CATALOGUE

DRC SOLUTIONS

Version 1.1

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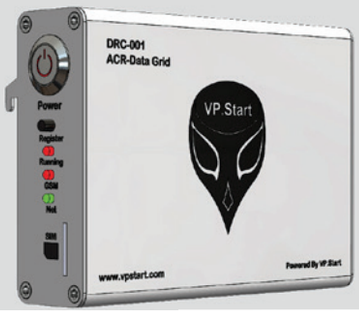
DRC-001 Remote Control for Auto Recloser

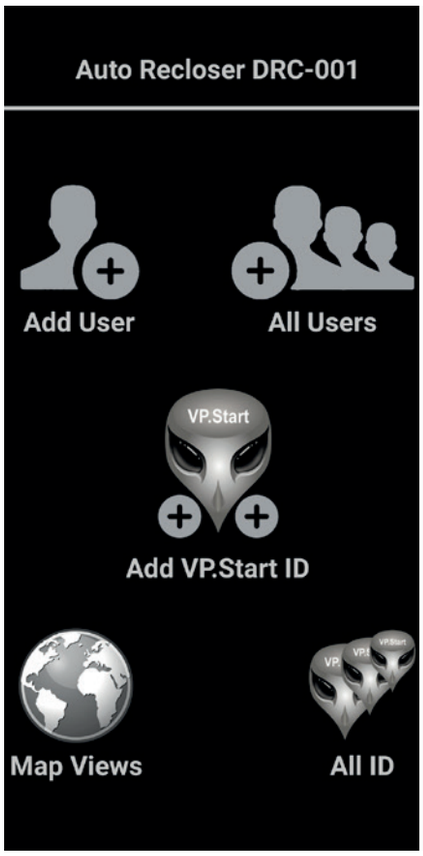
Schneider Auto Recloser Connected with DRC-001

- Remote Control mode (anywhere, anytime) on Auto Recloser via smartphone app.
- Remotely Trip or Close Switchgear via smartphone app or RPM Grid software (PC).
- Alarm notifications for ACR Switchgear OFF, CB 220V Switch OFF, 22kV Source OFF.
- Google Map views of DRC-001.
- Remote Control capability functions via RPM Grid and smartphone app.



Application

The DRC-001 is a smart controller for Schneider Auto-Reclosers, which is our flagship solution and continues to be popular in supporting effectively electric utility operators with its monitoring & control capabilities over medium voltage distribution grid operations (22kV & 35kV). Operators benefit from more significant insights such as line fault activity, power information, power quality data and other vital information that help minimize outages, outage duration and increase power reliability. Due to its effective operation, advanced capabilities & results, the DRC-001 maintains its popularity among the largest electric utility power providers in the market. In addition, the enhanced capabilities through our DRC-001 “Smart-Controller” for Schneider auto-reclosers have not only yielded impressive results in increasing energy reliability and minimized power losses on the network but, It has also enabled increased safety for maintenance teams due to the remote control & monitoring capabilities through the DRC-001 for distribution grids.



- The DRC-001 is designed to control the ADVC recloser via smartphone app or RPM Grid software (PC) to Open or Close the Switchgear.
- Control & configure multiple DRC-001 controllers through smartphone app or PC application.
- Monitor vital measurements of the ADVC recloser: Current, Voltage, Power (P, Q, S), Power Factor, Battery Voltage, Trip Flag, Protection Status (On/Off), Fault Type, Switchgear Position (Open/Close), etc.
- Record & view data on: value of Current Faults, Total Power Reports, Trip Flags and ADVC Event Logs and User Event Logs.
- Stay connected & maintain control of the recloser through GSM Call-Control functions to Trip/Close the Switchgear.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Automatic alarm system for various alerts: Switchgear OFF, 220V CB OFF, 22kV Source OFF. Alarm notifications can also be received via SMS with additional detail (date & time).
- Google Map views support on DRC-001.
- Add/remove up to 15 users (Admin, User and Guest) and retrieve user reports.

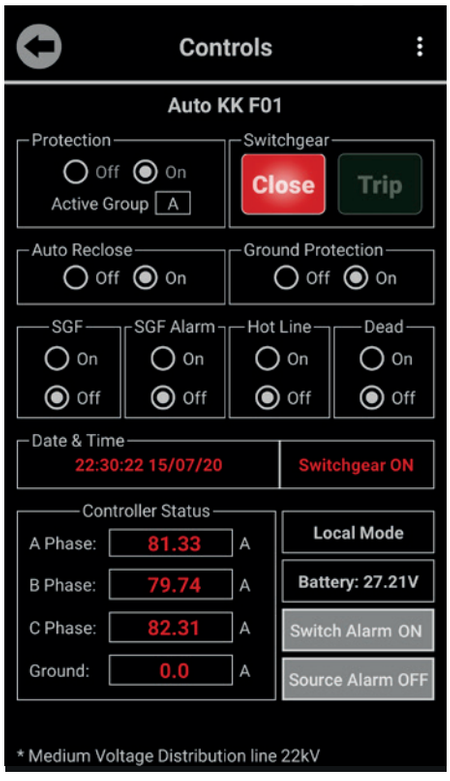
Technical Specifications

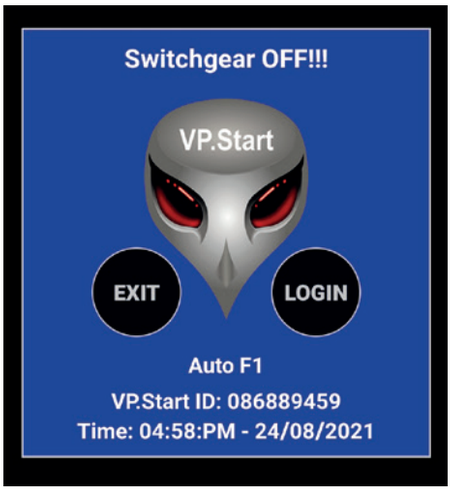
Remote Control Unit

Voltage Supply Range	12 - 36Vdc
Operating Frequency Bandwidth	GSM/GPRS: 900/1800 (MHz)
Ambient Temperature Range	0 to 65°C
Humidity	30% to 95%

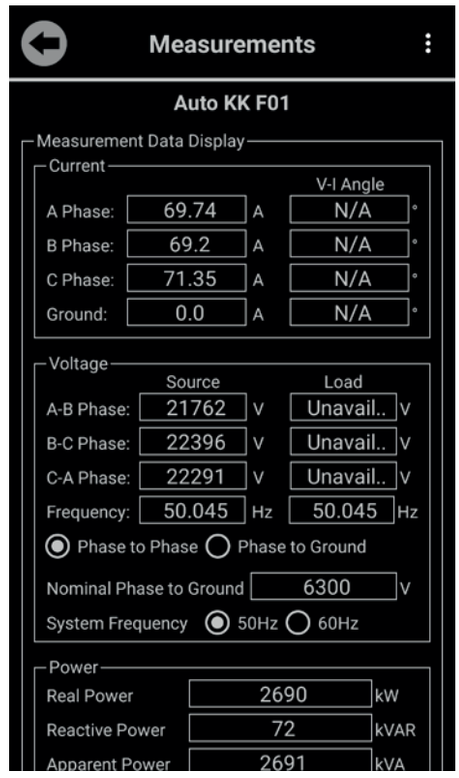
Remote Control Functions

Control Function:	
Control Switchgear (Trip/Close)	Yes
Configuration Settings:	
Phase Trip Current Fault	Yes
Ground Trip Current Fault	Yes
Reclose Time	Yes
Trip Lockout	Yes
Protection Setting: Auto-Reclose (On/Off), Ground Protection (On/Off), SEF (On/Off), SEF Alarm (On/Off), Hotline (On/Off), Dead (On/Off).	Yes
Power Flow Direction Setting: Source I Load X, Source X Load I	Yes
Alarm Setting: Source Alarm (On/Off), Switchgear Alarm (On/Off).	Yes
Monitoring Functions:	
Measurements Current, Voltage, Real Power, Reactive Power, Apparent Power, Power Factor, Frequency, Battery Voltage.	Yes



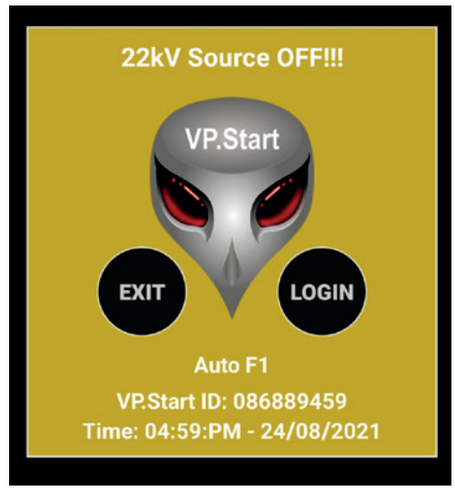


Switchgear Position: (Trip/Close)	Yes
System Frequency: 50 (Hz)/60 (Hz)	Yes
Trip Flags: Over Current, Earth Fault, SEF, NPS, Frequency Fault, Loss of Phase, External Fault.	Yes
Switchgear Operation Counter	Yes
Fault Type	Yes
Protection Status: (On/Off)	Yes
System Control Mode: Local Mode/Remote Mode	Yes
Track Controller Location via Google Maps (Tracking Abilities Function).	Yes
Reporting & Event Log:	
Power Report: Daily, Weekly & Monthly	Yes
ADVC Event Logs	Yes
User Event Logs	Yes
Alarm:	
Switchgear OFF Alarm	Yes
Source Supply OFF Alarm	Yes
CB 220V Switch OFF Alarm	Yes



Software Management

Add/Remove User	Yes
Add/Remove Controller (DRC-001)	Yes
View all Users	Yes
View all Controllers (DRC-001)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes
Check/Top-up Balance	Yes



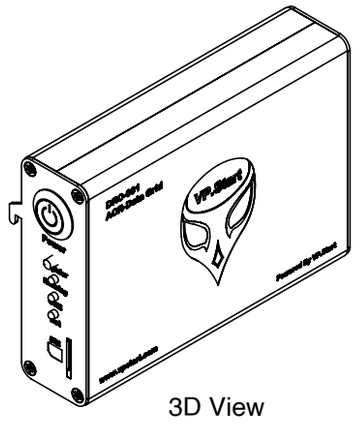
Remote Control System Software

Smartphone app (Android)	Yes
RPM-Grid Software (PC)	Yes

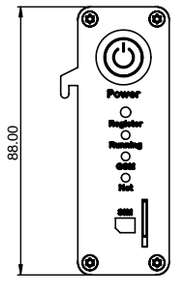
Call Control Features

SMS/Call-Control Commands:	
Read Measurement [Current, Voltage, Power]	Yes
Control Switchgear (Trip/Close)	Yes
Read Switchgear State (Trip/Close)	Yes

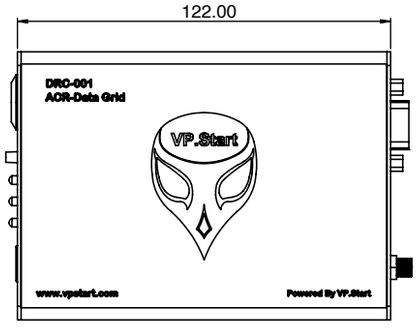
Dimensions



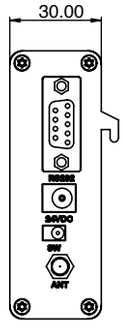
3D View



Side View

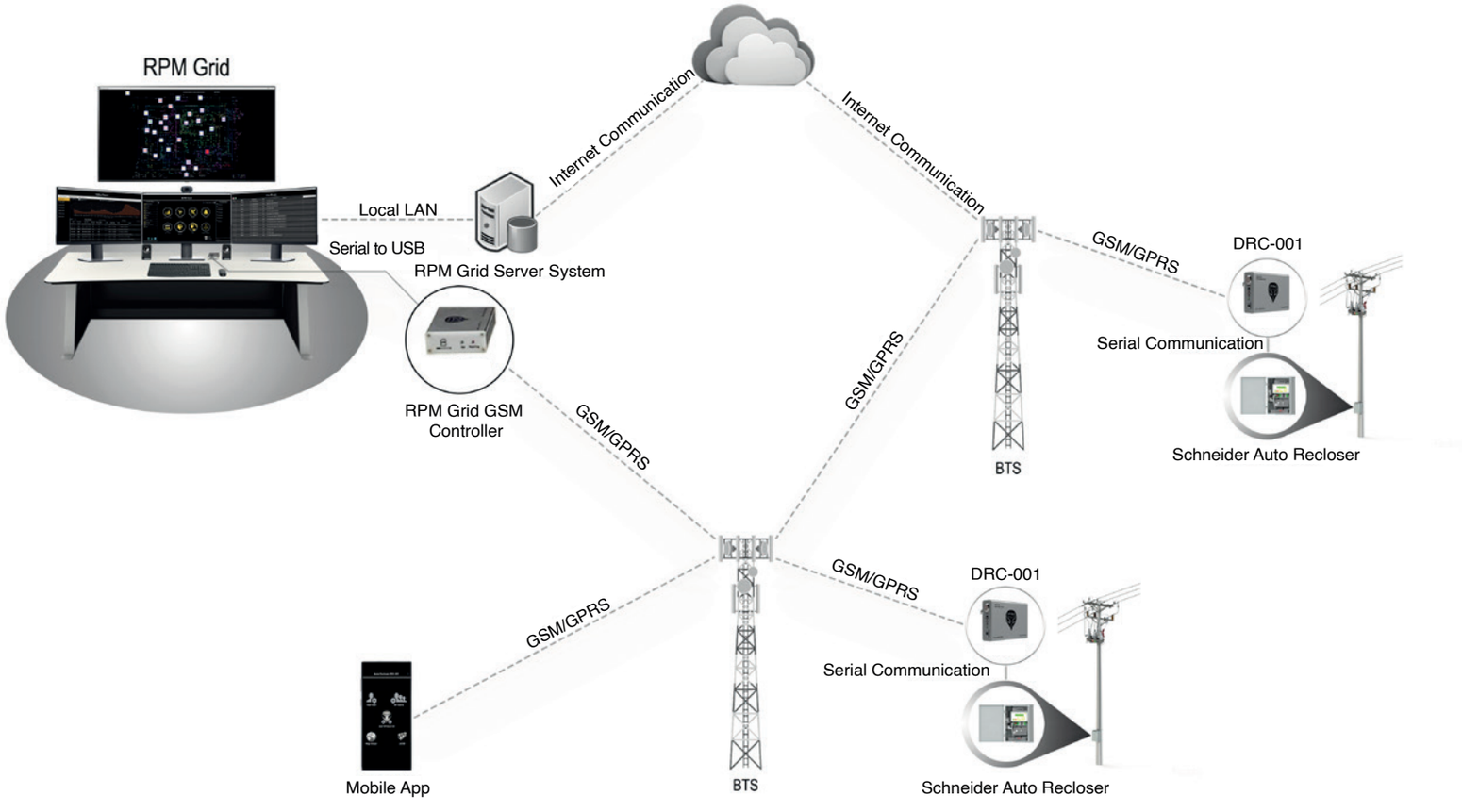


Front View



Side View

System Diagram



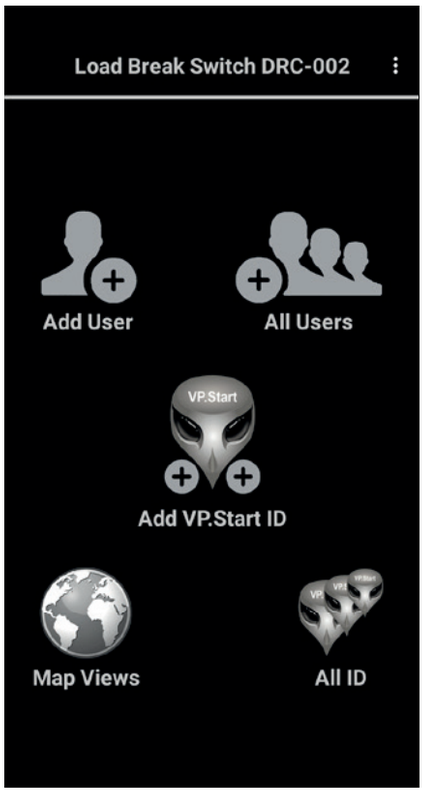
DRC-002 Remote Control for Load Break Switch (LBS)

Load Break Switch (LBS) Connected with DRC-002

- Remote Control mode (anywhere, anytime) on LBS via smartphone app.
- Remotely Open or Close Switchgear via smartphone app or RPM Grid software (PC).
- Alarm notifications for Battery Low, Switchgear OFF Source OFF (Using VT), Door Open.
- Google Map Views of DRC-002.
- Remote Control capability functions via RPM Grid and smartphone app.

