

# How to Read A Digital Dial Meter



**Badger Meter**

## How to Read an Encoder

HR | E LCD Encoder and  
E-Series® Meters with High Resolution Protocol

The HR-E LCD encoder has a 9-digit Liquid Crystal Display (LCD) to show consumption, flow and alarm information. The display automatically toggles between 9-digit and 6-digit consumption, rate of flow and meter model.

### VISUAL READING DISPLAYS

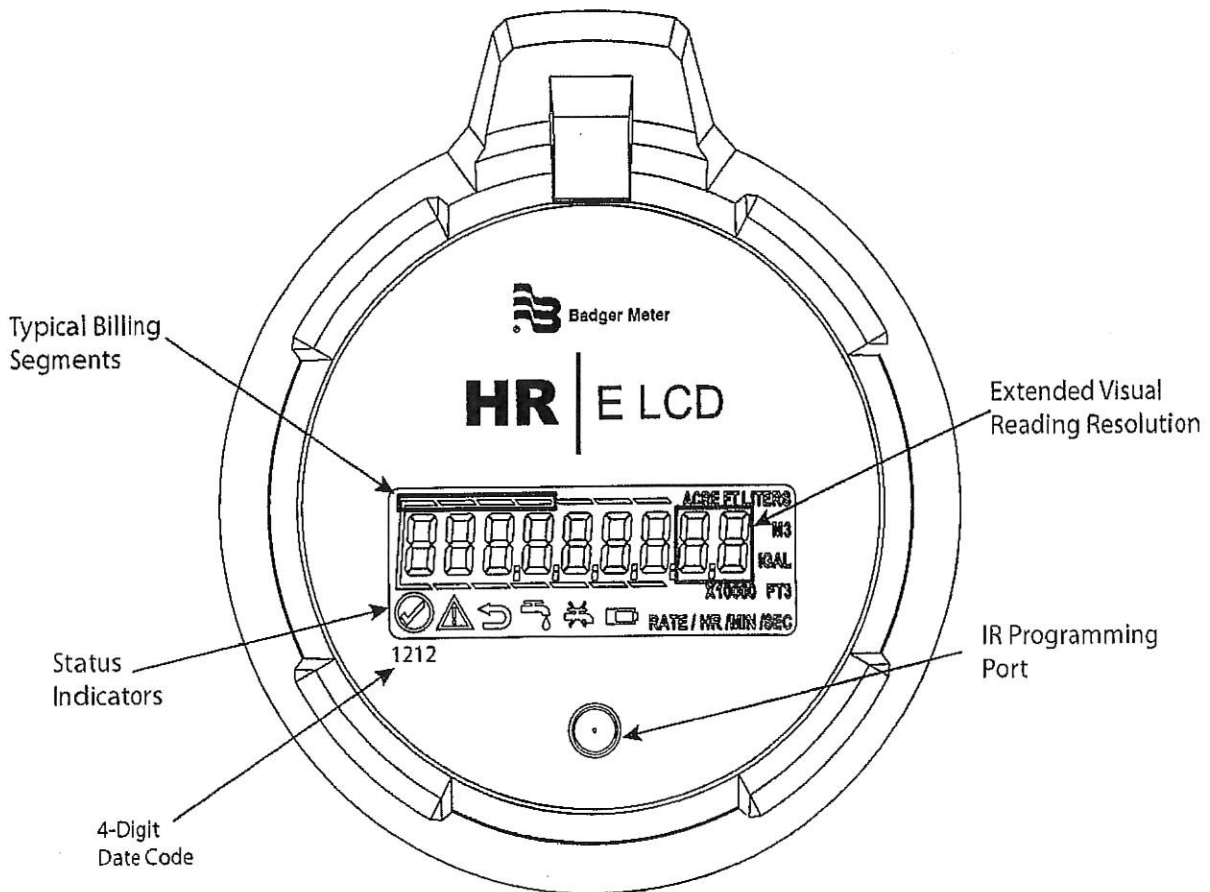
- The 9-digit display provides your utility with the finest reading resolution.
- The 6-digit display represents the equivalent of the moveable number wheels on a 6-dial mechanical encoder.

