Instructions

Installation and Operation of the TPDL1 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 TPDL1 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.

17-3139-01.

Use of Smart-Board Buttons:

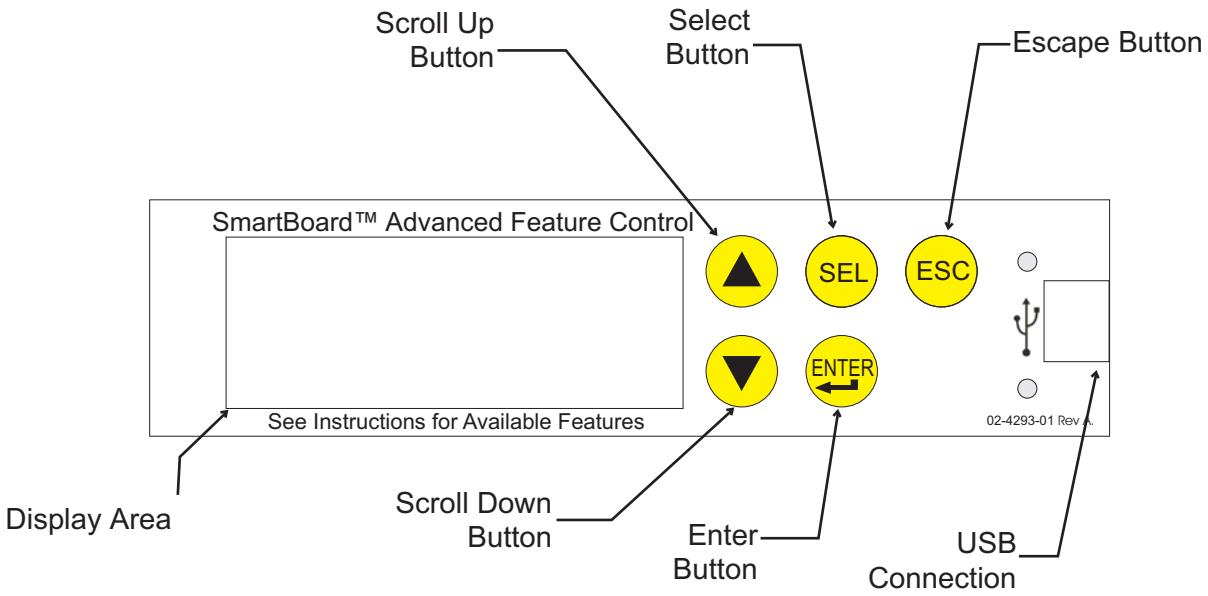
Scroll Up: Changes the display to a menu item higher on the menu list or goes up one number on a setting

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

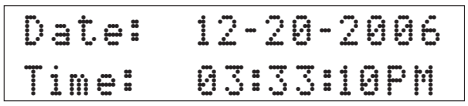
If the controller senses finished ice thickness before the minimum freeze time has elapsed, this warning or fault will be displayed.

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 if the machine and the machine will be shut down.

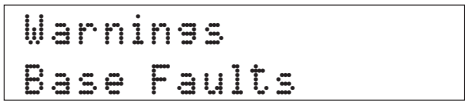
Smart-Board Button Use:

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



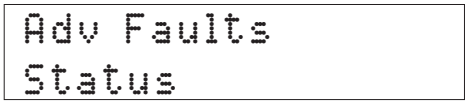
Date - preset

Time - preset to Central Time



Warnings

Base Faults

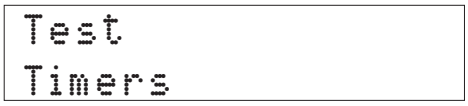


Adv (advanced) Faults

Status

Cleaning

Performance



Test

Timers

Revision

Setup

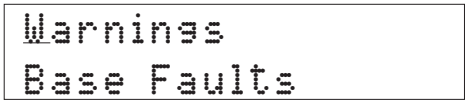
PGM Bin Level

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

Date and Time Groups: No submenus are available.