Application

The DRC-002 smart Controller is unique for its wide integration applicability for all popularly used load-break switch equipment such as Schneider, SEL, ABB, S&S, ZW32, PRECISE. In addition to the integration ease with various types of LBS brands, the DRC-002 smart-controller instantly converts existing manual switches into a digitally operated, monitored and remotely controlled asset on the medium voltage distribution grid. The Controller can be configured & applied to multiple LBS assets and operated via the mobile app (Android) or locally operated or via RPM Grid system. In case of emergencies, it can also override control manually .
Electric utility providers benefit from reduced OPEX & CAPEX costs as well as efficient preventive maintenance capabilities that translate to increased energy system reliability for downstream consumers.



- Supports integration with widely used LBS brands: SEL, ABB, S&S, ZW32, PRECISE, etc.
- Control & configure multiple DRC-002 controllers through smartphone app or PC application.
- Record, store and view User Event Logs data.
- Stay connected & maintain control of LBS through GSM Call-Control functions to Trip/Close the Switchgear.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Automatic alarm system for various alerts: Source OFF (Using VT), Battery Low, Switchgear OFF, Door Open, etc. Alarm notifications can also be received via SMS with additional detail (date & time).
- Google Map views support on DRC-002.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

Technical Specifications

Remote Control Unit

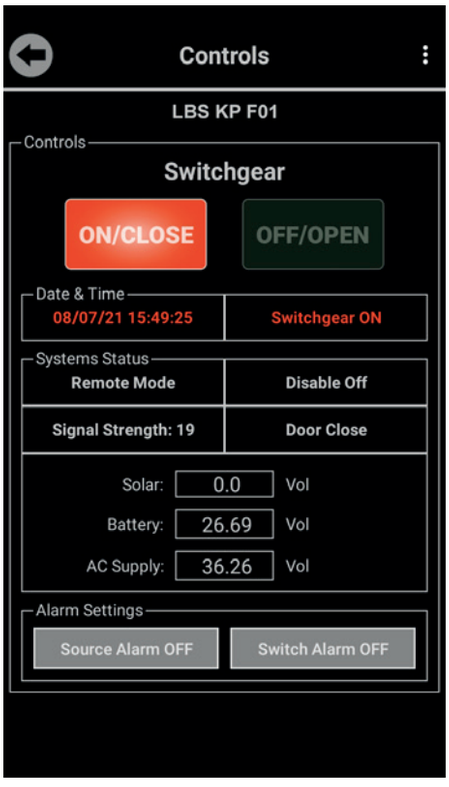
Voltage Supply Range	12 - 24 Vdc
Power Supply Supply for Controller	Solar Cell, 20W
Operating Frequency Bandwidth	GSM/Internet/Call Control 900/1800 MHz
Ambient Temperature Range	0 to 45°C/32 to 113°F
Humidity	≥ 95%

Remote Control Functions

Control Function:	
Trip or Close Switchgear	Yes
Check Signal (GSM), Power Supply Status	Yes
View User Event Logs	Yes
Alarm notifications: door open, Power Supply Loss, Source OFF, Trip/Close, Switchgear OFF etc.	Yes
Track Controller & LBS Location Via Google Maps (Tracking Abilities Function)	Yes

Software & Admin Settings

Add/Remove Users	Yes
Add/Remove Controller (DRC-002)	Yes
View all Users	Yes
View all Controllers (DRC-002)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes



Check/Top-up Balance	Yes

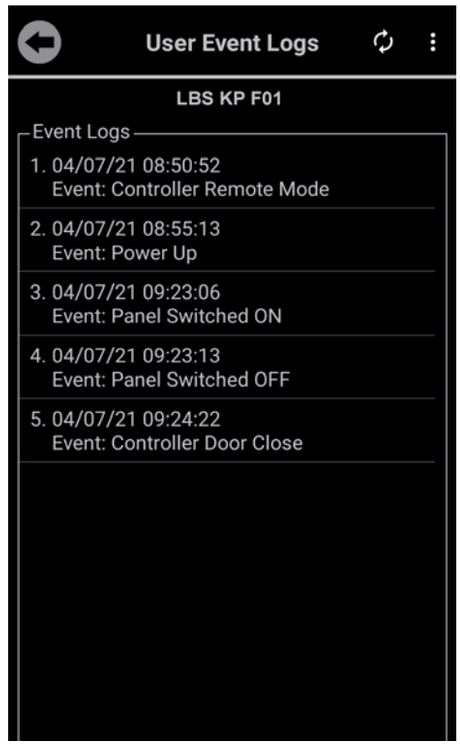
Remote Control System Software

Smartphone app (Android)	Yes
RPM-Grid Software (PC)	Yes

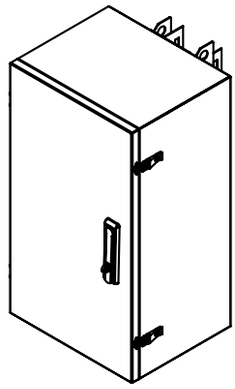
Call Control

SMS/Call-Control Commands:

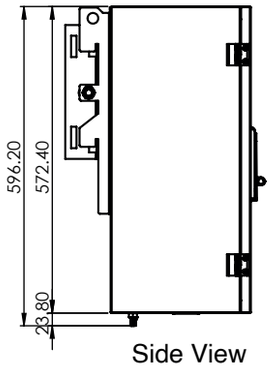
Read Switchgear State (Trip/Close)	Yes
Control Switchgear (Trip/Close)	Yes



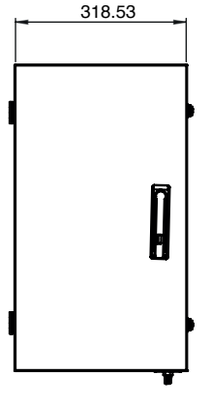
Dimensions



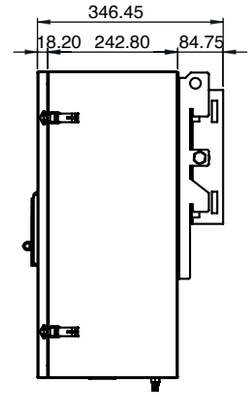
3D View



Side View

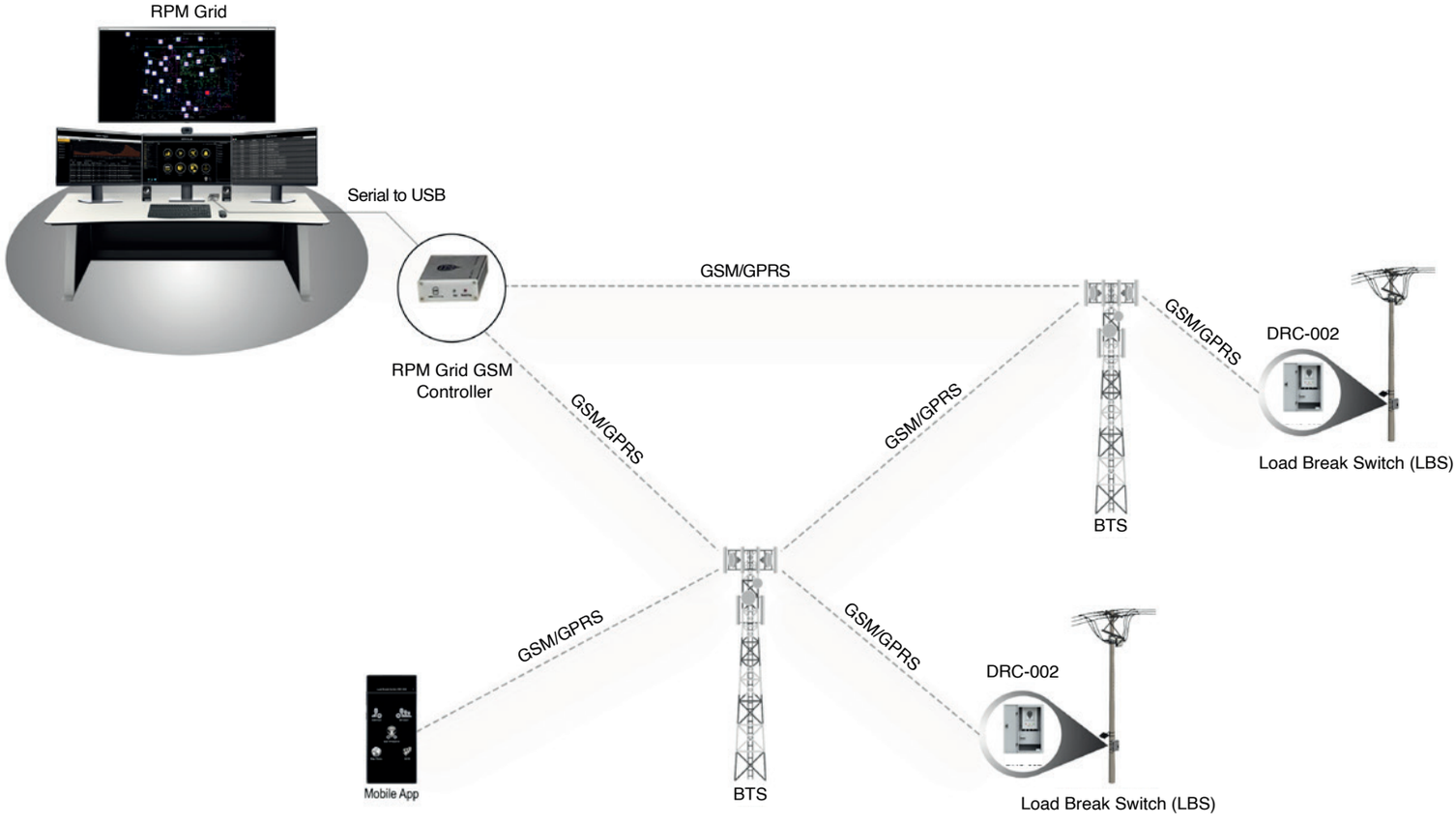


Front View



Side View

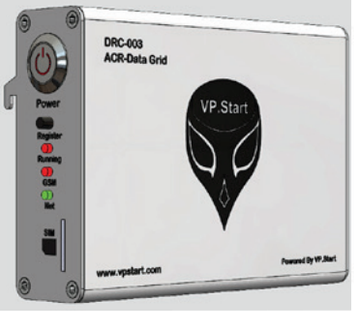
System Diagram



DRC-003 Remote Control for Auto Recloser

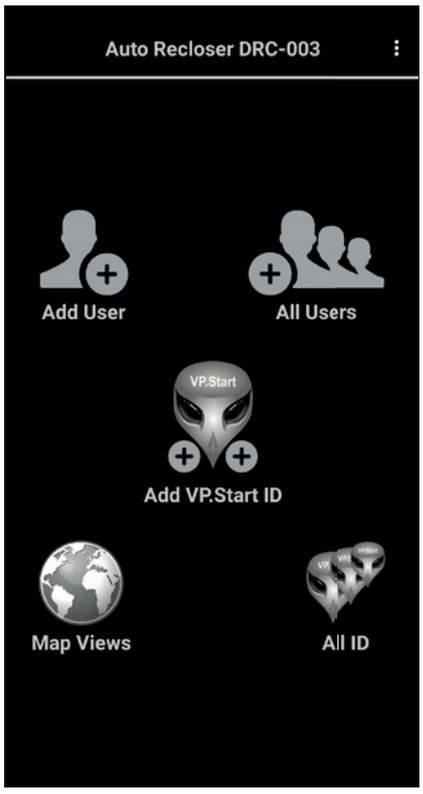
Cooper Auto Recloser Connected with DRC-003

- Remote Control mode (anywhere, anytime) on Auto Recloser via smartphone app.
- Remotely Trip or Close Switchgear via smartphone app or RPM Grid software (PC).
- Alarm notifications for ACR Switchgear OFF, 22kV Source OFF.
- Google Map views of DRC-003.
- Remote Control capability functions via RPM Grid and smartphone app.



Application

The DRC-003 is a Smart controller for Cooper Auto-Reclosers. The DRC-003 effectively enables electric utility operators to take advantage of enhanced remote control, monitoring and distribution grid management for medium voltage operations (22kV & 35kV). Operators benefit from greater insights such as line fault activity, current load information, power quality data and other vital information that help minimize outages, outage duration times and increase power reliability. In addition, the enhanced capabilities offered by the DRC-003 “Smart-Controller” solution for Cooper auto-reclosers have not only yielded impressive results in increasing energy reliability and minimizing power losses on the network. It has also enabled increased safety for maintenance teams due to the data-insights the DRC-003 provides for cooper auto-reclosers. As a result, operators benefit from decreased OPEX & CAPEX while ensuring a higher level of energy supply reliability for their downstream consumers.



- The DRC-003 is designed to control recloser via smartphone app or RPM Grid software (PC) to Open or Close the Switchgear whilst retrieving data through the recloser.
- Control & configure multiple DRC-003 controllers through smartphone app or PC application.
- Monitor vital measurements: Current, Voltage, Power (P, Q, S), Power Factor, Battery Voltage, Trip Flag, Protection Status (On/Off), Fault Type, Switchgear Position (Open/Close), etc.
- Record, store and view Faults, Power report and User Event Logs data.
- Stay connected & maintain control of Auto Recloser through GSM Call-Control functions to Trip/Close the Switchgear.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Automatic alarm system for various alerts: Switchgear OFF, 22kV Source OFF, etc.
- Google Map views support on DRC-003.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

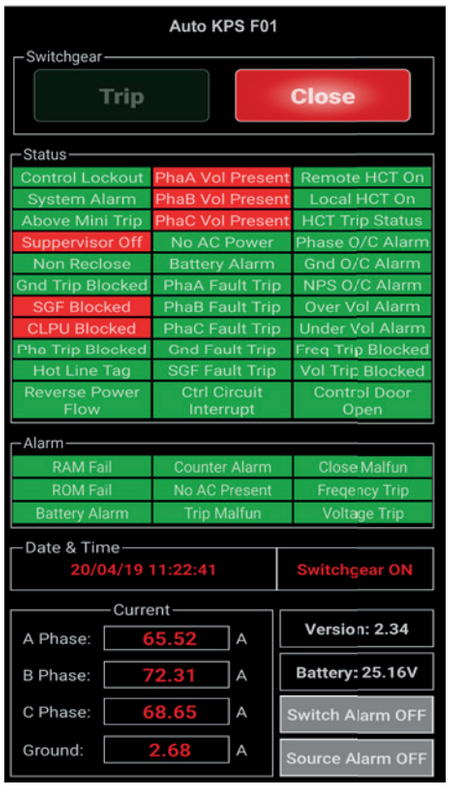
Technical Specifications

Remote Control Unit

Voltage Supply Range	12 - 36Vdc
Operating Frequency Bandwidth	GSM/GPRS: 900/1800 (MHz)
Ambient Temperature Range	0 to 65°C
Humidity	30% to 95%

Remote Control Functions

Control:	
Control Switchgear (Trip/Close)	Yes
Configuration Settings:	
Alarm Setting: Source Alarm (On/Off), Switchgear Alarm (On/Off)	Yes
Monitoring:	
Measurements: current, voltage, real power, reactive power, apparent power, power factor, controller version, battery voltage	Yes
Switchgear Position (Trip/Close)	Yes
View: Alarm Status, System Status	Yes
View: Controller location on Google Map by using the Tracking Abilities function	Yes
View: User Event Logs	Yes
View: Recloser COOPER Event Logs	Yes
Alarm:	
Switchgear OFF Alarm	Yes
Source Supply OFF Alarm	Yes



