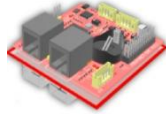




LMX-200

Teknik Manuel

Technical Manual



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Beton santrali kum, çakıl, kırmataş gibi malzemelerin oluşturduğu agreganın, su, çimento ve çeşitli katkılarla karıştırılarak, üretilen hazır betonun transmikser veya kamyonlara dolumunun yapıldığı tesis. Beton santralini oluşturan ana parçalar agrega bunker, agrega tartı bandı, mikser besleme bandı, mikserin yer aldığı ana şase grubu, çimento silo ve ekipmanları ile santrali çalıştıran otomasyon sistemleridir.

Concrete plant is a facility where the aggregate formed by materials such as sand, gravel, crushed stone is mixed with water, cement and various additives and the ready-mixed concrete produced is filled into transmixers or trucks. The main parts that make up the concrete plant are the aggregate bunker, aggregate weighing band, mixer feeding band, main chassis group where the mixer is located, cement silo and equipment, and automation systems that operate the plant.



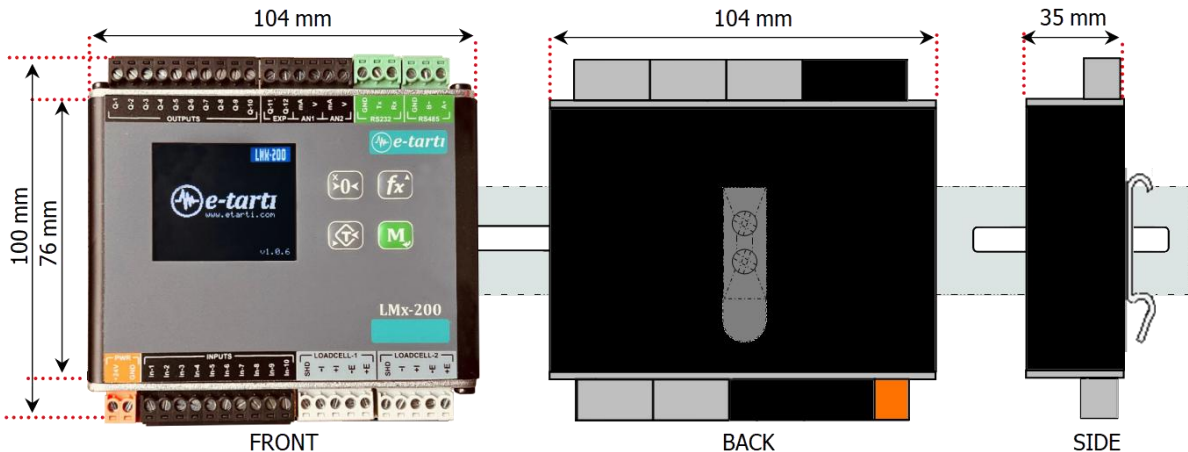
1.2 ÖZELLİKLER SPECIFICATIONS

- 2kanal Bağımsız Ağırlık Ölçme
2 Channel Individual Weight Measurement
- Bağımsız ayarlanabilir 1280 Hz e kadar çevrim hızı
Adjustable up to 1280Hz measurement speeds each channels
- 12 adet 24V FET tipi Hızlı Çıkış
12 pcs 24V FET type Fast Outputs
- 2 adet 0/10V-4/0mA Analog Çıkış
2 pcs 0/10V-4/20mA Analog Outputs
- 9 adet 0-36V Analog Ölçme Girişi
9 pcs 0-36V Analog Measurement
- 1 adet RS232, 1 adet RS485 Modbus RTU/ASCII 1200-115200bps
1pcs RS232, 1pcs RS485 Modbus RTU/ASCII 1200-115200bps
- Opsiyonel PROFINET Çift Port haberleşme
Optional PROFINET Dual Port communication
- Opsiyonel ModbusTCP Ethernet bağlantı
Optional ModbusTCP Ethernet communication
- Haberleşme ve Durum Gösterge ikonları ile kolay izleme
Easy view with Communication and Status Indicator Icons
- Harici Gösterge Çıkışı
Remote Display Output

1.1 BOYUTLAR DIMENSIONS

100 x104 x 35 mm Ray Tipi Kutu

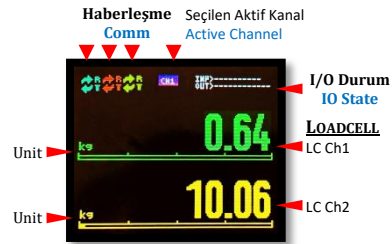
100 x104 x 35 mm Din-Rail Case



Ekran görseli ve açıklamaları aşağıdaki gibidir. Kullanılmayan kanallar menüden kapatılarak gizlenebilir.

