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DFR0498 FireBeetle Covers-Camera&Audio Media Board
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DFR0508 FireBeetle Covers-DC Motor & Stepper Driver
DFR0511 FireBeetle Covers-ePaper Black&White Display Module
DFR0531 FireBeetle Covers-ePaper Black&White&Red Display Module
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DFR0548 Micro bit Driver Expansion Board
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ROB0150 Micro bit Circular RGB LED Expansion Board
MBT0005 micro IO-BOX
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DFR0049 DFRobot Gas Sensor
TOY0058 Barometric Pressure Sensor
SEN0220 Infrared CO2 Sensor 0-50000ppm
SEN0219 Gravity Analog Infrared CO2 Sensor For Arduino
SEN0226 Gravity I2C BMP280 Barometer Sensor
SEN0231 Gravity HCHO Sensor
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SEN0132 Carbon Monoxide Gas Sensor MQ7
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SEN0072 CMPS09 - Tilt Compensated Magnetic Compass
SEN0073 9 Degrees of Freedom - Razor IMU
DFR0188 Flymaple V1.1
SEN0224 Gravity I2C Triple Axis Accelerometer - LIS2DH
SEN0140 10 DOF Mems IMU Sensor V2.0
SEN0250 Gravity BMI160 6-Axis Inertial Motion Sensor
SEN0253 Gravity BNO055 + BMP280 intelligent 10DOF AHRS
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SEN0002 URM04 V2.0
SEN0004 SRF01 Ultrasonic sensor
SEN0005 SRF02 Ultrasonic sensor
SEN0006 SRF05 Ultrasonic sensor
SEN0007 SRF08 Ultrasonic Sensor
SEN0008 SRF10 Ultrasonic sensor
SEN0149 URM06-RS485 Ultrasonic
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SEN0304 URM09 Ultrasonic Sensor (Gravity-I2C) (V1.0)
SEN0304 URM09 Ultrasonic Sensor (Gravity-I2C) (V1.0)
SEN0300 Water-proof Ultrasonic Sensor ULS
SEN0301 Water-proof Ultrasonic Sensor ULA
SEN0307 URM09 Ultrasonic Sensor Gravity Analog
SEN0311 A02YYUW Waterproof Ultrasonic Sensor
SEN0312 ME007YS Waterproof Ultrasonic Sensor
SEN0313 A01NYUB Waterproof Ultrasonic Sensor
DFR0066 SHT1x Humidity and Temperature Sensor
DFR0067 DHT11 Temperature and Humidity Sensor
SEN0137 DHT22 Temperature and humidity module
DFR0023 DFRobot LM35 Linear Temperature Sensor
DFR0024 Gravity DS18B20 Temperature Sensor Arduino Compatible V2
DFR0024 Gravity DS18B20 Temperature Sensor Arduino Compatible V2
SEN0114 Moisture Sensor
TOY0045 TMP100 Temperature Sensor
TOY0054 SI7021 Temperature and humidity sensor
SEN0206 IR Thermometer Sensor MLX90614
SEN0227 SHT20 I2C Temperature & Humidity Sensor Waterproof Probe
SEN0236 Gravity I2C BME280 Environmental Sensor Temperature, Humidity, Barometer
SEN0248 Gravity I2C BME680 Environmental Sensor VOC, Temperature, Humidity, Barometer
DFR0558 Gravity Digital High Temperature Sensor K-type
SEN0308 Waterproof Capacitive Soil Moisture Sensor
SEN0019 Adjustable Infrared Sensor Switch
SEN0042 DFRobot Infrared sensor breakout
SEN0143 SHARP GP2Y0A41SK0F IR ranger sensor 4-30cm
SEN0013 Sharp GP2Y0A02YK IR ranger sensor 150cm
SEN0014 Sharp GP2Y0A21 Distance Sensor 10-80cm
SEN0085 Sharp GP2Y0A710K Distance Sensor 100-550cm
DFR0094 Digital IR Receiver Module
DFR0095 DIGITAL IR Transmitter Module
SEN0018 Digital Infrared motion sensor
DFR0107 IR Kit
SEN0264 TS01 IR Thermal Sensor (4-20mA)
SEN0169 Analog pH Meter Pro
DFR0300-H Gravity: Analog Electrical Conductivity Sensor(K=10)
DFR0300 Gravity Analog Electrical Conductivity Sensor Meter V2 K=1
SEN0165 Analog ORP Meter
SEN0161-V2 Gravity Analog pH Sensor Meter Kit V2
SEN0161 PH meter
SEN0237 Gravity Analog Dissolved Oxygen Sensor
SEN0204 Non-contact Liquid Level Sensor XKC-Y25-T12V
SEN0205 Liquid Level Sensor-FS-IR02
SEN0244 Gravity Analog TDS Sensor Meter For Arduino
SEN0249 Gravity Analog Spear

