MIOS DIN/DOUT Pin Numbers

Sometimes the pin numbers of special DINs or DOUTs can be specified in the main.asm or setup_*.asm file of a MIOS application.

Examples:

```
#define DEFAULT_MIDI_RX_LED 0x40        ; DOUT SR#9, pin D0
#define DEFAULT_MIDI_TX_LED 0x41        ; DOUT SR#9, pin D1
```

or

```
#define DEFAULT_DIN_MENU_EXEC         7       ; menu exec button assigned to
DIN pin #7
#define DEFAULT_DIN_MENU_SNAPSHOT     6       ; menu snapshot button
assigned to DIN pin #4
#define DEFAULT_DIN_MENU_RIGHT        5       ; NOT USED - overlayed by
datawheel
#define DEFAULT_DIN_MENU_LEFT         4       ; NOT USED - overlayed by
datawheel
```

or

```
       ;;         SR  Pin  Mode
        ENC_ENTRY  5,  0,  MIOS_ENC_MODE_NON_DETENTED   ; V-Pot 1
        ENC_ENTRY  5,  2,  MIOS_ENC_MODE_NON_DETENTED   ; V-Pot 2
        ENC_ENTRY  5,  4,  MIOS_ENC_MODE_NON_DETENTED   ; V-Pot 3
        ENC_ENTRY  5,  6,  MIOS_ENC_MODE_NON_DETENTED   ; V-Pot 4
```

The following table should give you a quick overview over the numbers. Please bear in mind that we are sometimes counting from 0, and sometimes from 1.

Means: sometimes the first pin or shiftregister has number 0, sometimes it has number 1 - thats always an issue, because programmer mostly prefer to count from 0, users want to count from 1 - it's a bit of a mess! Forgive me! 

In the meantime I've tried to make the setup more consistent. Shiftregisters are always counted from 1, and pins are always counted from 0

Important Note: for DOUT shift registers, software pin-numbers will be reflected in reverse direction on hardware level:

pin-number 0 (software level) is D7 of the first shift register (hardware level), not D0!
pin-number 15 (software level) is D0 of the second shift register(hardware level), not D7!

The first shift register is for both DIN and DOUT the one that is closest to the core on hardware level.

In the datasheets of the shift-register IC's, D0 is often labled A / QA, D7 is labled H / QH.

In TK's layouts the labels for IC-pins are I0 - I7, O0 - 07, which corresponds to A/QA - H/QH.

DIN chain hardware-level: CORE ← R1::qH ← R1::H ← R1 ← R1::G ..... R2::qH ← R2::H etc.
The first bit read is DIN1::I7, this goes to the MSB on software level. MSB represents the higher pin value, so you have the same order in hard- as in software.

DOUT chain hardware-level: CORE → R1::SER → R1::A → R1::B → R1::C ..... R2::SER → R2::A etc.
first bit pushed out is LSB of the last SR(software level), this goes to Rlast::H. Last bit pushed out is MSB of first SR (software level), this goes to R1:A. On software level, MSB represents the higher pin value, so A will represent alway the higher pin value on hw-level for DOUT chains.

If you want to read more about this, refer this forum discussion:
http://www.midibox.org/forum/index.php/topic,12379.0.html

See also the following table to get a clearer picture. The shift registers have the same order on hardware than on software level.

MIOS_DOUT_SRSet / MIOS_DOUT_SRGet / MIOS_DIN_SRSet / MIOS_DIN_SRGet: LSB always reflects the lowest pin number, MSB the highest pin number.

Ok, here the table:

