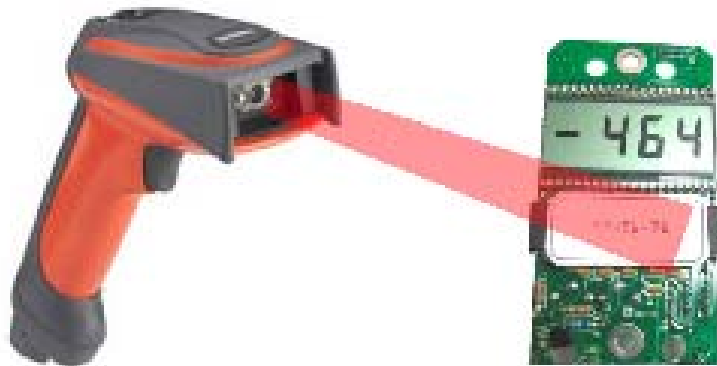


Synergy Controller Bar Code Reader Applications



**Synergy Controller with
Hand Held Products Bar Code Scanner**

Introduction

The value of the ubiquitous “Bar Code Scanner” for speeding data entry and improving accuracy (error-proofing) is obvious to anyone that shops at a grocery store. The Synergy Controller offers the advantages of bar code scanning to environmental test chamber and process oven operators and organizations.

This application note describes the capabilities of the Synergy Controller’s bar code scanner feature and some typical applications.

This application note employs the Synergy Controller’s macro capability to automatically select and start an environmental test profile simply by scanning the OCR (Optical Character Recognition) plain text or bar code label on the part or work instruction.

In addition, the use of the bar code feature to log data such as product part numbers, serial numbers, employee id’s and other data is demonstrated.

Virtually any bar code reader can be used with the Synergy Controller. The Appendices in this application note provide general bar code reader programming specifications and specific setup instructions including programming bar codes for these popular bar code scanners:

Appendix A Barcode Interface Specifications

Appendix B Symbol LS2208 USB Scanner Setup

Appendix C Motorola DS6878-SR USB Scanner Setup

Appendix D Symbol DS4308 USB Scanner Setup

Appendix E Honeywell ImageTeam 4800 OCR USB and PS/2 Scanner Setup

Appendix F Intermec (Honeywell) SG20T USB Scanner Setup

Controller Setup

A user-created text macro file defines the Synergy Controller's response to each bar code. The macro file is a look-up table that the controller uses to determine the required sequence of commands for each bar code.

Macro File Format

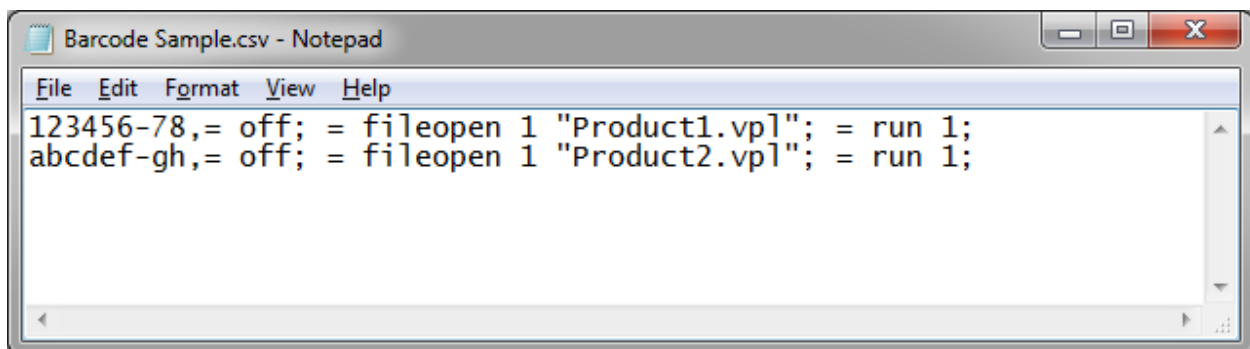
The macro file used by the Synergy Controller is a simple comma separated file easily generated with Windows notepad, Microsoft Excel, or any other program that can create text files.

The file layout consists of two columns, the barcode text and a communication command (or string of commands) to execute when that barcode is scanned. The communication commands can be any valid communication commands, separated by a semicolon (;). The command string length can be up to 900 characters. A communications command list for the Synergy Controller is available in the technical manual and downloaded from www.TidalEng.com/synergy.htm.

As an example, assume that you want to scan the barcode text "123456-78" to stop the chamber or oven and then load and run the profile "Product1.vpl".

Open Notepad and enter 123456-78 followed by a comma, and then the command string = off; = fileopen 1 "Product1.vpl"; = run 1; "Product1.vpl"; = run 1;

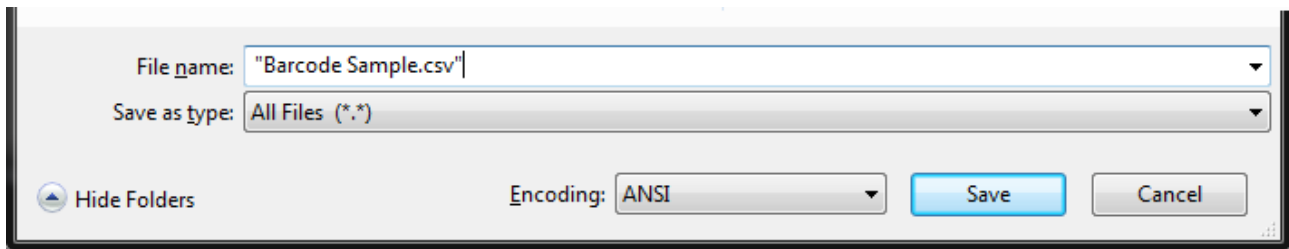
Note: Make sure that the profiles specified in the "fileopen" commands are already loaded on the Synergy Controller when the bar code is scanned.



