Door Access Manager

Introduction

Opto 22 provides two sample software applications for use with SNAP-SCM-W2 serial communication modules. These modules comply with the Security Industry Association Access Control Standard Protocol for the 26-bit Wiegand® Reader Interface.

- Door Control—an ioControl™ strategy for configuring modules and handling 16 doors with up to 4200 users
- ioDoorAccessManager—a Microsoft® Windows® utility program for managing user names and entry permissions, written in Visual Basic.

This technical note shows you how to use the sample applications, which are available for download from our Web site at www.opto22.com.

This software manages security access using a SNAP Ultimate I/O system with access cards and readers that conform to the 26-bit Wiegand reader interface. The SNAP-SCM-W2 modules receive incoming data from the card readers. This data is processed by the ioControl strategy running on the SNAP Ultimate brain. The brain opens the doors for authorized users and reports door activity by sending Simple Network Management Protocol (SNMP) traps to a PC on the same network as the SNAP Ultimate I/O™ system.

The sample strategy can be used as is or modified to fit your application.

Hardware and Software Needed

To use the sample software to manage up to 16 doors, you will need the following:

- SNAP-B16M, SNAP-B16MC, or SNAP-B16MC-P mounting rack
- SNAP-UP1-ADS brain with firmware version 1.0.2.A or newer

- Four SNAP-ODC5SNK digital output modules, four SNAP-IDC5-SW digital input modules, and eight SNAP-SCM-W2 Wiegand serial modules
- SNAP power supply (usually a SNAP-PS5)
- ioControl version 1.0c or newer running on a PC on the same network as the I/O unit
- Sample Door Control strategy and ioDoorAccess Manager from our Web site at www.opto22.com
- Access cards and card readers (available from standard security equipment vendors) and wiring from readers to SNAP-SCM-W2 modules. Some card readers can use other protocols. Make sure your device is correctly configured to use the Wiegand protocol. Transmission data for cards is assumed to be a 37-bit format with site and badge codes as follows:

```
Bits-1234 5678 9012 3456 7890 1234 5678 9012 3456 7
Code-P000 0000 SSSS SSSS SBBB BBBB BBBB BBBB BBBB P
```

```
    Key: P = parity bit
         0 = zero-filled
         S = Site code
         B = Badge code
```

Note that although the first and last bits are parity bits, the SNAP-SCM-W2 does no parity checking.

- Contacts and solenoids to monitor and control doors, and wiring from them to the I/O unit.

Installing Hardware

1. Install the SNAP mounting rack and power supply at a convenient location near the doors you are managing. Install the brain on the rack following directions in Opto 22 form #1460, the *SNAP Ethernet-Based I/O Units User's Guide*.

2. Install I/O modules on the rack in the positions shown in the following table:

Position	Module
0	SNAP-ODC5SNK digital output
1	SNAP-ODC5SNK digital output

Position	Module
2	SNAP-ODC5SNK digital output
3	SNAP-ODC5SNK digital output
4	SNAP-IDC5-SW digital input
5	SNAP-IDC5-SW digital input
6	SNAP-IDC5-SW digital input
7	SNAP-IDC5-SW digital input
8	SNAP-SCM-W2
9	SNAP-SCM-W2
10	SNAP-SCM-W2
11	SNAP-SCM-W2
12	SNAP-SCM-W2
13	SNAP-SCM-W2
14	SNAP-SCM-W2
15	SNAP-SCM-W2

Each digital output module (positions 0–3) opens four doors, one door per output point. Each digital input module (positions 4–7) reports open/closed status for four doors, one door per input point. Each SNAP Wiegand module receives security card data from two doors, one on each port.

NOTE: If you are managing fewer than 16 doors, you can still use the sample strategy with very little modification if you use a 16-module rack and place the modules in the same positions shown in the table. For example, if you are managing ten doors, use three digital output modules in positions 0–2, three digital input modules in positions 4–6, and five SNAP-SCM-W2s in positions 8–12.

3. Following the wiring diagrams below and on the next page, wire solenoids from the doors to the output points, and wire contacts from the doors to the input points. Also wire card readers from the doors to the SNAP-SCM-W2 modules.

Make sure doors are wired in order as shown in the following table, so they will match the ioControl strategy. You can use the form on the last page of this technical note to keep track of door numbers, names, and locations.