Software & Admin Settings

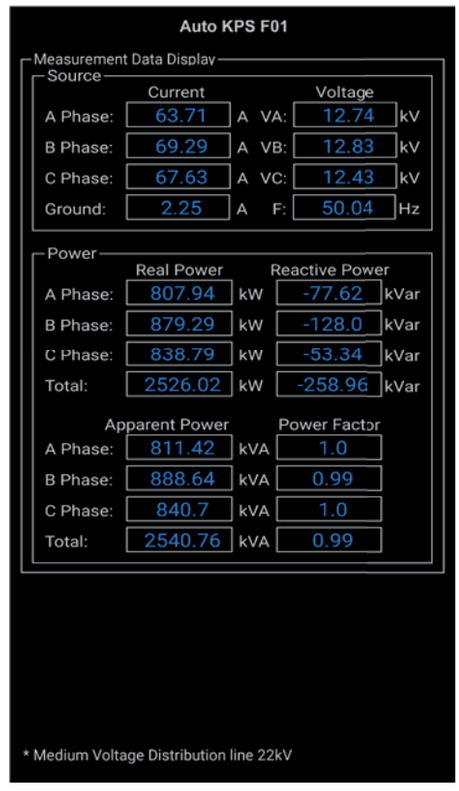
Add/Remove User	Yes
Add/Remove Controller (DRC-003)	Yes
View all Users	Yes
View all Controllers (DRC-003)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes
Check/Top-up Balance	Yes

Remote Control System Software

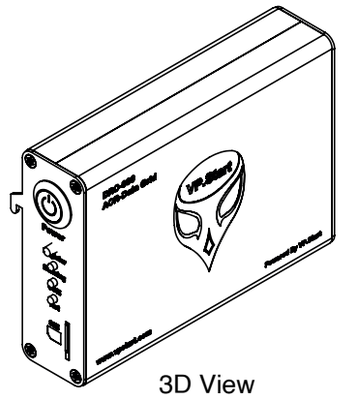
Smartphone app (Android)	Yes
RPM-Grid Software (PC)	Yes

Call Control

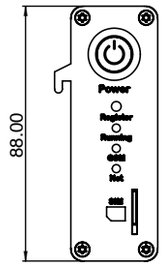
SMS/Call-Control Commands:	
Read Measurement [Current, Voltage, Power]	Yes
Control Switchgear (Trip/Close)	Yes
Read Switchgear State (Trip/Close)	Yes



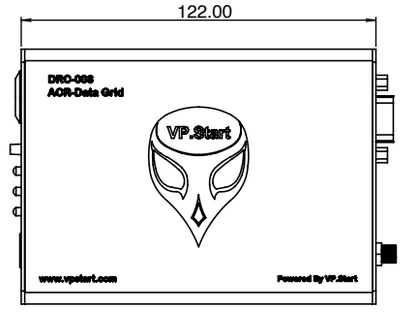
Dimensions



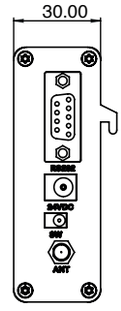
3D View



Side View

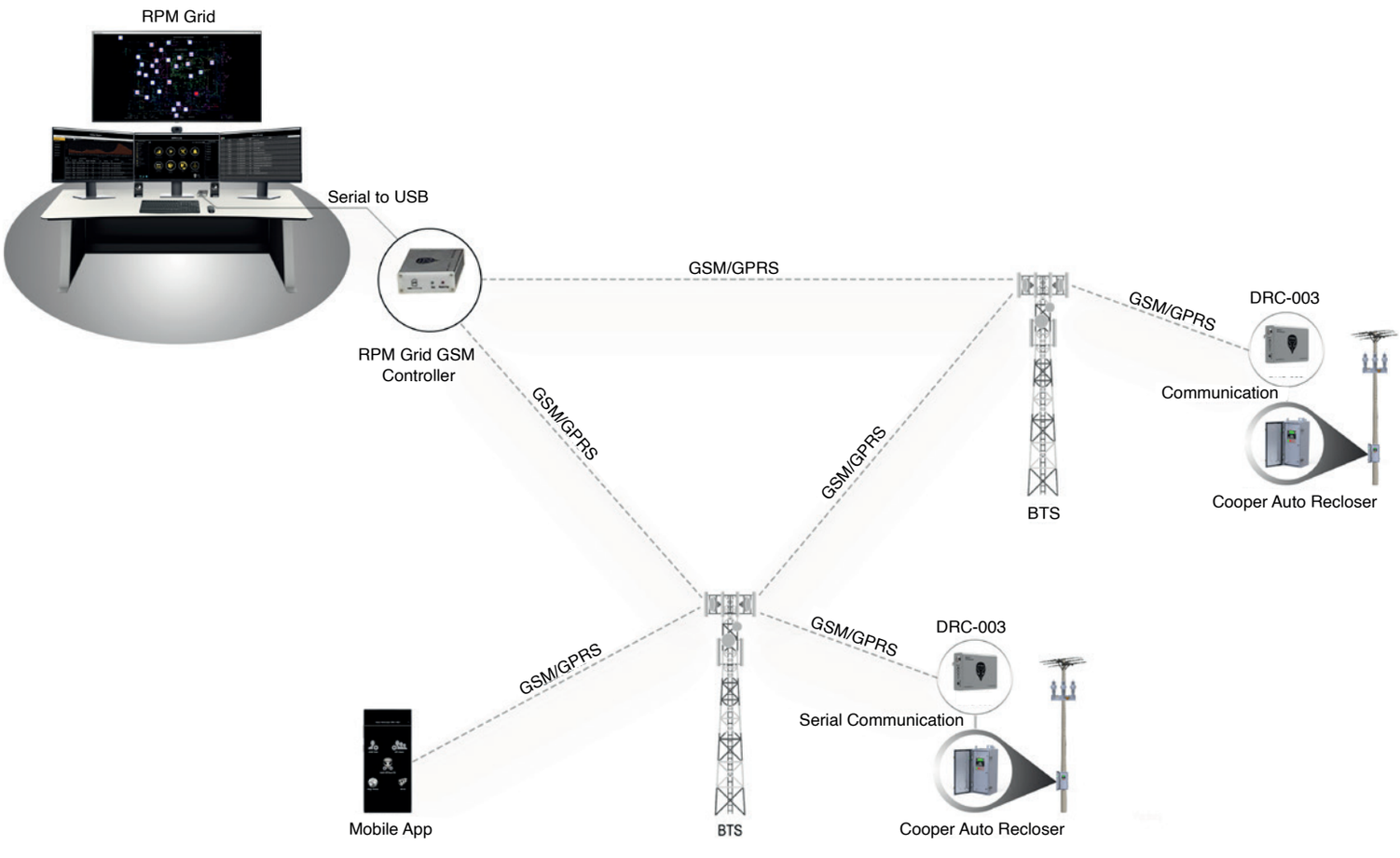


Front View



Side View

System Diagram



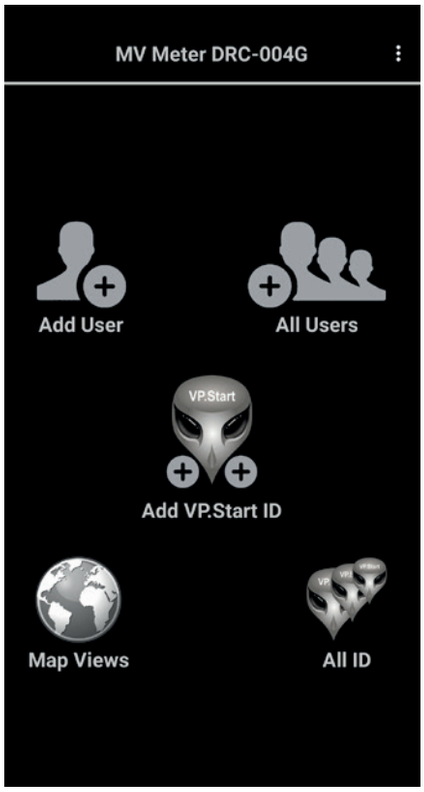
DRC-004G Remote Monitoring for LV/MV Meter

Landis +Gyr Meter Connected with DRC-004G

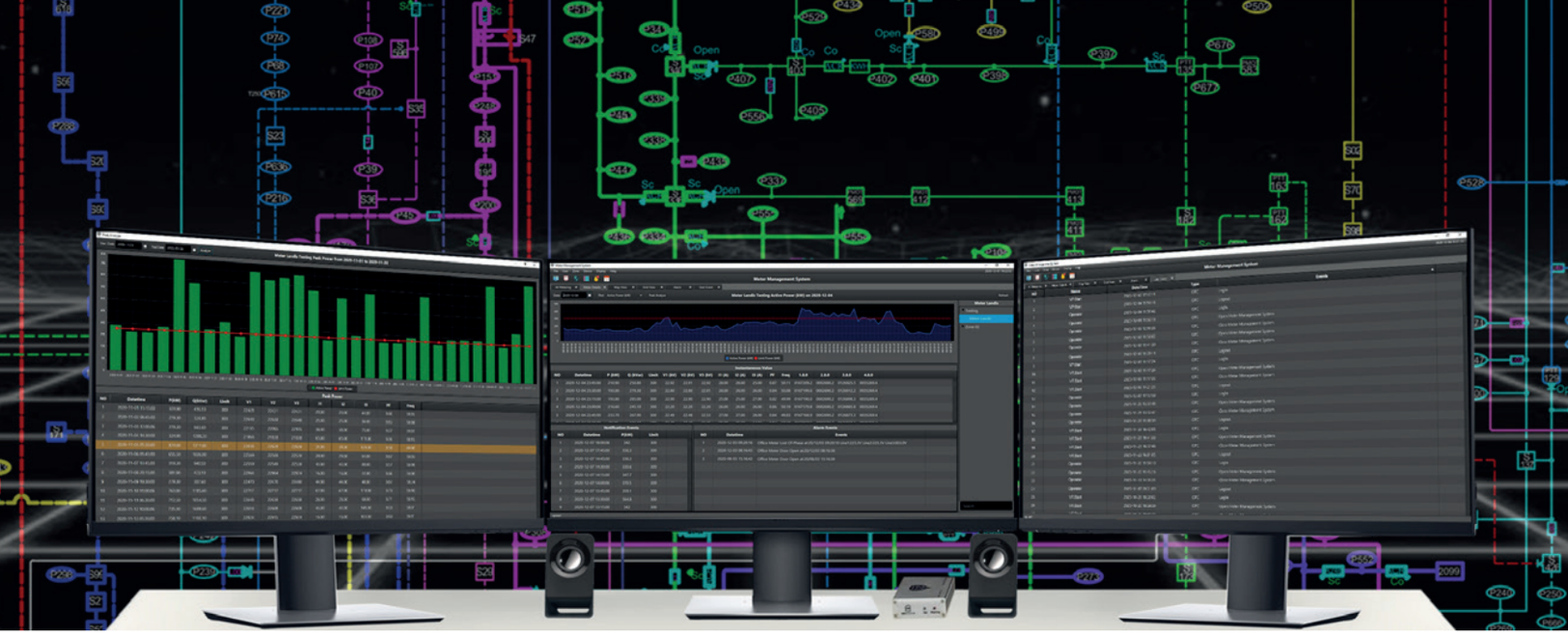
- Remote Monitoring on MV Meter by GSM/GPRS communication (anywhere, anytime).
- Remote Monitoring Meter data Energy, Power, TOU.
- Alarm system & notifications: Source Supply OFF, Loss of Phase, Connection Loss, Low Current Warning and Door Open.
- Google Map views of DRC-004G.
- Remote Control capability functions via DRS and smartphone app.

Application

The DRC-004G is a smart controller for Landis +Gyr meters. The DRC-004G controller can easily integrate with any Landis +Gyr meter to monitor import or export power flows to better meter downstream consumers. In addition, operators can instantly view power quality data, load information to better understand trends in power consumption and monitor losses through the DRC-004G smart-remote control. These additional insights have helped operators reduce their OPEX costs, execute better preventive maintenance enhanced decision making & better resource planning for managing the distributed grid assets.



- Monitor & configure multiple DRC-004G controllers through smartphone app or PC application.
- Remote monitoring meter data: Power, Current, Voltage, Power Factor, Frequency, Energy, TOU.
- Store events (Load data history) retrieve and record data power, TOU and total energy on LV/MV meters.
- Automatic alarm system for various alerts: Source Supply OFF, Loss of Phase, Connection Loss, Low Current Warning and Door Open, etc. Alarm notifications can also be received via SMS with additional detail (date & time).
- Google Map views support on DRC-004G.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Add/remove up to 15 users (Admin, User) and retrieve user reports.



Technical Specifications

Remote Control Unit

Voltage Supply Range	50 to 230 Vac
Operating Frequency Bandwidth	GSM/GPRS: 900/1800 (MHz)
Ambient Temperature Range	-10 to +70°C
Operating Humidity	30% to 95%

Software Interface

PC Application	Distribution Remote Control System
Mobile Application	Android

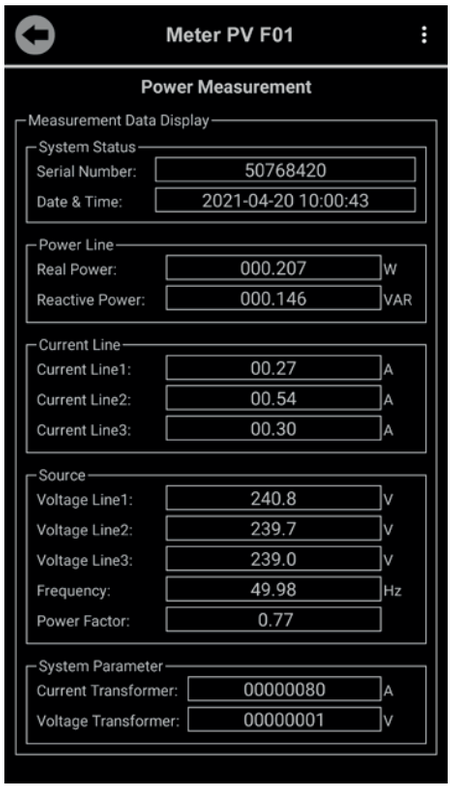
Remote Control Functions

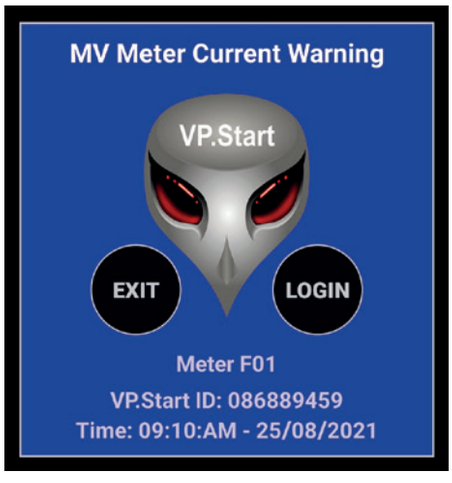
Data Monitoring:

Power	Yes
Current	Yes
Voltage	Yes
Power Factor	Yes
Frequency	Yes
Active Power	Yes
Reactive Power	Yes

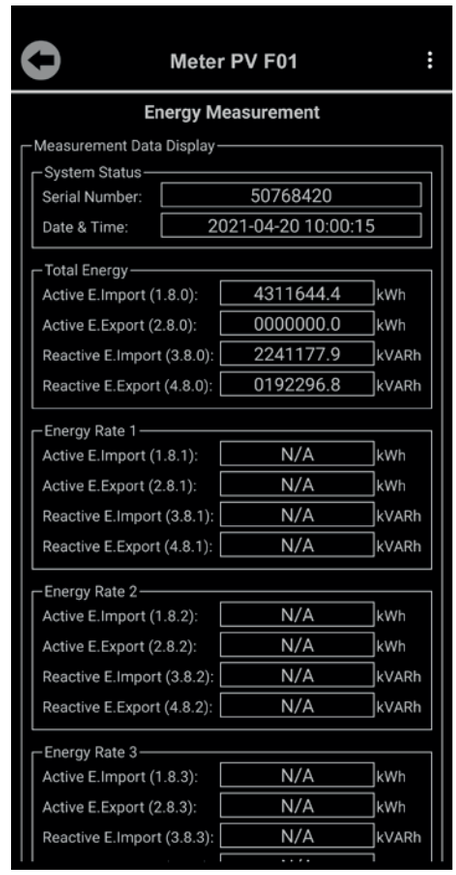
Energy

Active Energy Import	Yes
Active Energy Export	Yes
Reactive Energy Import	Yes
Reactive Energy Export	Yes





Energy TOU (Time of Use)	Yes
Meter Serial Number	Yes
Date & Time Stamps	Yes
Configuration Settings:	
Tracking Abilities	Yes
Source Supply OFF Alarm (On/Off)	Yes
Loss of Phase Alarm (On/Off)	Yes
Current Warning Alarm (On/Off)	Yes
Current Warning Value	0.01 to 100
Meter Interface Connection	.c1/Optical Len
Data Upload/Refresh (secs)	15, 30, 45, 60
Internet Hosting Address	Yes



