

LIQUID CONTROLS



**Electronic Registers and
Data Management Systems**



Practical Electronic Flowmeter Systems

Applications

Tank wagons and transports

LPG bobtails

Aviation refuelers

Hydrant carts

Load Racks

Fixed Installations

Bulk Plants & Terminals

Liquid Controls electronic flowmeter systems are designed to meet and exceed the increasing demands of today's custody transfer and inventory control operations. Liquid Controls' (LC) has been manufacturing flowmeters and flowmeter accessories for more than 60 years. In that time, LC has built a reputation for reliable positive displacement flowmeter systems that sustain their outstanding accuracy, even in the harshest of environments.

More than 30 years ago, in order to enhance the capabilities of the LC positive displacement meter, Liquid Controls began designing and developing electronic registers and data processors for flowmeter systems. Since then, LC has consistently produced leading edge electronics for flowmeter systems, pioneering a number of advances in flowmeter data processing and Weights & Measures-approved electronic registration.

Today, LC electronic flowmeter systems measure with near-perfect accuracy over a full range of flow rates and throughout a wide range of viscosities. They are easy to use and maintain their high performance in harsh fixed-site and vehicle-mounted environments. LC electronic flowmeter systems streamline dataflow between the flowmeter and your office network, increase the security of your inventory, and promote a safer work environment for your employees.

Liquid Controls remains committed to providing straightforward, practical solutions to the challenges you face today and generating innovative opportunities to help you build your future.



M-80 with LectroCount LCR 600

The Advantages of Liquid Controls Electronics

IMPROVED EFFICIENCY

- Electronic presetting
- No more hand written tickets
- Reduced delivery time

SUPERIOR ACCURACY

- Multi-point calibration

INCREASED PROFITABILITY

- No more manual pricing errors
- Streamlined office operations

AUTOMATIC DATA COLLECTION

IMPROVED SECURITY AND AUDIT TRAILS



LectroCount® LCR-II™

The LectroCount LCR-II is the electronic register of choice for those who have experienced its performance in the field. The LCR-II earned its sterling reputation because of its simple design and sturdy construction, which provide easy operation and longevity in the most challenging environments.

Temperature rating

-40 to 158 °F (-40 to 70 °C)

Input Voltage

9 to 28 VDC, 4.5 A maximum *including solenoid valves*

Communications

RS-232: EIA-232E standard

RS-485: SAE J1708 standard

Inputs

Electronic temperature volume compensation RTD probe, Optical air/vapor elimination sensor

Outputs

Scaled Pulse: 150mA sinking capability

Auxiliary 1: 1 A sinking capability

Auxiliary 2: 150 mA sinking capability

External display: 1 A sinking capability

Solenoid (3): 10.2 to 27.2 VDC, 1 A maximum

Features

- Simple 'Pump & Print' delivery system
- Weights & Measures custody transfer (product delivery and ticket generation)
- Metrological data collection
- Four product calibrations
- Multi-point and Single-point Calibration
- Printed delivery, shift, and diagnostic tickets
- Security settings
- Two auxiliary programmable outputs
- No-flow timer
- Electronic temperature volume compensation (ETVC) *optional*
- Electronic presetting by volume
- Electronic valve control
- Electronic air or vapor elimination
- 10-digit totalizer
- NEMA 4X enclosure
- Available in Class I, Div 1 or Div 2 enclosure, Groups C & D



Flowrate Screen



Temperature Screen



Preset Screen



10-digit Totalizer Screen



Class I Division 1 Enclosure

- Proven long service life
- Increased accuracy with multi-point calibration
- Simple operation
- Reliable in harsh environments
- Improved efficiency relative to mechanical systems



LectroCount LCR 600™

The LectroCount LCR 600 marks the next evolution of Liquid Controls electronic registers, providing a large display, user-friendly interface, and increased functionality. The LCR 600 is a flexible computing platform that can be supplied standard or with industry-specific custody transfer applications, such as Point-of-Sale (POS), for customer-direct fuel delivery, and FlightConnect, for aviation fueling.