Shift Register	SR number	Pin Number (sw)	Pin Hex number (sw)	Pin Name (DIN PCB / SR IC)	Pin Name (DOUT PCB / SR IC)
first	1	0	0x00	D0 / QA	D7 / H
first	1	1	0x00	D1 / QB	D6 / G
first	1	2	0x00	D2 / QC	D5 / F
first	1	3	0x00	D3 / QD	D4 / E
first	1	4	0x00	D4 / QE	D3 / D
first	1	5	0x00	D5 / QF	D2 / C
first	1	6	0x00	D6 / QG	D1 / B
first	1	7	0x00	D7 / QH	D0 / A
second	2	8	0x0 8	D0 / QA	D7 / H
second	2	9	0x0 9	D1 / QB	D6 / G
second	2	10	0x0a	D2 / QC	D5 / F
second	2	11	0x0b	D3 / QD	D4 / E
second	2	12	0x0c	D4 / QE	D3 / D
second	2	13	0x0d	D5 / QF	D2 / C
second	2	14	0x0e	D6 / QG	D1 / B
second	2	15	0x0f	D7 / QH	D0 / A
third	3	16	0x10	D0 / QA	D7 / H
third	3	17	0x11	D1 / QB	D6 / G
third	3	18	0x12	D2 / QC	D5 / F
third	3	19	0x13	D3 / QD	D4 / E
third	3	20	0x14	D4 / QE	D3 / D

Shift Register	SR number	Pin Number (sw)	Pin Hex number (sw)	Pin Name (DIN PCB / SR IC)	Pin Name (DOUT PCB / SR IC)
third	3	21	0x15	D5 / QF	D2 / C
third	3	22	0x16	D6 / QG	D1 / B
third	3	23	0x17	D7 / QH	D0 / A
fourth	4	24	0x18	D0 / QA	D7 / H
fourth	4	25	0x19	D1 / QB	D6 / G
fourth	4	26	0x1a	D2 / QC	D5 / F
fourth	4	27	0x1b	D3 / QD	D4 / E
fourth	4	28	0x1c	D4 / QE	D3 / D
fourth	4	29	0x1d	D5 / QF	D2 / C
fourth	4	30	0x1e	D6 / QG	D1 / B
fourth	4	31	0x1f	D7 / QH	D0 / A
fifth	5	32	0x20	D0 / QA	D7 / H
fifth	5	33	0x21	D1 / QB	D6 / G
fifth	5	34	0x22	D2 / QC	D5 / F
fifth	5	35	0x23	D3 / QD	D4 / E
fifth	5	36	0x24	D4 / QE	D3 / D
fifth	5	37	0x25	D5 / QF	D2 / C
fifth	5	38	0x26	D6 / QG	D1 / B
fifth	5	39	0x27	D7 / QH	D0 / A
sixth	6	40	0x2 8	D0 / QA	D7 / H
sixth	6	41	0x2 9	D1 / QB	D6 / G
sixth	6	42	0x2a	D2 / QC	D5 / F
sixth	6	43	0x2b	D3 / QD	D4 / E
sixth	6	44	0x2c	D4 / QE	D3 / D
sixth	6	45	0x2d	D5 / QF	D2 / C
sixth	6	46	0x2e	D6 / QG	D1 / B
sixth	6	47	0x2f	D7 / QH	D0 / A
seventh	7	48	0x30	D0 / QA	D7 / H
seventh	7	49	0x31	D1 / QB	D6 / G
seventh	7	50	0x32	D2 / QC	D5 / F
seventh	7	51	0x33	D3 / QD	D4 / E
seventh	7	52	0x34	D4 / QE	D3 / D
seventh	7	53	0x35	D5 / QF	D2 / C
seventh	7	54	0x36	D6 / QG	D1 / B
seventh	7	55	0x37	D7 / QH	D0 / A
eighth	8	56	0x3 8	D0 / QA	D7 / H
eighth	8	57	0x3 9	D1 / QB	D6 / G
eighth	8	58	0x3a	D2 / QC	D5 / F
eighth	8	59	0x3b	D3 / QD	D4 / E
eighth	8	60	0x3c	D4 / QE	D3 / D
eighth	8	61	0x3d	D5 / QF	D2 / C
eighth	8	62	0x3e	D6 / QG	D1 / B
eighth	8	63	0x3f	D7 / QH	D0 / A

