



# Getting Started

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## Mpression Hydra Board

Revision 1.0

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# 1. For Ensuring Safe Use

Be sure to follow the instructions given in this Manual which are intended to prevent harm to the user and others as well as material damage.

## 1.1 Legend

 <b>Danger</b>	Indicates an imminent hazardous situation which if not avoided will result in death or serious injury.
 <b>Warning</b>	Indicates a potentially hazardous situation which if not avoided could result in death or serious injury.
 <b>Caution</b>	Indicates a potentially hazardous situation which if not avoided may result in minor or moderate injury or in property damage.

## 1.2 Cautions

 <b>Danger</b>	<p>Make sure to use the AC adapter (if uses or required) that is specified in this Manual or included one in package.</p> <p>Using an AC adapter not meeting the specifications described in this Manual will cause the kit to emit heat, explode, or ignite.</p>
 <b>Warning</b>	<p>Do not apply strong impacts or blows to the kit.</p> <p>Doing so may cause the kit to emit heat, explode, or ignite, or the equipment in the kit to fail or malfunction. This may also cause fire.</p>
	<p>Do not put the main unit or the AC adapter in cooking appliances such as microwave ovens, or high-pressure containers.</p> <p>Doing so might cause the main unit or AC adapter to emit heat, explode, ignite, or emit smoke, or its parts to break or warp.</p>
	<p>Do not wrap the main unit that is in use with cloth or other materials that are likely to allow heat to build up inside the wrapping.</p> <p>This will cause heat to build up inside the wrapping which may cause the main unit to ignite or malfunction.</p>
	<p>When disposing of the main unit, do not dispose of it along with general household waste.</p> <p>Throwing the main unit into fire may cause it to explode. Dispose of the main unit following the laws, regulations, and ordinances governing waste disposal.</p> <p>Do not use the kit in places subject to extremely high or low temperatures or severe temperature changes.</p> <p>Doing so may cause the kit to fail or to malfunction.</p> <p>Always be sure to use the kit in a temperatures ranging from 5°C to 35°C and a humidity range of 0% to 85%.</p>

 <p><b>Warning</b> (Continued from previous page)</p>	<p>Do not pull the power supply cable with excessive force or place heavy items on it.</p> <p>Do not damage, break, bundle, or tamper with the power supply cable. Damaged parts of the power supply cable might cause a short circuit resulting in fire or accidents involving electrical shock.</p>
	<p>Do not unplug the power plug with wet or moist hands.</p> <p>This might cause injuries or equipment malfunctions or failures due to electrical shock.</p>
	<p>Plug the power plug securely into the outlet.</p> <p>If the power plug is not securely plugged into the outlet, it may cause accidents involving electrical shock or fire due to heat emitted.</p>
	<p>Do not connect many electrical cords to a single socket or connect an AC adapter to an outlet that is not rated for the specified voltage.</p> <p>Failing to do so may cause the equipment to malfunction or fail, or lead to accidents involving electrical shock or fire due to heat emitted.</p>
	<p>Periodically remove any dust accumulated on the power plug and around the outlet (socket).</p> <p>Do not use a power plug with dust accumulated on it because doing so will lead to insulation failure due to moisture which may lead to fire.</p> <p>Remove any dust on the power plug and around the outlet with dried cloth.</p>
	<p>Do not place any containers such as cups or vases filled with water or other liquid on this Board.</p> <p>If this Board is exposed to water or other liquids it may cause the Board to malfunction or lead to accidents involving electrical shock. If you spilled water or other liquid on this Board, immediately stop using the Board, turn off the power, and unplug the power plug. If you have any requests for repairs or technical consultation, please contact the Manufacturer.</p>
	<p>Do not place the kit on unstable places such as shaky stands or tilted locations. Doing so may cause injuries or cause this Board to malfunction if the Board should fall.</p>
 <p><b>Caution</b></p>	<p>Do not attempt to use or leave the kit in places subject to strong direct sunlight or other places subject to high temperatures such as in cars in hot weather. Doing so might cause the kit to emit heat, break, ignite, run out of control, warp, or malfunction.</p> <p>Also, some parts of the equipment might emit heat causing burn injuries.</p>
	<p>Unplug the power supply cable when carrying out maintenance of devices in which the main unit is embedded.</p> <p>Failure to do so may lead to accidents involving electrical shock.</p>
	<p>Do not place this Board in locations where excessive force is applied to the Board.</p> <p>Failure to do so may cause the PC board to warp, leading to breakage of the PC board, missing parts or malfunctioning parts.</p>
	<p>When using the kit together with expansion boards or other peripheral devices, be sure to carefully read each of their manuals and to use them correctly.</p> <p>Manufacturer does not guarantee the operation of specific expansion boards or peripheral devices when used in conjunction with this Board unless they are specifically mentioned in this Manual or their successful operation with this Board has been confirmed in separate documents.</p>

