

## Monitor - ISSN 1472-0221

The Newsletter for PC-Based Data Acquisition and Control  
Issue 230, October 2017

Welcome to Monitor, the data acquisition and control newsletter. Thanks for subscribing. If you wish to download our free data acquisition software please do so.

You can download this issue of Monitor as a pdf file from

<http://www.windmill.co.uk/monitor/monitor230.pdf>.



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### Using Windmill to Control Digital Outputs

Web Link: <http://www.windmill.co.uk/digital-outputs.html>

Windmill has several programs which you can use to control your digital outputs, including DigitalOut, AnalogOut, Graphics and Test-Seq. Additionally, the Windmill IML Tools make it easy for you control outputs from your own applications.

### Windmill Test-Seq for Sequence Control of Equipment

Test-Seq interprets a file of commands and controls equipment and applications accordingly. It can send commands and data to other Windows programs, or directly to the hardware inputs and outputs. The command, or test sequence file is a text file which you can easily create in a text editor or word processor. Use Test-Seq to control digital outputs depending on timing or environmental conditions. For example, check if a temperature is greater than 20 oC then switch off a heater For more details see

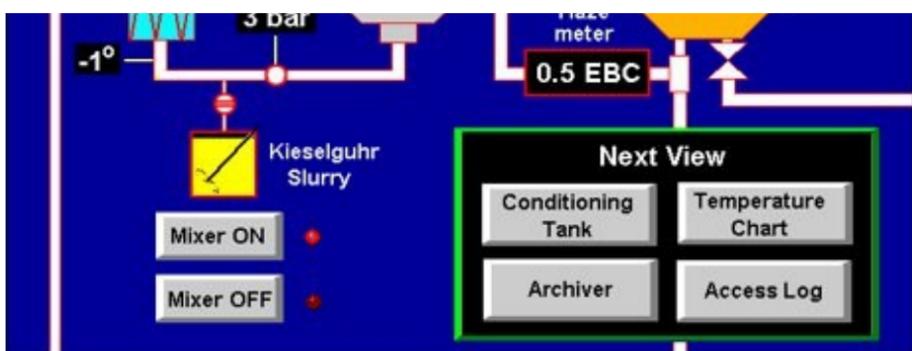
<https://www.windmillsoft.com/dagshop/test-control.html>

### Windmill Graphics for Process Mimics

Graphics lets you design and create your own display and control windows. You can insert buttons to control digital outputs. These can take any appearance you like. There are three types of button: one that toggles between on and off, one that always turns an output on and one that always turns an output off. You can also insert "LEDs" to light up when the output is on. Finally, you can choose whether the the digital output should initially be on or off. For more details see

<http://www.windmill.co.uk/graphics.html>





## Windmill AnalogOut for Controlling Groups of Outputs

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You normally use AnalogOut to control analogue, not digital, outputs. However there is one special case when you could use it to control digital channels. This is when you have grouped digital channels using Windmill SetupIML.

Each digital channel (or line) is initially set to on or off by a single bit. You might, however, want to always switch several channels at the same time - for example to open or close 8 relays at the same instant. In this case you can group the 8 channels together. All 8 relays will be controlled by a single value rather than by 8 separate ON/OFF values. In binary the value would be from 00000000 to 11111111.

Bit 0 corresponds to line 0, bit 1 to line 1, bit 2 to line 2 and so on. A value of 1 sets a line to on, a 0 sets it to off. So, for example, to set lines 0, 3, 6 and 7 to on and lines 1, 2, 4 and 5 to off you would send the following number in binary:

```
Data bits: 76543210  
Binary:    11001001
```

In hexadecimal you would send "C9" and in decimal "201".

For more details see the AnalogOut and SetupIML Help files, available from <http://www.windmill.co.uk/help.html>

## Windmill DigitalOut for Push Button Control

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This software lets you control any number of digital output channels. It provides push buttons for you to change the state of each channel. You can switch each channel individually, or switch several channels at once.

## Windmill IML Tools

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You can use the IML Tools to switch digital outputs directly from Windows applications like Excel, from JavaScript code running on a web page, from Visual Basic programs or from any developer tool can integrate Active X controls. Windmill takes care of the communication with the hardware leaving you free to concentrate on your application. For more details see <https://www.windmillsoft.com/daqshop/programming-tools.html>

All the Windmill programs mentioned can be used with equipment connected to the PC over Ethernet, USB, RS232, RS422, RS485 or Modbus. Contact Windmill Software at [sales@windmill.co.uk](mailto:sales@windmill.co.uk) for more information.

