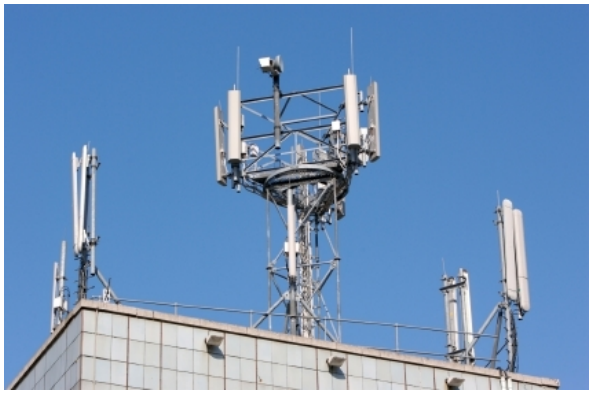
Radio-based Telemetry Survey Services

Features

- Provide design and support on a wide range of industry-leading radio telemetry communication systems
- Solutions function under applicable parts of FCC rules
- Over two decades experience providing survey services
- A comprehensive report provides valuable information on original design or improvements to your telemetry system
- Additional customer support is available to assist with on-site installation and service



As Emerson's Power & Water Solutions business unit, we lead the company's business endeavors in the power generation and water/wastewater treatment industries by delivering the widest array of advanced instrumentation, control, and automation technologies available from any supplier. From expert consultant services to world-class technologies to comprehensive project management, field service and technical support, we offer comprehensive I&C solutions.

One such solution offered by Emerson includes the design and support of industry-leading radio telemetry communications systems for a wide variety of control, instrumentation, and measurement applications. We provide radio system designs in a various frequency bands, including:

Band	Frequency
VHF Band	150-174 MHz
UHF Band	406-512 MHz
Spread Spectrum Band	902-928 MHz
MAS Band	928/952 MHz 932/941 MHz
Point-to-Point Microwave Band	960 MHz

Emerson’s radio-based telemetry systems are designed to function under applicable parts of the Federal Communications Commission (FCC) rules and regulations and to meet the requirements of various other regulatory agencies. Most importantly, Emerson’s radio-based telemetry solutions are custom designed to meet the specifications and requirements of our customers.

EMERSON

On-site Radio Surveys

Emerson has over two decades of completing onsite radio surveys that involve customer site visits for the generation and measurement of on-the-air radio data signal levels under actual operating conditions. To ensure reliable and accurate data, a computer-based topographical analysis program is used for evaluating radio path profiles.
Upon completion of the radio survey, Emerson provides a complete report which includes:

- A recommended system block diagram
- Terrain path profiles
- Antenna height requirements
- Site photographs
- A preliminary bill-of-material for the radio-related hardware for each site

Emerson also offers assistance in obtaining FCC (and other governmental) radio operating licenses, including band of operation identification, channel availability determination, coordination with other licensees, and FCC license application coordination along with generating and submitting required forms.

Emerson's customer support program offers additional support programs that can be implemented after the initial survey, as necessary, to ensure the successful interface between radio hardware and control equipment. Emerson's technical experts can provide on-site support to resolve any radio-related problems, or to assist in the installation and startup of new systems.

The Survey Process

The survey process begins with an Emerson review of the existing communications network. To ensure timely completion of this process, the customer typically:

- Verifies the location of all central and remote sites within the system. This data should be in the form of a listing of the latitude and longitude in a 'degree/minute/second' format of each site or the location of each site identified on USGS topographic maps.
- Identifies any radio/towers licensed for use within this system
- Describe existing buildings, tanks, and towers, etc., which could conceivably be antenna locations.
- Identifies potential repeater sites available for use by the customer (outside of the sites which are to be active portions of the system).
- Identifies potential problem sites, such as those that may have restrictions on antenna heights.
- Outlines customer preferences regarding system layout, such as particular sites which may have to report to specific masters or central locations.
- Reviews any existing radio licenses.

Upon completion of the above steps, Emerson will then review other call signs that may be in operation on existing towers. With this information, a proposed system block diagram is generated using this information based upon analysis of topographical path profiles for all sites within the system, including terrain plots of all sites to the central location and the associated repeaters along with block diagrams indicating the proposed layout. Emerson creates profiles from the collected information that are used as a starting point for the on-site test plan. Following customer review and approval of the proposed layout and plan, Emerson visits each site to measure the on-the-air radio signal level using the appropriate sized radio equipment.

After the on-site data gathering portion of the survey has been completed, Emerson then begins the data analysis phase, which includes a review of the measured data to determine the best layout to obtain the desired results. Emerson will issue a comprehensive report describing the recommended technical approach and the recommended radio-related hardware requirements. This report will include a proposed system block diagram, along with a detailed analysis of measured and projected radio signal levels at each site location. Photographs of all sites showing the general area and paths and obstructions as viewed towards the appropriate repeater or central sites, etc., will also be included. In general, a survey consists of:

EMERSON

- Gathering data sufficient to generate a preliminary system layout and survey plan
- Shipping test equipment, including transmitters, receivers, and antennas to the site
- Measuring on-the-air radio signal levels, recording latitude and longitude data, and photographing site particulars and path directions to master/repeater sites at each remote site
- Analyzing data and generating a comprehensive report