
Instructions

Installation and Operation of the TPD1 Prodigy Smart-Board™ Datalogger

Scotsman's Advanced Feature Smart-Board is an optional add on electronic device that can be applied to most Prodigy models. It can be used:

- With the standard controller
- With the standard controller and the SmartLock Out Control (KSL)
- With the standard controller and the Vari-Smart™ Ice Level Control (KVS)
- With the standard controller, and both the KSL and the KVS

Smart-Board abilities include:

- USB connection to Scotsman's Prodigy TechTool software
- Data Logging
- Data Display

Kit Contents

- Pre-mounted Smart-Board, connecting cable, USB cable, CD-ROM.

Installation: Temporary Data Logger

1. Depress and hold the Off button until the machine shuts Off (Status light will go out).
2. Disconnect electrical power from the ice machine.

Note: Connecting the TPD1 to a controller that is powered is NOT recommended, as it might result in a reset of the controller.

3. Remove front panel.
4. Remove screw holding control cover to control box, swing control & cover open.
5. Route wire into back of control box. Locate datalogger in a secure spot in the cabinet.
6. Connect supplied wire from Smart-Board box to main controller Accessory connection.
7. Close the control box cover.
8. Reconnect electrical power. Display will show time and date (US Central Time). See time set section for instructions on changing the time. The prior data should be cleared so the datalogger only contains information on the machine it is now connected to. See page 3 for instructions on clearing the data.

Use of Smart-Board Buttons:

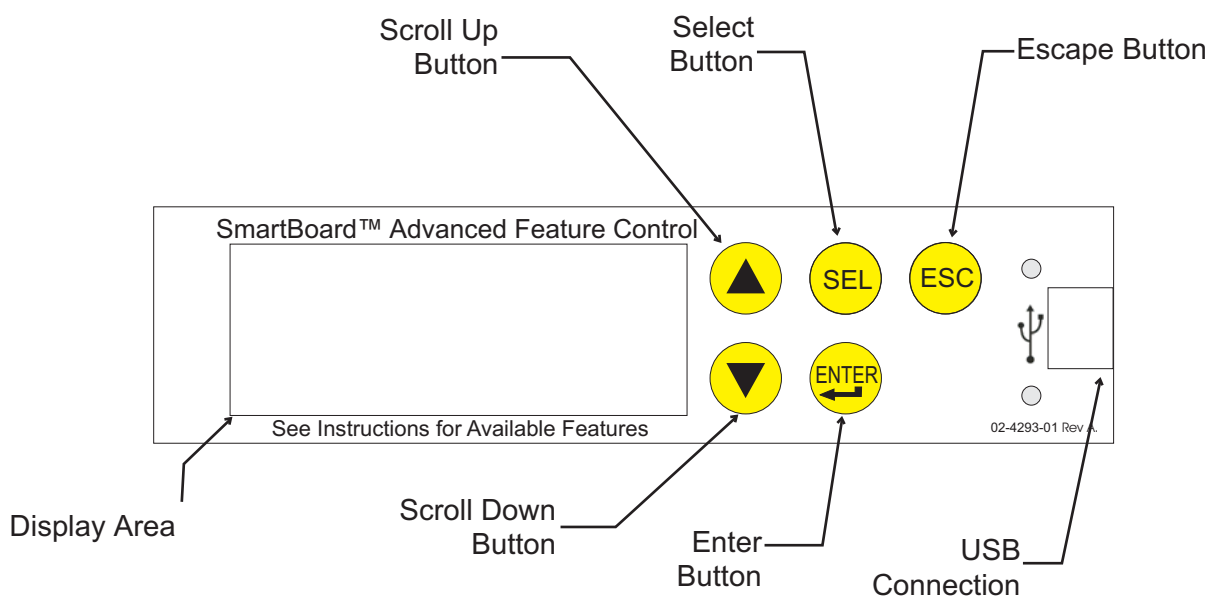
Scroll Up: Changes the display to a menu item higher on the menu list or goes up one number on a setting

Scroll Down: Changes the display to a menu item lower on the menu list or goes down one number on a setting

Select Button: Use to make changes to settings.

Enter Button: Changes display to a sub menu list.

Escape Button: Changes display to the main menu.