Temperature rating

-40 to 158 °F (-40 to 70 °C)

Input Voltage

9 to 28 VDC, 4.5 A maximum *including solenoid valves and display heater*

Communications

RS-232: EIA-232E standard

RS-485: SAE J1708 standard

Inputs

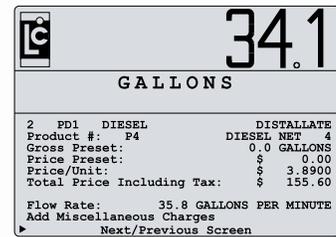
Electronic temperature volume compensation RTD probe, Optical air/vapor elimination sensor

Outputs

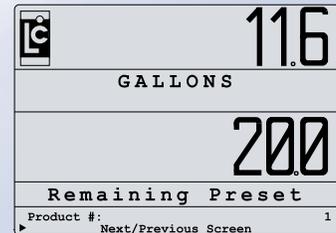
Scaled Pulse: 150mA sinking capability
 Auxiliary 1: 1 A sinking capability
 Auxiliary 2: 150 mA sinking capability
 External display: 1 A sinking capability
 Solenoid (3): 10.2 to 27.2 VDC, 1 A maximum

Features

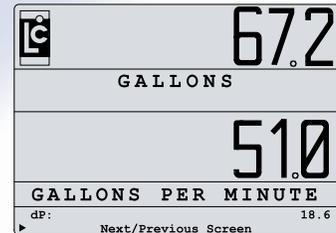
- Point-of-Sale (POS) and FlightConnect upgrades *optional*
- Customized pricing, taxes, discounts, and miscellaneous charges *with POS upgrade*
- Simple 'Pump & Print' delivery system
- Weights & Measures custody transfer (product delivery and ticket generation)
- 16 product calibrations *POS only*
- Multi-point and Single-point Calibration
- Four delivery screens
- Volume, flow rate, and other key values visible during delivery
- Printed shift and diagnostic tickets
- In-field configuration and setup
- Two auxiliary programmable outputs
- No-flow timer
- Electronic temperature volume compensation (ETVC)
- Electronic presetting by volume and price *price presetting with POS upgrade*
- Electronic valve control
- Electronic air or vapor elimination
- NEMA 4X enclosure



POS Delivery Screen



Preset Delivery Screen



Flowrate Delivery Screen

- Proven long service life
- Increased accuracy with multi-point calibration
- Reliable in harsh environments
- Reduced delivery times and billing errors with priced and taxed delivery tickets *with POS*
- Reduce time to post and shorten cash cycle *with POS*
- Industry-specific applications: POS and FlightConnect



The DMS is an in-cab data management system designed for fuel delivery vehicles. After each delivery, the DMS gathers the metrological data from the electronic register, combines it with customer and transaction data, and transfers a complete record of delivery activity to your office computer. There are three types of application software available for the DMS, each one tailored to the intricacies of a specific fueling application: DMS Delivery for customer-direct, point-of-sale fuel delivery, EZConnect for fleet fueling, and FlightConnect for aviation fueling.

Temperature rating

-22 to 158 °F (-30 to 70 °C)

