Safe-Weigh® Process Weighing System

FEATURES

- Patented synchronization techniques for digitized load cells
- Proactive diagnostics assure system performance
- Dynamic digital filtering
- 1 million count resolution per load cell
- **Optional features**
  - 8 process setpoints
  - Up to 4 analog current outputs
  - DeviceNet, A-B Remote I/O, Modbus Plus, or Profibus interface capability

APPLICATIONS

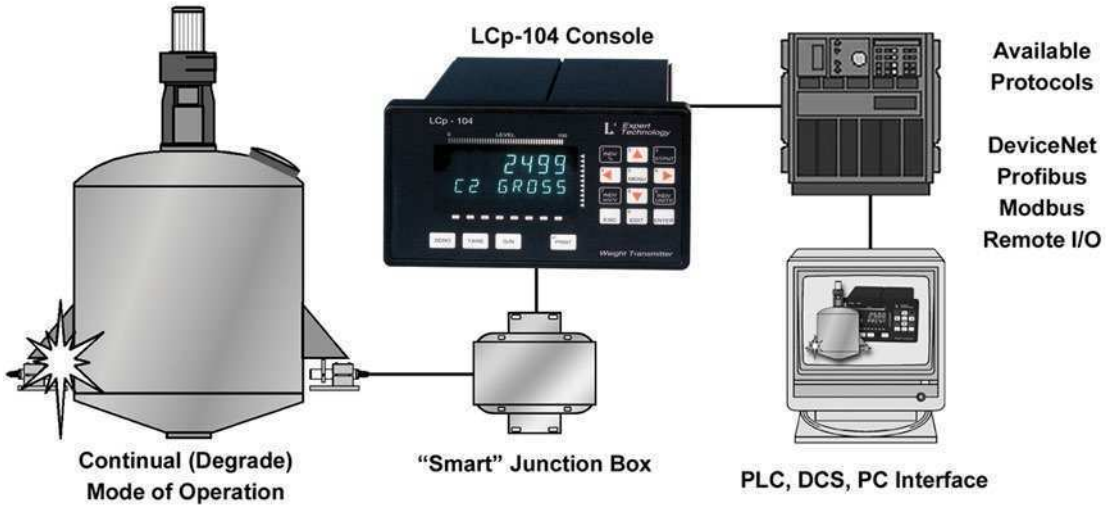
- Quality critical batch and blend systems
- Reactor vessels
- High value ingredient/product processing
- Fault tolerant—no down time requirements

DESCRIPTION

The LCp-104 System's patented synchronous digital measurement of multi-cell systems continues to be the 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 online dynamic diagnostics throughout the system process. Unique diagnostic "look-ahead" profiles alert operating personnel to potential system malfunctions, before they happen.

Dynamic digital filtering maximizes display stability and setpoint cutoff accuracy.

CONFIGURATION



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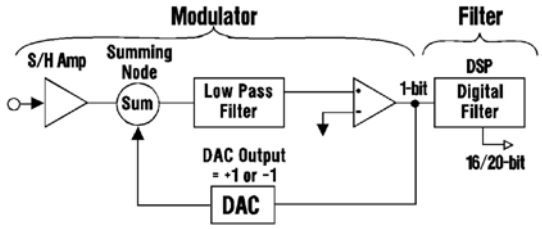
L⁴ TECHNOLOGY BASED DIGITAL WEIGHT PROCESSING

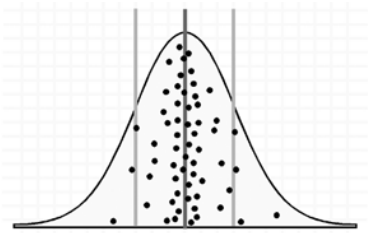
Sigma Delta A-D Conversion

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



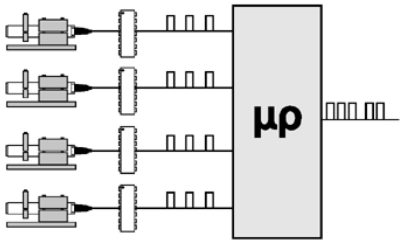
Intuitive Digital Filter

Combining 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.



