

Weighing Electronics

Stand-alone

Belt scales / Milltronics BW500 and BW500/L

Overview



Milltronics BW500 is a full feature integrator for use with both belt scales and weighfeeders.

Milltronics BW500/L is an integrator for use in basic belt scale or weighbelt applications.

Benefits

- Automatic zero and electronic span calibration
- Alarms for rate, load, speed, or diagnostic error
- On-board Modbus and optional: PROFIBUS DP, Modbus TCP/IP, PROFINET, EtherNet/IP, and DeviceNet
- Comprehensive weighfeeder control functions
- PID control and on-line calibration with optional analog I/O card
- Differential speed detection with second speed sensor
- Moisture meter input with optional analog I/O card for calculation of dry weight
- Inclinator input with optional analog I/O card to compensate for conveyor slope
- Suitable for belt scale custody approval
- Measurement Canada, OIML, MID, PAC Russia, and NTEP approved

Application

Milltronics BW500 and BW500/L operate with a belt scale and a speed sensor. Belt load and speed signals are processed for accurate flow rate and totalized weight of bulk solids.

BW500 can take on lower level control functions traditionally handled by other devices, and it supports popular industrial communication buses. Its proven load cell balance function eliminates matching of load cells.

The PID function may be used for rate control on shearing weighfeeders - where belt loading is constant - but can also control pre-feeding devices. Operating in tandem with two or more weighfeeders, the BW500 may be used for ratio blending and controlling additives. Batching, load out, and alarm functions are also provided by the BW500.

Integrator selection guide

	BW500 (advanced feature set)	BW500/L (basic feature set)
PID control	With optional I/O card	N/A
Differential speed detection	Standard	N/A
Online calibration	Standard	N/A
Trade approval (OIML, MID, Measurement Canada, GOST, NTEP)	Optional	N/A
SmartLinx communications (DeviceNet, PROFINET, Modbus, TCP/IP, EtherNet/IP, and PROFIBUS DP)	Optional	Optional
Modbus	Standard	Standard

Application (Continued)

	BW500 (advanced feature set)	BW500/L (basic feature set)
Ratio blending and batching	Standard	N/A
Moisture and incline compensation	<ul style="list-style-type: none"> • With optional I/O card, or • Parameter set 	Parameter set
Multi Span	Standard	N/A
RD500 connectivity	Standard	Standard
Relay output	5	2
Time/date stamped printing	Standard	N/A
mA output	3 ¹⁾	1
mA input	2 ¹⁾	0

¹⁾ mA input/output for BW500 is based on I/O card

Selection and ordering data

Milltronics BW500 and BW500/L Integrator Full-feature, powerful integrator designed for use with both belt scales and weighfeeders.	Article No. 7MH7152- ● ● ● ● ● - ● ● ●									
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.										
Input voltage										
AC voltage					2					
DC voltage					3					
Auxiliary input/output board										
None							A			
Board with 2 analog inputs and 2 analog outputs ¹⁾							B			
Feature software										
BW500, 1 ... 6 load cell input (advanced feature set)								A		
BW500/L, 1 ... 2 load cell input ²⁾ (basic feature set)								B		
Auxiliary memory										
None								0		
Data communications³⁾										
SmartLinX ready									0	
SmartLinX PROFIBUS DP module									2	
SmartLinX DeviceNet module									3	
SmartLinX PROFINET module									4	
SmartLinX EtherNet/IP module									5	
SmartLinX Modbus TCP/IP module									6	
Enclosures										
Standard enclosure, no entry holes										1
Standard enclosure, 4 entries, for M20 glands										2
Trade approval stickers										
No trade approval sticker										A
Not legal for Canadian and EU trade sticker										B
Legal for Canadian trade ⁴⁾⁵⁾⁶⁾										C
Legal for U.S. trade (NTEP) ⁴⁾⁵⁾⁶⁾										D
Legal for World trade (OIML), European trade (MID) ⁴⁾⁵⁾⁶⁾										E
Legal for Russian Trade (PAC) ⁴⁾⁶⁾										F
Approvals										
Ordinary Locations/General Purpose (Non-Ex), CE, UKCA, cCSA _{US} , FM, RCM, EAC, KC										A