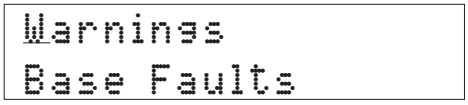
Warnings: Press and release the Enter button to see information on current Warnings.

Press and release ESC to return to the prior menu.

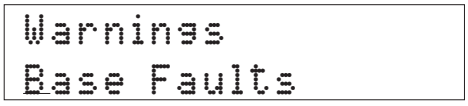


Base Faults: Press and release the Down arrow to underline the B in Base Faults, then the Enter button to see in the display:

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.

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

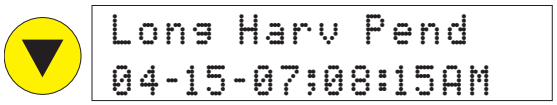
Press and release the escape button to return to the main menu tree.

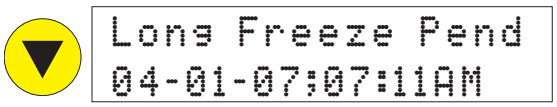
Press and release the down arrow key to underline the A in Advanced Faults.

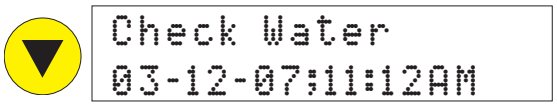
Advanced Faults: Press and release the Enter button to see in the display:

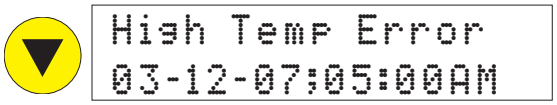
Most recent failure and the exact time it occurred. Pressing and releasing the down arrow cycles through the other failures back to the oldest.

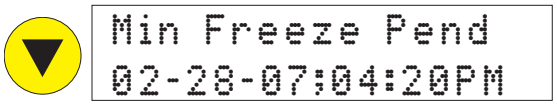
Several examples are listed to the right.

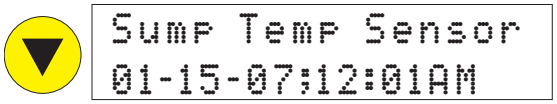










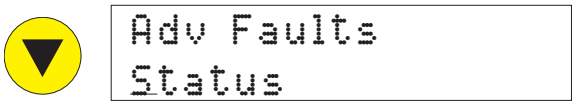


At the end of the list the display will show directions to go back to the main menu.

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

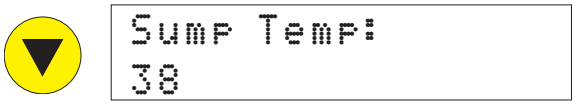
Press and release the down arrow to underline the S in Status.

Status: Press and release the Enter button to see:

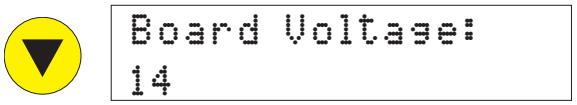


Discharge Temp in degrees F., Then press and release the Down arrow key to see:

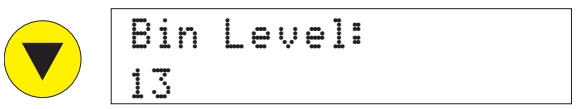
Sump Temp in degrees F. Then press and release the Down arrow key to see:



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

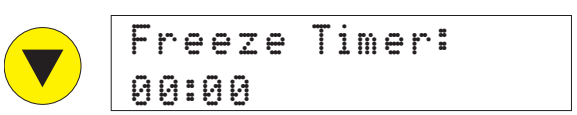


Bin Level number. Use with Vari-Smart control. Displays level currently sensed. Will display 255 when no Vari-Smart present. Then press and release the Down arrow key to see:

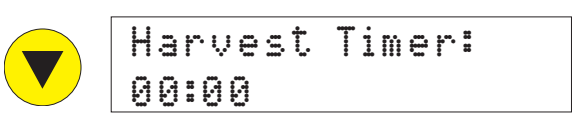


Bin set point: Used with Ultrasonic control. Then press and release the Down arrow key to see:

