

NXP evaluation kit for PCA9564

Quickly add I²C-bus port to DSP, ASIC, microcontroller, or microprocessor

Built around the NXP parallel-to-I²C-bus controller PCA9564, this flexible design kit provides engineers with everything they need to demonstrate adding and I²C-bus port to a microcontroller. The board is pre-loaded with firmware, but can be configured with custom code.

Key features

- ▶ Flexible PCA9564 evaluation board
 - Demonstrates microcontroller/PCA9564/I²C-bus connection
 - Microcontroller provides master control over target slave devices
 - Pre-loaded with four firmware programs
 - Configurable for different I²C-bus slave devices
 - Operates in stand alone, PC-configured, or 80C51-based design environment
- ▶ Serial cable for connecting to RS-232 port of a PC
- ▶ 9-V power supply
- ▶ Downloadable support tools
 - Application notes and data sheets
 - IBIS model
 - Source code for 8051-type microcontroller (in C, with drivers)
 - “Hex” files
 - Third-party support tools

The NXP parallel-to-I²C-bus controller supports bidirectional communications between most standard parallel-bus microcontrollers/processors and the serial I²C-bus. It converts eight-bit parallel data to an I²C-bus serial data stream, eliminating a large number of traces running across the PC board. The PCA9564 is a migration path to the legacy PCF8584, which operates at a lower frequency and a higher voltage.

The evaluation kit includes a PCA9564 evaluation board – a two-layer PCB that measures 25 inches square – a serial cable, and a 9-V power supply.

On the evaluation board, the PCA9564 is connected to an NXP microcontroller P89LV51RD2 and an I²C-bus. The microcontroller uses embedded firmware to provide master control over the target slave devices on the board. For added flexibility, board’s master controller can be replaced with an external microcontroller, a microprocessor, a DSP, or an emulator.

There are two slave devices: an NXP 8-bit I²C-bus LED dimmer PCA9531, and an NXP microcontroller P89LPC932 that can be

configured as a target slave device or as a master equipped with the proper firmware.

To store information used by the firmware, the board has an NXP 16-kbit (2-kByte) I²C-bus EEPROM PCF85116. To let the user interface with the master controller, there is an NXP 8-bit I²C-bus GPIO PCA9554A that can also be used as a target slave device. An RS-232 transceiver, along with an RS-232 cable, supports in-system programming (ISP) of both microcontrollers via the serial port of a standard PC.

Operating modes

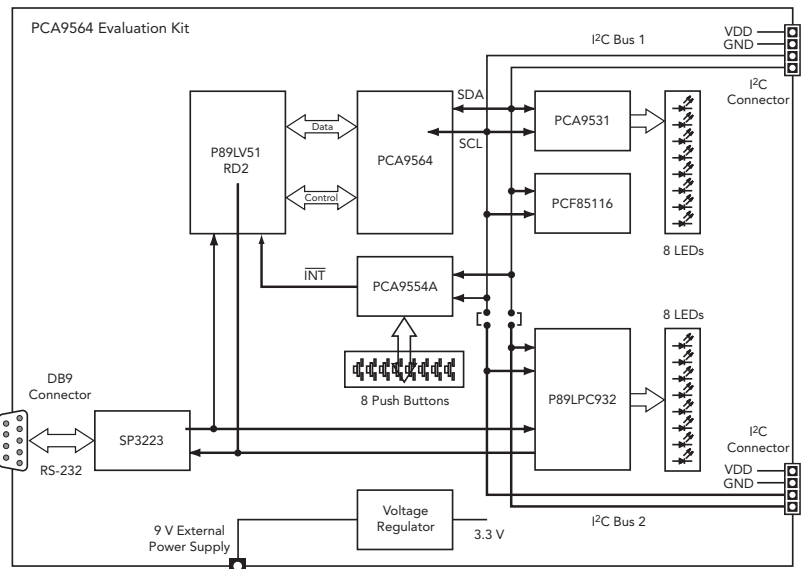
The evaluation board is pre-loaded with four default firmware programs, so it can run on its own, without external hardware or software. The firmware is written in C and is compatible with any 80C51-type microcontroller. It tests bidirectional communications between the master and slave, and can be configured for a particular set of characteristics.

To support additional applications and programs, the board's microcontrollers can be loaded with compiled "Hex" files via the ISP interface. A free, Windows-based software program, called Flash Magic, can be used to load the Hex files. Flash Magic is sponsored by NXP and available from the Embedded Systems Academy (www.flashmagictool.com).

The evaluation board can be used with the full complement of 80C51-based software development tools, including C or Assembler code generators, debuggers, compilers, and loaders. The board also works with optional I²C-bus daughter boards, available from NXP. A free evaluation/development tool that works with up to four kilobits of code is available from Raisonance (www.raisonance.com/download/index.php).

Ordering and support

To order the evaluation kit, please email i2c.support@nxp.com. For downloadable support tools, visit www.standardics.nxp.com/support/boards/pca9564.



Block diagram of PCA9564 evaluation board

Components of the PCA9564 evaluation board

Part number	Description	Function on evaluation board
P89LV51RD2	Microcontroller	Connects to the 8-bit parallel port of PCA9564. Uses embedded firmware to provide master control over the target slave devices on the board. With the appropriate software loaded, it can also be used as a slave device.
PCA9564	I ² C-bus controller	Interfaces between the P89LV51RD2 microcontroller and the I ² C-bus.
PCA9531	I ² C-bus 8-bit LED dimmer	Acts as I ² C-bus target slave device
P89LPC932	Microcontroller	Connects to the I ² C-bus. Using the default P89LV51RD2 firmware programs, it acts as a target slave device. With stored, user-definable firmware, it acts as a master.
PCF85116	16-kbit (2-kByte) I ² C EEPROM	Stores information to be used by the evaluation board firmware.
PCA9554A	I ² C-bus 8-bit GPIO	Acts as interface/keyboard between the user and the P89LV51RD2 microcontroller.
SP3223	RS-232 transceiver (from Sipex)	Enables in-system programming of the P89LV51RD2 and P89LPC932 microcontrollers via the serial port of a standard PC.

For more information visit www.nxp.com/i2clogic.



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