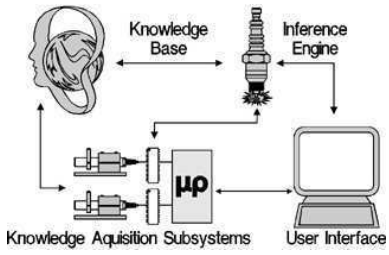
Multi-Channel, Synchronous Signal Processing

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

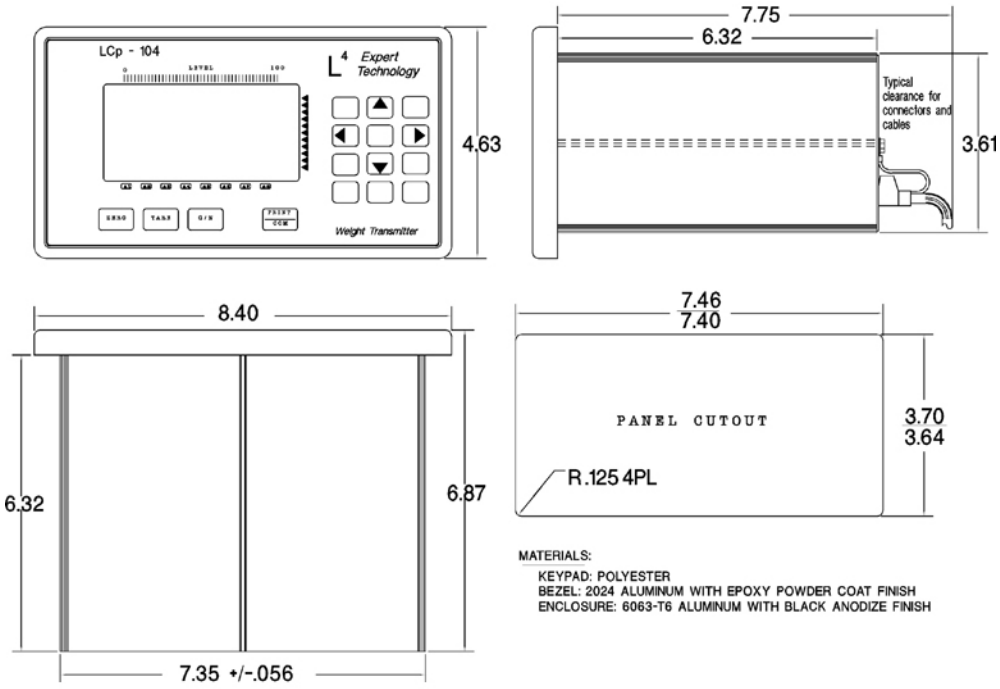
The LCp-104 uses the expert system concept to compare various measurements against known standards of acceptable performance and uses that relative comparison to identify and diagnose both transducer and system performance problems. The BLH expert system identifies piping influences, structural problems,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

