



# LIQUID CONTROLS

Simply the Best™



## LectroCount® Electronic Registers





## Premier products, premier performance

### Applications

Tank wagons and transports

LPG bobtails

Aviation refuelers

Hydrant carts

Load Racks

Fixed Installations

Liquid Controls produces among the most reliable and accurate metering systems available, worldwide. For truck-mounted or fixed-site custody transfer applications requiring **Weights & Measures-approved** accuracy, LC products deliver consistent, error-free, dependable service. Liquid Controls' family of LectroCount electronic registers provide near-perfect metering accuracy over a full range of flow rates and deliver enhanced functions including: automated data collection (e.g., date, time, product selection, delivery quantity), on-site ticket generation, meter linearization, electronic temperature volume compensation, improved security, and more.

### Features and benefits

Compatible with virtually all flow meters, the family of LectroCount electronic registers is UL Class I listed and Weights & Measures approved. A simple "Run," "Stop," "Print" operator selector switch makes product delivery easy. The large 6-digit weatherproof LCD display provides readout of totalizer, preset quantity, flow rate, temperature, time, and more. Optional electronic temperature volume compensation eliminates the effect of product temperature change on measured volume. LectroCount registers are easily field calibrated to Weights & Measures standards.

### Advantages of electronic registration

- **Superior accuracy**
  - Meter linearization
  - Electronic temperature volume compensation
- **Improved efficiency**
  - Electronic presetting
  - No more hand written tickets
  - Reduced delivery time
- **Increased profitability**
  - No more manual pricing errors
  - Reduced postage expense
  - Streamlined office operations
- **Automatic data collection**
- **Improved security and audit trail for custody transfer**
- **"Real time" communication platform for sophisticated dispatching systems involving RF, GPS, and CDPD**

# LectroCount® Systems: The standard in electronic registration

LectroCount electronic registers provide numerous features that make it an ideal flow computer for vehicle mounted and fixed applications. Some features include the following:



*Class I, Div. 2 Enclosure*



*Class I, Div. 1 Enclosure*

## Multi - Point Calibration

Virtually eliminates deviations in accuracy caused by variations in flow rate. Increases accuracy by improving meter linearity over entire flow range.

## Multi - Product Calibration

Different fluids can produce variations in meter accuracy. Multi-product calibration maintains the accuracy of the flow meter on multiple fluids over entire flow range.

## Electronic Temperature Volume Compensation (ETVC)

Accurately corrects volume measured to a programmable base temperature. ETVC utilizes a standard RTD for measuring temperature and is 100 times more responsive than a traditional mechanical temperature compensator. There are no moving parts that wear or require adjustment.

## Increased Security

LectroCount systems have been approved by many Weights & Measures agencies including NCWM, Measurement Canada, and NMI (Netherlands) under National and International regulations such as OIML for dispensing, recording, printing, calibration and audit trail software and hardware to ensure accuracy and prevent unauthorized tampering.

## Increased Security of Transaction Record

LectroCount systems control the printing of the ticket/receipt/report irrespective of other peripherals, including third party PC or hand held computers, PLC, Card Lock, POS, RF, and other interface devices.

## Increased Security of Delivery System

LectroCount systems control a variety of fail-safe system components which prevent unauthorized delivery or system bypass, minimizing potential for fraudulent activity.

## Modular Designs with RS232 and RS485 Communication Capability

No planned obsolescence, adapts to your system requirements today and in the future, with upgrade capabilities at minimum cost.

## Increased Reliability

Highest quality components, NEMA 4X, state-of-the art manufacturing, and ISO 9001 accreditation result in longer service life for all LC electronic products.

