



## 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 **I<sup>2</sup>C 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

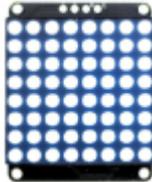
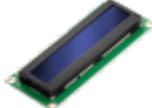
## Featured topic

[LoRa / LoRaWan / LoraMesh](#)

## LamaPLC Sensoric / Actoric / Display Content

### Display Module

#### Display moduls

 <p><b>DM56A04 / DM36B06</b> digital tube display with Modbus Communication</p>	 <p><b>TM1650</b> 7-Segment Display with I<sup>2</sup>C like or Modbus Communication</p>
 <p><b>HT16K33</b> 7-segment display with I<sup>2</sup>C communication</p>	 <p><b>HT16K33</b> 7-segment display with I<sup>2</sup>C communication</p>
 <p><b>TM1637</b> 7-segment display with I<sup>2</sup>C-like protocol</p>	 <p><b>LCD 1602/2004</b> with I<sup>2</sup>C communication</p>
 <p><b>SSH1106/SSD1306</b> OLED Display with I<sup>2</sup>C communication</p>	

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# Actors

## TEC / Peltier Elements



## LED controllers / addressable LEDs



## Motor controllers/drivers

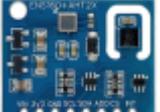
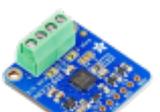


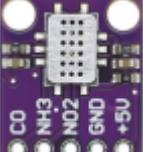
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# Sensors

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><b>AHT10 Modul</b> Temperature, Humidity + Arduino example code</p>	 <p><b>ENS160 + AHT21</b> Air Quality Sensor - CO, ECO, TVOC, Temp &amp; Humidity Module</p>
 <p><b>AHT20/BMP280 Modul</b> Temperature, Humidity, Air pressure + Arduino example code</p>	 <p><b>MAX31865</b> RTD to Digital Converter - PT100/PT1000 Platine</p>
 <p><b>PTA8C04</b> 4-channel PT100 Modbus Modul with Modbus RTU + Holding Registers Description</p>	 <p><b>NT18B07</b> 7 Kanal RS485 Temperature Sensors with Modbus RTU + Holding Registers Description</p>

 <p><b>DS18B20</b> 1-Wire Digital Thermometer</p>	 <p><b>BMP/BME</b> Bosch Temperature/Humidity/Pressure sensors with I<sup>2</sup>C communication (BME280, BME680, BMP180, BMP280, ...)</p>
 <p><b>DHT</b> Temperature / Humidity sensors with 1-wire / I<sup>2</sup>C communication (DHT11, DHT20, DHT22/AM2302, ...)</p>	 <p><b>DPS</b> Infineon Temperature/Pressure sensors with I<sup>2</sup>C communication (DPS310)</p>
 <p><b>D6T</b> Omron Non-Contact Thermal Sensors with I<sup>2</sup>C communication (D6T-32L, D6T-44L, D6T-8L, D6T-1A, ...)</p>	 <p><b>GM</b> MEMS Gas-sensors (GM-102b, GM-302b, GM-502b, GM-702b, ...)</p>
 <p><b>ENS</b> ScioSense Multi-gas sensors with I<sup>2</sup>C communication (ENS-160)</p>	 <p><b>HTU</b> TE Connectivity temperature/humidity sensors with I<sup>2</sup>C communication (HTU-21)</p>
 <p><b>MQ</b> 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><b>SGP</b> SGP Sensirion TVOC/VOC sensors with I<sup>2</sup>C communication (SGP30, SGP40, SGP41, ...)</p>
 <p><b>SHT</b> Sensirion Temperature/humidity sensor with I<sup>2</sup>C communication (SHT20, SHT21, SHT25, SHT30, SHT31, SHT35, SHT40, GY21, ...)</p>	 <p><b>HDC</b> Texas Instruments Temperature/humidity sensors with I<sup>2</sup>C communication (HDC-1080)</p>
 <p><b>CJMCU-6814</b> combined gas sensor module for CO, NO<sub>2</sub>, NH<sub>3</sub> (MICS-6814)</p>	 <p><b>MH-Z19</b> series of NDIR CO<sub>2</sub> sensors (MH-Z19B, MH-Z19C, MH-Z19D, MH-Z19E)</p>

 <p><b>CJMCU-811 CCS811</b> Gas Sensor (VOCs TVOC CO2)</p>	 <p><b>Sensision SCD CO<sup>2</sup> measurement module</b> (SCD30, SCD40, SCD41)</p>
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**Distance measurement, Gesture Recognition, Optical flow, Motion**