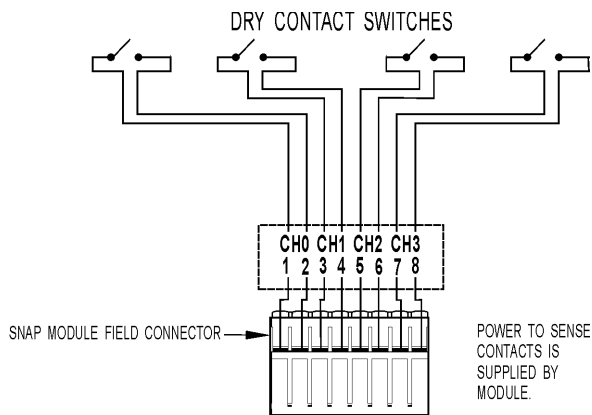| Door	Output		Input		Wiegand	
	Module	Point	Module	Point	Module	Port
0	0	0	4	0	8	A
1	0	1	4	1	8	B
2	0	2	4	2	9	A
3	0	3	4	3	9	B
4	1	0	5	0	10	A
5	1	1	5	1	10	B
6	1	2	5	2	11	A
7	1	3	5	3	11	B
8	2	0	6	0	12	A
9	2	1	6	1	12	B
10	2	2	6	2	13	A
11	2	3	6	3	13	B
12	3	0	7	0	14	A
13	3	1	7	1	14	B
14	3	2	7	2	15	A
15	3	3	7	3	15	B

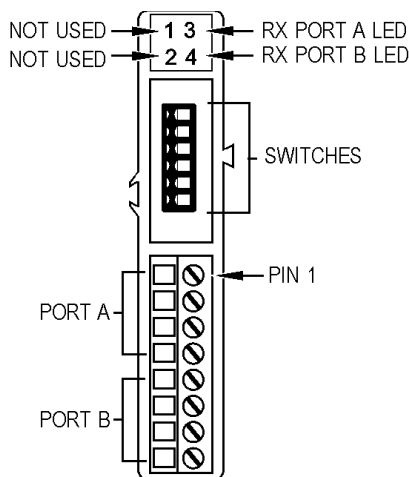As an example, the diagram below shows the modules Door 0 would be wired to.
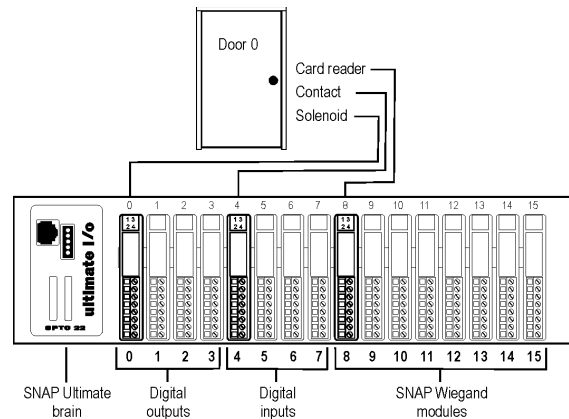
Wiring for a SNAP-ODC5SNK
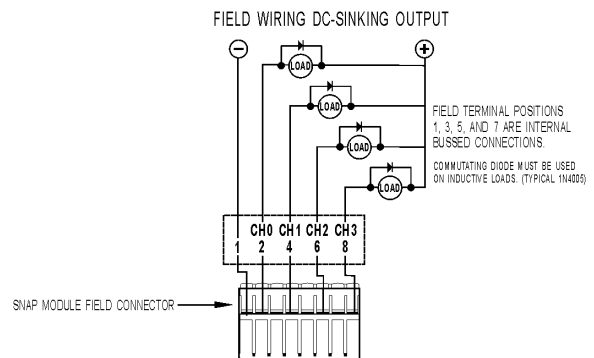
### Wiring for a SNAP-IDC5-SW

Wiring for a SNAP-SCM-W2

Pinouts for SNAP-SCM-W2:

Pin	Port	Color	Description
1	A	Black	Common
2	A	White	Data One
3	A	Green	Data Zero
4	A	--	Not used
5	B	Black	Common
6	B	White	Data One
7	B	Green	Data Zero
8	B	--	Not used

Note that the small switches on top of the module are reserved. Make sure you do not change them from their factory default positions. Defaults are shown in the following diagram:
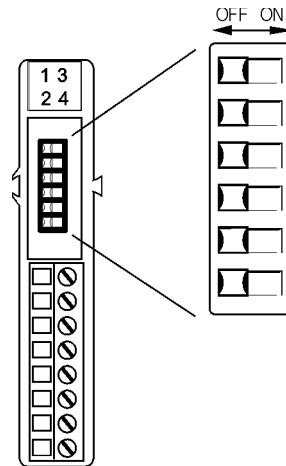
Assigning an IP Address

Follow instructions in form #1440, the *ioManager User's Guide,* to assign an IP address to the I/O unit.