The screenshots and descriptions are as follows. Unused channels can be hidden by closing them from the menu.

1.3	Tuşlar	Keys
Tuş KEY	ANA EKRANDA ON MAIN SCREEN	MENÜDE ON MENU
	Sıfırlama Zeroing	Çıkış Exit
	YH Kanal Geçiş Switch Loadcell Ch	Yukarı Geçiş Up Side
	Dara Alma Tare Operation	Aşağı/Sağa Down/Right
	Menü Giriş Menu Enter	Giriş/Onay Enter/Accept

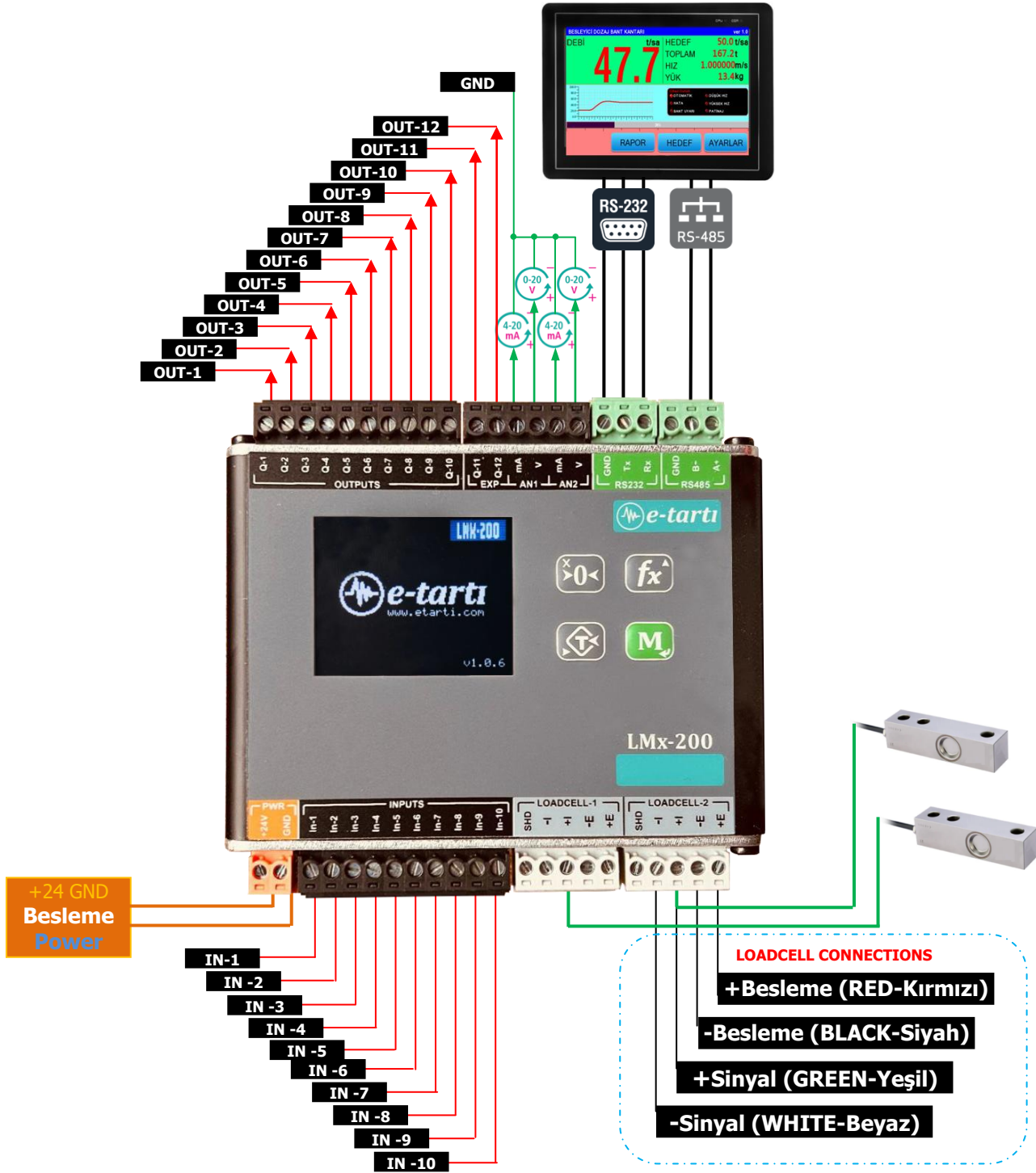


3 BAĞLANTILAR

CONNECTIONS

3.1 Elektrik Şema

Electrical Scheme



3.2 GİRİŞLER

3.2.1 Tartı Uygulaması

INPUTS

Scale Application

Nr	Tanım	Description
IN-1	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-2	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-3	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-4	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-5	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-6	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-7	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-8	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-9	Dijital/Analog Giriş 0-36VDC (ayarlanabilir)	Digital/Analog Input 0-36VDC (configurable)
IN-10	Dijital Giriş 24VDC (ayarlanabilir) *	Digital Input 24VDC (configurable)

* 0/24V digital giriştir, sayaç olarak çalışabilir

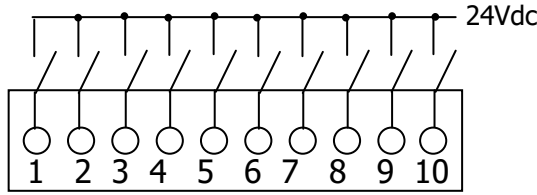
* 0/24V digital input. Can be used as counter

3.2.2 Dolum Uygulaması

Filling Application

Nr	Tanım	Description
IN-1	CH1 Dolum Başlat	CH1, Filling START
IN-2	CH1 Dolum DURDUR	CH1, Filling STOP
IN-3	CH1 Dolum TORBA TUT	CH1, Filling BAG HOLD
IN-4	CH1 Dolum BOŞALT İZNİ	CH1, Filling DISCHARGE
IN-5	CH2 Dolum Başlat	CH2, Filling START
IN-6	CH2 Dolum DURDUR	CH2, Filling STOP
IN-7	CH2 Dolum TORBA TUT	CH2, Filling BAG HOLD
IN-8	CH2 Dolum BOŞALT İZNİ	CH2, Filling DISCHARGE