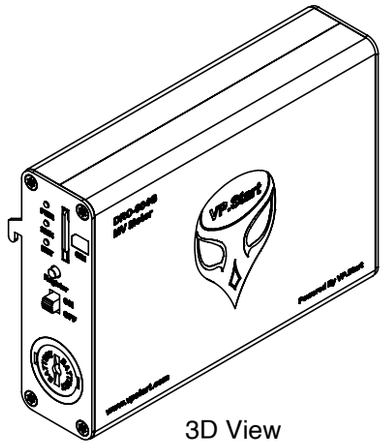
Software Interface

Add/Remove User	Yes
Add/Remove Controller (DRC-004G)	Yes
View all Controllers (DRC-004G)	Yes
View all Users	Yes
Check/Top-up Balance	Yes

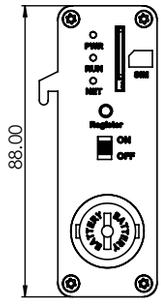
Alarm Systems

Source Supply OFF Alarm	Yes
Loss of Phase Alarm	Yes
Low Current Warning Alarm	Yes
Door Openning Alarm	Yes
Maintenance Alarm	Yes
IR Sensor Connection Loss Alarm	Yes

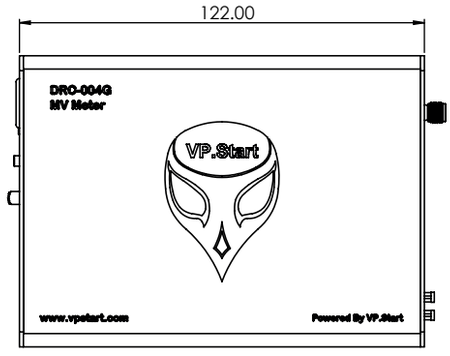
Dimensions



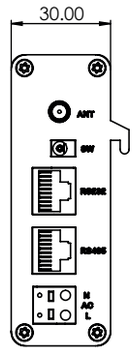
3D View



Side View

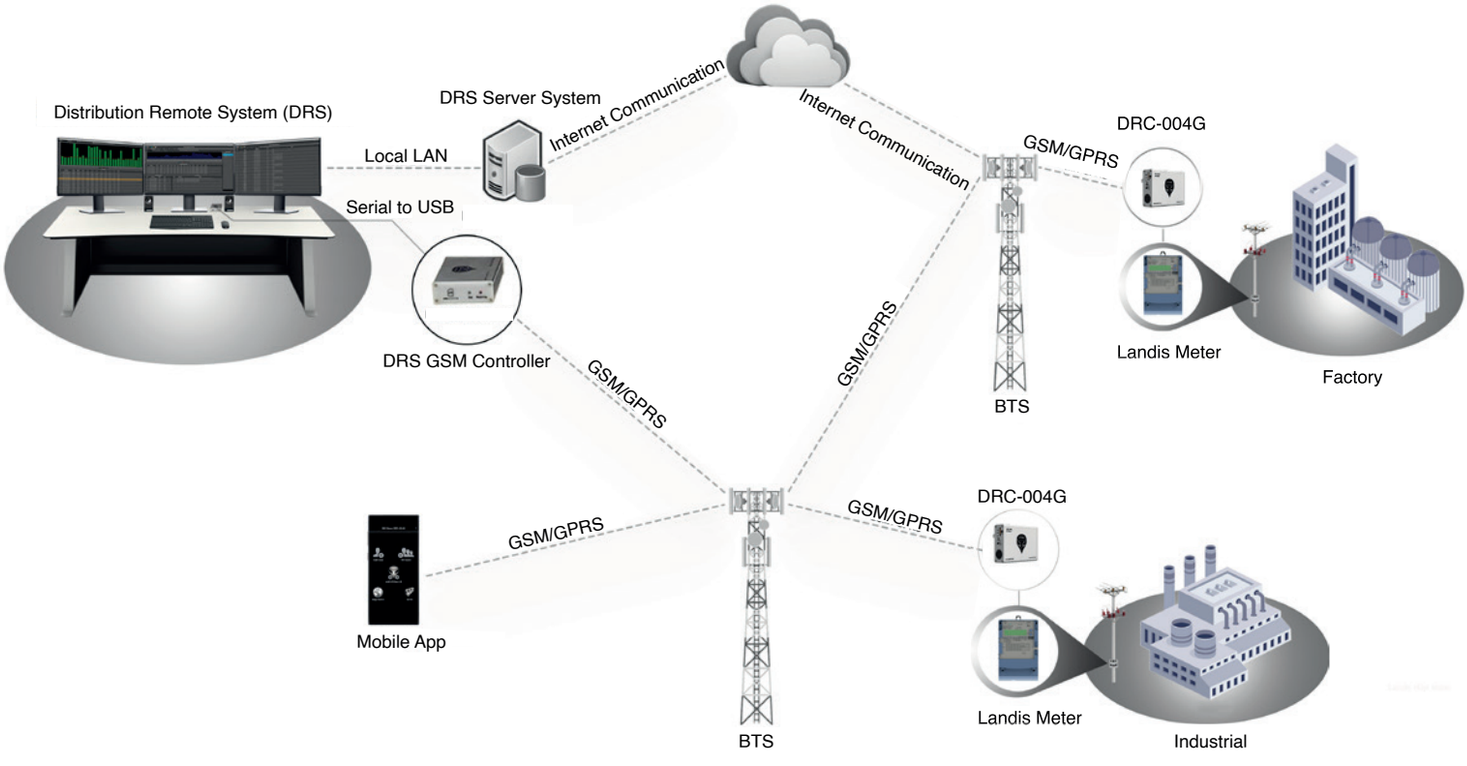


Front View



Side View

System Diagram



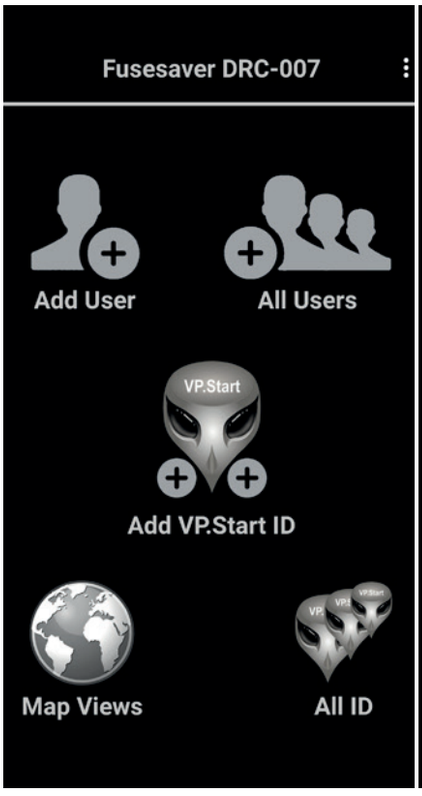
DRC-007 Remote Contol for Fusesaver

Fusesaver Connected with DRC-007

- Remote Control mode (anywhere, anytime) on Fusesaver via smartphone app.
- Remotely Trip or Close Switchgear via smartphone app or RPM Grid software (PC).
- Alarm notifications: Switchgear OFF, Door Open, Low Battery.
- Google Map views of DRC-007.
- Remote Control capability functions via RPM Grid and smartphone app.

Application

The DRC-007 is a smart controller for Siemens Fusesaver 3AD8. The DRC-007 can easily integrate with the RCU (Remote Control Utility) of the Siemens Fusesaver 3AD8 enabling higher level of flexibility, remote-control capabilities and data-insights for operators managing medium-voltage distribution grid configurations of 22kV & 35kV. The DRC-007 is especially helpful when distinguishing between temporary and permanent faults. As a result of the new-capabilities offered by the DRC-007 such as the switch from manual to remote-control operation along with real-time data-insights. The added benefits enable operators to achieve higher levels of power-reliability for downstream consumers and better asset protection, including fusesavers. These translate to lower OPEX & CAPEX costs due to the higher efficiency gains, remote-control & monitoring capabilities of the DRC-007 for faster & better decision making and resource-planning management. Electric utilities can control the DRC-007 via smartphone app (Android) and RPM Grid software (PC) over a secure GSM & GPRS network. Due to the significant results in energy efficiency gains and cost-optimization, the DRC-007 remains as one of the popular solutions for distribution-grids throughout Cambodia.



- DRC-007 retrieve data from RCU & Fusesaver and be able to control and monitoring (Trip/Close Switchgear) via RPM Grid and smartphone app.
- Control & configure multiple DRC-007 controllers through smartphone app or PC application.
- View status of controller & Switchgear: Line Current, Switchgear Position & Status, Fusesaver Lever, Protection Mode, Fault Reports and User Event Logs.
- Stay connected & maintain control of Fusesaver through GSM Call-Control functions to Trip/Close the Switchgear, Phase Current and Switchgear Position.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Alarm & notification functions: Switchgear OFF, System Low Battery, Open Door.
- Google Map views support on DRC-007.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

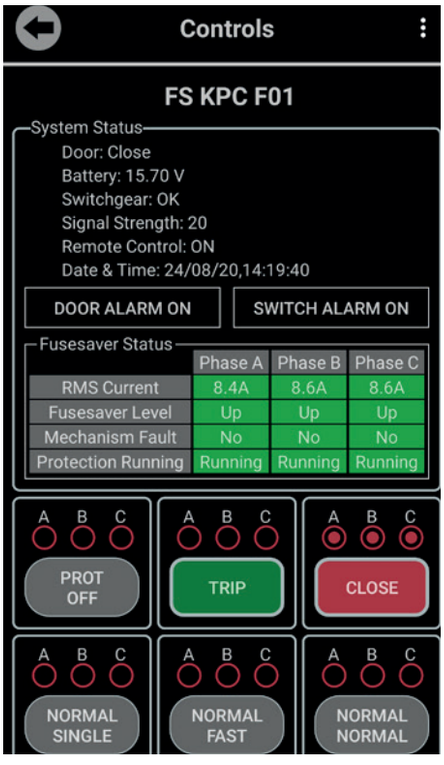
Technical Specifications

Remote Control Unit (RCU)

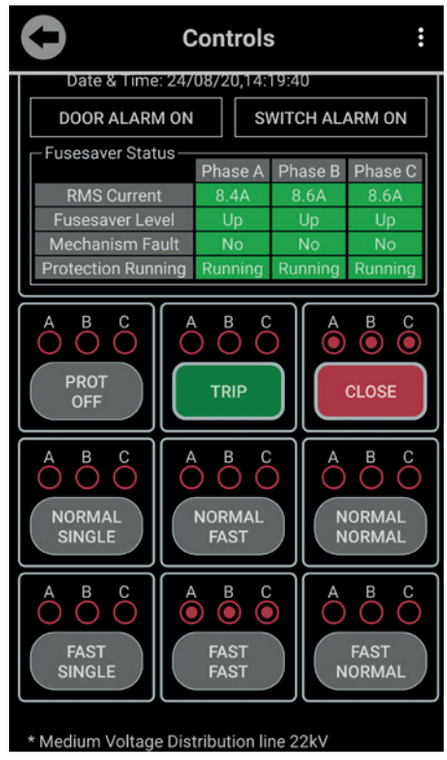
Power Supply Battery Type/Capacity	115 or 230VAC (±20%) 12VDC, 7.2Ah
Battery Hold Up Time	48h
Ambient Conditions	-30 to 50°C
Humidity	5% to 95%
Dimensions (L x W x H)	320 x 400 x 650mm

Remote Control Functions

Control:	
Control Switchgear (Trip/Close)	Yes
Configuration Settings:	
Protection: (On/Off)	Yes
Change Protection Mode: Fast-Fast, Fast-Single, Fast-Normal, Normal-Fast, Normal-Single or Normal-Normal.	Yes
Alarm Setting: Switchgear OFF Alarm (On/Off), Door Opening Alarm (On/Off).	Yes
Monitoring:	
Measurements Current RMS, Battery Voltage.	Yes
Switchgear Position: (Trip/Close)	Yes
RCU Cabinet Door Status: (Open/Close)	Yes
Fusesaver Lever Position: (Up/Down)	Yes
GSM Signal Strength: (1 to 30)	Yes



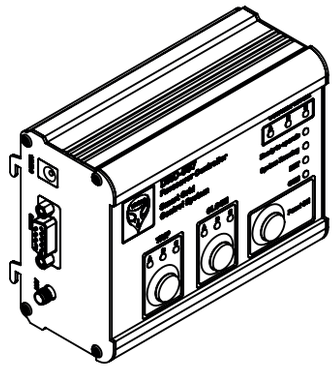
Fault Flag: Operator(Trip/Close), protection trip, 3 phases lockout, fault current (RMS/Peak).	Yes
Protection Running: (Running/Halted)	Yes
System Control Mode: (Local Mode/Remote Mode)	Yes
Controller Location: Via Google Maps by Using the Tracking Abilities Function.	Yes
Reporting & Data Logs:	
Fault Reports	Yes
User Event Logs	Yes
Alarm:	
Switchgear OFF	Yes
Door Open	Yes
Low System Battery	Yes



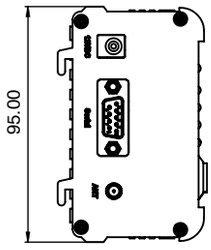
Software & Admin Settings

Add/Remove User	Yes
Add/Remove Controller (DRC-007)	Yes
View all Users	Yes
View all Controller (DRC-007)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes
Check/Top-up Balance	Yes
SMS/Call-Control Commands:	
Read Load Current	Yes
Control Switchgear (Trip/Close)	Yes
Read Switchgear Position (Trip/Close)	Yes
Language Support:	
Language: Khmer/English	Yes
Voice Instruction	Yes

