



Online professional books

Simatic S7- TIA Portal programming: [Automation!](#)

lamaPLC Simatic know-how contents

Simatic S7-1500 / S7-1200: [Simatic S7-1500 / S7-1200](#)

Simatic TIA portal (and classic) type-definitions: [TIA Data-types](#)

Simatic TIA SCL commands: [SCL commands](#)

Simatic TIA Basic know-hows: [TIA Portal know-how](#)

Simatic (TIA and classic) Modbus error- and statuscodes: [Simatic Modbus S7 error- and statuscodes](#)

Simatic S7 PLC types: [S7 PLC types](#)

Simatic TIA lamaLibrary: [Simatic LamaLibrary](#)

Simatic TIA Diagnose generator: [TIA Diagnose generator](#)

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lamaPLC Arduino know-how contents

[Arduino basics](#)

[Arduino display](#)

[Arduino wiring](#)

[Arduino MKR family](#)

[Espressif ESP family](#)

[STM32F10: ARM STM32 Minimum System Development Module Board](#)



Software

[Arduino code collection](#)

[Arduino - OLED SH1106 with AHT20/BMP280 Sensor](#)

lamaPLC Communication basic contents

1-Wire basics **AS-i basics** Bluetooth basics **CAN basics** ControlNet basics **DALI basics** DASH7 basics **deviceNet basics** DMX512 basics **EtherNet/IP basics** GPS basics **I²C basics** IE basics **Interbus IoT basics** **KNX / EIB basics** LoRa / LoRaWan / LoraMesh **Matter basics** Modbus basics **MQTT basics** NFC basics **nRF24 basics** OPC basics **PowerLink basics** ProfiBus basics **ProfiNet basics** RS-232 basics **RS-422 basics** RS-485 basics **Sinec H1 basics** SPI basics **TCP / UDP basics** Thread basics **UART basics** USB basics **Wifi basics** Wiegand basics **WS2812 basics** Z-Wave basics **Zigbee basics** IEC 61850

Featured topic




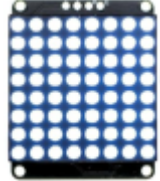
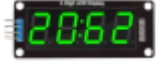
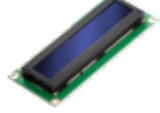
[LoRa / LoRaWan / LoraMesh](#)




LamaPLC Sensoric / Actoric / Display Content

Display Module

lamaPLC: Displays

Display moduls

 <p>DM56A04 / DM36B06 digital tube display with Modbus Communication</p>	 <p>TM1650 7-Segment Display with I²C like or Modbus Communication</p>
 <p>HT16K33 7-segment display with I²C communication</p>	 <p>HT16K33 7-segment display with I²C communication</p>
 <p>TM1637 7-segment display with I²C-like protocol</p>	 <p>LCD 1602/2004 with I²C communication</p>



 <p>SSH1106/SSD1306 OLED Display with I²C communication</p>	 <p>ST7789 driver TFT-LCD screen driver with SPI/I²C communication</p>
 <p>st756x display drivers ST7565, ST7567, GM12864, GM12864-59N, GM12864-03A, GM12864-01A, GME12864-41</p>	

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Actors

lamaPLC: Actors

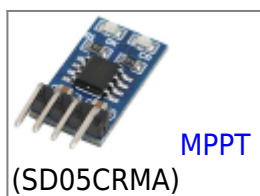
Switches / Relays / SSRs

 <p>Multi-channel optocoupled relay module (HL-54, HW-316, KY-019, HFD4/3-S, FY-T734)</p>	 <p>Multi-channel Solid State Relay (SSR) Module (SSR G3MB-202P)</p>
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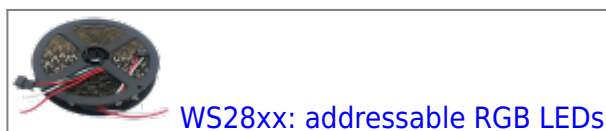
TEC / Peltier Elements



MPPT (Maximum Power Point Tracking)



LED controllers / addressable LEDs



Motor controllers/drivers



NEMA units & drivers

(A4988, DRV8825, TMC2208, TMC2209, TMC2225, TMC2240, TB6600, DM556, DM542, DM860, DM860H)

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Sensors

LamaPLC: Sensors




The page below lists sensors compatible with microcontrollers such as Arduino, Raspberry Pi Nano, ESP32, and ESP8266, as they operate at 3.3V/5V signal levels.

The search is easier in the [summarized abbreviation index](#), depending on the type designation.