# LectroCount LCR-II - Pump & Print system

LectroCount LCR-II is an ideal solution for Pump & Print applications offering:

- Easy to use RUN, STOP, PRINT, SHIFT PRINT rotary switch
- 4 product selections
- Printed delivery and shift ticket
- Delivery quantity and totalizer
- Time, Temperature, Flowrate, Preset, Product Select, and more
- Operates with or without optional Lap Pad
- Available in Class I, Div. 1 or Div. 2 enclosure, Groups C & D

## Features

Weights & Measures approvals

NEMA 4X enclosure

Multiple product calibrations

Multi-Point calibration

Optional Electronic temperature volume compensation (ETVC)

RS232/RS485 communication

Temperature range: -40° to 158°F (-40° to 70°C)

## The LCR-II Advantage

The LectroCount LCR-II is a state-of-the-art electronic register featuring the industry's largest display and easy "pump & print" delivery system. The LCR-II offers what the industry demands of an electronic register...

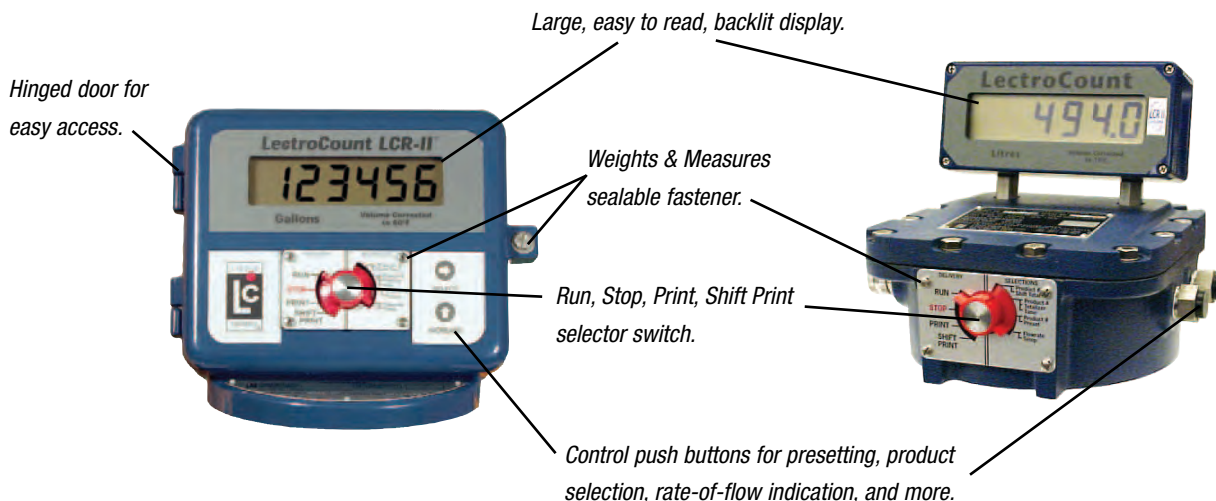
- Improved efficiency relative to mechanical systems
- Weights & Measures approvals
- Ruggedness and reliability
- Simplicity of operation
- Compatibility with industry-standard printers

The LCR-II has highly engineered hardware and software for compatibility with the full range of delivery systems from the simple to the sophisticated. It is backed by the Liquid Controls commitment to stand by the product for the many years it will be in service.

## LCR-II versatility

The LectroCount LCR-II can be installed on Liquid Controls meters or retrofit to other manufacturers' meters through the use of drive shaft couplings supplied by Liquid Controls. Installation is simplified with:

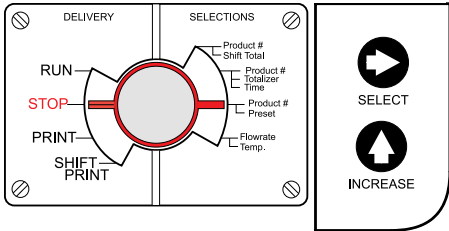
- Hinged door for easy access to internal connections.
- Ample access to wiring connections inside the enclosure.
- One closure connection point with Weights & Measures sealable captive fastener.
- Seven conduit connections located on the back of the enclosure.



