

SCADA MASTER

A SCADA system will typically include a central computer, an operator interface, mass data storage, control software, and an integrated communication network. A description of the major components of the system is provided in the following sections.

Central Computer

The heart of any SCADA system is the central control computer. The central computer is used to control the SCADA system data communications as well as providing a usable operator interface for monitoring and implementing any control decisions. The central computer may also be used to manage the real time and historical database as well as generate any associated system trends or relevant reports (Clingenpeel and Rice, 1990).

The central computer system may consist of one large computer with its associated peripherals, or several smaller computers, each with separate functions. When a distributed approach is used, the individual units may be connected together on a local area network. Where one large computer is used, the system will normally employ a dual-redundant operating environment in which all operations are transferred to an equivalent backup computer in the event of a failure of the primary system. Under normal operations the backup computer can be used for optimal control applications such as demand calculations, demand forecasting, network models and automatic optimization strategies. This arrangement allows for the separation of the real-time SCADA functions from the heavy processing requirements of optimal control applications and thus allows both systems to be tuned for peak performance (Clingenpeel and Rice, 1990).

User Interface

The user interface may consist of a series of screens, menus, and keyboards or point and pick devices such as a mouse, trackball, light pen, or touch screen. In general, a keyboard will not function as a good control interface device unless it is set up with special function keys to facilitate point and pick interaction (Clingenpeel and Rice, 1990).

The user interface should allow the system operator to easily monitor the status of various system components and their associated parameter values or to control the operational status of these components. This is normally accomplished through the use of graphics software which allows the normal monitoring and control functions to be broken down into a series of screen images. These images may consist of schematics of various components of the distribution network or data spreadsheets or charts that allow for rapid visual feedback to the operator.

Control Center Software

Selection of the SCADA system software should take into consideration the graphics generation system, any alarm structures, required data trending, and desired report formats. The selected package should be sufficiently robust to provide modification and/or expansion of the system database without requiring programming skills. Typical features of a comprehensive software package should include (Clingenpeel and Rice, 1990):

- Point and pick command structure using interactive graphics.
- Simultaneous graphical display trending of multiple variables.

- Historical trending of all database parameters.
- Real time annunciation of system alarms utilizing single key graphic access.
- Alarm and system status differentiation.
- Advisory statements on critical system status.
- Ability for authorized operator to remotely change set points in remote stations.
- Ability for authorized operator to create new or modify existing displays, and create new or modify existing report format with minimal computer programming skills.
- Automatic printing of routine preformatted reports and logs.
- Capability to provide graphic screen dumps.
- Ability to interface with other standard software packages.
- Authorized accessibility of system database by engineering or management computers.
- A report generation package.