



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

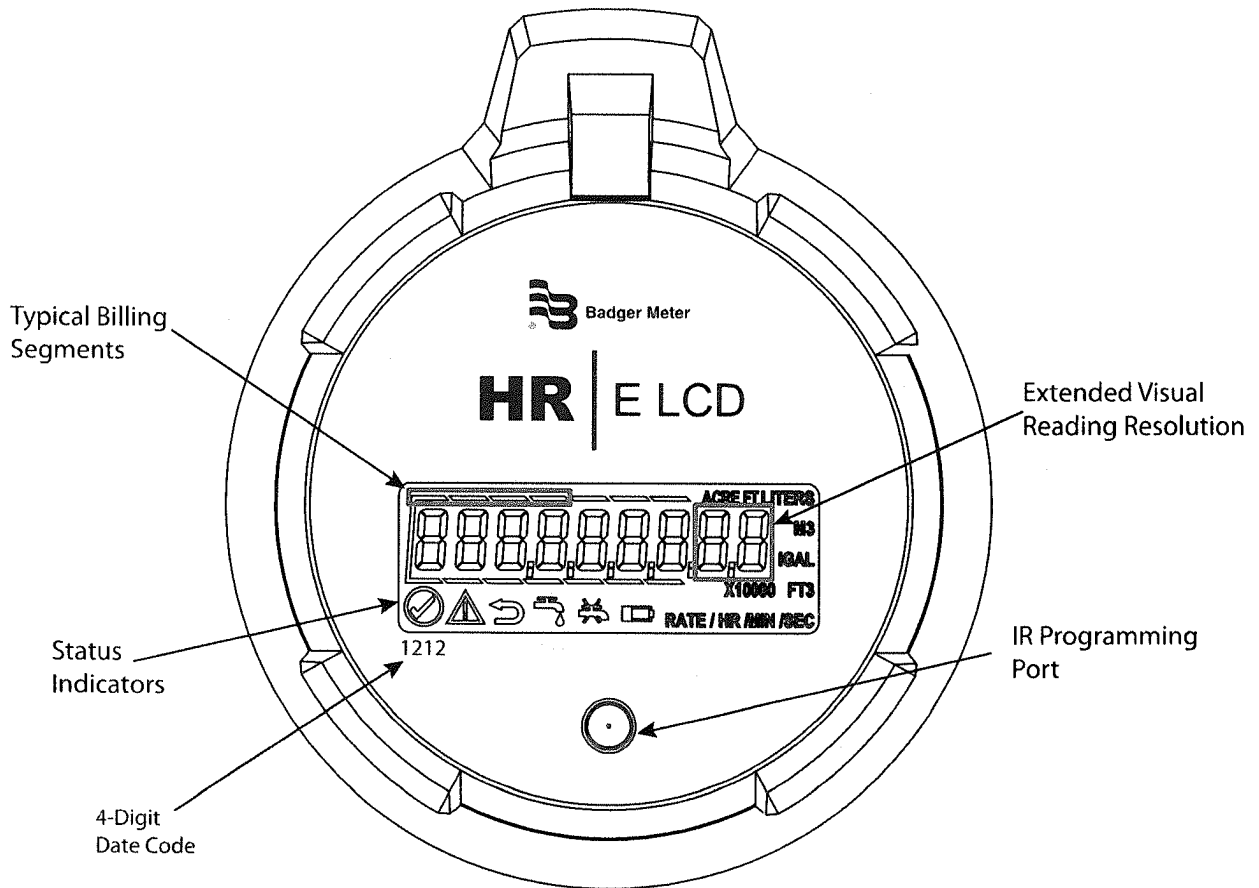
- The 9-digit display provides your utility with the finest reading resolution.
- The 6-digit display represents the equivalent of the moveable number wheels on a 6-dial mechanical encoder.

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 ft³
- Cubic Meters – reading to the nearest 10 m³

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.



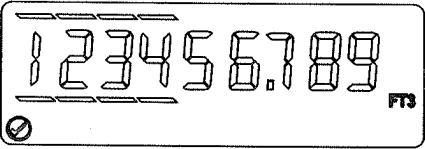
CUBIC FEET

Typical Billing Unit of 100 Cubic Feet

9-DIGIT VISUAL DISPLAY

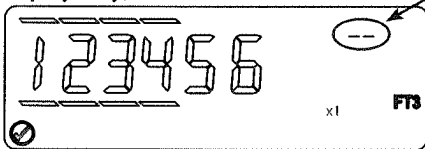
6-DIGIT VISUAL DISPLAY

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



Meter reading to the nearest? 1000th ft³ = 123456.789
100th ft³ = 123456.78
10th ft³ = 123456.7
1 ft³ = 123456
10 ft³ = 12345
100 ft³ = 1234