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Selection and ordering data (Continued)

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to article no. and specify order code(s).	
Stainless steel tag (69 x 50 mm), Measuring-point number/identification (max 27 characters), specify in plain text.	Y15
Manufacturer's test certificate: According to EN 10204-2.2	C11
OIML/MID approval additional nameplate (submit application data with order)	Y77
NTEP approval additional nameplate (submit application data with order)	Y78
LVDT conditioner card mounted and connected for use with LVDT belt scales	G21
Stainless steel, sun/weather shield 357 x 305 x 203 mm (14 x 12 x 8 inch) (finished unit is field mounted with enclosure)	S50
Stainless steel enclosure, 304 (1.4301), [406 x 305 x 152 mm (16 x 12 x 6 inch), Nema/Type 4X, IP66; (finished unit is mounted inside enclosure)]	
• With window	A11
• Without window	A12
Painted mild steel, [406 x 305 x 152 mm (16 x 12 x 6 inch), Nema/Type 4, IP66; (finished unit is mounted inside enclosure)]	
• With window	A13
• Without window	A14
Painted mild steel, anti-vibration enclosure with viewing window [406 x 305 x 203 mm (16 x 12 x 8 inch), Nema/Type 4, IP66; (finished unit is mounted inside enclosure)]	A15
Painted mild steel, heated enclosure with viewing window for use down to -50 °C (-58 °F); finished unit is mounted inside enclosure 483 x 584 x 203 mm (19 x 23 x 8 inch)	A35
Instruction manuals	Article No.
All literature is available to download for free, in a range of languages, at http://www.siemens.com/weighing/documentation	
Optional equipment	
Auxiliary I/O card spare	7MH7723-1BJ
LVDT Conditioners in Nema 4 enclosure (to interface LVDT Flowmeter/Belt scale without internal pre-amplifier)	7MH7723-1AJ
Supply voltage regulators, 120 V AC, 60 Hz	7MH7726-1AN
Cables to connect BW500, BW500/L, and SF500 keypad to -motherboard	7MH7723-1CB
SITRANS RD100 Remote displays, see SITRANS RD100 catalog page: https://support.industry.siemens.com/cs/document/109765059	7ML5741-.....
SITRANS RD200 Remote displays, see SITRANS RD200 catalog page: https://support.industry.siemens.com/cs/document/109765328	7ML5742-.....
SITRANS RD300 Remote displays, see SITRANS RD300 catalog page: https://support.industry.siemens.com/cs/document/109765138	7ML5744-.....
Large LED display, 150 mm (6 inch) high characters	A5E31871009
Spare parts	
Display card	7MH7723-1AF
BW500 motherboard, AC	A5E34320772
BW500/L motherboard, AC	A5E34320773
BW500 motherboard, DC	A5E34320774
BW500/L motherboard, DC	A5E34320775
Fuse, 2 A, 250 V, BW500, BW500/L, and SF500, spare	7MH7723-1DG
Lid with overlay and keypad for BW500	7MH7723-1AK

Selection and ordering data (Continued)

Selection and Ordering data	Order code
Lid with overlay and keypad for trade approved BW500	7MH7723-1HN
Lid with overlay and keypad for BW500/L	A5E34699647
Keypads spare for BW500, BW500/L, and SF500	7MH7723-1CD
LVDT card spare, internal to BW500	A5E34699664
Modbus TCP/IP, EtherNet/IP module	7ML1830-1PN
PROFINET IO module	7ML1830-1PM
PROFIBUS DP module	7ML1830-1HR
DeviceNet module	7ML1830-1HT

- 1) Required for PID control and online calibration, available with feature software option A only.
- 2) Available with auxiliary I/O option A, and trade approval stickers A, B only.
- 3) Required for industrial communications. SmartLinX PROFINET module is certified per standard V2.2.4.
- 4) Requires use with applicable certified MSI or MMI.
- 5) Complete specification data sheet found on the MSI/MMI catalog page and submit with order: <https://support.industry.siemens.com/cs/document/109764828>
- 6) Available with feature software option A only.

