

UM10799

PCA9629A advanced stepper motor controller demo board quick start instructions

Rev. 1 — 4 June 2014

User manual

Document information

Info	Content
Keywords	Fm+ I2C-bus, PCA9629A, GPO, LPCXpresso LPC1343 daughter card, motor direction, speed and ramp control
Abstract	The OM13285 is a demo kit for PCA9629A stepper motor controller. This quick start guide shows how to operate the stepper motor drive control logic with three pulse width drive formats plus ramp-up and ramp-down features. The motor drive outputs can drive one-phase (wave drive), two-phase, and half-step drive format logic level outputs for stepper motor control modes.



Revision history

Rev	Date	Description
1.0	20140604	user manual; initial release

Contact information

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1. Introduction

The PCA9629A is available with a self-contained demo kit (OM13285) that enables detailed evaluation of its operation. The kit includes a motor with position sensors and a demo board with pre-programmed push-button switches that make it easy to select functions. Advanced users can quickly reprogram the on-board microcontroller to evaluate custom functions.

2. PCA9629A demo kit (Rev. 2.2) contents



Fig 1. PCA9629A advanced stepper motor controller demo kit

1. PCA9629A demo board with LPC1343 LPCXpresso (software Rev 0.6) daughter board
2. Stepper Motor Board with two sensors
3. +12 V DC power adapter
4. Motor cable (6-wire)
5. Sensor cable (4-wire)

3. Quick start instructions, step-by-step

- Step 1 Connect motor cable (6-wire) and sensor cable (4-wire) as shown in [Figure 1](#).
- Step 2 Connect +12 V power source to the PCA9629A demo board.
- Step 3 You are ready to control the motor as shown in [Table 1](#), [Table 2](#) and [Table 3](#) for each switch function.

Remark: When the board is powered up and operating normally, a Red LED2 on the LPCXpresso LPC1343 daughter card blinks once per second for Demo_Mode_1 as shown in [Table 1](#).

Remark: When ‘S1’ and ‘S2’ buttons are pressed at the same time to switch demo function from Demo_Mode_1 to Demo_Mode_2 as shown in [Table 2](#), a Red LED2 on the LPCXpresso LPC1343 daughter card blinks twice per second for this mode. The Demo_Mode_2 is for the ramp-up/ramp-down control as well as user-customized operations.

Remark: When ‘S1’ and ‘S7’ buttons are pressed at the same time to switch demo function from Demo_Mode_1 to Demo_Mode_3 as shown in [Table 3](#), a Red LED2 on the LPCXpresso LPC1343 daughter card blinks faster for Demo_Mode_3. The Demo_Mode_3 sets output logic levels on OUT[3:0] pins for GPO function.

Table 1. Demo_Mode_1 functions (power-on default mode; LED2 blinking once per second)

Switch/Label	Demo function	Notes	LED indication
S1/Mode	Motor Phase Mode Select	Default is Single-phase mode. Press to cycle through 2-Phase and 1/2-Step Modes.	Selected Mode is indicated by the corresponding: LED2 ON = Single-phase LED3 ON = 2-phase LED4 ON = 1/2-phase
S2/Direction	Motor Direction Select	Default is CW. Press again to switch between CW and CCW.	LED1 ON = CW (clockwise) LED1 OFF = CCW (counter-clockwise)
S3/Rotate Fixed Steps	Rotate Fixed 12 steps Rotation	Rotate a fixed number of steps. Default is 12 Steps (one rotation is 48 steps).	Direction rotated is indicated by CW LED1.
S4/Rotate Fixed Rotations	Rotate Fixed Rotations	Rotate a fixed number of rotations. Default is 10 rotations (480 steps). Press again to change the motor speed between 50 pps and 200 pps.	Direction is indicated by CW LED1.
S5/Rotate and Reverse	Rotate between CW and CCW with delay interval in continuous loop	Continuously rotate 36 steps CW and CCW with delay interval of 128 ms (after CW) and 512 ms (after CCW). Press again to stop motor operation.	Direction is indicated by CW LED1. Time delay between changing directions is set by LOOPDLY_CW/CCW registers.
S6/Continuous Rotation	Continuous Rotation	Continuously rotate and press again to change the motor speed between 50 pps and 200 pps with ramp control. Press either S5 or S8 to stop motor operation.	Direction is indicated by CW LED1.

Table 1. Demo_Mode_1 functions (power-on default mode; LED2 blinking once per second) ...continued

Switch/Label	Demo function	Notes	LED indication
S7/Interrupt Mode	Start/Stop Interrupt Mode	Interrupt Mode. Continuous rotation and reverse motor on interrupt caused by P0 or P1 falling edge. Press again to stop motor operation.	Direction is indicated by CW LED1. Time delay between changing directions is set by LOOPDLY_CW/CCW registers.
S8/Xpresso Reset	To reset LPCXpresso LPC1343	This reset function to bring this demo board to power-on reset default state (Demo_Mode_1)	Xpresso/LPC1343 Reset; this control also resets the PCA9629A device.
S9/PCA9629A Reset	To reset PCA9629A device	This reset is only for PCA9629A device.	Set all registers to power-on default values.

Table 2. Demo_Mode_2 functions (LED2 blinking twice per second)

Switch/Label	Demo function ^[1]	Notes	LED indication
S1/Mode	same as Demo_Mode_1		
S2/Direction	same as Demo_Mode_1		
S3	Ramp control	Ramp-up and ramp-down in 48 steps (1 rotation in 0.5 second) with ramp multiplication value = 9.	Direction is indicated by CW LED1
S4	Ramp control	Ramp-up and ramp-down in 480 steps (10 rotations in 5 seconds) with ramp multiplication value = 6.	Direction is indicated by CW LED1
S5	Available for user-defined function.		
S6	Available for user-defined function.		
S7	Available for user-defined function.		
S8/Xpresso Reset	same as Demo_Mode_1		
S9/PCA9629A Reset	same as Demo_Mode_1		

[1] Press either S8 (Xpresso Reset) or S1 and S2 at the same time to return Demo_Mode_1 function.

Table 3. Demo_Mode_3 functions (LED2 blinking faster)

Switch/Label	Demo function ^[1]	Notes	LED indication
S1	Set OUT0 pin as General Purpose Output (GPO)	Motor output OUT0 (pin 12) goes 'High' while the button is pressed.	n/a
S2	Set OUT1 pin as General Purpose Output (GPO)	Motor output OUT1 (pin 11) goes 'High' while the button is pressed.	n/a
S3	Set OUT2 pin as General Purpose Output (GPO)	Motor output OUT2 (pin 10) goes 'High' while the button is pressed.	n/a
S4	Set OUT3 pin as General Purpose Output (GPO)	Motor output OUT3 (pin 9) goes 'High' while the button is pressed.	n/a
S5	not available		
S6	not available		
S7	not available		
S8/Xpresso Reset	same as Demo_Mode_1		
S9/PCA9629A Reset	same as Demo_Mode_1		

[1] Press either S8 (Xpresso Reset) or S1 and S7 at the same time to return Demo_Mode_1 function.

4. Abbreviations

Table 4. Abbreviations

Acronym	Description
CCW	Counterclockwise
CW	Clockwise
GPO	General Purpose Output
LED	Light Emitting Diode
pps	pulses per second

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