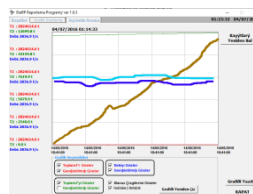
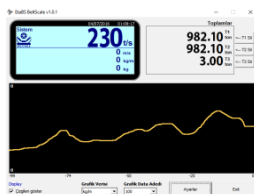


LPR-100

Belt Scale

Technical Manual



23/02/2021
Last Updated

www.etarti.com

LPR-100 Technical Manual

Beltscales are designed for measuring bulk materials on the belt conveyors continuously. Instant flow rate, total amount of transferred materials, speed and spreading load can be displayed, recorded and taken into control. Especially used on mining industry, building materials and chemicals, food industry, energy sectors and powders, pellets and granule based bulk materials.

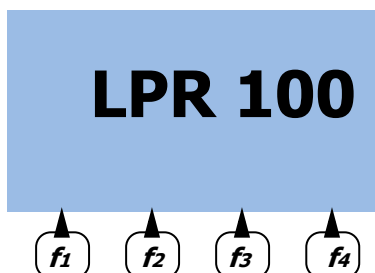


SPECIFICATIONS

- 3 different Totalisers (**Total1**, **Total2** and **Total3**)
- +/- % 0.25 accuracy (% 20 to 100 flowrate)
- Up to 1kHz encoder output compatible
- Speed[m/s], Flowrate[t/h], Spreading Load [kg/m] can be monitored
- 3840 measurements per second
- Modbus RTU/ASCII
- Batching with specified quantities of material
- Adjustable periodic pulse output
- 0-10V /4-20mA Analogue Output
- Remote Display Output
- PID Control Output (WF Only)

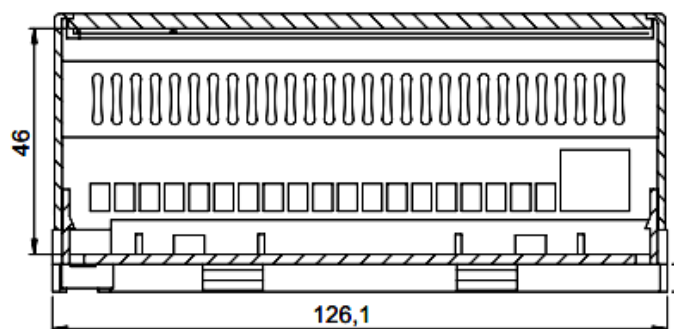
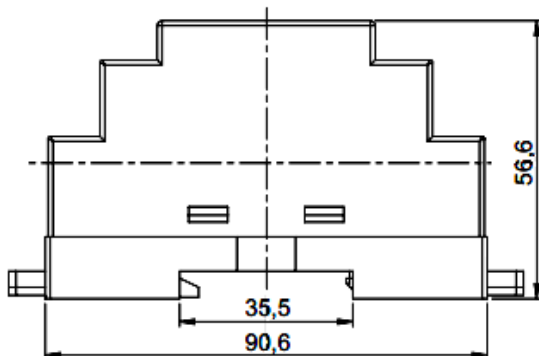
KEYS

- F1: Reset
 - F2: Changing the screen view
 - F3: total view in x10
 - F4: Entry into the menu
- In menu operations as used below;
- F1: Exit
 - F2: Up
 - F3: Down/Right
 - F4: Enter/Confirmation



DIMENSIONS

126 x 91 x 57 mm Din-Rail Case



1. DEVICE INPUTS

Nr	Description
1	Encoder Input
2	Batching START
3	Batching STOP
4	Do not TOTALIZE weighings
5	WF RUN (0:Manual Operation, 1:Automatic Control Mode)
6	WF Front Roller Sensor for Skidding
7	WF Back Roller Sensor for Skidding
8	WF Belt Shift Input (Touching the Sides)

2. DEVICE OUTPUTS

Nr	Description
1	Totalizing for Mechanical Counter Output (500ms ON)
2	Bath Output or Error Statement Batching Output Energizes after a Start of Batch Input Error Statement When BatchSet Value = 0, this output used for "No Error" state. Q2 = 0 (ADC overflow, ADC module error, Capacity over) Q2 = 1 No error, device is OK
3	WF is RUN state (Only WF) (When WF RUN input is exists and no Error flag on Modbus StatusB)
4	WF is in Error Condition (Error flags is 1 from the Modbus StatusB)
5	Indicates WF is in Warning Condition (Skid, Shift, Analog out under min or max)
6	Not Used
7	Not Used
8	Not Used

