TR EN

e-tarti

*Daha iyisi için çok çalışıyoruz...*
*We work hard for better...*

# LMX-500

## Teknik Manuel

## Technical Manual


14/03/2023
Last Updated

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 bunkeri, 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.


## ÖZELLIKLER SPECIFICATIONS

- 5 kanal Bağımsız Ağırlık Ölçme
  5 Channel Individual Weight Measurement
- Bağımsız ayarlanabilir 1280 Hz e kadar çevrim hızı
  Adjustable up to 1280Hz measurement speeds each channels
- 5 adet 24V FET tipi Hızlı Çıkış
  5 pcs 24V FET type Fast Outputs
- 2 adet 5A Akım Ölçme Girişi (akım trafosu uyumlu)
  2 pcs 5A Current Measurement (Transformer compatible)
- 2 adet 4/20mA Akım Ölçme Girişi
  2 pcs 4/20mA Current Measurement Inputs
- 3 adet Sayaç Okuma Girişi (10kHz e kadar okuyabilir)
  3 pcs Counter Inputs (Can reads up to 10kHz)
- 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

## TUŞLAR KEYS

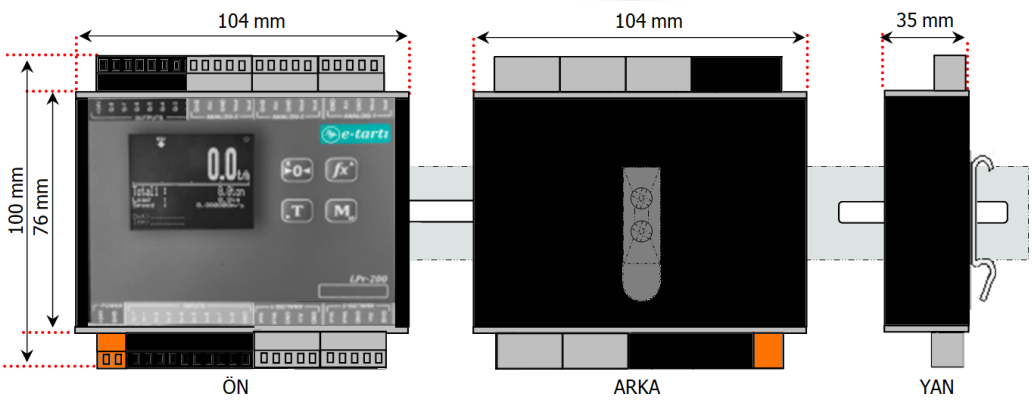
| TUŞ<br>KEY | ANA EKRANDA<br>ON MAIN SCREEN | MENÜDE<br>ON MENU |
|---|---|---|
|  | Sıfırlama<br>Zeroing | Çıkış<br>Exit |
|  | YH Kanal Geçiş<br>Switch Loadcell Ch | Yukarı Geçiş<br>Up Side |
|  | Dara Alma<br>Tare Operation | Aşağı/Sağa<br>Down/Right |
|  | Menü Giriş<br>Menu Enter | Giriş/Onay<br>Enter/Accept |