**Class I, Div 2 enclosure (vehicle applications requiring Div 2 enclosure).**

**Class I, Div 1 enclosure (bulk plant or fixed site applications requiring Div 1 enclosure).**

## “Pump & Print” operation



As a stand alone device, the LCR-II selector switch is used for “Pump & Print” operations. The control buttons provide access to additional device functions, as shown to the right.

Two control buttons provide access to:

- Delivery quantity ----- 123456
- Flowrate ----- F 2000
- Product temperature ----- 72.3 °F
- Time of day ----- 11:30:22
- Setting preset deliveries ----- 002000
- 10 digit totalizer ----- H98765 L43210
- Single point calibration ----- 098024
- Selection of four different products ----- Prod 1

## Advanced software features

The LectroCount LCR-II can be configured to address the specific needs of the application. A few of the special features resident in the LectroCount LCR-II are:

- **Multi-point calibration.** When the meter is being commissioned in the field, the Lap Pad can be used to calibrate meter performance for either single point or multi-point calibration at up to 10 flow rates from low flow to high flow.
- **Inventory monitoring.** The LCR-II can be set up to monitor the remaining volume (current inventory) in the delivery vehicle. Simply select INVENTORY for the preset type.
- **Low flow alarm.** Auxiliary output 1 can be set to MONITOR FLOWRATE. When set to MONITOR FLOWRATE, the LCR-II will activate a circuit at the beginning of each delivery. If the flowrate does not exceed 40 GPM during the delivery, the output remains active. This can be used to control an external device, such as an alert light and to print a special note on the delivery ticket. This may be an indication that the system filter/strainer requires maintenance.

# LectroCount DMS “Data Management System”

DMS Lap Pad



RF Radio Antenna

Auxiliary Ports

(Card Reader, Bar Code, Scanner, etc.)

USB Port



Printer Signal & Power Connections

Power Lamp

Lap Pad Connection

## Features

Simultaneous delivery of up to three meter systems

USB port for USB memory device

Auxiliary Ports for custom devices (card readers, bar code scanners, etc.)

Three user programmable inputs and outputs

Optional RF communication



USB Flash Memory

## Features and benefits

LectroCount DMS is a dynamic, new data management system. Versatile, expandable and configurable, LectroCount DMS interfaces with up to three LectroCount LCR and LCR-II electronic registers and allows for simultaneous deliveries on dual and triple meter systems.

Cased in a rugged, metal housing, the DMS module can be easily mounted in the cab of any delivery vehicle. An embedded computer board and compact flash memory card supplies a virtually unlimited data base capacity for products and future upgrades. A USB flash memory device transfers information seamlessly between the DMS module and the office. The

rugged Lap Pad, rated NEMA 3 rainproof, has a backlit, 8 line by 30 character display for easy viewing.

The software allows for a virtually unlimited number of customers and products, four calibrations per meter, driver logon capability, route reports,

Three Meter/Register Connections

RF Antenna Connection



LectroCount DMS Rear Panel

Terminal Strip for Power, Inputs, Outputs, and GPS Connection

numerous tax categories and calculations, and ticket storage for future reprints. Serving as the systems' data coordination point, the DMS Office program manages the company's customer data base and delivery records, configures delivery tickets and customizes the operator interface.

# System Components



*LectroCount LCR-II Electronic Register with LC Flowmeter, Optical Air Eliminator, and E-7 Two-Stage Valve with Flow Switch*



*LectroCount DMS Module*



*LectroCount DMS Lap Pad*

## Metering System

The LectroCount DMS works with LectroCount LCR and LCR-II Electronic Registers and all Liquid Controls PD Flowmeters. No special software is required for the LectroCount registers. The LectroCount DMS system can be ordered with a new system or retrofit to existing systems. Once installed and configured, up to three metering systems can be controlled with the LectroCount DMS allowing for simultaneous delivery from all three meters.

