



Programming Guide

Introduction

For all Official Vex & intelitek technical support, refer to www.vexforum.com.
For all Official ROBOTC support refer to www.ROBOTC.net



When programming a VEX Robotics Competition Robot for autonomous competition, one needs three main things:

The first thing needed is the VEX Programming Cable which is available in the VEX Hardware Kit (276-2186) which interfaces between the computer and vex robot and allows code to be downloaded into the robot. This kit is available from VEXrobotics.com for \$49.99.

The Programming Hardware Kit comes with no bundled software.

The second thing you need is the software to interface with the Vex microcontroller. This software is the "IFI_Loader" software. This comes pre-bundled with easyC & ROBOTC, and is also available as part of the MPLAB

section of the Autonomous Files of this Appendix.

The third thing you need is software to write the code which will be used by the robot. There are currently three main options which can be used to program a robot for competition usage. You can program your robot using one of the following:

1. easyC v 2 (or newer) by intelitek
2. C Language (using MPLAB and the C18 compiler) by MicroChip
3. ROBOTC by the CMU Robotics Academy

Each team will need to pick one of these three options for their programming. For more information and the guidelines for competition usage for each of these options refer below.

easyC by intelitek



<http://www.intelitek.com>

easyC is designed to be a bridge between pure object-oriented block-style programming, and the actual 'C' language. Programming is done with a drag-and-drop interface which allows the user to create flow-chart type programs. As these flow charts are created, the easyC software will generate the corresponding C-code real time; this allows users to get a taste of the actual C-language while they program in easyC.

If a team wishes to program in easyC they need the following:

1. easyC Version 2 (or newer)
 - a. This is available for purchase from www.vexrobotics.com under "Programming".
2. The newest version of the VEX Master Code.
 - a. This is available as part of the Autonomous Files in this Appendix.
3. The newest, correct easyC Competition Template:
 - a. There are three updated Competition Templates provided in the Autonomous Files of this Appendix, one for each Challenge of the VEX Robotics Competition:
 - i. "VRC Tournament Template.ECT"
 - ii. "VRC Programming Skills Challenge Template.ECT"
 - iii. "VRC Robot Skills Challenge Template.ECT"

The competition template is essential, as it allows the robot to correctly transition between disabled, autonomous and enabled during matches.

Once all the required components are obtained, follow the instructions in the "easyC Autonomous Programming Guide" which is included in the Autonomous Files.

ROBOTC by the CMU Robotics Academy

<http://www.robotc.net>

ROBOTC is designed for engineering, programming, and robotics education. It provides users with the opportunity to utilize standard C-language while also offering many integrated support features. These support features include the ability to real-time monitor motor and sensor values while stepping through the code. This debug helps users understand how their code is interacting with the robot itself.

If a team wishes to program using ROBOTC they need the following:

1. ROBOTC (v 1.40 or greater)
 - a. This is available as a free 30-day trial for download from www.ROBOTC.net
 - i. This is also included in the Autonomous Files provided.
 - b. This is available for purchase from www.vexrobotics.com under “Programming”

Once all the required components are obtained, follow the instructions in the “ROBOTC_140_VEX_Competition_Support.pdf” which is available in the Autonomous Files.

MPLAB by MicroChip



<http://www.microchip.com>

MPLAB is a true C environment, where users can write actual C code.

If a team wishes to program using MPLAB they need the following:

2. MPLAB IDE (6.62 or greater) with the C18 compiler.
 - a. This is available for purchase from:
<http://www.vexrobotics.com> listed under “Programming”.
3. The most recent Vex Master Project File.
 - a. This includes:
 - i. The latest version of the Vex Master Code
 1. version 7 - “VEX_MASTER_V7.BIN”
 - ii. The correct library files.
 - b. This project file is available in the Autonomous Files.

Once all the required components are obtained, follow the instructions in the “MPLAB Autonomous Programming Guide” which is available in the Autonomous Files