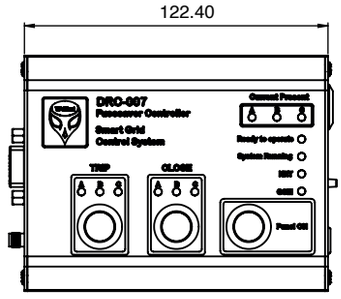
Dimensions



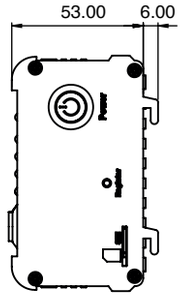
3D View



Side View

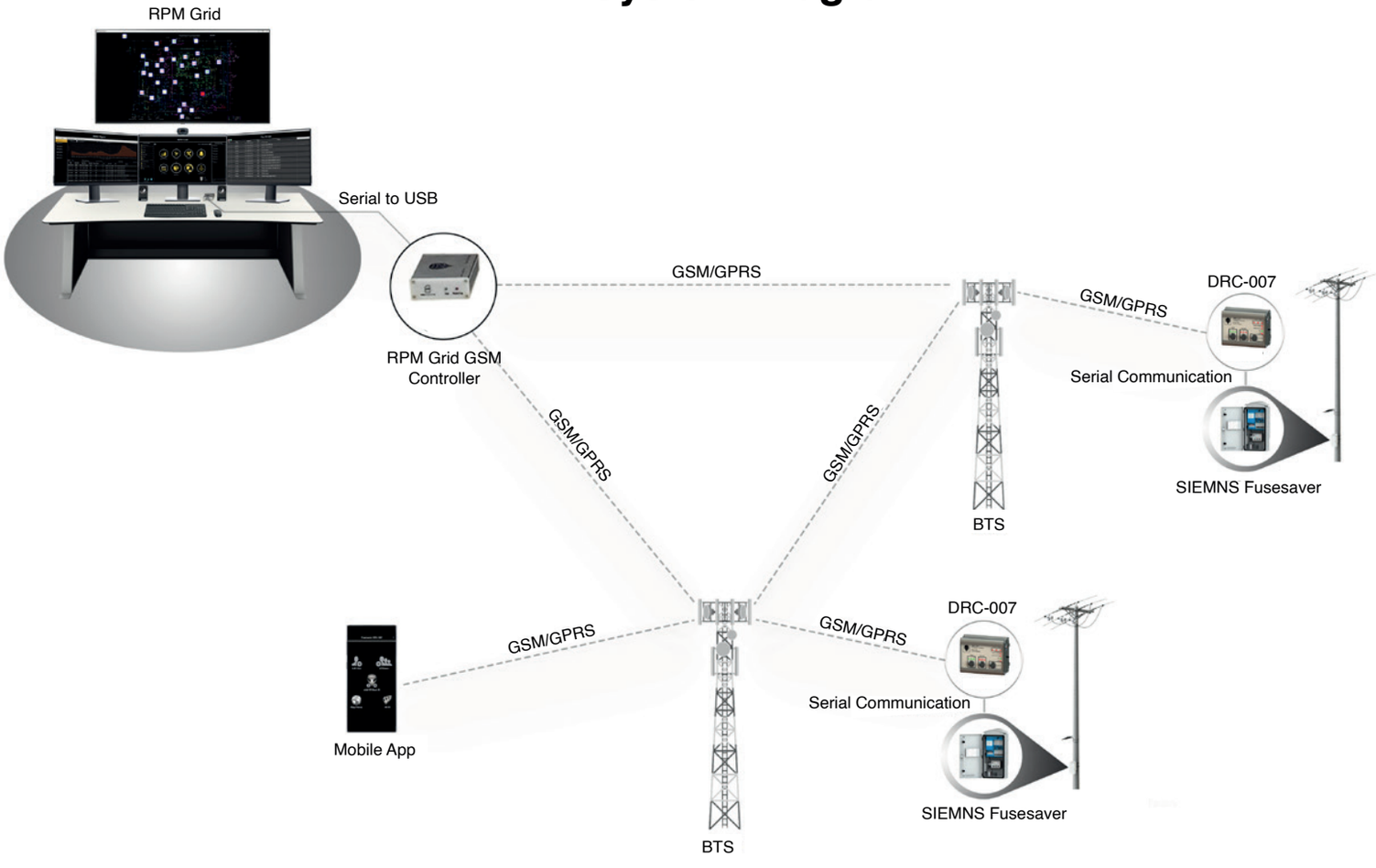


Front View



Side View

System Diagram



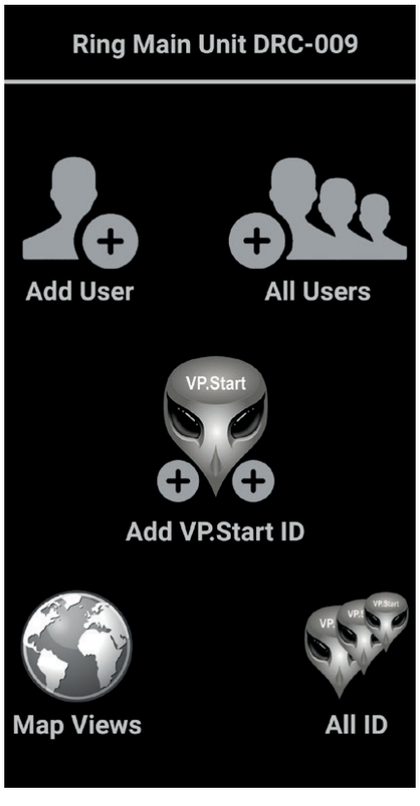
DRC-009 Remote Control for Ring Main Unit (RMU)

Ring Main Unit Connected with DRC-009

- Remote Control mode (anywhere, anytime) on RMU via smartphone app.
- Remotely Trip or Close Switchgear via smartphone app or RPM Grid software (PC).
- Obtain data for analysis, decision making and optimization of operations to improve power quality.
- Increase efficient network utilization and minimize network losses.
- Google Map views of DRC-009.
- Remote Control capability functions via RPM Grid and smartphone app.

Application

The DRC-009 has been an effective solution for operators in reducing energy losses whilst improving overall grid network reliability. It's ''Smart Grid Ready'' multifunction interface that integrates all the functional units necessary for remote supervision and control of various types of the RMU switchgear systems such as ABB, Schneider & Siemens is an added advantage for the redundancy. As a result, where LV/MV grid operators would typically spend hours maintaining RMUs, they are now able to do the same task within seconds with the DRC-009. Thus saving on their OPEX costs and operational risks by significant margins.



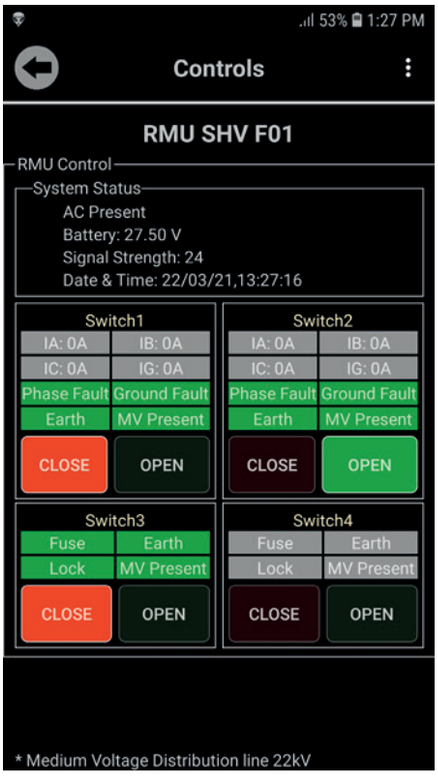
- DRC-009 retrieve data from RMU and be able to control and monitoring (Trip/Close Switchgear) via RPM Grid and smartphone app.
- Control & configure multiple DRC-009 controllers through smartphone app or PC application.
- Measure phase current data on phase A, B and C (Optional Fault Underground).
- Call-Control functions to Trip/ Close the Switchgear and check Switchgear Position.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Alarm notifications for Fuse Break, CB Trip, MV Absence, Phase & Earth Fault.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

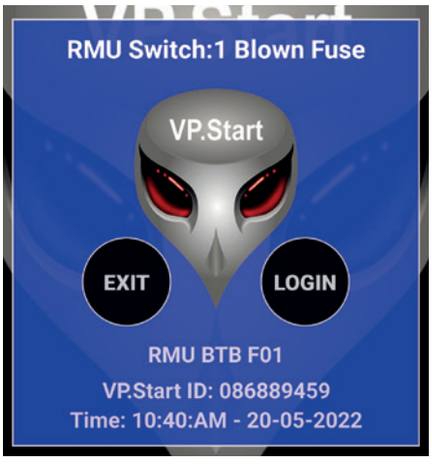
Technical Specifications

In Addition to DRC-009 General Technical Data, the Following Applies

Remote Control Unit	
Power Supply	(190 - 230) ± 10%
Ambient Temperature Range	0 to + 65 °C
Humidity	< 95%
Operation Frequency Bandwidth	GSM/GPRS, 850/900/ 1800/1900MHz
Battery Voltage	24vdc

Remote Control Function	
Switch Position	Open/Close
Maximum Switch Control	Up to 8 Switches
RMU Type Support	Fuse Function “P” I Switch Function “S” Breaker Function “CP”, “CF”
Call Control:	
Remote Switch	Open/Close
Switch Status	Open/Close
Read Current Measurement	Fault Detection Apply
Check Line Condition (Normal/Fault)	Fault Detection Apply
Fault Detection Optional	
Phase Overload	Yes
Fault Current Setting	Yes
Phase and Earth Fault	Yes

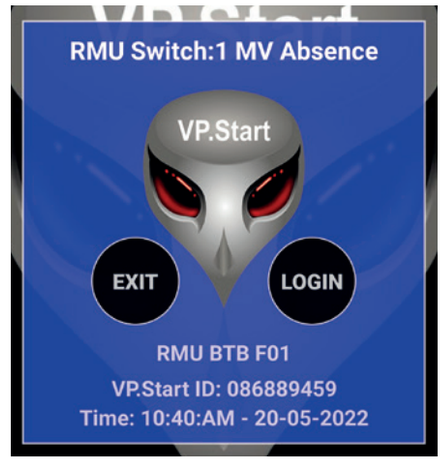


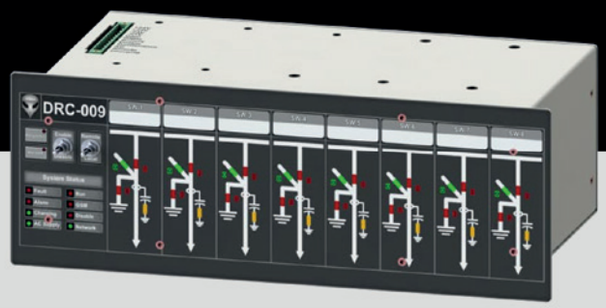


Alarm:	
Switch Open	Yes
CB Open	Yes
Fuse Break Out	Yes
MV Lost Voltage	Yes
Low Battery	Yes

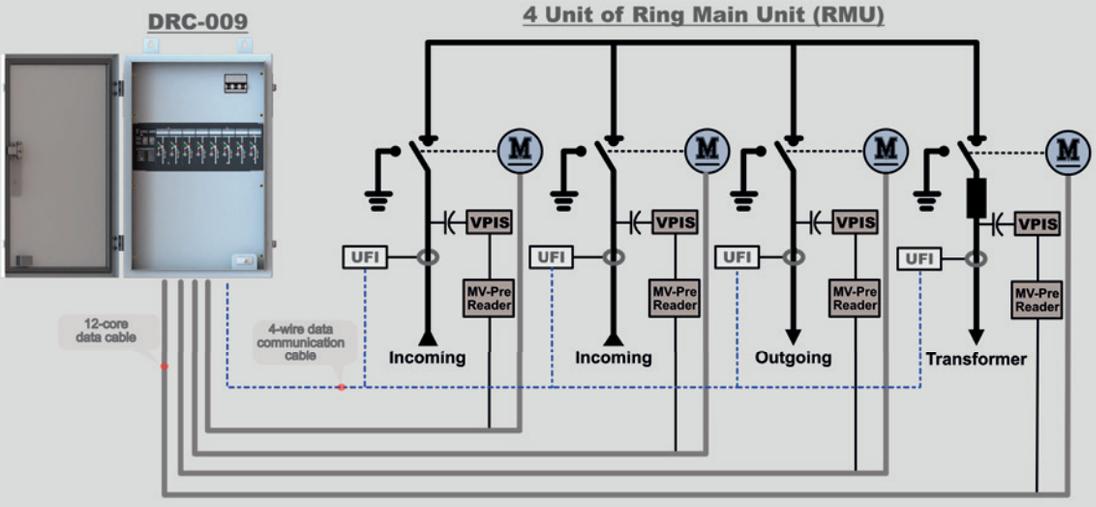
Software Management

Add/Remove user I Add/Remove controller (DRC-009)
View all users I View all controller (DRC-009)
Controller ID setting & Tracking abilities I
Map views I Check all user I Top-up Balance



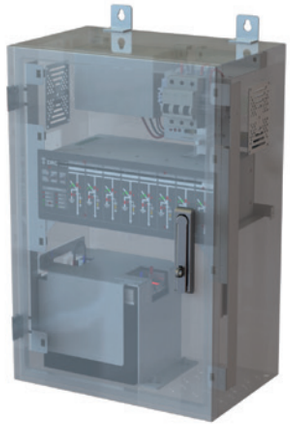


DRC-009 Configuration Diagram



1 VPIS (Voltage Present Indicator System)

2 MV-Pre Reader (Medium Voltage Present Reader System)

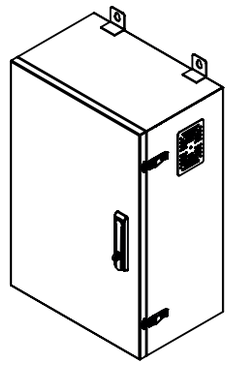


Function and Design

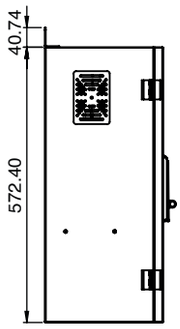
DRC-009 designs to connect directly to the MV switchgear without requiring a special converter. It has a simple front panel for local operation with a bright LED indicating the status of switchgear, which allows management of electrical rating mechanisms (local/remote switch) and display of information concerning the switchgear's status.

The DRC-009 is a smart controller with a back-up power supply guaranteeing service continuity as an auxiliary power-source in case of primary power-source loss. The back-up battery is capable of supplying power to the DRC-009, the MV switchgear's motor mechanisms as well as 24VDC and 48VDC motor units.

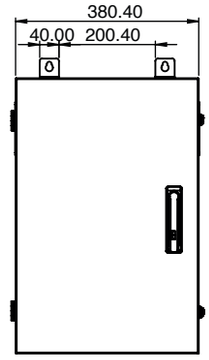
Dimensions



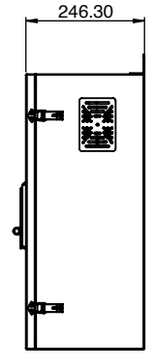
3D View



Side View

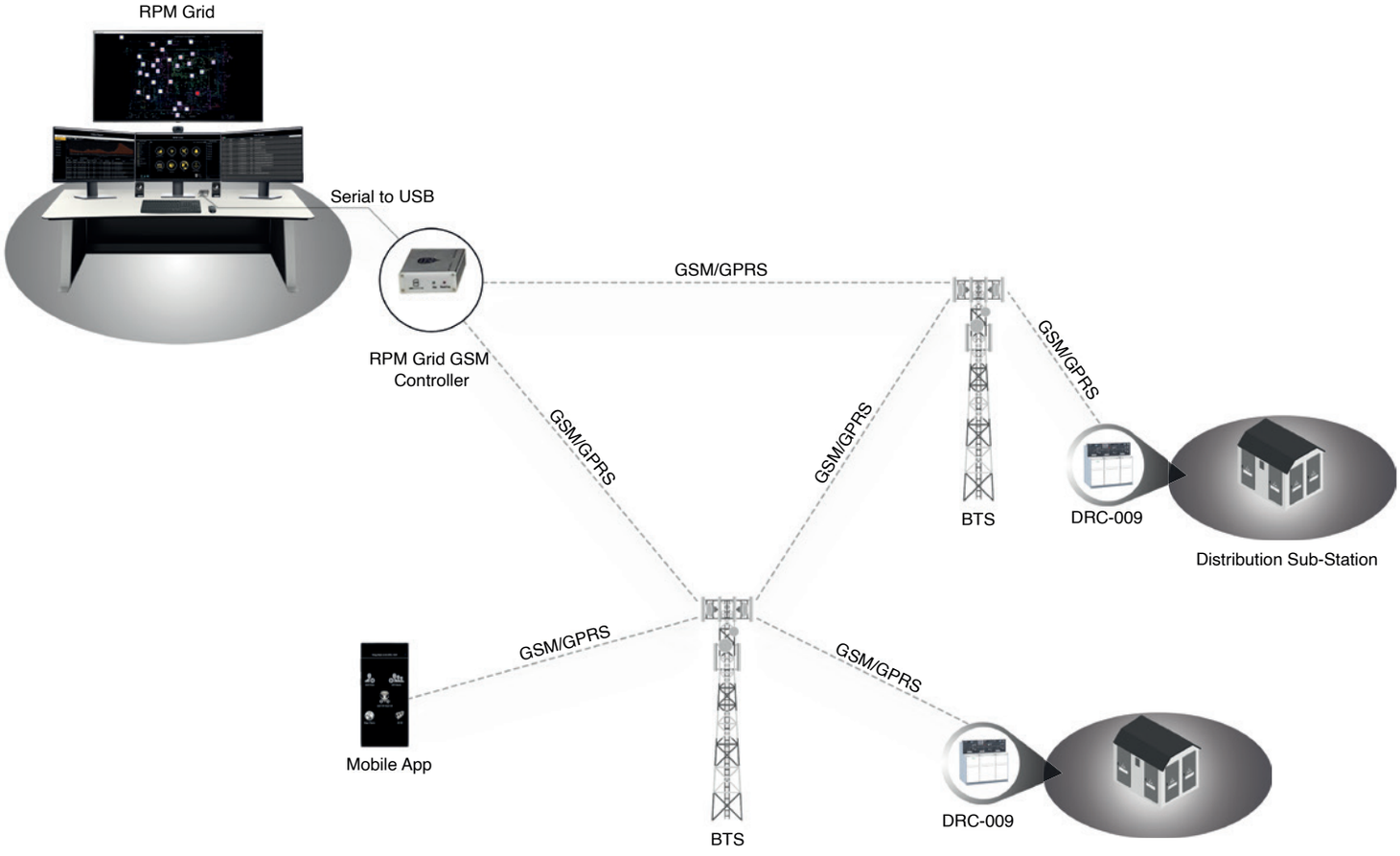


Front View



Side View

System Diagram



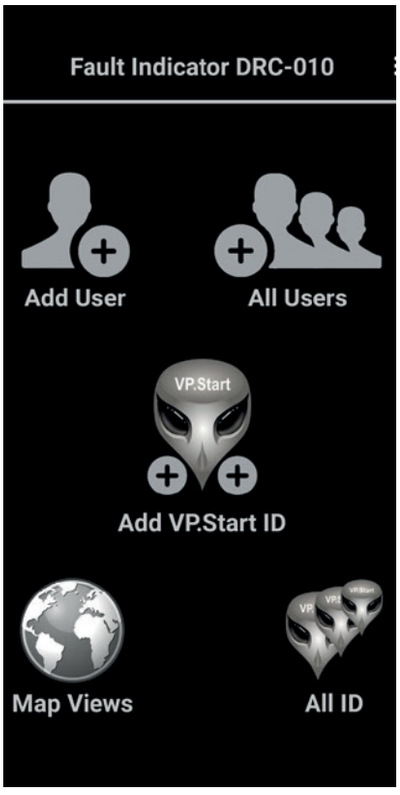
DRC-010 Remote Monitoring for Overhead Line Fault Indicator

Fault Indicator Connected with DRC-010

- Remote monitoring (anywhere, anytime) on Fault Indicator via smartphone app.
- Alarm notifications for Permanent Fault, Temporary Fault, High Current Warning, Low System Battery.
- Google Map views of DRC-010.
- Remote Control capability functions via RPM Grid and smartphone app.

