LMCANopen

QUICK SET-UP.

MICELECT

Index

Revision history:

Date	Rev	Changes	Autor
04 May 2016	1.0	First version .	A.Ruiz
01 Dec 2016	2.0	Additional features New Flowchart (1.0)	A.Ruiz

Introduction

Full access to the object dictionary (OD) of the device is defined in document:
LMCAN LWD (3.0).eds
Order to use this device correctly, we recommend that the user reads the instructions before connecting cables or installing the device. For any further information, please don't hesitate to contact our technical department.

Main Features

More information detailed in ***P-LMCANopen-003 Reference Guide.pdf***

- Power Supply Voltage: 24Vdc.
- Easy configurable.
- Up to 16 individual sensor USB inputs.
- High sampling speed.
- Non-connection sensor detection. (EMCY codes)
- Power supply CAN isolation and transceiver isolation (optional)
- Dip Switch termination resistor (120Ω)
- Fully compliant CANopen according Cia 417
- CANopen alarms:
  - Zero-Load.
  - Normal-Load.
  - Full-Load.
  - Overload.
  - Slack rope.
  - Difference of rope.
- LEDs indicate the status of the node according to DS 303-3.
- CAN-bus connection: DS 303-1 (Open Style Connector or 9-pin D-sub connector).

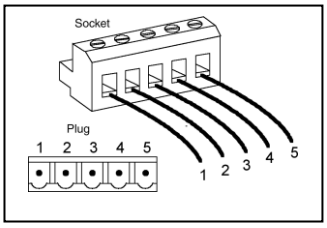
Installation and set-up (sections 1-7)

1. Mount the ***Sensors*** according to the procedure indicated.
2. Connect the node to the CANopen network according to the colour code and PIN-OUT.

Connection type (DS 303-1).

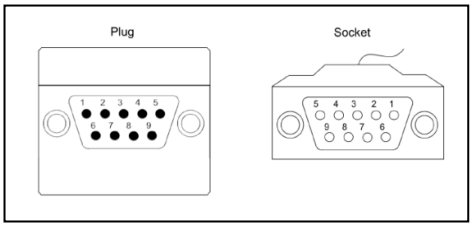
Open style connector;

Description	Signal	Colour Code	Pin-Out
Power Supply	CAN_GND	Black	1
(DC)0-24V	CAN_V+	Red	5
	CAN_SHLD	Mesh	3
CANopen Output	CAN_H	Green	4
	CAN_L	Yellow	2



9-pin D-sub connector;

Description	Signal	Pin-Out
Reserved	-	1
CAN_L bus line (dominant low)	CAN_L	2
CAN ground	CAN_GND	3
Reserved	-	4
Optional CAN shield	(CAN_SHLD)	5
Optional ground	(GND)	6
CAN_H bus line (dominant high)	CAN_H	7
Reserved	-	8
24Vdc	(CAN_V+)	9



3. Check the bit-rate which by default is 250Kbit/s (in order to modify this value, please see point 6).

4. When the node is initiated it will send a BOOT-UP message and, from this point on, complete communication will be possible.

5. At this point the node will send error messages in the following cases:

- When the consumer heartbeat of node 1 is not received in the allocated time (default is, 3 seconds). This parameter can be modified in OD 1016h-1h. The node, however, will continue to function.

6. **Bit-rate** configuration. This parameter can be changed in two ways :
   - (OD 4646h-04h). In order for the communication speed modifications to take effect it should be saved in a non-volatile memory file (OD 1010-1h) and after that, the node should be restarted and the communications reset.

60Dh	8	2F 46 46 04 D0 00 00 00

Where D0 (byte 4) can be the index values

   - LSS protocol. The device is compatible with LSS protocol according CiA 305.

Index	Bit rate
0	1 Mbit/s ✔
1	800 kbit/s ✔
2	500 kbit/s ✔
3	250 kbit/s ✔
4	125 kbit/s ✔
5	reserved
6	50 kbit/s ✔
7	20 kbit/s ✔
8	10 kbit/s ✔
9	Automatic bit rate detection ✘

7. **Configuration.**

It is possible access to all parameters through device buttons or CAN Bus frames.

1) Way one: Buttons + LCD.

