

DIN & DOUT pin-numbers

The following table shows the relation between pin- and serial-register-numbers on the software side, and physical pins and their labeling on the hardware side. Shiftregisters are always counted from 1 (also on the software-side), and pins are always counted from 0.

Please note that the order of DOUT pins is reversed compared to DIN pins. For a deeper explanation of this issue, refer the information after the table.

Pin 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 |
| 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 |

| Shift Register | SR number | Pin Number (sw) | Pin Hex number (sw) | Pin Name (DIN PCB / SR IC) | Pin Name (DOUT PCB / SR IC) |
|----------------|-----------|-----------------|---------------------|----------------------------|-----------------------------|
| 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 |
| 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 |

| Shift Register | SR number | Pin Number (sw) | Pin Hex number (sw) | Pin Name (DIN PCB / SR IC) | Pin Name (DOUT PCB / SR IC) |
|-----------------------|------------------|------------------------|----------------------------|-----------------------------------|------------------------------------|
| 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 |
| 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 |

| Shift Register | SR number | Pin Number (sw) | Pin Hex number (sw) | Pin Name (DIN PCB / SR IC) | Pin Name (DOUT PCB / SR IC) |
|----------------|-----------|-----------------|---------------------|----------------------------|-----------------------------|
| fifteenth | 15 | 119 | 0x77 | D7 / QH | D0 / A |
| sixteenth | 16 | 120 | 0x78 | D0 / QA | D7 / H |
| sixteenth | 16 | 121 | 0x79 | 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 |

Numbers, labels and order of pins

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 labeled A / QA, D7 is labeled H / QH.

In TK's layouts the labels for IC-pins are I0 - I7, O0 - O7, 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 hardware 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 always the higher pin value on hardware level for DOUT chains.

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

If you want to read more about this, refer this forum discussion:

<http://www.midibox.org/forum/index.php/topic,12379.0.html>

Pin mappings in software (assembler)

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</file>
```

```
#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 - overlaid by
datawheel
#define DEFAULT_DIN_MENU_LEFT      4      ; NOT USED - overlaid by
datawheel</file>
```

```
;;      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</file>
```

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Last update: **2008/11/25 05:39**

