

LCR.iQ[®]

THE NEXT GENERATION
ELECTRONIC REGISTER



CENTRILOGIQ[®]

THE CENTER OF FUELING LOGIC

by  LIQUID CONTROLS[®]

CENTRILOGiQ[®] Center of Fueling Logic

Inspired through LC's PartnerConnect™ initiative, Liquid Controls' new **CENTRILOGiQ[®]** platform provides adaptive sensing and communication that is scalable to adapt to future decades of new technology.

LPG & Refined Fuels

LCR.iQ[®] is designed to simplify fueling operations offering process configurability, intuitive operation, and real-time fueling diagnostics and data connectivity to maximize up-time and daily throughput.

Aviation

LCR.iQ[®] provides an easy to use, intuitive operator interface and ties together critical sensing devices in aviation fueling systems, reducing complexity, improving efficiency and safeguarding all fueling system data.



Security / Preset Valves



Optical Air Eliminators



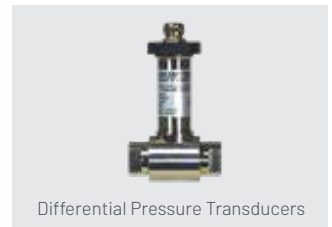
Strainers



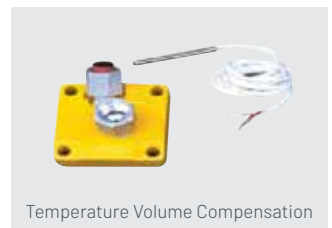
LCR.iQ[®] with M7 meter and accessories



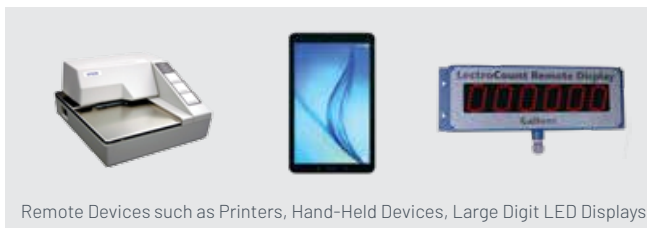
Slipstream[®] Densitometers



Differential Pressure Transducers



Temperature Volume Compensation



Remote Devices such as Printers, Hand-Held Devices, Large Digit LED Displays

LCR.iQ[®] Designed by those who'll use it

At the center of the **CENTRILOGiQ[®]** platform is the **LCR.iQ[®]**, built from the ground up by Liquid Controls' Research & Development team and close collaboration with customers who will benefit from it! Ease of use, process configurability, and data security were the highest priorities in the design and foundation of the **LCR.iQ[®]**.

HIGH-RESOLUTION DISPLAY WITH DAY/NIGHT MODES

7" ultra bright video display designed for extreme climates and rigorous fueling environments.

LARGE SCALABLE DIGITS FOR EASY VIEWING

Large digits provide easy viewing, day or night, up to 100 feet (30 m) away.

CONFIGURABLE FUELING DATA

The **LCR.iQ[®]** allows users complete control over the fueling data fields displayed on the detailed delivery screen.

SMART KEYS FOR GUIDED OPERATION

Smart keys guide the operator through the next available steps in the operation to minimize risk of error.

LARGE KEYS FOR EASY OPERATION

Large, petroleum and UV resistant elastomeric keys provide confident feel and consistent operation.

METER MOUNT BASE

Liquid Controls standard meter-mount base with integrated pulser allows easy mount-and-connect retrofit.



PANEL MOUNT ENCLOSURE OPTION

New panel mount design allows convenient remote mounting, providing OEMs greater design flexibility.

ACTIVE FUELING FULL SCREEN MODE

Yellow background indicates active fueling mode to improve safety and fueling status awareness of operators.

LCR.iQ® Ease of Use

It's just that simple.

Liquid Controls engineers took an aggressive approach by designing the LCR.iQ® from the operator's perspective as if no training* should be required to use it. The result is a user-guided, configurable interface that walks the operator through the fueling operation, minimizing chance for error.

COMMON FUELING PROCESSES COMPLETED IN 3 STEPS OR LESS

User-configurable fueling processes control the number of steps required for the operator to complete his or her delivery. Pump and print operations are complete in two steps, using one smart-key!



OPERATOR FRIENDLY SCREENS WITH DAY / NIGHT MODES AND BRIGHTNESS CONTROL

LCR.iQ® screens adapt to the operator. Idle screen shows the last delivery data, changing to full screen, active fueling mode with yellow background when "Start" is pressed. Operators have the option to see fueling details during active fueling and can easily adjust screen brightness and toggle between day or night modes for reduced eye strain.



Day mode idle screen

Night mode idle screen

Active mode full screen

Active night mode detail screen

Technical Features and Benefits

The **LCR.iQ®** is built on a foundation of hardware and software designed to support decades of future innovation, regulatory requirements, and wireless technologies.

