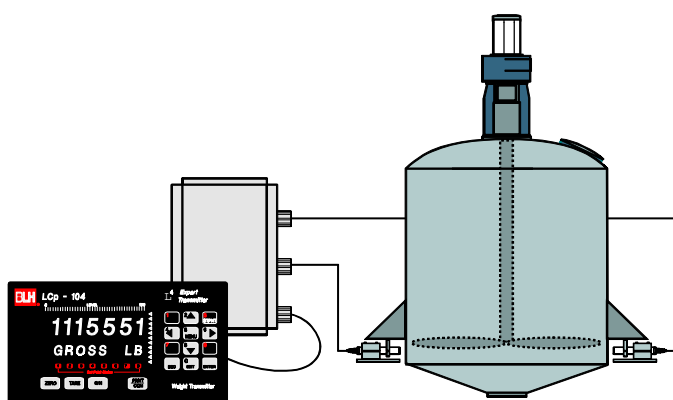


L⁴ Technology

The Next Generation of Digital Weight Processing



- **Patented Synchronization of Digitized Load Cells**
- **Proactive Diagnostics Assure System Performance**
- **Intuitive Digital Filtering**
- **1 Million Count Resolution per Cell**
- **A-B Remote I/O, Modbus Plus, or Profibus... Interface**
- **120 Updates/Second**
- **Multiple Analog Outputs**



Product Description

The LCp-104 System's patented synchronous digital measurement of multi-cell systems establishes the new benchmark in scale technology. True parallel data processing, with each update, guarantees real time continuous weight measurement unheralded in process weighing.

Until now, inherent load shifting during weighing cycles, mixing, or reactions have restricted performance of independent load cell measurement systems. With synchronous measurement, each system update is correctly summed and the benefits of individual measurement are retained.

LCp-104 Process Weighing Systems individually digitize each transducer in a multi-cell system and display the resultant weight signals, live, on the console display. Measuring each individual load cell provides greater system resolution and accuracy, while facilitating on-line dynamic diagnostics throughout the system process. Unique diagnostic 'look-ahead' profiles alert operating personnel to potential system malfunctions, before they happen.

Intuitive Digital Filtering maximizes stability and dynamic response by continuously analyzing system noise characteristics and automatically adjusting software filtering parameters.

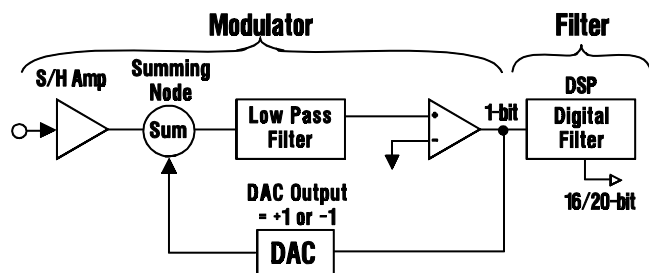
LCp-104 systems provide designers with a wide range of communication and network options. Available 'Easy Digital Interfaces' include Allen-Bradley Remote I/O, Modbus Plus, Modbus RTU, and Profibus.

BLH Electronics, Inc.

An ISO 9001 Registered Company

L⁴ Technology: The Next Generation of Digital Weight Processing

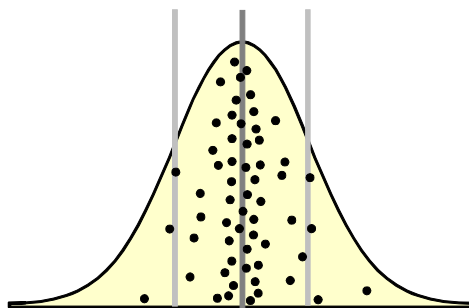
Sigma Delta A-D Conversion



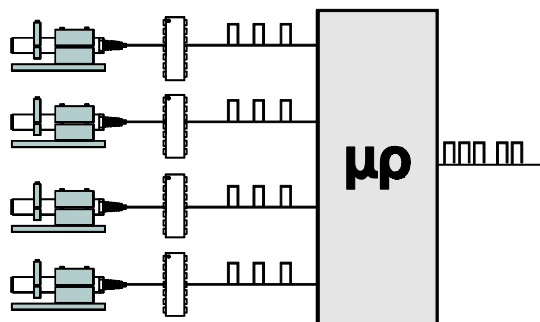
Very high-resolution weight data is obtained by using an individual Sigma Delta A-D converter for each transducer input. This new technology uses a high-speed integrator coupled with digital signal processing to produce a precision of up to one part in 1,000,000.