Shift Register	SR number	Pin Number (sw)	Pin Hex number (sw)	Pin Name (DIN PCB / SR IC)	Pin Name (DOUT PCB / SR IC)
ninth	9	64	0x40	D0 / QA	D7 / H
ninth	9	65	0x41	D1 / QB	D6 / G
ninth	9	66	0x42	D2 / QC	D5 / F
ninth	9	67	0x43	D3 / QD	D4 / E
ninth	9	68	0x44	D4 / QE	D3 / D
ninth	9	69	0x45	D5 / QF	D2 / C
ninth	9	70	0x46	D6 / QG	D1 / B
ninth	9	71	0x47	D7 / QH	D0 / A
tenth	10	72	0x4 8	D0 / QA	D7 / H
tenth	10	73	0x4 9	D1 / QB	D6 / G
tenth	10	74	0x4a	D2 / QC	D5 / F
tenth	10	75	0x4b	D3 / QD	D4 / E
tenth	10	76	0x4c	D4 / QE	D3 / D
tenth	10	77	0x4d	D5 / QF	D2 / C
tenth	10	78	0x4e	D6 / QG	D1 / B
tenth	10	79	0x4f	D7 / QH	D0 / A
eleventh	11	80	0x50	D0 / QA	D7 / H
eleventh	11	81	0x51	D1 / QB	D6 / G
eleventh	11	82	0x52	D2 / QC	D5 / F
eleventh	11	83	0x53	D3 / QD	D4 / E
eleventh	11	84	0x54	D4 / QE	D3 / D
eleventh	11	85	0x55	D5 / QF	D2 / C
eleventh	11	86	0x56	D6 / QG	D1 / B
eleventh	11	87	0x57	D7 / QH	D0 / A
twelfth	12	88	0x5 8	D0 / QA	D7 / H
twelfth	12	89	0x5 9	D1 / QB	D6 / G
twelfth	12	90	0x5a	D2 / QC	D5 / F
twelfth	12	91	0x5b	D3 / QD	D4 / E
twelfth	12	92	0x5c	D4 / QE	D3 / D
twelfth	12	93	0x5d	D5 / QF	D2 / C
twelfth	12	94	0x5e	D6 / QG	D1 / B
twelfth	12	95	0x5f	D7 / QH	D0 / A
thirteenth	13	96	0x60	D0 / QA	D7 / H
thirteenth	13	97	0x61	D1 / QB	D6 / G
thirteenth	13	98	0x62	D2 / QC	D5 / F
thirteenth	13	99	0x63	D3 / QD	D4 / E
thirteenth	13	100	0x64	D4 / QE	D3 / D
thirteenth	13	101	0x65	D5 / QF	D2 / C
thirteenth	13	102	0x66	D6 / QG	D1 / B
thirteenth	13	103	0x67	D7 / QH	D0 / A
fourteenth	14	104	0x6 8	D0 / QA	D7 / H
fourteenth	14	105	0x6 9	D1 / QB	D6 / G
fourteenth	14	106	0x6a	D2 / QC	D5 / F

Shift Register	SR number	Pin Number (sw)	Pin Hex number (sw)	Pin Name (DIN PCB / SR IC)	Pin Name (DOUT PCB / SR IC)
fourteenth	14	107	0x6b	D3 / QD	D4 / E
fourteenth	14	108	0x6c	D4 / QE	D3 / D
fourteenth	14	109	0x6d	D5 / QF	D2 / C
fourteenth	14	110	0x6e	D6 / QG	D1 / B
fourteenth	14	111	0x6f	D7 / QH	D0 / A
fifteenth	15	112	0x70	D0 / QA	D7 / H
fifteenth	15	113	0x71	D1 / QB	D6 / G
fifteenth	15	114	0x72	D2 / QC	D5 / F
fifteenth	15	115	0x73	D3 / QD	D4 / E
fifteenth	15	116	0x74	D4 / QE	D3 / D
fifteenth	15	117	0x75	D5 / QF	D2 / C
fifteenth	15	118	0x76	D6 / QG	D1 / B
fifteenth	15	119	0x77	D7 / QH	D0 / A
sixteenth	16	120	0x7 8	D0 / QA	D7 / H
sixteenth	16	121	0x7 9	D1 / QB	D6 / G
sixteenth	16	122	0x7a	D2 / QC	D5 / F
sixteenth	16	123	0x7b	D3 / QD	D4 / E
sixteenth	16	124	0x7c	D4 / QE	D3 / D
sixteenth	16	125	0x7d	D5 / QF	D2 / C
sixteenth	16	126	0x7e	D6 / QG	D1 / B
sixteenth	16	127	0x7f	D7 / QH	D0 / A

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