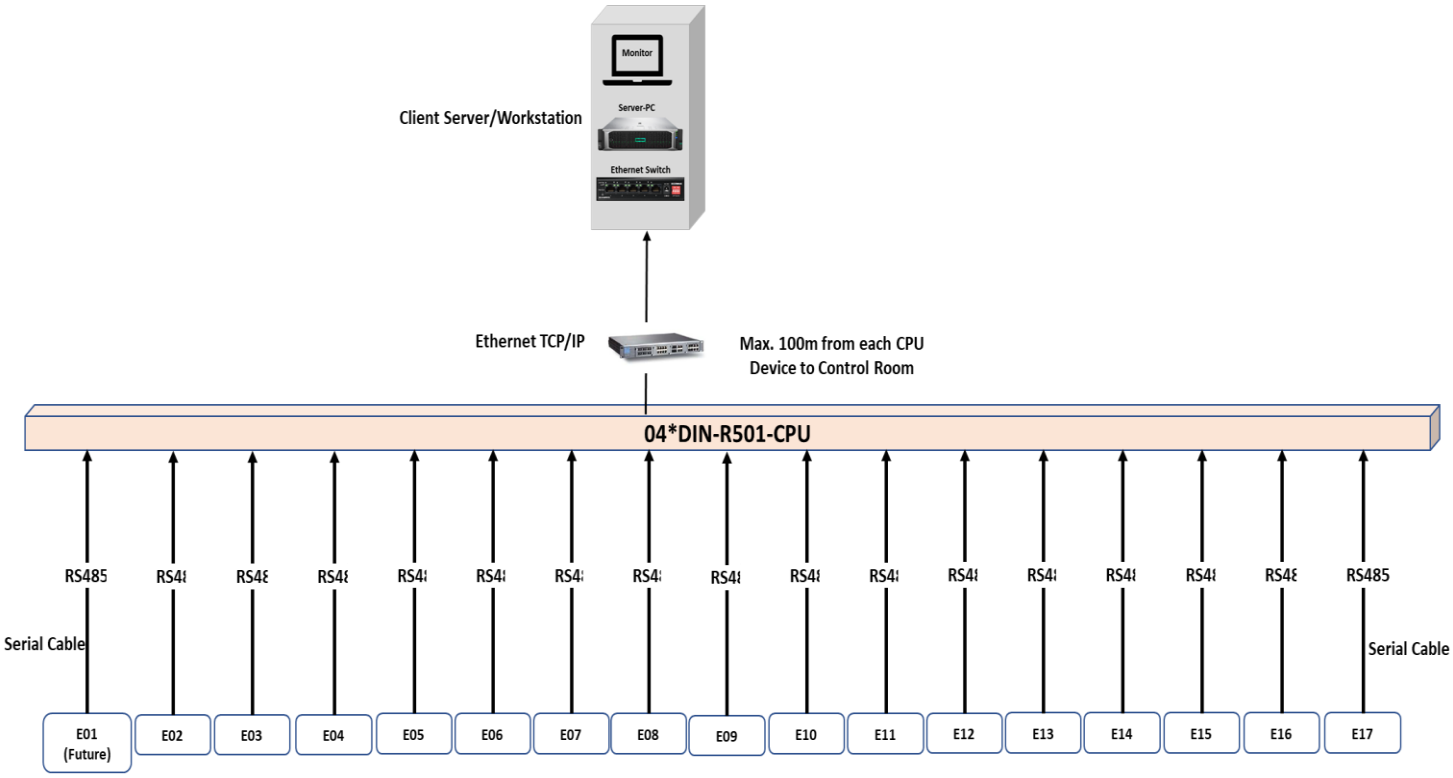
- 04 X Din-R501-CPU to collect data from the SF6 sensors through MODBUS RTU over serial network and perform analysis.

HCC Substation:

35 X SF6 sensors – Sensors for monitoring the gas density shall be provided by the customer.

- 02 X Din-R501-CPU to collect data from the SF6 sensors through MODBUS RTU over serial network and perform analysis.

The typical system architecture for GIS SF6 monitoring for 66kV for one of the substations is as shown in the figure below.