IN-9	DİKİŞ SENSÖRÜ	SEWING SENSOR
IN-10	DİKİŞ KESME SENSÖRÜ	SEW CUT OFF SENSOR

Vin MODEL



Inputs 1-2 girişleri opsiyoneldir ve isteğe bağlı olarak donanımsal 5A AC okuma şeklinde üretilebilir! Üretici ile görüşünüz!!!

Inputs 1-2 optional inputs can be manufactured as Hardware configuration read 5A AC! Please contact manufacturer!!!

3.3 ÇIKIŞLAR

3.3.1 Tartı Uygulaması

No	Tanım	Description
Q1	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q2	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q3	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q4	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q5	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q6	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q7	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q8	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q9	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q10	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q11	24V FET output (ayarlanabilir)	24V FET output (configurable)
Q12	24V FET output (ayarlanabilir)	24V FET output (configurable)

OUTPUTS

Scale Application

3.3.1 Dolum Uygulaması

Filling Application

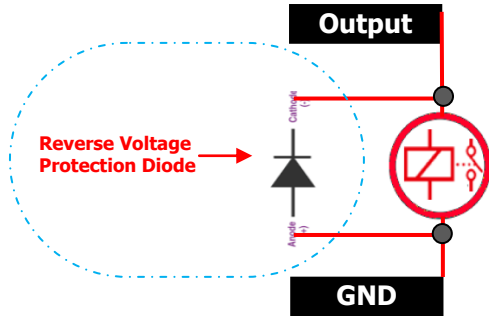
No	Tanım	Description
Q1	CH1 HIZLI DOLUM ÇIKIŞI	CH1 FAST FILLING OUTPUT
Q2	CH1 YAVAŞ DOLUM ÇIKIŞI	CH1 FINE FILLING OUTPUT
Q3	CH1 TORBA TUT ÇIKIŞI	CH1 BAG HOLD OUTPUT
Q4	CH1 BOŞALT ÇIKIŞI	CH1 DISCHARGE OUTPUT
Q5	CH1 SARSMA ÇIKIŞI	CH1 VIBRATE OUTPUT
Q6	CH2 HIZLI DOLUM ÇIKIŞI	CH2 FAST FILLING OUTPUT
Q7	CH2 YAVAŞ DOLUM ÇIKIŞI	CH2 FINE FILLING OUTPUT
Q8	CH2 TORBA TUT ÇIKIŞI	CH2 BAG HOLD OUTPUT
Q9	CH2 BOŞALT ÇIKIŞI	CH2 DISCHARGE OUTPUT
Q10	CH2 SARSMA ÇIKIŞI	CH2 VIBRATE OUTPUT
Q11	DİKİŞ ÇIKIŞI	SEWING OUTOUT
Q12	MAKAS ÇIKIŞI	CUT_OUT OUTOUT