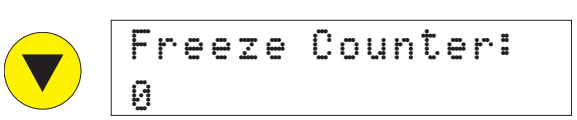
Freeze Timer: Freeze time. Then press and release the Down arrow key to see:



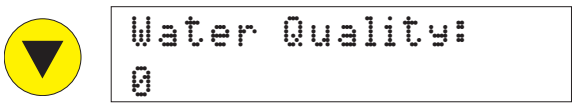
Harvest Timer: Harvest time. Then press and release the Down arrow key to see:



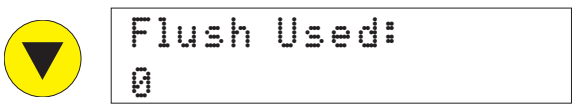
Freeze Counter: Then press and release the Down arrow key to see:



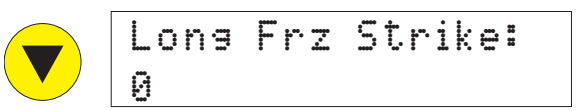
Water Quality.: Measurement of the conductivity of the reservoir water. Typically between 20 and 60, lower numbers mean higher mineral content. Then press and release the Down arrow key to see:



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:

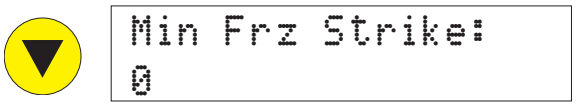


Long Freeze Strike: Long Freeze Strike number. Number of long freeze errors in memory. Then press and release the Down arrow key to see:



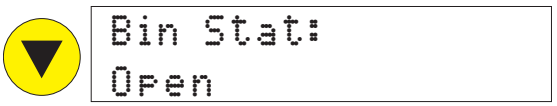
Long Harvest Strike: Long Harvest Strike number: Number of long harvest errors in memory. Then press and release the Down arrow key to see:

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

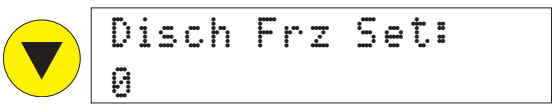


Pwr Interrupts: Number and time of power interruptions. Then press and release the Down arrow key to see:

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:

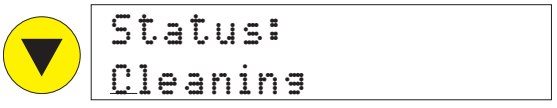


Disch Frz Set: In degrees F. Shows the discharge temperature recorded as a set up number. The set up number is used for determining how long the fan is off at the end of the freeze cycle.



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

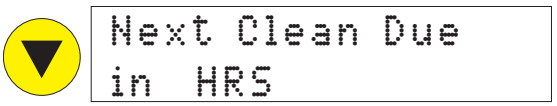
Push and release the Down arrow to put the line under the C in Cleaning. Then push and release the Enter button to see.



Cleaning. Press and release the Enter button to see:

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

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



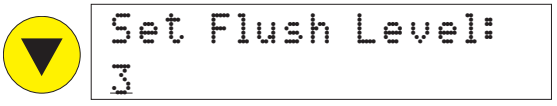
Last Clean: x HR Ago.

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.

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



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

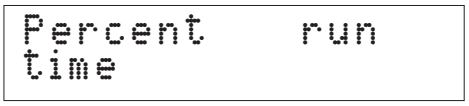
Then press and release the ESC button.