Technical specifications

Milltronics BW500 and BW500/L	
Mode of operation	
Measuring principle	Belt scale integrator
Typical application	<ul style="list-style-type: none"> Compatible with Milltronics belt scales or equivalent 1, 2, 4¹⁾, or 6¹⁾ load cell scales Compatible with LVDT equipped scales, with use of optional interface board (remotely mounted)
Inputs	
Load cell	0 ... 45 mV DC per load cell
Speed sensor	
• Pulse train	<ul style="list-style-type: none"> 0 ... 5 V low, 5 ... 15 V high 1 ... 3 000 Hz, or Open collector switch, or Relay dry contact
Auto zero	Dry contact from external device
mA	See optional mA I/O board ¹⁾
Auxiliary	5 discrete inputs for external contacts, each programmable for either: display scrolling, totalizer 1 reset, zero, span, multi-span, print, batch reset, PID function or online calibration, 2nd speed sensor
Outputs (load and speed)	
mA	Programmable 0/4 ... 20 mA, for rate, optically isolated, 0.1 % of 20 mA resolution, 750 Ω load max. (see optional mA I/O board)
Load cell	10 V DC compensated excitation for strain gauge type, 6 cells max, 150 mA max.
Speed sensor(s)	12 V DC, 150 mA max. excitation
Remote totalizer 1	<ul style="list-style-type: none"> Contact closure 10 ... 300 ms duration Solid state relay contact 30 V DC, 100 mA max. Max. contact on-resistance = 36 ohms Max. off-state leakage = 1 uA
Remote totalizer 2	<ul style="list-style-type: none"> Contact closure 10 ... 300 ms duration Solid state relay contact rated 240 V AC/DC, 100 mA max. Max. contact on-resistance = 36 ohms Max. off-state leakage = 1 uA
Relay output	5 alarm/control relays, 1 SPST Form A relay contact per relay, rated 5 A at 250 V AC, non-inductive or 30 V DC
Measuring accuracy	
Resolution	0.02 % of full scale
Accuracy	0.1 % of full scale

Technical specifications (Continued)

Milltronics BW500 and BW500/L	
Rated operating conditions	
Ambient conditions	
Location	Indoor/outdoor
Ambient temperature	-20 ... +50 °C (-5 ... +122 °F)
Relative humidity/ingress protection	Suitable for outdoor/Type 4X/NEMA 4X/IP65
Installation category	II
Pollution degree	4
Design	
Material (enclosure)	Polycarbonate
Dimensions	209 W x 285 H x 92 D mm (8.2 W x 11.2 H x 3.6 D inch)
Weight	2.6 kg (5.7 lb)
Power supply	
Standard	AC version <ul style="list-style-type: none"> 100 ... 240 V AC, ± 10 %, 50/60 Hz, 55 VA max. Fuse FU3 = 2AG, 2 AMP, 250 V Slo Blo DC version <ul style="list-style-type: none"> 10 ... 30 V DC, 26 W max. Fuse FU2 = 3.75 A resettable (not user replaceable)
Controls and displays	
Displays	Illuminated 5 x 7 dot matrix liquid crystal display with 2 lines of 40 characters each
Programming	Via local keypad
Memory	Program and parameters stored in non-volatile Flash memory
Communications	<ul style="list-style-type: none"> Two RS 232 ports One RS 485 port SmartLinX compatible
mA I/O board	
Inputs	2 programmable 0/4 ... 20 mA for PID control and on-line calibration, optically isolated, 0.1 % of 20 mA resolution, 200 Ω input impedance
Outputs	2 programmable 0/4 ... 20 mA for PID control, rate, load, and speed output, optically isolated, 0.1 % of 20 mA resolution, 750 Ω load max
Output supply	Isolated 24 V DC at 50 mA, short circuit protected
Approvals	
BW500	CE, UKCA, cCSA _{US} , FM, Measurement Canada, NTEP, MID, OIML, PAC Russia, RCM, EAC, SABS, STAMEQ, KC

