

Mueller Systems Solid State Register™ (SSR™)

COMPOSITE REGISTER TECHNOLOGY

Effective October 15th, 2015, Mueller Systems has implemented changes to the SSR register that enhance the functionality of the product.

1. A single 1 second activation of the light sensor with an incandescent flashlight activates the Liquid Crystal Display. The LCD remains on for a total of 5 minutes now instead of 30 seconds to make visual data collection easier for utility customers and during field testing.
2. The screen refresh rate in the standard viewing mode is 8 times per second once the LCD has been activated.
3. TEST mode can be activated for 2 hours when required. The initialization sequence for entering TEST mode is detailed later in this document.

The Mueller Systems Solid State Register (SSR) brings enhanced usability and accuracy to all current Mueller Systems positive displacement meters in sizes 5/8" through 2". Using a market leading composite enclosure to house the processor electronics, battery, high resolution liquid crystal display, and magnetic sensors under a heat treated, tempered glass lens, the SSR register delivers extraordinary functionality and value when paired with the latest metrology and AMR/AMI solutions from Mueller Systems.

The SSR register provides a lower profile than its electromechanical counterparts to make installation in small meter boxes easier. The SSR housing provides multiple options for integral AMR/AMI device mounting. Units integrated with the AMI/AMR device transceiver are equipped with a knuckled joint to allow adjustments of up to 90° from vertical.

Installation is easier and installers can obtain the best possible radio frequency propagation. The register can rotate 358° on the meter, adding flexibility in tight spaces – field personnel can spin the display to any orientation.

Mueller Systems

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Solid State Register (SSR)§

SSR Gallon Register Display

AMR/AMI units can be ordered with mating Nicor or Itron connectors to simplify installation and facilitate investigation of field issues. Replacements for a variety of radio frequency devices are also available.

The SSR is compatible with all bayonet-style locking register designs on Mueller Systems positive displacement meters. The register is mechanically protected from tampering by an integral installation ring making tampering readily apparent to field technicians. The register and installation ring can be replaced without removing the meter from the service line when required due to vandalism or damage.

The SSR register uses no hazardous substances within the electronic equipment. The Printed Circuit Board, components and solder are all lead-free, making the SSR register a “green” choice.

A View From The Top

The easy-to-read, factory programmable, 10-digit liquid crystal display provides a precise visual reading of units, totalized consumption and intuitive icons for visual verification of field performance.

Icons provide utility personnel key information at a glance:

- battery strength when six months of effective life remains
- presence and direction of water flow even at ultra-low flow rates
- billing units, indicated by lines under and over digits in the display

In standard energy-saving mode, the LCD display remains unlit. When a visual meter reading is required, opening the lid triggers the SSR's optical sensor to display its data for 5 minutes, ample time to obtain the meter reading. The Mueller Systems logo and SSR product name identify the register as the latest product in a long line of electronic register devices designed for the reliable transmission of meter data since the early 1960s.

The pad located at the top of the display is permanently etched with a unique, never duplicated 10-digit ID number, meter model, size, and the date of manufacture. A plastic lid protects the glass lens while usage and additional data are collected.



**420 Composite PD
meter with SSR
and integral Hot Rod
transmitter**

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

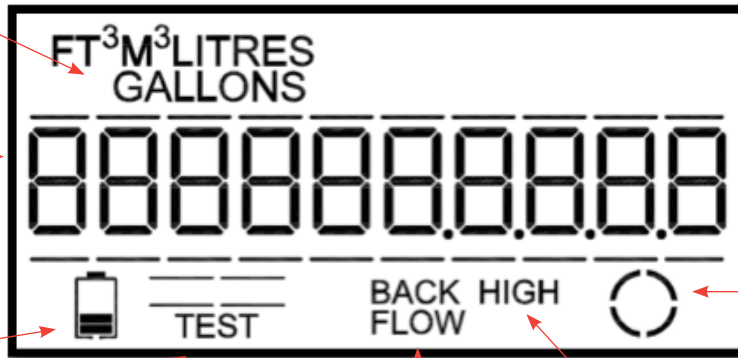
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SSR Display Features

Units of registration are illuminated: gallons, cubic feet, cubic meters or litres.

The 10 digit display provides excellent resolution. Up to 9 digits can be transmitted electronically. The position of the decimal place is factory-programmable.

The low battery icon is illuminated only when approximately 6 months of battery life remain.



The TEST icon is illuminated when the meter is placed in test mode by 3 flashes of light to the optical sensor followed by 15 seconds of darkness with the lid closed, and 1 additional flash of light. Successful sensor communication is indicated by illumination of the double bar above the word TEST each time the sensor detects a light flash.

The BACKFLOW icon is illuminated when the meter experiences reverse flow.

High icon indicates ambient light prevents the use of the light sensor to change LCD functionality. Shade the LCD to permit sensor communication.

Lines above and below the numeric display indicate the desired billing units.

The wheel indicates low flow or leak. The display illuminates in turn either clockwise for positive flow or counterclockwise for reverse flow in each of four segments.

Register Operation

Activating the Display

The SSR display is normally unlit. Activate it by opening the lid. With sufficient ambient light, the unit will display the standard reading screen for 5 minutes. The 10-digit display shows either usage or an error message, if detected.

If there is insufficient light to activate the display, shine a standard incandescent flashlight on the optical sensor on the lower face of the SSR. Quickly flash the light once to illuminate the display again for 5 minutes.

Test Mode

You can test the SSR under controlled conditions.

Place the SSR register in TEST mode by flashing the light in the optical sensor 3 times, 15 seconds of darkness with the lid closed and one more flash of the optical sensor.

The LCD will prompt the user to CLOSE Lid after 3 successful sensor activations which are indicated by the appearance of double bars at the lower left side of the display. After 15 seconds, the LCD will display OPEN Lid. One additional flash of the optical sensor will place the SSR register in TEST mode. The screen displays the flashing TEST icon when the register is in this mode. The display will show:

- the 10-digit register ID for 5 seconds
- the model number for 1 second, and then
- the meter can be tested utilizing the standard total screen for test calculations

After your test, flash the optical sensor 3 times to return to standard mode. The register automatically reverts to standard mode 120 minutes after the TEST mode began.

Error Display

Up to eight error notifications are available visually on the SSR display. For example, "ERR 008" indicates the SSR was removed from the meter.

Error codes cannot be cleared in the field and will require factory support. Please contact Mueller Systems for instructions.

Currently, the SSR supports the following error codes:

- 001 – Magnetic tamper detected – The magnetic sensors have detected the presence of a strong, interfering, external magnetic field.
- 002 – Internal memory failure – The background BIST tasks identified an error in the firmware image.
- 004 – Sensor error – Periodic checking of the magnetic sensors identified that they are not presenting the correct signals.
- 008 – Removal error – The magnetic sensors have determined that the register has been removed from the meter body.
- 016 – FU Upgrade Image Error – The saved variable image was corrupted during the Firmware Upgrade process; this indicates that default values have been reloaded.

These codes can be combined by adding together the relevant codes, so a magnetic tamper (001) and memory failure (002) will be code 003.

Other errors numbers will be defined as required.

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