Operating voltage

+9 to 30 VDC

Power Consumption

5 A maximum

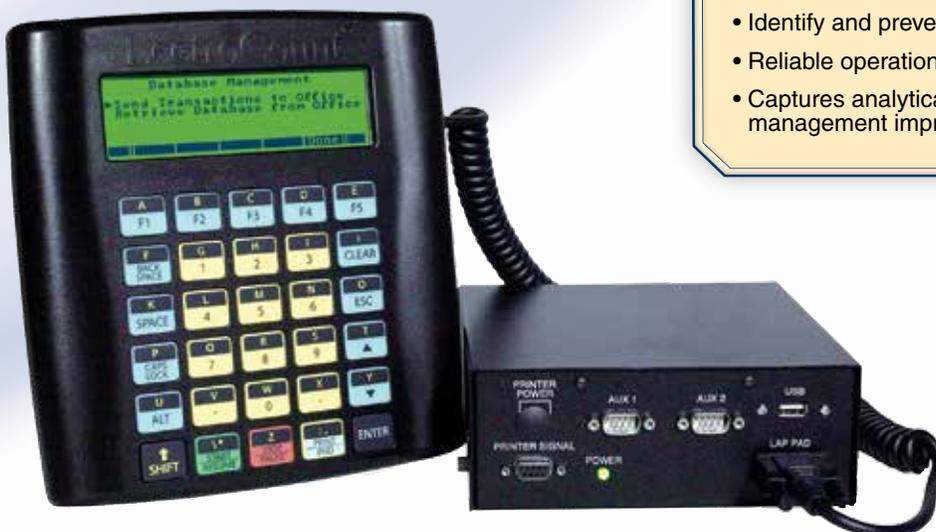
60 W maximum, *intermittent*

Display

LCD, dot matrix, 240 x 64 pixels, backlit, 5.2" W, 1.55" H, 8 rows, 20 characters per row

Features

- Simultaneously manage deliveries from up to three meter systems
- Two auxiliary ports for custom devices
- Three programmable outputs for injectors, warning lamps, and other devices
- Software designed to specific applications available: customer-direct fueling, fleet fueling, and aviation refueling
- Rugged construction provides longevity and operation in extreme environments
- Data transfer via RF, cellular, or USB
- Two support software programs preinstalled
- Controls all LectroCount register functions and settings



- Flexible and expandable customization fits your unique needs
- Identify and prevent theft
- Reliable operation in harsh environments
- Captures analytical data that can lead to fleet management improvement

LectroCount Systems: Features Table



LCR-II



LCR 600



DMS & LCR-II

	LCR-II	LCR 600	DMS & LCR-II
Weights & Measures Approval	✓	✓	✓
Weights & Measures Security	✓	✓	✓
Pump & Print	✓	✓	✓
POS (Point of Sale)		✓	✓
DMS Delivery			✓
EZConnect			✓
FlightConnect		✓	✓
Diagnostics	✓	✓	✓
Shift Tickets	✓	✓	✓
Single-point Calibration	✓	✓	✓
Multi-point Calibration	✓	✓	✓
4 Product Calibrations	✓		✓
16 Product Calibrations		✓	
Volumetric Presetting	✓	✓	✓
Price Presetting		✓	✓
Valve Control	✓	✓	✓
Wireless Communication		✓	✓
Electronic Air and Vapor Elimination	✓	✓	✓
Differential Pressure Shutdown	✓	✓	✓
Low Flow Auxiliary Output	✓	✓	✓
No-flow Timer	✓	✓	✓
Integrated Keypad Controls		✓	



MS-30 with F-Series Strainer and Division 1 LCR-II



M-7 Meter with Optical Air Eliminator, High Capacity Strainer, E-7 Valve, and LectroCount LCR-II

Versatile Point-of-Sale Fueling

DMS Delivery accelerates the efficiency of fuel delivery operations—at the fueling point and in the office. DMS Delivery is a point-of-sale application that provides complete pricing and taxing at the fueling point and a versatile data management and transfer system.

DMS combines metrological, customer, and transaction data, prints a priced and taxed ticket, and transfers the data back to the office. Discounts, taxes, pricing, and miscellaneous charges are easily customized and applied to the customer in the database or at fueling point.

DMS Delivery is ideal for fuel delivery operations with large customer bases and complex billing structures.

- Shorten fueling times
- Increase operational efficiency
- Reduce processing time and data entry errors
- Avoid inventory reconciliation errors and rework
- Reduce transaction cycle time

ACCOUNT INFORMATION	↑ (2/3)
AC120	2
Albert Constantine	
Presets	250.00
▶ Miscellaneous Fees	\$25.00
Discounts	10 day
Price and Tax	3.499
	Util Back Fwd

DMS Delivery

Main Functions

- Account management
- Operational data management
- Delivery data tracking
- Data entry interface
- File conversions
- Security settings for fueling access and system configuration
- Print ticket configuration
- Customer equipment identification
- Delivery start and stop



