SCADA

WHAT IS SCADA ?

- SCADA: SUPERVISORY CONTROL & DATA ACQUISITION
- It is the technology that enables user to collect data from one or more distant facilities and/or send limited control instructions to those facilities.
- It includes the operator interface and manipulation of application related data
- SCADA allows an operator to make set point changes on distant process controllers, to open or close valves or switches, to monitor alarms etc
- SCADA is a form of instrumentation used for indusrial process control

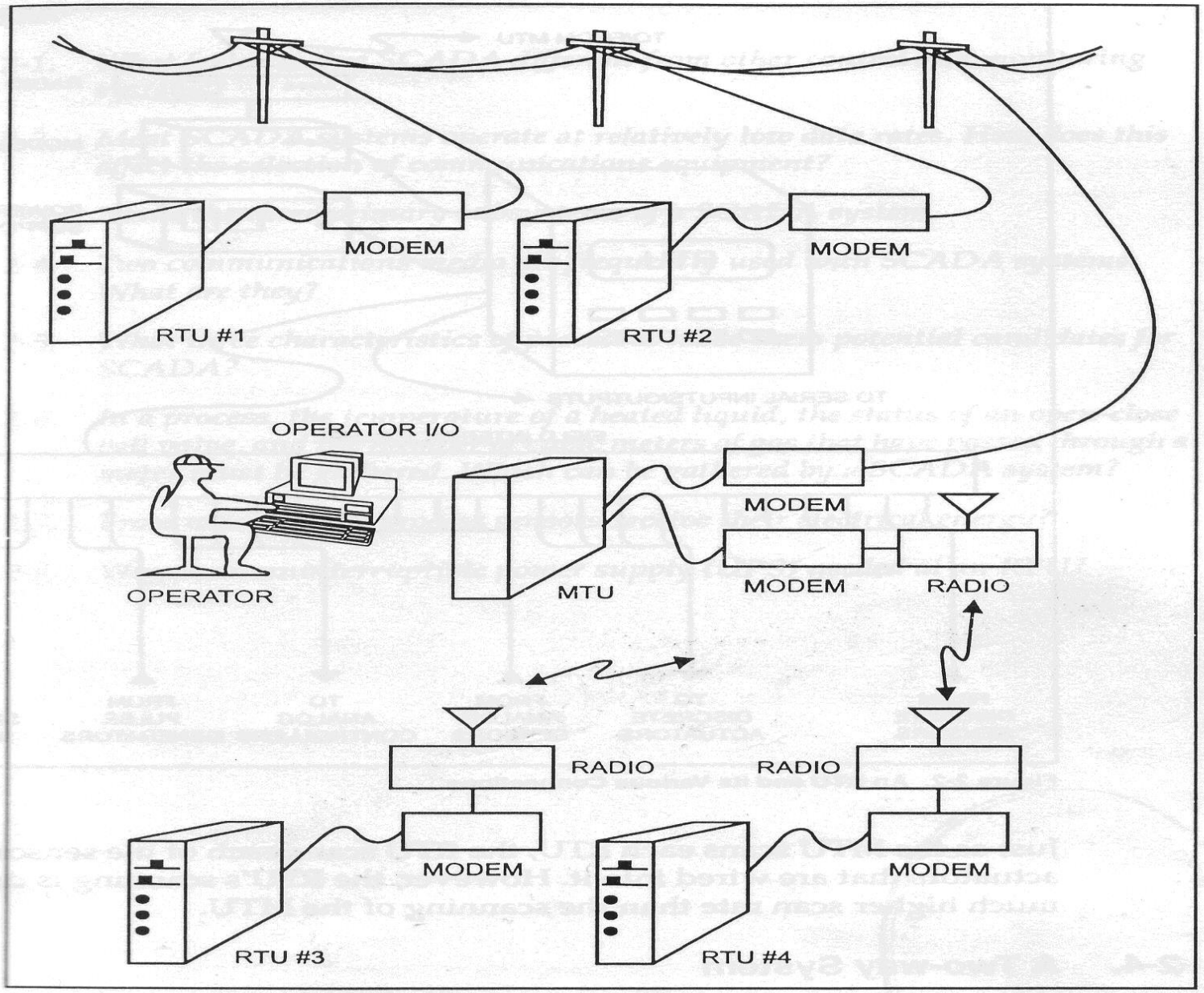


Figure 2-1. Major Components of a SCADA System

Components of SCADA

- Sensors and actuators
- RTUs and PLCs
- Communication
- MTU

1. OPERATOR/OPERATOR CONSOLE:

- It accesses system by means of an operator interface device.
- It consists of output & input devices for an operator.
- Output devices consist of video display unit that displays real time data & input devices consist of keyboard , mouse etc

2. MTU (MASTER TERMINAL UNIT):

- It is system controller based on computer (also called as host comp.)
- It can monitor or control the field even when operator is not present.
- It has a built in scheduler that can be programmed to repeat intructions at set interval.
- It is situated in control room.