## BOYUTLAR

***100 x104 x 35 mm Ray Tipi Kutu***

## DIMENSIONS

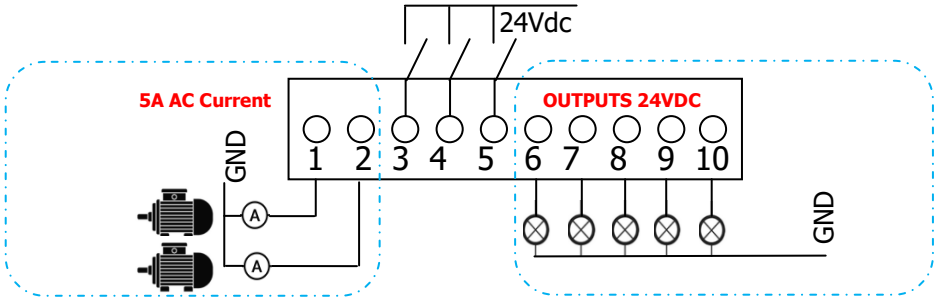
***100 x104 x 35 mm Din-Rail Case***



# BAĞLANTILAR CONNECTIONS

## 1. GIRIŞLER DEVICE INPUTS

| Nr | Tanım | Description |
|---|---|---|
| 1 | **5A AC** Akım Okuma Girişi (GND ile)<br>Akım trafosu uyumludur | **5A AC** Current Read Input (to GND terminal)<br>Current transformer compatible |
| 2 | **5A AC** Akım Okuma Girişi (GND ile)<br>Akım trafosu uyumludur | **5A AC** Current Read Input (to GND terminal)<br>Current transformer compatible |
| 3 | Dijital/Analog Giriş 0-36VDC (ayarlanabilir)<br>DC maksimum 36V okunabilir.<br>**1kHz** e kadar **yükselen kenar** sayaç özelliği vardır | Digital/analog Input (configurable)<br>DC maximum 36V can read.<br>Up to **1kHz** Increasing **EDGE** counter |
| 4 | Dijital/Analog Giriş 0-36VDC (ayarlanabilir)<br>DC maksimum 36V okunabilir.<br>**1kHz** e kadar **yükselen kenar** sayaç özelliği vardır | Digital/analog Input (configurable)<br>DC maximum 36V can read.<br>Up to **1kHz** Increasing **EDGE** counter |
| 5 | Dijital/Analog Giriş 0-36VDC (ayarlanabilir)<br>DC maksimum 36V okunabilir.<br>**1kHz** e kadar **yükselen kenar** sayaç özelliği vardır | Digital/analog Input (configurable)<br>DC maximum 36V can read.<br>Up to **1kHz** Increasing **EDGE** counter |

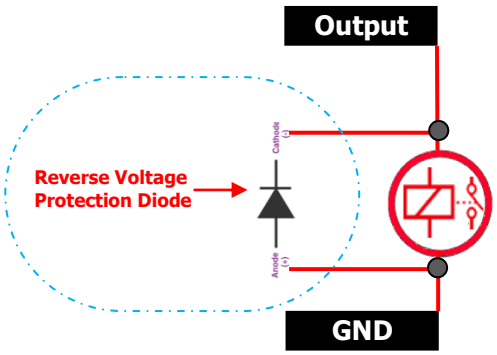



## 2. ÇIKIŞLAR DEVICE OUTPUTS

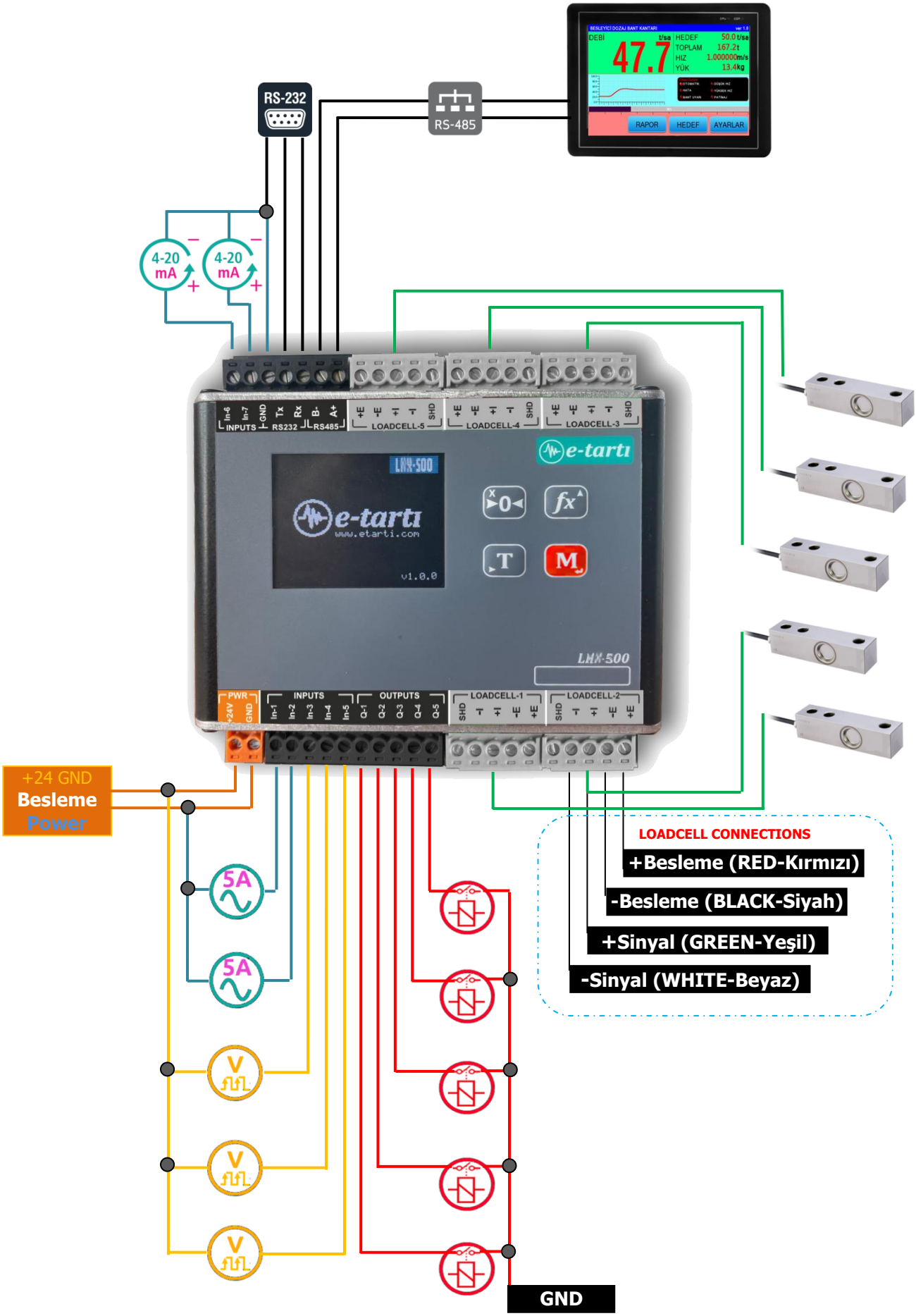
| No | Tanım | Description |
|---|---|---|
| 1 | 24V FET output (ayarlanabilir) | 24V FET output (configurable) |
| 2 | 24V FET output (ayarlanabilir) | 24V FET output (configurable) |
| 3 | 24V FET output (ayarlanabilir) | 24V FET output (configurable) |
| 4 | 24V FET output (ayarlanabilir) | 24V FET output (configurable) |
| 5 | 24V FET output (ayarlanabilir) | 24V FET output (configurable) |

