I2C: Part 2

Ramin Zarebidoky (LiterallyTheOne)

07 Dec 2025

I2C: part 2

Introduction

In the previous tutorial, we learned about the **I2C Communication**. Also, we introduced two components and learned how to communicate with them. To understand this way of communication better, let's work with another component and define an **Arduino** as a **slave**.
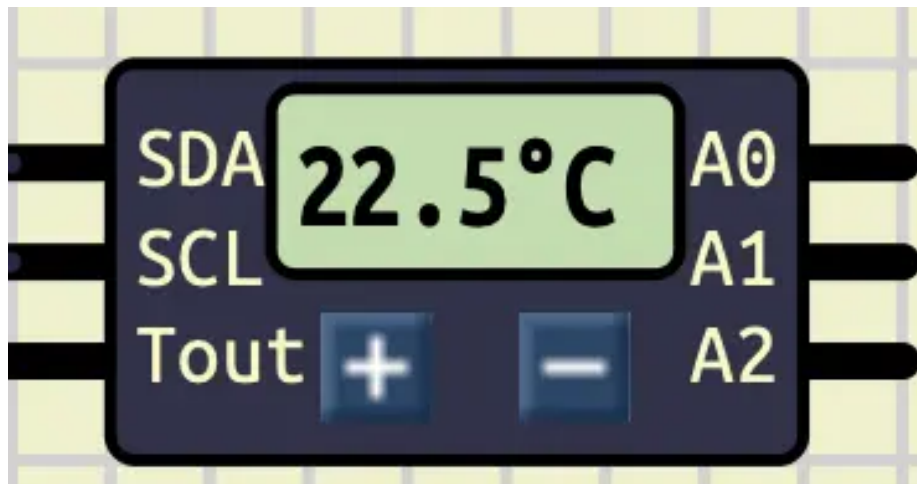
Temperature: DS1621

Figure 1: DS1621

Link to the Datasheet

Command Table

Configuration registers

Table 3. DS1621 COMMAND SET

INSTRUCTION	DESCRIPTION	PROTOCOL	2-WIRE BUS DATA AFTER ISSUING PROTOCOL	NOTES
TEMPERATURE CONVERSION COMMANDS				
Read Temperature	Read last converted temperature value from temperature register.	AAh	<read 2 bytes data>	
Read Counter	Reads value of Count_Remain	A8h	<read data>	
Read Slope	Reads value of the Count_Per_C	A9h	<read data>	
Start Convert T	Initiates temperature conversion.	EEh	idle	1
Stop Convert T	Halts temperature conversion.	22h	idle	1
THERMOSTAT COMMANDS				
Access TH	Reads or writes high temperature limit value into TH register.	A1h	<write data>	2
Access TL	Reads or writes low temperature limit value into TL register.	A2h	<write data>	2
Access Config	Reads or writes configuration data to configuration register.	ACh	<write data>	2

NOTES:

1. In continuous conversion mode a Stop Convert T command will halt continuous conversion. To restart the Start Convert T command must be issued. In one-shot mode a Start Convert T command must be issued for every temperature reading desired.