Application

The DRC-010 is a smart controller for overhead lines, earth & short-circuit fault indicators. In most developing countries, overhead distribution lines are a common part of the energy construction infrastructure. In comparison to underground lines, overhead lines are at higher risk due to; natural disasters, human errors and other risks from the surrounding environment making it a complex, expensive and a time-consuming management task for electric utilities. The DRC-010 resolves these issues and ensures higher energy supply reliability for consumers by allowing electric utilities to better manage overhead line sections through remote-control capabilities, view data-driven insights on power line activity such as fault location detection and identification between temporary and permanent faults as well as enabling higher safety for maintenance crews over all three power line phases. As a result, outage times have reduced from 1-4 hours down to 25-30 mins in 98% of use cases. Thereby increasing network reliability scores and reducing OPEX & CAPEX costs. The DRC-010 continues to be one of our popular smart-grid solutions due to its results & efficiency in distribution grid management.



- Control & configure multiple DRC-010 controllers through smartphone app or PC application.
- Remotely monitor over-head ines through connected fault-indicators [FI] & retrieve data on: Line Current, Measurement, Restart Controller, Fault Report, GSM Signal Strength, Battery Voltage, Controller Location, time and date, etc.
- Record, store and view FI Event Logs.
- Alarm & notification functions: Temporary Fault, Permanent Fault, System Low Battery Alarm, High Current Warning Notification.
- Google Map views support on DRC-010.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

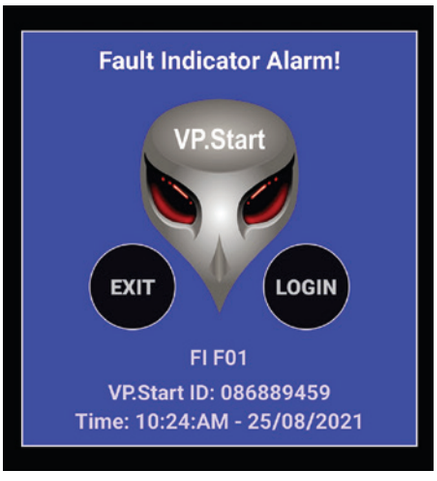
Technical Specifications

Overhead Fault Indicator

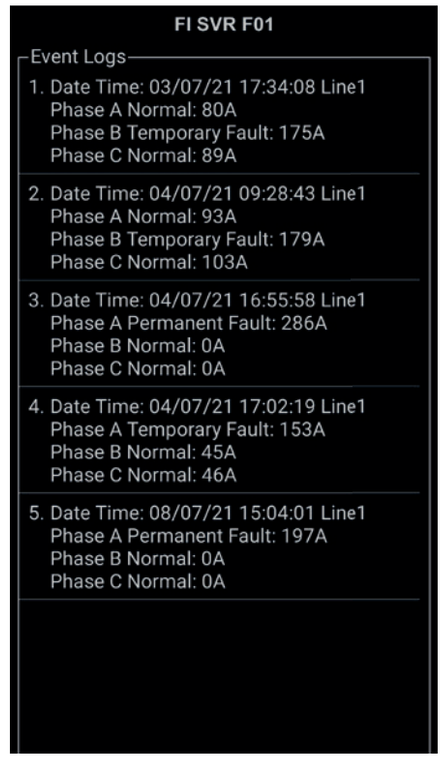
Model	SNV-308
Manufacturing Standard	ANSI/IEEE495-1988 Q/GPW 436-2010
Type of Installation	Overhead Line
Rated Voltage	6 to 76kv
Current Rating	Up to 1,000A
Rating Frequency	50/60 Hz
Fault Indicator	Permanent Fault Temporary Fault

DRC-010 Controller

Configuration Settings:	
Alarm Control	On/Off
Current Warning	Yes
Line Identification	Up to 3 Feeders.
Data Monitoring Features:	
Measurement	Load Current Line System Battery Voltage FI Voltage Battery Fault Current.
Line Status	Normal/Temporary/ Permanent
GSM Signal Strength	(1-30)
Controller Location	On Google Map by Using the Tracking Abilities Function.



Reporting & Event Log:	
Fault Indicator Event Logs	Yes
Alarm:	
Permanent Fault Alarm	Yes
Temporary Fault Alarm	Yes
High Current Warning Alarm	Yes
System Low Battery Alarm	Yes

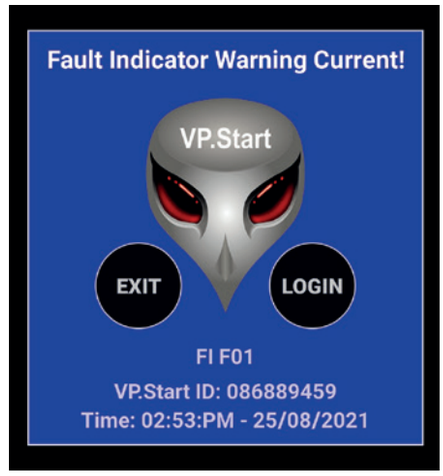


Software & Admin Settings

Add/Remove User	Yes
Add/Remove Controllers (DRC-010)	Yes
View all Users	Yes
View all Controllers (DRC-010)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes
Check/Top-up Balance	Yes

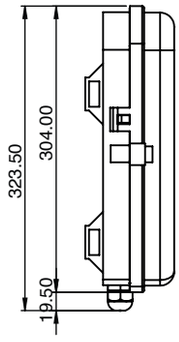
Call Control Features

SMS/Call-Control Commands:	
View Current (Load) Status	3 Phase & up to 3 feeders on same pole
Power Line Status	Permanent/Temporary/ Normal
Language Support:	
Language	Khmer
Voice Instruction	Yes

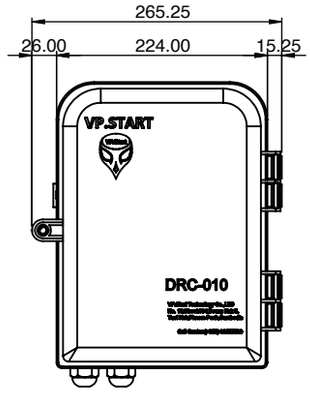


Dimensions

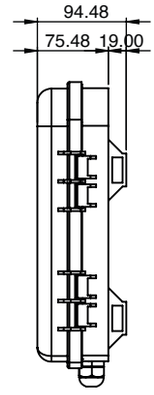
3D View



Side View

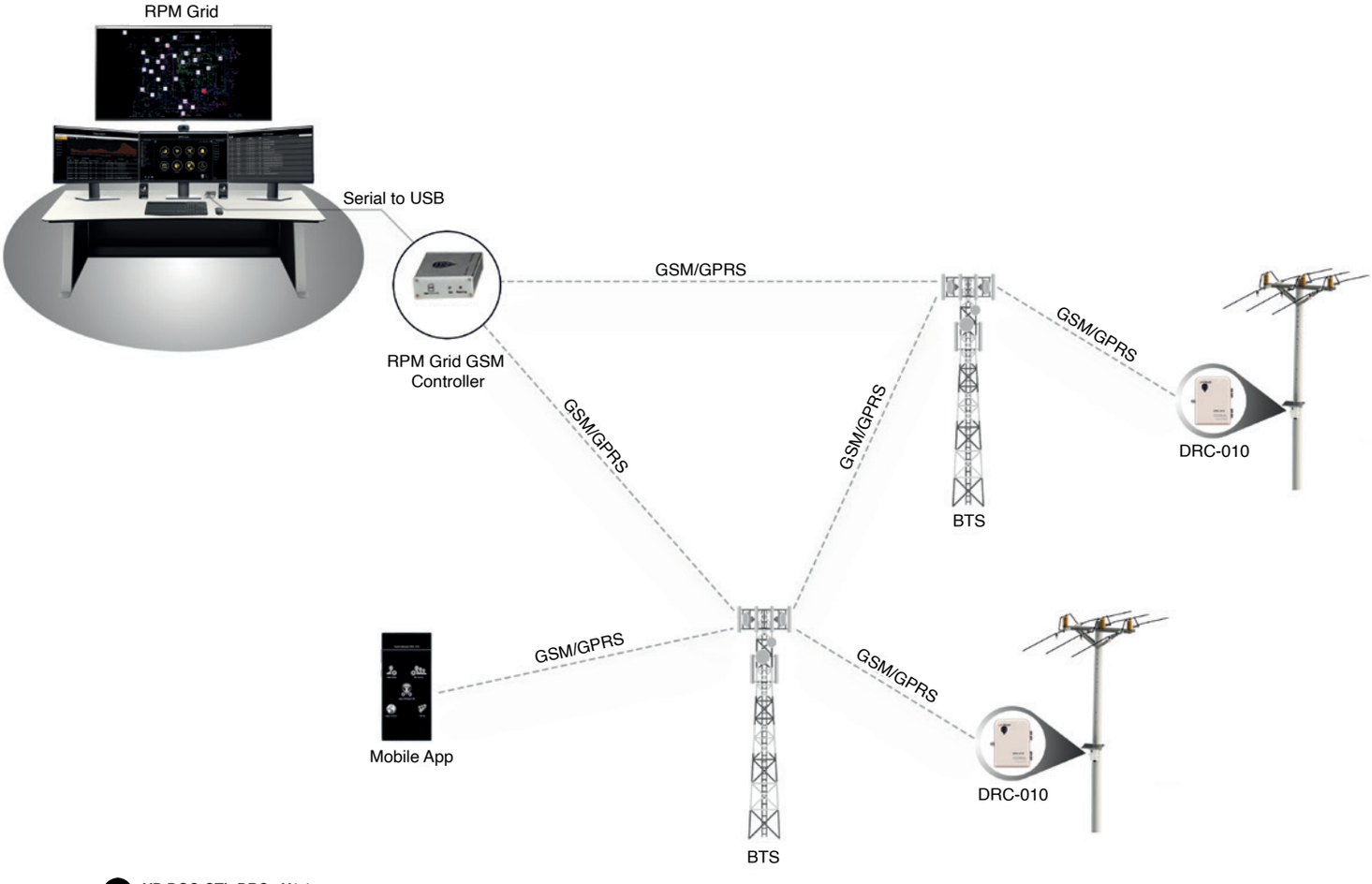


Front View



Side View

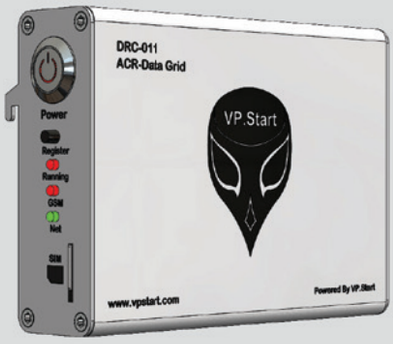
System Diagram



DRC-011 Remote Control for Auto Recloser

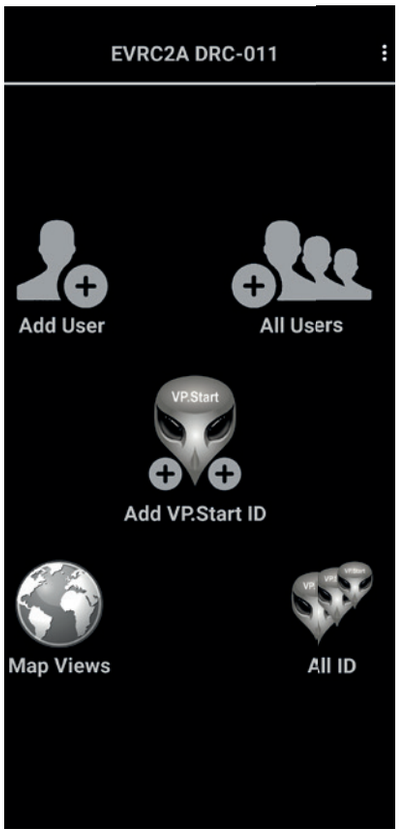
ENTEC Auto Recloser Connected with DRC-011

- Remote Control mode (anywhere, anytime) on Auto Recloser via smartphone app.
- Remotely Trip or Close Switchgear via smartphone app. or RPM Grid software (PC).
- Alarm and notification function: Switch OFF, 22kV Source OFF.
- Google Map views of DRC-011.
- Remote Control capability functions via RPM Grid and smartphone app.



Application

The DRC-011 is a smart controller for ENTEC auto-reclosers. The DRC-011 enables operators to gain remote control & monitoring capabilities over medium voltage distribution grid operations (22kV & 35kV). Operators benefit from more significant insights such as line fault activity, power information, power quality data and other vital information that help minimize outages, outage duration and increase power reliability. Due to its effective operation, advanced capabilities & results, the DRC-011 maintains its popularity amongst the some of the largest electric utility providers in the market. In addition to the benefits yielded from enhanced capabilities through the DRC-011 smart-controller for ENTEC auto-reclosers, such as increased energy efficiency, reliability and minimization of power losses on the network, operators can also ensure higher levels of safety for their maintenance teams.The DRC-011 uses GSM/GPRS network for communication, control and monitoring via smartphone app application (Android) & RPM Grid system (PC).

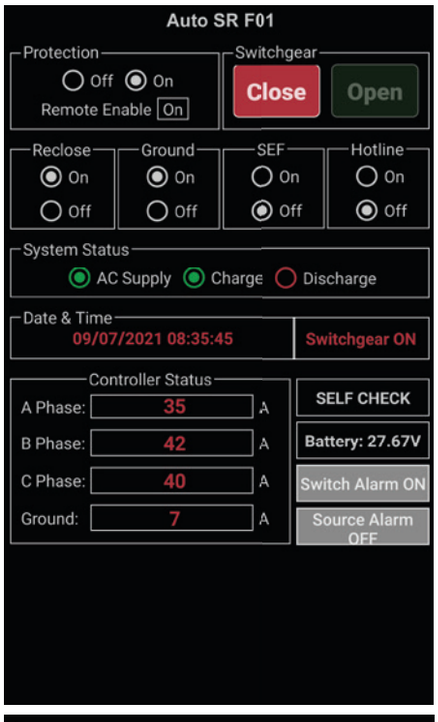


- The DRC-011 is designed to control ENTEC recloser via smartphone app or RPM Grid sofware (PC) to Open or Close the Switchgear whilst retrieving data through the recloser.
- Control & configure multiple DRC-011 controllers through smartphone app or PC application.
- Monitoring recloser measurements data: Current, Voltage, Power (P, Q & S), Power Factor, Battery Voltage, Recloser Protection Status, Recloser data state/flag.
- Record, store and view User Event Logs.
- Call-Control functions to Trip/ Close the Switchgear and check Switchgear position.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Automatic alarm system for various alerts: Switchgear OFF, 22kV Source OFF.
- Google Map views support on DRC-011.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.

