

Analog, Mixed-Signal and Power Management

# MC34975

## Multiple Switch-Detection Interface with Suppressed Wake-Up and 32 mA Wetting Current

### Target Applications

- Industrial control systems
- Process control systems
- Security systems
- Systems requiring switch status verification for safety, operation or process-control purposes

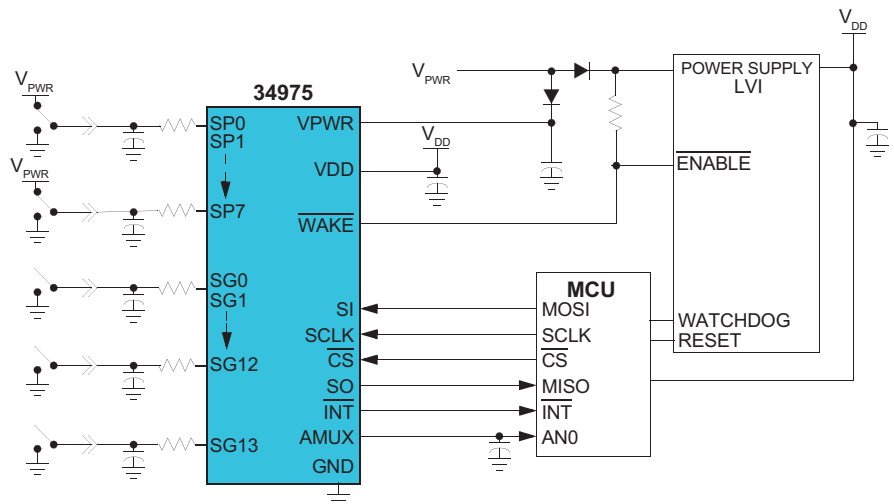
### Overview

The MC34975 multiple switch-detection interface with suppressed wake-up is designed to detect the closing and opening of up to 22 switch contacts. The switch status, either open or closed, is transferred to the microprocessor unit (MCU) through a Serial Peripheral Interface (SPI). The device also features a 22-to-1 analog multiplexer for reading inputs as analog.

The MC34975 device has two modes of operation: Normal and Sleep. Normal mode allows programming of the device and supplies switch contacts with pull-up or pull-down current as it monitors the switch change-of-state. The Sleep mode provides low quiescent current making the MC34975 ideal for industrial products requiring low sleep-state currents.

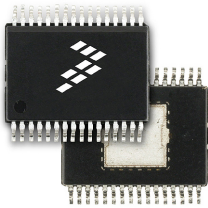
Features include a programmable interrupt timer for Sleep mode that can be disabled, switch detection currents of 32 mA and 4 mA for switch-to-ground inputs, and an interrupt bit that can be reset.

### Simplified Application Drawing



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## Product Features and Benefits

Features	Benefits
Designed to operate $5.5\text{ V} \leq V_{PWR} \leq 28\text{ V}$	Optimized switch OPEN/CLOSE status verification of multiple switches with changes immediately reported to the MCU
Switch input voltage range: -14–40 V	Multiplex analog signals via the AMUX pin for analog-to-digital input
Interfaces directly to microprocessor using 3.3/5 V SPI protocol	Simple interfacing to industry-standard 3.3/5.0 V MCUs having SPI
Selectable wake-up on change of state	Surface-mounted device requiring minimal PC board space and few components, enhancing application reliability and providing lower costs
Selectable wetting current (32 mA or 4 mA for switch-to-ground inputs)	Simple system-power conservation solution providing a WAKE output with which the MCU power supply can be enabled when MCU activation is required
Eight programmable inputs (switches to supply or ground)	Increased wetting current
Fourteen switch-to-ground inputs	Increased operating voltage
Sleep-state current $V_{PWR} = 100\ \mu\text{A}$ , $V_{DD} = 20\ \mu\text{A}$	Multiple MC34975 devices in a module system

## Development

Part Number	Description
KIT33975AEWEVBE	Evaluation Board, featuring the MC33975

## Documentation

Freescal Document Number	Title	Description
MC34975	Multiple Switch-Detection Interface with Suppressed Wake-Up and 32 mA Wetting Current	Data sheet
SG1002	Analog Product Selector Guide	Selector guide
SG200	Analog and Power Management Industrial Selector Guide	Selector guide

For more information, please visit [freescale.com/analog](http://freescale.com/analog)