

PC/CP 364

Serial Communication-I2C

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January 18, 2017

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- Inter-Integrated Circuit Interface

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SDA and SCL

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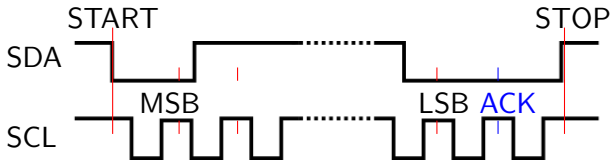
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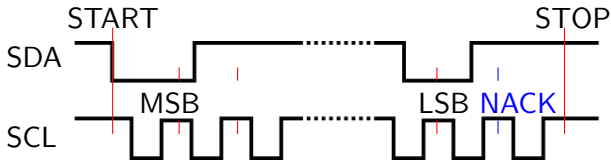
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- Master/slave communication
- Uses 2 signals (and Ground),
SDA and SCL
- Many slaves can be on the same bus since each has an address
Device addresses are pre-programmed, but can usually be changed
- Synchronous, so master controls clock rate



- I²C ; bits are read when SCL is HIGH
- ACK is sent by receiver if OK
sender must release SDA after LSB



- I²C ; bits are read when SCL is HIGH
- NACK is sent by master-receiver if OK sender must release SDA after LSB



- I²C write to slave register



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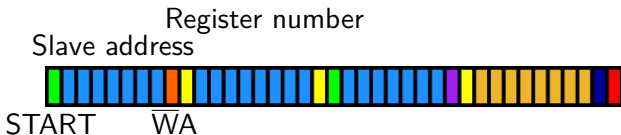
- I²C read from slave register



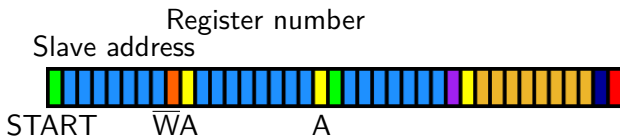
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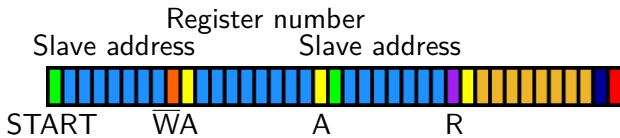
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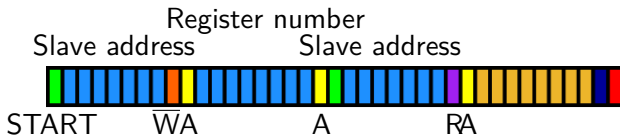
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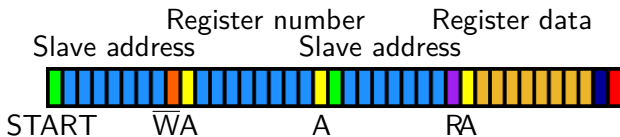
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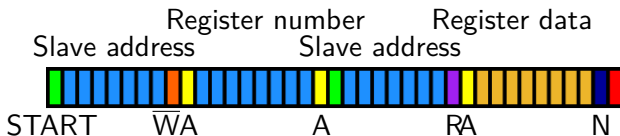
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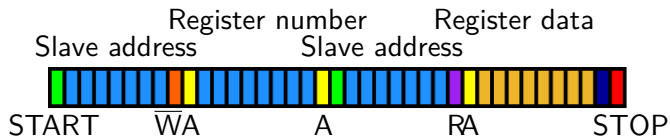
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Arduino Wire

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initiallize I²C bus

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- **Wire.write(byte(0x00))**
transmit byte
- **Wire.write(val)**
transmit value
- **Wire.endTransmission()**
end tranmission

Arduino Wire (write example)

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```
#include <Wire.h>
void setup() {
  Wire.begin(); // join i2c bus
}
byte val = 0;
void loop() {
  Wire.beginTransmission(44);
  Wire.write(byte(0x00));
  Wire.write(val);
  Wire.endTransmission();
}
delay(500);
}
```

Arduino Wire (read example)

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- **Wire.requestFrom(44,2,stop)**
request 2 bytes from address d'44
stop is a boolean; true to stop

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request 2 bytes from address d'44
stop is a boolean; true to stop
- **Wire.read()**
read bytes

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```
#include <Wire.h>
void setup()
{
  Wire.begin();           // join i2c bus
}
void loop()
{
  Wire.requestFrom(2, 6);
  while(Wire.available())
  {
    char c = Wire.read(); // receive a byte
  }
  delay(500);
}
```