Technical Specifications and Register Map For

mLink 12bit Digital Port Expander Module (HCMODU0180)

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Specifications

Module specifications:

Module code:	HCMODU0180
Supply Voltage (VDD):	3V to 5.5V
Current consumption (no load):	4.5mA
Interfaces:	I2C & 12 x digital I/O pins
I2C Interface speed:	400kbits/s (fast mode)
I2C default address (HEX):	0h50
Maximum number of modules:	5 with pullups fitted, 112 with pullups removed*
Module dimensions (inc headers):	43mm x 19mm x 11.5mm

*Note the maximum number of connected modules will depend on cable lengths and power requirements of each module. Do not exceed 5 mLink modules connected in series with all pullups fitted.

Digital IO pin specifications:

Digital output max freq:	1.54KHz
Digital Input low level voltage:	-0.3V to 0.3 x VDD
Digital Input high level voltage:	0.7 x VDD to VDD + 0.3V
Digital output pin current source:	Max 10mA
Digital output pin current sink:	Pins 0 to 2 & 5 to 11 max 10mA
	Pins 3 & 4 max 4mA
Digital output pullup resistor:	30K to 80K Ohms

Register Map

Register quick reference table

REGISTER	REG ADD	Reg Bit 7	Reg Bit 6	Reg Bit 5	Reg Bit 4	Reg Bit 3	Reg Bit 2	Reg Bit 1	Reg Bit 0
STATUS	0h00	RESERVED						REGERR	I2CERR
I2C ADD (Def = 0h50)	0h01	RESERVED	I2CADD						
MODULE TYPE	0h02	0h01							
MODULE SUBTYPE	0h03	0h00							
FIRMWARE VERSION	0h04	0hXX							
RESERVED	0h05 to 0h09	RESERVED							
DIO DIR LOW	0h0A	DIR7	DIR6	DIR5	DIR4	DIR3	DIR2	DIR1	DIR0
DIO DIR HIGH	0h0B	x				DIR11	DIR10	DIR9	DIR8
DIO DATA LOW	0h0C	DATA7	DATA6	DATA5	DATA4	DATA3	DATA2	DATA1	DATA0
DIO DATA HIGH	0h0D	0				DATA11	DATA10	DATA9	DATA8

Status register

Register address: 0h00
Default value: 0

7	6	5	4	3	2	1	0
RESERVED						REGERR	I2CERR
r						rw	rw

Bits 7:2 Reserved
Bit 1 **REGERR**: Register access error
      This bit is set by hardware and reset by software
      0: No register access error
      1: Register access error caused by attempting to access an non-existent register,
      writing an illegal value to a register, or writing to a read only register

Bit 0 **I2CERR**: I2C bus access error
      This bit is set by hardware and reset by software
      0: No I2C error
      1: An I2C bus error has occurred

Writing any value to this register will clear all bits

I2C Address Register

Register address: 0h01
Default value: 0h50

7	6	5	4	3	2	1	0
N/A	I2CADD						
r	rw						

Bit 7 N/A: Returns 0
Bits 6:0 **I2CADD**: 7 bit I2C address (default factory reset value = 0h50)
      These bits are set by software
      Values written to this register will be stored in non-volatile memory
      Valid address range is 0h08 to 0h77. Addresses outside this range will be ignored but
      will set the **REGERR** bit in the status register.

      Before a new address can be written to this register it must first be unlocked by
      writing bytes 0x55 followed by 0xAA. The new address byte must then be written
      within 100ms of writing the 0xAA byted otherwise the unlock process will timeout and
      reset.

Module Type Register

Register address: 0h02
Default value: 0h01

7	6	5	4	3	2	1	0
MTYP							
r							

Bits 7:0 **MTYP**: 8 bit value representing the module type.
    This register will always return 0h01 signifying this module type is 'Temperature & humidity sensor'

Module Subtype Register

Register address: 0h03
Default value: 0h00

7	6	5	4	3	2	1	0
STYP							
r							

Bits 7:0 **STYP**: 8 bit value representing the module subtype.
    This register will always return 0h00 signifying this module subtype is 'DHT22'

Firmware Version Register

Register address: 0h04
Default value: 0hXX

7	6	5	4	3	2	1	0
FWMAV				FWMIV			
r				r			

Bits 7:4 **FWMAV**: 4 bit value representing the modules major firmware version
Bits 3:0 **FWMAV**: 4 bit value representing the modules minor firmware version

DIO Direction Register Low

Register address: 0h0A
Default value: 0hFF

7	6	5	4	3	2	1	0
DIR7	DIR6	DIR5	DIR4	DIR3	DIR2	DIR1	DIR0
rw							

Bits 7:0 **DIR[7:0]**: Data direction for DIO pins 7 to 0.

    These bits are set by software
    0: Output (push-pull)
    1: Input (with pullup)

DIO Direction Register High

Register address: 0h0B
Default value: 0hFF

7	6	5	4	3	2	1	0
x				DIO11	DIR10	DIR9	DIR8
r				rw			

Bits 7:4 Don't care
Bits 3:0 **DIR[11:8]**: Data direction for DIO pins 11 to 8.

    These bits are set by software
    0: Output (push-pull)
    1: Input (with pullup)

DIO Data Register Low

Register address: 0h0C
Default value: 0hXX

7	6	5	4	3	2	1	0
DATA7	DATA6	DATA5	DATA4	DATA3	DATA2	DATA1	DATA0
rw							

Bits 7:0 **DATA[7:0]**: Input/Output pin values for pins 7 to 0.
Can be used to read or write pin states irrespective of whether the pin is an input or output.
0: Low logic level
1: High logic level

DIO Data Register High

Register address: 0h0D
Default value: 0hXX

7	6	5	4	3	2	1	0
		0		DATA11	DATA10	DATA9	DATA8
rw							

Bits 7:4 Returns 0
Bits 3:0 **DATA[11:8]**: Input pin values for pins 11 to 8.
Can be used to read or write pin states irrespective of whether the pin is an input or output.
0: Low logic level
1: High logic level