DMS Delivery Office Software



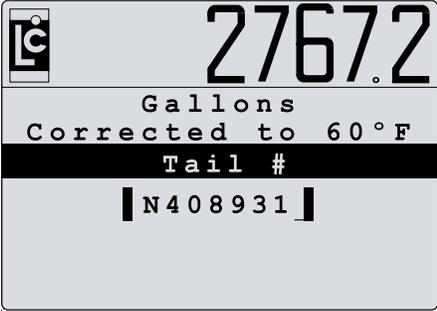
Efficient, Automated Aviation Fueling

FlightConnect is an automated, easy-to-use data capture and management system that streamlines into-plane fueling operations. FlightConnect collects the details of each fueling and delivers them, wirelessly, to the doorstep of your back office software.

FlightConnect eliminates the need for hand-written tickets at the gate or at the plane as well as the majority of manual data entry required in the office. Fuelers simply enter the plane details into their LCR 600 register or DMS, and when the fueling is complete, FlightConnect prints a ticket of the fueling details and wirelessly sends all of the data to your office computer. There, the data is organized and formatted by FlightConnect's office software so it can be easily imported into your fuel management or POS system. FlightConnect's office software also features a dispatching tool that wirelessly sends fueling assignments to fuelers on the tarmac.

FlightConnect is ideal for commercial or fixed-based operations. It is available on the LectroCount LCR 600 and the DMS and operates seamlessly in a mixed environment of refuellers, hydrant trucks and hydrant carts.

- Reduce processing time and data entry errors
- Print on-site delivery summaries
- Dispatch fueling assignments wirelessly
- Avoid inventory reconciliation errors and rework
- Reduce transaction cycle time
- Shorten fueling times
- Increase operational efficiency



LectroCount LCR 600 FlightConnect

Data Fields

- Tail number
- Fueling date and time
- Fuel type
- Gallons delivered
- Airport ID
- Fueler ID
- Aircraft type
- Gate number
- Origin
- Destination
- Requested volume
- User-defined fields
- Maximum ΔP reading



FlightConnect Office Software



Fleet Fueling Made Simple

EZConnect simplifies fuel delivery and streamlines accounting procedures for fleet fueling operations. Using a handheld reader, it identifies vehicles and equipment at the fueling site, automatically verifies the customer and the type of fuel required, records the delivery data, and transfers the delivery data into an office computer.

EZConnect can practically eliminate misfuelings. Before allowing a delivery, fuelers must use the EZConnect Button Reader to identify the vehicle or piece of equipment. EZConnect then pulls the vehicle's data from the database, verifies the correct fuel type, makes the delivery, prints a delivery ticket, and records the delivery data. No handwritten tickets are required and delivery data is electronically transferred into the office computer, decreasing fueling times and accounting inaccuracies significantly.

EZConnect is ideal for fueling ground support equipment at an airport, construction sites, or any other fleet fueling application.

- Prevent misfuelings
- Deliver to multiple customers without stopping or changing accounts
- Prevent fuel theft
- Print on-site delivery summaries
- Shorten fueling times
- Reduce billing errors
- Simplify accounting
- Reduce time to post and shorten cash cycle
- Improve preventative maintenance
- Audit fleet performance according to fuel burn and fuel consumption

FILL VEHICLES		↑ 16:01:12
Button ID:	640000F4FCD0651	
LCR #1	Product:	Gasoline
Gross Qty:	55.7 Gallons	
Account #:	45	
Vehicle #:	178	
Quantity:	55.7 Gallons	

