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Programming with easyC and WPILib
Speakers

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Why Use easyC and WPILib

- It makes programming easier – reduces the “barrier to entry” (marketing-eese for gives people access with less experience)
- easyC is unified environment with all aspects of FRC & FVC programming tied together in a single package.
- Your team focuses on your problem – not embedded processor programming
- You don’t have to reinvent the wheel – the base code is already there
- easyC Gives a common base between FRC and Vex platforms
What You’re Going to See Today

- Show how to set up and test motors
- How to write operator control programs
- How to write autonomous programs
- How to use the hard-to-use sensors - \textit{encoder, gyro, CMU Camera, Interrupt Watcher}
- Learn more about using WPILib outside of the easyC environment
- Do all this right before your very eyes
  - Nothing up our sleeves
  - No pre-canned programs
Audience Poll

- How many are interesting in learning more about programming for the Vex Robotics System?
- How many are interesting in learning more about programming for FRC?
- How many are novice programmers?
- How many are experienced programmers?
Good News!

- This conference is applicable for everyone.
Who is Intelitek?

- Intelitek is a world-leading developer, producer and supplier of industrial CNC machines and technology training solutions.

- Our educational solutions are the ideal choice for Pre-Engineering programs, Automation Programs and Middle School and High School Technology Programs.

- Our educational and industrial product line covers subjects such as CAD, CAM, CNC, robotics, machine vision, FMS, CIM, hydraulics, pneumatics, PLC, sensors, process control and data acquisition. We also offer e-learning solutions designed to prepare students for careers in technologically advanced business environments.

- For over 20 years we have provided comprehensive solutions for training in engineering, mechatronics, automated manufacturing and industrial technologies.
More than 10,500 CNC and 12,500 robots installed worldwide
  ▸ PLTW
  ▸ Skills USA
More than 1,100 CNC machines to industrial accounts
  ▸ World leader in industrial Benchtop VMC’s
250 CIM installations worldwide
More than 500 Labs worldwide
Over **$250 Million installed** in North America
What is easyC?
easyC Development Timeline

- January 2005 – intelitek introduced to Vex
- April 2005 – Beta version of easyC demonstrated to RadioShack at FIRST Championship
- July 2005 - easyC version 1.0 developed for RadioShack for the Vex robotics system.
- September 2005 - Version 2.0 for Vex released for the 2006 FVC challenge
- Version 2.5 for FRC released for 2006 FRC kickoff.
- easyC Pro for FRC and Vex released for 2007 FRC kickoff.
Robot Configuration
On-line Window

- In order to use the On-Line control, the On-Line code must be downloaded to the Vex controller.

- Motors:
  - Value
  - Subgroup
  - Input Directions

- Interrupts:
  - Reset All

- Interrupts:
  - #1
  - #2
  - #3
  - #4
  - #5
  - #6

- Interrupts:
  - #7
  - #8

- MOTORS:
  - #1: Left Motor
  - #2: Right Motor

- ANALOG/DIGITAL:
  - #1: Gyro
  - #2: Digital Input
  - #3: Digital Input
  - #4: Digital Input
  - #5: Digital Input
  - #6: Digital Input
  - #7: Digital Input
  - #8: Digital Input
  - #9: Digital Input
  - #10: Digital Input
  - #11: Digital Input
  - #12: Digital Input
  - #13: Digital Input
  - #14: Digital Input
  - #15: Digital Input
  - #16: Digital Input
Graphics Display Window
easyC Syntax Editor

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Competition Project with Operator Control

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Driving the Robot Autonomously

- Intelitek
Using the Encoder

- Intelitek
Driving Straight with the Gyro

- Intelitek
CMU Camera

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What’s WPILib

- WPILib is the code that runs in the robot controller.
WPILib Additions

- Additional devices
  - Serial ports, compass, and more
- Drive functions built-in
- Better timer support
  - More timer options
  - Timer interrupt routines
  - Repetitive timer notifications
- Extensibility
  - You can add your own devices
  - Exchange devices from others
- Upgrading without source code merging
Summary

- Use easyC and WPILib to make your team more productive
  - Anyone can program the robot
  - You spend your time on your robot, not integrating code
  - Makes Vex a perfect learning tool for FRC Teams