 <p><b>HC-SR04</b> Ultrasonic Sensor Module</p>	 <p><b>VL53Lnn</b> STMicromicroelectronics time-of-flight (ToF) laser-ranging sensors with I<sup>2</sup>C communication (VL53L0X, VL53L1X, VL53L0/1XV2, GY-530, ...)</p>
 <p><b>VL6180X</b> STMicromicroelectronics Time-of-Flight (ToF) sensor with I<sup>2</sup>C communication</p>	 <p><b>TOFnnnC</b> STMicromicroelectronics Time-of-Flight (ToF) sensors with I<sup>2</sup>C communication (TOF050C, TOF200C, TOF400C, ...)</p>
 <p><b>PAJ</b> Pixart gesture recognition sensors/module with I<sup>2</sup>C communication (PAJ7620U2, GY-PAJ7620)</p>	 <p><b>APDS</b> Avago ALS and proximity detection sensors with I<sup>2</sup>C communication (APDS-9900, APDS-9930, APDS-9960)</p>
 <p><b>M01</b> V0.4 Laser ranging sensor with UART communication</p>	 <p><b>A0221AU/A02YYUW</b> Waterproof Ultrasonic Distance Sensor with UART communication</p>
 <p><b>Waveshare TOF</b> Laser Range Sensor with UART / I<sup>2</sup>C communication</p>	 <p><b>RD-XX</b> Ai-Thinker Radar Module with UART communication (RD-01, RD-03, RD-03D, ...)</p>
 <p><b>RCWL</b> Microwave radar sensor (RCWL-0516)</p>	 <p><b>CJMCU-3901/PMW-3901</b> compact optical flow sensor module/IC by PixArt with SPI communication</p>
 <p><b>PIR sensors</b> (HC-SR501, HC-SR505, AM-312, EKMB/EKMC)</p>	

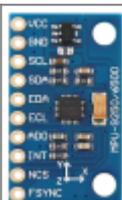
### Light, Ambient light, Proximity



CJMCU-3216 / AP-3216

integrated digital ambient light and proximity sensor module/IC with I<sup>2</sup>C communication

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



MPU-9250/6500

9-axis motion detection module



MPU-6050 (HW-123, GY-521)

6-axis MotionTracking device



Magnetic angle sensors

(AS5047P, AS5600, MT6701, MT6816, MT6835, TLE5012B)



GY-511

6DOF sensor module



Vibration sensors

(GXFM0459, LDTM-028K)

### Signal Converters, Shift Registers



PCA9306

I<sup>2</sup>C Voltage Level Translator



CJMCU-164

SN74HC164D 8-bit Shift Register Module



TTL to RS485 Module

MAX485



TCA9548A

(HW617); Low-Voltage 8-Channel I<sup>2</sup>C Switch Module



MCP23017 / MCP23S17

(CJMCU-2317) 16-Bit I/O Expander with Serial Interface I<sup>2</sup>C / SPI



SC16IS750 / SC16IS752

One or two serial (UART) ports from microcontroller via I<sup>2</sup>C or SPI communication (CJMCU-750, CJMCU-752)



Texas Instruments ADCs

Delta-sigma multi-channel Analog Converters with SPI communication (ADS111x, ADS12xx)



TXS0108E (HW-0108)

8-channel, bidirectional 5V-3.3V logic level converter

### Amplifiers, DC-DC converters, PWM signal converters

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

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

 <p><b>Eastron SDM 630</b> 3-phase Energy Meter with Modbus communication + Modbus map</p>	 <p><b>Eastron SDM 230</b> 1-phase Energy Meter with Modbus communication + Modbus map</p>
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### Energy harvesting (EH)

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

### Energy, power, current, voltage, XDCP

 <p><b>INA-Moduls</b> current/voltage/power monitor with I<sup>2</sup>C communication INA219 INA226 INA228 INA237 INA238 INA260 INA3221</p>	 <p><b>CJMCU-219/INA-219</b> breakout board/IC with I<sup>2</sup>C communication</p>
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[Allegro ACS758](#)

Hall-effect linear current sensors  
(CJMCU-758)



[Digitales Potentiometer Board Moduls](#)

Renesas X9C series  
(X9C102, X9C103, X9C104, X9C503)

## Magnetic, Induction, Angle



[AS5600](#)

Magnetic Induction Angle Measurement Sensor Module

## Healthcare sensoric



[MAX30100/MAX30102](#)

Heart Rate Click Sensor Module



[CJMCU-6701](#)

Biosensor for measuring Galvanic Skin Response (GSR) with SPI communication

## Audio, Microphone



[MAX4466/MAX9814](#)

Low-noise Microphone Preamplifiers

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