Sample Macro File

Create as many barcode entries in the file as required, as long as they are unique, however, all the barcode identifiers must be in one file because the Synergy Controller can only load one file at a time. i.e. Reloading a Macro file will overwrite the Macro file on the controller.

Once you have added all the entries to your macro file, click on File/Save As and enter a file name with the CSV extension as shown below.

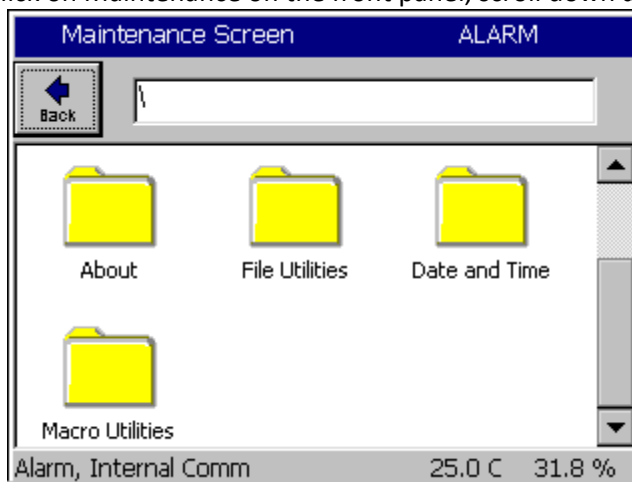


Saving the file as type CSV

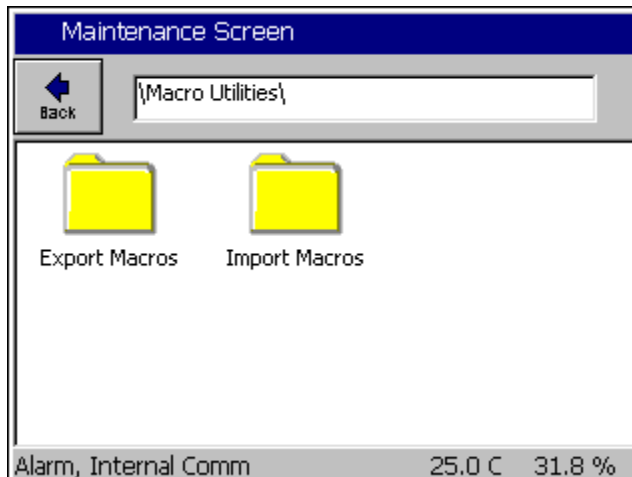
Importing the Macro File

The Synergy Controller can import the .csv macro file either from a floppy disk or from a USB Hard Disk. Copy the macro file in .csv form from the PC to the root directory of either a floppy disk or a USB Hard Disk.

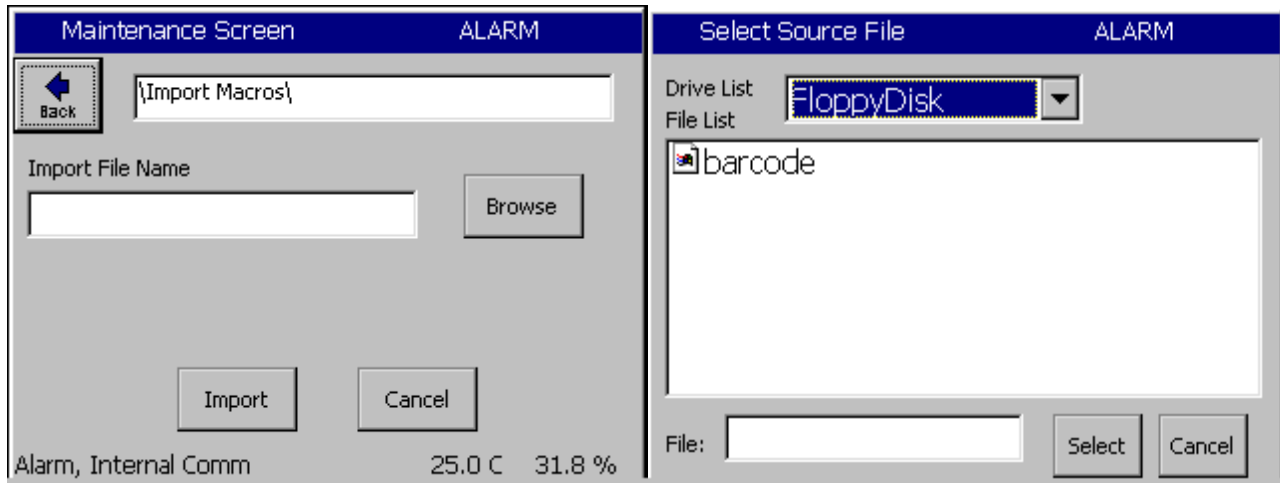
To Import the macro file, click on Maintenance on the front panel, scroll down and click on Macro Utilities.