Intuitive Digital Filter

Combining new A-D technology with multi-channel control produces extremely precise internal weight information. Resultant data is sampled and evaluated statistically to determine the sample mean and standard deviation. This vital information is then used to optimize filter averaging and filter cutoff bands to maximize both data stability and response to true weight changes.



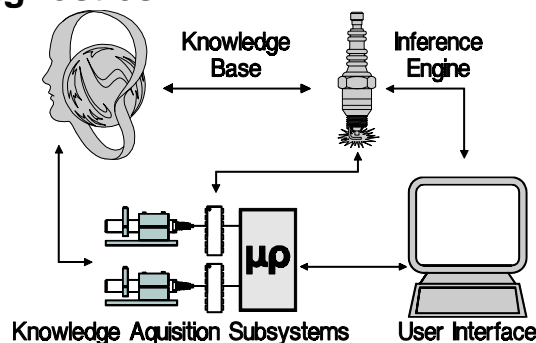
Multi-Channel, Synchronous Signal Processing



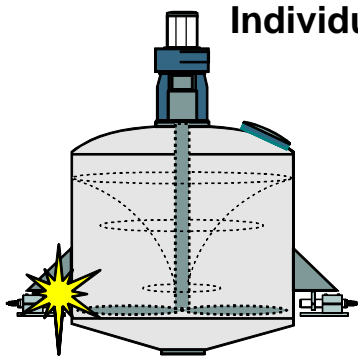
A patented method to control the timing of several dependent A-D converters with a single microprocessor allows for the use of individual transducer data without accumulated errors due to mass moving within a vessel. This capability makes it possible to individually digitize each transducer in a multi-cell system and achieve the benefits of additive resolution and system redundancy.

Expert System Diagnostics

The LCp-104 uses the expert system concept to compare various measurements against known standards of acceptable performance and uses that relative comparison to identify and diagnose both transducer and system performance problems. The BLH expert system identifies piping influences, structural problems, transducer drift, cell overload, and the location and characteristics of process noise.

