



SapCheck® User's Guide

Version 2.1*

Model # MS-SCK-001

*requires SapCheck v7.75 software or above

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LIMITED WARRANTY

You should first read all the instructions in this User's Guide before attempting to use this product.

The SapCheck Controller and sensors are warranted against defective material or workmanship from the date of purchase. The warranty period is one (1) year.

This limited warranty applies to repair or replacement of product found to be defective in material or workmanship. This warranty does not apply to damage resulting from commercial, abusive, unreasonable use or supplemental damage. Defects that are the result of normal wear and tear will not be considered manufacturing defects under this warranty. **THE BOSWORTH COMPANY IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.** Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you also may have other rights which vary from jurisdiction to jurisdiction. This warranty applies only to the original purchaser of this product from the original date of purchase.

At its option, The Bosworth Company will repair or replace this product if it is found to be defective in material or workmanship.

This warranty does not cover damage resulting from any unauthorized attempts to repair or from any use not in accordance with the instruction manual.

NOTE: IF YOU EXPERIENCE A PROBLEM, PLEASE FIRST CONTACT SUPPORT@THEBOSWORTHCO.COM OR CALL US TOLL-FREE AT 1-888-438-1110. PLEASE HAVE AVAILABLE THE SAPCHECK MODEL NUMBER PRINTED ON THE BOTTOM OF THE CONTROLLER BOX. DO NOT RETURN THE PRODUCT TO THE ORIGINAL PLACE OF PURCHASE WITHOUT A RETURN MERCHANDISE AUTHORIZATION. DO NOT ATTEMPT TO OPEN THE SAPCHECK CONTROLLER BOX YOURSELF. DOING SO MAY VOID YOUR WARRANTY AND MAY CAUSE PERSONAL INJURY OR DAMAGE TO THE PRODUCT.

IMPORTANT! READ THIS FIRST !**SAVE THE PACKAGING!**

Should you need to return SapCheck for any reason, you will need to send it back in its original carton in order to reduce the risk of possible damage during shipping. Shipping damage may not be covered under the product warranty if SapCheck has not been properly packaged in its original container prior to shipment.

BEFORE YOU BEGIN—CHECK FOR COMMUNICATIONS

Before you begin your installation, check to be sure that there is sufficient cell phone signal strength at your sugarbush for SapCheck to operate.

Note: If you purchased your SapCheck unit from a dealer, you will need to first contact The Bosworth Company to purchase a SapCheck Support Plan for your unit. (See page 20 for details.) Purchasing a plan will allow your SapCheck device to be assigned a SapCheck phone number to communicate on a cellular network. If you purchased your SapCheck directly from The Bosworth Company, then a phone number has already been assigned to your SapCheck, and your unit is ready to send and receive text messages.

Remove the SapCheck Controller from the packaging and attach the antenna to the box as shown in the figures below.



Figure 1a. Screw the antenna into the antenna port on the side of the SapCheck Controller.



Figure 1b. Flip the antenna up. Optionally, rotate the antenna so that the flat side faces forward.



Figure 1c. Antenna installed in optional rotated orientation.

CHECK FOR COMMUNICATIONS (CONT'D)

Bring the SapCheck Controller and power cord to your sugarbush. Be sure to have the cell phone with you that is going to function as the Command Number.

While at your sugarbush, connect the SapCheck Controller to power. If there is sufficient cell phone connectivity at the sugarbush, then within approximately two minutes after powering on, SapCheck will send a text message to the Command Number, indicating the software version that is running. You can text the command “**get signal**” to SapCheck and it will return a percent indicator of cell phone signal strength.

If you do not receive this text message, or if the percent signal strength is below 10%, then there may be insufficient cell phone signal strength at your sugarbush for SapCheck to operate.

In this case, you may return SapCheck for a full credit if you act within 15 days of date of purchase and if you return SapCheck in its original shipping carton.

INTRODUCTION

SapCheck is used to remotely monitor and control vacuum pump operation at maple syrup sugarbushes. It consists of a controller together with three (3) sensors and associated connecting wires to monitor vacuum and temperature conditions at the sugarbush. SapCheck also sends an alert when the sap in the collection tank has reached a user-specified target level.