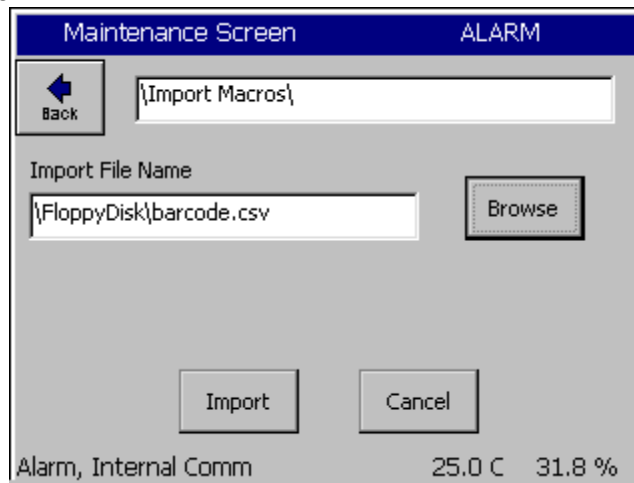
Click on the Import Macros folder.



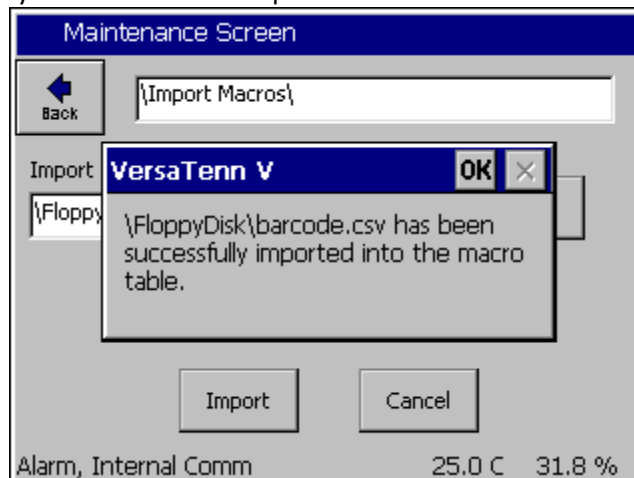
The import screen will appear. Click on Browse and then select the file you want to import, and then click the Select button.



Then click the Import button.

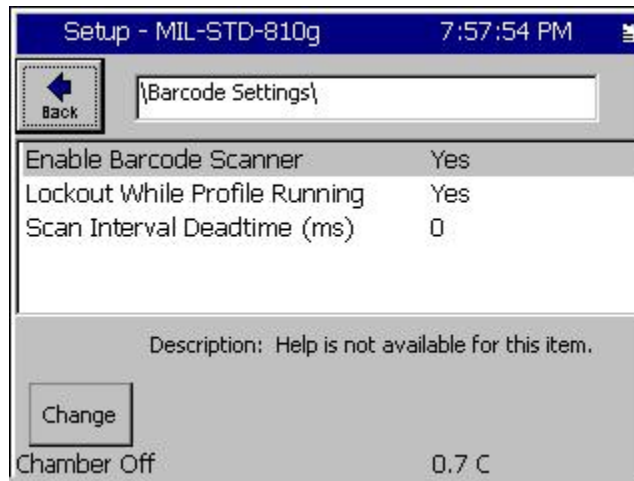


A message box will then let you know that the import was successful.



Now that the file is loaded we can test the barcode scanner.

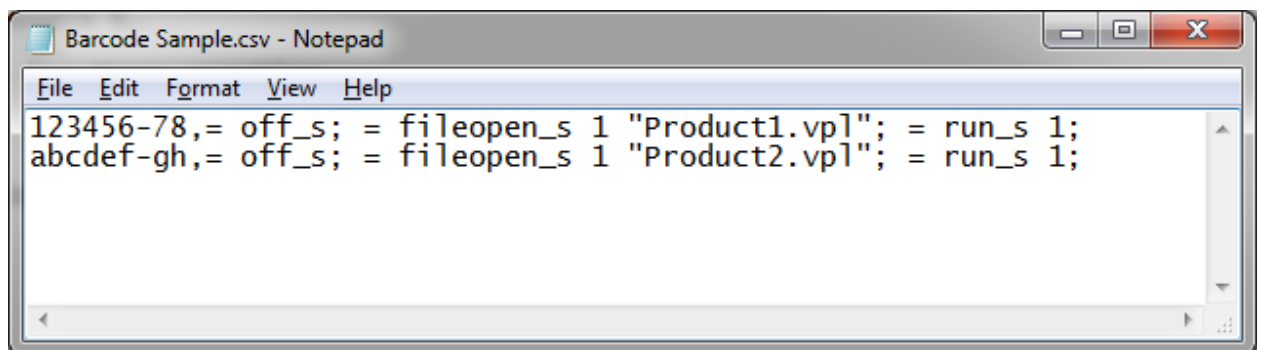
There are a few additional parameters in the Barcode Settings folder in Synergy Controller software version 4.3.x (and newer) that adjust the controller behavior to improve reliability and reduce operator errors.



For example, the Barcode Scanner can be disabled or locked out when a profile is running to prevent multiple inadvertent start/stop cycles. The controller can also limit the processing of sequential scans when they occur more quickly than the Scan Interval Dead time (milliseconds).

