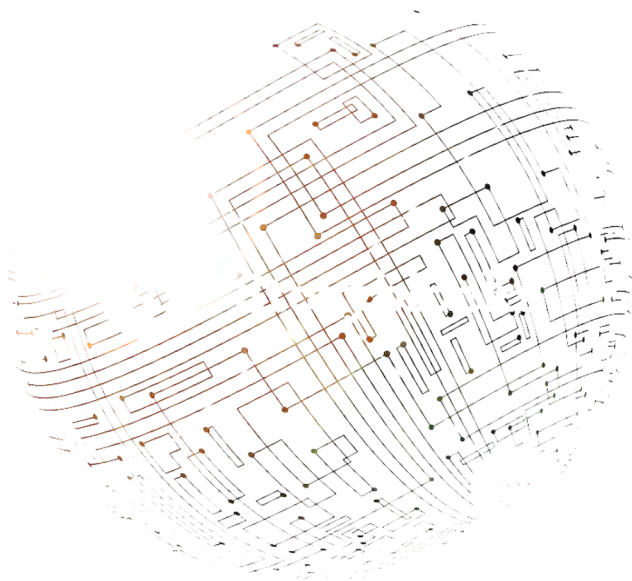




Verticross India Pvt. Ltd.

vSmart Meter Reader APP

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INTRODUCTION

The vSmart Meter Reader mobile application offers a cutting-edge solution for acquiring data through an OTG cable in remote locations where other data acquisition options are unavailable. This user-friendly application enables field engineers and substation managers to efficiently read, analyze, and manage meter data, ensuring accurate data collection, timely reporting, and effective task management, even when physical or related issues hinder data acquisition.

The vSmart Meter Reader provides a comprehensive solution with features that simplify meter data management. Field engineers can remotely read meter data through the application, removing the need for manual data entry and minimizing the risk of human error.

The application also includes powerful tools to analyze meter data, allowing users to identify trends, anomalies, and potential issues. Additionally, vSmart Meter Reader streamlines task assignment and tracking, equipping field engineers with the necessary information to complete tasks efficiently.

The application generates comprehensive reports that users can easily share with stakeholders, offering valuable insights into meter performance and system health. vSmart Meter Reader also allows users to access and manage meter data remotely, enhancing collaboration and improving response times.

The vSmart Meter Reader application serves as a powerful tool for field engineers and substation managers looking to optimize meter data management and deliver exceptional results.

This user manual guides you through the installation, configuration, and usage of vSmart Meter Reader, with detailed instructions for each feature and function.

By using vSmart Meter Reader, you can:

- Reduce manual data entry and errors,
- Improve data accuracy and consistency,
- Enhance operational efficiency and productivity,
- Boost customer satisfaction with faster response times and better service,
- Gain valuable insights into energy usage patterns and identify potential issues.

