

3.5 AMR/AMI SMART POINTS

The water Smart Point should be a radio transceiver that provides water utilities inbound and outbound access to water measurement and ancillary device diagnostics via radio signal.

3.5.1 FUNCTION

- 3.5.1.1 The Smart Point shall be migrateable allowing it to be read by a handheld device, a vehicle interrogation unit, or advanced metering infrastructure.
- 3.5.1.2 The Smart Point shall be capable of collecting hourly readings and transmitting that information on demand in walkby/driveby mode or a minimum of 4 times per day in fixed base mode.
- 3.5.1.3 After being transmitted from the meter endpoint, transmissions must be immediately received at the VGB or the back-end software, in fixed base mode, for review. No “storing and forwarding” of readings on collectors shall be acceptable. Low power endpoints, under 2 Watts of power output, originally designed for walk-by/drive-by applications shall not be acceptable due to low power and range capabilities, and undesirable quantity of required “collectors”.

3.5.2 CONSTRUCTION

- 3.5.2.1 The water transmitter shall be enclosed in a two-piece molded plastic housing capable of being mounted on a wall or installed through the meter/vault lid.
- 3.5.2.2 The Smart Point plastic housing shall incorporate a tamper resistant, waterproof connection, known as Touch Coupler technology (or equivalent), allowing smart points to be installed utilizing an existing Sensus Metering Systems Inc Touch Pad with a two wire connection. Three wire connections to Smart points shall not be necessary with the use of touch coupler technology.
- 3.5.2.3 The electronics of the transmitter shall be hermetically sealed in a High Density Polyethylene (HDPE) enclosure that is waterproof and provides an operating temperature range of -22°F to 185° F (-30°C to 85°C).
- 3.5.2.4 Pit set transmitter shall have the ability to be completely submerged in water for the life of the product without any internal damage or malfunction.
- 3.5.2.5 The two-piece enclosure must contain the unit components including, HDPE enclosure, battery, and wire connections.
- 3.5.2.6 The unit shall be available with TouchCoupler technology (or equivalent) that eliminates the need for wire connectors.

3.5.3.1 3.5.3 PERFORMANCE REQUIREMENTS

- 3.5.3.2 In walk-by/drive-by mode, the Smart Point shall collect data after receiving an activation signal from the vehicle collection system or a hand held reading unit. Upon signal receipt, the Smart Point interrogates the meter’s encoder; and transmits the most current information, including the identification number, meter reading, and any alarms.
- 3.5.3.3 As a fixed base endpoint, the Smart Point shall interact with the strategically placed Sensus Tower Gateway Basestations located in the utility service area. Readings and other diagnostics are instantly forwarded to the Regional Network Interface (RNI) at time of transmission.

The migration of the Smart point from a walk-by/drive-by mode shall include the installation of a Tower Gateway Basestation and Regional Network Interface by Sensus personnel. Smart

- points will automatically adjust to fixed base mode after receiving the command from the Tower Gateway Basestation. The utility shall not have to revisit endpoints to perform the programming of Smart point during the transition.
- 3.5.3.4 The water Smart Point shall be a two-way device that transmits at a power level of two (2) Watts in primary-use licensed band in the 900 MHz spectrum whether it is in walkby/driveby mode or fixed base mode. The Smart Point shall provide inbound and outbound access to water measurement and ancillary device diagnostics via radio signal.
- 3.5.3.5 Water Smart Point must also have the ability to provide leak detection, tamper detection, and reverse flow capability in walkby/driveby and fixed base mode.
- 3.5.3.6 The Smart Points/transmitters shall be FCC Part 90, 101, and 24 approved for licensed band operation, and shall transmit on a primary use (unshared) licensed band in the 890-960 MHz spectrum.
- 3.5.3.7 The Smart Point shall also be required to transmit at least eight (8) reading digits from the encoded register in a resolution of at least 0.1 gallon or 0.01 cubic feet for meters up to 1 inch when in fixed base mode.
- 3.5.3.8 Smart Points shall be capable of providing an instantaneous notification of a successful installation and successful communication with the VGB or Tower Gateway Base Station (TGB) if installed in fixed base mode.
- 3.5.3.9 When in fixed base mode the Smart Points shall communicate with the TGB using an RF modulation designed specifically for AMR/AMI applications. Furthermore, the modulation shall use CRC-32 error detection and Viterbi forward error correction scheme capable of recovering up to one bit error out of every three bits. The receiver will have a sensitivity of -109 dBm or better in order to provide adequate range for minimal infrastructure.
- 3.5.3.10 The Smart Point shall receive input from the meter register and remotely send “top of the hour” data to a collection device, based on its system configuration in walk-by/drive-by or fixed base modes.
- 3.5.3.11 SmartPoint shall provide an on-demand read when interrogated by the utility from the regional network interface.

3.6 PERFORMANCE WARRANTIES

The vendor shall be required to state its warranty and/or guarantee policy with respect to each item of proposed equipment. As a minimum, the transmitter electronics shall be warranted for twenty (20) years from the date of shipment for defects in materials and workmanship. Battery warranty shall be twenty (20) years from date of factory shipment. Sensus will repair or replace non-performing:

- 3.6.1 SmartPoint 510M/520M modules (configured to the factor setting of six transmissions per day under normal operation of up to one demand read to each SmartPoint Module per month and up to fix firmware downloads during the life of the product) and batteries, unless the SmartPoint 510M/520M Module is ever paired with an ally Meter, which immediately amends the warranty terms.
- 3.6.2 At no cost for the first fifteen (15) years from the date of Sensus shipment, and for the remaining five (5) years at a prorated percentage, applied towards the published list price in effect for the year the product is accepted by Sensus under warranty conditions according to the following schedule:

Years	Replacement Price
1-15	0%
16	30%
17	40%
18	50%

19	60%
20	70%
>20	100%

In addition to warranty periods, vendors are required to supply information on required or optional maintenance programs beyond the warranty period for both hardware. Features of those programs shall also be included with any additional charges such as hourly rate for on-site and/or remote support. The locations of and procedures for obtaining such support shall be stated. Any additional training required by the utility after the initial installation of system shall be provided free of charge.

3.17 PERFORMANCE WARRANTIES

In evaluating bid proposals, warranty coverage will be considered. The vendor shall be required to state its warranty and/or guarantee policy with respect to each item of proposed equipment. The procedure for submitting warranty claims must also be approved. As a minimum, the transmitter electronics shall be warranted for twenty (20) years from the date of shipment for defects in materials and workmanship. Battery warranty shall be twenty (20) years from date of factory shipment.

3.18 SYSTEM MAINTENANCE AND SUPPORT

In addition to warranty periods, vendors are required to supply information on required or optional maintenance programs beyond the warranty period for both hardware and software. Features of those programs shall also be included with any additional charges such as hourly rate for on-site and/or remote support. The locations of and procedures for obtaining such support shall be stated.