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

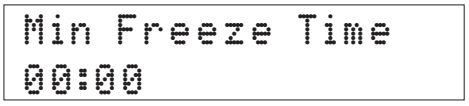
Then push and release the Enter button to see:

Performance

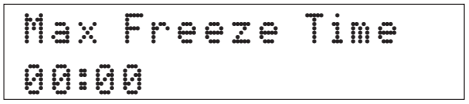
Percent run time. Then press and release the Down arrow to see:



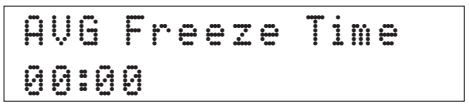
Min Freeze Time. Then press and release the Down arrow to see:



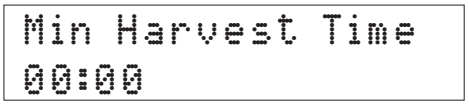
Max Freeze Time. Then press and release the Down arrow to see:



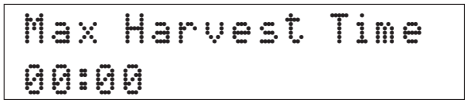
AVG Freeze Time. Then press and release the Down arrow to see:



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



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

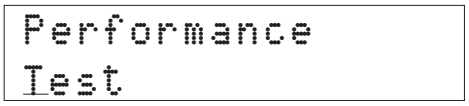


AVG Harvest Time.

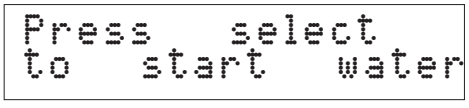
Press and release the Down arrow open last time to enter the Clear History screen. Press and release the SEL button to clear the performance history.

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

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

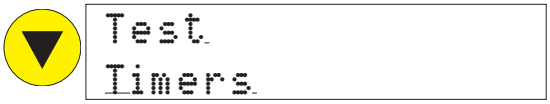


Test. Press and release the SEL button to begin a water test. The time to fill the reservoir will be displayed.



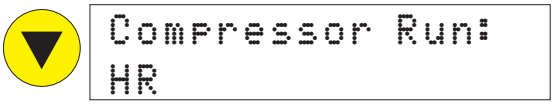
When done with Test, or to cancel it, press and release the ESC button.

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



Timers. Push and release the Enter button to see

<u>Compressor run time</u>. Then press and release the Down arrow to see:

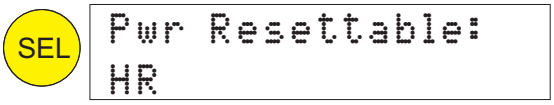


<u>Compressor run resettable.</u> Press the Down arrow to go to the next line or Press SEL to enter reset mode.

Press Enter to reset compressor run time to 0

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

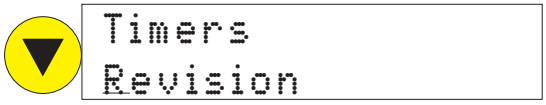
<u>Power on resettable</u>. Press the Down arrow to go to the next line or Press SEL to enter reset mode.



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:



Revision. <u>AFB SW Rev</u> number.

Then press and release the Down arrow to see:

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

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

AFB Hardware Rev (Smart-Board revision)

Then press and release the Down arrow to see:

Controller HW (hardware rev number).

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

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

Then push and release the Enter button to see:

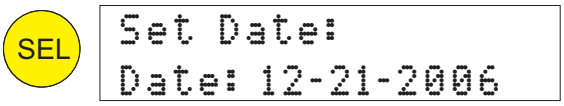
Setup:

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.



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.

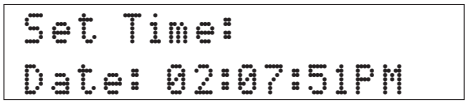
When done, push and release the Enter key.

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

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.

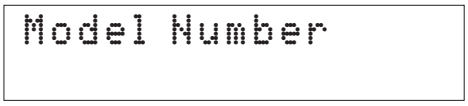
Push and release the Select key to move to the next character, repeat prior step to change the character.

When done, push and release the Enter key.

Then press and release the Down arrow to view the

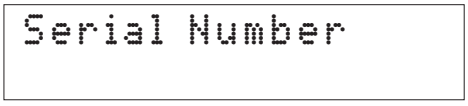
Model number.