### UTILITY BILLING STANDARDS FOR METER READING

Typical 6-wheel odometer registration is designed with white and black number wheels for local readability with the white number wheels corresponding to the “typical” utility standard meter reading units:

- Gallons – reading to the nearest 1000 gallons
- Cubic Feet – reading to the nearest 100 ft<sup>3</sup>
- Cubic Meters – reading to the nearest 10 m<sup>3</sup>

The HR-E LCD encoder is designed with segmented lines above the numeric dials. The segmented lines above the numbers on the LCD display represent what the white numbers wheels do for the mechanical encoders—the typical utility standard meter reading.



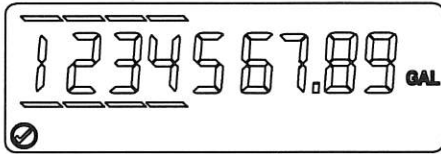
## GALLONS

Typical Billing Unit of 1000 Gallons

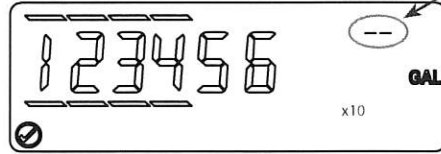
### 9-DIGIT VISUAL DISPLAY

### 6-DIGIT VISUAL DISPLAY

**Recordall Disc LP, M25, M35, M40, M55, M70, Recordall CSM 2, 3, 4, 6 inch Low Side,  
E-Series E-25, E-35, E-55 (9-digit display only)**

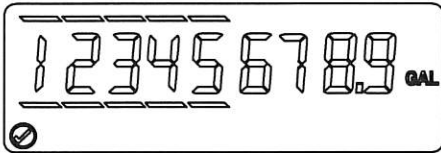


Meter reading to the nearest?      100th gallon = 1234567.89  
 10th gallon = 1234567.8  
 1 gallon = 1234567  
 10 gallons = 123456  
 100 gallons = 12345  
 Typical Billing Units → 1000 gallons = 1234

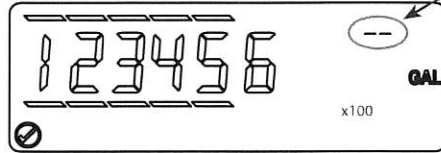


Meter reading to the nearest?      1 gallon = 1234560  
 10 gallons = 123456  
 100 gallons = 12345  
 Typical Billing Units → 1000 gallons = 1234

**Recordall Disc M120 & M170, Recordall TSM 1-1/2, 2, 3 & 4 inch, Recordall CSM 2, 3 & 4 inch High Side,  
Recordall Combo 8 inch Low Side, E-Series E-1-1/2 inch & E-2 inch (9-digit display only)**

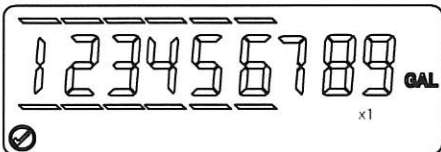


Meter reading to the nearest?      10th gallon = 12345678.9  
 1 gallon = 12345678  
 10 gallons = 1234567  
 100 gallons = 123456  
 Typical Billing Units → 1000 gallons = 12345

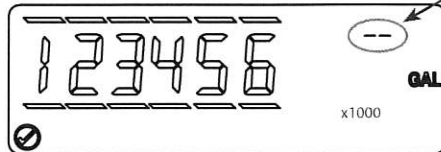


Meter reading to the nearest?      1 gallon = 12345600  
 10 gallons = 1234560  
 100 gallons = 123456  
 Typical Billing Units → 1000 gallons = 12345