- MTU is connected to all RTU’s.
- MTU scans all RTU one by one, communication method used by SCADA system is a master–slave scanning.
- MTU is master , it calls RTU , gives instructions ,asks for information updated ,orders RTU & waits for reply from RTU.

3. COMMUNICATION LINKS:

- There are two types of communication links used:
- A) Land Line
  - In the form of optical fiber or electrical cables
  - Owned by company or leased from telephone utility
- B) Radio Link
  - It is wireless communication

4. MODEM:

- It modulates or demodulates signal on the carrier.
- They are placed at two ends of communication links.
- There are three types of modulation:
  - Amplitude Modulation
  - Frequency Modulation
  - Phase Modulation

5. RTU (REMOTE TERMINAL UNIT):

- It is situated at remote situation , near the field.
- It communicates with MTU by modulated signal on cable or radio.
- RTU gathers information from field about analog values, alarm & status points & metered amounts.
- It keeps information in memory until MTU asks for it. It then codes and transmits the information to MTU.

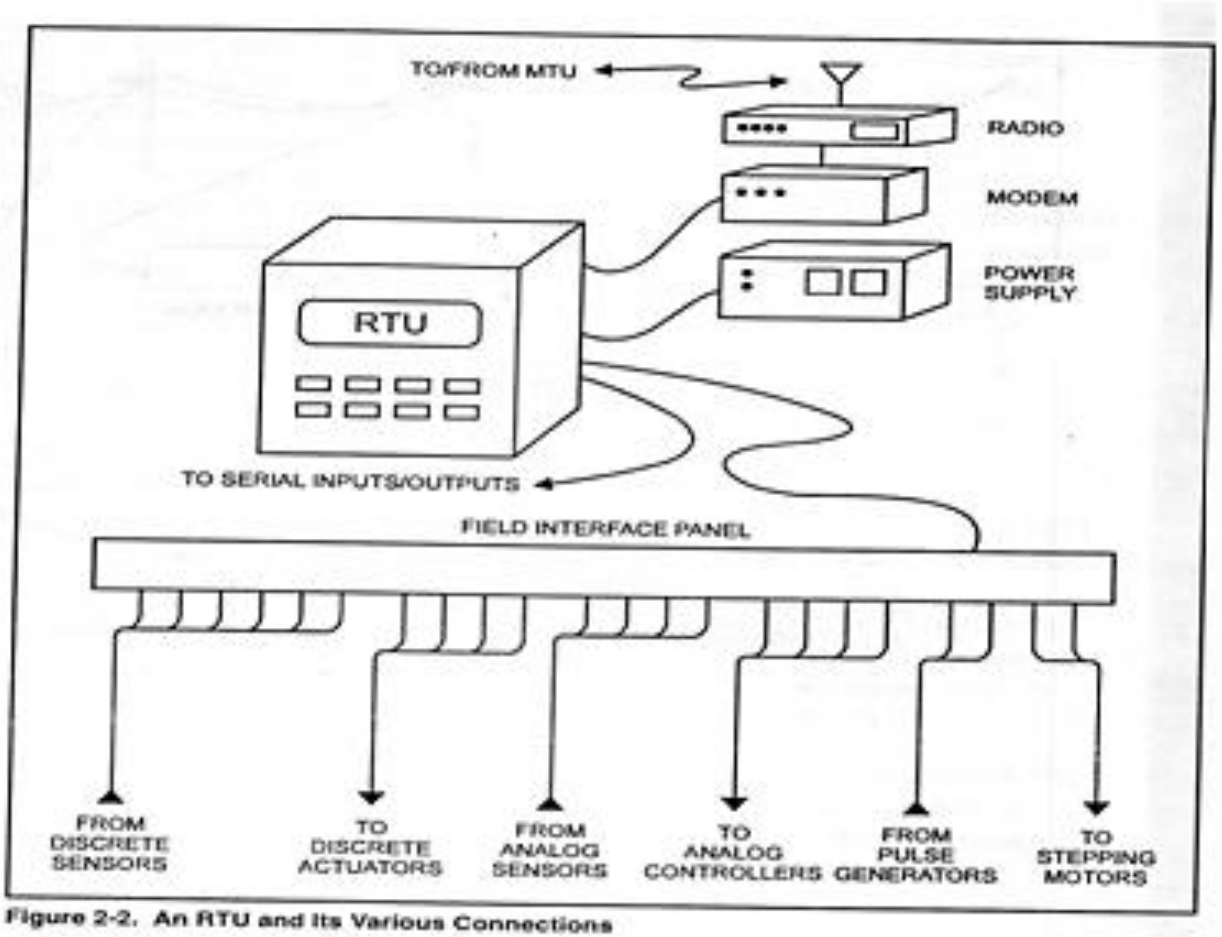
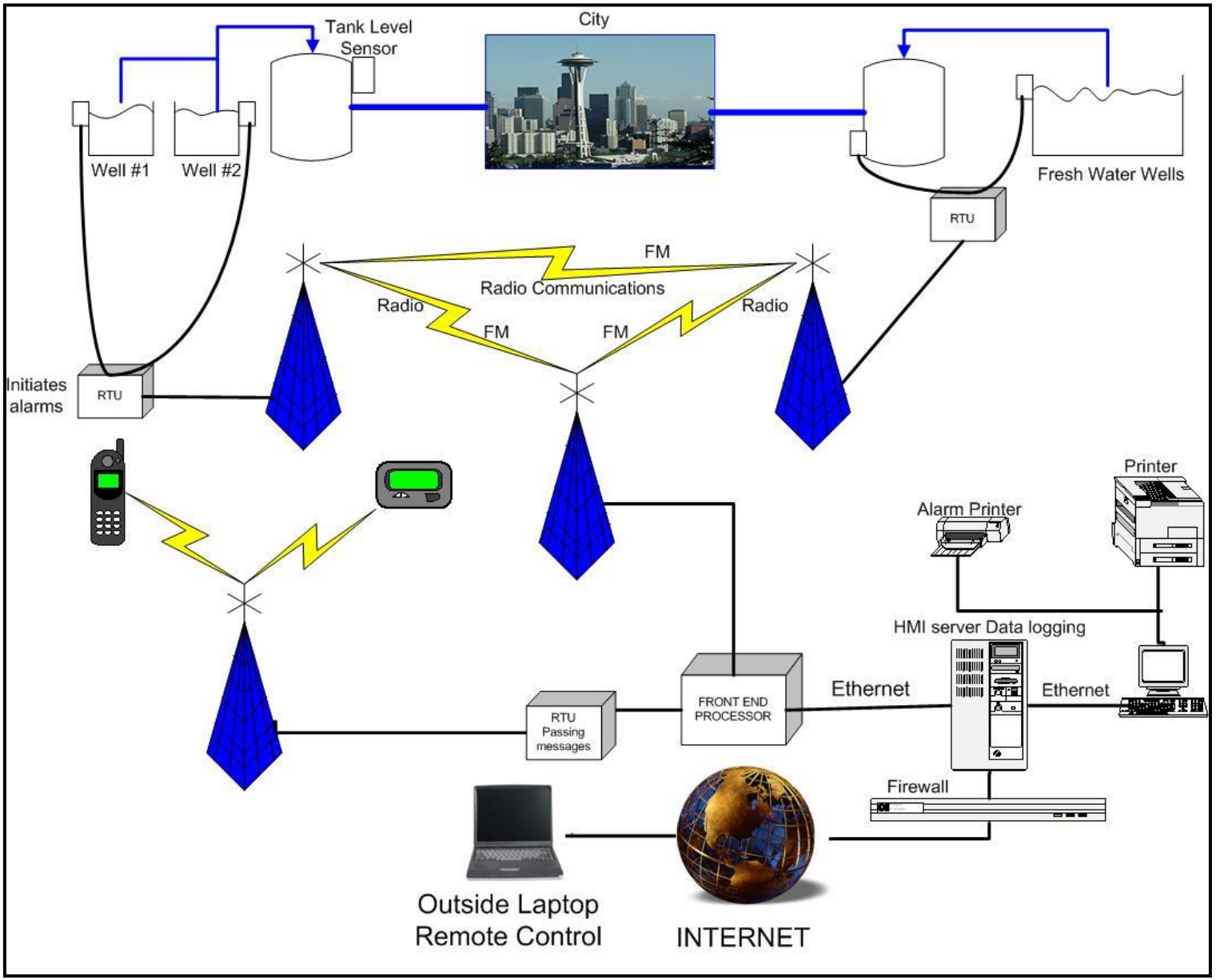