 <p><b>Caution</b> (Continued from previous page)</p>	<p>Be sure to turn off the power switch when moving this Board to connect to other devices. Failure to do so may cause this Board to fail or lead to accidents involving electrical shock.</p>
	<p>Do not clean this Board by using a rag containing chemicals such as benzine or thinner. Failure to do so will likely to cause this Board to deteriorate. When using a chemical cloth be sure to comply with any directions or warnings.</p>
	<p>Do not immediately turn on the power if you find that water or moisture had condensed onto the main unit after removing the board from the package. Condensation might occur on this Board when taking it out of the box, if the board is cool yet the room temperature is warm.</p>
	<p>Do not apply power to the Board while water or moisture has condensed on it because the moisture may cause the Board to break or may shorten the service life of the parts. When you first take this Board out of the box be sure to leave it at room temperature for a while before using it. If condensation or moisture has occurred on this Board, first wait for the moisture to fully evaporate before installing or connecting the Board to other devices.</p>
	<p>Do not disassemble, dismantle, modify, alter, or recycle parts unless they are clearly described as customizable in this Manual. Although this kit is customizable, if parts not specified in this Manual as customizable are modified in any way, then the overall product operation cannot be guaranteed. Please consult with Manufacturer beforehand if you wish to customize or modify any parts that are not described in this Manual as customizable.</p>

## 1.3 Developer Information

The Developer of this product is:

Altima Corp.

1-5-5 Shin-Yokohama, Kouhoku-ku, Yokohama, 222-8563 JAPAN

<http://www.altima.co.jp>

## 1.4 Inquiries

In case you have any inquiries about the use this product, please contact your local Macnica company or make inquiries through the contact form in the following web site:

<http://www.m-pression.com/contact>

Macnica companies:

- China & HK:            Cytech Technology            <http://www.cytech.com/>
- ASEAN & India:        Cytech Global                <http://www.cytechglobal.com/>
- Taiwan:                Galaxy Far East Corp.        <http://www.gfec.com.tw/>
- North America:        Macnica Americas            <http://www.macnica-na.com/>
- Brazil:                 Macnica DHW                 <http://www.macnicadhw.com.br/en/>
- Japan:                 Altima                         <http://www.altima.co.jp>
- Elsenia                         <http://www.elsenia.co.jp>

## 2. Overview

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### 2.1 Introduction

This getting started guide walks you through how to set up the Board. After reading this document, you will be able to:

- Perform basic setup for the Hydra Board.

### 2.2 Prerequisites

- Hydra Board
- Quartus II v12.1 SP1 or later

\* You can download Quartus II related information from the following URL  
<http://www.altera.com/products/software/sfw-index.jsp>