If you would like our assistance in choosing a data acquisition system please get in touch at [sales@windmill.co.uk](mailto:sales@windmill.co.uk).

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## Your Data Acquisition Questions Answered

### Question

"I need to transfer Windmill to a new laptop - is this fairly easy to do, and can I use the same release key from the old machine? Also, is there an easy way to transfer the configuration files too?"

### Answer

Yes, just download the software to the new laptop. It may ask you for a new release key - if so send the request to us and we will give you the new key.

To transfer the configuration files

1. Copy the contents of your old /windmill/setup directory to the new one
2. Copy iml.ini from the old windmill directory to the new one.

It's easiest if you transfer Windmill to the same directory as it was in on the old laptop, for example c:\windmill. If you use a different directory then run the ConfIML program, choose the Directory button and enter the new directory.

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## Spreadsheet Corner: How to Move a Formula and Keep Identical References

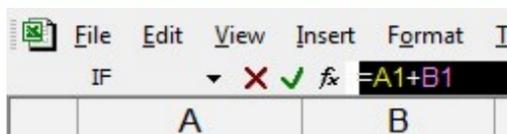
These tips apply to both Excel and Calc (OpenOffice and LibreOffice).

When you copy a formula the references change accordingly. For example, in cell C1 you have the formula to add A1+B1. You copy the contents of C1 to D1. The formula now adds B1+C1. The cell references change relative to the location of the formula.

But what if you want the references to stay the same? You can Cut and Paste, although this will delete the original cell contents.

If you want to keep both the original cell as it is you have two choices.

1. Change the original formula to use absolute references rather than relative ones, by adding a \$ sign before each letter and number. To quickly do this in Excel, highlight the formula in the formula bar and press the F4 key on the keyboard. It's even easier in Calc, just highlight the cell and press F4.
2. Copy from the formula bar and paste. Highlight the formula in the bar, select Copy, click the Escape key and then paste wherever you want.



For more **spreadsheet tips** see <http://www.windmill.co.uk/excel/> and <http://www.windmill.co.uk/openoffice.html>

If you have an Excel question contact [monitor@windmillsoft.com](mailto:monitor@windmillsoft.com).

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## DAQ News Round-up

Welcome to our round-up of the data acquisition and control news. If you would like to receive more timely DAQ news updates then follow us on [Twitter](#) - [@DataAcquisition](#) - or grab our [rss feed](#).

### JILA Spinning Method Confirms the Electron Still Seems Round

Physicists have for the first time used the spinning molecules technique to measure the "roundness" of the electron.

Source: NIST

<https://www.nist.gov/>

### Drone designers accidentally explain colour of albatross wings

Why are some birds' wings darker on top? Engineers may have found the answer while trying to design a biomimetic drone that goes further on less fuel

Source: New Scientist  
<https://www.newscientist.com/>

### **Bacteria self-organise to build working sensors**

American researchers have turned bacteria into the builders of useful devices by programming them with a synthetic gene circuit.

Source: Duke University  
<https://pratt.duke.edu/>

### **Flexible sensor skin gives robots a sense of dexterity**

Robots could soon handle objects with the same dexterity as humans thanks to a flexible sensor skin developed by engineers from the University of Washington and UCLA.

University of Washington  
<http://www.washington.edu/>

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\* For more articles see <http://www.windmill.co.uk/>

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For previous issues by subject see  
<http://www.windmill.co.uk/monitorindex.html>

### **DOWNLOAD DATA ACQUISITION SOFTWARE**

As a thank you for subscribing we offer you the ComDebug data logging and Com port trouble-shooting software. Log data over RS232, RS422, RS485 or Modbus. Also included is a month's trial of the Windmill 7 logging, charting and control programs. To download go to

<http://www.windmill.co.uk/jsarrpsrr.htm>

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Windmill Software Ltd, PO Box 58, North District Office,  
Manchester, M8 8QR, UK

Telephone: +44 (0)161 833 2782

Facsimile: +44 (0)161 833 2190

E-mail: [monitor@windmillsoft.com](mailto:monitor@windmillsoft.com)

<http://www.windmill.co.uk/>

<https://www.windmillsoft.com/>

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