

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

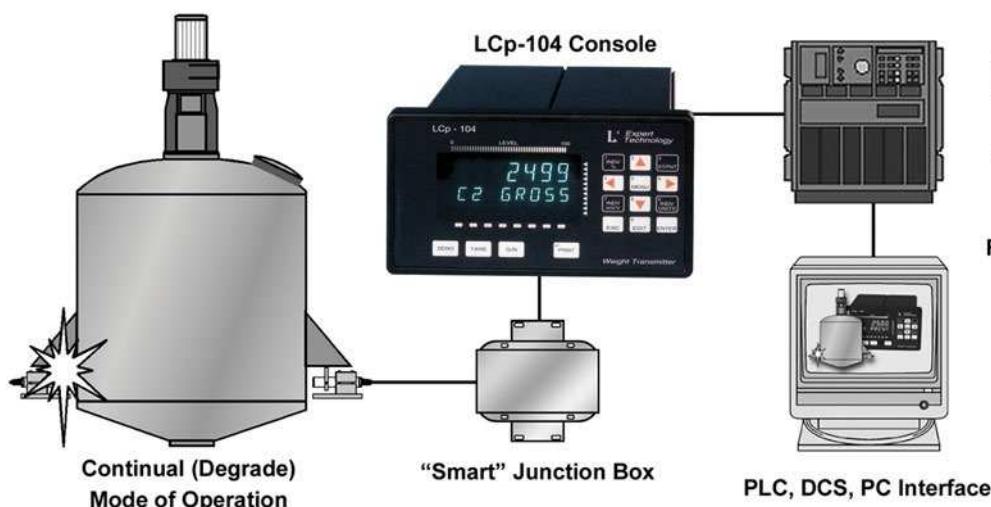
The LCp-104 System's patented synchronous digital measurement of multi-cell systems continues to be the benchmark in scale technology. True parallel data processing, with each update, guarantees real-time continuous weight measurement unheralded in process weighing. Until now, inherent load shifting 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.

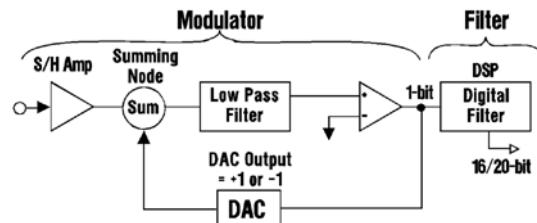
CONFIGURATION



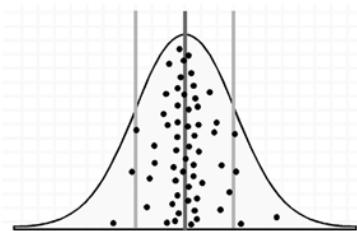
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L⁴ TECHNOLOGY BASED DIGITAL WEIGHT PROCESSING**Sigma Delta A-D Conversion**

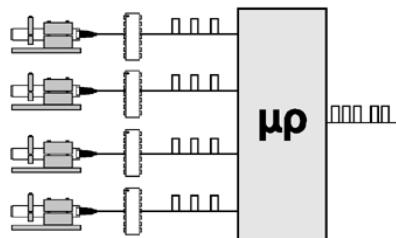
Very high-resolution weight data is obtained by using an individual Sigma Delta A-D converter for each transducer input. This technology uses a high-speed integrator coupled with digital signal processing to produce a precision of up to one part in 1,000,000.

**Intuitive Digital Filter**

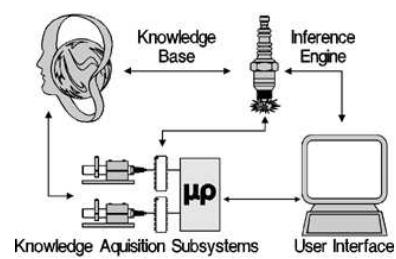
Combining A-D technology with multi-channel control produces extremely precise internal weight information. Resultant data is sampled and evaluated statistically to determine the sample mean and standard deviation. This vital information is then used to optimize filter averaging and filter cutoff bands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