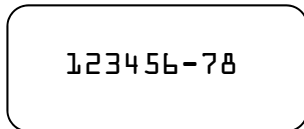
In addition, in the Synergy Controller Software Version 4.3.x (and newer) there are three new Synchronous command variants that prevent race conditions that can occur when the printing, and emailing features introduce latencies.

These are: `off_s`, `fileopen_s`, and `run_s 1`. For example:

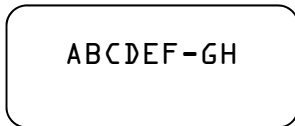


Test the Bar Code scanner with a Macro

If you followed the steps above, everything is ready and the barcode scanner should be fully functional. Printed below are two example OCR-A Test Labels that can be scanned to test the configuration. Now we can scan each label to load and run the appropriate profile in the controller. When we scan 123456-78 the controller should load product1.vpl and run it. When we scan ABCDEF-GH the controller should load product2.vpl and run it.



Test Label 1



Test Label 2

Test the Bar Code scanner with Log File entries

Alternatively, create a list of part numbers, employee names etc. and print it. This can be attached near the operator's station.

Date	Application
Employee RICHARD LAWRENCE	Employee Name
Employee Peter Paul	Employee ID
S/N 01/0639	Serial Number
P/N TE1299-04, S/N 01/0639	Part Number and Serial NumberTCweb16-Slave
W/O 1219080-12-87W	Work Order

Trouble Shooting

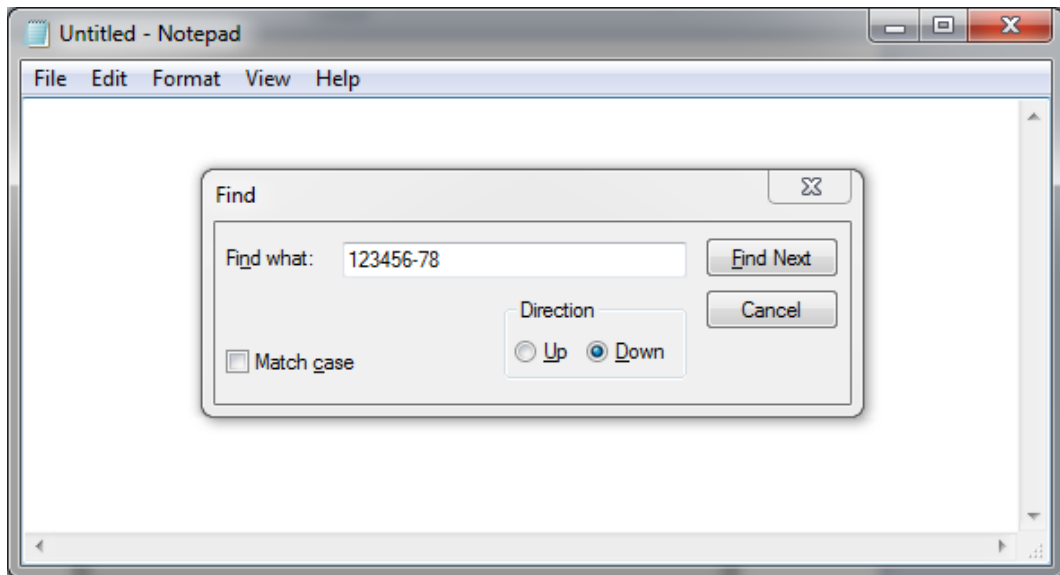
If the barcode scanner does not work with the Synergy Controller try the following trouble shooting steps.

Test Scanner on a PC as follows:

To test the scanner, plug it into the PC. Open a text editor such as notepad then scan test label below. If the scanner is functioning correctly the text “123456-78” should appear in the Notepad Find window. If the scanner does not output the correct text, repeat the scanner setup procedure. If the problem continues, consult your scanner’s user manual or contact Tidal Engineering.



Product 1



Test Macros on the Synergy Controller

If the scanner is functioning correctly, the next step is to test the macro feature of the Synergy Controller. Plug a standard PS/2 or USB keyboard into the Synergy Controller. To run a macro press “CTRL F” then type the Macro name “123456-78” and hit enter. The macro should run. If it does not run as expected, open the macro file on your PC, check for syntax accuracy, and import the macro into the Synergy Controller again.

Update Synergy Controller Software

If the controller doesn’t run your macro consistently, install Synergy Controller Version 4.3.x (and newer) and try the Synchronous versions of the commands (off_s, fopen_s, and run_s commands) and/or adjust the timing properties as shown on page 5.

Appendix A – Barcode Interface Specifications

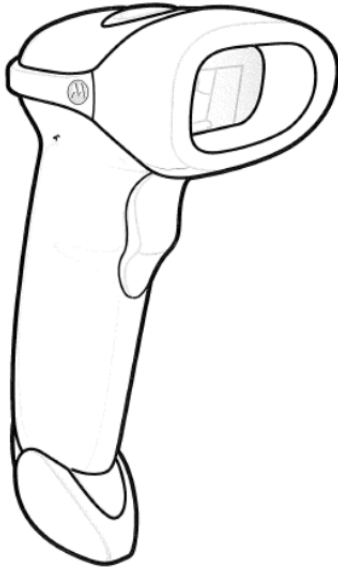
This is the specification for the barcode scanner setup for use with other barcode scanners.

The format required by the Synergy Controller is as follows:

[CTRL+F][400ms pause][Barcode Data][Carriage Return]

Any barcode scanner that can attach via a keyboard wedge or USB cable, and can be configured with the above format will work with the Synergy Controller.