2. Writing to the E^2 requires a maximum of 10ms at room temperature. After issuing a write command, no further writes should be requested for at least 10ms.
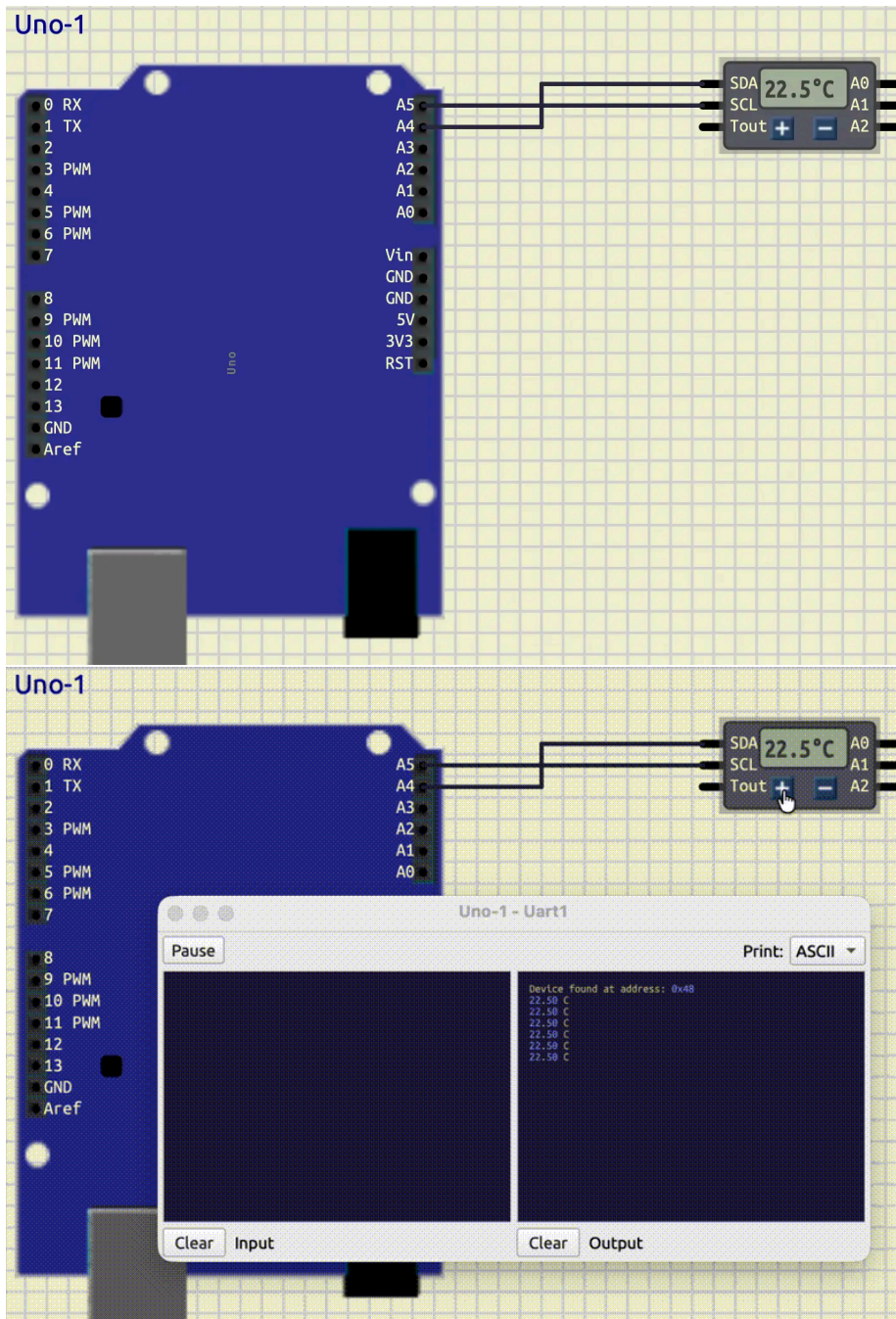
Figure 2: Command Table

MSb	Bit 6	Bit5	Bit 4	Bit 3	Bit 2	Bit 1	LSb
DONE	THF	TLF	NVB	X	X	POL	1SHOT

Figure 3: Register byte

Table 2. TEMPERATURE/DATA RELATIONSHIPS

TEMPERATURE	DIGITAL OUTPUT (Binary)	DIGITAL OUTPUT (Hex)
+125°C	01111101 00000000	7D00h
+25°C	00011001 00000000	1900h
+½°C	00000000 10000000	0080h
+0°C	00000000 00000000	0000h
-½°C	11111111 10000000	FF80h
-25°C	11100111 00000000	E700h
-55°C	11001001 00000000	C900h

