

Smart Structures Inc.  
Product: SmartPile  
Model: SP\_201/ 401/ 601  
Revision: D2  
FCC ID: V9CSP-X01D2

#### Operational Description:

The SmartPile™ System is used by the heavy construction industry to capture critical installation and health status data for a variety of Deep Foundation structures, specifically from driven pre-stressed concrete piles during the installation process. The SmartPile™ System is available in three configuration options: SP\_201, SP\_401, and SP\_601. The first numeric digit details the number of active internal data acquisition channels (2, 4, or 6).

The end-to-end system consists of an application-specific commercial laptop computer utilizing a spread spectrum Bluetooth wireless link (SmartPile Workstation™) communicating with a low power, low cost, and non-recoverable data capture and logging device (DataPort™) connected to embedded internal gauges/electronics (the SmartPile™ System). Using spread spectrum Bluetooth wireless communication technology, the DataPort™ is able to transmit acceleration, strain, temperature, and diagnostics information from the pile internals to the commercial laptop computer in real time at channel rates of 10,000 readings/sec.

The DataPort™ is a non-recoverable instrumentation device embedded in a concrete structure (pile) that (in real time) wirelessly communicates internal embedded sensor data with a separate Bluetooth receiver connected to a data processing unit (SmartPile Workstation™). The DataPort™ is composed of a configurable number of channels and transducer types that capture critical performance / status on the health of the concrete pile during installation. The current design of the DataPort™ supports up to six channels of accelerometers and/or strain gauges through conditioning circuitry that feeds the data collector / transmitter. Every component is embedded in the concrete pile including the antenna, which is mounted flush to the pile face.

The data collected by the SmartPile™ Workstation is presented to various individuals at the construction site in order to optimize the installation process and assess the load capacity of the concrete pile. Because of its small size and low cost (instrumentation and transmitter), the non-recoverable data logger unit (DataPort™) can remain as a long term sensing element to be used for monitoring during the life of the structure, where appropriate. The system is built upon patented and exclusively licensed technology from the University of Florida. Future variations of the product will extend monitoring capabilities to other types of concrete structures in different application deployments.