Typical System Architecture for 66 kV GIS at CCPP Substation

Commercial Proposal

GIS PD & SF6 Monitoring:

CCPP Substation:

Bill of Quantity and Pricing Schedule: GIS PD & SF6 Monitoring System meeting customer specifications

Sl #	Part Number	Item Description	Qty
1	CPU-E2-M4-DIN	Din rail (DIN) CPU module, with Ethernet (RJ-45) and SFP ports, RS-485 communication ports. 4GB memory included. All Communications are standard (Native protocol, CANBUS, Modbus, DNP3.0, IEC 61850) on serial/ Ethernet ports. 24/48 Volts DC (20 Watts). Rugged Connect software. Made in Canada	06
2	24V-120W-DIN	Power Supply unit, 24V, 120W Industrial Din-rail.	03
3	PD211-08-M0	PD Module, for up to 8 UHF PD Sensors	02
4	PD211-04-M0	PD Module, for up to 4 UHF PD Sensors	02
5	RM-ACC-Coax-20	Co-Ax Cable suitable for UHF Sensors (20 meters each) to connect Sensors to PD211 along with connectors.	480m
6	ACC-RMEYE	RMEYE software for Data Analysis	01
7	PDM-Enclosure	PD Enclosure to mount PD211 Device, completely assembled. Carbon Steel Enclosure, without any corrosive painting.	03
8	RM-ACC-ETH-08	Ethernet 8 CU & 2 FO ports	01
9	RM-ACC-RJ45-CBL-01	Communication cable between PD Monitor & CPU to Ethernet Switch (RJ 45) and from Ethernet Switch to workstation PC/ Server in the control room.	350m
10	RM-ACC-RS485-CB-01	RS 485 cable from SF6 sensors to nearby Junction box and from junction box to PD Enclosure (Approx. 30 meters each)	2910m
11	RM-ACC-JBOX-01	Junction Box required for terminating the RS485 Cables	17
12	RM-ACC-SRVR-PNL	PDM Server Panel along with server, monitoring, and Keyboard and ethernet Switch as accessories Server (Tower) Specifications: Dell/HP or Equivalent Operating system: Windows	01

		RAM: 32 GB CPU: 3 GHZ/ 6 core Storage: 1 TB	
13	RM-INST-COMM-01	• Installation of PDM Enclosure, PDM Server Panel/ Workstation PC and cabling (Done by Local Contractor). Tentatively 12 days. • Supervision of Installation & Commissioning of Partial discharge & SF6 monitoring System as per the scope: Tentatively 10 days. • 1 day Site Training on Partial discharge monitoring, its use, and maintenance. (Assuming the training is done at the same visit as commissioning). Note: **Food, Travel & Accommodation will be charged to Siemens as actual.**	01
TOTAL PRICE (in USD) for GIS PD & SF6 Monitoring for 66kV GIS at CCPP Substation			

EGR Substation:

Bill of Quantity and Pricing Schedule: GIS PD Monitoring System meeting customer specifications

Sl #	Part Number	Item Description	Qty
1	CPU-E2-M4-DIN	Din rail (DIN) CPU module, with Ethernet (RJ-45) and SFP ports, RS-485 communication ports. 4GB memory included. All Communications are standard (Native protocol, CANBUS, Modbus, DNP3.0, IEC 61850) on serial/ Ethernet ports. 24/48 Volts DC (20 Watts). Rugged Connect software. Made in Canada	04
2	24V-120W-DIN	Power Supply unit, 24V, 120W Industrial Din-rail.	02
3	PD211-08-M0	PD Module, for up to 8 UHF PD Sensors	02
4	RM-ACC-Coax-20	Co-Ax Cable suitable for UHF Sensors (20 meters each) to connect Sensors to PD211 along with connectors.	260m
5	ACC-RMEYE	RMEYE software for Data Analysis	01
6	PDM-Enclosure	PD Enclosure to mount PD211 Device, completely assembled. Carbon Steel Enclosure, without any corrosive painting	02

7	RM-ACC-ETH-06	Ethernet 06 CU & 2 FO ports	01
8	RM-ACC-RJ45-CBL-01	Communication cable between PD Monitor & CPU to Ethernet Switch (RJ 45) and from Ethernet Switch to workstation PC/ Server in the control room.	250m
9	RM-ACC-RS485-CB-01	RS 485 cable from SF6 sensors to nearby Junction box and from junction box to PD Enclosure (Approx. 30 meters each)	1620m
11	RM-ACC-JBOX-01	Junction Box required for terminating the RS485 Cables	07
11	RM-ACC-SRVR-PNL	PDM Server Panel along with server, monitoring, and Keyboard and ethernet Switch as accessories Server (Tower) Specifications: Dell/HP or Equivalent Operating system: Windows RAM: 32 GB CPU: 3 GHZ/ 6 core Storage: 1 TB	01
12	RM-INST-COMM-01	• Installation of PDM Enclosure, PDM Server Panel/ Workstation PC and cabling (Done by Local Contractor). Tentatively 07 days. • Supervision of Installation & Commissioning of Partial discharge & SF6 monitoring System as per the scope: Tentatively 07 days. • 1 day Site Training on Partial discharge monitoring, its use, and maintenance. (Assuming the training is done at the same visit as commissioning). Note: **Food, Travel & Accommodation will be charged to Siemens as actual.**	01
TOTAL PRICE (in USD) for GIS PD & SF6 Monitoring for 66kV GIS at EGR Substation			

HCC Substation:

Bill of Quantity and Pricing Schedule: GIS PD Monitoring System meeting customer specifications

