# DIPFORTy1 "Soft-Propeller"

**2015**

First year an Xilinx 7 series based product or Zynq based product passed into semifinals for the

HackdaDay prize

**Trip To Space**

A small step for those on the way to

All Programmable ...

**... world?**

open source hardware

## Overview

The DIPFORTy1 "Soft Propeller" is based on the Xilinx Zynq-7010, a System on Chip which contains a FPGA and a Dual Core ARM A9+ processor with enough logic gates to become a Propeller. The board also has 16 MByte of Flash used for configuration and everything fits on a Propeller-compatible DIP 40 pinout.

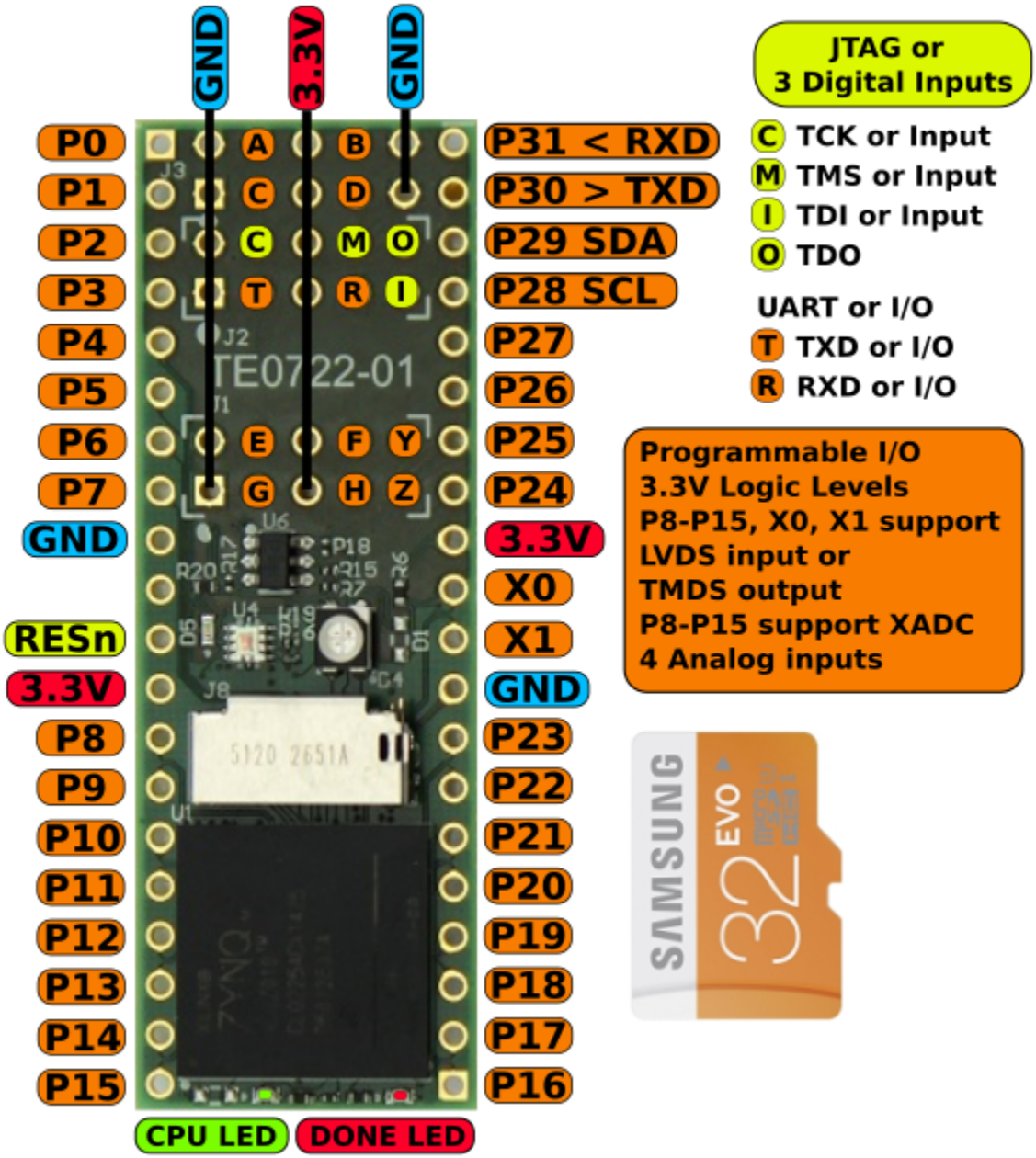
DIPFORTy1 "Soft-Propeller" is the lowest cost Zynq-based module ever made and the first ZYNQ module that can use existing bases and project boards (Parallax Propeller chip compatibility). All this in a compact 1.8 x 5.1 cm form factor, at the most competitive price.

