



# Electronic Register LCD Guide

HOW TO READ AN LCD REGISTER DISPLAY

REV. #G070120F

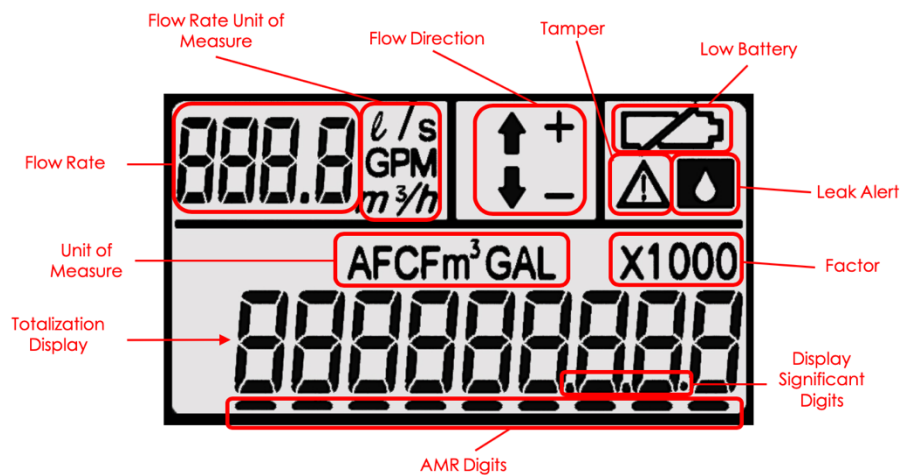


# HOW TO READ AN LCD REGISTER

## ELECTRONIC REGISTER DISPLAY

The Master Meter electronic register display is a high resolution 9 digit LCD display which is hermetically sealed inside the Under-the-Glass (UTG) design of register. This design is intended to negate the effects of a harsh pit environment such as fogging of the lense, dust in the display, and moisture intrusion.

The display is fully programmable for any water system design in N. America and can be field programmable or remotely programmable (in the case of AMI). The indicators on the display are described in detail in the following sections.



### AMR Digits

The AMR Digits will be displayed in bars underneath the Consumption Display. Only the Consumption Display units which are underlined will be transmitted back as the interval reading. For Fixed Network this number can be anywhere from 4-9 digits transmitted back to the MDM Software (4-8 in the case of the DIALOG 3G family of Drive-by products).

### Flow Direction

The flow direction will be either positive or negative (forward or reverse). If there is no flow in the line, then neither icon will be displayed.

### Flow Rate and Unit of Measure

The Flow Rate is the current volume of water traveling through the water line. This unit of measure doesn't necessarily have to match the Totalization Unit of Measure.

### Totalization Display, Unit of Measure, and Significant Digits

The Electronic Register totalization display is a high resolution 9 digit LCD. In the United States the predominant unit of measure is US Gallons or Cubic Feet. The most common unit of



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measure in Canada is Cubic Meters. Acre Feet is another less common unit of measure in the United States typically used in agricultural applications.

## Leak Alert, Tamper, and Low Battery

These alerts are triggered by measurement from the register and are transmitted back via the Master Meter proprietary protocol.

1. A Leak is triggered after 24 hours of continuous 15 minute periods of NO zero consumption reads.
2. Tamper is triggered when a magnetic field is sensed for more than 1 minute.
3. Low Battery alarm is illuminated once the unit reaches its final 2-6 months of usable life.

## Factor

The Factor is set manually and will only be used on larger C&I meters.

## STANDARD DEFAULTS

Master Meter electronic registers are fully programmable and can meet nearly any customer need. Electronic registers, while customizable, must take into consideration both billing units transmitted back to the central office software, in addition to the on-meter display for field testing, direct read usability, and account close-out. In addition, AMI (Fixed Network) and AMR (Drive-by) transmissions will vary due to a maximal transmission length in the AMR communication of 8 digits.

Field or shop testing can be accomplished to a reasonable level of accuracy with an electronic register when programmed to display a minimum resolution that is at least 1/1000<sup>th</sup> of the value of the initial dial listed in Table 1 (below). For example, the initial dial of a ¾" LCD register shall not exceed 10 gallons per AWWA standards, thus the resolution needed for testing would be 0.01 gallons.