Çıkışlar 24V besleme sinyaline göre çalışır. Aktif olduğunda 24V besleme terminalindeki gerilim çıkışa iletilir. FET tipi yüksek hızlı çıkıştır. Bağlanan yükün diğer ucu GND terminaline bağlanır.

Not: Bobin içeren valf yada röle gibi bağlantılarda ters diyot bağlanmalıdır!

Outputs operate according to 24V supply signal. When active, the voltage at the 24V supply terminal is transmitted to the output. It is FET type high speed output. The other end of the connected load is connected to the GND terminal.

Note: A reverse diode must be connected to connections such as valves or relays containing coils!



4 Modbus Adresleri

Modbus Memory Map

R/W	Address	Data	Tanim	Description
R/W	0	Command	Komut Adresi	Command Register
R/W	1	Reg A	Yardımcı Adres A	Extension for command
R/W	2	Reg B	Yardımcı Adres B	Extension for command
R/W	3	Device Status A	Status A Information Bits 0-1: Run bits, ch1-ch2 2-3: Tare bits, ch1-ch2 4-5: Stable bits, ch1-ch2 6-7: AbsZero bits, ch1-ch2 8: Alive bit, toggles every seconds automatically 9: Active Channel selected 0:Ch1,1:Ch2 10-12: NA (free) 13: Keypad lock 0:Unlocked, 1:Locked 14-15: NA (free)	
R/W	4	Device Status B	Status B Information bits 0-1: Channels Error (Overflow or Converter error), ch1-ch2 2-3: Channels Enabled, ch1-ch2 4-7: NA (free) 8-15: Error Message Number when device is in Error condition	
RO	5	Device Status C	Status C Information bits 0: Device Language 1-7: NA (free) 8-15: Options bits	
RO	6-7	LC Ch-1 NET (32bits)	32bits signed value	
RO	8-9	LC Ch-2 NET (32bits)	32bits signed value	
RW	10	Target Value	Ch1, Filling Target Value	
RW	11	Fine Value	Ch1,	
RW	12	Last Fill Value	Ch1,	
RW	13	Flowrate	Ch1,	
RW	14	Set Flowrate	Ch1,	
RW	15	Fill State	Ch1,	
RW	16-17	Totalisor 32bits	Ch1,	
RW	18	Counter	Ch1,	
RW	19	Zero Range	Ch1,	
RW	20	TareLimit	Ch1,	
RW	21	Manual Chute	Ch1,	
RW	22-23	Status	Ch1,	
RW	24-25	Target	Ch1,	
RW	26-27	Target Remainder	Ch1,	
RW	28	Tolerance	Ch1,	
RW	29	Keep Bag	Ch1,	
RW	30	Start Delay	Ch1,	
RW	31	Discharge Delay	Ch1,	
RW	32	Discharge After Delay	Ch1,	
RW	33	Fill Time Out	Ch1,	
RW	34	Target Value	Ch2, Filling Target Value	
RW	35	Fine Value	Ch2,	
RW	36	Last Fill Value	Ch2,	
RW	37	Flowrate	Ch2,	
RW	38	Set Flowrate	Ch2,	
RW	39	Fill State	Ch2,	
RW	40-41	Totalisor 32bits	Ch2,	
RW	42	Counter	Ch2,	
RW	43	Zero Range	Ch2,	
RW	44	TareLimit	Ch2,	
RW	45	Manual Chute	Ch2,	
RW	46-47	Status	Ch2,	
RW	48-49	Target	Ch2,	
RW	50-51	Target Remainder	Ch2,	
RW	52	Tolerance	Ch2,	
RW	53	Keep Bag	Ch2,	
RW	54	Start Delay	Ch2,	
RW	55	Discharge Delay	Ch2,	
RW	56	Discharge After Delay	Ch2,	
RW	57	Fill Time Out	Ch2,	
RW	58	Sew Output Delay	x100ms	
RW	59	Sew Cut Out Delay	x100ms	
RW	60	NA	NA	
RW	61	NA	NA	

