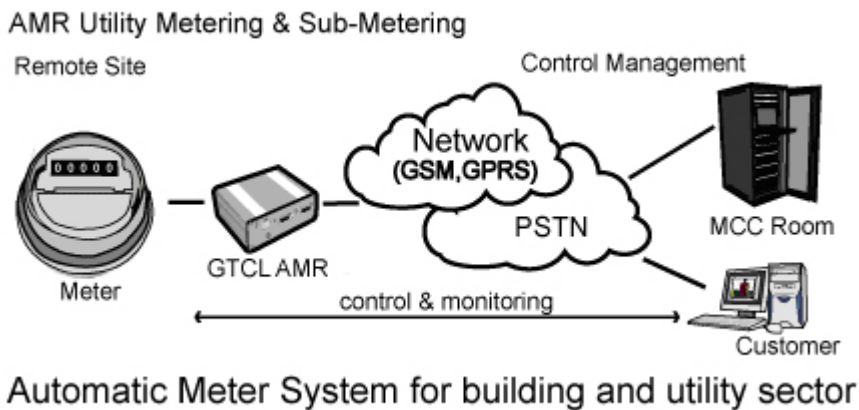


Automatic Meter Reading (AMR)

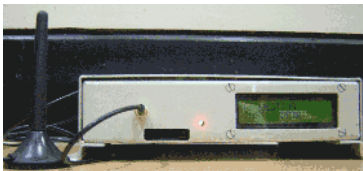
Automatic Meter Reading (AMR) for meters and sub-meters for energy management in commercial & utility applications.



Today with the cost of Electricity soaring high industries are trying all the means to save it by deploying good or malpractice. Of all the means theft of electricity is a major one that is nagging the profitability of the Electricity Boards and the consumer. The need of time is to keep track of the electricity usage. Gloabtel has developed Automatic Monitoring Reading system (AMR) for this specific purpose, which takes steps in reducing consumption through a remote management Automatic Meter Reading (AMR) It can also used for monitoring oil, gas and water pipelines.

Automatic Meter Reading Background

The traditional utility meter displays energy usage as an accumulation of counts (KWH) presented to a display, which is used to calculate the monthly bill. It has applications within the electricity, gas and water utility industries for domestic, commercial and industrial applications. Sub metering is often used within a building, retail or



industrial facility where it is desirable to measure power consumption for specific equipment, locations or sub-level accounts.

Reducing losses and waste, and adopting power efficient products and technology can achieve this utilizing by remote management.

Predicting energy usage remains a key issue in an industry or Utility sector where downtime is unacceptable.

However, since power losses are not easy to identify, it is difficult to determine the key culprits whether they are human users or power-hungry devices. In many cases it is difficult to store energy e.g. electricity, which must be generated to fulfill immediate demand. Predicting usage remains a key issue in an industry where downtime is unacceptable, which is made difficult by slow access to the remote meter readings.