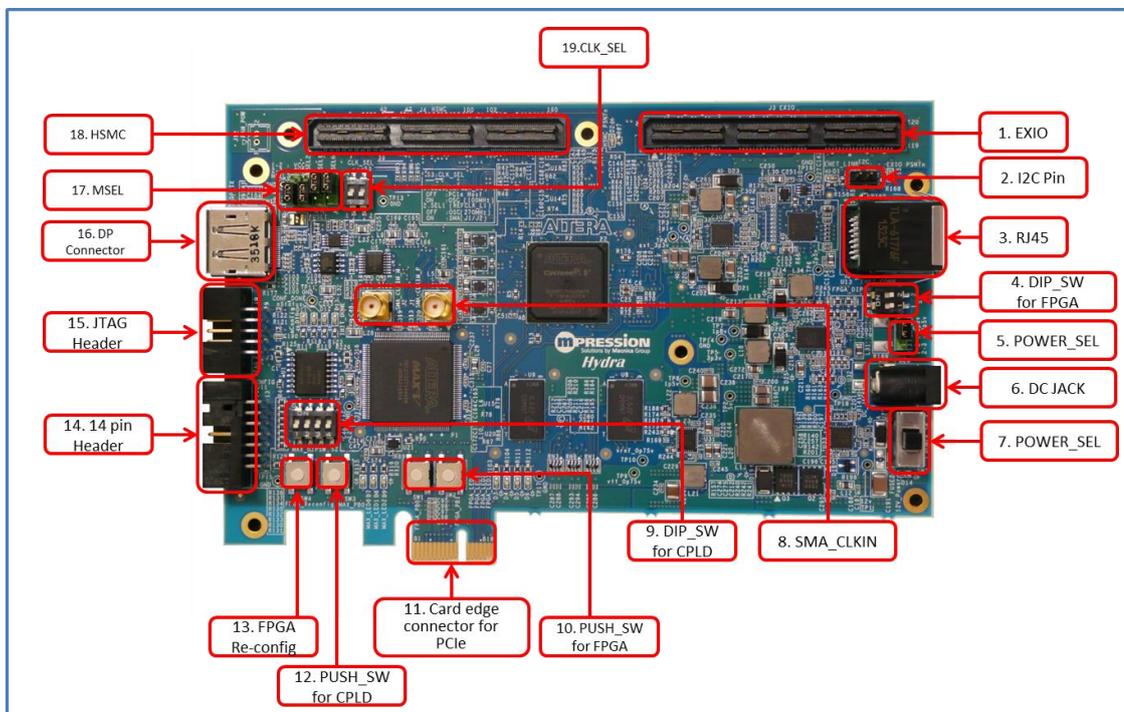
# 3. Board Settings

## 3.1 Board Layout

This section provides an overview of the Hydra Board and explains how to set it up.

Figure 2-1-1 shows the layout of switches and connectors used on the Hydra Board.

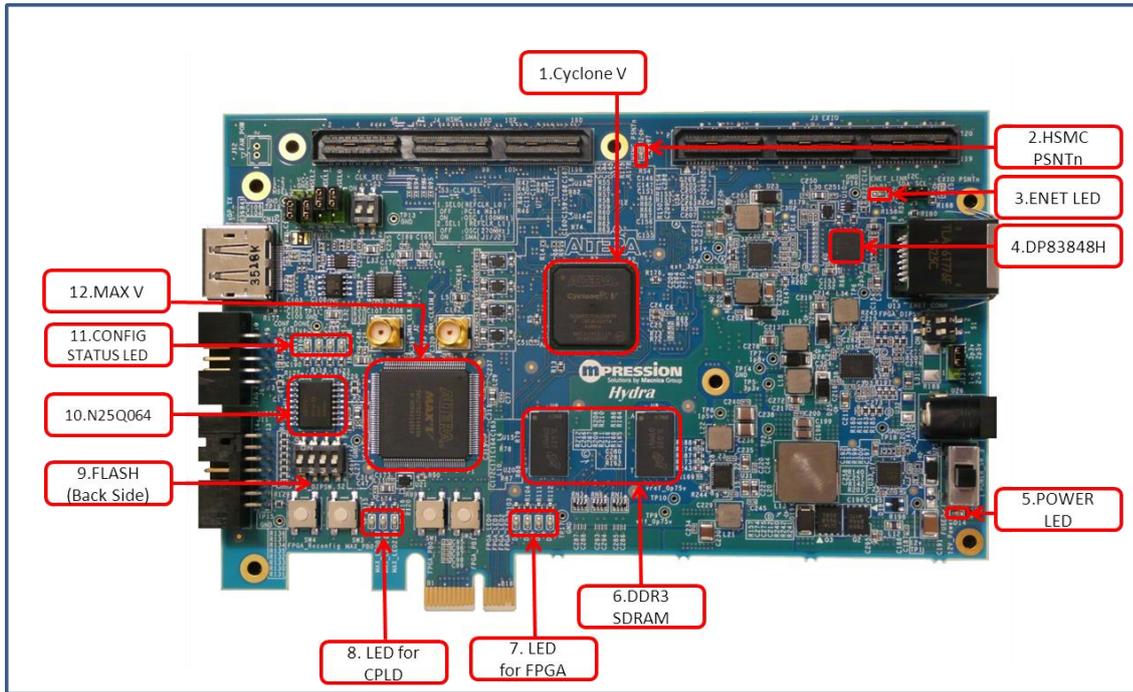
Figure 2-1-1. Hydra Switch/Connector Layout