Appendix B – Symbol LS2208 USB Scanner Setup



The Symbol LS2208 USB Scanner is a popular low cost bar code scanner that is compatible with all Synergy Controller models including the VersaTenn V, Synergy Micro and Micro 2, Synergy Quattro and Synergy Nano.

This appendix provides the setup procedure, the test bar codes and Macro files to demonstrate this scanner with Synergy Controllers. The setup and example bar codes in this Appendix are Code 39 bar codes.

The following steps are described in this appendix:

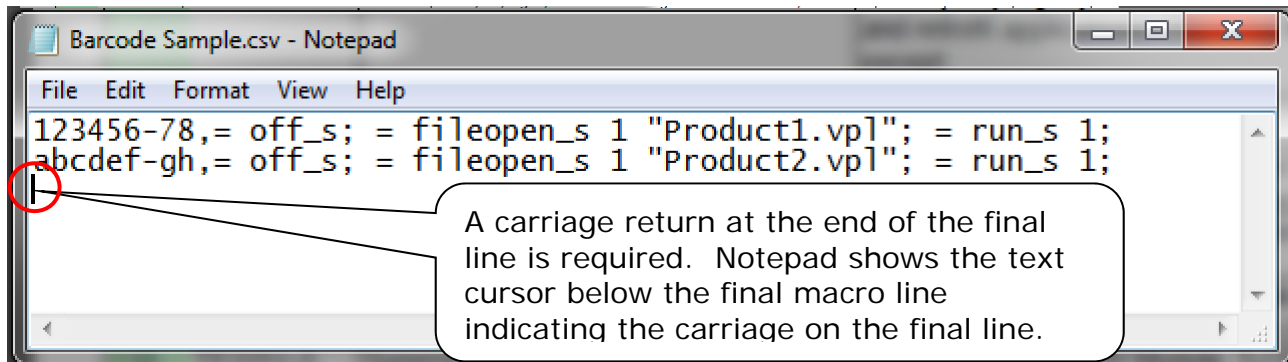
1. Setup Scanner
2. Test the scanner with the example product bar codes provided.

Scan the Bar Codes below in numerical order.



2. Create and Load the macro File.

Edit the macro file in Notepad or other plain text editor as shown below. Note that a carriage return at the end of the final line is required.



Load the Macro file as described in the main body of this application note.

3. Test the Bar Codes.

When the following bar code is scanned, the controller will open and start PRODUCT1 profile:



Product 1

When the following bar code is scanned, the controller will open and start PRODUCT2 profile:



Product 2

Appendix C – Motorola DS6878-SR USB Scanner Setup



The Motorola DS6878-SR USB Scanner is a popular Wireless scanner that is compatible with all Synergy Controller models including the VersaTenn V, Synergy Micro and Micro 2, Synergy Quattro and Synergy Nano.

This appendix provides the setup procedure, the test bar codes and Macro files to demonstrate this scanner with Synergy Controllers. The setup and example bar codes in this Appendix are Code 39 bar codes.

The following three steps are described in this appendix:

1. Setup Scanner
2. Create and Load the Macro File.
3. Test the scanner with the example product bar codes provided.

1. Setup Scanner – Follow the bar code sequence in the table below.

Begin Rule	 Begin New Rule
Send Ctrl F	 Send Control F
Send all data	 Send All Data That Remains
Send Carriage return	 Send Enter Key
Save Rule	 Save Rule

2. Test Bar Codes

Motorola DS6878-SR



Product 1



Product 2

Appendix D – Symbol DS4308 USB Scanner Setup



The Symbol DS4308 USB Scanner is a popular scanner that is compatible with all Synergy Controller models including the VersaTenn V, Synergy Micro and Micro 2, Synergy Quattro and Synergy Nano.

This appendix provides the setup procedure, the test bar codes and Macro files to demonstrate this scanner with Synergy Controllers. The setup and example bar codes in this Appendix are Code 39 bar codes.

The following three steps are described in this appendix:

1. Setup Scanner
2. Create and Load the Macro File.
3. Test the scanner with the example product bar codes provided.

1. Setup Scanner – Follow the bar code sequence in the table below.

Factory Defaults	 Return to Factory Defaults
Begin Rule	 Begin New Rule
Send Ctrl F	 Send Control F
Send all data	 Send All Data That Remains
Send Carriage return	 Send Enter Key
Save Rule	 Save Rule

2. Test Bar Codes

Motorola DS6878-SR



123456-78

Product 1



ABCDEF-GH

Product 2

Appendix E – Honeywell ImageTeam 4800 OCR USB and PS/2 Scanner Setup



The Honeywell ImageTeam 4800 OCR scanner can be used with a PS/2 keyboard wedge as well as with a USB interface. In addition, this scanner supports OCR text as well as conventional bar codes for use in a wide range of applications. The original Synergy Controller has a PS/2 keyboard interface and a USB interface. Newer Synergy Controllers only have a USB interface.

Part Numbers

1. Honeywell part number: 4800SR051C
Industrial Bar Code Area Imager provides decoded output to:
PC XT/AT/PS-2 Keyboard Wedge, TTL Level RS-232, IBM Retail, Wand Emulation, USB, Retail USB.
2. Honeywell part number: 42206132-02, PS/2 keyboard wedge.
3. Honeywell part number: 42206161-01, USB Type A Interface.