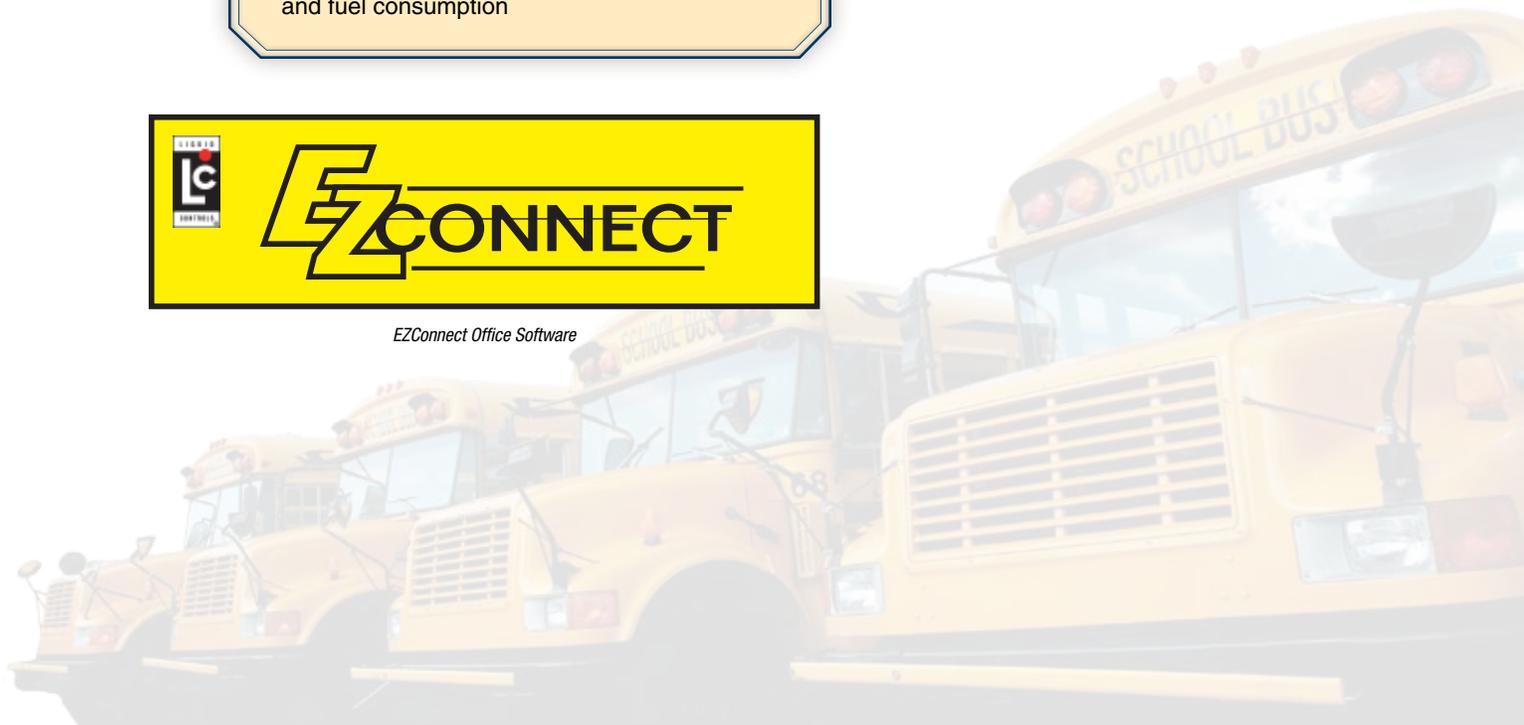
EZConnect Fill Vehicles Screen

Main Functions

- Account management
- Operational data management
- Delivery data tracking
- Data entry interface
- File conversions
- Security settings for fueling access and system configuration
- Print ticket configuration
- Equipment identification
- Delivery start and stop



EZConnect Office Software



Electronic Accessories

POD (Pulse Output Device)

The POD converts the rotary motion of Liquid Controls flowmeters into a high resolution, unscaled pulse stream. The POD's pulse stream is accepted by LectroCount registers and a wide variety of other electronic monitoring devices and control equipment.



XL LED Remote Display

Perfect for aviation refuelers, load racks, and other applications in vast spaces where long-distance viewing is necessary, the six 2¼" high digits, each consisting of 18 red LED lights, are discernible from up to 250 feet away.



