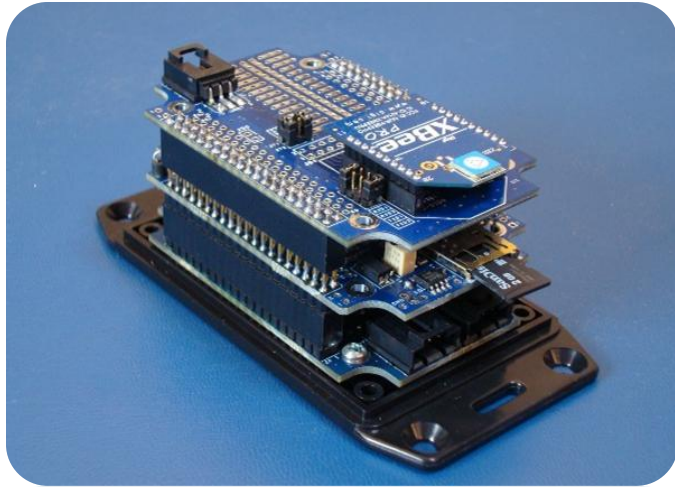
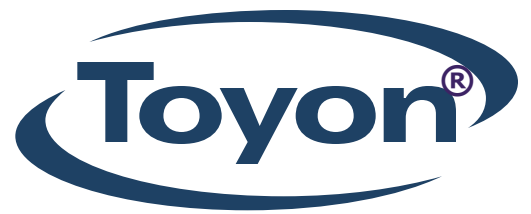


# ► CANDiY™ for Rapid Prototyping

Guidance, Navigation and Control (GNC) Systems



## CANDiY Features:

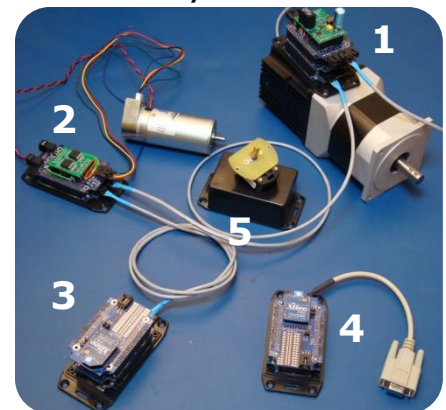
- Small, Stackable, Flexible Rapid Prototyping Tool for Embedded Systems
- Semi-Productized
  - CAN, RS232, JTAG already connectorized
  - Built to fit small enclosure
  - Easily add application connectors
- Wired networking
  - Uses CAN for wired control/sensor networks
- Wireless networking
  - Zigbee (XBee) module for wireless control/sensor networking
- Data Logging
  - MicroSD card for logging large amounts of data
- Flexible Application Space
  - Multiple perfboard options for wiring-in application specific circuitry

## Why use CANDiY?

- In robotics, automation and sensor network development several common problems arise:
  - Need for easy connectorization
  - Need for a rugged enclosure with minimal cutting and mounting
  - Need to network multiple  $\mu$ Cs for complex systems
  - Need for both wired and wireless networking
  - Need for prototyping space for application specific circuitry
- CANDiY meets all of these needs
- Uses free AVRStudio IDE/Compiler
- Free design tools to help plan, organize and document designs
- Free library source code for common sensors like ADCs and optical encoders

### Automation Example:

1. CAN, Gearhead Servo via RS232
2. CAN, Custom H-bridge, DC Servo, Encoder
3. CAN, Data logger, XBee
4. XBee, PC via RS232
5. Enclosure box (black)



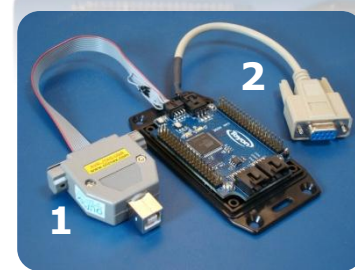
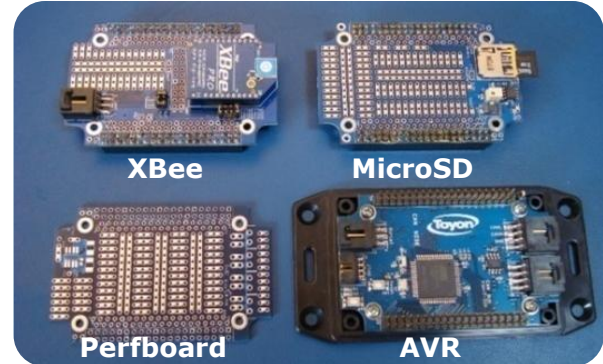
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## CANDiY: Low Cost Rapid Development Tool for Sensor/Control Networks

- Four circuit boards, can stack as many as desired in any order
- Each board has two 40 pin stackable header connectors which allow all boards to be compactly and securely stacked
- Special microcontroller-application interface circuitry is often required when developing prototype or one-off sensor/control applications
- Each circuit board in the suite has a complete breakout of all of the stacking header pins, a perfboard prototyping area, and a connector area at the board edges.
- Allows development of fully connectorized and contained prototype circuits at a near product-level of quality with little effort.



### Getting Started:

1. Purchase one USB-JTAG programmer (<\$80)
2. Purchase CANDiY boards
3. All software is free

### • Microcontroller Board (AVR)



- Using Atmel's 8 bit AVR  $\mu$ C (AT90CAN128) featuring CAN, SPI, USART, TWI communication interfaces. Developed using the free avr-gcc compiler and AVRStudio development environment (provides debug interface)
- Free library code for common sensors/actuators and schematic tools

### • Wireless Board (XBee)



- Works with XBee modules from Digi to provide easy wireless networking. Based on the Zigbee (802.15.4) standard
- Small prototyping space

### • Data Logger Board (MicroSD)



- A MicroSD card slot connects to the AVR via the SPI interface for gigabytes of data logging
- General purpose 500 mA, up to 15.5 V adjustable voltage regulator built in
- Large prototyping (perfboard) area

### • Perfboard with High Current Connectors



- Large prototyping perfboard area, with 0.1" pitch area for connectors along board edges
- Footprints and breakout nodes for up to 4 Molex Eurostyle 3.5 mm 8 A connectors (for motor control or other high power applications)

## Example Applications:

- High current servo motor controller
- Control interface to industrial equipment (e.g. smart servo motors, high power traction motors)
- Network interface for sensors (e.g. GPS, inertial measurement units (IMUs), analog sensors)
- Wireless telemetry and control link for autonomous robots