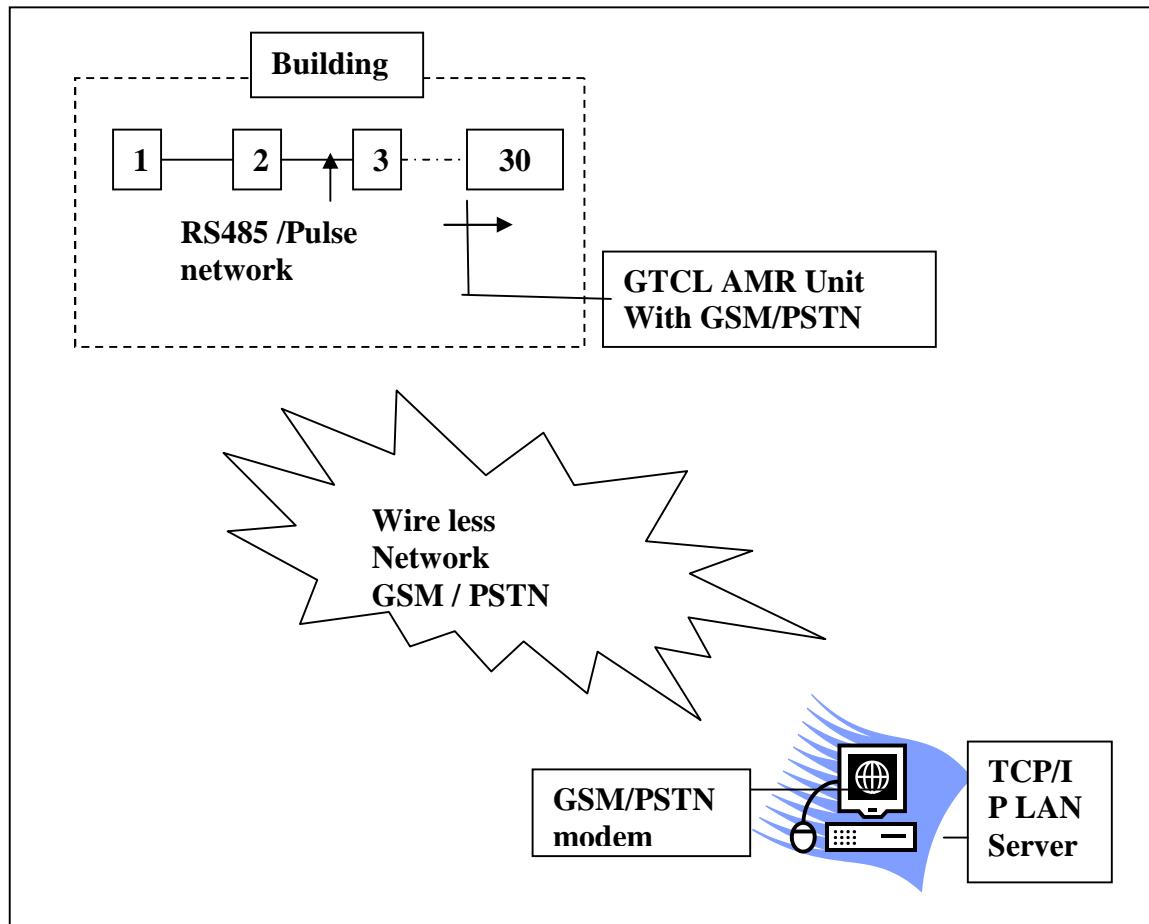
Automatic Meter Reading Solutions:

Gloabtel has developed Automatic Meter Reading called "smart metering" can be as simple as a central application that polls the remote utility meter using protocols such as MODBUS, IEC 1107. Pulse or the RS 485 outputs from the meter can be monitored externally as part of wider monitoring solution where reducing energy usage is key. A wider smart metering monitoring system determines usage over time, identifies peaks, compares sites and correlates use with offending devices and people.

Communication solution example - Automatic Meter Reading

Gloabtel offer communication solutions from simple GSM/PSTN modems through to Centralized Data Monitoring systems suited at master location, where it's collecting data from individual consumer meter for monitoring and billing purpose. The entire consumer meters are loop together with the help of hard wire to Smart Metering unit where it's collecting data from all connected consumer meters.

Figure below shows typical installation and wiring diagram of Gloabtel AMR system



Automatic meter reading systems consist of three primary components:

1. **Meter interface module:** Smart Metering consist of meter interface module with power supply, Battery backup and required controlling module and a communication interface that allows data to be transmitted from this remote device to a central location. In many instances, this communication interface is bi-directional and allows central office signals to be received by the remote unit as well. Every electric, gas or water meter must have such an interface unit to be remotely read. Some key components of the Smart Metering device may be shared by more than one meter without regard for the type of meter; i.e., electric, gas or water.

2. **Communications systems:** This used for the transmission of data and control send signals between the meter interface units and the central of fice. Typically, such communications take the form of telephone, radio frequency (RF), GSM,

and over hard wire cable. The system components in the communications system depend on the communication media used.