RW	62-63	Relay1 Set values	32bits signed,
RW	64-65	Relay2 Set values	32bits signed,
RW	66	Relays Reverse	0-7:Reverse Enable Relay 1 8-15:Reverse Enable Relay 2
RW	67	Relays Relation	0-7:Relation Relay 1 8-15:Relation Relay 2
RW	68	Relay1 Hysteresis	16bits relay hysteresis value
RW	69	Relay2 Hysteresis	16bits relay hysteresis value
RW	70	Relay status	0: Relays enabled 1-15:N/A
RW	71	Digital Inputs	0-9: Input-1 to 10, 10bits 10-14: NA 15: Force Control bit. 0:Normal, 1:Forced Inputs active
RW	72	Digital Outputs	0-11: Outputs of device 12-14: NA 15: Force Control bit. 0:Normal, 1:Forced Outputs active on output
RW	73	NA	
RO	74	Bar Percent Ch1	Bar graph value, 0-160 pix
RO	75	Bar Percent Ch2	Bar graph value, 0-160 pix
RO	76	DAC Out Current Ch1	Actual analog output value 0-13200 as mV scaled (Actual 12bits)
RO	77	DAC Out From Ch1	Output Start Value
R/W	78	DAC Out To Ch1	Output End Value (According to Capacity on Scale Mode)
RO	79	DAC Out Status Ch1	0:Force mode 1:Simulation mode (factory use) 2-7: NA 8-15: DAC Out mode selection
RW	80	DAC Out Current Ch2	Actual analog output value 0-13200 as mV scaled (Actual 12bits)
RW	81	DAC Out From Ch2	Output Start Value
RW	82	DAC Out To Ch2	Output End Value (According to Capacity on Scale Mode)
RW	83	DAC Out Status Ch2	0:Force mode 1:Simulation mode (factory use) 2-7: NA 8-15: DAC Out mode selection
RW	84-85	mV/V Ch1	32bits signed (2.000000mV/V = 2000000)
RW	86-87	mV/V Ch2	32bits signed (2.000000mV/V = 2000000)
RW	88	PN Flash	0: Blink active 0:Normal 1:LCD flashes ID 1-15: NA
RW	89	NA	
RO	90-98	Digital/Analog Input Values	0-36V Analog value of the inputs. As 10mV resolution 2400 equals 24.00V
RO	99	NA	
RW	100-101	Capacity of Ch1	32bits Capacity for Ch1, Used for DAC or err1 calculations
RW	102-103	Capacity of Ch2	32bits Capacity for Ch2, Used for DAC or err1 calculations
RW	104-107	LC Total Capacities	When more than one Loadcell used on the channel, use total LC Capacity for mV/V calibration via 1109-2109 commands (Each 32bits)
		BELOW FACTORY USE ONLY	BELOW FACTORY USE ONLY
		ADC counts (24bits of channels)	32bits signed, from Channel 1 to 5, ADC counts value
		LC Channels Error	0-4: Conversion Error on Ch. 0:Normal, 1>Error (err90) 5-7:NA 8-12: ADC Overflow Err on Ch. 0:Normal, 1>Error (err5)
		LC Channels Step Value	16bits step value (as only 1x,2x,5x)
		Tare Values	Each values 32bits signed, from Channel 1 to 5 Tare values
		mV/V (mV/V value of channels)	32bits signed, from Channel 1 to 5, mV/V value
		NA	NA
		NA	NA
		ADC Internals Channels 12b	Factory use only! Internal ADCs as 12bits pure
		ADC Internals Average	Factory use only! Average values for Internal ADCs as floating point

**These ADC readings are valid on Voltage option mode and can read as 10mV resolution (24V = 24.00) default. Can be zeroed, zero shifted or calibrated via modbus commands, like 11122, 11108, 11123). See cmd listings below...