Then press and release the Down arrow to view the



Serial number

Then press and release the Down arrow to view the

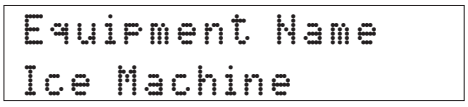


Manufacturer

Then press and release the Down arrow to view the

Equipment Name

Then press and release the Down arrow to view the

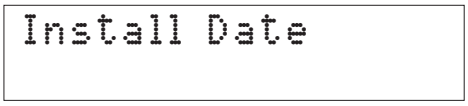


Manufacture date

Then press and release the Down arrow to view the

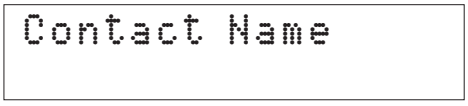
Install date

Then press and release the Down arrow to view the



Contact name

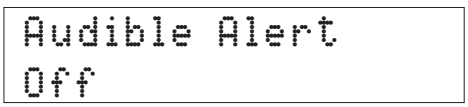
Then press and release the Down arrow to view the



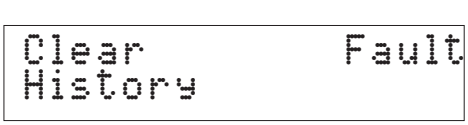
Contact phone number. Then press and release the Down arrow to view the

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.



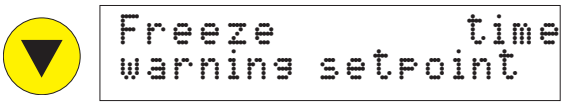
Then press and release the Down arrow to view the Clear Fault History file. Then press and release the Down arrow to view the



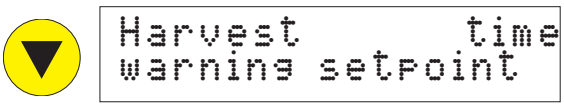
Logging rate. Then press and release the Down arrow to view the

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

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



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



Discharge temp warning.

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.

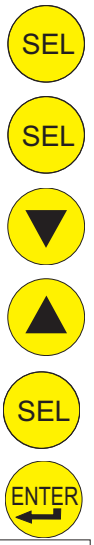
To Change Setup Settings:

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.

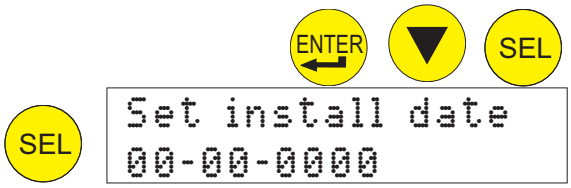


Example 1: Set Install Date

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

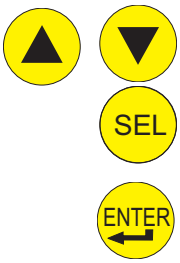
Repeatedly push and release the Down key until the Install Date screen appears. Press SEL key to get to Setup screen

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.



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).

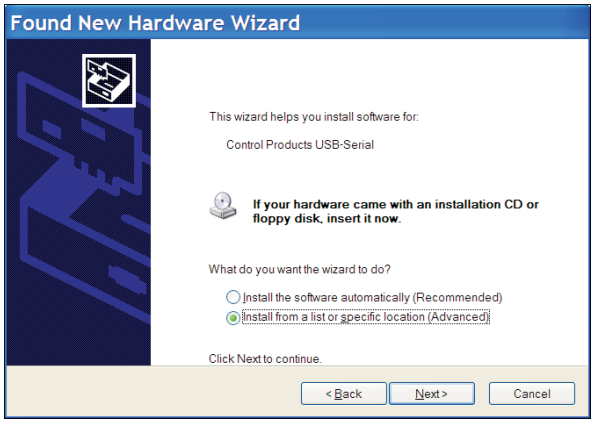
3. After the installation is complete, remove the CD-ROM from the drive.

