SPARK
Drives & Automation

MODBUS LOAD CELL TRANSMITTER

24Vdc, 16-bit MODBUS data, DIN Rail

Load cells are an essential portion of many machines, used for measuring weight, load, and tension. SPARK DNA's Load cell transmitter plays a vital role in converting the output of load cells which is normally in the range of mV (with uV sensitivity) into 16-bit MODBUS data without losing the sensitivity and preserving the accuracy. Hence the output of the Load Cell Transmitter can be easily interfaced to standard controllers like PLCs, Microcontrollers.

Image of Load Cell Transmitter

Specifications:
- 12Vdc / 24Vdc Supply Voltage
- Any Load Cell from 1Kg to 1000Kg
- 10 Samples / sec.

Output options:
- MODBUS RTU, 16-bit Resolution
- RS232 and RS485 available

Features:
- Start/Stop pin, Tare pin
- Slave Address, Baud Rate Configurable.

Mounting Options:
- DIN Rail Mount.

It has an inbuilt high resolution Load Cell Converter with a sampling frequency of 10SPS, which means that user can get an updated output for every 100ms.

- Power LED indication available.
- Separate Run/Stop Control pin provided.
- Separate Tare Input pin provided.

Ordering Info

Depending on resolution requirements and output type needs, we provide below models.

S.no	Model No	Output type	Specifications
1	LCT01-02	MODBUS	RTU Slave, RS485, 16-bit Resolution

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#44, Marvel Parambariam, Kalapatti Road, Saravanampatti,
Coimbatore, Tamilnadu, India 641035.

Mechanical Characteristics

Operating temperature	:	0...+65 (°C)
Size (l*b*h)	:	100*45*50 mm
Housing	:	DIN Rail ABS Plastic Enclosure
Weight	:	70grams.

MODBUS Output Module (Model no: LCT01-02)

LCT01-02 provides 16-bit load cell data via MODBUS. Our unit performs well as RTU Slave with Slave address '01' via RS232 and RS485 by default. RS232 is used for configuration changes like RS485 slave address change, RS485 baud rate setting and filter settings. The slave address of RS232 remains as 01 always with a fixed baud rate of 9600bps, whereas the RS485 slave address and baud rate are configurable.

Connector Info for LCT01-02 (MODBUS Module)

Pin numbers mentioned are from left to right.

TOP SIDE CONNECTOR

PIN#	CONNECTION
SUPPLY CONNECTION	
1	24V Supply
2	Ground – 0V
DIGITAL INPUT PIN	
3	Tare Input
4	Reserved
RS485 CONNECTION	
5	D+
6	D-
RS232 CONNECTION	
7	TX
8	RX
9	Ground

BOTTOM SIDE CONNECTOR

PIN#	CONNECTION
LOAD CELL CONNECTION	
7	Excitation +
8	Signal +
9	Signal –
10	Excitation -

Communication Parameters for RS-485 & RS-232:

Parameter	RS232	RS485	
		Default	Configurable
Protocol	MODBUS – RTU Slave (Hex)	MODBUS – RTU Slave (Hex)	No
Slave Number	1	1	Yes
Baud Rate	9600	9600	Yes
Data bits	8	8	No
Parity	None	None	No
Stop Bits	2	2	Yes
Retry Count	2	2	No
Time Out	1000ms	1000ms	No

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NOTE: The Slave Number for RS232 is always "1", cannot be changed. To change Slave number for RS485 refer the Register Section below.

Data Registers:

Hex Address	Function	Type	Port
0001H	Load Cell Raw Count	Read	RS232 & RS485
0004H	Load Cell Tare Count	Read	
0005H	Load Cell Zero Count	Read	

Control Registers:

Hex Address	Function	Type	Port
0019H	Tare Command	Read / Write	RS232 & RS485

Load Cell Configuration Registers:

Hex Address	Function	Type	Port
0032H	Sampling Time	Read / Write	RS232 & RS485
0033H	Moving Average	Read / Write	
0034H	ADC Resolution	Read / Write	

RS485 Configuration Registers:

Hex Address	Function	Type	Port
07D0H	Slave Address of RS485	Read / Write	RS232
07D1H	Baud Rate of RS485	Read / Write	
07D2H	Stop Bits of RS485	Read / Write	

NOTE: The above registers can read by RS485, but can't write through RS485.

Functions of Data Registers:

- 0001H (40002) - Load Cell Raw Count: This register has unsigned 16-bit value. When this address is read, the raw load cell value will be transmitted. The tare option will not affect this register.
- 0004H (40005) - Load Cell Tare Count: This register has unsigned 16-bit value. When this address is read, the 16-bit load cell value after tare will be transmitted.
- 0005H (40006) – Load Cell Zero Count: This register has unsigned 16-bit value. When the Tare operation is performed, the present load cell value will be moved to this register. The value called as "Zero Count Value" will be retained until next tare.

Functions of Control Registers:

- 0019H (40026) – Tare Command: This register has signed value. When this register written as '1' or Tare Input pin 'HIGH', the present load cell value will be moved to the Zero Count Value (0005H) as well as Load Cell Tare Count, obtained it's zero value. This register value will automatically '0' after the tare process completed.

Functions of Load Cell Configuration Registers:

- 0032H (40051) – Sampling Time: This register has default '4'. The values written to this register with the corresponding Sampling Time shown in below and this will retained until next change.
  - ➔ '0' – 12.5ms
  - ➔ '1' – 25ms
  - ➔ '2' – 50ms
  - ➔ '3' – 75ms
  - ➔ '4' – 100ms (Default)

- 0033H (40052) – Moving Average: This register has default '0'. The values written to this register with the corresponding Moving Average shown in below and this will retained until next change.
  - ➔ '0' – No Average (Default).
  - ➔ '1' – 2 Average
  - ➔ '2' – 4 Average
  - ➔ '3' – 8 Average

- 0034H (40053) – Bit Resolution: This register has default '1'. The values written to this register with the corresponding Load Cell Resolution shown in below and this will retained until next change.
  - ➔ '0' – 13 Bit
  - ➔ '1' – 14 Bit (Default)
  - ➔ '2' – 15 Bit
  - ➔ '3' – 16 Bit
  - ➔ '4' – 17 Bit

Functions of RS485 Configuration Registers:

- 07D0H (42001) – Slave Address of RS485: This register has default '1'. The values written to this register will change the Slave Address of RS485 com-port and this will retained until next change. This register can read by either RS232 & RS485 and write by RS232 only.

- 07D1H (42002) – Baud Rate of RS485: This register has default '0'. The values written to this register with the corresponding Baud Rate of RS485 which is shown in below and this will retained until next change. This register can read by either RS232 & RS485 and write by RS232 only.
  - ➔ '0' – 9600 bps(Default)
  - ➔ '1' – 14400 bps
  - ➔ '2' – 19200 bps
  - ➔ '3' – 38400 bps
  - ➔ '4' – 56000 bps
  - ➔ '5' – 57600 bps
  - ➔ '6' – 115200 bps

- 07D2H (42003) – Stop Bits of RS485: This register has default '0'. The values written to this register with the corresponding Stop Bits of RS485 which is shown in below and this will retained until next change. This register can read by either RS232 & RS485 and write by RS232 only.
  - ➔ '0' – 2 Stop Bits(Default)
  - ➔ '1' – 1 Stop Bits

Configurator Tool:

PC based Configurator tool is available for Module configuration (Salve ID, Baud rate, Stop bits etc.,).

Load cell transmitter configuration can be done and measured count display, tare options are available.

This greatly reduces the initial testing efforts and time.