



<http://home.hccnet.nl/anj/nof/noforth.html>

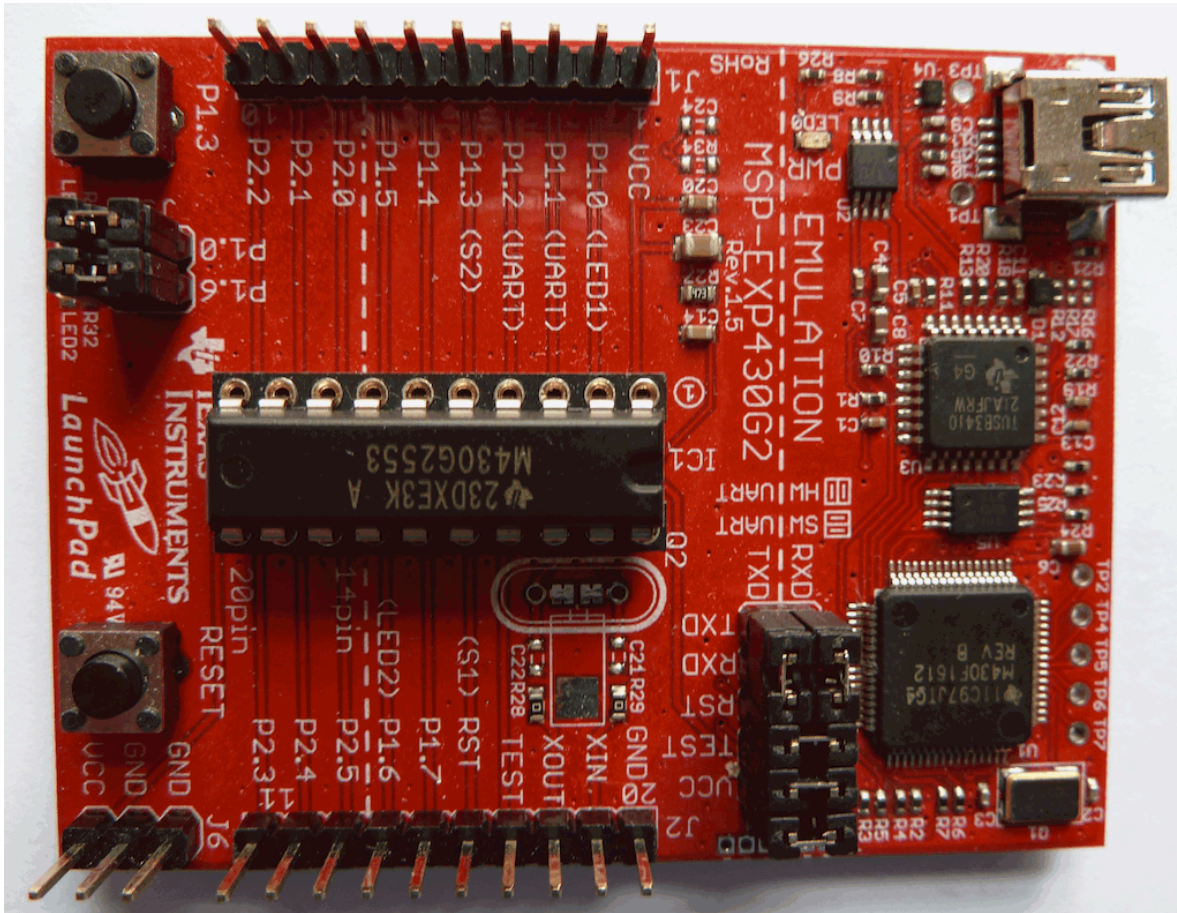
MSP430G2553 Launchpad with noForth C,V (Lp.0)

1. MSP430G2553 Launchpad with noForth C,V
 - i/o port connections on G2553 Launchpad
 - Connectors on G2553 Launchpad
 - Hardware on G2553 Launchpad
2. MSP430G2553 i/o Ports
 - Port addresses
 - PxDir, PxREN and PxOUT
 - PxSel
 - UART
3. MSP430G2553 RAM & ROM
4. MSP430G2553 interrupt vectors
5. Processor registers in noForth

In this text we refer to these two documents:

- SLAS735E.PDF "MSP430G2x53, MSP430G2x131 mixed signal microcontroller"
- SLAU144I.PDF "MSP430x2xx Family User's Guide"

1. MSP430G2553 Launchpad with noForth C,V



MSP430G2XX, LAUNCHPAD, DEV KIT

Silicon Manufacturer: Texas Instruments

Core Architecture: MSP430

Core Sub-Architecture: MSP430

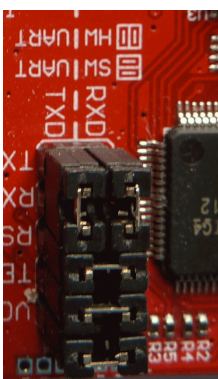
Silicon Core Number: MSP430

Silicon Family Name: MSP430G2xx

No. of Bits: 16 bit

Kit Contents: LaunchPad Emulator, Mini USB-B Cable, Quick Start Guide

- Farnell - Ordercode: 1853793, TEXAS INSTRUMENTS - MSP-EXP430G2
- Aliexpress - Product ID: 1125692571, msp-exp430g2 launchpad



