



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

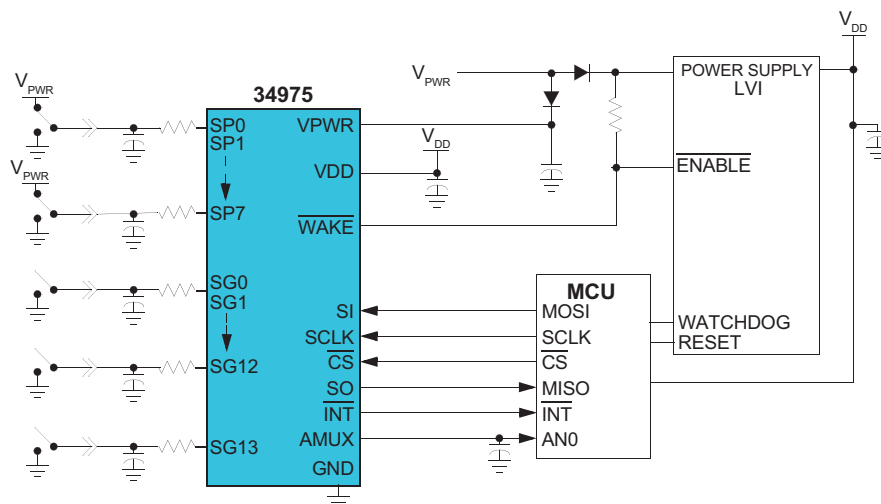
Overview

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.

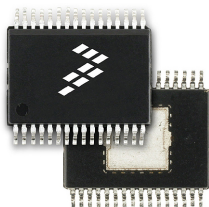
Features include a programmable interrupt timer for Sleep mode that can be disabled, switch detection currents of 32 mA and 4 mA for switch-to-ground inputs, and an interrupt bit that can be reset.

Simplified Application Drawing



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Expanding on more than 30 years of innovation, Freescale is a leading provider of high-performance products that use SMARTMOS technology, combining digital, power and standard analog functions. Freescale supplies analog and power management ICs that are advancing the automotive, consumer, industrial and networking markets. Analog solutions interface with real-world signals to control and drive for complete embedded systems.



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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: $-14\text{--}40\text{ V}$	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 $V_{PWR} = 100\text{ }\mu\text{A}$, $V_{DD} = 20\text{ }\mu\text{A}$	Multiple MC34975 devices in a module system

Development

Part Number	Description
KIT33975AEWEVBE	Evaluation Board, featuring the MC33975

Documentation

Freescale 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

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