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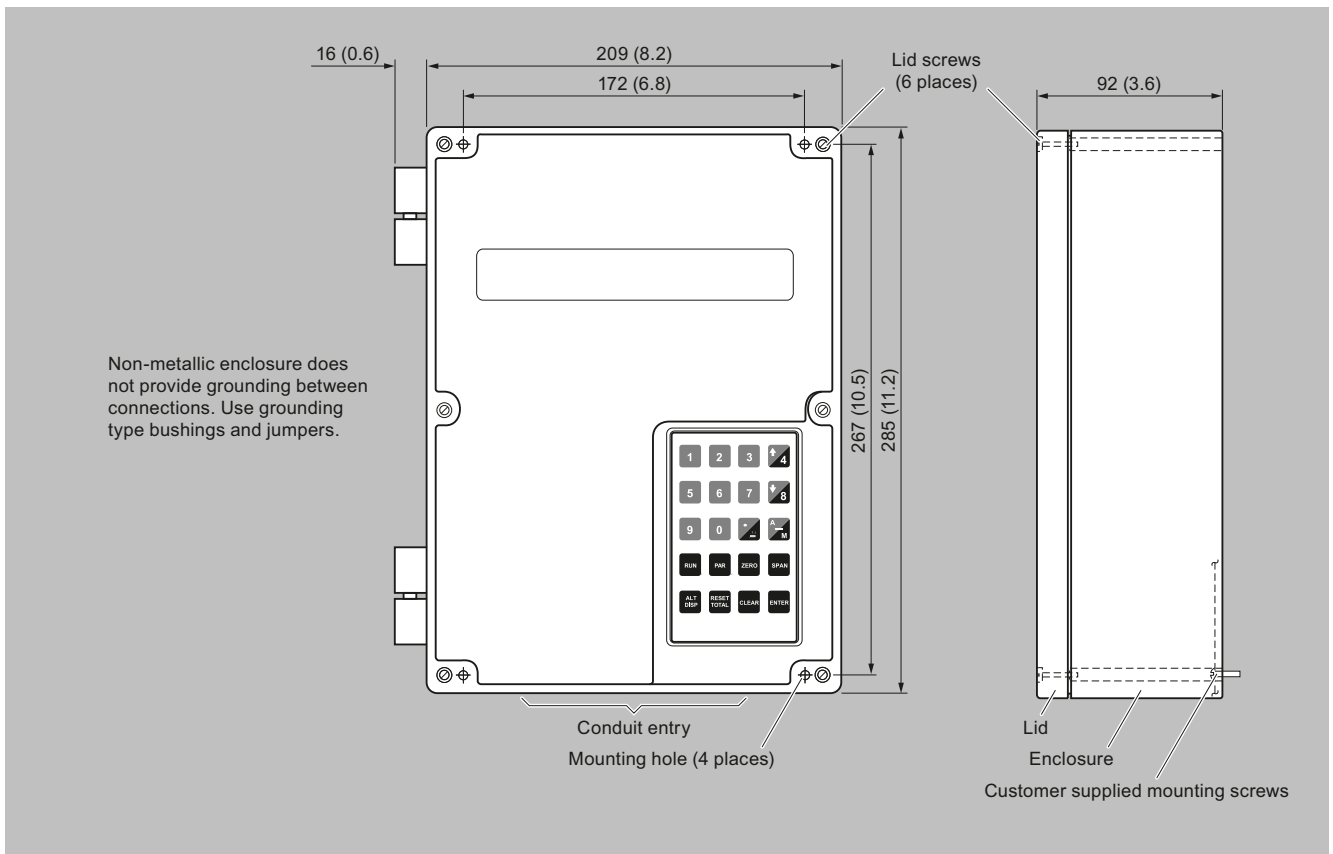
Belt scales / Milltronics BW500 and BW500/L