The Smart-Board can display **Warnings** and **Data**.

Data Available:

- Time, Date
- Average freeze time
- Minimum freeze time
- Maximum freeze time
- Average harvest time
- Minimum harvest time
- Maximum harvest time
- Diagnostic code with timestamp
- Compressor run time
- Freeze cycles
- Flush level used
- Water quality
- Operational mode
- Water temperature
- Discharge temperature
- Voltage from the transformer
- Bin stat input status

Warnings - will appear in display after malfunction

- Self Test Fail
- Long Freeze Pend
- Long Freeze Err
- Long Harvest Err
- Check Water
- High Temp Error
- Sump Temp Sensor
- Disch Temp Sensor
- Min Freeze Pend
- Min Freeze Error
- Check Water Warn
- Long Freeze Warn
- Long Harv Warn
- High Temp Warn

Communication Features:

The datalogger can communicate information in two ways:

- Display: The two line display is controlled by the buttons on the front of the datalogger.
- USB: There is a USB connection on the front of the SmartBoard. It can be used by a laptop or other PC type computer to read, download or log data. Scotsman software is required.

Other Features:

Although use with the datalogger version of the Smart-Board is unlikely, 7 Day Programmable Ice Level Control is available when the optional Vari-Smart adjustable ice level control is installed on the Prodigy controller. Instructions for programing are included in these instructions. **Some features are not available when installed on a cuber that has Rev 1 software.** Rev 2 use began approximately March 2007.

Suggestions for use:

The datalogger will be most useful when connected to a machine that needs further diagnostics. It can record information that otherwise would be difficult to get. Of particular use will be freeze cycle time, harvest cycle time, power interruptions and any diagnostic shut downs. The Status and Performance sections contain that type of information.

Menu Tree

Date - preset

Time - preset to Central Time

Warnings

No warnings

See prior page for warning list

Base Faults

Fault code 1:

Fault code 2:

Fault code 3:

Fault code 4 :

Fault code 5 :

Fault code 6 :

Fault code 7 :

Fault code 8 :

Fault code 9 :

Fault code 10 :

Adv (advanced) Faults, descriptions of faults with time and date of occurrence

Self test failure

Long Freeze Pend

Long Freeze Strikeout

Long Harv Pend

Long Harvest Strikeout

Check Water

High Temp Error

Disch Temp Error

Sump Temp Sensor

Discharge Temp Sensor

Min Freeze Pend

Minimum Freeze Strikeout

Status

Discharge Temp

Sump Temp

Board Voltage

Bin Level

Bin Setpoint

Freeze Timer

Harvest Timer

Freeze Counter

Water Quality

Flush Used

Long Frz Strike

Long Hrv Strike

Min Frz Strike

Pwr Interrupts

Bin Stat

Disch Frz Set

Cleaning

Clean interval

Next Clean Due

Last Clean

Flush level

Set Flush Level

Performance

Percent run time:

Min Freeze Time

Max Freeze Time

Avg Freeze Time

Min Harvest Time

Max Harvest Time

Avg Harvest Time

Clear History

Test

Water Test

Water fill time

Esc to cancel test

Timers

Compressor run time

Comp resettable

Press enter to reset

Pwr up time

Pwr resettable

Press enter to reset

Revision

AFB SW Revision

Controller SW

US Bin Level SW

AFB Hardware Rev

Controller HW

Setup

Date

Set date

Time

Set time

Model Number

Set model number

Serial Number

Set serial number

Manufacturer

Equipment Name

Manufacture date

Set Manufacture Date

Install Date

Set Install Date

Contact Name

Set Contact Name

Contact Phone Number

Set contact phone

Audible alert

Set audible alert on / off

Clear current log file

Press Select to clear log

Clear fault history

Press Select to clear fault code

Logging rate

Set logging rate

Fill time warning xxx seconds

Set fill time warning

Freeze time warning xx minutes and seconds

Set freeze time warning

Harvest time warning minutes and seconds

Set harvest time warning

Discharge temp warning in degrees F

Set discharge temp warning

PGM Bin Level*

Bin Level Ctrl

Set Bin Level Ctrl On Off

Monday time 1

Monday level 1

Monday time 2

Monday level 2

Monday time 3

Monday level 3

Monday time 4

Monday level 4

Tuesday time 1

Tuesday level 1

Tuesday time 2

Tuesday level 2

Tuesday time 3

Tuesday level 3

Tuesday time 4

Tuesday level 4

Wednesday time 1

Wednesday level 1

Wednesday time 2

Wednesday level 2

Wednesday time 3

Wednesday level 3

Wednesday time 4

Wednesday level 4

Thursday time 1

Thursday level 1

Thursday time 2

Thursday level 2

Thursday time 3

Thursday level 3

Thursday time 4

Thursday level 4

Friday time 1

Friday level 1

Friday time 2

Friday level 2

Friday time 3

Friday level 3

Friday time 4

Friday level 4

Saturday time 1

Saturday level 1

Saturday time 2

Saturday level 2

Saturday time 3

Saturday level 3

Saturday time 4

Saturday level 4

Sunday time 1

Sunday level 1

Sunday time 2

Sunday level 2

Sunday time 3

Sunday level 3

Sunday time 4

Sunday level 4

Network Configuration*

IP Address

Subnet mask

Default gateway

DHCP Enable

Update IP Address

Update Subnet mask

Update default Gateway

Update DNS

Update DHCP

* Included but does not apply to this version Smart-Board.

Advanced Fault Definitions

Self test failure

The controller checks for proper operation at power up. If the check shows a problem, this warning or fault will be displayed.

Long Freeze Pend

If the ice machine fails to make ice within the maximum time limit, the controller will note that and display this warning or fault while it is attempting another freeze cycle.

Long Freeze Strikeout

If the ice machine fails to make ice within the maximum time limit for a third consecutive time, this warning or fault will be displayed and the machine will be shut down.

Long Harv Pend

If the ice machine fails to release ice within the maximum time limit, the controller will note that and display this warning or fault while it is attempting another freeze cycle.

Long Harvest Strikeout

If the ice machine fails to release ice within the maximum time limit for a third consecutive time, this warning or fault will be displayed and the machine will be shut down.

Check Water

If the water level sensor does not sense a full reservoir during the maximum time limit, this warning or fault will be displayed. The machine will automatically attempt to fill with water.

High Temp Error

If the discharge temperature exceeds 250 degrees at any time, the controller will shut the machine down and display this warning or fault.

Sump Temp Sensor

The water temperature sensor's resistance varies with the water temperature. If the resistance is beyond what the sensor's capability is, this warning or fault is displayed.

Discharge Temp Sensor

The discharge temperature sensor's resistance varies with the refrigerant temperature. If the resistance is beyond what the sensor's capability is, this warning or fault is displayed.

Min Freeze Pend

If the controller senses finished ice thickness before the minimum freeze time has elapsed, this warning or fault will be displayed.

Minimum Freeze Strikeout

If the controller senses finished ice thickness before the minimum freeze time has elapsed three cycles in a row, this warning or fault will be displayed and the machine will be shut down.

Smart-Board Button Use:

Menu Groups: Push and release the down arrow key to scroll down to the next group.

Date - preset

Time - preset to Central Time

Warnings

Base Faults

Adv (advanced) Faults

Status

Cleaning

Performance

Test

Timers

Revision

Setup

PGM Bin Level

Within each group are several screens of information or settings, like times, that can be changed.

Date: 12-20-2006
Time: 03:33:10PM

Warnings
Base Faults

Adv Faults
Status

Cleaning
Performance

Test
Timers

Revision
Setup

Setup
PGM Bin Level

Date and Time Groups: No submenus are available.

Warnings: Press and release the Enter button to see information on current Warnings.

Press and release ESC to return to the prior menu.

Base Faults: Press and release the Down arrow to underline the B in Base Faults, then the Enter button to see in the display:

Most recent failure (labeled 0) and how long ago it occurred (in hours), then press and release the down arrow to see:

Second to most recent failure (labeled 1) and how long ago it occurred (in hours), then press and release the down arrow to see:

Third, fourth, fifth, and so on up to ninth where the list ends.



Warnings
Base Faults



No Warnings



Warnings
Base Faults



Warnings
Base Faults

If there are no errors, the screen will display End of Errors.