⚠ Only PCB Revision 01 is Open Source.

## Resources

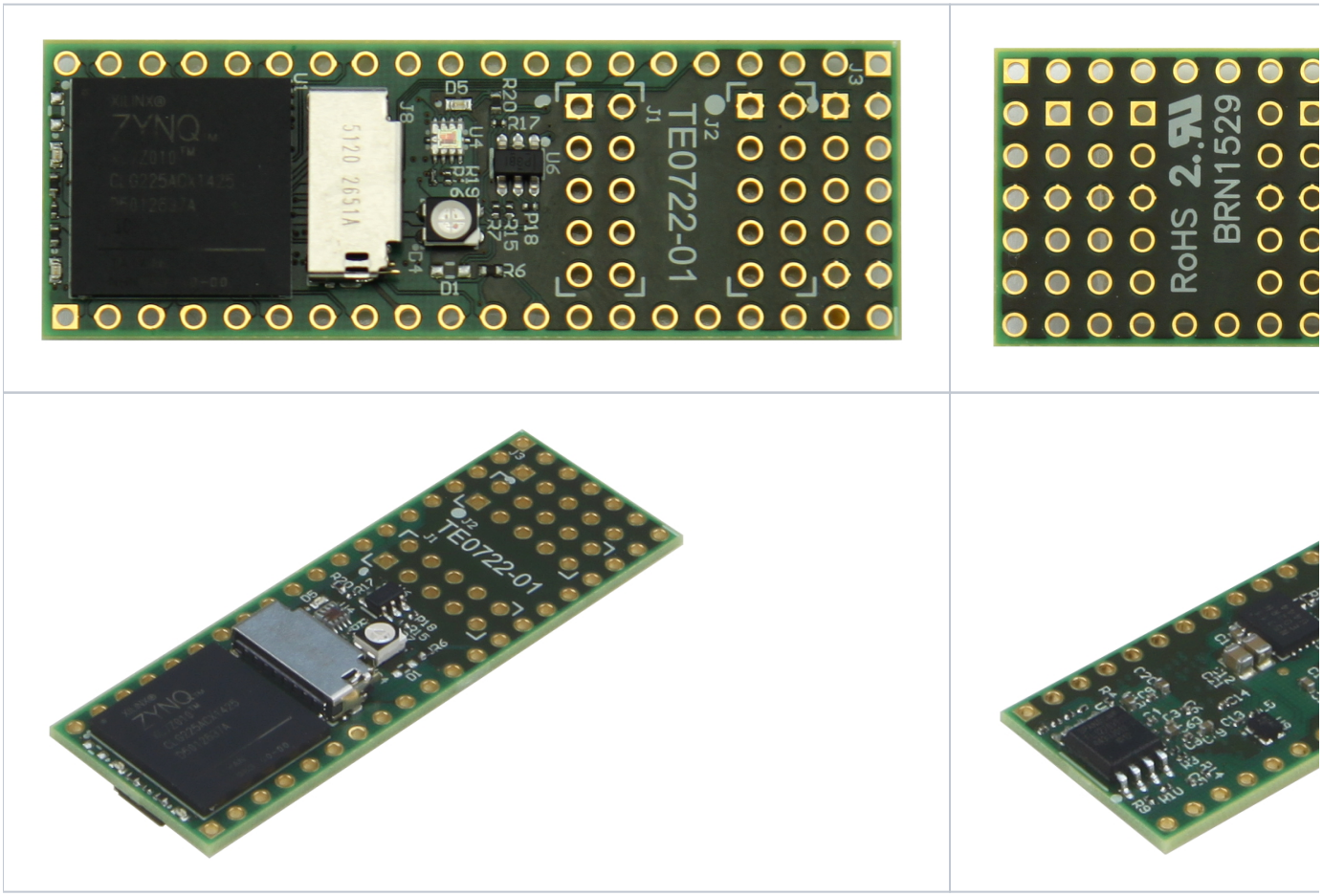
- TE0722 Resources

## DIPFORTy1 PINOUT




Pinout for Parallax Propeller compatible names

| TOP Side | Bottom Side |
|---|---|




## Features

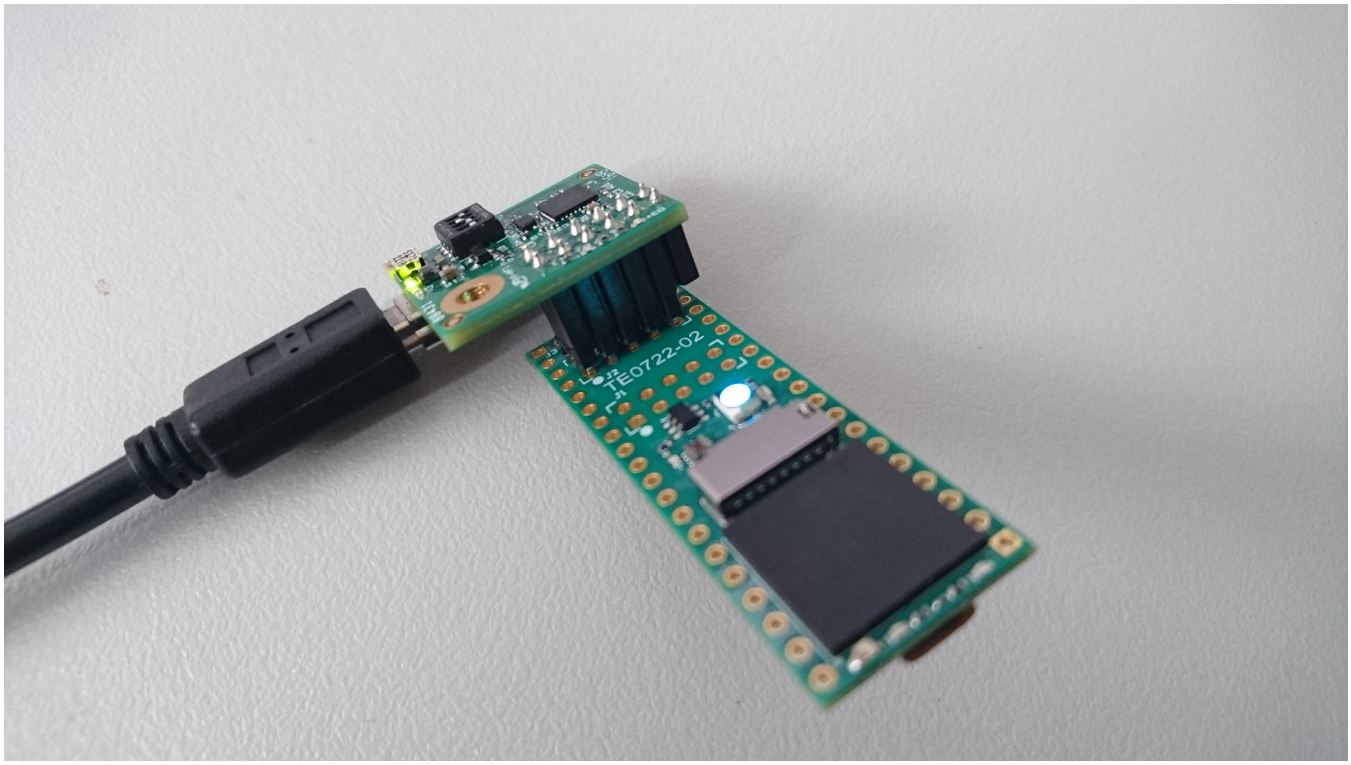
- Xilinx ZYNQ-7: XC7Z010-CLG225
  - 16 MByte SPI Flash (primary boot)
  - 33.333 MHz Clock (MEMS oscillator)
- DIP40 form factor
  - 2 x 20 holes for socket pins or pin-header
  - Size: 18 x 51 mm
- Total user accessible PL I/O: 46 (+3 Input only)
  - DIP40 header pins: 34 I/O
  - XMOD J1: 6 I/O
  - XMOD J2: JTAG + 2 I/O (or 3 input + 2 I/O)
  - XMOD J3: 4 I/O
- 3.3V single supply
- RGB LED (PL I/O connected)
- "Done" LED (inverted polarity)
- User LED (ARM CPU MIO GPIO)
- MicroSD card socket (MIO, ZYNQ secondary boot media)
- Sil1143 Proximity and ambient light sensor

## JTAG Header

TE0722 JTAG Connector J2 -TOP view

## Use XMOD - Programmer

XMOD Programmer can be used as JTAG-Programmer and UART Interface.




JTAG header pinout using "alternate" mapping for XMOD-FT2232 JTAG adapter. This mapping, if needed can be changed by reprogramming the XMOD-CPLD. Connect XMOD on the top side of the PCB (Side with FPGA and module name). Use XMOD Pin 1 to 10.