4.1 Cihaz Komutları 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;

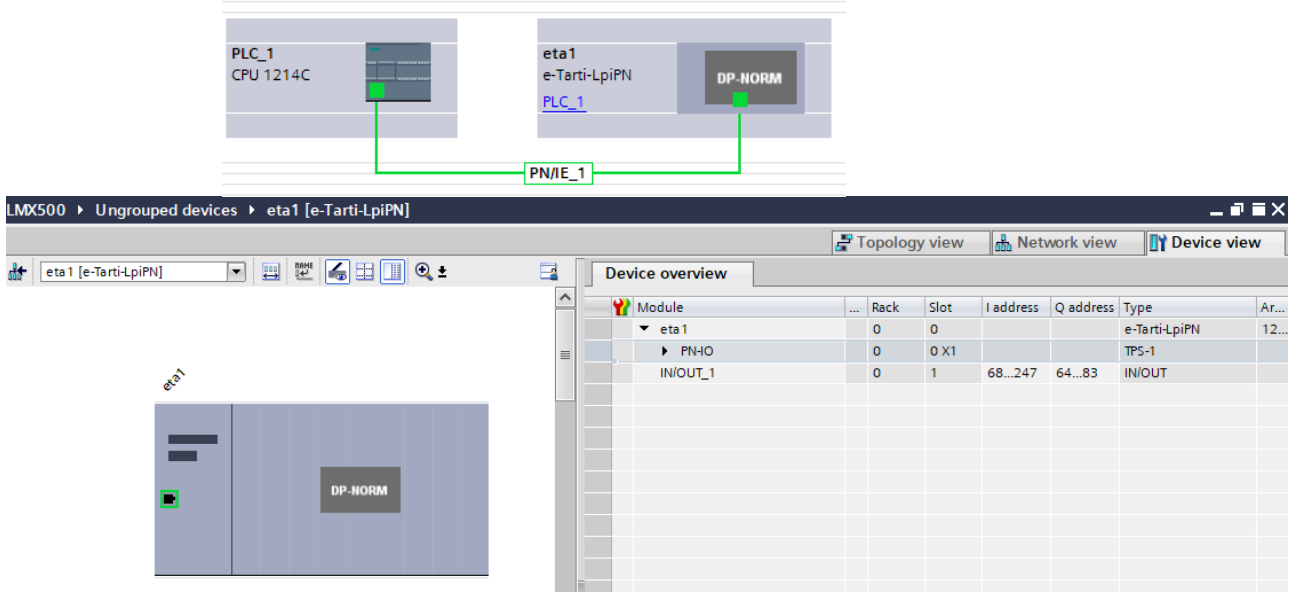
Cmd Register: Address 0 [Command register]

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
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	-	-	Volatile Zero for ALL Channels
1005,2005,3005,4005,5005	-	-	Volatile Zero for Single Channel
900x	-	-	Bitwise Multi-Channel Zero Operations (volatile) 9001-9031 9001 for Channel-1 only (binary order xxx0 0001) 9003 for Channel-1 and 2 together (binary order xxx 0 0011) 9005 for Channels 1 and 3 together (binary order xxx 0 0101) 9004 for Channel 3 only (binary order xxx 0 0100)
6	-	-	Tare Set for ALL channels
1006,2006,3006,4006,5006	-	-	Tare Set for single channel
7	-	-	Tare Reset for ALL channels
1007,2007,3007,4007,5007	-	-	Tare Reset for single individual channel
8	Device Type	-	By using this cmd the Device Type can be read as RegA da register. LMX family code is 47623.
9	Version	-	Device Version No is seen on RegA register. 107 = v1.0.7
10	-	-	All parameters are refreshed from eeprom to RAM
11	-	-	Record settings cmd gLogic, LC Channel enables, decimal points are recorded
21	Ch3 Frequency (R)	Ch4 Frequency (R)	When cmd 21 issued, frequency of the Input channels-3 and 4 can be read as x100 resolution up to 100Hz pricesly. 4500 is equals 45.00Hz
75	Key	-	Key evaluate 1=M,2=Fx,4=T,8:Z 128LongPress
88	-	-	PN Blink when Profinet, ID blink when RS comm
89	-	-	LCD test * fac use only
102	-	-	Eeprom write Unlock (To work with eeprom memory operations)
112	-	-	Keypad Lock ON
113	-	-	Keypad Lock OFF
122 ('z')	-	-	Zero calibration All channels once
1122,2122	-	-	Channel Zero Calibrations
1123,2123	Shift Value Low	Shift Value High	Channel Zero Shift Operation
1108,2108	Calib Low	Calib High	Channel Calibration command. RegA and RegB holds calibration value
1109,2109	mV/V Low	mV/V High	LC Channels mV/V Calibration cmd. RegA-RegB holds mV/V value as mV/V (2000000 = 2.000000mV/V) The LC channel is calibrated by using mV/V in regA/B and "LC Total Capacity" registers. Example: 8kg LC with 2.000000mV/V output on CH0 with Dp=1. Reg100: 14464, Reg101:1 (As 8000.0kg, 80000) RegA: 33920, RegB:30 (As 2.000000, 2000000) Reg0: 1109 (ch0 to cmd mV/V calibration issue)
10000 +			Commands for Inputs 1-5 as Analog Usage
11122,12122,13122,14122,15122,16122,17122,18122,19122	-	-	Zero Calibration for Digital/Analog Voltage on Channels
11123,12123,13123,14123,15123,16123,17123,18123,19123	Shift Value 16bits	-	Zero Shift cmd for Digital/Analog Voltage on Channels
11108,12108,13108,14108,15108,16108,17108,18108,19108	Calib Value 16bits	-	Calibration for Digital/Analog Voltage on Channels
11109,12109,13109,14109,15109,16109,17109,18109,19109,	Max	-	Makes Digital/Analog Voltage Input Range calibration. Cmd with RegA:10000 makes the channel result 0-10000 at 36V applied
10102	-	-	Factory Settings ALL command