End of Errors

Press and release the escape button to return to the main menu tree.



Press and release the down arrow key to underline the A in Advanced Faults.



Base Faults
Adv Faults

Advanced Faults: Press and release the Enter button to see in the display:



Most recent failure and the exact time it occurred. Pressing and releasing the down arrow cycles through the other failures back to the oldest.

Several examples are listed to the right.



Long Harv Pend
04-15-07;08:15AM



Long Freeze Pend
04-01-07;07:11AM



Check Water
03-12-07;11:12AM



High Temp Error
03-12-07;05:00AM



Min Freeze Pend
02-28-07;04:20PM



Sump Temp Sensor
01-15-07;12:01AM

At the end of the list the display will show directions to go back to the main menu.



up arrow = back
esc = main menu

Press and release the escape button to return to the main menu tree.



Press and release the down arrow to underline the S in Status.

Status: Press and release the Enter button to see:

Discharge Temp in degrees F., Then press and release the Down arrow key to see:

Sump Temp in degrees F. Then press and release the Down arrow key to see:

Board Voltage - from the transformer. Then press and release the Down arrow key to see:

Bin Level number. Use with Vari-Smart control. Displays level currently sensed. Will display 255 when no Vari-Smart present. Then press and release the Down arrow key to see:

Bin set point: Used with Ultrasonic control. Then press and release the Down arrow key to see:

Freeze Timer: Freeze time. Then press and release the Down arrow key to see:

Harvest Timer: Harvest time. Then press and release the Down arrow key to see:

Freeze Counter: Then press and release the Down arrow key to see:

Water Quality: Measurement of the conductivity of the reservoir water. Typically between 20 and 60, lower numbers mean higher mineral content. Then press and release the Down arrow key to see:

Flush Used: The WaterSense system has selected this purge setting. Will read 255 if no water in sump. Then press and release the Down arrow key to see:

Long Freeze Strike: Long Freeze Strike number. Number of long freeze errors in memory. Then press and release the Down arrow key to see:

Long Harvest Strike: Long Harvest Strike number: Number of long harvest errors in memory. Then press and release the Down arrow key to see:

Min Frz Strike: Minimum freeze strike number. Then press and release the Down arrow key to see:



Adv Faults
Status



Discharge Temp:
157



SUMP Temp:
38



Board Voltage:
14



Bin Level:
13



Bin Setpoint:
9



Freeze Timer:
00:00



Harvest Timer:
00:00



Freeze Counter:
0



Water Quality:
0



Flush Used:
0



Long Frz Strike:
0



Long Hrv Strike:
0



Min Frz Strike:
0

Pwr Interrupts: Number and time of power interruptions. Then press and release the Down arrow key to see:



Pwr Interrupts:
0

Bin Stat: Open or Closed. Open is normal when no bin thermostat is attached or there is no ice on a thermostat. Then press and release the Down arrow key to see:



Bin Stat:
Open

Disch Frz Set: In degrees F. Shows the discharge temperature recorded as a set up number. The set up number is used for determining how long the fan is off at the end of the freeze cycle.



Disch Frz Set:
0

When done with Status, press and release the ESC button.



Push and release the Down arrow to put the line under the C in Cleaning. Then push and release the Enter button to see.



Status:
Cleaning



Cleaning. Press and release the Enter button to see:

The Clean Interval. Then press and release the Down arrow to see:



Clean Interval:
HR

The Next Clean Due in x HRS. Then press and release the Down arrow to see:



Next Clean Due
in HRS

Last Clean: x HR Ago.



Last Clean:
HR Ago

Then press and release the Down arrow to see:

Flush Level: Set to Auto or 1, 2, 3, 4 or 5.



Push and release the SEL arrow key to enter flush level set mode.



Flush Level:
1

Push and release the Up or Down arrow keys to change flush level.



Set Flush Level:
3

Push and release the Enter key to set the new flush level.



Then press and release the ESC button.



Push and release the Down arrow to put the line under the P in Performance.