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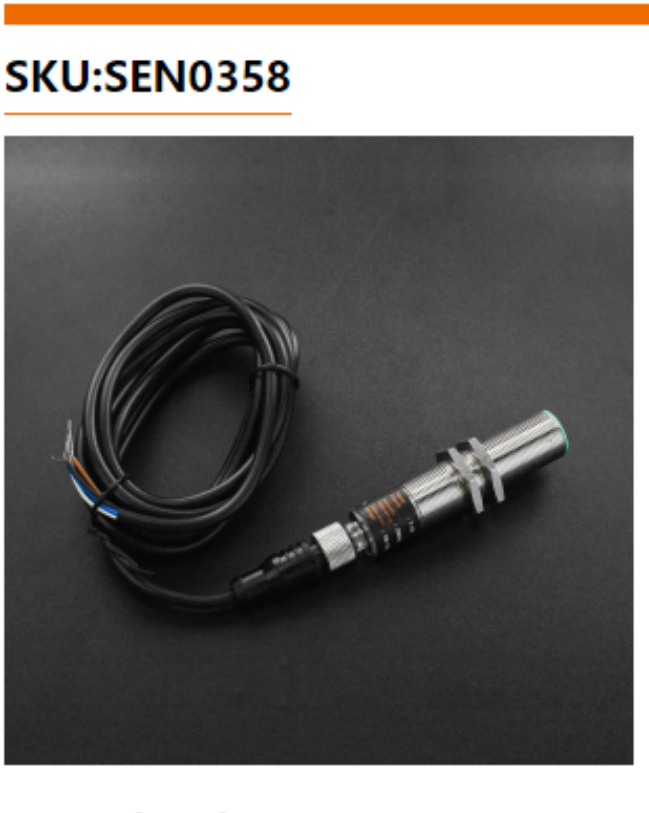


Introduction

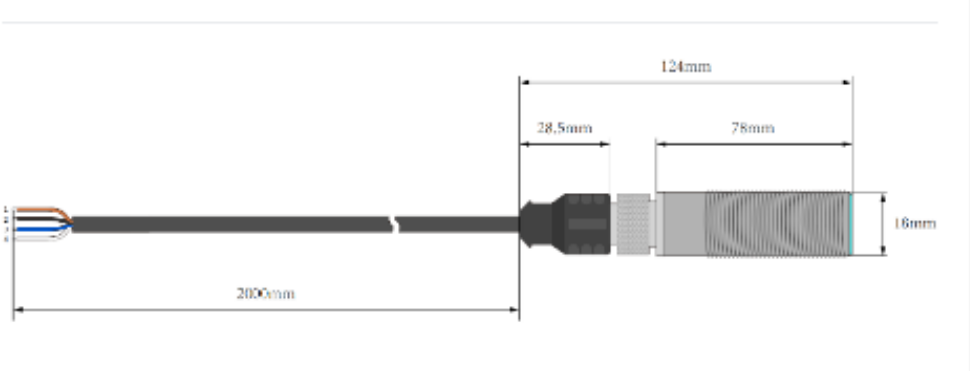
This is 200KHz high-frequency ultrasonic ranging sensor with IP65 protection grade. The sensor uses the RS485 interface that follows the standard Modbus-RTU communication protocol, featuring reliable communication. The sensor's slave address and serial port parameter can be revised according to the actual use, so it can be conveniently used with all kinds of industrial controlling machines. In addition, the sensor comes with flexible temperature compensation function that allows users to use the sensor built-in temperature compensation or external temperature compensation according to their needs, which makes it applicable to various complicated application scenarios.

