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VIEWPOINT SYSTEMS, INC.

**Viewpoint News**

# LabVIEW 8.0 Basics I and II Training Update

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As the passing of the seasons brings changes in the weather, so to the passing of versions of LabVIEW brings with it changes in the courses used to teach the basics. Typically as new versions of LabVIEW are released the accompanying training courses Basics I and II are updated. Exercises will be updated to use the newer functionality brought forth in the new version of LabVIEW, newer concepts will be added into the course to teach the new tools, while older exercises are trimmed.

The jump from LabVIEW 6.1 to 7.0 brought with it the introduction of Express VIs and the replacement of many of the DAQ exercises in the course with the use of Express VIs for data acquisition.

However, the jump from LabVIEW 7.1 to 8.0 brought with it entirely new Basics I and II courses changing not only the exercises but the methods in which the material is presented to the students. New in this version of the course, students are introduced to a software development method in the very first chapter of Basics I. This method provides a common language to describe the course exercises to the students and introduces the students to a method for developing professional software.

Each exercise starts with a scenario, a short problem description of what the student is trying to solve. This approach allows the student and the book to assume roles that closely resemble possible roles they may face in the real world. The student is placed in the role of a consulting firm approaching a customer (the book) and trying to solve the customer's problem. Early scenarios range from acquiring a sine wave for 2 seconds and displaying the results on the front panel, to creating type defined enumerated controls. In Basics I, the course concludes with developing a full featured simulated weather monitoring station.

After the scenario has been given to the stu-

dent they are tasked to design the project. For the sake of the course, almost all exercises give the student a correct design for the scenario. These designs often are not the only way the scenario could be solved and invite the students after the course to attempt their own design to solve the problem. Many designs in the manual give flow charts and/or state diagrams to further explain the textual description of the design.

In the implementation phase, students use the design to implement a solution to the scenario. In this phase, the students use the tools and skills described in the lecture and apply the knowledge directly to the scenario. During the implementation phases, the instructor is readily available to assist students with questions and comments about the scenario and LabVIEW techniques.

After the implementation, the students are set to test their work. The majority of the exercises in the manual will give a set of test values to operate the student's implementation and ensure their application meets the goals of the scenarios. This step stresses the importance that correct values produce correct results and that incorrect values are handled properly within the application.

The last step introduces the idea of application maintenance and update. This step brings to life the idea that projects change over their lifetime and the student's responsibility to update and maintain the project through its lifespan after completion. This topic is however only an introduction as this is a rather difficult topic to simulate without a real customer with real change requirements and update requests.

The changes to the course structure for Basics I and II further enhance the learning experience for the students by not only teaching LabVIEW, but by also providing a sample software engineering model to design applications.

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# National Instruments Training

For detailed course descriptions, prerequisites, and up to the minute schedule, go to [www.ViewpointUSA.com/training](http://www.ViewpointUSA.com/training).

## LabVIEW Core

<a href="#">LabVIEW Basics I: Introduction</a>	3 days	5/8–5/10 6/12–6/14	\$1595
<a href="#">LabVIEW Basics II: Development*</a>	2 days	5/11–5/12 6/15–6/16	\$1095 <i>25% discount if scheduled concurrently with Basics I</i>

## LabVIEW Vision & Motion

<a href="#">LabVIEW Machine Vision &amp; Image Processing*</a>	2 days	4/25–4/26	\$1095
<a href="#">Motion Control Fundamentals*</a>	2 days	4/27–4/28	\$1095 <i>25% discount if scheduled concurrently with Machine Vision &amp; Image Processing</i>

\* Indicates prerequisite required

Don't see a course listed here? Call 585-475-9555 to inquire about other courses offered by National Instruments and Viewpoint Systems. Viewpoint can also custom tailor a training course to meet your company needs.



All classes are held at Viewpoint's Certified Training Center in Rochester.

To register go to [www.ni.com/training](http://www.ni.com/training) or call 585-475-9555.

## Viewpoint is Growing, Again!

Viewpoint Systems is proud to announce the addition of two new engineers to our staff! With the addition of Michael and Adam Viewpoint has significantly grown our operations in the Rochester / Buffalo area in the past six months and look to continue to grow. Resumes are always welcome, current job descriptions for openings can be found on our website [www.ViewpointUSA.com/employment.asp](http://www.ViewpointUSA.com/employment.asp)



Michael Weaver joined Viewpoint as a Systems Engineer in March of 2006. Michael's prior experience of designing LabVIEW solutions to interface with test equipment is already serving him well in his new position. Outside of work Michael enjoys playing the drums, riding his motorcycle, and keeping up with the latest technology and gadgets. He hopes one day to build Robo One J Class Humanoid Robot, no small feat.



Adam Marrer joined Viewpoint as a Systems Support Engineer in March of 2006. Prior to joining Viewpoint Adam worked for the Monroe County Sheriff's Office as the network administrator for the country records system. Outside of Viewpoint Adam enjoys spending time with his family, dyno tuning, drag racing, and building cars. Adam is the co-founder of POPSracing.com, a local Mustang club.

# Tips and Techniques: Printing Front Panel Objects

LabVIEW 6.1-8.0 all versions except Base

Estimated time: 15 minutes.

Difficulty: advanced beginner.

Have you ever desired to print only one object on the front panel and not print all the supporting controls and indicators? In this edition of Tips and Techniques we will outline one such method to take a front panel object and send it directly to the printer.