For a working RS232/USB connection the jumpers must be in the "HW|UART" position, as the picture shows.

i/o port connections on G2553 Launchpad

| Port 1 | | Port 2 | |
|----------------------|-----------|-------------|------|
| Digital i/o and UART | | Digital i/o | |
| P1.0 | Led red | P2.0 | ... |
| P1.1 | Uart | P2.1 | ... |
| P1.2 | Uart | P2.2 | ... |
| P1.3 | S2 | P2.3 | ... |
| P1.4 | ... | P2.4 | ... |
| P1.5 | ... | P2.5 | ... |
| P1.6 | Led green | P2.6 | Xin |
| P1.7 | ... | P2.7 | Xout |

Connectors on G2553 Launchpad

| | |
|--------|---------------------------------------|
| J1 | = i/o P1, P2 and VCC |
| J2 | = i/o P1, P2, Reset, Test and GND |
| J3 | = Programmer connection and USB RS232 |
| J4 | = eZ430 interface |
| J5 | = Jumpers to red led and green led |
| J6 | = External power (2,5V tot 3,6V) |
| EZ_USB | = USB RS232 and programmer interface |
| TP1 | = +5 Volt |
| TP3 | = GND |

Hardware on G2553 Launchpad

- Red led on P1.0
- Green led on P1.6
- Switch S2 on P1.3
- Reset switch S1

2. MSP430G2553 i/o ports

Addresses

The MSP430G2553 port registers are memory mapped. An overview:

| | | P1 | P2 |
|--------|----|----|-------------------|
| PxIN | 20 | 28 | In |
| PxOUT | 21 | 29 | Out |
| PxDIR | 22 | 2A | Direction |
| PxIFG | 23 | 2B | Interrupt flag |
| PxIES | 24 | 2C | Interrupt edge on |
| PxIE | 25 | 2D | Interrupt on |
| PxSEL | 26 | 2E | Select |
| PxREN | 27 | 2F | Resistor on/off |
| PxSEL2 | 41 | 42 | Select 2 |

See: SLAS735E.PDF under "peripheral file map", from page 18.

PxDir, PxREN and PxOUT

The three registers PxDIR, PxREN and PxOUT are used to configure an i/o pin:

| PxDIR | PxREN | PxOUT | Pin configuratie |
|-------|-------|-------|----------------------------|
| 0 | 0 | x | Floating input |
| 0 | 1 | 0 | Input with resistor to GND |
| 0 | 1 | 1 | Input with resistor to VCC |
| 1 | x | x | Output |

More info in SLAU144I.PDF page 335.

Texas Instruments recommends to configure unconnected i/o pins as Output.

PxSEL and PxSEL2

The registers PxSEL and PxSEL2 are to assign a special function to an i/o pin. In this way, for example the ADC or UART can be activated.

More info: SLAS735E.PDF from page 43: P1-functions.

| PxSEL2 | PxSEL | i/o-function |
|--------|-------|-----------------------|
| 0 | 0 | Normal i/o |
| 0 | 1 | Basic extra function |
| 1 | 0 | Controller specific! |
| 1 | 1 | Second extra function |

3. MSP430G2553 RAM & ROM

RAM 0200 - 03FF
FlashROM C000 - FFFF

4. MSP430G2553 Interrupt vectors

| | |
|------|--------------------|
| FFDE | End of free Flash |
| FFE0 | ... |
| FFE2 | ... |
| FFE4 | P1 |
| FFE6 | P2 |
| FFE8 | ... |
| FFEA | ADC |
| FFEC | USCI B0 TX |
| FFEE | USCI B0 RX |
| FFF0 | TIMER0A0 CCR1 CCR2 |
| FFF2 | TIMER A0 CCR0 |
| FFF4 | WATCHDOG |
| FFF6 | COMPARATOR |
| FFF8 | TIMER A1 CCR1 CCR2 |
| FFFA | TIMER A1 CCR0 |
| FFFC | NMI |
| FFFE | RESET |

See SLAS735E.PDF page 11 for details.

5. Processor registers in noForth

All processor registers (R0..R15) have their own name in noForth assembler:

| | | | | | |
|----|-----------------------|-----|------|-------------------------|------------------------------------|
| PC | RP (=SP in TI texts!) | SR | CG | MSP430 system registers | |
| SP | IP | TOS | DOX | NXT | noForth system registers |
| W | DAY | SUN | MOON | | Registers, locally used by noForth |
| XX | YY | ZZ | | | Unused (free) registers |