Besides that, the URM14 adopts high-requency and stable ultrasonic transducer that offers 100mm~1500mm effective measuring range for flat reflecting wall, 1mm accuracy, and ±1% error. Compared with the general ultrasonic ranging sensor working at 40 KHZ acoustic frequency, this ranging sensor has higher measurement accuracy and shorter measurement period, which makes it very suitable for high precision and fast response ranging applications. In addition, the sensor has built-in noise level evaluation function, which can realize adaptive ranging in complex scenes. Users can also obtain noise level to optimize the working conditions of the sensor, so as to obtain the highest precision measurement data.

Specification

- Operating Voltage: DC 7-15V
- Max Instantaneous Current: 350mA
- Effective Measuring Range: 100-1500mm
- Distance Resolution: 0.1mm
- Measuring Accuracy: 1mm
- Distance Error: ±0.1%
- Temperature Resolution: 0.1℃
- Temperature Error: ±1℃
- Measuring Frequency: 30HZ
- Operating Temperature: -20℃ ~ +80℃
- Sensor Acoustic Frequency: 200KHz±4%
- Directional Angle: 12°±2°(-6dB)
- Protection Grade: IP65
- Communication interface: RS485

Board Overview



Module Wire Connecting Order:

- Orange-----VCC
- Black------GND
- Blue------RS485-B
- White-----RS485-A

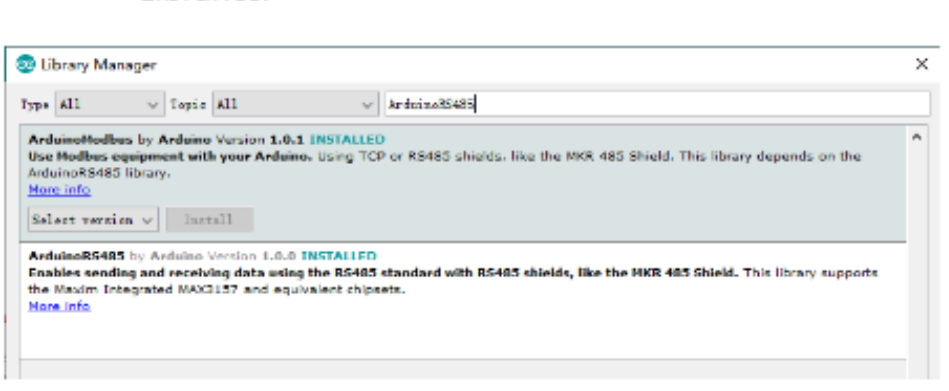
Register

Register Address	Number	Name	Read/Write	Da Ra
0x00	1	Module PID Register	R	0x 0xF
0x01	1	Module VID Register	R	0x 0xF
0x02	1	Module Address Register	R/W	0x 0x
0x03	1	Serial parameter control register 1	R/W	0x 0xF
0x04	1	Serial parameter control register 2	R/W	0x 0xF
0x05	1	Distance register	R	0x 0xF
0x06	1	Onboard temperature data register	R	0x 0xF
0x07	1	External temperature compensation data register	R/W	0x 0xF
0x08	1	Control register	R/W	0x 0xF
0x09	1	Electrical noise level register	R	0x 0x

