# Data Acquisition With QuickControl®

This application note describes how to acquire data using QuickControl's Register Watch and Strip Chart tools. It assumes the reader is familiar with programming SilverLode products (see chapters 1 and 2 of the SilverLode User Manual).

## **Test Setup**

A simple test setup can be used to illustrate the use of the Register Watch tool. Wire a potentiometer to Analog Input#1 (I/O #4). See the Application Note QCI-AN023 – Analog Inputs for details. Many of QCI Start-Up Kits are provided with this potentiometer already wired.

Create the single line program shown below (Program 1). Analog Continous Read (ACR) is used to store analog values from Analog Channel #1 (I/O #4) into User[11] register.

Line# Oper	Label	Command
1:REM		
2:ACR		Analog Continuous Read: "User[11]" = Analog Channel #1

Program 1

Download and run the above program to put the servo into a continuous analog read mode. This mode will persist even after the servo finishes running the above program.

### **Register Watch**

Register Watch is found under Tools in QuickControl. Press Add Register in the Register Watch Window.



Diagram 1

Property of QuickSilver Controls, Inc. Page 1 of 8 This document is subject to change without notice. QuickControl® is a registered trademark of QuickSilver Controls, Inc. Other trade names cited are property of their explicit owner. Select User[11], Display as "Register" and ignore "Strip Chart" and "Log to File" – Diagram 2. Click 'OK' and choose long as the data format.

Select Register	×		
Register          Delay Counter (5)         Max Position Error   Current Position Error (6)         Velocity 1   Velocity 2 (7)         Reserved (8)         Reserved (8)         Reserved [ Torque (9)         Accumulator (10)         User (11)         User   Input Source Data (12)	OK Cancel Display Register Upper Word Couver Word Strip Chart Strip Chart Log to File	Select Data Format Select the format you wish to display the data in. Data Format O Hex O ULong O Acceleration O Long O Position O Velocity	

Diagram 2

The Register Watch Window now contains User[11] – Diagram 3. Since register User[11] is tied to analog input #1, the Data box will constantly update as the potentiometer is turned. This provides the simplest form of data acquisition.

tt	Register Wat	ch		<u> </u>
	<u>A</u> dd Register	<u>D</u> elete Registe	r Device ID 1	6 Dev #1
	Register		Data	Units
	User[11]		0	

Diagram 3

#### **Register Watch Charting**

Data is acquired approximately every 500 ms depending on the number of registers being watched. Multiple strip charts can be opened at a time, but only one channel per strip chart is allowed. Right-click User[11] register and choose Strip Chart as shown in Diagram 4. The Strip Chart loads and contains data within x-y axes with features to save, copy, zoom, print and pause.

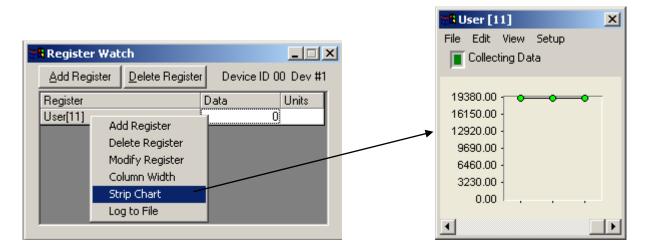


Diagram 4

#### **Register Watch Logging**

Right-click User[11] and choose Log to File. A window pops up prompting for the file name to be saved within the Log Folder. Specify a name or accept the default name and click save – Diagram 5.

	Save As	<u>? ×</u>
	Savejn: 🔄 Logs	- 🖬 🖆 🛨
📲 Register Watch	E Day Of Month 01.txt	
Add Register Delete Register Device ID 16	Day Of Month 02.txt	Day Of Month 08.txt     Day Of Month 09.txt
Register Data U	Day Of Month 03.txt	Day Of Month 10.txt
User[11] 0	Day Of Month 04.txt	Day Of Month 13.txt
Add Register	Day Of Month 06.txt	🗒 Day Of Month 14.txt
Delete Register	Day Of Month 07.txt	🗒 Day Of Month 16.txt
Modify Register		
Column Width	•	Þ
Strip Chart		
Log to File	File name: Register Watch Log Dev 0 - U	Jser [11].txt <u>S</u> ave
	Save as type: Chart Files (*.txt)	Cancel

Diagram 5

/agar	egist	er Watch	n Log Dev 0 - User [11].txt - Notepad	-D×
File	<u>E</u> dit	F <u>o</u> rmat	Help	
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	258			
36	3,12	582		
78	3,12	582		
12	03,1:	2581		
16:	23,1	2583		
204	43,1	2580		-
•				

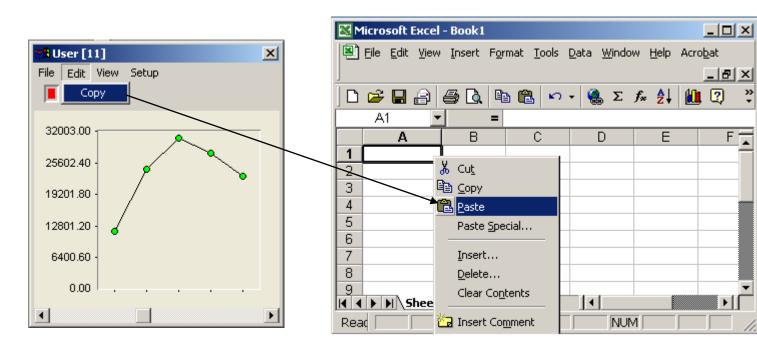


Data within the log file is stored in two columns – Diagram 6. The data type for the first column is time and the second reflects the data format specified during 'Add Register' routine. The actual data seen in Diagram 6 is the analog value stored into User[11] register.