4. Power up the datalogger and plug the USB connector into the PC and the datalogger.

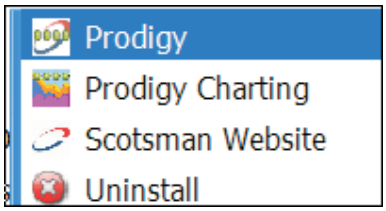
5. The PC will automatically find the Smart-Board and begin the process to install the driver.

6. Select all default settings for installing the device driver.

7. Installation is now complete.



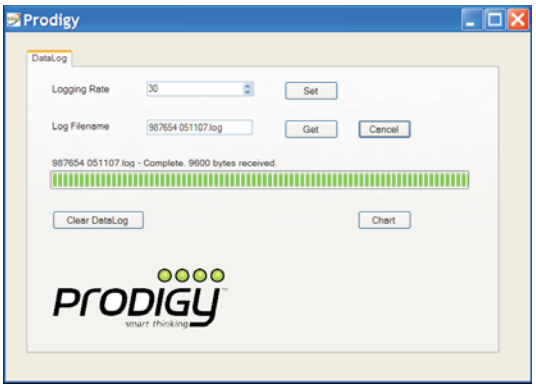
Use:



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

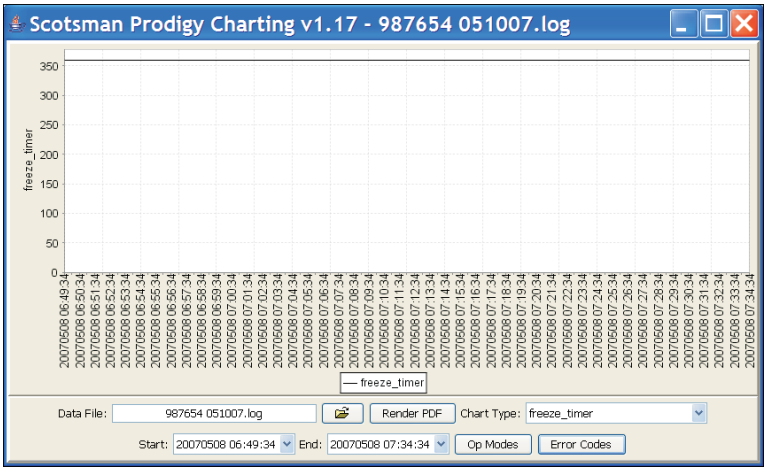
Start, All Programs, Scotsman Prodigy, Prodigy

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.



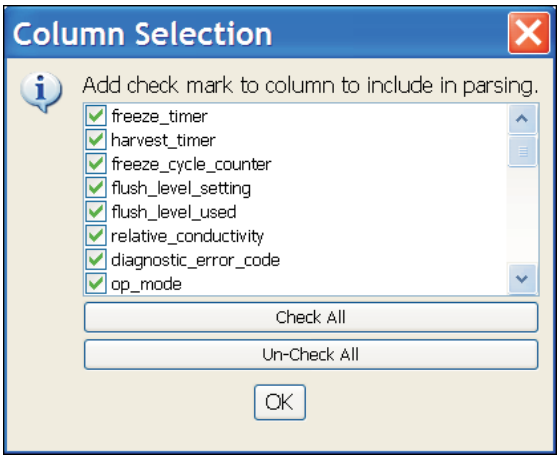
When you click on **Chart**, the Column Selection dialog box will appear. You can select any chart you want to review. The default is all of them. Click on **OK** to go to the next step.

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.