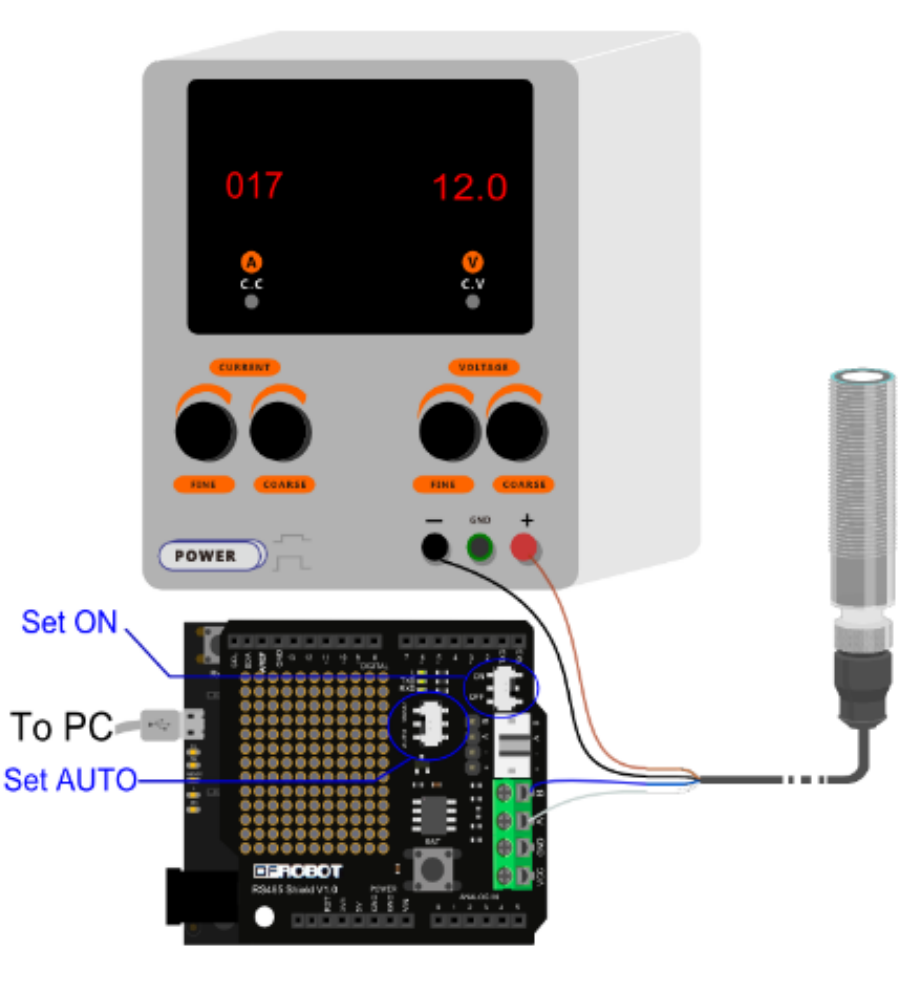
SEN0358 Register Read/Write Tutorial

Requirements

- **Hardware**
  - Arduino Leonardo x 1 (RS485 to TTL needs to occupy one serial port, so we recommend you to use device with more than 2 serial ports. Since Arduino Modbust takes up a lot of memory, it is suggested to use Arduino Mega2560 controller.)
  - RS485 Shield for Arduino x1
  - DC Power Supply x1
  - USB Data Cable (Connect the Arduino board to a computer via the USB cable)
- **Software**
  - Arduino IDE
  - Open Library Manager(Ctrl+Shift+I) in Arduino IDE, find and install ArduinoModbus and ArduinoRS485 Libraries.