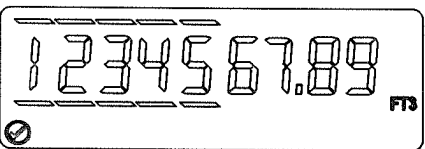
Typical Billing Units →



Meter reading to the nearest? 1 ft³ = 123456
10 ft³ = 12345
100 ft³ = 1234

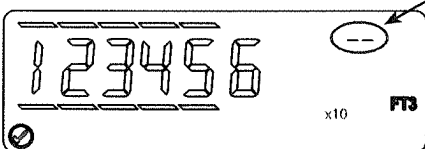
Typical Billing Units →

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



Meter reading to the nearest? 100th ft³ = 1234567.89
10th ft³ = 1234567.8
1 ft³ = 1234567
10 ft³ = 123456
100 ft³ = 12345

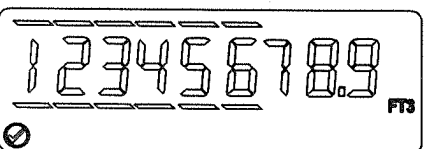
Typical Billing Units →



Meter reading to the nearest? 1 ft³ = 1234560
10 ft³ = 123456
100 ft³ = 12345

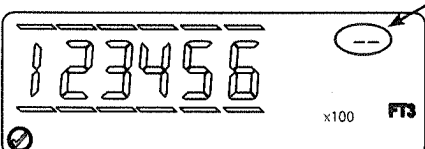
Typical Billing Units →

Recordall TSM 6", 8" & 10", Recordall CSM 6" High Side, Recordall Combo 8" High Side



Meter reading to the nearest? 10th ft³ = 12345678.9
1 ft³ = 12345678
10 ft³ = 1234567
100 ft³ = 123456

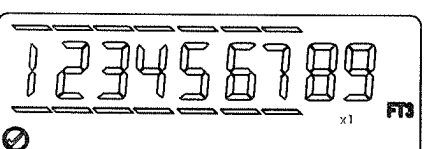
Typical Billing Units →



Meter reading to the nearest? 1 ft³ = 12345600
10 ft³ = 1234560
100 ft³ = 123456

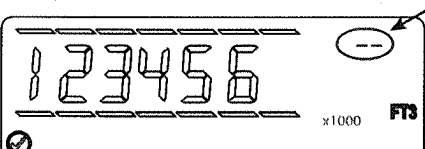
Typical Billing Units →

Recordall TSM 12", 16" and 20"



Meter reading to the nearest? 1 ft³ = 123456789
10 ft³ = 12345678
100 ft³ = 1234567

Typical Billing Units →



Meter reading to the nearest? 1 ft³ = 123456000
10 ft³ = 12345600
100 ft³ = 1234560

Typical Billing Units →







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"> Encoder removal Temperature limit exceeded (34...140° F) Magnetic tamper 	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.

How to Read the Badger E LCD Encoder Meter

Bold words in the description below correspond to labels on diagrams in the attached document.

The application toggles between four displays.

Where applicable, the corresponding Volume unit-of-measure will be displayed on the right.

FT3= cubic feet

GAL= gallons

- **9-Digit Visual Display**, in cubic feet.
Typical Billing Segments. There are horizontal lines above and below the left-most digits, flagging the columns that correspond to the meter reading on your bill.

NOTE: The meter reading on your bill is in Units.

1 Unit = 100 cubic feet = 748 gallons.

- **6-Digit Visual Display.**
- This display also has the horizontal lines flagging the **Typical Billing Segments.**
Flow Finder. At the right-side of this display, there is a straight line; this will move in a clockwise motion, from horizontal to vertical and back, if water is flowing.
For this display, there will also be "x1" or "x10", indicating an additional multiplier on the flow rate.
- The Model of the meter.
- **RATE**, typically Gallons/Minute.
The word **RATE** will be displayed along the bottom right, along with the time interval (HR, MIN, SEC).

Status Indicators. Along the bottom left, various status codes may be displayed. The one that looks like a dripping hose bib is the "Suspected Leak" indicator; it will appear when there has been flow for 24 hours without a single 15-minute interval of no flow.

To check for a leak, check the meter at a time when no water is being intentionally used.

The following will indicate that water is flowing:

- The **Flow Indicator** will be moving
- The right-most digits on the **9-Digit Visual Display** will increase.
- The flow on the **Rate** display will be greater than zero.