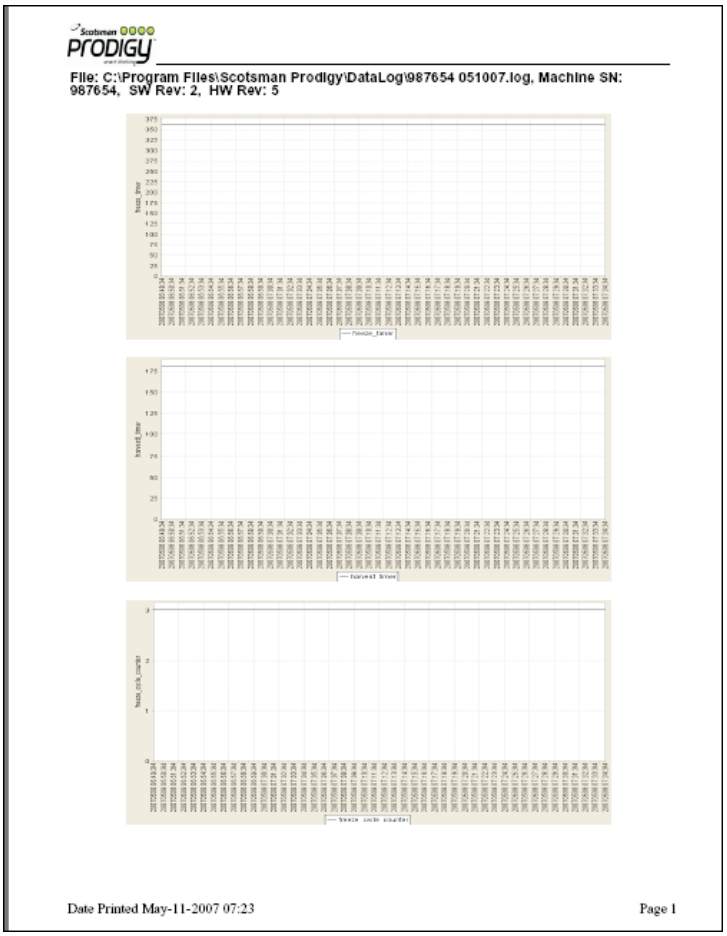
Another example is a complaint of low capacity. The chart on Power up time should show if the machine is on all the time. Then a look at the freeze timer chart will show how often it is cycling. The two will provide a good idea of the machine's ability to produce ice.

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.

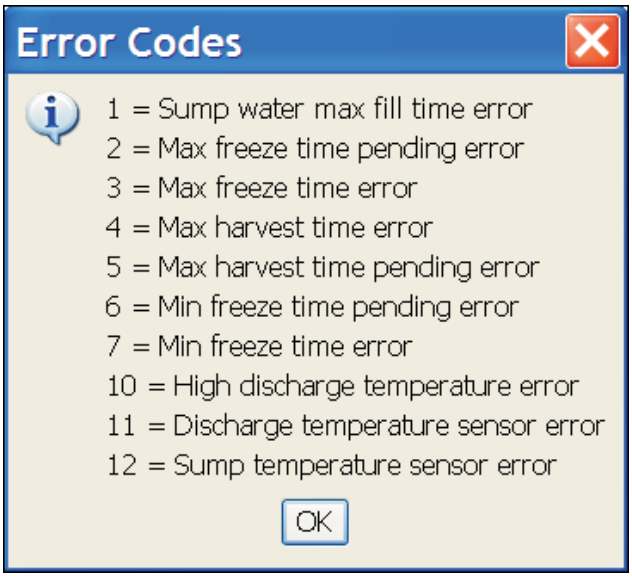
Chart Definitions:

- 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

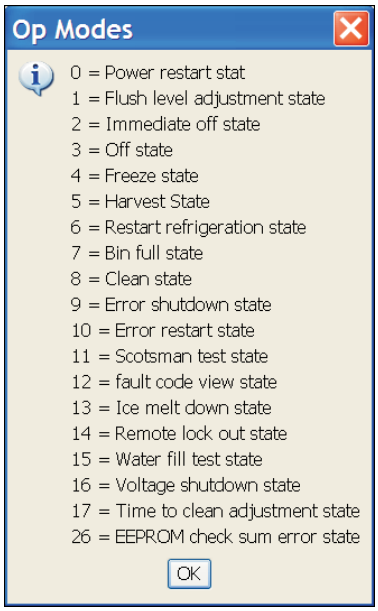
Reference



Example of generated PDF file



Error Code Display



Op Mode Display