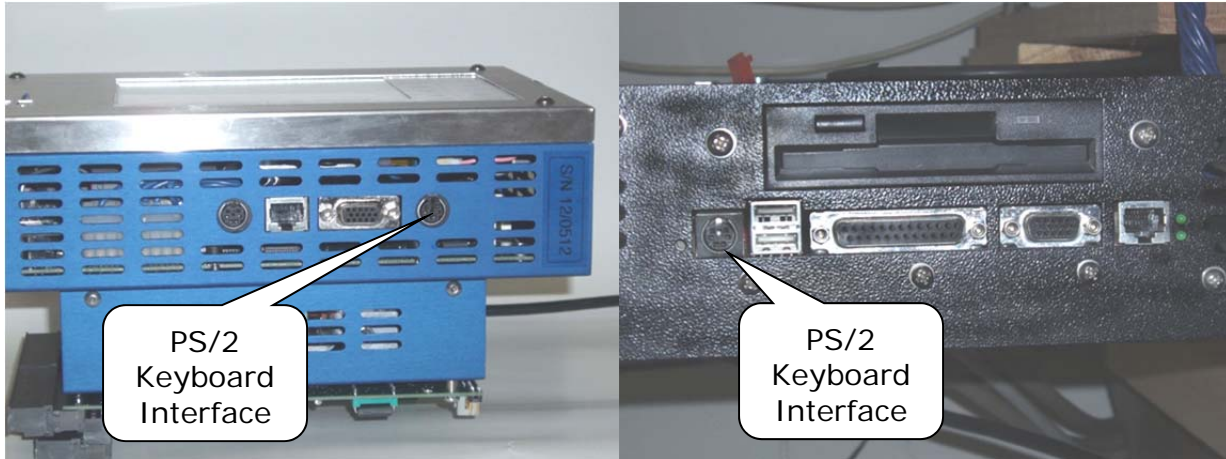
The Synergy Controller Bar Code feature is available in software version 2.0.6 and newer. These are both available from Tidal Engineering® Corporation. This note also describes the step by step process you can use to configure the barcode scanner.

Installation

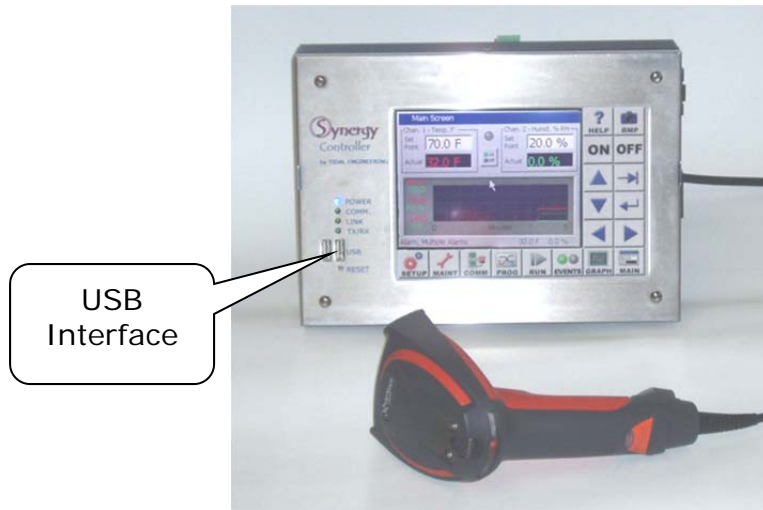
Installing the barcode scanner is a simple process.

Connecting the Barcode Scanner

1. Connect the appropriate cable to the handle of the ImageTeam 4800 and screw on the retainer clip.
2. Then either connect the PS/2 connector to the keyboard input on the Synergy Controller or connect the USB connector to the Synergy Micro. The keyboard input on the two controller configurations can be located using the figures below.



PS/2 Keyboard Connectors



USB Keyboard Connector

Once the barcode scanner is plugged in, configure the barcode scanner as follows.

Configuring the Barcode scanner

We followed the steps below to configure the ImageTeam 4800 for use with the Synergy controller and OCR-A fonts. If a different configuration or barcode scanner is required, see the appendices for alternative settings for other devices.

1. Reset the barcode scanner to factory defaults. The configuration steps listed below adjust the settings that differ from the factory defaults.



Standard Product Default Settings

2. If using the Bar code reader with the USB interface, scan the following.



**Scan only when
using the USB
interface.**

3. Add the CTRL+F Prefix to be sent before the barcode data.

- a. Scan the “Add Prefix” symbol.



Add Prefix

- b. Scan the “9” symbol.



9

- c. Scan the “9” symbol.



9

- d. Scan the “0” symbol.



0

- e. Scan the “6” symbol.



6

- f. Scan the “Save” symbol.



Save

4. Enable OCR-A font recognition.



OCR-A On

5. Create the OCR Template to match XXXXXX-XX.

- a. Scan the "Enter OCR Template" symbol.



Enter OCR Template †

- b. Scan the "a" symbol **six** times.



a



a



a



a



a



a

- c. Program the "-" as follows: Scan the "2" symbol and the "D" symbol.



2



D

- d. Scan the "a" symbol **two** times.



a



a


- e. Scan the "Save OCR Template" symbol.



Save


6. Add the Carriage Return Suffix if using the PS/2 Keyboard interface. (Appended after the barcode data.)

a. Scan the "Add CR Suffix All Symbologies" symbol.



