

Meter Data Acquisition System In Power Utilities

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Abstract: Reeling under an average AT & C losses of around 33%, it is quite impossible for power distribution sector to keep up the desired economic pace without major reforms in the Power sector, especially in Distribution. System Integrator has been working closely in Power distribution sector to address AT & C loss reduction, bring transparency, improve customer satisfaction and increase employee productivity through right convergence of IT & Automation. Technology innovation can only benefit the sector and system integration has major role to play in empowering the power distribution utilities. There is a huge need for specialized, customized and upgraded system solution for the power sector and System Integration Power solutions can help utilities to make a significant leap in Field Automation and reducing their Aggregate Technical and Commercial losses. The objective of Meter Data Acquisition Solution Provider is to collect meter data of DT and consumer meters at desired frequencies remotely and make available for DISCOM operations.

Keywords: Data Concentrator Unit (DCU), Meter Data Acquisition Solution (MDAS), Automatic Meter Reading (AMR), Common Automatic Meter Reading (CAMR)

I. INTRODUCTION

Meter data acquisition system, supply necessary hardware, software and communication equipment in the Substations, DTs and select consumers in the towns for the purpose of centralized meter data logging. The substation Data logger PC will acquire data from Feeder Meters and will transmit the same to Sub division office server through a GSM/GPRS/EDGE/CDMA/PSTN/LPR Modem, whereas the Sub division office Data Acquisition server will acquire data directly from all Distribution Transformers as well as HT/select LT Consumers through GSM/GPRS/EDGE/CDMA/LPR Modems.

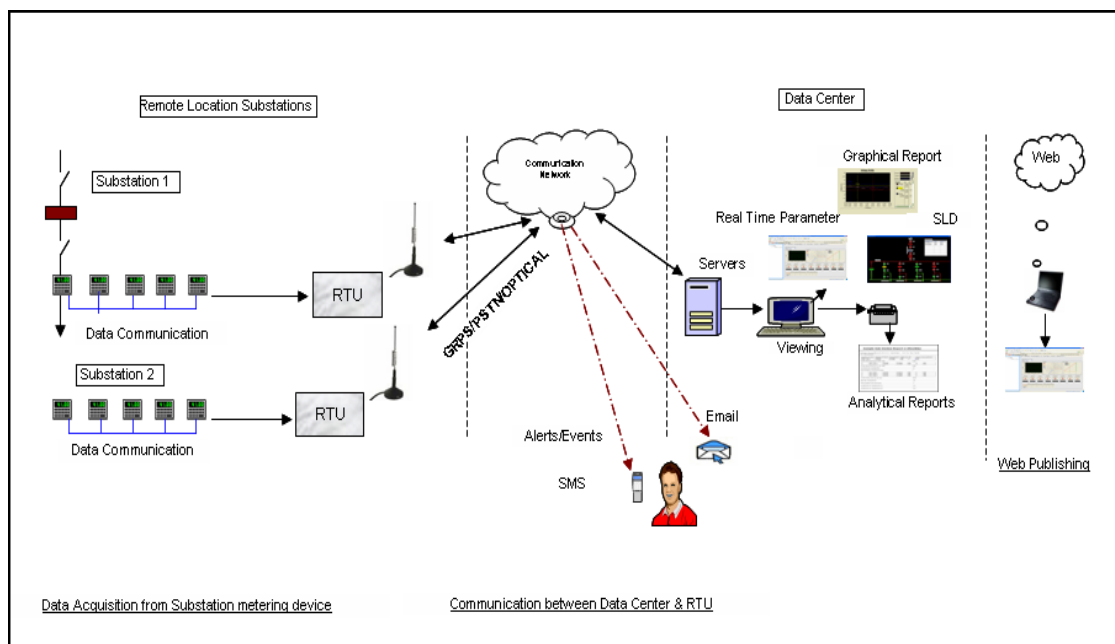


Fig. 1. Architecture of MDAS system

The Data acquisition servers at all sub division offices shall push the entire meter data to central data centre on incremental basis during off-peak period on daily basis through MPLS/VPN based WAN network for data aggregation, analysis and generation of MIS report as per requirement of the utility.

II. OBJECTIVE

The main objective is to acquire meter data from System and Select consumer meters automatically from remote avoiding any human intervention, Monitor important distribution parameters, use meter data for accurate billing purposes and generate exceptions and MIS reports for proper planning, monitoring, decision support and taking corrective actions on the business activities by the management. The above objective under this specification is achieved by providing an Automatic Meter Reading (AMR) based Data Logging System using any of the available Communication Technologies like GSM, GPRS, EDGE, CDMA, PSTN or Low Power Radio covering all the Feeder Meter, DT Meters and select Consumer Meters in the entire Utility area.

III. PURPOSE OF THE RESEARCH

For solving the interoperability issue of different make / model of Meters installed presently in different utilities, Utility is responsible for providing meter protocol and memory map of the meters installed in their area.

The proposed Data Logging system is expected to provide continuous on line monitoring and logging

There are the following parameters in respect of all incoming and outgoing feeders, Distribution Transformers and consumers on real time basis :-

- a) Voltage, Phase to Phase and Phase to Neutral
- b) Current on each phase
- c) Power factor
- d) Frequency
- e) Power - Active / reactive / Apparent
- f) Energy – Active, Reactive and Apparent

The proposed system is expected to provide continuous on line monitoring and logging of above mentioned parameters and capability to generate Spread Sheets and MIS report as below:

- a) System outage / downtime feeder wise.
- b) Energy balancing at sub stations.
- c) Daily peak loads feeder / transformer wise.
- d) Peak Load of the Station.
- e) Bus bar profile.
- f) Daily Log sheets & any other forms / reports as required by the Utility

IV. SCOPE OF RESEARCH

The Scope of Meter Data Acquisition Solution Provider is to collect meter data of DT and consumer meters at desired frequencies remotely and make available for DISCOM operations.

This Scope is achieved by supply, installation and commissioning of Common Automatic Meter Reading (CAMR) units with GSM/ GPRS modems at remote meter terminals of identified HT/LT consumer locations and the Distribution Transformer locations.

These units will collect the data from the meter units and send to the central data center in the predefined format at regular intervals. Meter data received will be processed for

- Billing data extraction
- Analysis of metering healthiness
- Analysis of system conditions such as

The scope also includes maintenance of remote CAMR units in case of non response up to a period of 5 years

V. CONCLUSION

The project envisages to implement Automatic meter-reading of various makes of energy meters installed in the 33/11 KV Sub-stations using the Data Concentrator Unit (DCU). The meter data from these Substation feeder meters shall be transferred to Centralized Data base server. This Module collects data from network of metering device installed at incoming & outgoing feeders with in substation. The NG-9601 device is a reliable & consistency solution for processing data from the metering device using Modbus communication protocols. It can handle different interfaces developed on the single FPGA chip which allows data processing in real time.

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BIOGRAPHY

Dr.Utkarsh Seetha has serving as a Project Manager In HCL Infosystems Ltd. Since Oct'09. At present, he is Working as a System Integrator (IT Implementation Agency) for a prestigious Power Sector project "R-APDRP" funded by Power Finance Corporation, Ministry of Power, Government of India He did his Ph.D. in IT Management from Canterbury University and M.Phil. in Management from Alagappa University. He have 12 year experience in Research and development field and also the member of various E-journals.

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