3. MODBUS MEMORY MAP

R/W	Address	Data	Description
R/W	0	Command	Command Register
R/W	1	RegA	Extension for command
R/W	2	RegB	Extension for command
R/W	3	Device StatusA	Devices StatusA Information Bits 0:Device Type. 0: BeltScale,1:WeighFeeder (In factory manufactured) 1: Angle Correction. 0:Correnction OFF, 1:Correnction ON 2-3: Password state. 0: Total erase password active (T1=1,T2=2, T3=3) 1: Total + Menu password is ON (Menu = 0009) 2: Menu password active 3: Password is OFF 4-5:Analog Input Mode. 0:Not Used, 1:0/10V, 2:4/20mA 6: System Usage 7: Relay Outputs forced control. 0:Normal,1:Forced Output 6-15: Not Used
R/W	4	Device StatusB	Devices StatusB Information Bits 0:Run. 0:ManualMode,1:PID mode 1:GeneralError. 0:Normal, 1:Error Seen (Caused by one of the error sources (Can be reset by writing Command Register0=31) 2:BeltShifted. 0:Normal, 1:Belt is in Shifted Confiton 3:FrontSkidding. 0:Normal, 1:Skidding more than 5 times 4: BackSkidding. 0:Normal, 1:Skidding more than 5 times 5:Not Used 6: Not Used 7:AnalogOutUnderLowLimit. 0:Normal,1:Error 8:AnalogOutAboveHighLimit. 0:Normal,1:Error 9:Load is under defined limits. 0:Normal,1:Error 10:Load is over defined Limits. 0:Normal,1:Error 11-15: Not Used
R/W	5	Device StatusC	Devices StatusC Information bits 0-11: Devices 12bit Analog Out Information (WF Only) 12-15: Not Used
RO	6-7	Flowrate	[t/h] Current flowrate data (32bits)
RO	8-9	Speed H	[m/s] Current Speed data (32bits)
RO	10-11	T1	[ton] Total1 Totalized Load (32bits)
RO	12-13	T2	[ton] Total2 Totalized Load (32bits)
RO	14-15	T3	[ton] Total3 Totalized Load (32bits)
RO	16-17	kg/m	[kg/m] Load on the Belt as Kg per meter kg/m (32bits)
RO	18-19	kg	[kg] Load on the Belt in Kg (32bits)
R/W	20-21	Set Flow	[t/h] Target Flowrate value for Analog output (32bits)
R/W	22	Analog Output Coefficient	Used for analog output correntions. 0.000-9.999 (16Bits) Use 1.000 as default. When used from 1 to 0.5, the output will decreased 1/2
R/W	23	alarmDelayTime	[s] 8bits value. Used on WF applications, alarm output waits before active. (+2seconds more always)
RO	24	Batch Value L-H	[kg] Current Batching value if Batching Started (32Bits)
R/W	26	Batch Set value L-H	[kg] Batching Target Value (32Bits)
R/W	28-29	Angle Multiplier	*Angle corrected models only
R/W	30	Digital Outputs	Bits 0-7 outputs. (Bits 8-15 when forced out bit enabled)
RO	31	Digital Inputs	Digital Inputs Value. 8bits
R/W	32-33	Dead Load	*Angle corrected models only

R/W	34-35	Relay Alarm Min	When load on the belt is under this value, after a alarmRelayTime gives an error Relay Output
R/W	36-37	Relay Alarm Max	When load on the belt is above this value, after a alarmRelayTime gives an error Relay Output
R/W	38	DAC Out Analog From	0-4095 12bits analog start point Default 0
R/W	39	DAC Out Analog To	0-4095 12bits analog end point Default 2500 (10V=20mA)
R/W	40	Weight Capacity	Used on AutoZero operations
R/W	42	Flowrate Min	Used with Coefficient1
R/W	44	Flowrate Max	Used with Coefficient2 and Target flow calculations on WF
R/W	46	Analog Input Channel1 non-filt	0-4095 12bits analog input value
R/W	47	Analog Input Channel2 non-filt	0-4095 12bits analog input value
R/W	48	Analog Input CH1 Percentage	100 for maximum
R/W	49	Analog Input CH2 Percentage	
R/W	50	Analog Input Channel1 filtered	0-4095 12bits analog input value
R/W	51	Analog Input Channel2 filtered	0-4095 12bits analog input value
R/W	52	Calculated Target value	*WF application Calculated Target from Analog Input1
R/W	54--	Not Used	

4. DEVICE COMMANDS

The Modbus commands are individual to the LPr devices. There is no relation between supported modbus functions (3,6-16 etc) and Device Commands!!

To use the Device Commands, the following registers are used;

Cmd Register: Address 0 [Command register]

RegA Register: Address 1 [Auxiliary register]

RegB Register: Address 2 [Auxiliary register]

For single write operations (modbus func 6) please set RegA and RegB before the Command register, for multi write operations (modbus func 16) please write CMD, RegA and RegB at the same query.

(Modbus Addr: 0) Command Register	(Modbus Addr: 1) RegA	(Modbus Addr: 2) RegB	Description
0x0000	-	-	Ready to execute new commands or the last command is OK
0xFFFF	-	-	The operation result is in Error
0xFFFE	-	-	The operation result is in Error
1	-	-	N/A
2	Address	Data	Eeprom write operation: Put RegA = Address, RegB = Data to be written and finally write the Cmd register 2.
3	Address	Data	Eeprom read operation: Put RegA = Address to be read and write the Cmd register 3. The result value will be updated to RegB.
4	-	-	"Device Restart" command.
5-7	-	-	N/A
8	Device Type	-	By using this cmd the Device Type can be read as RegA da register. LPr family code is 47601.
9	Version	-	Device version number is seen on RegA register. 107 = v1.0.7

10	-	-	All parameters are refreshed from epprom to RAM
11	Total1H	Total1L	Total1 is changed according to the RegA and RegB
12	Total2H	Total2L	Total2 is changed according to the RegA and RegB
13	Total3H	Total3L	Total3 is changed according to the RegA and RegB
21	-	-	Batch start
22	-	-	Batch Stop
23	-	Free	
91	Coeff 1 LOW	Coeff 1 HIGH	Coefficient 1 is changed according to RegA and RegB
92	Coeff 2 LOW	Coeff 2 HIGH	Coefficient 2 is changed according to RegA and RegB
93	Coeff 1 LOW	Coeff 1 HIGH	Coefficient 1 is read to RegA and RegB
94	Coeff 2 LOW	Coeff 2 HIGH	Coefficient 2 is read to RegA and RegB
99			Device calculates zero shift according to angle change (Correction state must be OFF and at least 5 to 10degree angle has to be applied)
122 ('z')	-	-	Zero calibration is done. Belt Revolution time is starts after this command.