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!



## 3. ELEKTRİK ŞEMA — ELECTRICAL SCHEME



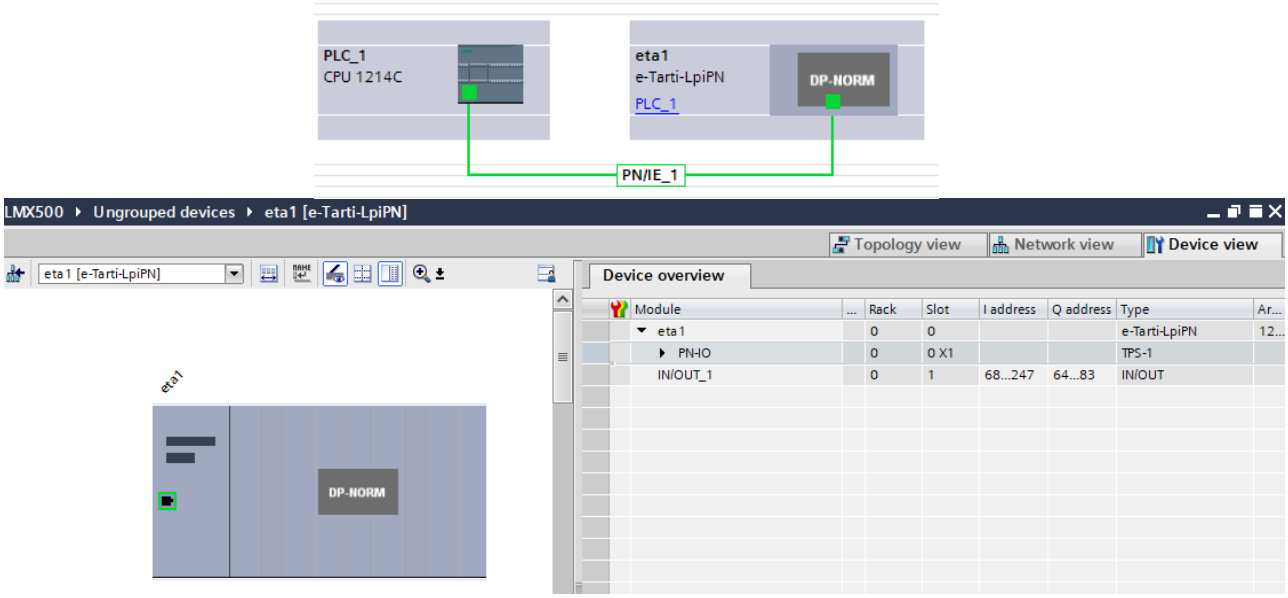
# MODBUS ADRESLERİ — MODBUS MEMORY MAP

| R/W | Address | Data | Tanım | Description |
|---|---|---|---|---|
| R/W | 0 | Komut Command | Komut Adresi | Command Register |
| R/W | 1 | Reg 1 | Yardımcı Adres1 | Extension for command |
| R/W | 2 | Reg 2 | Yardımcı Adres2 | Extension for command |
| R/W | 3 | Cihaz Durum A<br>Device Status A | **Devices Status A Information Bits**<br>**0-4**:LC Channel Stable bits, ch1 to ch1<br>**5-7**:Active LC channel for big screen and key operations<br>**8-12**:Digital Inputs state (ch 3-4-5 only)<br>**13**:Keypad lock 0:Unlocked, 1:Locked<br>**14-15**:NA | |
| R/W | 4 | Cihaz Durum B<br>Device Status B | **Devices Status B Information bits**<br>**0-4**: Channel Error (Overflow or Converter error)<br>**5-7**: NA<br>**8-15**: Error Message Number | |
| RO | 5-9 | LC Channels **NET** | Each values 16bits signed, from Channel 1 to 5 NET value | |
| RO | 10-19 | LC Channels **NET** | Each values 32bits signed, from Channel 1 to 5 NET value | |
| RO | 20-21 | Inputs channel 1-2<br>5A AC Current Values | Shown as 5000 for 5A (5.000A @1mA resolution) | |
| RO | 22-24 | Inputs Channel 3-5<br>24V DC Voltage Values | Shown as 2400 for 24V (24.00V @10mV resolution) | |
| RO | 25-26 | Inputs Channel 6-7<br>4/20mA DC Current Values | Shown as 2000 for 20mA Input (20.00mA @10uA resolution) | |
| RW/O | 27 | Digital Outputs | **0-4**: Current calculated outputs<br>**5-7**:NA<br>**8-12**: Forced control relay data<br>**13-14**:NA<br>**15**:Relay Outputs forced control. 0:Normal,1:Forced Output | |
| R/W | 28 | Cihaz Durum C<br>Device Status C | **Devices Status C Information Bits**<br>**0-5**: LC Channels Enable 0:Disabled, 1:Enabled<br>**6-8**: Active channel Index on LCD big font (currently channel in use)<br>**8-15**: N/A | |
| RW | 29 | Cihaz Durum D<br>Device Status D | **Devices Status D Information Bits**<br>**0**: Language. 0: English,1:Türkçe<br>**1**: Device Type 0:Basic, 1:5A-4/20mA module (RO)<br>**2-7**: N/A<br>**8-15**: Device Options (Used to identify device) | |
| R/W | 30-39 | Relay Set values | Each values 32bits signed, from Channel 1 to 5 Set values | |
| R/W | 40-44 | Relay reverse/relation | Reverse 5x8bits,relation 5x8bits | |
| R/W | 45-49 | Relay Hysteresis Values | 16bits relay hysteresis values | |