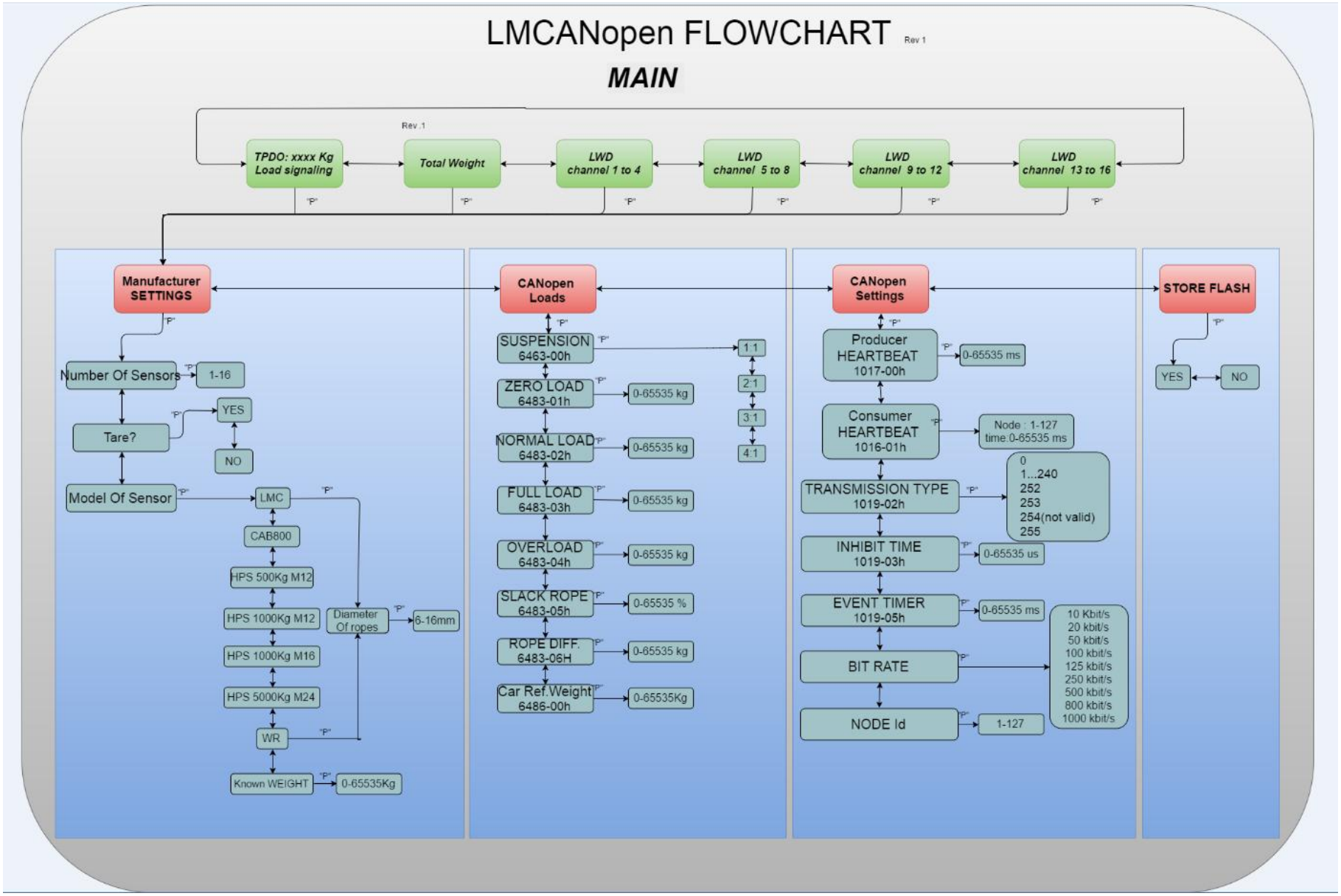
In order to navigate by the menus, you must use the control buttons.

P	Accept
S	Cancel/Back
△	Up.
▽	Down

The setting menu is divided in 5 sections:

- Main. You can see all channels individually and the total load value too.
- Manufacturer settings, you can set all parameters necessaries in order to the control unit work properly.
- CANopen Loads, you can set the CANopen loads parameters
- CANopen settings, you can set the CANopen technical parameters.
- Store Flash, It is very important store variables after the modifications. If not, after a reboot the values will not be changed.

CANopen



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a. **Number of sensor:**

1 to 16 sensors. (It depends of LMCAN version up to 8 or 16 channels)

b. **Tare:**

Zero calibration, Perform the zero setting with an empty cabin by selecting “YES”. It is recommended to jump inside the cabin before performing the zero to reduce the effect of any friction in the guide rails. Following this, press the “P” key and the controller display will start to flash for 5 seconds giving the installer time to leave the cabin completely empty.

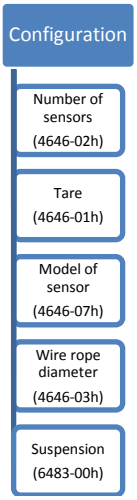
c. **Model Of Sensor:**
   - LMC (Wire Rope sensor): Calibration is automatic by entering the diameter of the ropes from 6.0mm to 16.0mm (3/8 inch = 10mm, 1/2 inch = 13mm, 5/8 inch = 16mm.)
   - CAB 800(CAB 800 sensors): Calibration is automatic by simply entering the number of sensors being used in the installation (4-6 or 8).
   - HPS-500Kg-M12 (sensors installed on wedge sockets).
   - HPS-1000Kg-M12 (sensors installed on wedge sockets).
   - HPS-1000Kg-M16 (sensors installed on wedge sockets).
   - HPS-5000Kg-M24 (sensors installed on wedge sockets).
   - HPS-1000Kg-M20 (sensors installed on wedge sockets)***->(coming soon)***
   - WR(Individual wire rope sensor - WR): Calibration is automatic by entering the diameter of the wire ropes from 6mm, 8mm to 16mm and 20mm (3/8 inch =10mm, 1/2 inch=13mm, 5/8 inch=16mm) The number of sensors being used must also be introduced (1-16). NB: Every wire rope must have a sensor mounted!
   - KNOWN WEIGHT (Test weight calibration): Test weights must be used to calibrate this type of sensor. The test weights must be at least 50% of the capacity of the elevator and, wherever possible, 100%. The weight is entered into the Control unit when the weights are placed inside the cabin.