If TE0722 is powered via XMOD (max. ~ 100mA), use XMOD DIP-Switch:

| POS | Value |
|---|---|
| 1 | ON |
| 2 | OFF |
| 3 | ON |
| 4 | ON |

If TE0722 is powered with external 3.3V, use XMOD DIP-Switch:

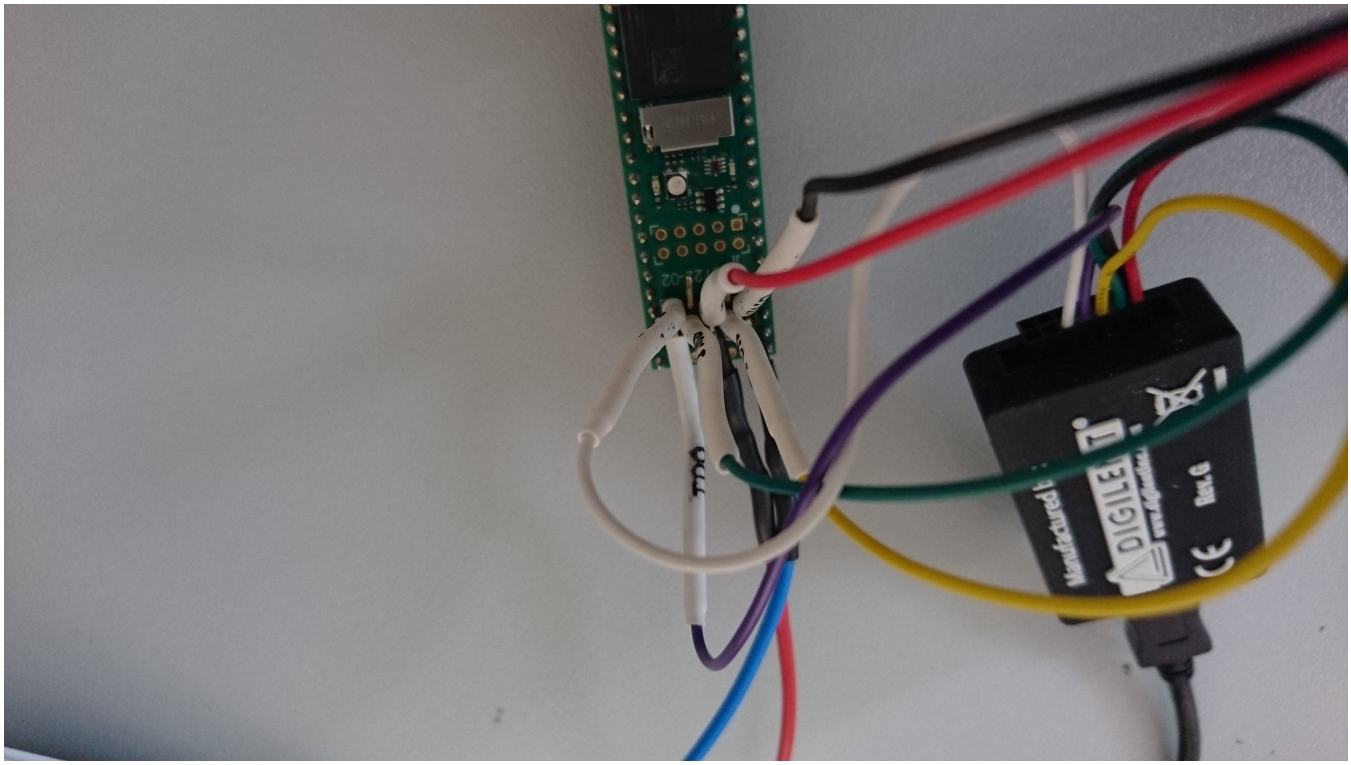
| POS | Value |
|---|---|
| 1 | ON |
| 2 | OFF |
| 3 | OFF |
| 4 | OFF |

For more details and downloads see:

- Xmod-FT2232H
- XMOD-Downloads

## Use other JTAG - Programmer

For example Xilinx Platform Cable USB2 or Digilent XUP USB-JTAG Programming Cable.




If you use a other programming cable than XMOD, TE0722 need a external 3.3V power supply. Use following connection:

| TE0722-J2 Pin | TE0722-Name | Platform Cable - Name | Platform Cable - Color | external power supply |
|---|---|---|---|---|
| 1 | GND | -- | -- | GND |
| 2 | GND | GND | black | -- |
| 3 | B34_L4_N | -- | -- | -- |
| 4 | TCK | TCK | yellow | -- |
| 5 | 3.3V | VREF | red | -- |
| 6 | 3.3V | -- | -- | 3.3V |
| 7 | B34_L10_P | -- | -- | -- |
| 8 | TMS | TMS | green | -- |
| 9 | TDI | TDI | white | -- |
| 10 | TDO | TDO | violet | -- |