Figure 2-2. An RTU and Its Various Connections

Water SCADA


Tank Level Sensor
City
Well #1
Well #2
Fresh Water Wells
RTU
FM
Radio Communications
Radio
FM
FM
Radio
Initiates alarms
RTU
Printer
Alarm Printer
HMI server Data logging
Ethernet
Ethernet
FRONT END PROCESSOR
RTU Passing messages
Firewall
Outside Laptop Remote Control
INTERNET

What is SCADA?

- Supervisory Control and Data Acquisition
- Supervisory
  - Operator/s, engineer/s, supervisor/s, etc
- Control
  - Monitoring
  - Limited
  - Telemetry
  - Remote/Local
- Data acquisition
  - Access and acquire information or data from the equipment
  - Sends it to different sites through telemetry
  - Analog / Digital

Automation solutions

SCADA system manufacturers

- Modular SCADA, UK
- MOSCAD, Motorola
- Rockwell Automation
- ABCO
- ABB
- Lantronix

SCADA Hardware

SCADA Hardware manufacturers

- Rockwell Allen Bradley
- General Electric (GE)
- Emerson
- Schneider Electric

SCADA Software

SCADA Software manufacturers

- Intellution (Fix 32)
- Iconics (Genesis32 v7.0)
- Wonderware (InTouch)
- Citect (CitectSCADA 5.42)
- National Instruments (Lookout SCADA)