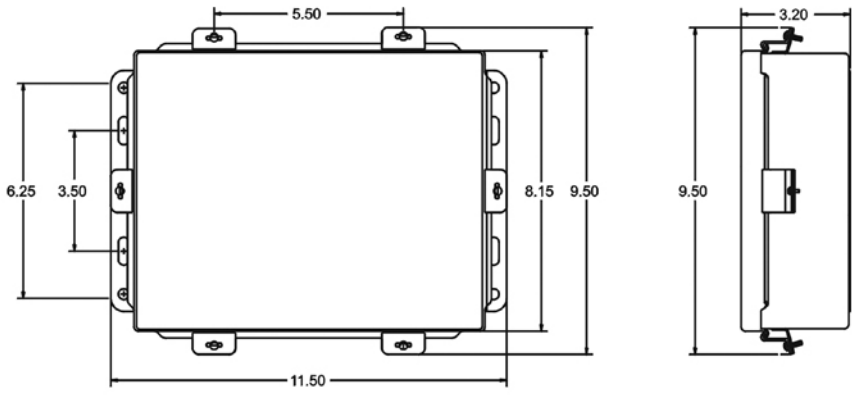


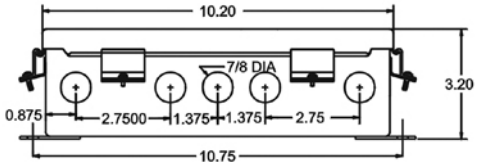
Individual Load Cell 'LIVE' Displays

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.

OUTLINE DIMENSIONS







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SPECIFICATIONS

PARAMETER	VALUE
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	33 msec (30 updates/sec)
Sensitivity (Noise)	0.001 1% full scale (maximum) (max ±16 counts w/o filter)
Full Scale Range	±35 mV/channel
Dead Load Range	100%
Linearity	±0.0015% of full scale
Load Cell Excitation	10 V (65 mA/channel max)
Software Filter (Std.)	50 to 10,000 msec
Temperature Effects **Zero** **Span**	 ±2 ppm/°C ±7 ppm/°C
Remote Sense	User configurable, each channel
Calibration Repeatability	0.3 µV per count
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
DISPLAY/OPERATOR INTERFACE	
Type	High intensity cobalt green vacuum fluorescent
Active Digits	7 digit alpha numeric 0.59 in high; for weight: 8 digit alphanumeric 0.39 in high for status
ELECTRICAL	
Voltage	117/230 VAC +15% 50/60 Hz
Power	12 watts maximum
Input Impedance	10 MΩ, min. per channel
Step Response	One conversion cycle
Common Mode Rejection	100 dB at 60 Hz
ISOLATED ANALOG OUTPUT (4 MAX, OPTIONAL)	
Type	16 bit digital to analog
Current	4–20 mA (600 Ω max load)
DIGITAL INPUTS	
Logic "0" (Low)	>0.5 VDC, sink 3 mA (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)

PARAMETER	VALUE
DC SETPOINT OUTPUTS – 8 (STANDARD)	
Type	Open collector (current sinking)
Operating Voltage	5–35 VDC
ON Voltage	12 VDC @ 40 mA 0.8 VDC @ 1 mA
OFF State Leakage	0.04 µA @ 40 VDC
Power	External supply required
AC SETPOINT OUTPUTS – 8 (OPTIONAL)	
Type	Triac
Operating Voltage	12–240 VAC
AC Frequency	20–500 Hz
ON State Voltage Drop	1.2 V_{RMS}
Min–Max Load Current	5 mA–1 A
Leakage Current	1 mA @ full rated load voltage
Power	External supply required
NETWORK SERIAL COMMUNICATION (STANDARD)	
Type	RS-485 Half Duplex (Multi-Drop)
Baud	9.600, 28.800, and 56.700
Data format	Proprietary
SIMPLEX DATA OUTPUT (STANDARD)	
Type	RS-485 (Simplex)
Baud	1,200 or 9,600
Data Format (Selectable)	ASCII— 7 data bits, even parity, stop bit
TERMINAL/COMPUTER INTERFACE (OPTIONAL)	
Interface Type	RS-485 half duplex (standard)
Baud	1,200 or 9,600
Protocol	Duplex command/response format ASCII— 7 data bits, even parity, stop bit
SPECIAL PROTOCOLS (OPTIONAL)	
Modbus	RTU Protocol
SPECIAL INTERFACE (OPTIONAL)	
Allen Bradley	Remote I/O – 1/4 logical rack
Modbus Plus	Peer-to-peer (with global data)
Profibus	Slave
DeviceNet	Slave
ENCLOSURE	
Dimensions (HxWxD)	Console: 4.63 x 8.40 x 6.5 in. J-Box: 9.5 x 11.5 x 3.2 in.
Weight	Console: 5.4 lbs. J-Box: 5.6 lbs.
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)

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

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