Cleaning
Performance

Then push and release the Enter button to see:



Performance

Percent run time. Then press and release the Down arrow to see:



Percent run
time

Min Freeze Time. Then press and release the Down arrow to see:



Min Freeze Time
00:00

Max Freeze Time. Then press and release the Down arrow to see:



Max Freeze Time
00:00

AVG Freeze Time. Then press and release the Down arrow to see:



AVG Freeze Time
00:00

Min Harvest Time. Then press and release the Down arrow to see:



Min Harvest Time
00:00

Max Harvest Time. Then press and release the Down arrow to see:



Max Harvest Time
00:00

AVG Harvest Time.



AVG Harvest Time
00:00

Press and release the Down arrow open last time to enter the Clear History screen. Press and release the SEL button to clear the performance history.



Clear History

SEL

When done with Performance, press and release the ESC button.

ESC

Push and release the Down arrow to put the line under the T in Test. Then press and release the Enter button to see:



Performance
Test

Test. Press and release the SEL button to begin a water test. The time to fill the reservoir will be displayed.

ENTER

When done with Test, or to cancel it, press and release the ESC button.



Press select
to start water

ESC

Push and release the Down arrow to put the line under the T in Timers. Then press and release the Enter button to see:



Test.
Timers.

Timers. Push and release the Enter button to see



Compressor run time. Then press and release the Down arrow to see:



Compressor Run:
HR

Compressor run resettable. Press the Down arrow to go to the next line or Press SEL to enter reset mode.



Comp Resettable:
0HR

Press Enter to reset compressor run time to 0



Press enter to
clear counter

Press the Down arrow to go to Power up time. Then press and release the Down arrow to see:



Pwr Up Time:
HR

Power on resettable. Press the Down arrow to go to the next line or Press SEL to enter reset mode.



Pwr Resettable:
HR

Press Enter to reset Power on time to 0



When done with Timers, press and release the ESC button.



Push and release the Down arrow to put the line under the R in Revision. Then push and release the Enter button to see:



Timers
Revision

Revision. AFB SW Rev number.

Then press and release the Down arrow to see:



Controller SW (software rev number) Then press and release the Down arrow to see:



AFB SW Rev

US Bin Level (Vari-Smart) software revision. Then press and release the Down arrow to see:



Controller SW



US Bin Level SW
140

AFB Hardware Rev (Smart-Board revision)

Then press and release the Down arrow to see:



AFB Hardware Rev
1

Controller HW (hardware rev number).

When done with Revisions, press and release the ESC button.



Controller HW
1



Push and release the Down arrow to put the line under the S in Setup.



Revision
Setup

Then push and release the Enter button to see:



Setup:

View the Date or change it.

To Set Day, Month and Year

Press SEL key to get to Setup screen

Push and release the SEL key to move to another underlined number.



Date:
Select to change

Push and release the Up or Down arrow key to change the marked character.

Push and release the Select key to move to the next character, repeat prior step to change the character.

When done, push and release the Enter key.



Then press and release the Down arrow to view the time or change it.:



Time:
Select to change

To Set Time

Press SEL key to get to Setup screen

Push and release the SEL key to move the underline to another number.



Push and release the Up or Down arrow key to change the marked character.

Push and release the Select key to move to the next character, repeat prior step to change the character.

When done, push and release the Enter key.



Set Time:
Date: 02:07:51PM

Then press and release the Down arrow to view the

Model number.



Then press and release the Down arrow to view the

Serial number

Then press and release the Down arrow to view the

Manufacturer

Then press and release the Down arrow to view the

Equipment Name

Then press and release the Down arrow to view the

Manufacture date

Then press and release the Down arrow to view the

Install date

Then press and release the Down arrow to view the

Contact name

Then press and release the Down arrow to view the

Contact phone number. Then press and release the Down arrow to view the

Audible Alert.

Then press and release the Down arrow to view the. Then press and release the Down arrow to view the screen to clear the current log file.

Then press and release the Down arrow to view the Clear Fault History file. Then press and release the Down arrow to view the

Logging rate. Then press and release the Down arrow to view the



Model Number



Serial Number



Manufacturer
Scotsman Ice



Equipment Name
Ice Machine



Manufacture Date



Install Date



Contact Name



Contact Phone Nu



Audible Alert
Off



Clear current
log file



Clear Fault
History



Logging rate

Fill time warning. Then press and release the Down arrow to view the



Fill time warning
setpoint

Freeze time warning. Then press and release the Down arrow to view the



Freeze time
warning setpoint

Harvest time warning. Then press and release the Down arrow to view the



Harvest time
warning setpoint

Discharge temp warning.