Sl #	Part Number	Item Description	Qty
1	CPU-E2-M4-DIN	Din rail (DIN) CPU module, with Ethernet (RJ-45) and SFP ports, RS-485 communication ports. 4GB memory included. All Communications are standard (Native protocol, CANBUS, Modbus, DNP3.0, IEC 61850) on serial/ Ethernet ports. 24/48 Volts DC (20 Watts). Rugged Connect software. Made in Canada	02
2	24V-120W-DIN	Power Supply unit, 24V, 120W Industrial Din-rail.	02
3	PD211-04-M0	PD Module, for up to 4 UHF PD Sensors	03
4	RM-ACC-Coax-20	Co-Ax Cable suitable for UHF Sensors (20 meters each) to connect Sensors to PD211 along with connectors.	220m
5	ACC-RMEYE	RMEYE software for Data Analysis	01
6	PDM-Enclosure	PD Enclosure to mount PD211 Device, completely assembled. Carbon Steel Enclosure, without any corrosive painting	02
7	RM-ACC-ETH-06	Ethernet 06 CU & 2 FO ports	01
8	RM-ACC-RJ45-CBL-01	Communication cable between PD Monitor & CPU to Ethernet Switch (RJ 45) and from Ethernet Switch to workstation PC/ Server in the control room.	200m
9	RM-ACC-RS485-CB-01	RS 485 cable from SF6 sensors to nearby Junction box and from junction box to PD Enclosure (Approx. 30 meters each)	1100m
10	RM-ACC-JBOX-01	Junction Box required for terminating the RS485 Cables	06
11	RM-ACC-SRVR-PNL	PDM Server Panel along with server, monitoring, and Keyboard and ethernet Switch as accessories Server Specifications: Dell/HP or Equivalent Operating system: Windows RAM: 32 GB CPU: 3 GHZ/ 6 core Storage: 1 TB	01
12	RM-INST-COMM-01	• Installation of PDM Enclosure, PDM Server Panel/ Workstation PC and cabling (Done by Local Contractor). Tentatively 07 days.	01

		• Supervision of Installation & Commissioning of Partial discharge & SF6 monitoring System as per the scope: Tentatively 07 days • 1 day Site Training on Partial discharge monitoring, its use, and maintenance. (Assuming the training is done at the same visit as commissioning). Note: **Food, Travel & Accommodation will be charged to Siemens as actual.**	
TOTAL PRICE (in USD) for GIS PD & SF6 Monitoring for 66kV GIS at HCC Substation			

Note

- Any additional visit to the site required shall be chargeable at $ 1,250 per day along with the actual charges for travel, food, and accommodation.

Assumption

- The distance between the PDM Enclosure to Workstation/Server in the control room is considered to be less than 100 meters.

Exclusion to the Scope

GIS PD Monitoring:

- Power supply to Power PD Device and PDM Server Panel to Supplied by the customer.
- Connection PDM Device/PDM Server to SCADA/DCS or any other RTU.
- Cable Layout Routing, Cable Laying, Trenches, and civil work if required for cable laying to be provided by the customer.

Terms and Conditions

1	Shipping Terms (Incoterm)	**EXW** (Ex Works) Québec, Canada - Incoterm 2010 Packed for Airfreight. Consignee details and shipping address to be supplied along with the Purchase Order (PO)
2	Payment Terms	• 20% Advance on the receipt of PO. • 15% on manufacturing clearance/Drawing approval – Net 30 days • 65% of material on shipment – Net 30 days
3	Delivery / Lead Time	• **03-04 weeks** for Drawing Approval from the date of KOM. • **10-12 weeks** after receiving manufacturing clearance or drawing approval from the customer/contractor for GIS PD monitoring system. • Additional **04-06 weeks in case of sea shipment.**
4	Warranty	**12 Months (One year) from the Date of Shipment**. Warranty covers electronic systems and connectors but excludes, Incorrect Operation, Mishandling, and Any consumable (if applicable)

Our footprints **Across the Globe**

Head Office

Canada

1415 Frank-Carrel, Suite 230, Quebec, QC - G1N 4N7, CANADA

+1-418-767-0111

Asia Pasific | **India** | **Europe** | **Latin America** | **Middle East** | **North America**

Rugged Monitoring Services

Rugged Monitoring provides customization of sensors, monitors & software. In addition we offer on-site commissioning services, maintenance contracts and technical support to all customers worldwide.

About Rugged Monitoring

Industry's leading team of asset condition monitoring experts with 100+ years of combined experience committed to delivering customizable solutions for challenging applications. We offer a range of reliable, high performance, customizable sensors and monitoring solutions that are immune to external influence.

ruggedmon

info@ruggedmonitoring.com

www.ruggedmonitoring.com

RUGGED MONITORING

MONITORING SIMPLIFIED