**Note:** Avoid opening the file until the program ends – Register Watch Window is closed. This eliminates errors and ensures that QuickControl has complete control while writing.

#### **Copy and Paste Data**

Data can be copied into a text processing software for analysis such as Microsoft® Word or Excel®. Diagram 7 shows an example of coping and pasting data from Register Watch's strip chart. Analog values for User[11] is shown graphically and distinctively within an excel column.



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21	2426	7				
22	3064	5				
23	2760	2				
24	2291	1				
25	2188	6				
26	2994					<b>_</b>
K C Sheet1 / Sheet2 / C						
	Sum=856	524			NUM	1.

Diagram 7

Set CCCCCCC

Get Analog Inputs (voltage)

1 5.1 2 4.66 3 4.24 4 4.1

### **Control Panel**

Control Panel can be launched from the Tools menu.

🛃 QuickControl - [QCprog1]					
🎁 File Edit View Programs	Tools Setu	p Window Help			
Program Info Toolbar	Configura	on Wizard ation Wizard Device Wizard			
Program Line Add (Cntl-A) Edit (Cntl-E) Insert (Cntl-I) Delete (Cntl-D)	Control Pa Register V Data Mon Firmware	Watch	L.		
Control Panel			*		×
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Motor "Dev #1" 16		Test Move <u>1</u>		-48000 <u></u> -96000 <u></u>	⊢ Motor Driver –
Type QI23H1 (Rev 47 Serial # 1000000	-03)	Distance 8021 Acceleration 399976.1	counts	-144000	<ul> <li>Enabled</li> <li>Disabled</li> </ul>
Device Status		Velocity 39985.6	 cps		
Target Pos ()	counts		cps	Inputs / Outputs	
Position 0	counts	Test Move 2		Digital I/O (rec	I=LOW)
Velocity 0 Pos Error 0	cps counts	Distance -4011	counts		

#### Diagram 8

Strip Chart

cps/s

cps

The Control Panel shows basic device properties. See Control Panel in SilverLode User Manual for more details.

Acceleration 8020.8

Velocity 4010.6

counts

%

volts

Ċ

Max Error 0

Get Temp 45.4

Get Voltage

Torque 30

#### **Control Panel Strip Chart**

The Control Panel's strip chart provides faster data acquisition than Register Watch and allows up to four channels on the same chart for analysis as in Diagram 9. The strip chart cannot be used while a program is running and is only active when the control panel is opened.

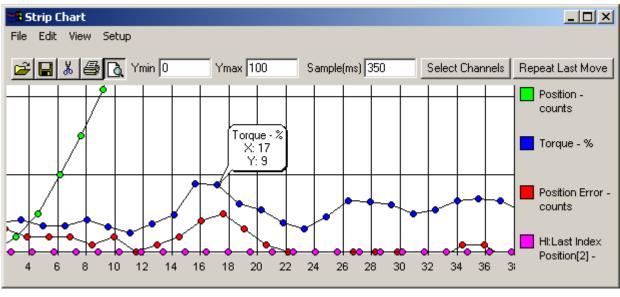


Diagram 9

Data is acquired for a maximum of ten seconds. Data point segments can be viewed individually by zooming. Click zoom and drag the mouse over the range of points while holding the upper right button. Double-click a point for the actual value.

To copy the data values for all four channels to a spreadsheet, follow the following steps:

- 1. Click Edit -> Copy.
- 2. Open Excel and highlight four columns.
- 3. Right-Click and paste.

Heading is automatically assigned as well as its respective data.

### **Download And Chart**

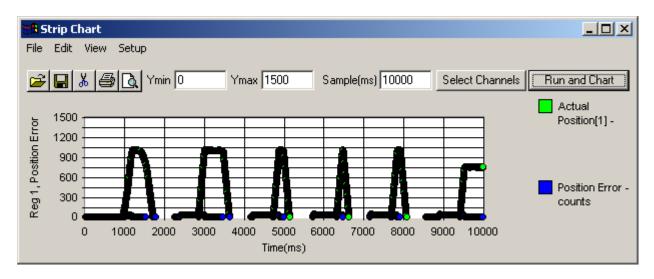
A Control Panel like strip chart can be run on any program file (qcp) using QuickControl's Download and Chart feature.

With the QCP file open, select

Programs->Download and Chart

After the active QCP is downloaded, the Strip Chart dialog box is displayed.

At this point, the strip chart is the same as the Control Panel's version. Press Run and Chart to run the program file and chart the results.





The window below is the data acquired by the strip chart (Diagram 10) copied and pasted into Excel®. Refer to the section copy and paste above.

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3 0	0
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Sum=-5770281	

Diagram 11