Discharge temp
warning setpoint

Any of the above can be modified by changing the settings as noted below. The warning set points can be adjusted to match local conditions, so that when they change the Smart-Board provides a notice of the change.

To Change Setup Settings:

Press SEL key to get to Setup screen. Push and release the SEL key to move the underline to another number.

Push and release the Up or Down arrow key to change the marked character.

Push and release the Select key to move to the next character, repeat prior step to change the character.

When done, push and release the Enter key.

Example 1: Set Install Date

Push the Down arrow key until Setup is visible and the S is underlined. Press Enter.

Repeatedly push and release the Down key until the Install Date screen appears. Press SEL key to get to Setup screen



Revision
Setup

Push and release the SEL key to move the underline to another number. Push and release the Up or Down arrow key to change the marked character.



Set install date
00-00-0000

Push and release the Select key to move to the next character, repeat prior step to change the character.

When done, push and release the Enter key.



Prodigy Software

Installation and Use

Description:

The Scotsman Prodigy Tech Tool is a software program designed to access the datalogger tool.

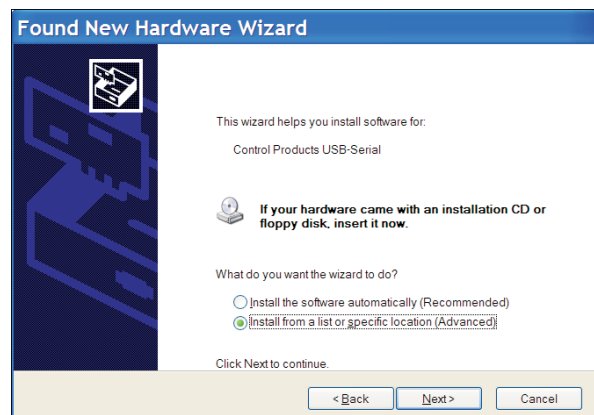
Requirements:

- Windows XP or Vista
- 40 MB disk space minimum. More will be needed if data logging is used.
- Desktop or Laptop PC with a USB port.
- Live ice machine with datalogger connected (to install USB driver)

Software Installation:

Pre-installation: The datalogger must be UNPLUGGED from the the PC.

1. Insert the CD into the computer's CD-ROM drive.
2. Follow the program installation instructions. At the finish, do NOT start the application.
 - The installation will place 2 icons on the desktop, Prodigy Charting and Scotsman Prodigy.
 - The installation will also set up a Scotsman Prodigy section under Programs (Start > All Programs > Scotsman Prodigy).
3. After the installation is complete, remove the CD-ROM from the drive.
4. Power up the datalogger and plug the USB connector into the PC and the datalogger.
5. The PC will automatically find the Smart-Board and begin the process to install the driver.
6. Select all default settings for installing the device driver.
7. Installation is now complete.



Use:

With the datalogger powered and connected to the computer's USB port, Open Scotsman Prodigy:

Start, All Programs, Scotsman Prodigy, Prodigy

Click on **Get**. The software will automatically begin to download the information from the Smart-Board. Once that is complete either click on **Chart** or select a new log file to review.

When you click on **Chart**, the Column Selection dialog box will appear. You can select any chart you want to review. The default is all of them. Click on **OK** to go to the next step.

The software will display the Charting information box. You may have to expand it to see the Chart Type selection area on the right.

Use the Chart Type box to display the list of available charts.

Which one of these to use depends upon what the machine situation is. For example, if the machine is down, displaying code 2, indicating a maximum length harvest cycle, it would be good to know the freeze cycle time before the long harvest cycle. If the freeze cycle time is long, it may be that no ice is being made, so none is available to open the curtain during harvest, causing a maximum harvest time code. Checking the Base Faults or Advanced Faults is another way to understand what occurred and when.

Another example is a complaint of low capacity. The chart on Power up time should show if the machine is on all the time. Then a look at the freeze timer chart will show how often it is cycling. The two will provide a good idea of the machine's ability to produce ice.