## DMS in-cab components

The LectroCount DMS consists of three major components; the LectroCount DMS Module, DMS Lap Pad, and DMS operating software. As its name suggests, LectroCount DMS is a system for recording and managing data such as customer accounts, day-to-day delivery transactions, shift information, and route information.

Housed in a rugged enclosure, LectroCount DMS offers a high-speed embedded computer and compact flash drive. The Lap Pad, rated NEMA 3 rainproof, provides an 8 line by 30 character, backlit display with an easy-to-use keyboard. This means a minimum of screens to navigate and fewer keystrokes for operators.

The software structure has been streamlined to further reduce navigation time and keystrokes. The software consists of four functional segments; one for setting up communications, one for product calibration, one for making deliveries, and a system menu used to navigate between them. Once configured, the operator makes deliveries from a single program.

At the end of a shift, the operator can send delivery transaction records to the home office computer using an optional RF transmitter, or download the transactions to a USB memory device and bring that to the office computer for upload. Software and data base upgrades can be effected using the same methods in reverse

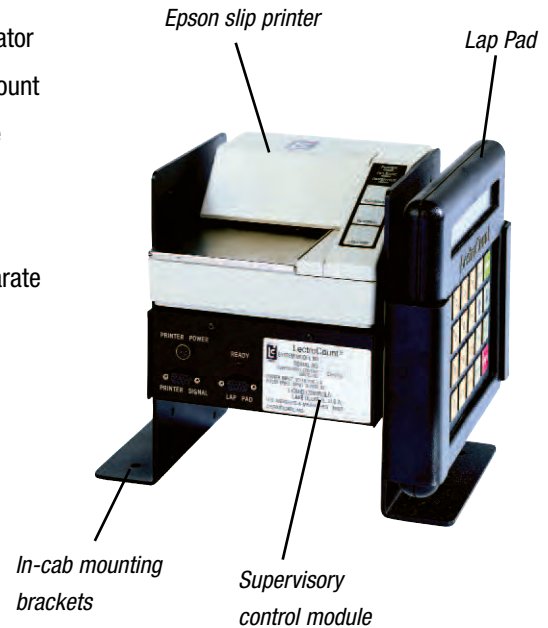
# LectroCount<sup>3</sup>: POS “Point of Sale” system

(Includes pricing data base)

The LectroCount<sup>3</sup> is a rugged, reliable, and time-tested product accountability system for truck applications. The system utilizes Weights & Measures approved hardware and software, and generates a priced invoice at the time of delivery with minimal operator interface. Owner/Operator has the option to use a default, itemized, price/tax discount structure by product or by customer classification, or to use an operator selectable structure on a per-delivery basis.

The system includes self-diagnostics and handles up to 24 products and four separate product calibration factors. The POS system options include:

- Electronic temperature volume compensation probe
- Preset delivery with two stage valve
- Odometer input for recording truck movement
- Dual meter module
- Available in Class I, Div. 1 or Div. 2 enclosure, Groups C & D
- Price extended delivery ticket and detailed shift report



## System components

- LectroCount<sup>3</sup> electronic register
- Supervisory control box
- Dot matrix or slip printer
- Accessory mounting brackets
- Lap Pad
- Control valve
- Wiring Harness

### Features

Simple RUN, STOP, PRINT operation

Weights & Measures approvals

NEMA 4X enclosure

Multiple product calibrations

Multi-Point calibration

Electronic temperature volume compensation (ETVC)

RS232 communication

Temperature range: -40° to 158°F (-40° to 70°C)

Advanced pricing features (discounts, taxes, etc.)



# LectroCount<sup>3</sup> POS system components



## Supervisory Control Module (cab mounted)

Microprocessor based, on-board truck computer. Monitors, controls, calculates, and records flow meter and related system activity on a real time basis.



## Dual meter module (cab mounted)

Permits sequential operation and control of two meters from one Supervisory Control Module. Reduces the size and cost of dual meter installations.



