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noForth website

MSP-EXP430FR5739 Experimenter Board with noForth 5739

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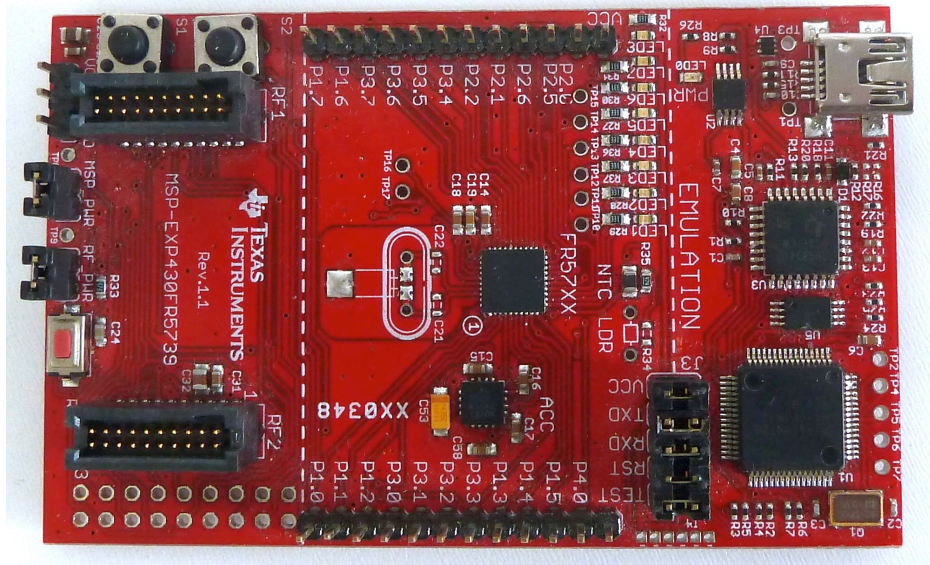
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In this text we refer to these two documents:

- SLAS639J.PDF "MSP430FR573x, MSP430FR572x mixed signal microcontroller"
- SLAU272C.PDF "MSP430x5xx Family User's Guide"

1. MSP-EXP430FR5739 Experimenter Board with noForth 5739



MSP430FR5739 Experimenters board

Core Sub-Architecture: MSP430

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

- Farnell - Ordercode: 1893308, TEXAS INSTRUMENTS - MSP-EXP430FR5739
- Aliexpress - Product ID: 1566452317, MSP-EXP430FR5739

i/o port connections on Experimenter Board

Port 1

P1.0 - ...
P1.1 - ...
P1.2 - ...
P1.3 - ...
P1.4 - NTC
P1.5 - ...
P1.6 - ...
P1.7 - ...

Port 2

P2.0 - RX
P2.1 - TX
P2.2 - ...
P2.3 - ...
P2.4 - ...
P2.5 - ...
P2.6 - ...
P2.7 - VS accelerometer

Port J

PJ.0 - LED1
PJ.1 - LED2
PJ.2 - LED3
PJ.3 - LED4
PJ.4 - XINB
PJ.5 - XOUTB

Port 3

P3.0 - XOUT
P3.1 - YOUT
P3.2 - ZOUT
P3.3 - LDR
P3.4 - LED5
P3.5 - LED6
P3.6 - LED7
P3.7 - LED8

Port 4

P4.0 - S1
P4.1 - S2

Connectors on Experimenter Board

SV1 = i/o P1, P3, P4 and GND
SV2 = i/o P1, P2, P3, Test and VCC
J3 = Programmer connection and USB RS232
J4 = eZ430 interface
RF1 = CCxxxx daughter cards
RF2 = CCxxxx daughter cards
J6 = External power (2,5V tot 3,6V)
EZ_USB = USB RS232 and programmer interface
MSP_PWR = MSP current measure
RF_PWR = RF current measure
TP1 = +5 Volt
TP3 = GND

Hardware on Experimenter Board

- Eight blue leds on PJ.0 to PJ.3 and P3.4 TO P3.7
- Switch S1 on P4.0
- Switch S2 on P4.1
- LDR on P1.3 (Not present)
- Accelerometer on P3.0, P3.1, P3.2 and P2.7
- NTC on P1.4
- Reset switch RST

2. MSP430FR5739 i/o ports

Port addresses

The MSP430FR5739 port registers are memory mapped. An overview:

<u>Label</u>	<u>P1</u>	<u>P2</u>	<u>P3</u>	<u>P4</u>	<u>PJ</u>	<u>Function</u>
PxIN	200	201	220	221	320	Input
PxOUT	202	203	222	223	322	Output
PxDIR	204	205	224	225	324	Direction
PxREN	206	207	226	227	326	Resistor enable
PxSEL0	20A	20B	22A	22B	32A	Select 0
PxSEL1	20C	20D	22C	22D	32C	Select 1
P1IV	20E	21E	22E	22F		Interrupt vector word
P1SELC	210	211	230	231		Complement selection
PxIES	218	219	238	239		Interrupt edge select
PxIE	21A	21B	23A	23B		Interrupt on
PxIFG	21C	21D	23C	23D		Interrupt flag

PxDir, PxREN and PxOUT

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

<u>PxDIR</u>	<u>PxREN</u>	<u>PxOUT</u>	<u>Pin configuration</u>
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 SLAU272C.PDF page 294.

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

PxSEL and PxSEL2

The registers PxSEL and PxSEL2 are used to assign a special function to an i/o pin. In this way, for example, the ADC or UART can be activated. See SLAS639J.PDF page 71-91.

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

RS232/USB driver

Download the [USB driver for the MSP-EXP430FR5739 under Windows](#) to your PC.

The eUSCI A0 is used as UART. Pins P2.0 (TX) and P2.1 (RX) are used, the default baudrate is 9600 baud.

3. MSP430FR5739 RAM and ROM

RAM 1C00 - 1FFF, ROM C200 - FFFF

4. MSP430FR5739 interrupt vector table

FFCC - End of free flash

FFCE - RTC

FFD0 - P4

FFD2 - P3

FFD4 - TIMER B2 CCR1 CCR2

FFD6 - TIMER B2 CCR0

FFD8 - P2

FFDA - TIMER B1 CCR1 CCR2

FFDC - TIMER B1 CCR0

FFDE - P1

FFE0 - TIMER A1 CCR1 CCR2

FFE2 - TIMER A1 CCR0

FFE4 - DMA

FFE6 - USCI 1 RX/TX

FFE8 - TIMER A0 CCR1 CCR2

FFEA - TIMER A0 CCR0

FFEC - ADC10

FFEE - USCI 0 RX/TX

FFF0 - USCI 0 RX/TX

FFF2 - WATCHDOG

FFF4 - TIMER B0 CCR1 CCR2

FFF6 - TIMER B0 CCR0

FFF8 - COMPARATOR

FFFA - NMI USER

FFFC - NMI SYSTEM

FFFE - RESET

See SLAS639J.PDF page 47-48.

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