VMX pi
Vision/Motion Processor & Robotics Controller

OVERVIEW

VMX-pi transforms a Raspberry Pi general-purpose computer into an Intelligent Robot Processor / Controller —at a groundbreaking low price point.

Key specifications include:

- 30 Digital IO Channels

- 4 12-bit Analog IO Channels

- Quadrature Encoder decode

- 9-axis navX-technology IMU w/100Hz update rate

- Digital Communication Interfaces including CAN, SPI, I2C and UART

- Hi-speed internal communication with Raspberry Pi

- 12V DC input power supply for Raspberry Pi and external sensors at 5V and 3.3V DC.

- Real-time Clock and high-resolution sensor timestamps

FEATURES

- **Supported by VMX Robotics Toolkit:**
    - **Vision Processing and Video Streaming Tools**
    - **Real-time Linux for low-latency control applications**
    - **Robot Operating System (ROS) Node and Master**
    - **Network Time Server**
- **Locking connectors**
- **Design files for 3d-printed enclosure**
- **VMX-pi Aero: adds a barometric pressure sensor for altitude measures**

BENEFITS

featuring navX-technology

Supercharge your robot with:

- **Vision Processing**
- **Motion Processing**

Control your robot with:

- **Digital I/O and PWM Generation**

Connect your robot with:

- **Wired Communication Interfaces**
- **Wireless Communication Interfaces**
- **Quadrature Encoders**
- Analog Inputs

Synchronize multiple robots with:

- **Battery-backed Real-time Clock & Network Time Server**

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Kauai Labs
Build Better Robots®

VMX pi

Vision/Motion Processor & Robotics Controller

▶ Technical Specifications

VMX-pi

30 Digital IOs	4 Analog IOs	SPI, I2C, TTL UART	CAN 2.0b	9-axis IMU / Motion Processor

- 12VDC Supply
- 5/3.3V Voltage Translation
- Battery-backed Realtime Clock

Raspberry Pi 4B

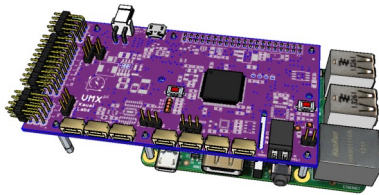|			
4-core 1.5Ghz 64-bit ARM Cortex-A72	1 to 4GB DDR RAM	Broadcom VideoCore V6 GPU	2 USB 3.0, 2 USB 2.0 Ports
	SD Card	CSI Camera Interface	
Gigabit Ethernet Networking	2.4 & 5Ghz 802.11n Wifi	Bluetooth 5	HDMI (4K Video-capable)

EASY-TO-USE DESIGN

Raspberry Pi 4B Configuration

Raspberry Pi 3 Configuration

I²C BUS · USB · SPI

UART · CAN-Bus

Wi Fi * · ▭ * · HDMI *
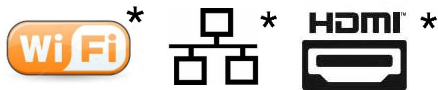
* These interfaces provided by the Raspberry Pi

Communication Interfaces (including Raspberry Pi 4B)

TYPE	MAXIMUM SPEED
USB 3.0*	5 Gb/s
Ethernet*	1 Gb/s
Wifi (802.11n)*	150 Mb/s
Bluetooth 5*	2 Mb/s
CAN 2.0b	1Mbp/s
SPI	8Mhz
I2C	400Khz
UART	230.4 kbps

I/O Interfaces

TYPE	Description	CAPABILITIES
Digital I/O	30 Channels	PWM Generation & Capture, Quadrature Encoders, Interrupt Inputs, SPI, I2C, UART
Analog I/O	4 Channels	12-bit A-D Converter, Analog Triggering

Key Features

FEATURE	DESCRIPTION	BENEFIT
Automatic IMU Calibration	Self-calibration ; storage of calibration in flash memory; continuous gyro recalibration during operation	High-accuracy yaw, pitch and roll measures with no calibration effort required.
2.1A Raspberry Pi & .5A External Device Power Supplies	Distributes power from a single 12VDC Supply to all compute and sensor resources	Simplifies Robot electric wiring
Voltage Translation & Circuit Protection	Jumper-selectable 5V or 3.3V signals and power supply to external sensors	Flexible device interfacing
Open-source Libraries and Sample Code	Libraries and Samples for developing Robot Applications	Accelerated application development

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