Temperature, Humidity, Air-pressure, Gas, Air-quality Sensors and Module

 <p>AHT10 Modul Temperature, Humidity + Arduino example code</p>	 <p>ENS160 + AHT21 Air Quality Sensor - CO, ECO, TVOC, Temp & Humidity Module</p>
 <p>AHT20/BMP280 Modul Temperature, Humidity, Air pressure + Arduino example code</p>	 <p>MAX31865 RTD to Digital Converter - PT100/PT1000 Platine</p>
 <p>PTA8C04 4-channel PT100 Modbus Modul with Modbus RTU + Holding Registers Description</p>	 <p>NT18B07 7 Kanal RS485 Temperature Sensors with Modbus RTU + Holding Registers Description</p>
 <p>DS18B20 1-Wire Digital Thermometer</p>	 <p>BMP/BME Bosch Temperature/Humidity/Pressure sensors with I²C communication (BME280, BME680, BMP180, BMP280, ...)</p>

 <p>DHT Temperature / Humidity sensors with 1-wire / I²C communication (DHT11, DHT20, DHT22/AM2302, ...)</p>	 <p>DPS Infineon Temperature/Pressure sensors with I²C communication (DPS310)</p>
 <p>D6T Omron Non-Contact Thermal Sensors with I²C communication (D6T-32L, D6T-44L, D6T-8L, D6T-1A, ...)</p>	 <p>GM MEMS Gas-sensors (GM-102b, GM-302b, GM-502b, GM-702b, ...)</p>
 <p>ENS ScioSense Multi-gas sensors with I²C communication (ENS-160)</p>	 <p>HTU TE Connectivity temperature/humidity sensors with I²C communication (HTU-21)</p>
 <p>MQ Winsen Gas-sensors (MQ-2, MQ-3, MQ-4, MQ-5, MQ-6, MQ-7, MQ-8, MQ-9, MQ-131, MQ-135, MQ-137, ...)</p>	 <p>SGP SGP Sensirion TVOC/VOC sensors with I²C communication (SGP30, SGP40, SGP41, ...)</p>
 <p>SHT Sensirion Temperature/humidity sensor with I²C communication (SHT20, SHT21, SHT25, SHT30, SHT31, SHT35, SHT40, GY21, ...)</p>	 <p>HDC Texas Instruments Temperature/humidity sensors with I²C communication (HDC-1080)</p>
 <p>CJMCU-6814 combined gas sensor module for CO, NO₂, NH₃ (MICS-6814)</p>	 <p>MH-Z19 series of NDIR CO² sensors (MH-Z19B, MH-Z19C, MH-Z19D, MH-Z19E)</p>
 <p>CJMCU-811 CCS811 Gas Sensor (VOCs TVOC CO₂)</p>	 <p>Sensio SCD CO² measurement module (SCD30)</p>



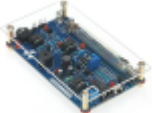
 <p>Sensiron SCD CO² measurement module (SCD40, SCD41)</p>	 <p>MLX90614 (GY-906) infrared non-contact thermometer</p>
 <p>XGZP68xx Silicon Pressure Sensors / Module (XGZP6810D, XGZP6857D, XGZP6859D, XGZP6887D, XGZP6897D, XGZP6899A)</p>	

Distance measurement, Gesture Recognition, Optical flow, Motion

 <p>HC-SR04 Ultrasonic Sensor Module</p>	 <p>VL53Lnn STMicorelectronics time-of-flight (ToF) laser-ranging sensors with I²C communication (VL53L0X, VL53L1X, VL53L0/1XV2, GY-530, ...)</p>
 <p>VL6180X STMicorelectronics Time-of-Flight (ToF) sensor with I²C communication</p>	 <p>TOFnnnC STMicorelectronics Time-of-Flight (ToF) sensors with I²C communication (TOF050C, TOF200C, TOF400C, ...)</p>
 <p>PAJ Pixart gesture recognition sensors/module with I²C communication (PAJ7620U2, GY-PAJ7620)</p>	 <p>APDS Avago ALS and proximity detection sensors with I²C communication (APDS-9900, APDS-9930, APDS-9960)</p>
 <p>M01 V0.4 Laser ranging sensor with UART communication</p>	 <p>A0221AU/A02YYUW Waterproof Ultrasonic Distance Sensor with UART communication</p>
 <p>Waveshare TOF Laser Range Sensor with UART / I²C communication</p>	 <p>RD-XX Ai-Thinker Radar Module with UART communication (RD-01, RD-03, RD-03D, ...)</p>