Differential Pressure (ΔP) Transducer

The ΔP transducer is a safety shutdown device and a maintenance tool for aviation refueling systems. The ΔP transducer, in conjunction with a LectroCount register and a solenoid operated valve, stops deliveries when the differential pressure (ΔP = pressure drop) across a full flow fuel monitor or filter separator meets a preprogrammed differential pressure shutdown value, eliminating the risk of tainted fuel deliveries and meter damage. Maximum differential pressure (across the full flow fuel monitor or filter separator) and the corresponding flow rate are printed on the ticket



Printers

Epson slip printers and Epson roll printers are industry standards for mobile and stationary flowmeter systems. Epson printers provide multiple copies of delivery tickets, diagnostic tickets, calibration reports, and shift tickets.



Epson Roll Printer



Epson Slip Printer

EZCommand™

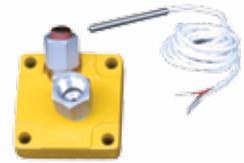
EZCommand is a user-friendly Windows®-based interface that saves and distributes LectroCount register settings and updates. It is a simple way to coordinate configurations and setups across your entire fleet.



Electronic Accessories

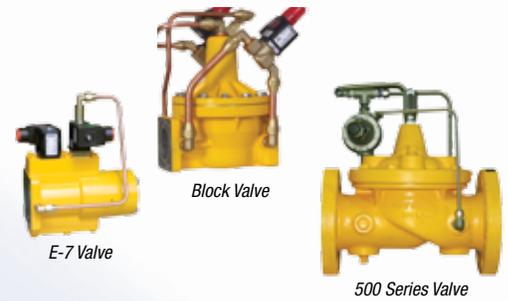
Electronic Temperature Volume Compensation (ETVC)

The ETVC kit all but eliminates the effect of product temperature change on the delivered volume. The platinum RTD probe sends two temperature readings per second back to the LectroCount register. It is accurate to 0.45 °F over the operating temperature range of -40 to 158 °F. Features include field programming for base temperature and a coefficient of expansion (or API) table.



Electronic Valves

LectroCount registers can controls a number of different types of solenoid control valves. Ask your Liquid Controls representative which valve is right for your application.



E-7 Valve

Block Valve

500 Series Valve

Optical Air and Vapor Eliminators

Optical air and vapor eliminators detect and eliminate air or vapor from the system before it reaches the flowmeter's measuring chamber. Optical air and vapor eliminators have no internal moving parts, so maintenance costs and downtime are minimal.



Optical Vapor Eliminator

Optical Air Eliminator

Dual Meter Module (cab mounted)

The dual meter module permits sequential operation and control of two flowmeter systems with LectroCount registers. The dual meter module reduces the size and cost of dual meter installations.



Lap Pad (cab mounted)

The lap pad is a valuable tool for the set up and calibration LectroCount registers, especially the LCR-II. It has a large, tactile, alpha-numeric keyboard and a dual line, backlit display.



SCAMP™

SCAMP is an advanced electronic flowmeter signal conditioner that converts the output signal from the flowmeter into a volumetric unit of measure. Features include temperature correction to delivered volume measurements (API standard or programmable coefficient of expansion) and multi-point calibration.





Liquid Controls - A Tradition of Excellence

Over fifty years ago, Liquid Controls set a new standard of excellence in engineering by building the finest flow meter products possible. The very first Liquid Controls meters metered aviation fuel for the United States Air Force, and it wasn't long until the Liquid Controls name became synonymous with dependability and accuracy. With years of constant innovation in flow meter technology, a flourishing worldwide distribution network and an ever-expanding industry base, Liquid Controls remains a premier name for controlling and measuring high-value liquids and gases.

The professionals at the Liquid Controls are driven to bring you products that perform efficiently and accurately with minimum maintenance for years to come. Delivering everything you'd expect from the very best—that's our goal.

Your Customers—Our Customers

Liquid Controls is part of IDEX Energy & Fuels. The IDEX Corporation is a diversified, engineered products company. IDEX leverages the resources of high quality, similar-profile businesses to innovate solutions that bring real and lasting value to you, our customer. At Liquid Controls and IDEX, the voice of our customers is our driving force. With your guidance, we will ensure that the quality of our existing products endures and we will continue to develop new products and services that best meet your customers' needs.

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