## Lap Pad (cab mounted)

The Lap Pad programs and displays all operational functions of the LCR or supervisory control module. It has a large, tactile, alpha-numeric keyboard and a dual line, backlit display. The umbilical cable permits convenient operation within nine feet of the supervisory control module. It is a standard component on POS systems.



## LectroCount<sup>3</sup> Electronic register (mounted to meter)

Provides local readout for ease of operator viewing during use. Serves as a terminal junction box for system inputs and outputs including RTD, control valve, external pulser, and other accessories.

# Accessories

## USB Flash Memory (DMS)

The USB Flash Memory device plugs into the DMS Module. This device can be used for downloading completed transactions for delivery to the in-house computer system, or it can be used for upgrading the Data Module software and data base.



## Control module mounting bracket (cab mounted)

These mounting brackets are ideal for mounting the different modules of the system in the cab of a truck. Made of 12 gauge steel and powder coated, these universal mounting brackets are designed for Lap Pad, supervisory control module, dual meter module, RAM module, and printer installation.



## Printers

These Epson printers are industry standards for mobile and stationary applications. The printers provide alpha-numeric printouts of delivery and other information for each transaction. They also print diagnostics, calibration reports, and shift tickets. Roll printers have an optional uptake reel for storage of a file copy.



*Epson Slip printer*



*Epson Roll printer*

## RF Communication (DMS)

An RF Transceiver may be added for wireless communication with the office computer. This provides a means of communicating with the office computer for downloading delivery transactions, or uploading software and revised files.



# Accessories

## Differential Pressure ( $\Delta P$ ) Transducer

The new differential pressure transducer available from Liquid Controls can be electrically connected directly to the LectroCount LCR-II. When a ticket is printed, the maximum differential pressure across the full flow fuel monitor or filter separator is printed on the ticket along with the corresponding flow rate. This feature is used primarily in the aviation industry.



*NEW - Differential Pressure Transducer*

## Optical Air Eliminator

The Optical Air Eliminator is a new accessory for use with LectroCount electronic registers. The Optical Air Eliminator utilizes a photo electric sensor and solenoid to detect and eliminate vapor from the system before it reaches the flow meter. The Optical Air Eliminator has no internal moving parts to service or maintain.



*Optical air eliminator system (for petroleum applications).*

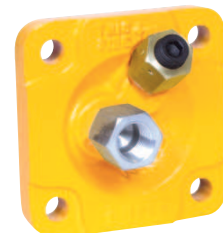
## E-7 Two-Stage Presetting Valve with Flow Control Switch

The E-7 electronic valve is the perfect companion device for the optical air eliminator. Two solenoids control presetting and shutoff. When air is detected by the optical air eliminator, the E-7 valve remains closed, preventing product flow and providing time for air to be purged from the system.

*E-7 valve with flow control switch (for petroleum applications).*

## Electronic temperature volume compensation (ETVC)

ETVC is used to record and compute changes in product temperature. ETVC virtually eliminates the effect of product temperature change on the volume delivered. Features include field programming for base temperature, coefficient of expansion or API table, platinum RTD probe accurate to 0.45°F over temperature range, and operating temperature range from -40° to 158°F.



*Thermowell*



## A tradition of excellence that benefits you

Over fifty years ago, Liquid Controls set a new standard of excellence in engineering and building the finest flow meter products possible, starting with metering aviation fuel for the United States Air Force.

Since that time, the industry base we serve has grown, broadened. Our product line has expanded to include a wide variety of flow meters, accessories and related items distributed worldwide. But our commitment to excellence will never change. The professionals at 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.

### A good fit

In 2001, Liquid Controls joined the IDEX team of companies. IDEX is a leader in the manufacture of a broad range of pump products, dispensing equipment and other engineered technologies. Maintaining a theme of leadership, IDEX delivers Innovation, Diversity and **EX**cellence to thousands of valued customers around the world.



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