d. **Suspension:**

Select the type of roping from the options available: 1:1, 2:1 ,3:1 or 4:1.

e. **Important !!!** The configuration settings should be saved in a non-volatile memory: STORE FLASH -> Yes

2) Way 2: CAN protocol (manufacturer specific profile 4646h)



- ***Select number of sensors*** connected to the control unit. 4646-02h.

Where D0 (byte 4) is the number of sensors connected.

60Dh	8	2F 46 46 02 D0 00 00 00

- ***Tare:*** Mount the sensors according to the installation procedure in the manual. Make the zero setting with an empty cabin by writing ***1h*** (byte 4) in the OD 4646-1h . It is recommended to jump inside the cabin before doing the zero setting, in order to avoid any possible cabin "hooks" on the guide rails. The lift must be located on the lowest floor, when we do the zero setting.

CAN-ID	Type	Length	Data
60Dh		8	2F 46 46 01 01 00 00 00

- ***Select the sensor model***: 4646-07h.

60Dh	8	2F 46 46 07 D0 00 00 00

Where D0 (byte 4) can be:

0x00 = No sensor selected.
0x01 = LMC.
0x02 = CAB800.
0x03 = HPS M12-500Kg.
0x04 = HPS M12-1000Kg.
0x05 = HPS M16-1000Kg.
0x06 = HPS M20-5000Kg.
0x07 = WR.
0x08 = Known weight (Beam, CCP....)

- ***Wire rope diameter:*** OD 4646-3h.Where D0 (byte 4) is the wire rope diameter.

60Dh	8	2F 46 46 03 D0 00 00 00

Where D0 is a value in millimeters.

- ***Known weight.*** known weight has to be used to set up this kind of sensor. Place a known weight, which must be -at least- half the useful load, inside the cabin and proceed to the weight settings by writing the weight value in KG in the OD 4646-09h.

60Dh	8	2B 46 46 09 E8 03 00 00

(In this case, the weight introduced into the cabin is 1000kg)

- ***Suspension: OD 6463-00h***. This object contains the suspension of the lift car. Where D0 (byte 4) is the **value** of table.

60Dh	8	2F 63 64 00 D0 00 00 00

Value	Description
00_h	1:1
01_h	2:1
02_h	3:1
03_h	4:1
04_h	reserved
to	
FE_h	reserved
FF_h	not valid

- Flash memory: The configuration settings should be saved in a non-volatile memory: OD 1010h-1h.

60Dh	8	23 10 10 01 73 61 76 65

By configuring these settings correctly, the device should be in full working mode.

Additional information:

A. LED indicators (according to DS 303-3 indicator specification):

Colour Led	RED	GREEN
Off	No error	
Blinking		PRE-OPERATIONAL
Single flash	Warning limit reached	STOPPED
Double flash	Error control event	
On	Bus off	OPERATIONAL

B. DIP Switch Termination resistor 120Ω. The control unit has a external dip switch to enable or disable the termination 120 Ω resistor.

C. LCD stand-by. After 5 minutes, the LCD controller will be in a low consumption state. When the user press any button, the LCD will power on again.

D. Flash update firmware, the control unit has an external button to update the firmware (if an update exit). For more information please contact with your supplier.

E. Emergency error codes (CEE):

EMCY error only will be send one per error. If the control unit is reset and the error persist , the EMCY message will be send again. By this way, no bus saturation will be exist.

CEE	ER	MSEF			Description
Byte 0-1	**Byte 2**	**Byte 3**	**Byte 4**	**Byte 5**	
0000h	00	0h			Reset error ***or*** no error
1000h	01	1h			Generic error
5000h	81	3h	00000000b (*Note 1)	00000000b (*Note 1)	Sensor internally damaged or disconnected from the controller
8130h	11	7h			Heartbeat consumer error
8140h	11	5h			Recovery from Buss Off

*Note 1. Example Mask Error sensor damaged/unplugged

Byte 4	Byte 5	Hex value	BROKEN
00000001b	00000000b	01h	Sensor 1
00000010b	00000000b	02h	sensor 2
00000011b	00000000b	03h	Sensor 1+sensor 2
00000111b	00000000b	07h	Sensor 1+sensor 2+sensor 3
00000000b	00000001b	100h	Sensor 9
11111111b	11111111b	FFFFh	All sensors broken

SAMPLE EMCY ERROR "SENSOR CHANNEL 1 unplugged"