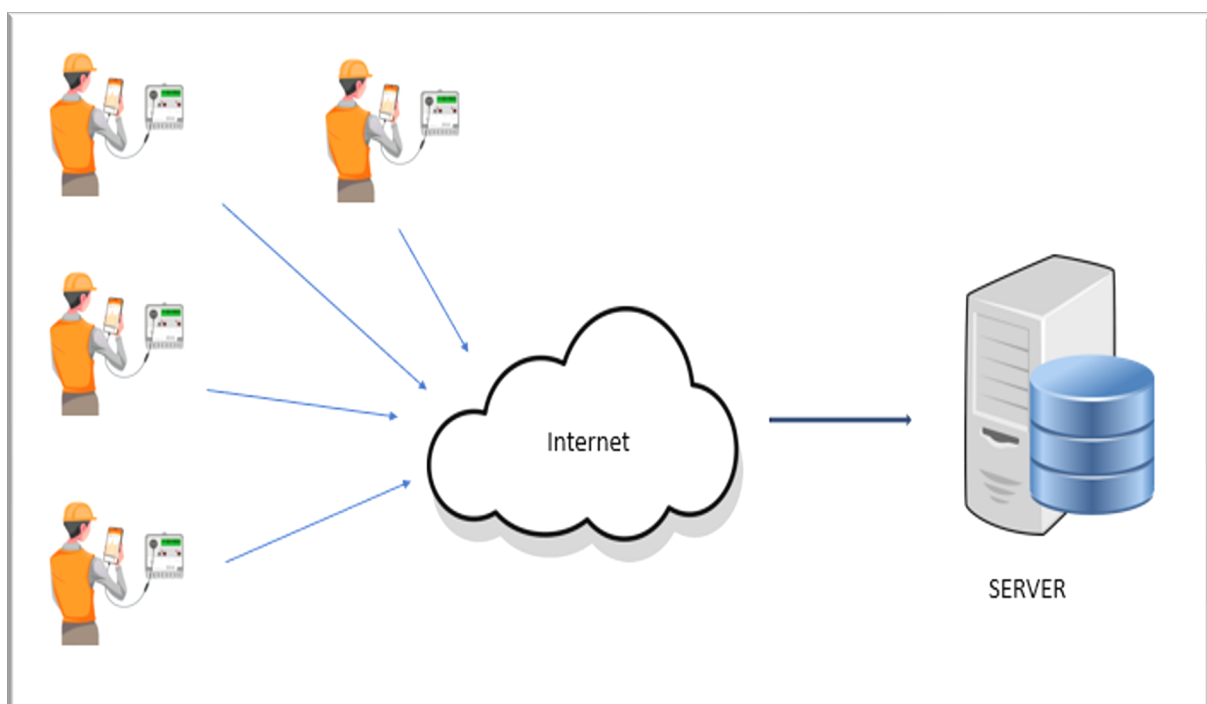
The vSmart Meter Reader is a powerful tool that helps utilities and energy service providers achieve their goals and stay competitive. With its comprehensive features and user-friendly interface, the app serves as a valuable asset for any organization seeking to streamline meter data management processes and enhance overall efficiency.



PREREQUISITES

- Android Mobile (RAM – 8 GB & ROM 256 GB)
- Below accessories are required for downloading of meter data.
 - a. OTG (On-The-Go) cable (Varies from mobile to mobile)
 - b. F2F Connector
 - c. USB to Serial (BAFO) cable for PC to modem connectivity.
 - d. Optical Cable
- GPRS Coverage

ARCHITECTURE



The above architectural diagram illustrates a system where field workers collect data using handheld devices, which is then transmitted via the internet to a central server for storage and processing.

This architecture enables real-time data collection and analysis, improving efficiency and decision-making, including meter reading, infrastructure inspection, environmental monitoring, and asset tracking. However, it relies on a stable internet connection and secure data transmission protocols to ensure reliable and protected data flow.

- **APK File Acquisition:**
 - Available via FTP, Email, or WhatsApp Sharing
- **Permissions Required:**
 - Phone
 - Storage
 - Location
 - Camera



FUNCTIONALITIES AND FEATURES

USER REGISTRATION

First-time users must register to start using the app. To create an account, simply click “SIGN UP” and enter the required details, including your device ID, name, email address, and mobile number. This quick registration process ensures a secure and personalized experience, allowing you to access all of the app’s powerful features right away

VSsmartReader

SignUp

Device Id f925fb0394e4cf1e

Name

Email Id

Mobile No

SUBMIT

After registration, a super user or project manager will assign necessary privileges.

USER LOGIN

Existing users can easily log in by entering their credentials on the login screen. Once logged in, you'll be taken directly to the main interface, where you can immediately access all the app’s features and tools. This seamless login process allows returning users to dive straight into managing and analyzing meter data efficiently.





DIAGNOSIS

Field engineers can quickly check the communication status by entering the modem's serial number. The app uses color-coded borders to indicate different statuses, allowing for instant recognition:

- **Green:** Data upload is successful, and communication is fully operational.
- **Yellow:** Communication is partial, suggesting potential issues that may need attention.
- **Red:** No communication, indicating that data is not being transmitted.

This system gives engineers immediate visual feedback, helping them assess and address connectivity issues efficiently.