Installing Software

1. Download the free sample software for the Wiegand module from our Web site at www.opto22.com.

2. Navigate to the location of the downloaded software on your computer and double-click setup.exe.

    The software is installed.

Notes on Changing the Sample Strategy

If you are using different digital input and output types, you can change them within the I/O Units➞me➞Points folder on the Strategy Tree. Try not to change the positions of modules on the rack, however, since doing so will necessitate major changes to the strategy.

For help in configuring I/O or adding additional I/O units, see Chapter 5, "Working with Control Engines and I/O," in the *ioControl User's Guide* (Opto 22 form #1300).

If you need to change SNMP configuration, Wiegand module data, or strategy logic, see Chapter 11 of the *ioControl User's Guide* for help in using OptoScript. See

the *ioControl Command Reference* (form #1301) or online command help for detailed information on all commands.

Loading the ioControl Strategy

1. From the Start menu, choose Programs→Opto 22→ioControl→ioControl.

2. In the ioControl window, choose File→Open Strategy. Navigate to the sample strategy and double-click it to open it.

3. Choose Configure→Control Engines to open the following dialog box:
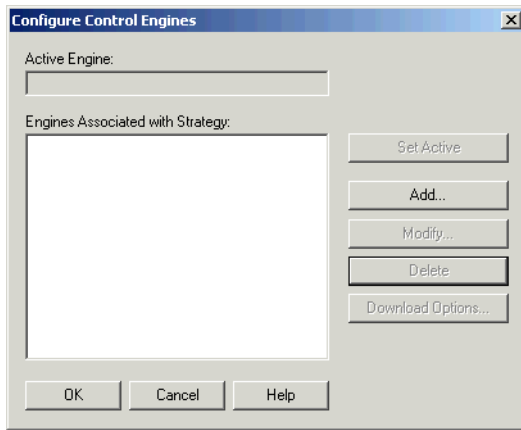
4. Click Add. If the SNAP Ultimate brain (control engine) you want is listed, skip to . If it is not listed, click Add.
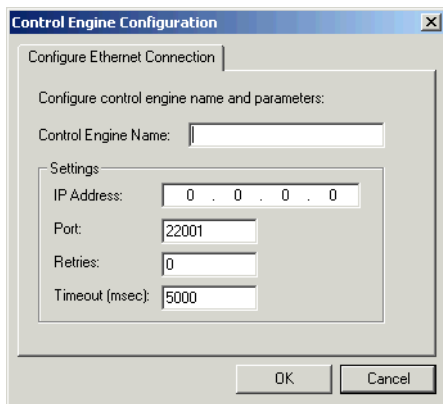
5. Enter the control engine's name and IP address. Change default Port, Retries, and Timeout only if necessary. (See the *ioControl User's Guide*.) Click OK.

6. In the Select Control Engine dialog box, highlight the control engine you want in the list and click OK.

7. In the Configure Control Engines dialog box, highlight the control engine and click Set Active. Then click OK.

8. In the Strategy Tree, expand the Variables and String Variables folders. Double-click str_SNMP_IP.
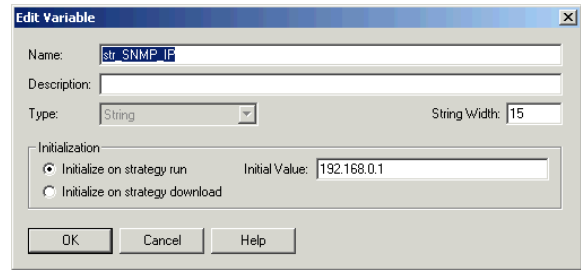
9. In the Initial Value field, enter the IP address of the computer that will receive the SNMP traps.

10. In the Strategy Tree, expand the I/O units, me, and Points folders. Rename output points DOUT_0 through DOUT_15 (and DIN_0 through DIN_15) with descriptive names for the doors they control.

    These names will appear in the SNMP traps.

11. Save the strategy. On the ioControl toolbar, click the Debug Mode button 📄↓ . At the Powerup Clear message, click OK. If a message asks if you want to continue to download, click Yes.