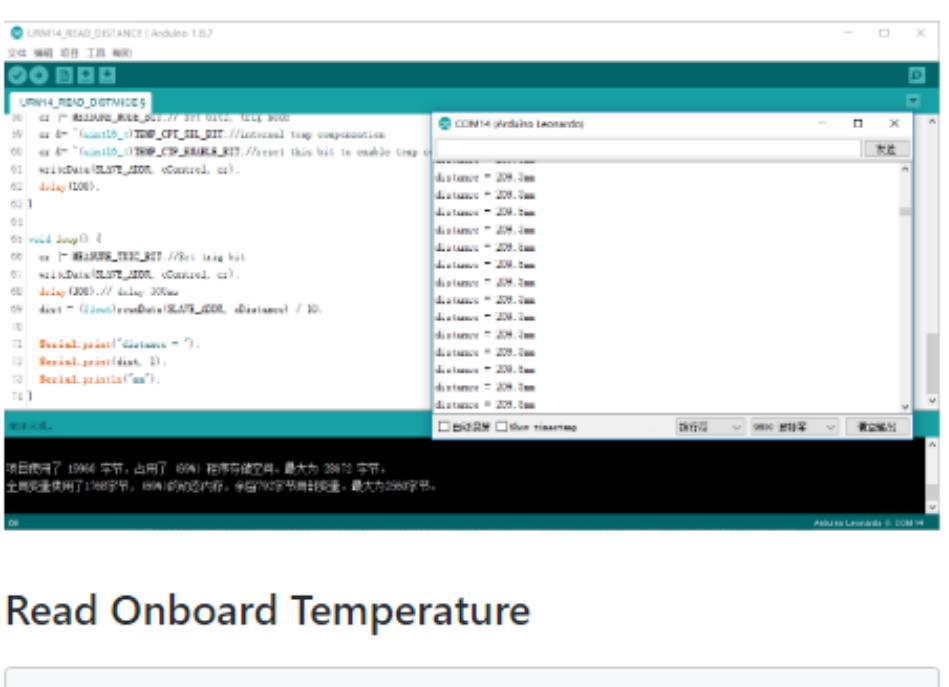

Library Manager
Type All Topic All ArduinoRS485
ArduinoModbus by Arduino Version 1.0.1 INSTALLED
Use Modbus equipment with your Arduino. Using TCP or RS485 shields, like the MKR 485 Shield. This library depends on the ArduinoRS485 library.
More info
Select version Install
ArduinoRS485 by Arduino Version 1.0.0 INSTALLED
Enables sending and receiving data using the RS485 standard with RS485 shields, like the MKR 485 Shield. This library supports the Maxim Integrated MAX3157 and equivalent chipsets.
More info

Connection Diagram



Read the detected distance

```
/***************************************************************
     This code tests the range finder function of the URM
     @ author : roker.wang@dfrobot.com
     @ data   : 11.08.2020
     @ version: 1.0
***************************************************************
#include <ArduinoModbus.h>
#include <ArduinoRS485.h>

#define   SLAVE_ADDR                ((uint16_t)0x0C)

#define   TEMP_CPT_SEL_BIT          ((uint16_t)0x01)
#define   TEMP_CPT_ENABLE_BIT       ((uint16_t)0x01 << 1)
#define   MEASURE_MODE_BIT          ((uint16_t)0x01 << 2)
#define   MEASURE_TRIG_BIT          ((uint16_t)0x01 << 3)


typedef enum{
  ePid,
  eVid,
  eAddr,
  eComBaudrate,
  eComParityStop,
  eDistance,
  eInternalTempreture,
  eExternTempreture,
  eControl,
  eNoise
}eRegIndex_t;//Sensor register index

/*
 *@brief Read data from holding register of client
 *
 *@param addr :  Address of Client
 *@param reg: Reg index
 *@return data if execute successfully, false oxffff.
 */
uint16_t readData(uint16_t addr, eRegIndex_t reg)
{
  uint16_t data;
  if (!ModbusRTUClient.requestFrom(addr, HOLDING_REGISTER
    Serial.print("failed to read registers! ");
    Serial.println(ModbusRTUClient.lastError());
    data = 0xffff;
  }else{
    data =  ModbusRTUClient.read();
  }
  return data;
}

/*
 *@brief write data to holding register of client
 *
 *@param addr :  Address of Client
 *@param reg: Reg index
 *@param data: The data to be written
 *@return 1 if execute successfully, false 0.
 */
uint16_t writeData(uint16_t addr, eRegIndex_t reg, uint16
{
  if (!ModbusRTUClient.holdingRegisterWrite(addr, reg, da
    Serial.print("Failed to write coil! ");
    Serial.println(ModbusRTUClient.lastError());
    return 0;
  }else
    return 1;
}

float  dist;
volatile uint16_t cr = 0;
void setup() {
  ModbusRTUClient.begin(19200);
  Serial.begin(9600);
  cr |= MEASURE_MODE_BIT;//Set bit2 , Set to trigger mode
  cr &= ~(uint16_t)TEMP_CPT_SEL_BIT;//Select internal tem
  cr &= ~(uint16_t)TEMP_CPT_ENABLE_BIT;//enable temperatu
  writeData(SLAVE_ADDR, eControl, cr); //Writes the setti
  delay(100);
}

void loop() {
  cr |= MEASURE_TRIG_BIT;//Set trig bit
  writeData(SLAVE_ADDR, eControl, cr); //Write the value 
  delay(300);//Delay of 300ms(minimum delay should be gre
  dist = (float)readData(SLAVE_ADDR, eDistance) / 10;//Re

  Serial.print("distance = ");
  Serial.print(dist, 1);
  Serial.println("mm");
}
```



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