TOC	ATTEMPTS	TIMESTAMP
TIMESYNC	1	19-10-2020 02:28:00
DIAGNOSIS	16	19-10-2020 14:12:02
ALERTS	0	
UNKNOWN	0	
RD IP	56	19-10-2020 14:46:28
RD CD	0	

To run a diagnosis, click on the "Diagnosis" option at the top of the screen. Enter the modem's serial number in the provided field, then click the "Get" button to receive a detailed diagnosis. This feature allows users to quickly access and assess the modem's status with just a few clicks.

DOWNLOADS

Once all the necessary accessories for downloading meter data are connected, click on the "Download" option and select the OTG cable. After successfully selecting the OTG cable, the screen will display a "Connected" message at the bottom, confirming that the connection is established and ready for data transfer.

connected



Connect the required accessories and select the OTG cable to begin downloading meter data. Then, click “DETECT METER” to authenticate the meter, ensuring a secure and accurate connection for data retrieval.



Once the meter is identified, select the type of data you wish to download and begin the download process. After the meter data has been successfully downloaded, click on “Show Details” to view the instantaneous profile of the meter, providing you with real-time data and insights.

PARAMETER	VALUE
REAL TIME CLOCK DATE AND TIME	19-10-2020 17:03:30
METER SERIAL NUMBER	XB470236
MANUFACTURER NAME	SECURE METERS LTD.
FIRMWARE VERSION FOR METER	M130003
INTERNAL CT RATIO	20
INTERNAL PT RATIO	100
METER TYPE (3P-3W / 3P-4W)	3P14-W
METER YEAR OF MANUFACTURE	2016
DEMAND INTEGRATION PERIOD	15
PROFILE CAPTURE PERIOD	15
CURRENT IR	0.00330
CURRENT IY	0.00478
CURRENT IB	0.00183
SIGNED ACTIVE POWER KW (+ FORWARD-REVERSE)	-0.00800
SIGNED REACTIVE POWER KVAR (+ LAG-LEAD)	0.00100
APPARENT POWER KVA	0.00900
VOLTAGE VIN	5832.80700
VOLTAGE VYN	5827.51300
VOLTAGE VEN	0.70800
SIGNED POWER FACTOR R PHASE	1.00000
SIGNED POWER FACTOR Y PHASE	1.00000
SIGNED POWER FACTOR B PHASE	1.00000
THREE PHASE POWER FACTOR PF	1.00000
FREQUENCY	49.99200
REAL TIME CLOCK DATE AND TIME	19-10-2020 17:03:31
BILLING DATE	06-03-2019 10:37:27
CUMULATIVE POWER FAILURE DURATION	1174851
NUMBER OF POWER FAILURES	710.000

(Instantaneous profile of the meter)



REPORTS

Users can easily access instantaneous reports for any meter by entering the meter's serial number and clicking the "Get" button, as shown below. This simple process allows for quick retrieval of up-to-date meter data and insights.

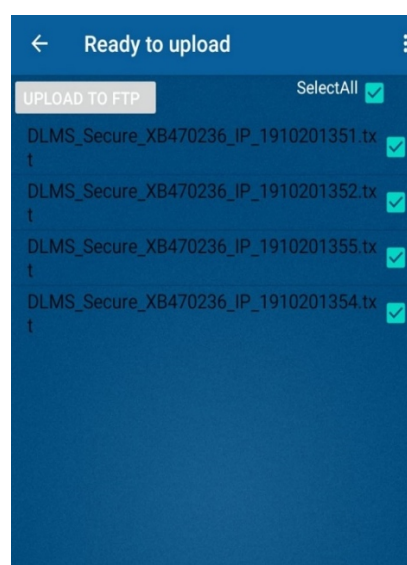


PARAMETER	VALUE
METER SL NO	00389597
MODEM RTC	19-10-2020 14:32:06
METER RTC	19-10-2020 14:35:16
RPH VOLTAGE	244.0800
YPH VOLTAGE	244.9400
BPH VOLTAGE	244.1900
RPH CURRENT	1.5500
YPH CURRENT	1.6100
BPH CURRENT	2.4400
RPH PF	0.9900
YPH PF	0.9900
BPH PF	0.9900
AVG PF	0.9900
KVA	1.3690
KVAR	0.0620
KW	1.3670
FREQUENCY	49.8900
CT MISSING PHASES	CURRENT IN ALL THREE PHASES
CT STATUS	ON LOAD

