

ID MOS Digital I.P. SHORTFORM

IM230: I2C Bus Interface



PRODUCT DESCRIPTION

The IM230 is an I2C bus interface. The I²C-bus configuration is an amalgam of microcontrollers and peripheral controllers.

By definition:

- a device that transmits signals onto the I²C-bus is the transmitter,
- a device that receives signals is the receiver,
- a device that controls signal transfers on the line in addition to controlling the clock frequency is the master,
- a device that is controlled by the master is the slave.

The master can transmit or receive signals to or from a slave, respectively. It is possible to combine several masters, in addition to several slaves, onto an I²C-bus to form a multimaster system.

Note : If more than one master simultaneously tries to control the line, an arbitration procedure decides which master gets priority.

The maximum number of devices connected to the bus is dictated by the maximum allowable capacitance on the lines, 400 pF, and the protocol's addressing limit of 16k; typical device capacitance is 10 pF.

Simplicity of the I²C system is primarily due to the bi-directional 2-wire design, a serial data line (SDA) and serial clock line (SCL), and to the protocol format. Because of the efficient 2-wire configuration used by the I²C interface compared to that of the MICROWIRE™ and SPI interface, reduced board space and pin count allows the designer to have more creative flexibility while reducing interconnecting cost.

For operating a slave over the I2C-bus, only six simple operating codes are required for transmitting or receiving bits of information:

- a start bit,
 - a 7-bit slave address,
 - a read/write bit which defines whether the slave is a transmitter or receiver,
 - an acknowledge bit,
 - a message bits divided into 8-bit segments,
 - a stop bit.
- (eventually, a repeated START condition)

FEATURES

- Divider by step ¼
- I2C compatible
- Serial, 8-bits oriented, bidirectional data transfers
- Only two bus lines required (+ a ground line)
- All I2C modes: Master/Slave & Transmitter/Receiver
- Address Recognition
- Arbitration between masters
- Number of ICs that can be connected only limited by a maximum capacitance of 400 pF

TYPICAL APPLICATIONS

- Communication between a microprocessor and peripheral devices
- Used, for example, in:
 - bus expander (8 bits in/out)
 - data converters
 - infra-red receptor (télécommande RC5)
 - Ni-Cd battery charger
 - single chip microcontrollers (like 80C552 or 80C652)
 - digital tuning and signal processing circuits for radio and video systems
 - DTMF generators for phones with tone dialling
 - lcd or led driver
 - memory (static ram, eeprom, etc...)
 - communications inside mobil phones

BLOCK DESCRIPTION