The following display standards are listed as best practices and are broadly accepted in the water meter industry based on these AWWA standards:

**Table 1 Maximum indication on initial dial and minimum register capacity**

Meter Size		Maximum Allowable Indication of Initial Dial			Minimum Allowable Capacity of Register (Millions)		
<i>in.</i>	<i>(mm)</i>	<i>ft<sup>3</sup></i>	<i>gal</i>	<i>m<sup>3</sup></i>	<i>ft<sup>3</sup></i>	<i>gal</i>	<i>m<sup>3</sup></i>
1/2	(13)	1	10	0.1	0.1	1	0.01
5/8	(15)	1	10	0.1	0.1	1	0.01
3/4	(20)	1	10	0.1	1	10	0.1
1	(25)	10	100	1	1	10	0.1
1 1/2	(40)	10	100	1	10	100	1
2+	(50)	10	100	1	10	100	1

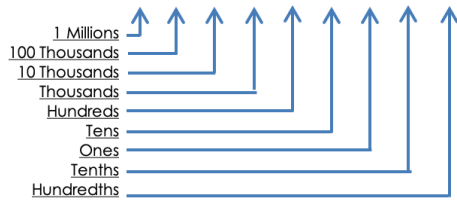
*AWWA Standards on "Minimum Allowable Capacity of Register".*



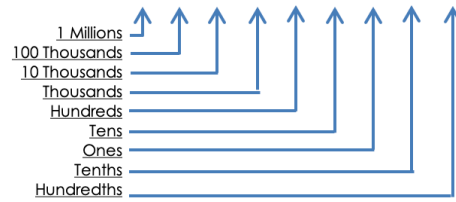
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## GALLONS

Programmed for US Gallons in AMR (Drive-by) Mode.

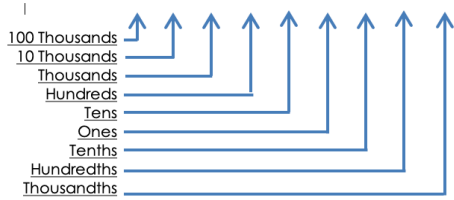
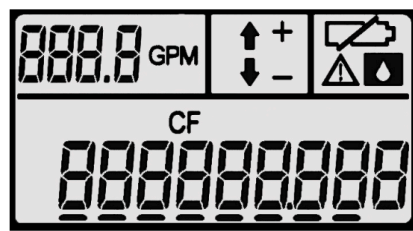


Programmed for US Gallons in AMI (Fixed Network) Mode.

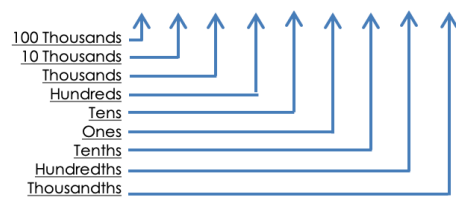
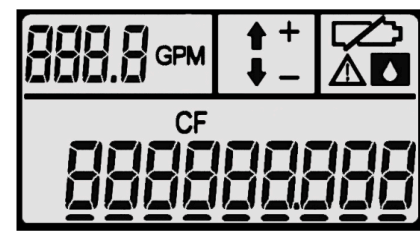


## CUBIC FEET

Programmed for Cubic Feet in AMR (Drive-by) Mode.

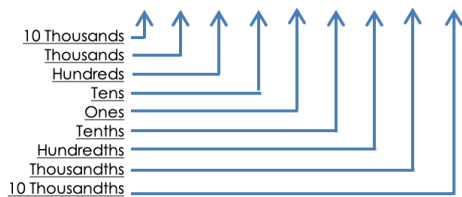
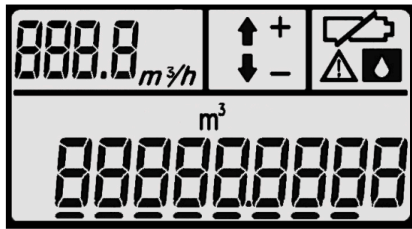


Programmed for Cubic Feet in AMI (Fixed Network) Mode.



## CUBIC METERS

Programmed for Cubic Meters in AMR (Drive-by) Mode.



Programmed for Cubic Meters in AMI (Fixed Network) Mode.