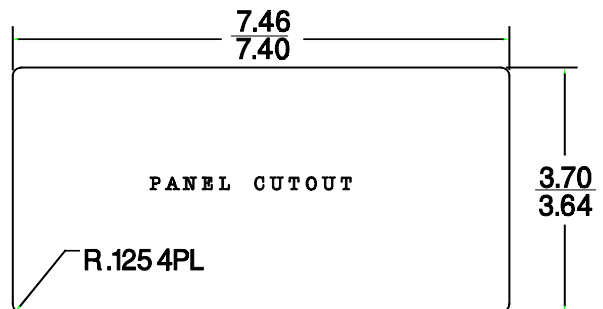
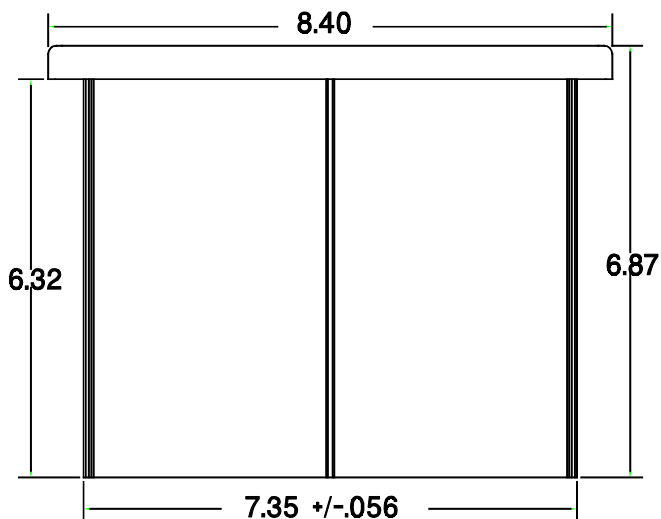
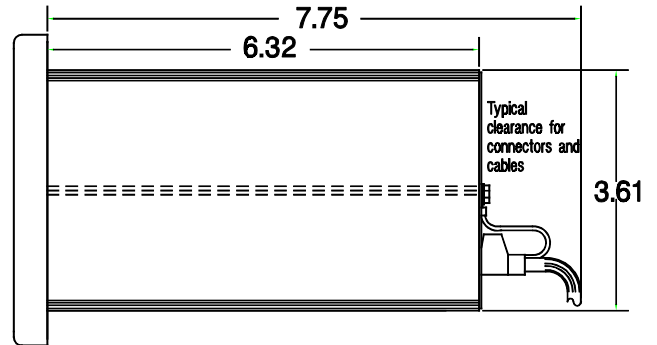
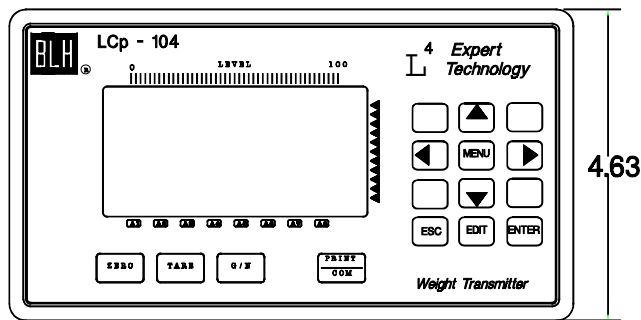


Individual Load Cell 'LIVE' Displays



Viewing individual load cells live, throughout the entire process, allows operating personnel to profile system trends or tendencies and adjust equipment for maximum performance. Although the total system may never overload, certain cells may experience overload or underload 'moments' which can affect cell integrity, longevity, and ultimately, product quality.

LCp-104 System Outline Dimensions

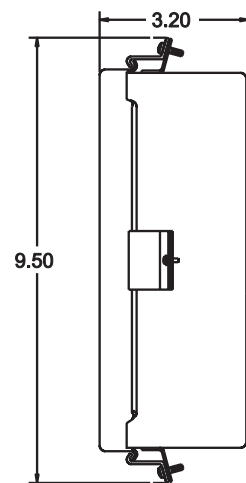
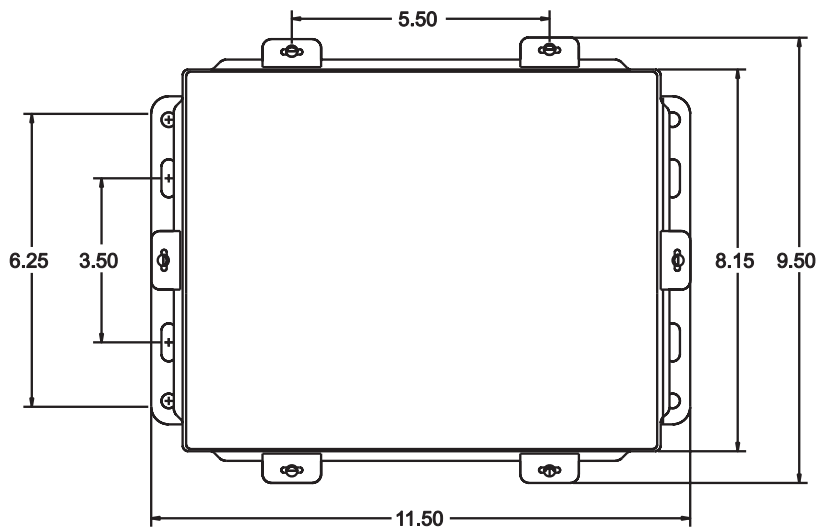