What is Needed

1. LabVIEW 6.1 or higher (I was able to test with 6.1 through 8.0).
2. A new VI, random number generator (Numeric Pallet\Random Number 0-1), waveform chart indicator, a for loop, and a constant numeric with the value of 50.
3. Four VIs found on the 'Report Generation Pallet'. These are 'New Report.vi', 'Append Control Image to Report.vi', 'Print Report.vi', and 'Dispose Report.vi'

Procedure

1. Place the waveform indicator inside the for loop along with the Random Number function and wire the two together.
2. Wire the numeric constant 50 into the count terminal of the for loop.
3. Outside wire the four report generation VIs together in this order, 'New Report.vi', 'Append Control Image to Report.vi', 'Print Report.vi', and 'Dispose Report.vi'. Connect the 'Report Out' and the error stream between each of the VIs.
4. On the 'New Report.vi' right click on 'report type (standard)' terminal and create a constant. Depending on what tool kits you have installed will give you different reporting options. For this exercise we are going to leave it on 'Standard Report'.
5. Create an error control and place it on the left hand side of the for loop. Create a shift register on the for loop, wire the error control to the left hand shift register, through the for loop to the right hand side shift register. Connect the output of the right shift register to the error in on the 'New Report.vi'. This will ensure the report printing will not execute until we have completed 50 iterations of the for loop.
6. Right click on the 'Waveform Chart' indicator and select 'Create\Reference'
7. Move the newly created reference outside the for loop and wire it into 'Ctrl Reference' on the 'Append Control Image to Report.vi' The completed block diagram is listed in figure 1.1.

We are now ready to run our VI. However, before we do, one thing to keep in mind is this VI will print to the default printer, we do not have the luxury of the normal windows print preview and printing dialogs. Once the run button is hit the image will go directly to the printer, so make sure your printer is setup and ready before running the VI.

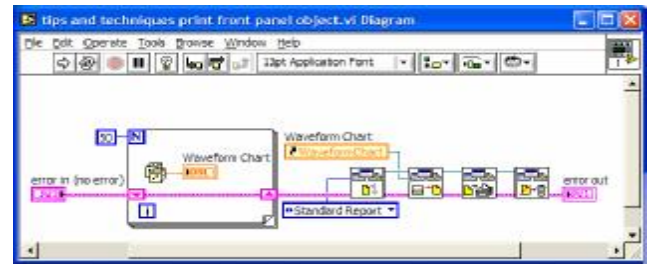


Figure 1.1 Completed Block Diagram of VI.

The Results

Figure 1.2 is an example of our resulting output. If we look at our output we'll see we have only printed our 'Waveform Chart' on our front panel and none of the other controls we have defined, (we have an 'error in' and 'error out' which do not show up in our output.

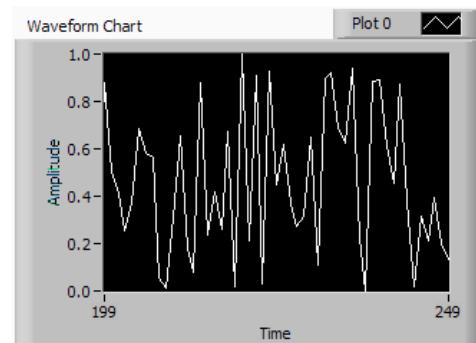


Figure 1.2 Printed Result from Running the VI.

## Questions and Comments

Please email us at [newsletter@ViewpointUSA.com](mailto:newsletter@ViewpointUSA.com). We welcome your input as we grow Tips and Techniques, our latest regular feature of the Viewpoint News.

## LabVIEW Code Challenge

Do you think you have what it takes? Check out this issue's code challenge and rules at [www.ViewpointUSA.com/CodeChallenge.asp](http://www.ViewpointUSA.com/CodeChallenge.asp). A \$50 gift certificate will be awarded to the winner prior to publication of our next issue.

**This Month: Recursive Algorithms.**

## Viewpoint—Your Informational Resource

### Programming an FPGA with LabVIEW

An FPGA combines programmability with hardware reliability and timing. LabVIEW is an excellent tool for programming the FPGA-based boards from NI. Tasks that require digital and/or analog I/O combined with basic logic and numerical algorithms are well-suited for these devices. Solutions are often in areas of custom instrumentation and projects that need fast, reliable timing.

In the next issue, Viewpoint will describe how to use FPGAs in conjunction with PC or cRIO controllers.

# Viewpoint News

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*Designed to be Right.  
Engineered to Work.*

#### Notes from the Editor:

Welcome to another exciting issue of the Viewpoint News! I hope our newsletter is becoming a valuable technical resource as it allows us a chance to share with you our experience, our knowledge, and our amazing staff. Our look and feel has begun to change with this issue and will continue to change as we begin to add new features to the newsletter and our website. Questions and comments are always welcome, and I look forward to hearing from you.

#### Inside this issue:

***We Are Growing Again***—See the faces of our new hires at Viewpoint as we continue to grow in the Rochester/Buffalo area

***National Instruments Training Schedule***—Check out upcoming classes taught right here in Rochester at our beautiful training facility.

***Tips and Techniques***—Learn how to print a single front panel object without printing all of the other controls on the front panel.

***LabVIEW Code Challenge***—Be the winner of a gift certificate! This month's challenge is recursion with VIs.

***Training Updates***—Discover what has changed with Basics I and II training with the introduction of LabVIEW 8.0

We always are looking for the next great challenge, and look forward to partnering with you to conquer it.

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