LCR.iQ® Features			
User Input & Display Features			
Large 7" high definition, full color video display - High clarity and easy visibility			
Customizable home screen and delivery setup prompts - Streamline driver interface			
Full alpha-numeric keypad and arrow selection keys - Quick, intuitive navigation			
Instant on-board diagnostics and help screens - Quickly troubleshoot & resolve issues to minimize downtime			
Full screen active delivery mode - Largest readable digits in the industry, viewable from up to 100'			
Day/night mode and brightness adjustment - Operator can select preferred viewing mode for conditions			
Customizable printed tickets - Easily tailor ticket formats without software updates			
Transaction history logs store 10,000+ records - No more lost tickets; Easily access and print historical tickets			
Weights & measures historical audit log and event log - Search and download by date range or field			
Large LED back lit keypad - Easy to operate with gloved hands, easy to read in daylight or at night			
Control Features			
Remote control (E-Stop) compatible to third party systems - Seamless retrofit into existing systems			
3rd party fleet automation connectivity and data management - Seamless retrofit into existing systems			
Toggle flow - Optimizes fuel flow rate without driver intervention in refined fuels delivery systems			
Wireless Printing - Operator can print from hand-held remote printer			
General			
Standard meter mount base - Drop-in retrofit for all conventionally mounted registers			
Panel mount enclosure option - For remote panel mounting of LCR.iQ®			
Preset delivery by volume or weight - Provides highest accuracy of fuel delivery to prevent over-fueling			
4-Bolt even seal o-ring design - Water-tight, weather-proof seal protects internal components			
Die-cast aluminum housing - Chromate and powder coated for long term corrosion resistance.			
11 Conduit Ports (1/2" NPT) - To accommodate many I/O and control options			
Multi-point calibration up to 16 points - Maximize accuracy over entire flow range			
Internal telescoping hinges - Eliminates seizing and corrosion of external door hinges			
Serial accessibility to LCP data communication protocol - Compatible with major in-cab/back office systems			
Electronic temperature volume compensation - Available with optional probe and thermowell kit			
LCR.iQ® Specifications			
Enclosure			
Waterproof, corrosion resistant and dust-proof - meets IP66 and UL Type 4X requirements			
Display			
7 inch, 800 x 480 high-resolution, Full Color			
Temperature Range		Input Voltage	
-40°F (-40°C) to 140°F (60°C)		9-28 VDC	
Keypad			
LED Back-lit		Petroleum-resistant	
Non-conductive, UV resistant elastomer		Field Replaceable	
Communication		I/O	
RS232/485 Comm Ports	2	Solenoid Outputs (high current)	4
RS485 Dedicated Comm Ports	2	Programmable Digital Outputs	6
WiFi	Internal antenna	Digital Inputs	6
Bluetooth	Internal antenna	RTD Probe Input	1
Extended range antenna (externally mounted)	Optional accessory	Optical Sensor Input	1
		Scalable Pulse Output (Additive inj, display, PLC)	1
Processor & Storage			
Dual-Core Processor Speed		800 MHz	
Internal RAM		1GB	
Internal Storage		128MB Flash NAND 8GB eMMC Flash drive	
External Storage via Removable USB			

LCR.iQ[®] Security, Accuracy, Diagnostics

SECURITY

The LCR.iQ[®] has been designed with the highest levels of security according to the Center for Internet Security (CIS) benchmarks.

As an internet enabled device, it is imperative that any weights & measures approved device meet or exceed CIS benchmarks for security as well as provide robust user level security to prevent tampering or inadvertent access to forbidden areas and settings on the device.

Safety and security go hand-in-hand, and are Liquid Controls number one priority.



Figure 1

SIMPLE METER CALIBRATION

The LCR.iQ's intuitive calibration allows you to simply enter the "corrected prover" or master meter volume, and it will do the rest. With up to 16 points of linearization, the LCR.iQ[®] is by far the most precise register ever made.



Figure 2

REAL-TIME ON-SCREEN DIAGNOSTICS

LCR.iQ[®] provides the operator real-time diagnostics and provides an error indicator and message whenever an error condition exists and conveniently allows the operator to print the report for corrective action and reference.



Figure 3

Configurability

CONFIGURABLE DELIVERY SETUP

Guide the operator through the fueling process of your choosing. From basic pump and print, to preset by volume or product weight, you can also adjust price per gallon, percent tax, or select multiple deliveries on a single ticket.