Figure 4: output of temperature

Uno-1

0 RX	A5
1 TX	A4
2	A3
3 PWM	A2
4	A1
5 PWM	A0
6 PWM	
7	Vin
	GND
8	GND
9 PWM	5V
10 PWM	3V3
11 PWM	RST
12	
13	
GND	
Aref	

SDA 22.5°C A0
SCL A1
Tout + − A2

Uno-1

0 RX	A5
1 TX	A4
2	A3
3 PWM	A2
4	A1
5 PWM	A0
6 PWM	
7	
8	
9 PWM	
10 PWM	
11 PWM	
12	
13	
GND	
Aref	

SDA 22.5°C A0
SCL A1
Tout + − A2

Uno-1 - Uart1

Pause   Print: ASCII ▾

Device found at address: 0x48
22.50 C
22.50 C
22.50 C
22.50 C
22.50 C
22.50 C

Clear Input   Clear Output

Arduino as an I2C Slave
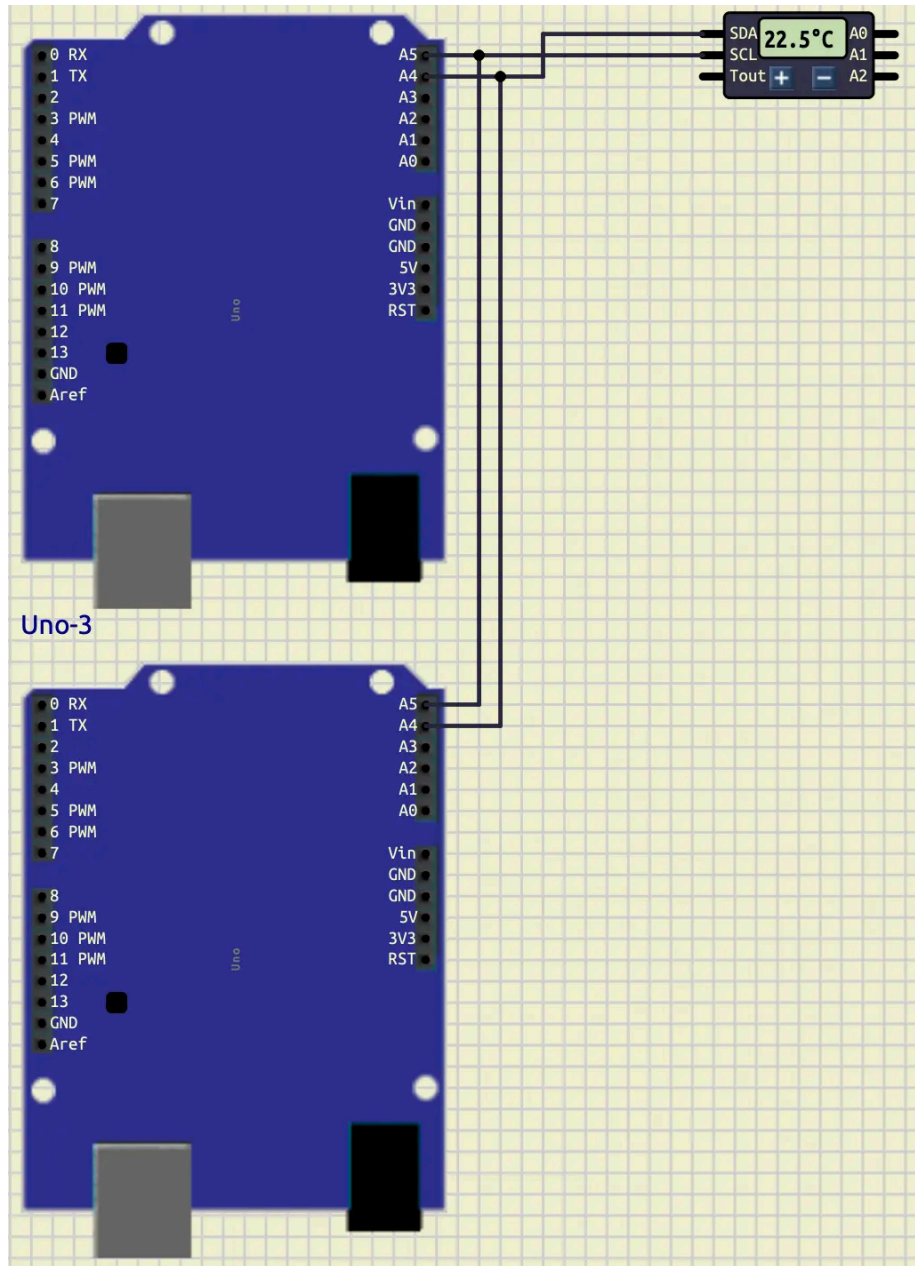
- onRequest
- onReceive
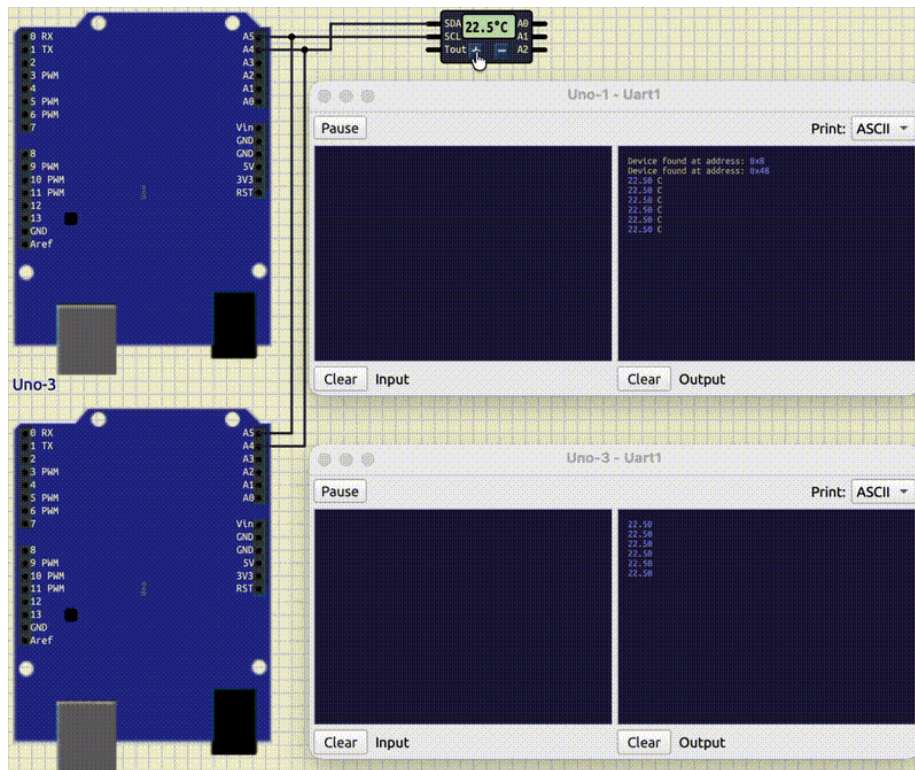
Conclusion

