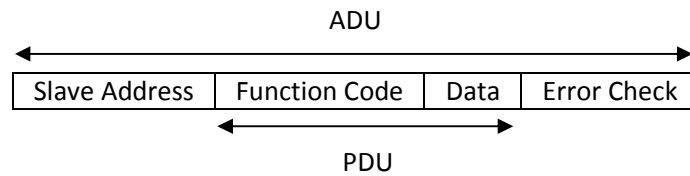


## Modbus Protocol

### General Modbus Frame



ADU-Application Data Unit

PDU-Protocol Data Unit

### Modbus Transmission Modes

1. Modbus ASCII – Use ASCII character, 0-9 and A-F
2. Modbus RTU – Use binary data, 0-255

### Modbus Function Code

1. Read Coils Status (0x01)

Request

Slave address	1 byte	
Function code	1 byte	0x01
Starting address	2 bytes	0x0000 – 0xFFFF
Quantity of coils	2 bytes	0x0000 – 0x07D0
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x01
Byte count	1 bytes	N
Coils status	N bytes	
Frame checking	2 bytes	

N=Quantity of output/8

2. Read Discrete Input (0x02)

Request

Slave address	1 byte	
Function code	1 byte	0x02
Starting address	2 bytes	0x0000 – 0xFFFF
Quantity of inputs	2 bytes	0x0000 – 0x07D0
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x02

Byte count	1 bytes	N
Input status	N bytes	
Frame checking	2 bytes	

N=Quantity of input/8

### 3. Read Holding Register (0x03)

Request

Slave address	1 byte	
Function code	1 byte	0x03
Starting address	2 bytes	0x0000 – 0xFFFF
Quantity of register	2 bytes	0x0000 – 0x07D0
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x03
Byte count	1 bytes	2 x N
Coils status	2 x N bytes	
Frame checking	2 bytes	

N=quantity of register

### 4. Read Input Register (0x04)

Request

Slave address	1 byte	
Function code	1 byte	0x04
Starting address	2 bytes	0x0000 – 0xFFFF
Quantity of register	2 bytes	0x0000 – 0x07D0
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x04
Byte count	1 bytes	2 x N
Coils status	2 x N bytes	
Frame checking	2 bytes	

N=quantity of input register

### 5. Write Single Coil (0x05)

Request

Slave address	1 byte	
Function code	1 byte	0x05
Output address	2 bytes	0x0000 – 0xFFFF
Output value	2 bytes	0x0000 – 0xFF00
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x05
Output address	2 bytes	0x0000 – 0xFFFF
Output value	2 bytes	0x0000 – 0xFF00
Frame checking	2 bytes	

#### 6. Write Single Register (0x06)

Request

Slave address	1 byte	
Function code	1 byte	0x06
Register address	2 bytes	0x0000 – 0xFFFF
Register value	2 bytes	0x0000 – 0xFF00
Frame checking	2 bytes	

Response

Slave address	1 byte	
Function code	1 byte	0x06
Register address	2 bytes	0x0000 – 0xFFFF
Register value	2 bytes	0x0000 – 0xFF00
Frame checking	2 bytes	

### Modbus Error Checking

There are two methods of error checking

1. Parity Checking – Configured as none parity, odd parity or even parity
2. Frame Checking – longitudinal redundancy check (LRC for ASCII mode) or cyclic redundancy check (CRC for RTU mode)