At any time clicking on the **Render PDF** button will generate all the charts in PDF format so they can be saved. Once saved they can be printed or emailed.

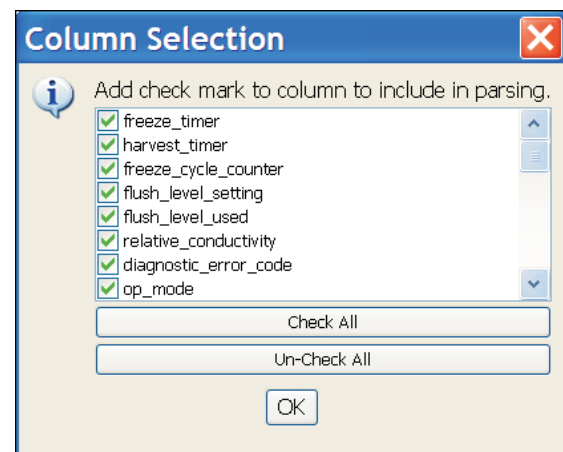
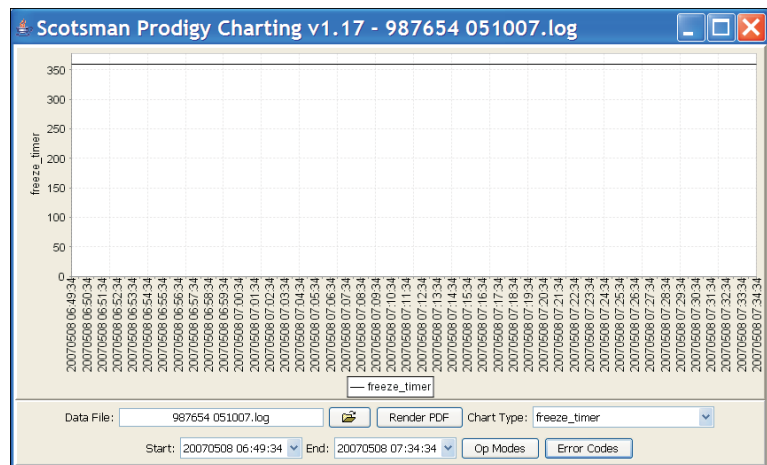
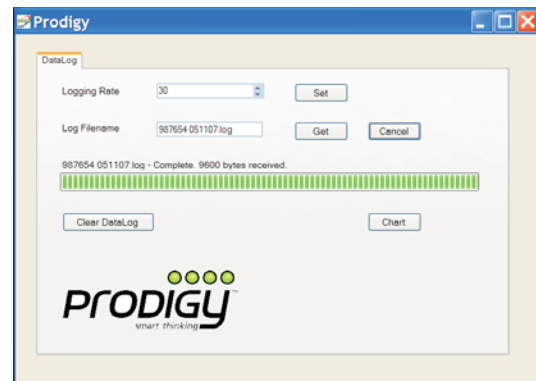
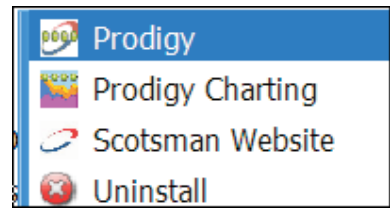
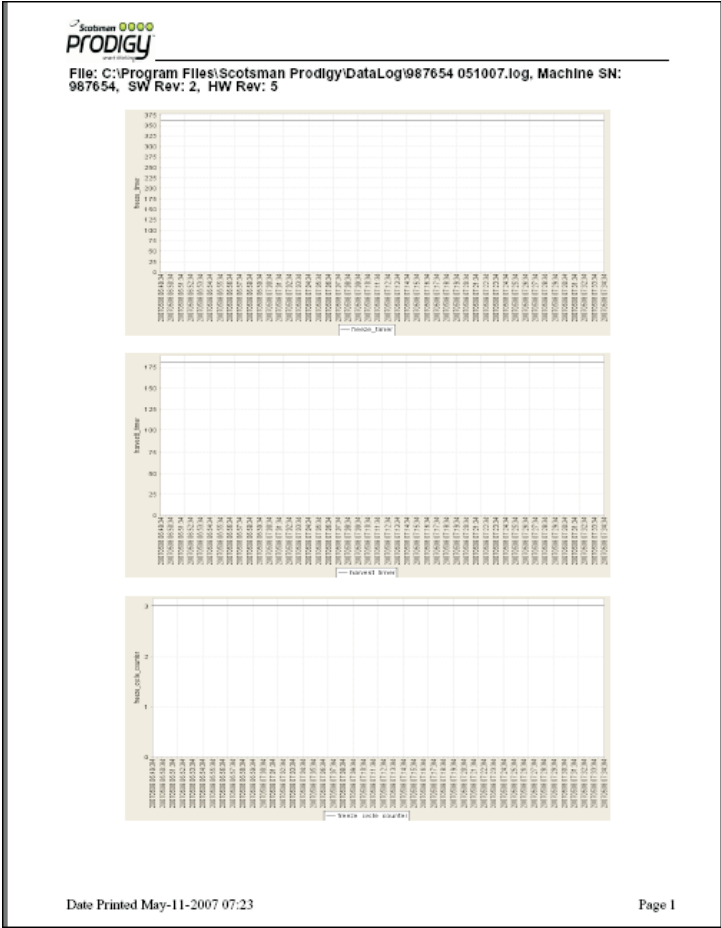


