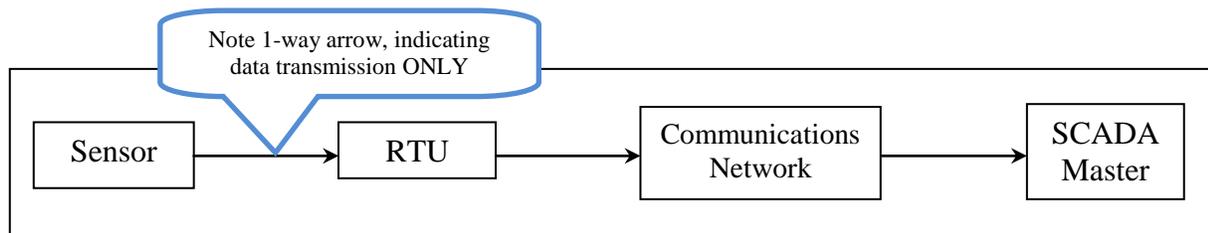


REMOTE TERMINAL UNITS

Before any data collection or remote sensing can be achieved, information needs to be passed between the sensors and the communications system in a form that is compatible with the language of the SCADA system. To accomplish this, a field interface unit is required. The most basic of these units are known as remote terminal units, or RTUs. RTUs convert electronic signals received from field sensors into machine language, known as protocol, and transmit data over the communications network to the SCADA Master, where a human will use and manage that information. RTUs by themselves are not typically used to control equipment but rather to collect and transmit data to a controller, where controls are then exercised. When in the field, the RTU appears as a small box-like device (or several, depending on how many sensors are being utilized) within a panel. The simplified figure below illustrates a typical system.

The remote terminal unit (RTU) has typically been the control unit of choice for applications in the water distribution industry. RTUs were initially developed to provide digital communications between remote stations and a central facility. More recently, smart RTUs have been developed which also provide some level of local control. RTUs for use with Supervisory Control and Data Acquisition (SCADA) systems typically consist of a box which contains a microprocessor and a database.

The RTUs normally provide stand-alone control at state component sites with a communication link to a central computer. In most cases the RTUs can support subremotes to bring control signals (i.e. Tank levels, pressures, etc.) directly back to the RTU. These values can then be stored in the database for subsequent use or transmitted back to the central processor unit. The RTU can run automatic control strategies which scan the database, make control decisions, and change database output points to operate equipment (Riddle, 1989).



Simplified Illustration of RTU Function in a SCADA System