 <p>RCWL Microwave radar sensor (RCWL-0516)</p>	 <p>CJMCU-3901/PMW-3901 compact optical flow sensor module/IC by PixArt with SPI communication</p>
 <p>PIR sensors (HC-SR501, HC-SR505, AM-312, EKMB/EKMC)</p>	 <p>LM393 sensor (FC-03, HC-89) Infrared Speed Sensor Module</p>



Light, Ambient light, Proximity, Radiation






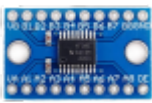
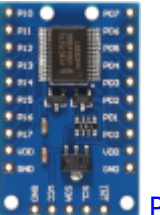
 <p>CJMCU-3216 / AP-3216 integrated digital ambient light and proximity sensor module/IC with I²C communication</p>	 <p>LM393 (KY-026) Flame Sensor (IR) Module</p>
 <p>RadiationD Geiger counter module with tubes (J305, J321, M4011, SBM-20, STS-5, LND-712)</p>	

Motion detection, Magnetometer, Magnetic angle sensors, 6DOF, Vibration



 <p>MPU-9250/6500 9-axis motion detection module</p>	 <p>MPU-6050 (HW-123, GY-521) 6-axis MotionTracking device</p>
 <p>Magnetic angle sensors (AS5047P, AS5600, MT6701, MT6816, MT6835, TLE5012B)</p>	 <p>GY-511 6DOF sensor module</p>
 <p>Vibration sensors (GXFM0459, LDTM-028K)</p>	

Signal Converters, Shift Registers, I/O_Expanders



 <p>PCA9306 I²C Voltage Level Translator</p>	 <p>CJMCU-164 SN74HC164D 8-bit Shift Register Module</p>
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 <p>TTL to RS485 Module MAX485</p>	 <p>TCA9548A (HW617); Low-Voltage 8-Channel I²C Switch Module</p>
 <p>MCP23017 / MCP23S17 (CJMCU-2317) 16-Bit I/O Expander with Serial Interface I²C / SPI</p>	 <p>SC16IS750 / SC16IS752 One or two serial (UART) ports from microcontroller via I²C or SPI communication (CJMCU-750, CJMCU-752)</p>
 <p>Texas Instruments ADCs Delta-sigma multi-channel Analog Converters with SPI communication (ADS111x, ADS12xx)</p>	 <p>TXS0108E (HW-0108) 8-channel, bidirectional 5V-3.3V logic level converter</p>
 <p>PCF857x I/O Expander chip/module with I²C communication (PCF8574, PCF8574A, PCF8575)</p>	



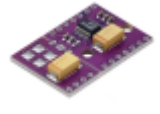
Amplifiers, DC-DC converters, PWM signal converters

 <p>XY_MOS MOS FET Drive Module 400W Support PWM Controller</p>	 <p>CJMCU-8221 Analog Devices Precision instrumentation amplifier module</p>
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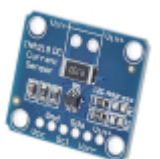


Weight sensors

 <p>YR-3180 YR-3180 - Weight sensor module with UART or Modbus communication + Modbus map</p>	 <p>HX711 24-bit analog-to-digital converter (ADC)</p>
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Energy harvesting (EH)

 <p>LTC-3588 Nanopower energy harvesting power supply IC</p>	 <p>BQ25570 / CJMCU-2557 Texas Instruments nano-power management IC and module</p>
 <p>LTC-3108-1 Ultra Low Voltage Boost Converter Power Manager Breakout Board</p>	



Energy, power, current, voltage, XDCP

 <p>INA-Moduls current/voltage/power monitor with I²C communication INA219 INA226 INA228 INA237 INA238 INA260 INA3221</p>	 <p>CJMCU-219/INA-219 breakout board/IC with I²C communication</p>
 <p>Allegro ACS758 Hall-effect linear current sensors (CJMCU-758)</p>	 <p>Digitales Potentiometer Board Moduls Renesas X9C series (X9C102, X9C103, X9C104, X9C503)</p>

Magnetic, Induction, Angle

 <p>AS5600 Magnetic Induction Angle Measurement Sensor Module</p>

Healthcare sensoric

 <p>MAX30100/MAX30102 Heart Rate Click Sensor Module</p>	 <p>CJMCU-6701 Biosensor for measuring Galvanic Skin Response (GSR) with SPI communication</p>
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Audio, Microphone

 <p>MAX4466/MAX9814 Low-noise Microphone Preamplifiers</p>	 <p>LM393 (HW-484, KY-037, KY-038) High-Sensitivity Sound Detection Module</p>
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