- |  |   |
|--|---|
| 1 EXIO   | 11 Card edge connector for PCIe         |
| 2 I2C_Pin  | 12 General-purpose push switch for CPLD |
| 3 RJ45   | 13 FPGA configuration push switch       |
| 4 General-purpose DIP switch for FPGA                | 14 14-pin connector for external FPP    |
| 5 IO power supply selection pin for EXIO (2.5/3.3 V) | 15 FPGA JTAG connector                  |
| 6 DC Jack  | 16 DisplayPort connector                |
| 7 Power supply switch                                | 17 MSEL pin header                      |
| 8 SMA CLOCK IN                                       | 18 HSMC                                 |
| 9 General-purpose DIP switch for CPLD                | 19 CLK_SEL                              |
| 10 General-purpose push switch for FPGA              |   |

Figure 2-1-2 shows the layout of the major Hydra components.

Figure 2-1-2. Hydra Component Layout

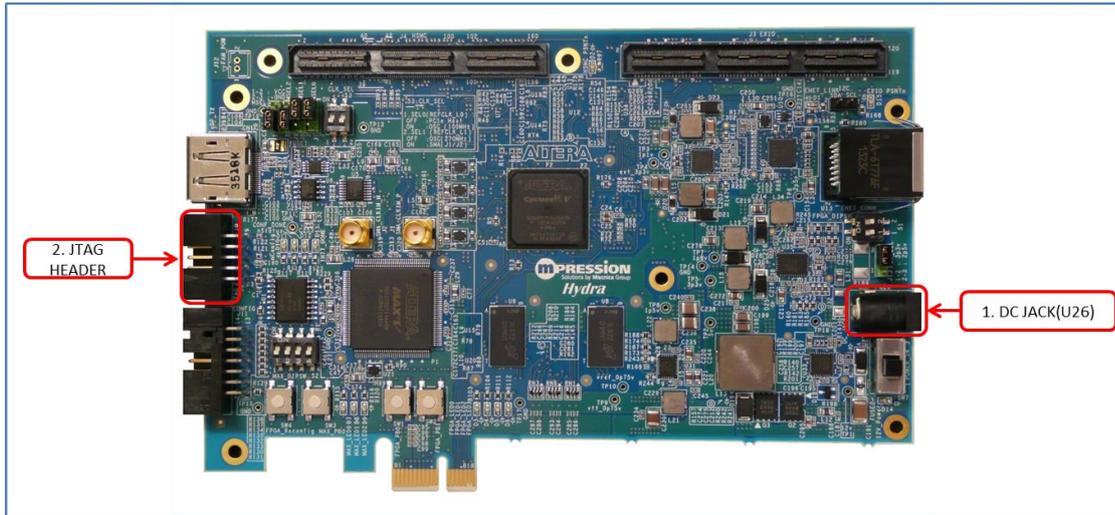


- |                                 |   |
|---------------------------------|---|
| 1 Altera Cyclone V GX FPGA      | 9 FLASH   |
| 2 HSMC PSNTn LED                | 10 N25Q064  |
| 3 Ethernet LED (ACT)            | - AS configuration ROM  |
| 4 TI DP83848H (Ethernet PHY)    | 11 FPGA status LEDs<br>(nSTATUS, nCONFIG, CONF_DONE, INIT_DONE) |
| 5 POWER LED                     | 12 Altera MAXV CPLD   |
| 6 DDR3 SDRAM                    |   |
| 7 General-purpose LEDs for FPGA |   |
| 8 General-purpose LEDs for CPLD |   |

## 3.2 External Connections

Figure 2-2-1 shows the layout of other Hydra external connectors.

Figure 2-2-1. Hydra External Connector Layout



- 1 External AC adaptor connector
- 2 JTAG 10-pin connector

## 4. Default Factory Design for the Hydra Board

### 4.1 Default Factory Design for the Hydra Board

This document explains the factory default FPGA design for the Hydra Board.

Figure 3-1-1 shows the FPGA design block diagram.

As basic operations, the DDR3 read/write test is performed by the Nios II in the FPGA design. In addition, LED1-LED0 is connected to the DIP switch, and LEDs light up or turn off as the switch turns on and off, respectively.