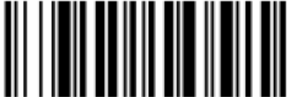
Add CR Suffix
All Symbologies

b. Scan the "Add Suffix" symbol.




Add Suffix

c. Scan the "9" symbol.




9

d. Scan the "9" symbol.




9

e. Scan the "0" symbol.




0

f. Scan the "D" symbol.



D

g. Scan the "Save" symbol.



Save

Note: Don't scan this group when using the USB interface.

7. Add the Prefix Delay before sending the barcode data.

a. Scan the "Interfunction Delay" symbol.



Interfunction Delay

b. Scan the "9" symbol.



9

c. Scan the "9" symbol.



9

d. Scan the "Save" symbol.



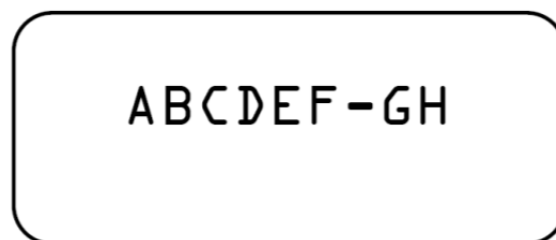
Save

8. Scan the "Control + ASCII mode on" barcode.

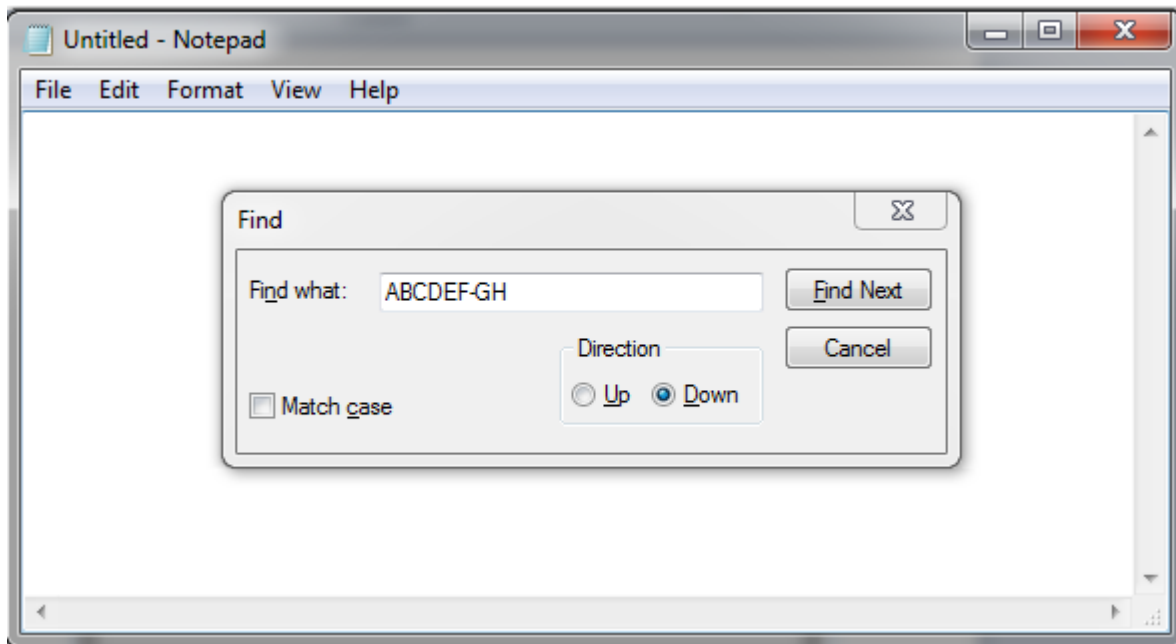


Control + ASCII Mode On

The barcode scanner is now configured for use with the Synergy Controller. To test the Scanner programming, open Windows Notepad and scan the label below.



The Ctrl-F sequence followed by the letters ABCDEF-GH should open the Find dialog as shown below.



Appendix F – Intermec (Honeywell) SG20T USB Scanner Setup



The Intermec SG20T USB Scanner is a popular scanner that is compatible with all Synergy Controller models including the VersaTenn V, Synergy Micro and Micro 2, Synergy Quattro and Synergy Nano.

This appendix provides the setup procedure and the test bar codes to test this scanner with Synergy Controllers. The setup and example bar codes in this Appendix are Code 39 bar codes.

The following three steps are described in this appendix:

1. Setup Scanner
2. Test the scanner with the example product bar codes provided.

1. Follow the bar code sequence in the table below to setup the Scanner.

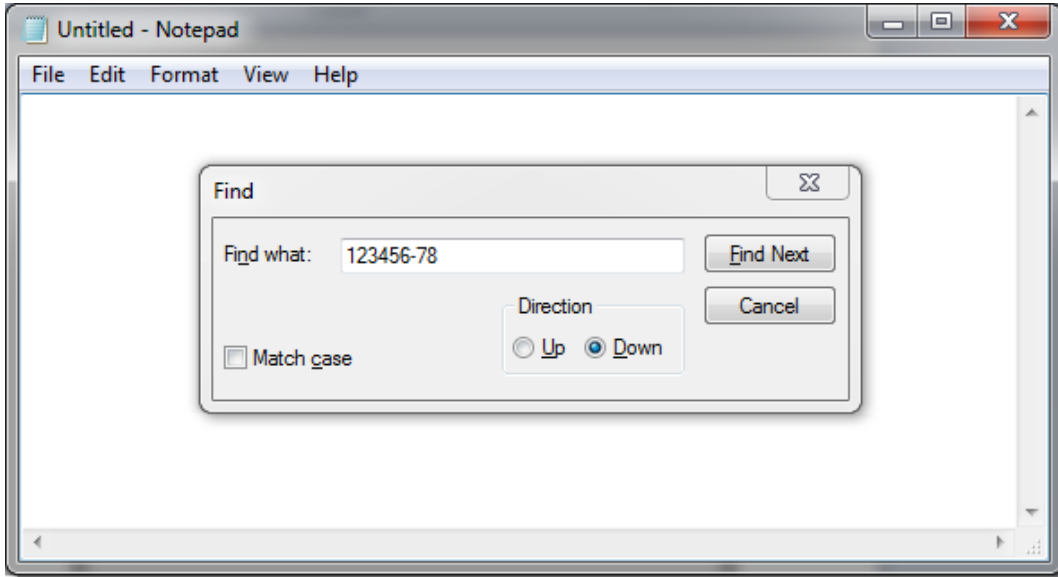
Factory Defaults	Reset factory defaults  <CCMD>4006
Send Ctrl F	Preamble - Compose: <ENQ><ACK>  <SW>60C000020506
Remove Postamble	Postamble - None  <SW>60C10000
Add Postamble <CR>	Postamble - Compose: <CR>  <SW>60C100010D

2. Open Windows Notepad application and scan the Bar Codes below to test the reader setup.



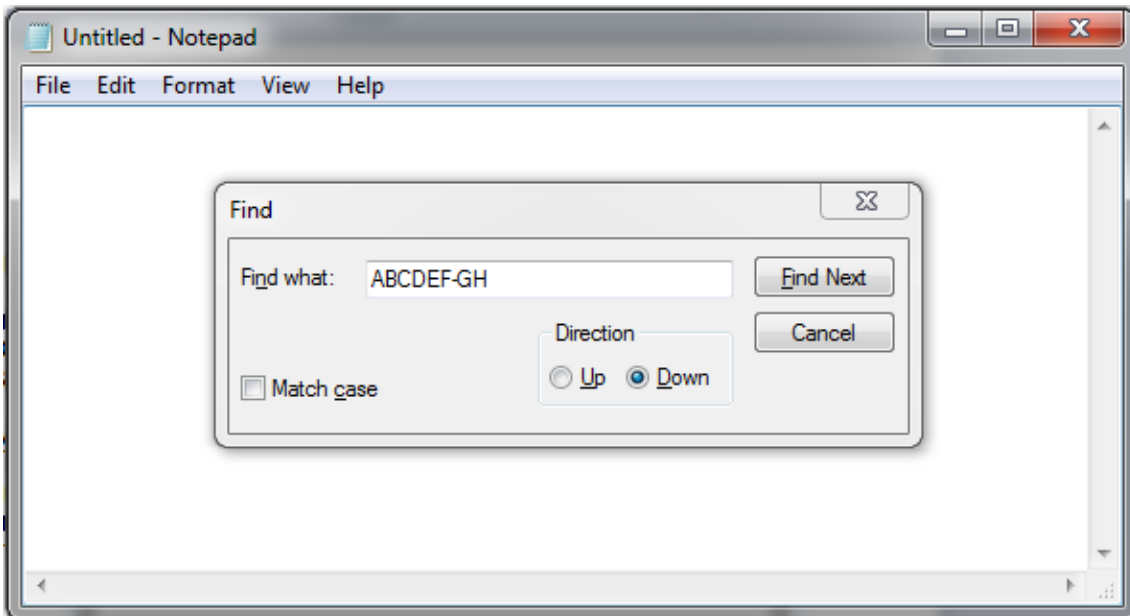
123456-78

Product 1



ABCDEF-GH

Product 2





About the Synergy Family

Tidal Engineering's Synergy Controllers, the ¼ DIN Synergy Nano, Synergy Micro 2 and the Synergy Quattro provide state-of-the-art usability and connectivity for environmental test control and data acquisition. They combine the functions of a chamber controller and a data logger and are designed to improve test efficiency by supporting both factory automation and test and measurement protocols and standards.

Synergy Controller feature highlights includes:

- ➔ Color touch screen
- ➔ Ethernet, RS-232 and GPIB communications
- ➔ Built in 100 MB Data logger with USB drive support
- ➔ Data Acquisition, up to 64 T-type thermocouples (Optional)
- ➔ Built-in Web Server for remote control; WebTouch Remote™
- ➔ Compatible with Synergy Manager for PC based control, monitoring and programming.
- ➔ Built-in FTP Server for factory automation and test and measurement applications

For more information regarding these controllers please see the full Synergy Controller Technical Manual on our website at <http://www.tidaleng.com/synergy.htm>

About Tidal Engineering

Headquartered in Randolph, NJ, Tidal Engineering Corporation has been designing and building award-winning embedded hardware and software for test and measurement and data acquisition applications since 1992. The company is recognized for technical expertise in such areas as Embedded IEEE 488, and turnkey SCADA (Supervisory Control and Data Acquisition) systems.

Tidal Engineering Corporation
2 Emery Avenue
Randolph, NJ 07869
Tel: 973/328-1173
www.TidalEng.com
info@tidaleng.com