Technical specifications (Continued)

Milltronics BW500 and BW500/L	
BW500/L	CE, UKCA, cCSA _{US} , FM, RCM, EAC, KC
Options	<ul style="list-style-type: none"> Speed sensor: MD-36/36A, MD-256, SITRANS WS300, TASS, or RBSS, or compatible SmartLinx Modules: protocol specific modules for interface with popular industrial communications systems. Refer to product documentation. LVDT interface card: for interface with LVDT based scales

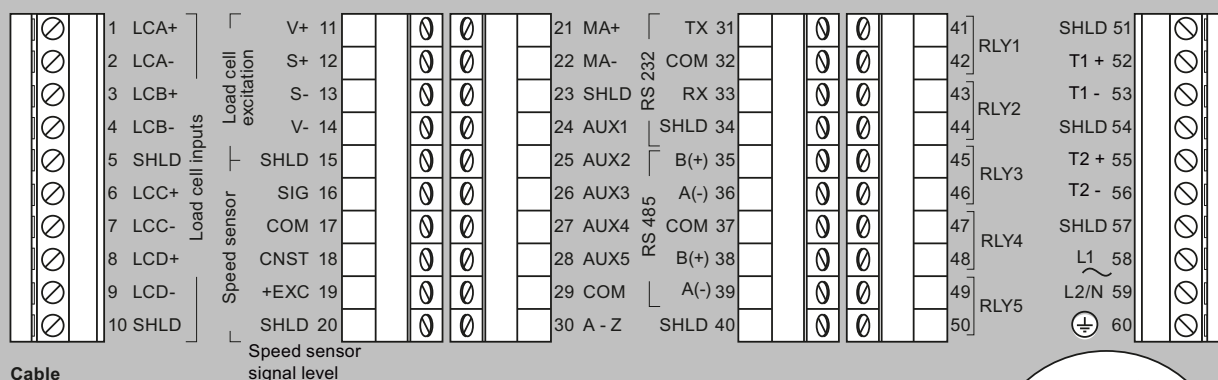
1) BW500 only

Dimensional drawings



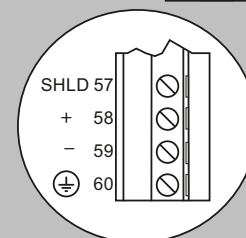
Milltronics BW500 and BW500/L, dimensions in mm (inch)

Circuit diagrams

**Cable**

- One load cell:
 - Non-sensing: Belden 8404, 4 wire shielded, 20 AWG (0.5 mm²) or equivalent, 150 m (500 ft) max.
 - Sensing: Belden 9260, 6 wire shielded, 20 AWG (0.5 mm²) or equivalent, 300 m (1 000 ft) max.
- Two/four/six¹⁾ load cells:
 - Non-sensing: Belden 9260, 6 wire shielded, 20 AWG (0.5 mm²) or equivalent, 150 m (500 ft) max.
 - Sensing: Belden 8418, 8 wire shielded, 20 AWG (0.5 mm²) or equivalent, 300 m (1 000 ft) max.
- Speed sensor: Belden 8770, 3 wire shielded, 18 AWG (0.75 mm²) or equivalent, 300 m (1 000 ft)
- Auto zero: Belden 8760, 1 pair, twisted/shielded, 18 AWG (0.75 mm²) or equivalent, 300 m (1 000 ft) max.
- Remote total: Belden 8760, 1 pair, twisted/shielded, 18 AWG (0.75 mm²) or equivalent, 300 m (1 000 ft) max.

¹⁾ For four/six load cell scale, run two separate cables of two load cell configuration



DC version

Milltronics BW500 and BW500/L connections