Technical Specifications

Remote Control Unit	
Voltage Supply Range	12 - 36Vdc
Operating Frequency Bandwidth	GSM/GPRS: 900/1800 (MHz)
Ambient Temperature Range	0 to 65°C
Humidity	30% to 95%

Remote Control Functions	
Control Function:	
Control Switchgear (Trip/Close)	Open/Close
Configuration Settings:	
Protection Setting:	On/Off
Recloser Function	On/Off
Hotline Setting	On/Off
Sensitive Earth Fault Setting	On/Off
Ground Protection	On/Off
Alarm Setting	Source Alarm (on/off), Switchgear Alarm (on/off)
Monitoring:	
Measurement	Current, Voltage, Real Power, Reactive Power, Apparent Power, Power Factor, Battery Voltage.
Switchgear Position	(Open/Close)
System SELF CHECK	Yes
Battery System Status	AC Supply, Charge, Discharge



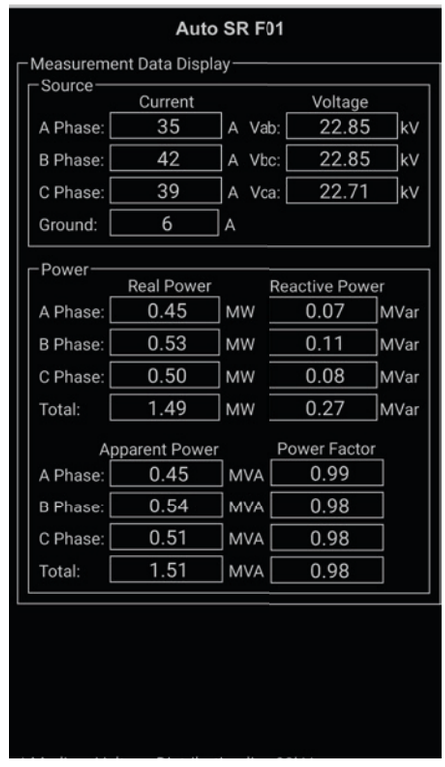
Track controller Location Via Google Maps (Tracking Abilities Function)	Yes
Reporting & Event log	
User Event Logs	Yes
Alarm	
Switchgear Off Alarm	Yes
Source Supply Off Alarm	Yes

Software & Admin Settings

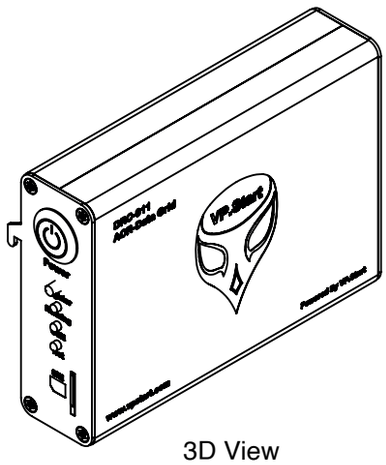
Add/Remove Users	Yes
Add/Remove Controller (DRC-011)	Yes
View all Users	Yes
View all Controllers (DRC-011)	Yes
Controller ID Setting & Tracking Abilities	Yes
Map Views	Yes
Check/Top-up Balance	Yes

Call Control Features

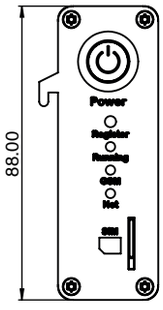
SMS/Call-Control Commands:	
Read Measurement	Current, Voltage, Power
Control Switchgear	Open/Close
Read Switchgear State	Open/Close



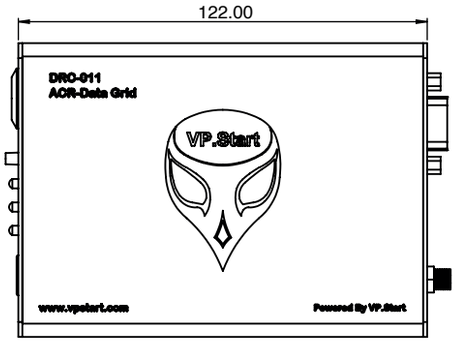
Dimensions



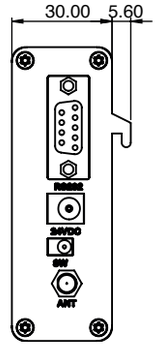
3D View



Side View

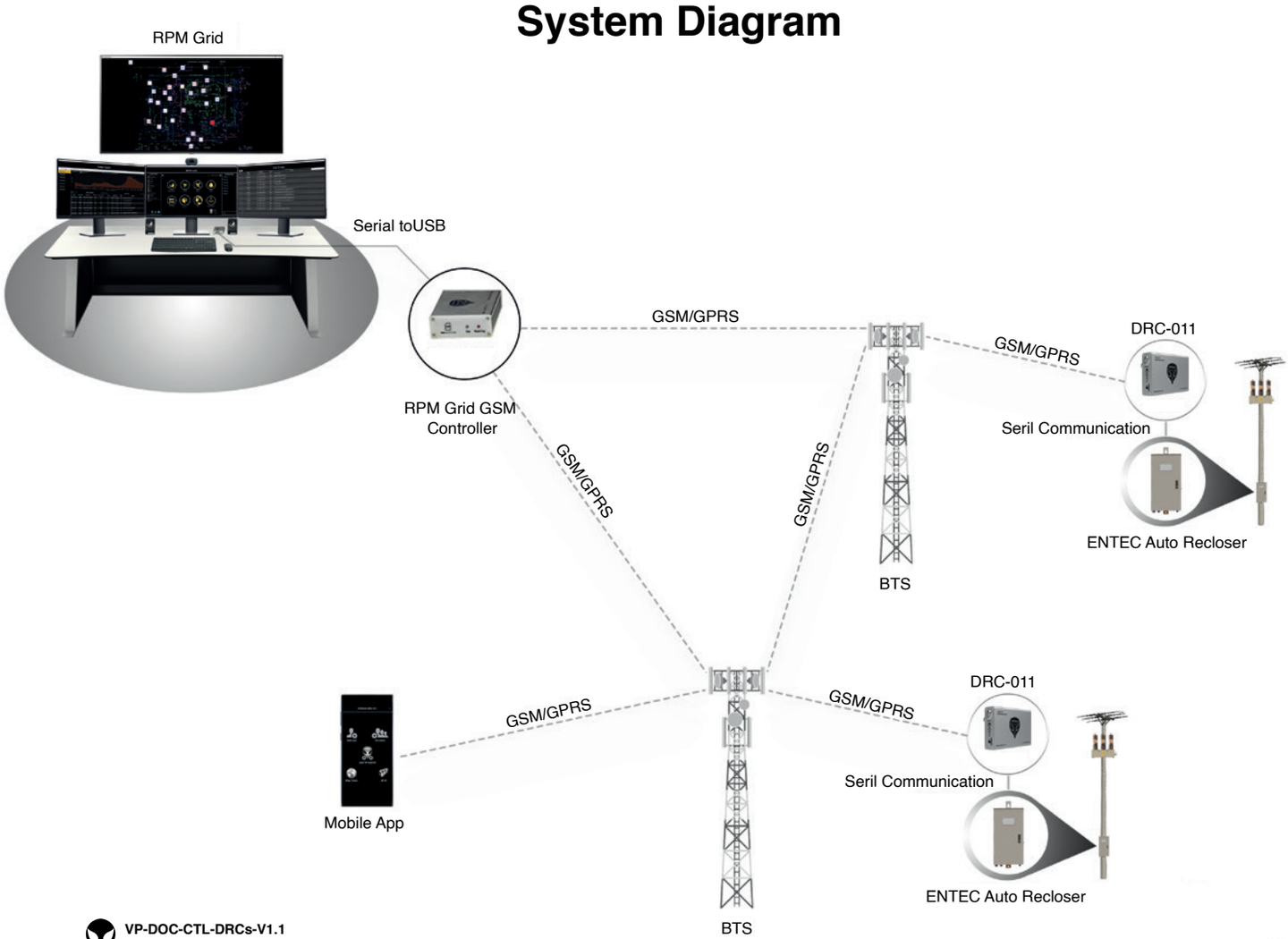


Front View



Side View

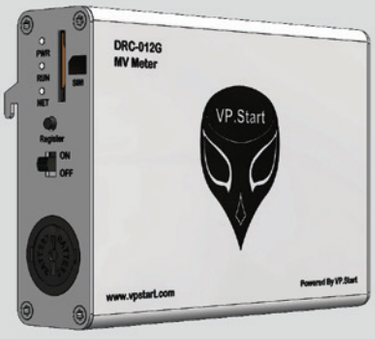
System Diagram



DRC-012G Remote Monitoring for LV/MV Meter

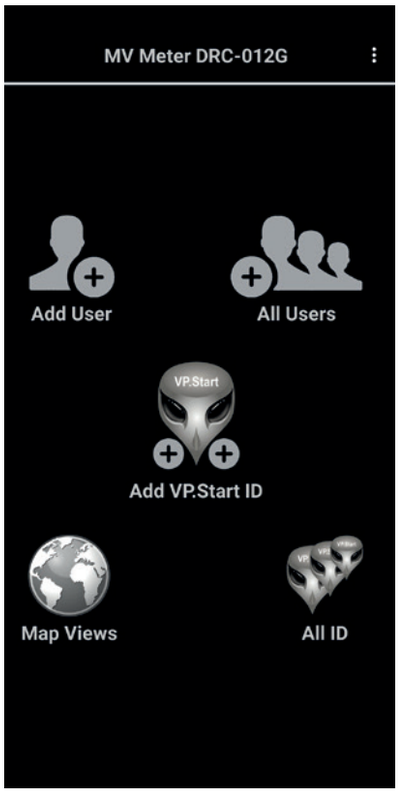
EDMI Meter Connected with DRC-012G

- Remote Monitoring by GSM/GPRS Communication (anywhere, anytime) on MV Meter via smartphone app.
- Remote monitoring meter data: Power, Current, Voltage, Power Factor, Frequency, Energy, TOU.
- Alarm system & notifications: Source Supply OFF, Loss of Phase, Low Current Warning and Door Open.
- Google Map views of DRC-012G.
- Remote Control capability functions via DRS and smartphone app.

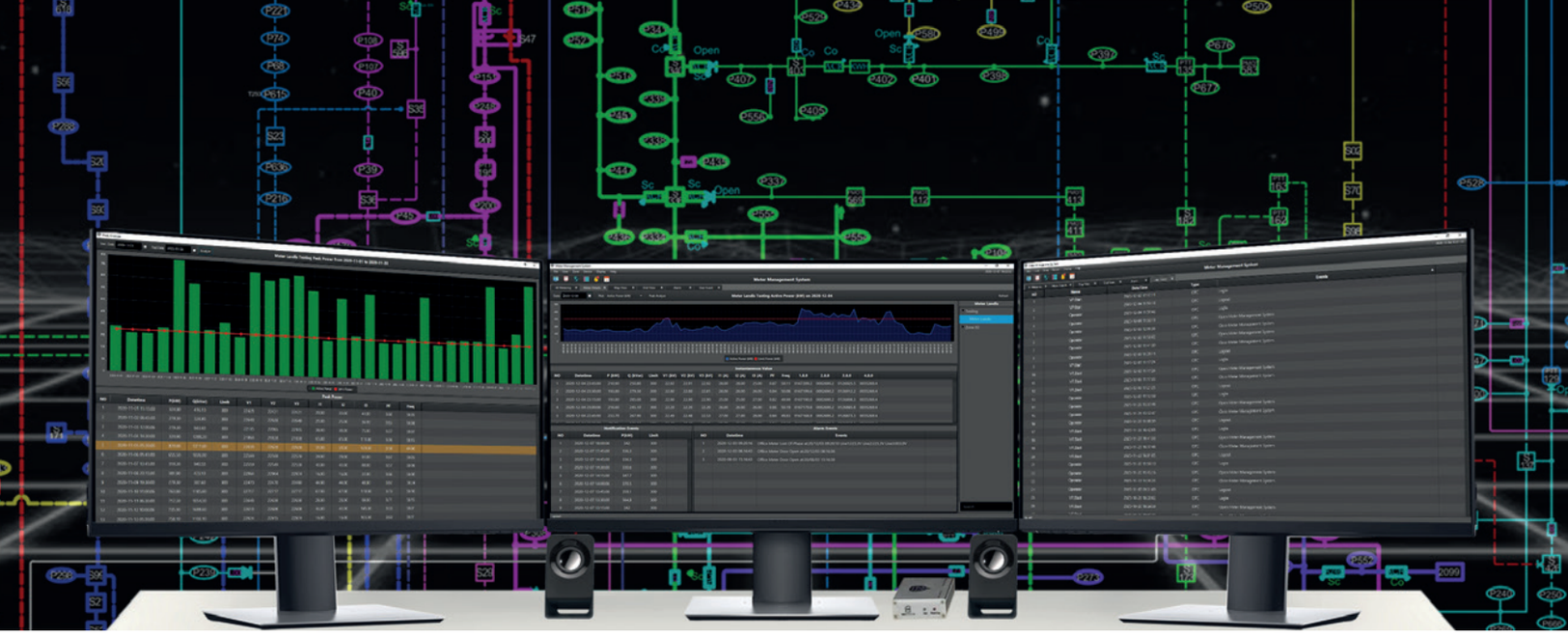


Application

The DRC-012G is a smart controller for EDMI meters. The DRC-012G version can easily integrate to monitor import or export power flows to better meter downstream consumers. The DRC-012G version of the smart-controller uses GSM & GPRS communication as a medium of data transmission while allowing operators to communicate, control and monitor EDMI meter assets at any location. In addition, the DRC-012G smart controller enables operators to view power quality data, load information, power losses and better understand trends in power consumption. The DRC-012G has helped operators reduce OPEX costs, execute better preventive maintenance, enhance decision making & overall improvement in resource planning.



- Monitor & configure multiple DRC-012G controllers through smartphone app or PC application.
- Remotely Monitor Meter Data: Power, Current, Voltage, PF, TOU, etc.
- Record & view data on: Load Measurements, TOU, Power, Energy on LV/MV meters.
- Automatic alarm system for various alerts: Source Supply OFF, Loss of Phase, Connection Loss, Low Current Warning and Door Open etc. Alarm notifications can also be received via SMS with additional detail (date &time).
- Google Map views support on DRC-012G.
- Communication data dynamic encryption, all data is encrypted before being saved into the controller and transmission between the system.
- Add/remove up to 15 users (Admin and User) and retrieve user reports.



Technical Specifications

Remote Control Unit

Voltage Supply Range	12 to 14 (VDC)
Operating Frequency Bandwidth	GSM/GPRS: 900/1800 (MHz)
Ambient Temperature Range	-10 to +70 (ºC)
Operating Humidity	30 to 95(%)
PC Application: DRS Software Solution	Yes
Mobile Application: Android	Yes

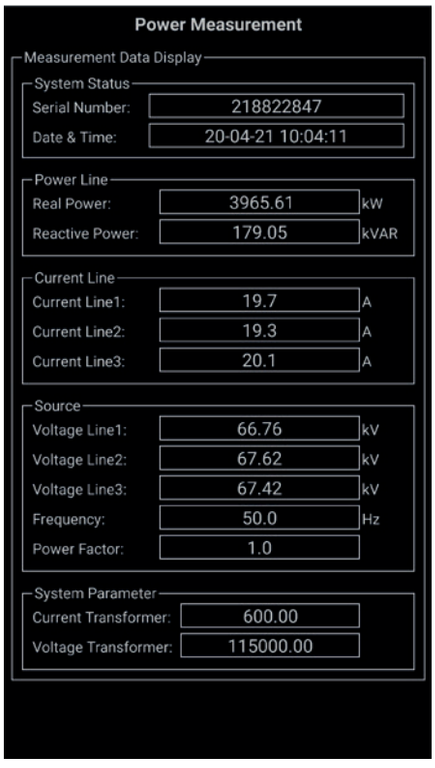
Remote Control Function

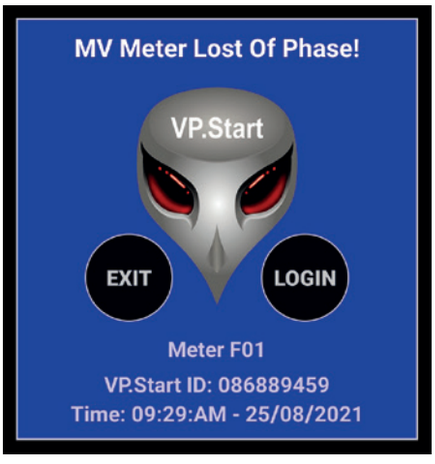
Data Monitoring:

Power: Current, Voltage, Power-Factor, Frequency, Active Power, Reactive Power	Yes
Energy: Active Energy Import, Active Energy Export,Reactive Energy Import, Reactive Energy Export	Yes
Energy TOU (Time of Use)	Yes
Meter Serial Number	Yes
Date & Time Stamps	Yes

System Setting:

Tracking Abilites	Yes
Source Supply OFF Alarm: (On/Off)	Yes
Loss of Phase Alarm: (On/Off)	Yes
Low Current Warning Alarm: (On/Off)	Yes