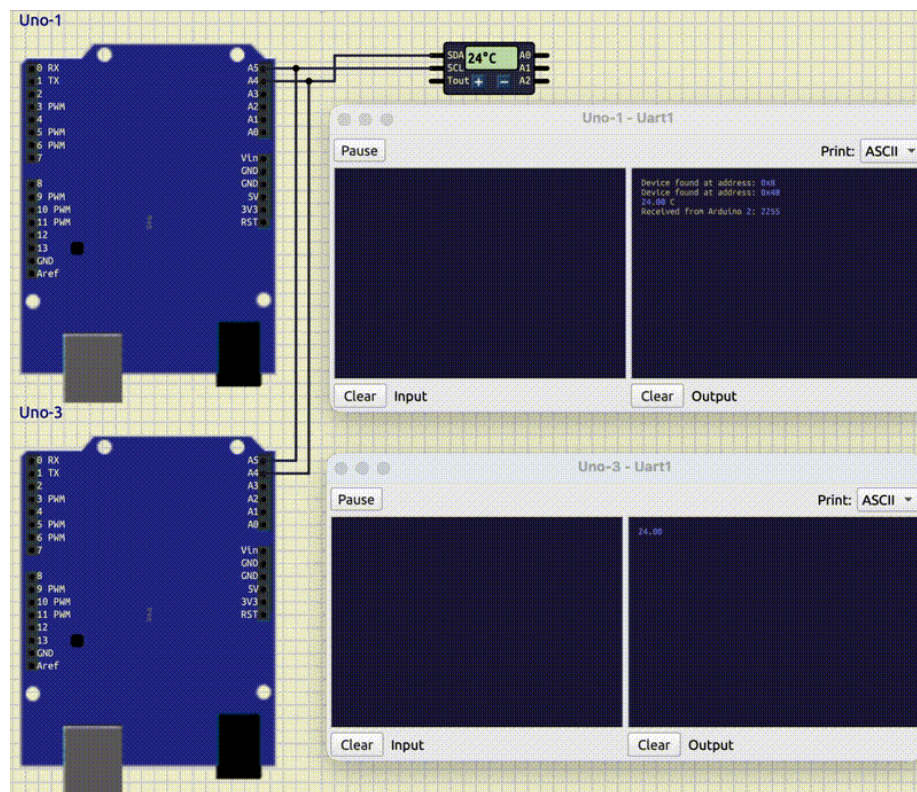Figure 5: Arduino slave temperature

Figure 6: Arduino slave temperature gif

Figure 7: Arduino slave temperature request gif