**Recordall TSM 6, 8 & 10 inch, Recordall CSM 6 inch High Side, Recordall Combo 8 inch High Side**

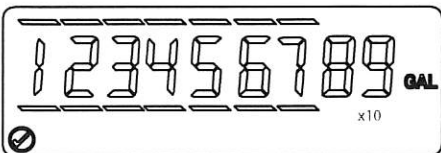


Meter reading to the nearest?      1 gallon = 123456789  
 10 gallons = 12345678  
 100 gallons = 1234567  
 Typical Billing Units → 1000 gallons = 123456

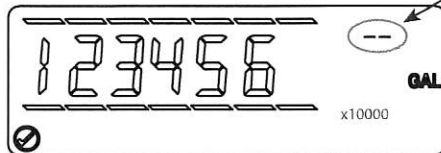


Meter reading to the nearest?      1 gallon = 123456000  
 10 gallons = 12345600  
 100 gallons = 1234560  
 Typical Billing Units → 1000 gallons = 123456

**Recordall TSM 12, 16 and 20 inch**



Meter reading to the nearest?      1 gallon = 1234567890  
 10 gallons = 123456789  
 100 gallons = 12345678  
 Typical Billing Units → 1000 gallons = 1234567  
 10000 gallons = 123456



Meter reading to the nearest?      1 gallon = 1234560000  
 10 gallons = 123456000  
 100 gallons = 12345600  
 Typical Billing Units → 1000 gallons = 1234560  
 10000 gallons = 123456







## Status Indicators

Status indicators are sent as part of the encoder message to AMR/AMI systems that are capable of receiving an extended message, such as ORION Cellular, Fixed Network (SE) and Migratable (ME) endpoints. The details can also be read through an IR interface.

Status indicators appear in the display as symbols that illuminate when the condition is active and dim when the condition is eliminated.

All HR-E LCD Encoders are delivered in a storage mode so that a meter alarm is not triggered. During storage mode, the meter model displays on the encoder. As water begins to flow through the meter, the encoder switches from storage mode to normal operation.

The following chart indicates the HR-E LCD Encoder conditions when connected to a Badger Meter ORION Cellular, Fixed Network or Migratable endpoint. The chart does *not* apply to ORION Classic (CE) or GALAXY endpoints, or HR-E LCD encoders programmed to 4.5- or 6-digit output. The HR-E LCD displays the information, but the extra information is not reported through the endpoints.

Status Indicator	Icon	Status Description	HR-E LCD Display	HR-E LCD with ORION Cellular or Fixed Network* and Migratable* Endpoints *Firmware version 1.8 or higher required
Meter functioning correctly		Encoder operating correctly.	Continuous display on encoder as long as no other status indicators are triggered.	Indicator status not sent to the endpoint.
Encoder alarm		Several potential conditions may exist, including: <ul style="list-style-type: none"> <li>Encoder removal</li> <li>Temperature limit exceeded (34...140° F)</li> <li>Magnetic tamper</li> </ul>	Encoder alarm remains active for 35 days. The alarm automatically clears after 35 days if any of the 3 conditions has not recurred.	Encoder alarm sent to the endpoint.
Reverse flow		Encoder detects reverse flow.	Reverse flow alarm remains active for 35 days. The alarm automatically clears after 35 days if reverse flow condition has not recurred.	Encoder detects reverse flow and sends alarm message to the endpoint.
Suspected leak		Encoder detects 24 hours without one 15-minute interval of no flow.	The alarm clears automatically when a 15-minute no-flow interval occurs	Encoder detects suspected leak and sends alarm message to the endpoint.  If condition clears before message is sent to the endpoint, it is not reported.
30 day no usage		No measured flow in past 30 days.	The alarm is automatically cleared once flow occurs.	Encoder detects 30 days no usage and sends alarm to the endpoint.
End of life battery indicator		Indicated battery life based on pre-calculated consumption.	Alarm activated at 19 years and does not clear.	Encoder sends alarm to the endpoint.