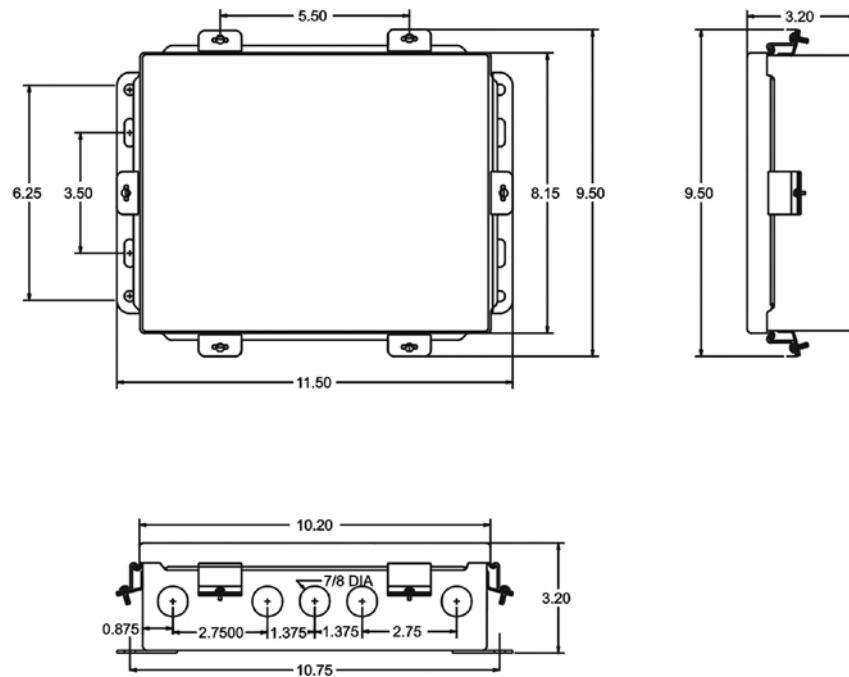
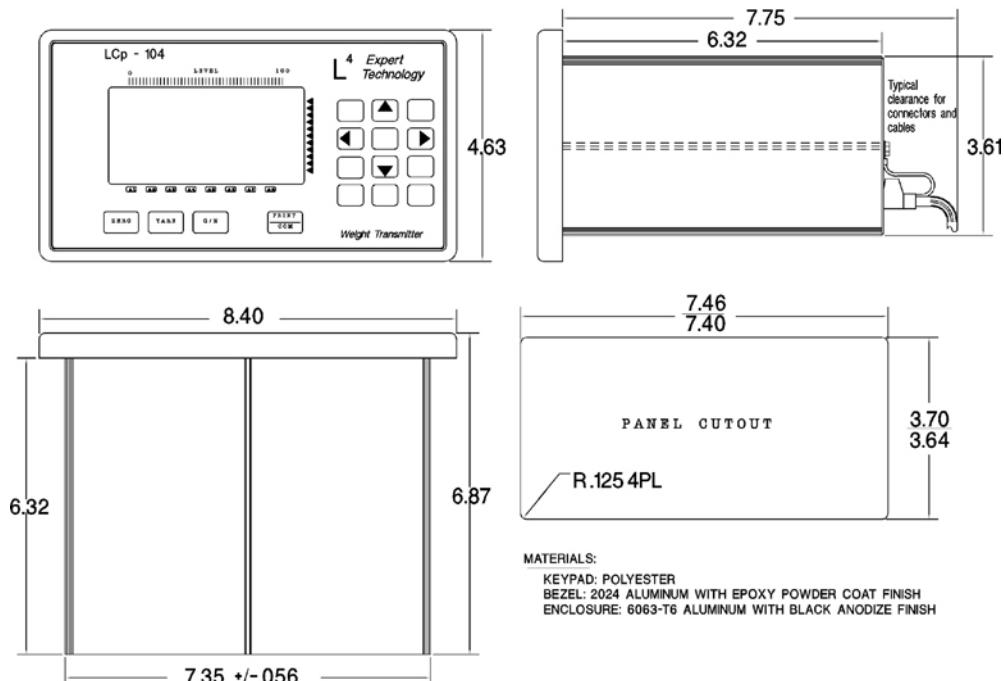
**Individual Load Cell 'LIVE' Displays**

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.



Safe-Weigh® Process Weighing System

OUTLINE DIMENSIONS



Safe-Weigh® Process Weighing System

| 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 | ± 2 ppm/°C |
| Span | ± 7 ppm/°C |
| Remote Sense | User configurable, each channel |
| Calibration Repeatability | 0.3 μ V 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 M Ω , 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) |
| 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 μ A @ 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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