MATERIALS:

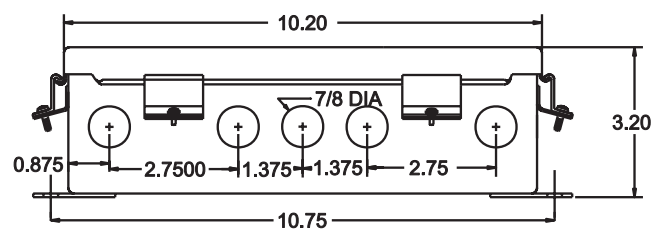
KEYPAD: POLYESTER

BEZEL: 2024 ALUMINUM WITH EPOXY POWDER COAT FINISH

ENCLOSURE: 6063-T6 ALUMINUM WITH BLACK ANODIZE FINISH



Dimensions shown in inches



LCp-104 System Specifications

Performance

Internal Resolution	4,194,304 total counts
Max. Display Resolution	3,000,000 total counts
Max. Res. Per Channel	1,000,000 counts
Conversion Speed	8.5 msec (120 updates/sec)
Sensitivity (Noise)	0.001 1% full scale (max +/-16 counts w/o filter)
Full Scale Range	+/-35 mV/channel
Dead Load Range	100%
Input Impedance	10 M-ohms, min. per channel
Load Cell Excitation	10 V (65 mA/channel max)
Remote Sense	user configurable, each channel
Linearity	+/-0.0015% of full scale
Calibration Repeatability	0.3 uV per count
Software Filter (Std.)	50 to 10,000 msec

Temperature Coefficient

Span/Zero	+/-2ppm/°C
Step Response	one conversion
Common Mode Rej.	100 db @ 60 Hz

Environment

Operating Temperature	-10 to 55°C (12 to 131°F)
Storage Temperature	-20 to 85°C (-4 to 185°F)
Humidity	5 to 90% rh, non-condensing
Voltage	117/230 + 15% 50/60 Hz
Power	12 watts max

Display/Operator Interface

Type	high intensity cobalt green vacuum fluorescent
Active Digits	7 digit alpha numeric.59" high for weight: 8 digit alphanumeric .39" high for status

Approvals

FM (Factory Mutual)	3611 (Class I, II, III; Div.1,2; Groups A-G)
CSA	C22.2 (Class I, II,III; Div.1,2; Groups A-G)

Isolated Analog Outputs

Type	16 bit digital to analog
Current	4-20 mA (600 ohm max load)

Relay Outputs (Optional)

Closed Contact	28V ac/dc at 0.4 amps (max)
Solid State	110/220 Vac at 1.0 amp

Digital Inputs

Logic'0' (Low)	less than 0.5Vdc, sink 3mA (min)
Logic'1' (High)	10 to 28 Vdc (TTL open collector)
Mechanical Relay'0'	closed (one side = digital common, the other side = input)
Mechanical Relay'1'	open (input internally pulled up)

Network Serial Communication (Std)

Type	RS-485 Half Duplex (Multi-Drop)
Baud	9.6K, 28.8K and 56.7k
Data Format	proprietary

Simplex Data Output (Standard)

Type	RS-485 (Simplex)
Baud	1200 or 9600
Data Format (Selectable)	
ASCII	7 data bits, even parity, stop bit

Terminal/Computer Interface (Optional)

Interface Type	RS-485 half duplex (standard)
Baud	1200 or 9600
Protocol	duplex command/response format
ASCII	7 data bits, even parity, stop bit

Special Protocols (Optional)

Modbus	RTU Protocol
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Special Interface (Optional)

Allen Bradley	Remote I/O - 1/4 logical rack
Modbus Plus	peer-to-peer (with global data)
Profibus	slave

Weight

NEMA	4/4X 12.0 pounds
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PLC and Allen-Bradley are trademarks of Allen-Bradley Co, Inc.

Modbus is a trademark of Schneider Automation.

Profibus is a trademark of Siemens.

BLH is continually seeking to improve product quality and performance. Specifications may change accordingly.

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