

DuinoMite MMBasic ReadMe

This is an implementation of MMBasic running on the DuinoMite series of boards from Olimex (<http://olimex.com>). It supports all the standard Maximite and advanced MMBasic features such as optional line numbers, user defined subroutines/functions and the full screen editor.

For documentation on MMBasic please refer to the "MMBasic Language Manual" included with this upgrade. For support on using the DuinoMite series and documentation regarding their hardware configuration and features please visit the Olimex website.

As far as the hardware is concerned, when running on the DuinoMite, MMBasic supports:

- Ten I/O pins that work normally (as on the Maximite).
- Five additional I/O pins that will operate with some hardware imposed limitations.
- The two hardware serial ports (giving a total of four serial ports).
- The CAN bus on the DuinoMite Mega.
- Reading the battery voltage on the DuinoMite and DuinoMite Mega.

However, please note that there are some features that are not supported:

- The watch crystal oscillator.
- SPI on the UEXT connector.
- USB OTG on the Mega.

You can easily upgrade your DuinoMite to my DuinoMite MMBasic (the software required is supplied with the upgrade) and you can just as easily revert back to the Olimex version of my software if you want to.

To use the serial communications over USB feature on a Windows computer you need to download and install the Windows Serial Port Driver from <http://geoffg.net/maximite.html#Downloads>. For Macintosh users this should automatically work but you can find helpful notes at the same location.

To be notified of future upgrades please register at <http://geoffg.net/maximite.html>.

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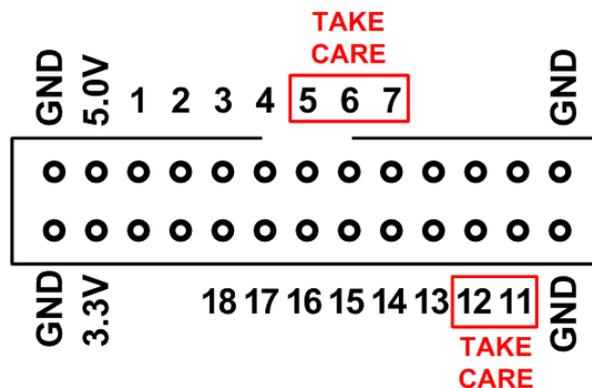
Hardware Considerations

This version of MMBasic does not support the full number I/O pins claimed for this board due to hardware limitations. The only way you can use all the claimed I/O pins is by giving up the use of the micro SD card, the video output (both VGA and composite) and other features. For all the pins to operate as both input and outputs (same as on the Maximite) you would also need to modify the board by removing components and/or cutting tracks.

Few people would want to go to these lengths and so MMBasic only implements the I/O pins that can work without confusing tradeoffs or by disabling important features. In summary, when running on the DuinoMite, MMBasic supports:

- Ten I/O pins that work normally (as on the Maximite). These are 1 to 4 and 13 to 18.
- Five additional I/O pins (5, 6, 7, 11 and 12) where you should take care and consult the circuit schematic before using them. There are extra components attached to these pins and these could interfere with their use as I/O pins (particularly as inputs).

This is the external view of the 26 pin IDC connector showing the supported I/O pins:



The following points should be noted when using MMBasic on the DuinoMite:

- Due to the hardware design of the DuinoMite MMBasic will default to disabling the composite video feature. To enable composite video, connect to the DuinoMite via USB and issue either one of the following two commands:
CONFIG COMPOSITE PAL -or- CONFIG COMPOSITE NTSC.
Either of these two commands will permanently enable the composite detect on the VGA connector and select the correct video timing. For details of connecting the composite monitor please refer to the Olimex documentation.

Analog Inputs

- Pins 1, 2, 3 and 4 can be used as analog inputs.
- Pins 5 to 10 do not work as analog inputs (as they do on the Maximite).
- Pin 21 is a virtual pin number which can be used as an input to measure the battery voltage. ie, PRINT PIN(21) 'SETPIN is not required.

Digital Input/Output

- Pins 1 to 4 support 3V digital input/output (same as the Maximite).
- Pins 5, 6, 7, 11 and 12 are 5V tolerant and support digital input/output with open collector output but may have other components connected to them (check the schematics).
- Pins 13 to 18 are 5V tolerant and support digital input/output with open collector output (same as the Maximite).
- Pins 8 to 10 and 19 and 20 are not supported.

Counting Inputs

- Pins 5, 6 and 7 support frequency, period or counting measurement.
- Pins 11 to 14 do not support these functions (as they do on the Maximite).

Serial Communications

- COM1: is a software UART on pin 15 (Rx) and 16 (Tx). If flow control is specified pin 17 is RTS (receive flow control) and pin 18 CTS (transmit control). If the Data output Enable (DE) signal for RS485 is enabled it will be on pin 17.
- COM2: is a software UART on pins 13 (Rx) and 14 (Tx).
- COM3: is the hardware UART on the DuinoMite UEXT connector.
- COM4: is a second hardware UART and it appears either on the RS232 connector (Mega version) or pins 11 (Rx) and 12 (Tx) on the other boards.
- Within MMBasic the syntax for using the hardware UARTs is the same as for other ports (ie, OPEN "COM3:38400" AS #1).
- The baud rate for the software UARTs must be 300, 600, 1200, 2400, 4800, 9600 or 19200. The baud rate for the hardware UARTs can be any value from 300 to 460800.

SPI and 1-Wire Communications

- The SPI() and 1-Wire function operates as normal (refer to the MMBasic Language Manual).
- Hardware SPI is not supported on the UEXT connector because it would conflict with the use of the SD card.

I²C Communications

- I²C is on the UEXT connector and simultaneously available on I/O pins 5 (SDA) and 6 (SCL).
- You do not need external pullup resistors as these are included on the board. However, these resistors also interfere with the use of pins 5 and 6 as normal I/O pins.

CAN Communications

There is a special version of MMBasic which includes the CAN (Controller Area Network) module written by John Harding who has kindly made it available for users of the DuinoMite.

This version can be downloaded from <http://geoffg.net/maximite.html#Downloads> and is different from the standard firmware that runs on the DuiniMite. When this firmware has been loaded the bootup version number (on the VGA monitor) will include the suffix "with CAN".

This download also includes the documentation for the CAN command. Other than support for CAN this version will operate the same as standard MMBasic.