GENIE 20 Microcontroller

Capabilities

The following table outlines the capabilities of this GENIE device:

|	
Type	GENIE
Version	2
Signals	
Pins	20
Analogue inputs	4
ADC resolution	8 bits
Digital inputs	8
Digital outputs	9
Features	
Parallel processing	Yes
Plug and play	Yes
Debug live	Yes
Device control	Yes
Sensor calibration	Yes
RTTTL music	Yes
16 channel MIDI music	Yes
Sound effects	Yes
PWM outputs	8
Servo motor control	8
Infra-red control	Yes
1-Wire® and I^{2}C	Yes
Ultrasonic sensing	Yes
Events and interrupts	Yes
1-second clock	Yes
Programming	
Program memory	10 K bytes
Variables	26 (A-Z)
Data (array) memory	256
EEPROM locations	16
Program start limit	16
Subroutine limit	No limit
Call stack limit	32
Electrical	
PICmicro® device	16F1829
Power supply	1.8-5.5V
Pin current limit	25mA
Total current limit	85mA

Component

The GENIE 20 microcontroller has 20 legs (known as pins) and these are used as follows (a simplified view is also shown):
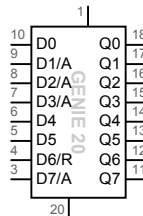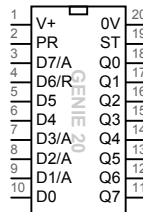
Pin	Description
1	Power supply voltage (1.8-5.5V only)
2	Programming input (PR)
3	Analogue input A7 or digital input D7
4	Digital input D6 or (optional) reset
5	Digital input D5
6	Digital input D4
7	Analogue input A3 or digital input D3
8	Analogue input A2 or digital input D2
9	Analogue input A1 or digital input D1
10	Digital input D0
11	Digital output Q7
12	Digital output Q6
13	Digital output Q5
14	Digital output Q4
15	Digital output Q3
16	Digital output Q2
17	Digital output Q1
18	Digital output Q0
19	Status output (ST)
20	Ground (zero volt) supply voltage

Circuit

The required circuit for a GENIE 20 is shown below. It includes a download socket and two resistors. See also 'Reset' overleaf.
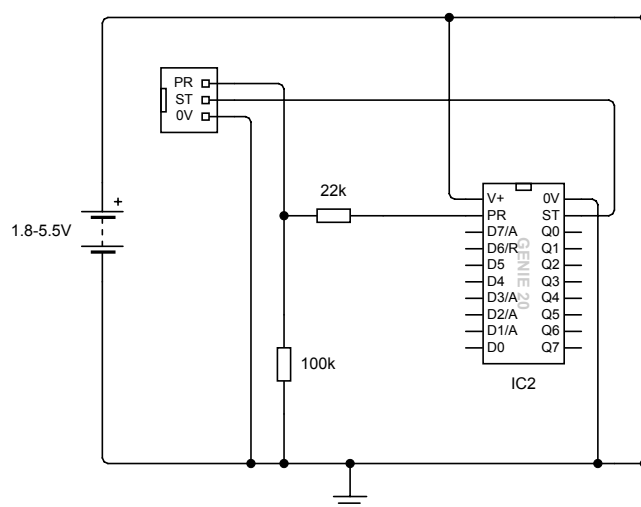
Notes

Reset

Pin 4 can be configured to be either an external reset pin or digital input G3. When configured as a reset pin, the microcontroller will reset whenever that pin goes low.

The recommend minimum circuit including a reset switch is shown on the right.

You can configure the reset pin by choosing the **Advanced** option in the **Program Settings** window and then clicking on **Reset**.
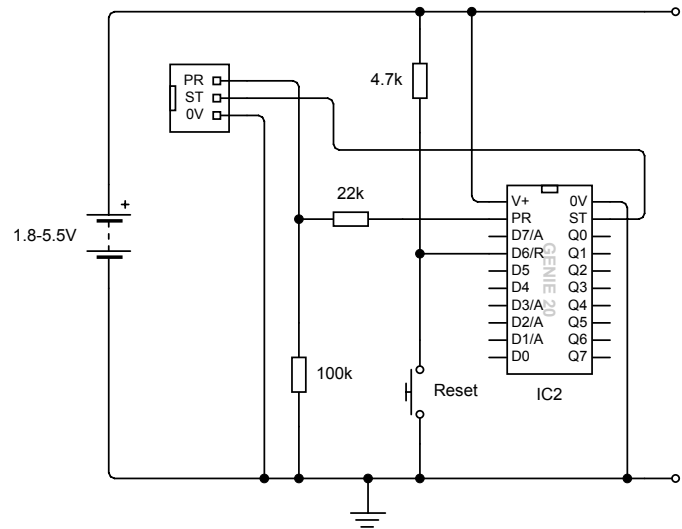
Turbo

The GENIE 20 microcontroller can operate at two different speeds: normal and turbo. In turbo mode, the internal oscillator within the microcontroller will be run at a faster (32 MHz rate), whereas in the normal speed mode, the oscillator will be at 16 MHz. Note that one consequence of running in turbo speed mode is that the minimum device supply voltage increases from 1.8V to 2.5V.

You can enable turbo speed mode by choosing the **Advanced** option in the **Program Settings** window and then clicking on **Turbo**.