Figure 3-1-1. FPGA Design Block Diagram

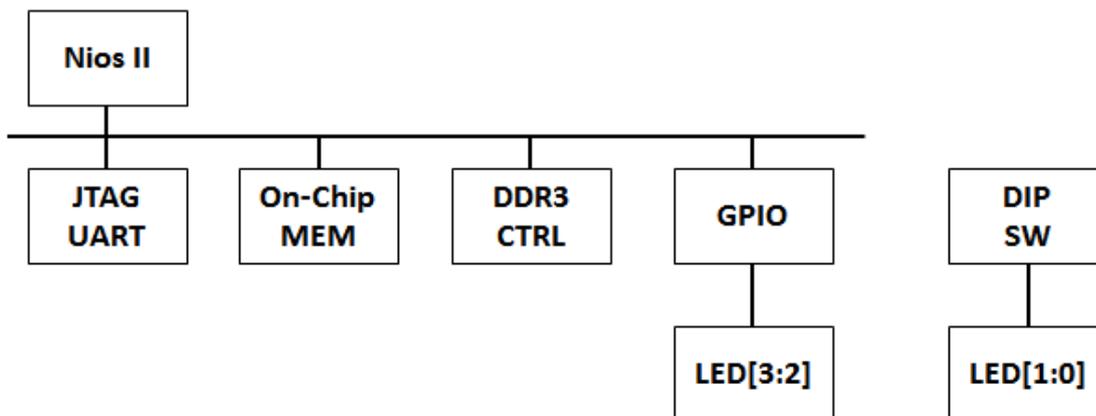
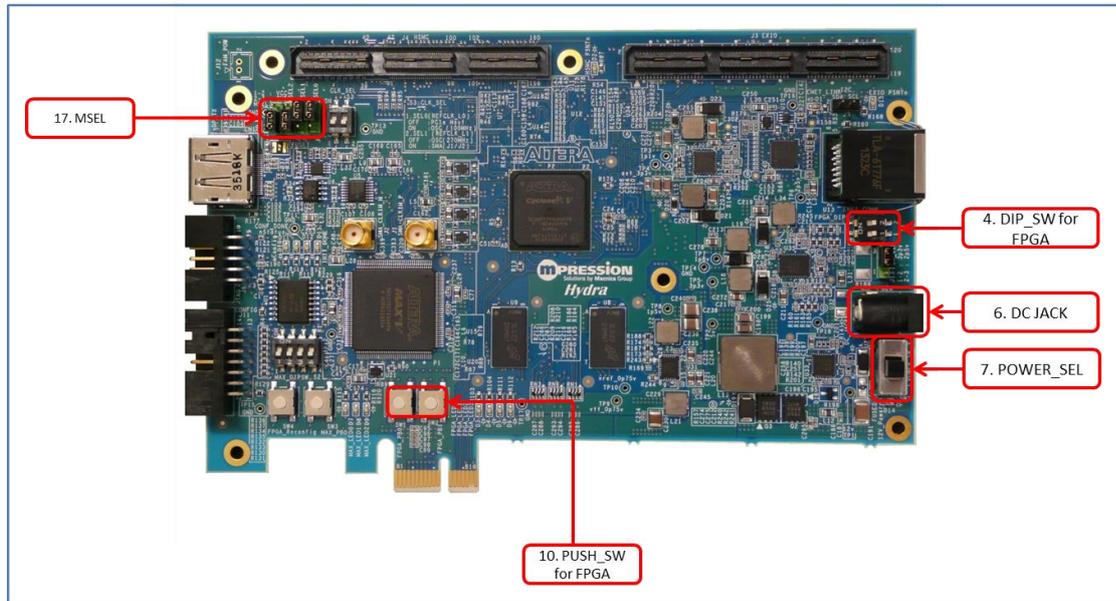


Figure 3-1-2. User Interface for FPGA Design



Follow the steps below to confirm that the FPGA design programmed into EPCS128 at the factory is working.

1. Connect the DC jack (U26) to the AC adapter supplied with the Hydra Board.
2. Confirm that all DIP switches (S1) have been turned off.
3. Confirm that MSEL 0-3 (J7-J10) is set to "0011."
4. Slide the power switch (SW7) to the "3" pin side.
5. Confirm that the 12V power LED (D14) lights up.
6. Several seconds later, confirm that LED0-1 (D3-D4) has lit up.

Once the DDR3 passes the read/write test, the above LEDs should light up.

7. Confirm that LED2-3 (D5-D6) lights up and turns off upon turning the DIP switch (S1) on and off, respectively.

## 5. Document Revision History

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Date	Version	Changes
2014/02/01	1.0	Document released