(instantaneous report of meter)

UPLOAD

After downloading the meter data, engineers can upload it to the server using the upload feature. They can select individual items as needed or simply click the "Select All" checkbox to upload all data at once, streamlining the process and ensuring efficient data transfer.





USER MANAGEMENT

Access to certain features and functions is restricted based on the privileges assigned by the Super User or Project Manager. These roles ensure that users only have access to the tools and data necessary for their tasks, helping to maintain security and proper data management within the system.

← User Management					
User	Diagnosis	Download	Upload	Reports	UserMngmn
Raam	☒	☒	☒	☒	☒
shiva	☒	☒	☒	☒	☒
maru	☒	☒	☒	☒	☐



CONFIGURATION

This section enables users to read, update, or clear the modem's configuration settings once the OTG cable is connected and the modem is powered on. It provides a convenient interface for managing modem settings, ensuring that users can easily configure or reset the modem as needed for optimal performance.

← CONFIG SETTINGS

READ

Server Settings

SIM Settings

Transparent Settings

Modem Settings

UPDATE CLEAR

← CONFIG SETTINGS

READ

Server Settings

SIM Settings

Transparent Settings

Modem Settings

UPDATE CLEAR

MCONFIG:20,1,8,N,1,upcl,,192.168.2.2,54000,2007,1,9100050646,01,00,02,00,63000,mdas,mdas@123,,1,05,,,,,1,IMEI 867584034980420,SIM REGR OK,EEPROM OK,VIPL4G0002,ETHERNET NOTOK,POWER OK,SIMNO 89915381171419899084,SIMIP 10.13.112.63,15,END

← CONFIG SETTINGS

READ

Server Settings

IP ADDRESS

Primary 192.168.2.2

Secondary

TCP/IP PORTS

54000

ALERTS

METER DATA

63000

FTP DETAILS

USER NAME mdas

PASSWORD mdas@123

PORT

SIM Settings

Transparent Settings

Modem Settings

← CONFIG SETTINGS

READ

Server Settings

SIM Settings

Transparent Settings

Modem Settings

LISTENING PORT

9100050646

MASTER - 1

VIPL4G0002

MODEM NO

MODEM TYPE INTELLIGENT

IP INTERVAL 15 MINS

LS DAYS 05

READ TIME 01 00

TRANSMIT TIME 02 00

UPDATE CLEAR

MCONFIG:20,1,8,N,1,upcl,,192.168.2.2,54000,2007,1,9100050646,01,00,02,00,63000,mdas,mdas@123,,1,05,,,,,1,IMEI 867584034980420,SIM REGR OK,EEPROM OK,VIPL4G0002,ETHERNET NOTOK,POWER OK,SIMNO 89915381171419899084,SIMIP 10.13.112.63,15,END

← CONFIG SETTINGS

READ

Server Settings

SIM Settings

Transparent Settings

Modem Settings

BAUD RATE Select Baudrate

PARITY None

DATA BITS 8

STOP BITS 1

Modem Settings

UPDATE CLEAR

MCONFIG:20,1,8,N,1,upcl,,192.168.2.2,54000,2007,1,9100050646,01,00,02,00,63000,mdas,mdas@123,,1,05,,,,,1,IMEI 867584034980420,SIM REGR OK,EEPROM OK,VIPL4G0002,ETHERNET NOTOK,POWER OK,SIMNO 89915381171419899084,SIMIP 10.13.112.63,15,END