Profinet haberleşmesini hızlı bir şekilde sıfırdan devreye almak için aşağıdaki linkteki youtube adresini ziyaret edebilirsiniz

<https://www.youtube.com/watch?v=uURPIYQkDoU> Profinet **gsd** dosyası www.etarti.com LMX500 ürün sayfasından indirilebilir.

Modbus map 0-9 nolu WORD adresler PLC de 0-19 byte (x2) olarak yerleşirler.

QW olarak belirlenen ilk adres komut olup sadece değiştiği anda cihaza 1 kez yazılır, Cihaz ise komutu uyguladığında bu komutu siler (dolayısı ile IW adresindeki komut 0 olarak okunur)

To quickly commission Profinet communication from scratch, you can visit the YouTube link below.

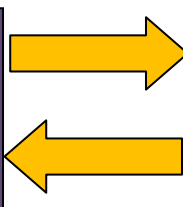
<https://www.youtube.com/watch?v=uURPIYQkDoU> Profinet gsd file can be downloaded from www.etarti.com LMX500 product page.

WORD addresses 0-9 in the Modbus map are located in the PLC as 0-19 bytes (x2). The first address specified as QW is the command and is written to the device once only when it changes. The device deletes this command when it executes the command (therefore, the command at the IW address is read as 0)

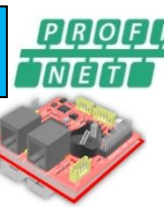
Address	Data	Description
IW68	Command	Command Register (read only, zeroed by device itself when issued)
IW70	Reg 1	Extension for command
IW72	Reg 2	Extension for command
IW74	Status	Please refer Technical manual
IW76	Status	Please refer Technical manual
IW78	LC Channel1	LC channel 1 value (signed 16bits)
IW80	LC Channel2	LC channel 2 value (signed 16bits)
IW82	LC Channel3	LC channel 3 value (signed 16bits)
IW84	LC Channel4	LC channel 4 value (signed 16bits)
IW86	LC Channel5	LC channel 5 value (signed 16bits)
IW88-247		*Please refer table above for details IW68-87 10words (20bytes) are high refresh rate, 80words lower rate
Address	Data	Description
QW64	Command	When this value changed (change only) below values are written to Modbus registers. Example: Changing from 0 to 1005 make ch1 Zero once
QW66	Reg 1	Extension for command
QW68	Reg 2	Extension for command
QW70	Addr extension	Advanced operation (refer manufacturer for detailed usage) Used as index address for Modbus MultiWrite operations
QW72	Nof Data extension	Advanced operation (refer manufacturer for detailed usage)
QW74-83	Data to write	Advanced operation (refer manufacturer for detailed usage)



Modbus Map



IW
QW



IW68-247
180bytes/90Words
QW64-83
20bytes/10Words