3. **Central office or Master Location Monitoring System:** This system include communication modems which work as a Tran receivers, computer. Many utilities have for some time been taking advantage of electronic meter reading systems using hand-held data terminals that communicate with a central controller via phone lines. There is great similarity between the host side electronic meter reading and automatic meter reading system function.

The benefits of AMR include:

- **Lower cost to read the meters**— using the GTCL AMR wireless system, the power or utility company can read all of the meters in a community every day, or more frequently as appropriate. It is not necessary to send a service person to visit every customer location once a month.
- **More accurate and complete reads**— the power or utility company will no longer need to estimate usage when meters are not physically accessible to their service people. They can get real -time usage data from any of the meters in the system instantly. Meters are always accessible.
- **Working as a two-way communication with each meter**—with intelligent power meters and two way communications, the power company can manage their peak loads better and offer incentives for customers to shift their power usage to off -peak times.
- **Theft of service detection and prevention**—Meter tampering is detected instantly through the wireless network, making it much more difficult for someone to steal the service.
- **Sub metering**-Multi-tenant properties can provide individual user data to the utility on a remote basis. The reduction of associated costs coupled with the magnitude of the transmitted information can, in many cases, allow the utility to offer its commercial customers new report -oriented services.
- Down loading of all relevant data from the meter installed at consumer premises or valves/checkpoints for pipelines.
- Transform the data into signals suitable for transmission through the wireless communication media.
- Transmit info to information centers of a company based on the priority.

- Transform the data into a format suitable for report generation, invoicing control from the computer system at any of above information centers. Also transform the data into a format suitable for management information, load monitoring, load surveying, evaluation of tamper attempts etc.
- Alarm the above information centers in a selectable cycle, in case of occurrence of deliberate tampering, pre specified parameters of system anomaly/variations/irregularity, initiated from the CMU itself without waiting for the interrogation from information centers.
- The system will have security features to prevent any access by unauthorized personnel to the data, hardware & software.
- The system will have security features for restricting personnel from performing activities, which are not within their authorization.
- The communication links between CMU & Boards various information centers will be fully encrypted as per relevant Data Encryption Standards (DES).
- Security of Data in transit will be provided by using standard protocols, Error detection and correction protocols & security measures
- **Intelligent building applications**-An area of overlap between intelligent buildings and the AMR system is customer information coupled with the variable rate structures. The AMR system can act as a specialized interface between the building and the outside world. Information regarding operations, prevailing rates, customer usage, etc., would be instrumental to intelligent building owners and operators. This information would be made available to the building's computer and could be displayed on wall-mounted units as well.

Features of system

- Regular transmission of all electrical parameters such as load current, voltage, active and reactive power, Phase wise voltage, Phase wise current, power factor, frequency to remote center.
- Change in status of any preset limits of parameter is sent to PC
- User at the control station can also generate a query to find out any specific parameters.
- The user at master station can also export the details to MS -Excel.
- It can also work with PSTN (land line)

- User from master station can send query command to the Smart Metering unit as an when required
- Query command can be send for one or multiple outputs from master station
- Display energy parameters of each Smart Metering unit
- The system also displays status report received from the Smart Metering unit
- Potential free inputs to monitor the status of relays *provide if required and it will cost extra
- Different settings for different Smart Metering possible
- Export input status received from Smart Metering to MS-Excel
- Generate various MIS reports based on the requirement

USP:

1. Only system that has GSM based SMS for communication, which can be customized for Radio Truncking or CDMA.
2. Helps keeping track of the electricity usage over large geographical areas.
3. Keeping track of the electricity usage on a real time basis reducing the chances of electricity theft.
4. Helps to determine the location of gas or oil lick age.
5. Determine the condition of various valves of pipe over vast geographical area



Scope of Supply:

Gloabtel Convergence will supply following materials:

1. Smart Metering – for monitoring different make of power meters
2. RS485 to RS232 converter
3. Master location data transceiver modem
4. Cables for connecting Smart Metering with each other and to PC
5. Software for PC, single user license.