    The Download dialog box shows progress as the strategy is downloaded and saved to flash memory.

12. On the Strategy Tree, expand the Control Engines folder. Right-click the control engine you are using and choose Inspect from the pop-up menu. In the Inspecting dialog box, click the Sync time to PC button.

    The date and time on the SNAP Ultimate brain are set to match the computer date and time.

13. Close the Inspecting dialog box. In the ioControl main window, click the Run button ▶ .

    The strategy runs, initializes I/O, is saved to flash, and the I/O unit is restarted. The strategy is automatically started.

14. At the Timeout error message, click Abort. Continue with the next section, "Setting Up Users."

Setting Up Users

With ioDoorAccessManager, you can manage access permissions for users. To add users, the ioControl strategy must be stopped. You need to have access cards for the users you are setting up and be able to use a card reader wired to one of the Wiegand modules on the I/O unit.

You also need to know which module and port the reader is wired to. Default port numbers are shown in the following table:

| Module Position	Port	IP Port Number	Module Position	Port	IP Port Number
0	A	22500	8	A	22516
	B	22501		B	22517
1	A	22502	9	A	22518
	B	22503		B	22519
2	A	22504	10	A	22520
	B	22505		B	22521
3	A	22506	11	A	22522
	B	22507		B	22523
4	A	22508	12	A	22524
	B	22509		B	22525
5	A	22510	13	A	22526
	B	22511		B	22527
6	A	22512	14	A	22528
	B	22513		B	22529
7	A	22514	15	A	22530
	B	22515		B	22531

1. From the Start menu, choose Programs➔Opto 22➔ioUtilities➔ioDoorAccessManager.

The main window appears:
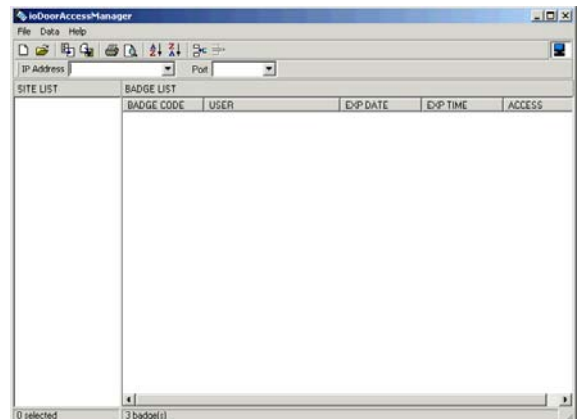
2. To create a new file of users, choose File➔New. Navigate to the location where you want the file to be, give it a descriptive name, and click Save.

(If a file already exists, use File➔Open to open it.)

3. Enter the IP address of the SNAP Ultimate brain. From the drop-down list, choose the port number for the Wiegand module that the card reader is wired to. (See the previous table for port numbers.)

4. Choose File➔Stop Control Engine. Select the control engine from the list and click OK.

The ioControl strategy must be stopped while you add users.

5. Right-click in the Badge List area and choose Add Account from the pop-up menu. When the message box prompts you, swipe the card through the card reader.

The Add Account dialog box appears.
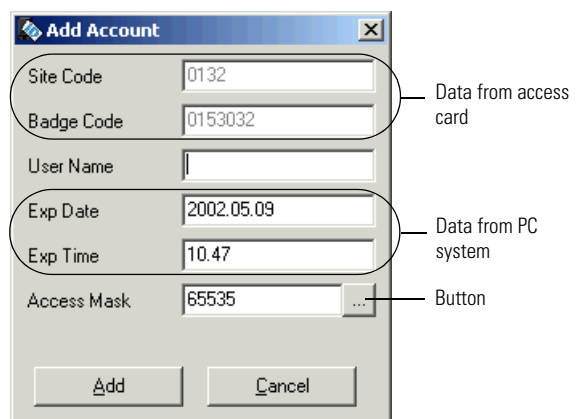
Site and badge codes are read from the card; they cannot be changed. The computer system's current date and time appear in the Exp Date and Exp Time fields.

6. Enter the user's name (maximum 20 characters).

7. Change the expiration fields to show the last date and time this user should have access.

Make sure you change the Exp Date and Exp Time. Since the current date and time are assumed, the cards will expire immediately.

Access Mask is the decimal number equivalent of a bit mask representing the 16 doors controlled by the ioControl strategy. The number indicates which doors this user has access to. The default is access to all doors.