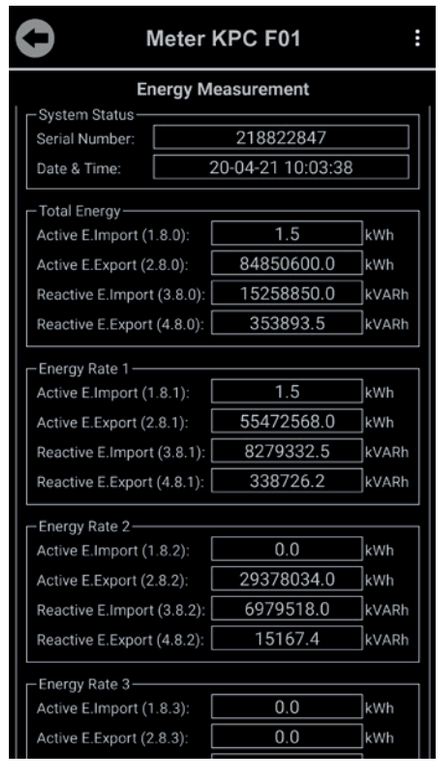




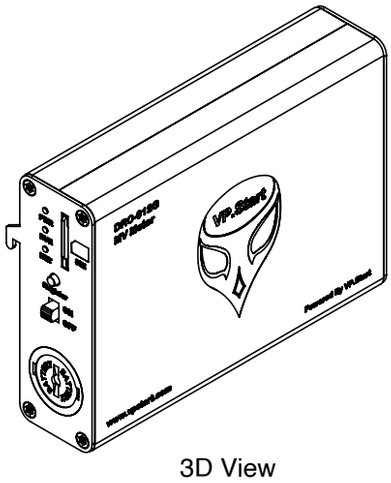
Meter Model Select: (MK10A/MK10E/MK6N)	Yes
Low Current Warning Value: (0.01 to 100.00) Amp	Yes
Meter Interface Connection Select: (Serial/IR-Reader)	Yes

Software & Admin Settings

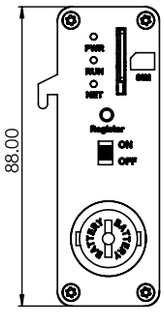
Add/Remove User	Yes
Add/Remove Controller (DRC-012G)	Yes
View all Controllers (DRC-012G)	Yes
View all Users	Yes
Check/Top-up Balance	Yes
Alarm Systems:	
Source Supply OFF Alarm	Yes
Loss of Phase Alarm	Yes
Low Current Warning Alarm	Yes
Door Open Alarm	Yes



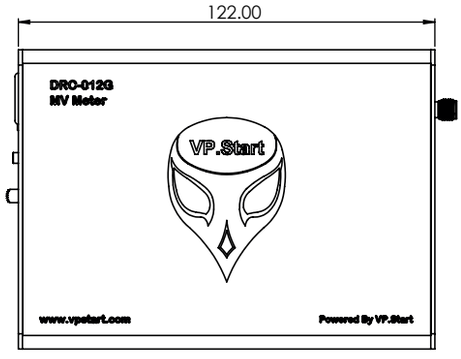
Dimensions



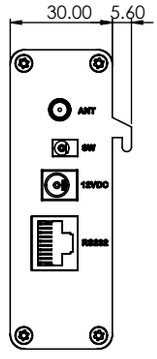
3D View



Side View

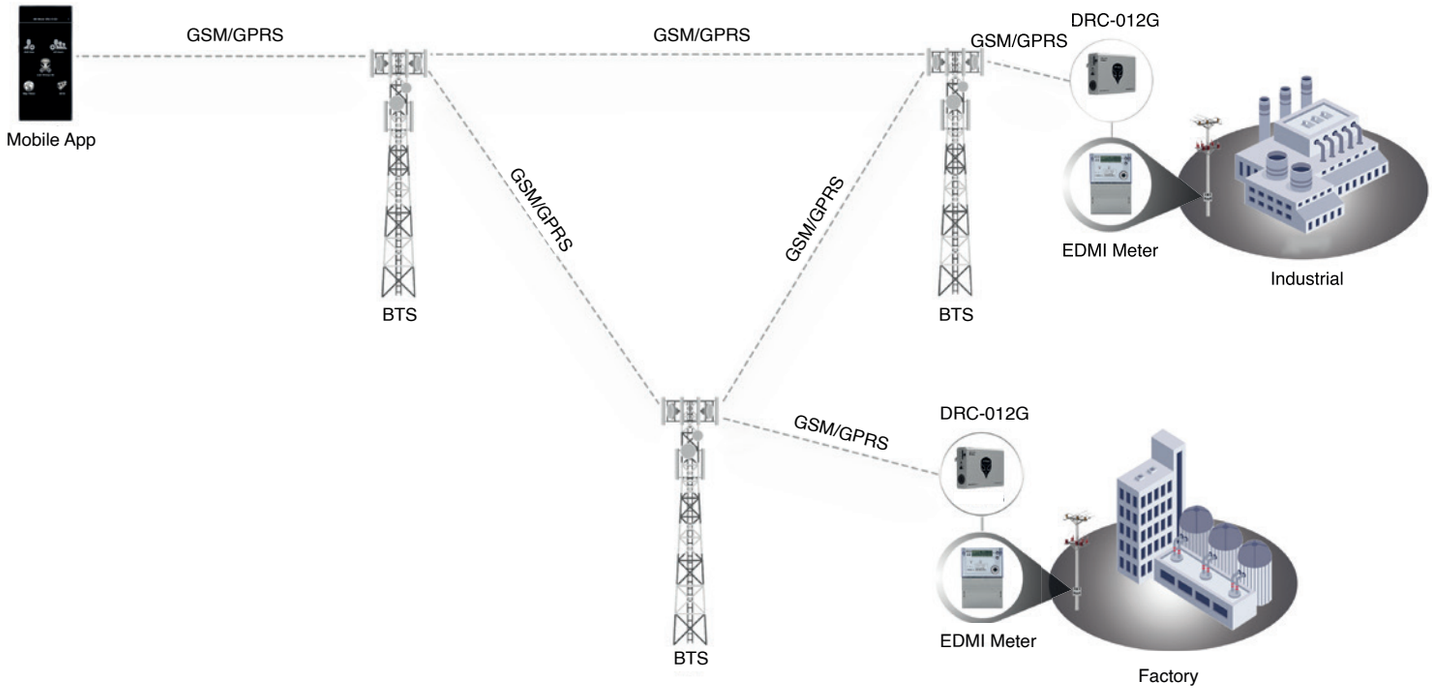


Front View



Side View

System Diagram



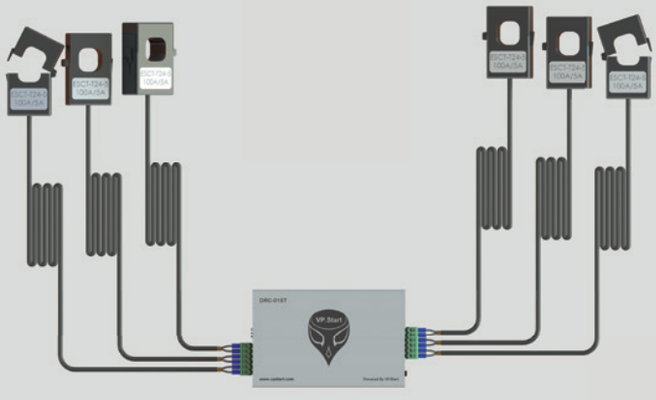
DRC-015G Remote Monitoring for Low Voltage Distribution

Low Voltage Distribution Connected with DRC-015G

- Management, Meaurements, Monitoring and analysis from LVDB system.
- Overload Warning and Alarm notification setting.
- Balanced and unbalanced Distribution Network.
- OPEX costs reductions.
- Intelligent device for automated system management.
- Google Map views support on DRC-015G.
- Remote Control capability functions via LMS.

Application

To enable utilities to monitor the low voltage distribution grid, DRC-015G and LVDB system has been an effective solution for management, measurements, monitoring and data analysis. DRC-015G remote monitoring is a smart CT module connected with LV feeders through CTs sensors that support up to 12 feeders with easy installation and integration with the existing setup. Thus saving on their OPEX costs and operational risks by significant margins.



CT Module and CT Sensors

Technical Specifications

Remote Monitoring Unit (DRC-015G)	
Country of Origin	Cambodia
Manufacture's Name	VP.Start Technology
Model	DRC-015G
Remote Control for LVDB Distribution Station	Remote Controller via PC for LVDB, and can be Configured to Load Tracking System.
Voltage Supply Range	200 - 240 Vac
Operation Temperature	0 to 65ºC
Ambient Temperature Range	-10 to +70ºC
Operating Humidity	30 to 95%
Communication Interface:	
Serial (.c1) RS232	Yes
Serial (.c2) RS485	Yes
Optical Len Port	Yes
GSM/GPRS Communication	Yes
Ethernet Communication	Yes
GPIO Digital Input (1Ch)	Yes
GPIO Digital Output (1Ch)	Yes
Front Panel Indication:	
System Running	Red LED Blinking 1s
AC Power Present	Green LED is ON
System Network	Green LED Flashing

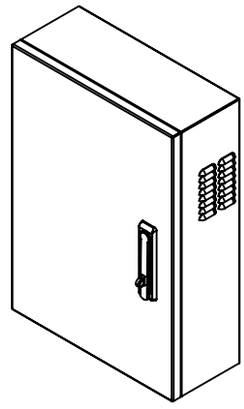
LCD Display for System Local Monitoring	Yes
Feeders Line Current Measurement (3Ph)	Yes
Feeder Line Over Limited Current Indication LED	Yes
Button Selected Feeder to Monitor on LCD	Yes
Support Upto 6 DRC-015T (36 Channels)	Yes
PC Software Configuration Tools:	
PC Application	DRC-015G Desktop App Configuration Tool

Remote Monitoring Functions & Features

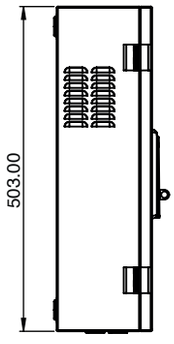
Monitoring Features:	
Power Source Voltage	Power Source Voltage (Reading from Landis +Gyr, EDMI)
Power Source Current	Power Source Current (Reading from Landis +Gyr, EDMI)
Room Temperature	Yes
Feeders Current Flow	Yes
Feeders Over Limited Current	Yes
Analysis Tools:	
Daily Over Limited Current Analysis	Yes
Feeder Line Trafic Analysis	Yes
Daily, Weekly & Monthly Feeder Over Limited Current Report	Yes
Feeder Line Current Warning	Yes
System Setting:	
Station Name	Yes
Feeders Name	Yes
Power Source OFF Alarm (On/Off)	Yes
Over Limited Current Alarm (On/Off)	Yes
Over Limited Current Value	1 to 380 Amp
Current Warning Notification (On/Off)	Yes
Current Warning Value	1 to 380 Amp
Room Temperture Overheat Alarm	35 - 100ºC
Meter Interface Connection	c2/.c1/Optical-Len
Data Upload/Refresh	15, 30, 45, 60 Min
System Alarm:	
Over Limited Current Alarm	Yes

Power Source OFF Alarm	Yes
Over Temperature Dectection & Alarm	Yes
Physical Specification:	
Position Mounting	The (DRC-015G) Solution is Installed and able to mount inside the Distribution-Station or PMT at to appropriate wall-space/area.
Cabinet Dimention	H=482 x L=160 x W=322mm.
DRC-015T (CT Module)	
Country of Origin	Cambodia
Manufacture's Name	VP.Start Technology
Model	DRC-015T
Controller Application	The Controller is Connected to DRC-015G.
Voltage Supply Range	12 - 24Vdc
Operation Temperature Range	0 to 65ºC
Ambient Temperature Range	-10 to +70ºC
Operating Humidity	30 to 95%
Communication Port	RJ45
Status LED Indicate System OK	Red LED is ON
CT Interfacing	Supported with 6 CTs (2 Feeders)
Over Limited Current Detection	Detect While Current is Over the Limited Value
Current Measurement	0 - 380Amp
Physical Specification	
Position Mounting	The controller (DRC-015T) is connected to DRC-015G and shall be mounted on its provided support.
Cabinet Dimention	H=28 x L=100 x W=66mm.

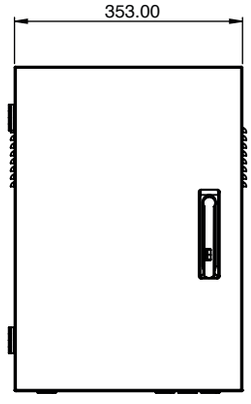
Dimensions



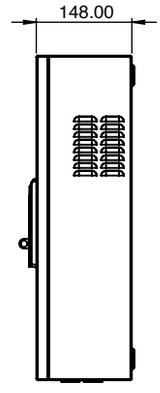
3D View



Side View

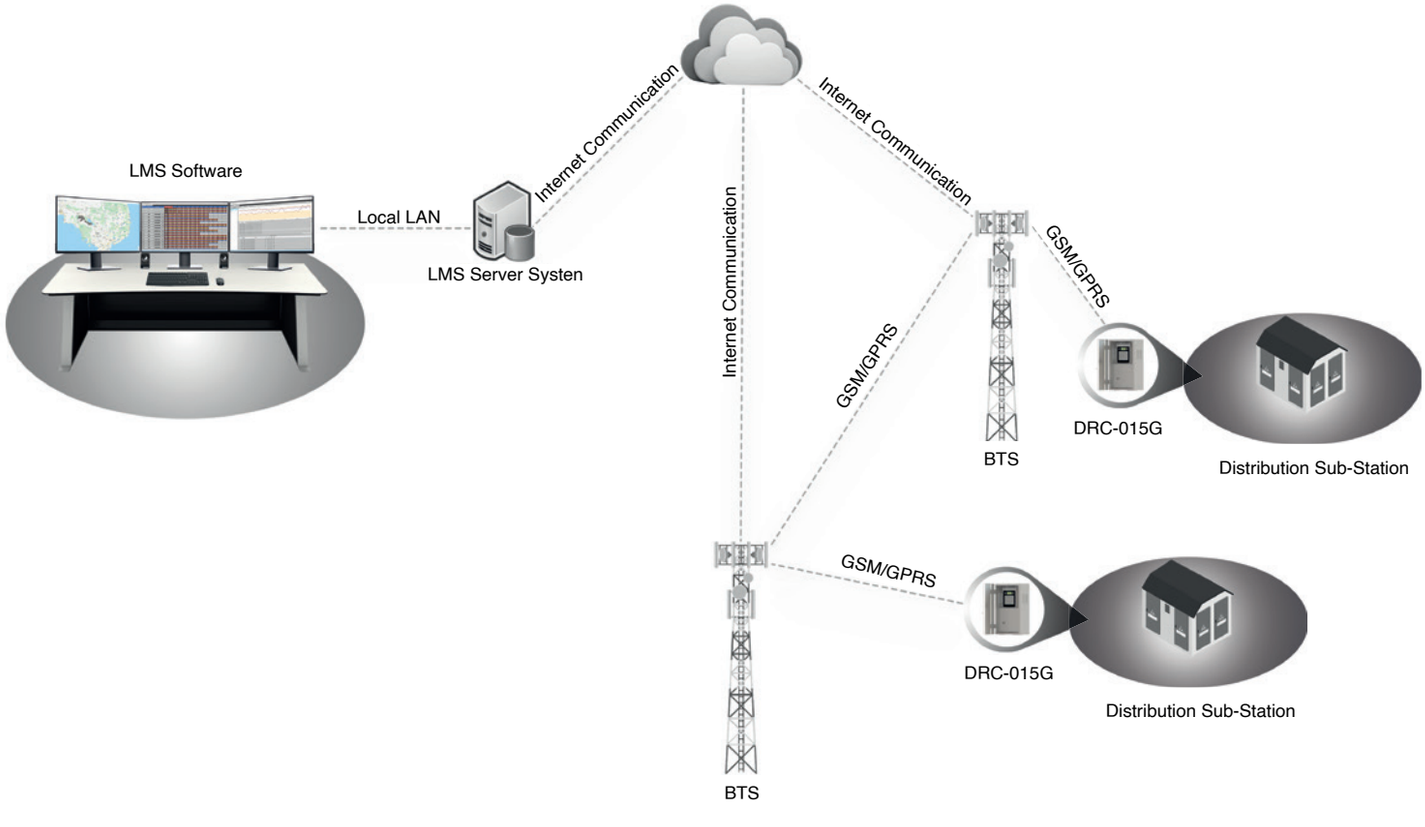


Front View



Side View

System Diagram



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