

# ***Solid State Register Specification***

## ***Scope***

This specification covers the Solid State Register intended for use with all sizes of currently manufactured positive displacement meters, at a minimum.

## ***Construction***

- The encoder register shall be completely sealed and waterproof to permit installation in any environment; meter pit/vault, basement, crawlspace, or outdoors.
- The register shall be housed in a composite enclosure that utilizes thermoplastic and a heat treated, tempered glass lens.
- The register shall incorporate a lid to protect the glass lens.
- The permanent markings on the register pad shall include the ID#, the model, size and date of manufacture.
- The register shall be permanently sealed by the manufacturer including all wire connections for AMR/AMI devices and integral options as required. All AMR/AMI devices shall be offered with mating connections to facilitate installation and troubleshooting when required.
- The numerals on the number wheels of the register shall not be less than 1/4" in height and should be readable at a 45-degree angle.
- The register shall be secured to the meter main case by an internal tamper-resistant bayonet-style locking mechanism protecting against unauthorized removal of the register.
- The locking mechanism must not be apparent to utility customers with no visible seal screw or obvious means of removal.
- The technology deployed for electronic data interchange shall be solid state and not contain any moving mechanical components.
- The technology deployed for capturing data shall be solid state and not contain any moving mechanical components.
- Encoder registers requiring mechanical gear trains, plastic lens, metal cans, field sealing of the wire connection or that are oil-filled will not be permitted.
- The register must conform to the most current revision AWWA C-707.

## ***Operation***

- The register shall be a true absolute encoder register that provides direct electronic transfer of meter reading information to any number of AMR/AMI radio frequency device options.
- The register shall provide for up to 9-digit electronic resolution to the AMR/AMI system.
- The register operation shall utilize sensors and a magnetic coupling with the measuring element of the meter.

- The register shall provide a means of capturing magnetic tampering and register removal from a meter displaying a numeric indication of these tampers on the LCD display as a deterrent to theft.
- The register shall display an error code any time the register is removed from the meter body.
- The register shall display an error code any time magnetic interference is detected in close proximity to the register and meter.
- The register shall display register removal and magnetic tamper codes for a minimum of 90 days on a rolling 90 day period.
- The register shall offer the option of up to a 10-digit visual registration at the meter.
- The default visual registration shall be 9 digits unless specified otherwise in all cases.
- The register shall provide a visual indication of all billing digits on the LCD by providing a line above and below these digits.
- The register shall provide a visual icon/indication when a minimum of 6 months of battery life remains.
- The register shall provide a visual icon/indication of specifiable backflow on the LCD.
- The register shall provide a visual icon/indication of low flow and the direction of such flow on the LCD.
- The register shall provide a visual icon/indication of high light conditions that may interfere with the optical sensor of the device when changing register modes.
- The register shall incorporate a test mode that permits field testing utilizing a single universal display that indicates test mode when placed there via the optical sensor.
- Test mode shall be accessed via the optical sensor on the register face with three light flashes of one second, a 15 second period of darkness and an additional one second flash. It must be able to be returned to normal display mode with three additional light flashes at any time.
- The register shall automatically revert to the standard display mode from test mode after two hours, with no light flashes required to prevent unnecessary battery drain.
- The register must be capable of storing, displaying and transmitting up to 8 electronic event codes to any number of AMR/AMI radio frequency device options in the extended protocol mode.
- The encoder register shall send data in ASCII format (American Standard code for Information Interchange) to the interrogation device.
- The encoder register shall transmit up to 9 digits electronically as specified.
- Up to 10 digits of the meter reading total shall be provided on the LCD display as requested by the customer.
- The encoder register shall transmit a 10-digit register identification number that has been factory set and never duplicated with the first 2 digits indicating the year of manufacture.

- The register error codes for magnetic tampering shall only be reset at the factory after the device is returned to the manufacturer.
- The register shall offer a specifiable backflow option to set the minimum volume and time required to initiate the backflow icon/alert on the LCD.

### ***Installation***

- No wire connections or wire splicing of any kind shall be required to be performed during installation of AMR/AMI devices unless specified by the customer.
- The register shall offer the options of unterminated flying lead wire, Nicor, or Itron connectors, or integral AMR/AMI device as required by the customer.
- No special tools shall be required to remove the register.
- The internal ring and wedge used to install the register to the body shall be invisible to customers.
- The internal ring and wedge used to install the register shall function in conjunction with the LCD display to notify customers of tampering.