8. Click the button next to the Access Mask field.
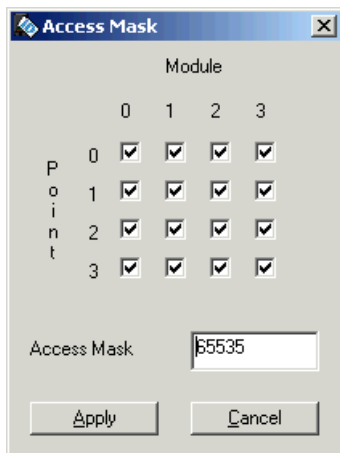
The check marks represent the doors controlled by the digital output modules in positions 0–3 on the rack.

Each column is a module; each module has four points (0–3) controlling four doors. For example, module 0 point 0 is door 0; module 2 point 1 is door 9 (see the table on page 2).

A check mark gives the user access to the door controlled by the module and point indicated.

The default access mask has check marks in every box, giving the user access to all doors.

9. Click the boxes to show check marks for all the doors the user should be able to access. Notice that the Access Mask number changes to match your

choice. When the correct doors are checked, click Apply. In the Add Account dialog box, click Add.
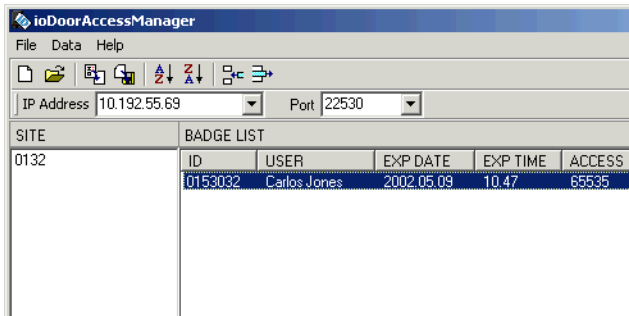
The new user name and data appear in the Badge List. The site code appears in the Site list.

10. Repeat from step 5 for each user.

11. When all users have been set up, choose File→Export→ioControl Engine. In the Select Control Engine dialog box, highlight the control engine and click OK.

A box shows progress as the file is downloaded.

12. To start the strategy running, choose File→Start Control Engine. Highlight the control engine and click OK.

The strategy starts running on the SNAP Ultimate brain.

Testing the Strategy

To test the strategy, scan a card that you have set up; the door should open. You can use any software application that receives SNMP traps to test the strategy, too. When you scan a card, the strategy will send the identity of the cardholder in a trap. Try leaving a door open for a couple of minutes; a trap will indicate that it was open too long.

Maintaining User Lists

Working with User Lists

User lists created in ioDoorAccessManager have a file extension of .mdb (they are Microsoft Access files). Changes you make to user lists are automatically saved on your computer. To open an existing list, choose File→Open and navigate to the .mdb file.

If you have a user list on an I/O unit that you would like to use on another unit, you can import it. Choose File→Import to copy the file from the first I/O unit; change user data if necessary; then choose File→Export to send it to the second I/O unit.

Sorting the User List

Within the ioDoorAccessManager main window, you can sort the list of users by any column, such as user name or expiration date. Simply click the column heading you want to sort by. To reverse the order, click the column heading again.

Printing and Saving the User List

You can print the list of users in an ioDoorAccess Manager file. All users are shown in the printed file, which is sorted by site ID and then by badge code.

You can also save the list as a text file.

1. Choose File→Print Preview.

   You see how the printed file would look.

2. To print, click the Print button ⊞ .

3. To save the list as a text file, click the Export button ⊞ . Navigate to the location where you want the file, enter a descriptive file name, and click Save.

4. To close the preview window, click the close button in the upper-right corner.

   You return to the ioDoorAccessManager main window.

For Help

If you have problems using the sample applications or the SNAP Wiegand module, check the following Opto 22 sources for help:

- Form #1300, *ioControl User's Guide*
- Form #1301, *ioControl Command Reference*
- Form #1460, *SNAP Ethernet-Based I/O Units User's Guide*
- Form #1191, *SNAP Serial Communication Module User's Guide*

If you cannot find the help you need, contact Opto 22 Product Support Monday through Friday, 8 a.m. to 5 p.m. Pacific Time.

Phone: 800/TEK-OPTO (835-6786)
           951/695-3080

Fax: 951/695-3017

E-mail: support@opto22.com

Door Locations

Door	Name	Location	Notes
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			