| R/W | 50-59 | Tare Values | Each values 32bits signed, from Channel 1 to 5 Tare values | |
| | | | | |
| | | | | |
| R/W | 60-69 | LC Channels **mV/V** | 32bits signed, from Channel 1 to 5, **mV/V** value | |
| RO | 70-79 | LC Channels **InternalADC** | 32bits signed, from Channel 1 to 5, **ADC** counts value | |
| R/W | 80-87 | NA | NA | |
| R/W | 88 | PN Flash | **0**: Blink active 0:Normal 1:LCD flashes ID<br>**1-15**: NA | |
| RO | 89 | LC Channels Error | 0-4: Conversion Error on Ch. 0:Normal, 1:Error (err90)<br>5-7:NA<br>8-12: ADC Overflow Err on Ch. 0:Normal, 1:Error (err5) | |
| R/W | 90-94 | LC Channels Step Value | 16bits step value (as only 1x,2x,5x) | |
| R/O | 100-140 | ADC Array Internal | Factory use only! | |
| | | | | |
| | | | | |

## 1. CIHAZ KOMUTLARI 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 [Auxilary register]
RegB Register: Address 2 [Auxilary 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<br>9001 for Channel-1 only (binary order xxx0 0001)<br>9003 for Channel-1 and 2 together (binary order xxx 0 0011)<br>9005 for Channels 1 and 3 together (binary order xxx 0 0101)<br>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 individual 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 number is seen on RegA register.<br>107 = v1.0.7 |
| 10 | - | - | All parameters are refreshed from epprom to RAM |
| 11 | - | - | Record settings<br>gLogic, LCchannel enables, decimal point, values<br>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.<br>4500 is equals 45.00Hz |
| 75 | Key | - | Key evaulate 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 |
| 112 | - | - | Keypad Lock ON |
| 113 | - | - | Keypad Lock OFF |
| 122 ('z') | - | - | Zero calibration All channels once |
| 1122,2122,3122,4122,5122 | - | - | Channel Zero Calibrations |
| 1108,2108,3108,4108,5108 | Calib Low | Calib High | Channel Calibration command. RegA and RegB holds calibration value |
| | | | |
| 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=uURPlYQkDoU
Profinet **gsd** dosyası www.etarti.com LMX500 ürün sayfasından indirilebilirdir.

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=uURPlYQkDoU 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<br>**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.<br>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)<br>**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) |