Chart Definitions:

- Freeze timer = Freeze time in seconds.
- Harvest timer = Harvest time in seconds.
- Freeze Counter = Continuous freeze cycles (starts over after bin full, power interruption, or ice melt state)
- Flush level set point = Flush level setting 0-5.
- Flush used = 1-5. Flush level used in autoflush (0) mode.
- Water quality = An indication of water quality where 0-24 Extremely Mineral Laden; 25-30 Somewhat Mineral Laden; 31-65 Normal; 66-120 Very Clean; >120 Extremely Clean
- Error code - Diagnostic Error Code. Codes listed in software and on next page
- Op mode = the current mode of the controller. Modes listed in software and on next page
- Sump temperature = Reservoir water temperature in degrees F
- Discharge temperature = Discharge temperature in degrees F
- Supply voltage = approximation of AC voltage to the control board from the transformer.
- Bin stat = Bin thermostat, when used. 0 open, 1 closed
- RLO = SmartLock option. 0 not locked, 1 locked
- Ready to Harvest = Ice thickness sensor. 0 no ice, 1 ice
- Sump Full = Water level sensor. 0 no water, 1 water
- Sump Empty = Water level sensor. 0 no water, 1 water
- Remote = 0 not remote, 1 remote
- Curtain SW1 = 0 closed, 1 open
- Curtain SW2 = 0 closed, 1 open
- Water Solenoid = 0 off, 1 on
- Water Pump = 0 off, 1 on
- Hot Gas = 0 off, 1 on
- Condenser Fan/Aux = 0 off, 1 on
- Compressor = 0 off, 1 on
- Purge Valve = 0 off, 1 on
- Power up time= Time power connected to machine.
- Compressor run = Time compressor has been operating
- Power interrupts = Number of electrical power interruptions to the machine
- Bin setpoint = Set point of the Vari-Smart control
- Bin level (inches) = Ice level measured by the Vari-Smart control
- HGV counter = Number of times the hot gas valve has cycled. Equals harvest cycles.
- Auto flush level min = minimum flush used when set to automatic

Reference



Example of generated PDF file

Error Codes



1 = Sump water max fill time error

2 = Max freeze time pending error

3 = Max freeze time error

4 = Max harvest time error

5 = Max harvest time pending error

6 = Min freeze time pending error

7 = Min freeze time error

10 = High discharge temperature error

11 = Discharge temperature sensor error

12 = Sump temperature sensor error

OK

Error Code Display

Op Modes



0 = Power restart stat

1 = Flush level adjustment state

2 = Immediate off state

3 = Off state

4 = Freeze state

5 = Harvest State

6 = Restart refrigeration state

7 = Bin full state

8 = Clean state

9 = Error shutdown state

10 = Error restart state

11 = Scotsman test state

12 = fault code view state

13 = Ice melt down state

14 = Remote lock out state

15 = Water fill test state

16 = Voltage shutdown state

17 = Time to clean adjustment state

26 = EEPROM check sum error state

OK

Op Mode Display