← CONFIG SETTINGS

READ

Server Settings

SIM Settings

SIM -1 upcl

APN

USER NAME

PASSWORD

Transparent Settings

Modem Settings

UPDATE CLEAR

MCONFIG:20,1,8,N,1,upcl,,192.168.2.2,54000,2007,1,9100050646,01,00,02,00,63000,mdas,mdas@123,,1,05,,,,,1,IMEI 867584034980420,SIM REGR OK,EEPROM OK,VIPL4G0002,ETHERNET NOTOK,POWER OK,SIMNO 89915381171419899084,SIMIP 10.13.112.63,15,END



Protocols implemented in the Application

To facilitate both reading data from the meter and transmitting it to the server, several communication protocols can be used:

1. DLMS/COSEM Protocol

- **Purpose:** The core protocol for communication between the mobile application and the meter.
- **Usage:** DLMS/COSEM is used to **query** and **retrieve data** from the meter. The protocol handles message encoding, authentication, data encryption, and ensures that data is transmitted in the correct format between the meter and the mobile device.
- **Features:**
 - **Secure Data Exchange:** DLMS ensures data integrity and confidentiality.
 - **Remote and Local Access:** Supports both local optical communication and remote communication via Ethernet, serial ports, etc.
 - **Transport Layer:** DLMS can run over different physical layers like optical, Ethernet, or serial connections.

2. HTTP/HTTPS (RESTful API)

- **Purpose:** To transmit the acquired meter data to a central server over the internet.
- **Usage:** The mobile application can use **HTTP** or **HTTPS** protocols to send data to the server via a **RESTful API**. The data is typically formatted as **JSON** or **XML**.
- **Security:** **HTTPS** ensures encrypted data transmission over the internet, protecting the data during transmission.
- **Advantages:** Reliable, widely supported, and easy to integrate with cloud-based systems and databases.

3. MQTT (Message Queuing Telemetry Transport)

- **Purpose:** A lightweight messaging protocol optimized for **low bandwidth**, **low power**, and **real-time communication**.
- **Usage:** The mobile application can publish the meter data to an **MQTT broker**, which forwards it to the server. This is particularly useful for IoT applications with many devices sending small amounts of data intermittently.
- **Advantages:** Very efficient, works well over unstable networks, supports **real-time** data transmission.
- **Data Format:** Typically uses **JSON** or **binary formats** for transmitting meter data.

4. Wi-Fi / Cellular Networks (4G/5G)

- **Purpose:** To transmit meter data to the server once it has been collected by the mobile device.



- **Usage:** Once the mobile device acquires and processes the meter data using the **DLMS/COSEM protocol**, it sends the data to a server over a **Wi-Fi** or **cellular network** (e.g., 4G/5G).
- **Security:** Secure communication using **SSL/TLS** encryption.
- **Advantages:** High data rate, suitable for mobile or stationary applications.
- **Applications:** Used in areas with good network coverage or where remote transmission of meter data is required.

BENEFITS

- **Seamless Data Collection:**

- Effortlessly connect mobile devices to meters using OTG cables and connectors.
- Automatically detect meter serial numbers and manufacturer types for quick setup.
- Instantly download meter data, including real-time profiles, historical readings, and event logs.

- **Real-time Monitoring:**

- Track communication status and meter health in real-time to ensure seamless operation.
- Receive immediate notifications about any anomalies, issues, or critical events, enabling prompt action.

- **Comprehensive Reporting:**

- Generate detailed reports on meter data, covering consumption trends, anomalies, compliance, and energy usage patterns.
- Analyze data to identify potential issues, optimize energy efficiency, and enhance customer satisfaction.

- **Efficient Task Management:**

- Assign tasks to field engineers and track their progress in real-time, ensuring timely completion.
- Capture essential details about rectification activities, including observations, actions taken, images, and GPS coordinates.
- Streamline the workflow for effective task management and reporting, improving overall operational efficiency.

- **Remote Configuration and Management:**

- Configure modem settings and update firmware remotely, eliminating the need for on-site intervention.
- Send SMS commands to modems for troubleshooting, adjustments, and remote control.



- **Enhanced Security:**

- Safeguard sensitive data with robust security measures, including encryption and authentication.
- Ensure compliance with industry standards and regulations, maintaining the highest levels of data protection and privacy.