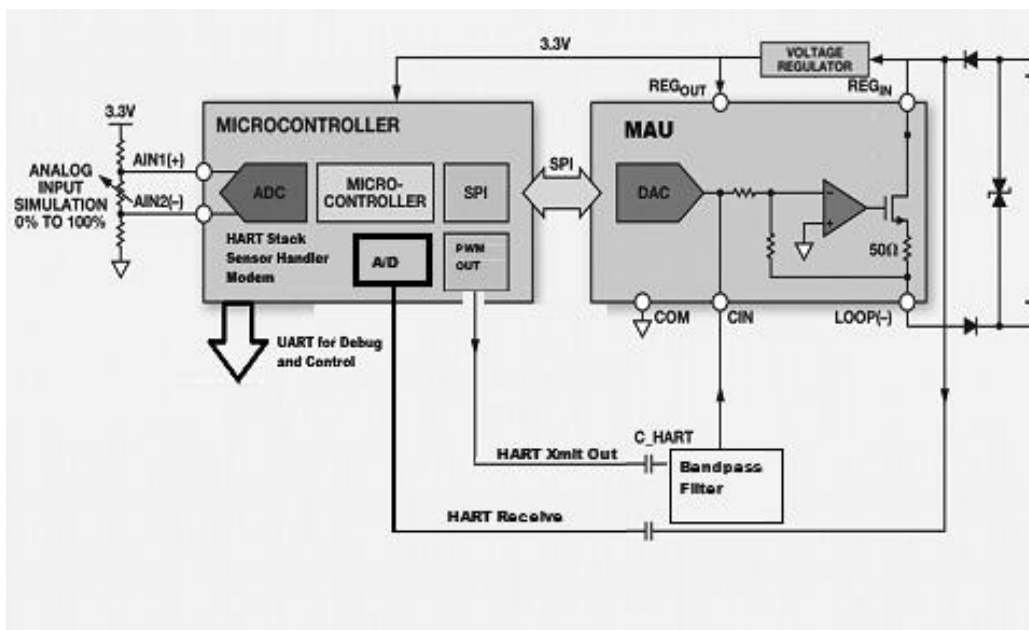


HART[®] TRANSMITTER DEVICE WITH A SINGLE MICROCONTROLLER (1200 bps Modem + HART 7.0 Stack)

Smart Embedded Systems (SES) , Inc. Silicon Valley, California Company is the first company to offer modem and HART Stack in a single microcontroller and this solution has been certified by the FieldComm Group. Since the modem functionality is implemented with the firmware, there is no need for an external chip modem. This makes the SES solution for the HART device to be cost effective, more reliable, requiring less PCB and also the design complies with the power requirements outlined by the standards of FieldComm Group.

OUR SOLUTION:

System on a chip (SoC) Based 1200 BPS (FSK)MODEM +HART 7.0 STACK :



Our 1200 BPS modem is firmware based; implemented with Texas Instruments (TI) MS430 microcontroller. Besides modem functionality, we also offer the following on the same microcontroller:

Soft Modem

Benefits

- Lower cost
- Lower power 400 uA FSK mode at VCC of 2.7V
- Works with any third party HART stack
- Low power table lookup based modulator using SES patented methods
- Smart Phase and Timing detection of incoming signals using SES patented methods
- High reliability
- Smaller footprint

SES HART STACK 7.0

Specific Features

- Smart Publishing
- Event Notification
- Report by exception
- Time stamping
- Long Tag Support
- Expanded Manufacturer ID

System on a Chip (SoC) based solution

- Uses off-the-shelf microcontroller
- Uses Low voltage FRAM based microcontroller for low power
- HART 7.0 Stack can run on the same microcontroller
- Sensor Interface

HART FSK Modem Characteristics

Binary Frequency Shift Keying

Bits per symbol : 1

Mark = 1200Hz; Space = 2200Hz ±1%

Carrier Frequency : 1700Hz.

Data Rate : 1200 Bits Per Second ±1%

Supports Normal Analog Wiring

Modulator Characteristics

Carrier Startup : Less than 3 symbols

Carrier Stop : Less than 3 symbols

Demodulator Characteristics

Dynamic Range : 15 dB minimum
(150mV – 900mV)

Receive Filtering for Analog signal Interference
rejection: 20 dB minimum

RX Signal CD On : 80mV - 120mV

CD On time : 1ms - 4ms

CD off time : 5ms - 10ms

Rx Signal Level : 120mV - 1000mV

Applications:

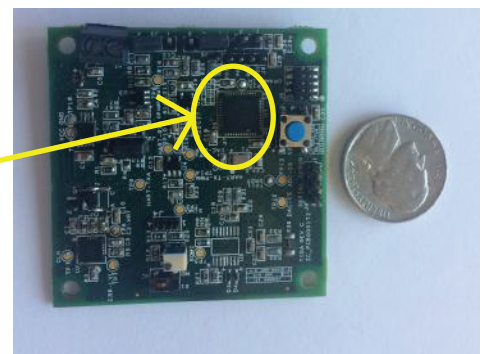
- A. Process control and factory automation
- B. Temperature sensors
- C. Flow transmitters
- D. Level transmitters
- E. Pressure transmitters

Board Support Package for Evaluation includes:

- A. Board
- B. Schematic
- C. BOM (Bill Of Materials)
- D. HART Stack Binary code
- E. SOFT Modem Binary code

SES has been awarded four patents related to its soft modem technology for HART devices: 9106488, 9184965, 9203665, 9281978 and additional patents pending.

Modem and/or
Stack circuitry



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