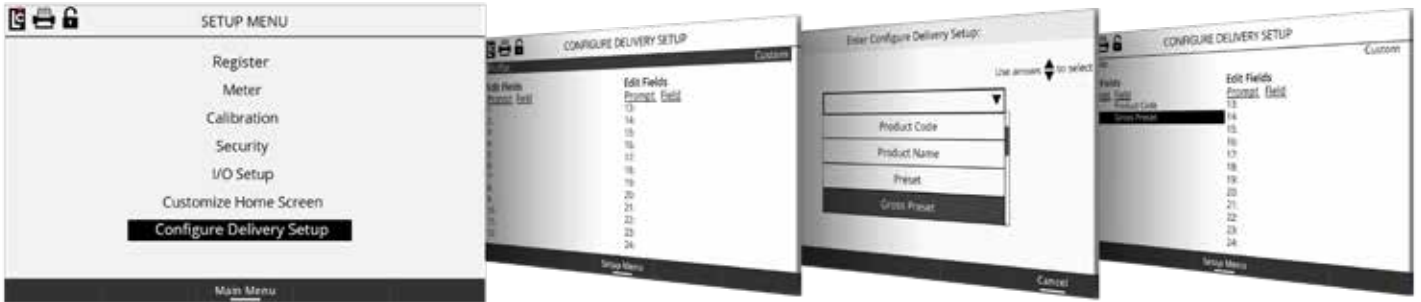


Figure 4

CONFIGURABLE IDLE SCREEN

Easily configure the idle screen fields the operator sees before, during, and after fueling. All units of measure including date and time formats are also configurable to comply with local standards.



Figure 5

LCR.iQ® User Configuration and Setup Features

User Configuration Features

- Configurable idle screen** - Design the fueling screen the way you want it. (See fig. 5)
- Configurable fuel delivery process** - Step by step on-screen instructions guide the operator through the fueling process you specify. (See fig. 4)
- Configurable date, time, and units of measure formats** - Set local units of measure and date/time formats to eliminate unit conversions
- Configurable product types** - Configure product types and terms based on local terminology
- Configurable flow rate min/max thresholds** - Set alerts to notify user if flow rates exceed thresholds
- Configurable I/O settings** - Define what each input and output is assigned to and how they are utilized
- Configurable tickets and printer settings** - Easily tailor ticket header text, fields, and printer type
- Configurable product pricing and taxes** - Either fixed or user definable pricing and taxes at the delivery level
- Configurable data logging and retention period** - Define how long to retain fueling transactional data on-board the LCR.iQ®
- Configurable electronic temperature volume compensation** - Available with optional temperature probe and thermowell kit

Setup, Calibration and Security

- iQ settings and preferences transferable to multiple registers** - Set up once, then backup and install configuration across multiple units
- Intuitive Calibration** - Easy to follow meter calibration and linearization process. (See fig. 2)
- Security** - Set security access for operators and supervisors (See fig. 1)

LCR.iQ[®] Wireless Connectivity

BLUETOOTH AND WIFI ON-BOARD

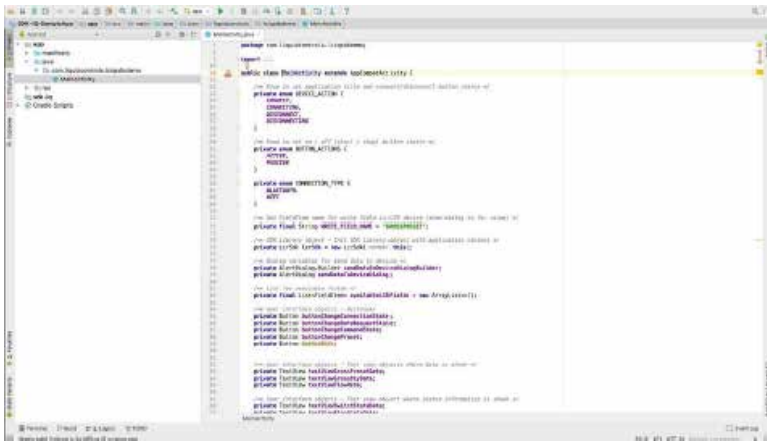
LCR.iQ[®] offers embedded bluetooth and WiFi for wireless printing as well as data communication for hand-held devices and tablets that utilize supported iQ Android apps.

LCR.iQ has an internal antenna for close range connectivity. For longer range needs, an optional external antenna that integrates directly with the LCR.iQ[®] is available.



LCR.iQ[®] SOFTWARE DEVELOPER'S KIT FOR ANDROID APPS

Liquid Controls offers an Android LCP Software Developers Kit (iQ SDK) to aid Android developers in building applications to communicate with the LCR.iQ[®] via Bluetooth or WiFi. The SDK utilizes an expanded LCP protocol to support the many additional fields available in the LCR.iQ[®]. It is also backward compatible with major 3rd party software and data management systems and the LCR 600 utilizing an external WiFi adapter.



SAMPLE ANDROID APP

Sample app gives developers a jump start on development.



Data values received from the LCR.iQ[®]

SDK debug messages

Demo control buttons:

- Connect: Establish Connection
- Request Data: Request data from LCR.iQ[®]
- Set Preset: Send preset value to LCR.iQ[®]
- Exit: Close demo app

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