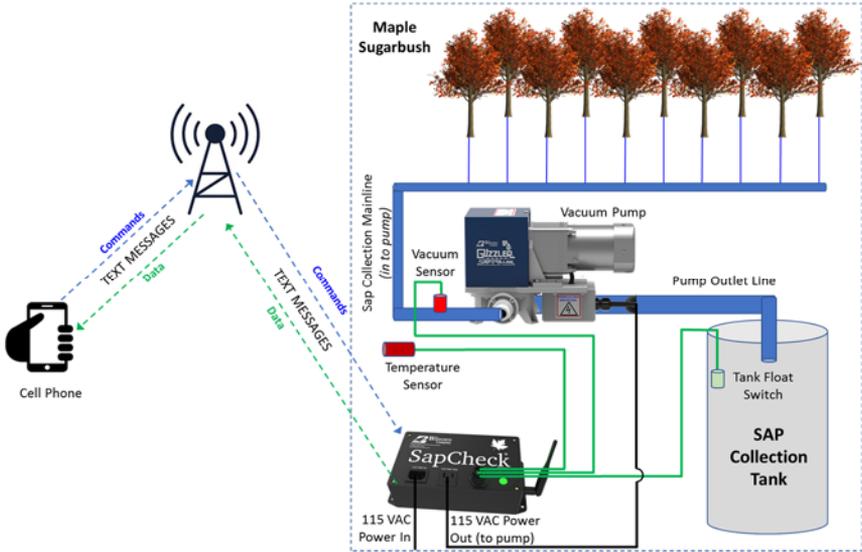


Figure 2

SapCheck requires 120 VAC power to the controller, and it can control vacuum pumps that operate on 120 VAC. Vacuum pumps up to 1/2 Hp can be directly controlled with SapCheck.

However, SapCheck is not limited to controlling pumps that plug directly into the SapCheck Controller. SapCheck can be used to control power to any electrical device that is powered by 120 VAC and does not draw more than 370 watts of power. This includes the possibility of controlling 120 VAC relays that control larger pump equipment.

SapCheck operates by sending and receiving text messages over a cellular network. To operate properly, cell phone communications must be available at the sugarbush, but only to the extent of being able to send and receive text messages.

Each SapCheck unit has an associated phone number that is used for sending text messages to it. If you purchased your SapCheck unit directly from The Bosworth Company, that phone number has already been assigned to your device and your unit is ready to send and receive text messages.

If you purchased your unit through a dealer, you must call The Bosworth Company (1-888-438-1110) or visit the company website at <https://thebosworthco.com/activate> to purchase a support plan that will provide the cell phone communications necessary for SapCheck to operate. When you purchase a support plan, your SapCheck unit will be activated and you will receive your SapCheck's phone number.

To purchase a support plan you will need to provide the SapCheck ID # printed on the bottom of the SapCheck Controller. (Figure 3 shows an example of a SapCheck with ID # "D0000XT003".)



Figure 3

Example of SapCheck ID # printed on bottom of SapCheck controller:.

SAFETY

SapCheck should not be used to power any device that requires more than 370 watts of power. Using SapCheck with such a device could pose a risk of fire or electrical shock.

The SapCheck controller requires protection from the elements. The unit should be deployed in a dry environment and should not be operated in temperatures below 20° F (-6° C) or above 90° F (32° C)

Under no circumstances should the SapCheck controller be opened or disassembled. Tampering with the SapCheck equipment will void the warranty.

DEFINITIONS

SapCheck Controller	That portion of the SapCheck product that contains the active electronics of the product. The product ID # is printed on the bottom of the Controller unit.
Command Number	SapCheck will only receive text commands from cell phone numbers that it recognizes. Each of these numbers is referred to as a Command Number. The “ set user ” text command can be used to add or delete cell phone numbers from this list.
SapCheck Phone Number	This is the phone # to which you will send text messages to your SapCheck device. You can add this phone # to your “Contacts” on your cell phone under the name “SapCheck”. (Note: if you have more than one SapCheck device, you may want to list each in your Contacts giving it a unique name, such as “SapCheck—Marshfield Rd”.)
Service mode	When service mode is turned on, SapCheck will only respond to text commands sent from The Bosworth Company's service support line. This mode is only activated upon a user's request and allows Bosworth to send and receive diagnostic text messages to the unit for troubleshooting purposes.
Activated	A SapCheck unit is “Activated” when its wireless communications components have been configured to send/receive text messages on a cell phone network. To be activated, a SapCheck unit must be covered by a Support Plan. An activated SapCheck has an assigned SapCheck phone #.
Inactive	A SapCheck unit is “Inactive” if its wireless communications components have not been configured to send/receive text messages. An inactive SapCheck unit has not been assigned a SapCheck phone #.
Deactivated	Unless a customer purchases additional support plan coverage, a SapCheck unit with an assigned phone # is Deactivated once the term of the Support Plan ends. When a SapCheck unit is deactivated, it can no longer send/receive text messages and it no longer retains its originally assigned SapCheck phone #. If a new Support Plan is purchased, a new phone # is assigned to the unit and communications

SAPCHECK COMPONENTS

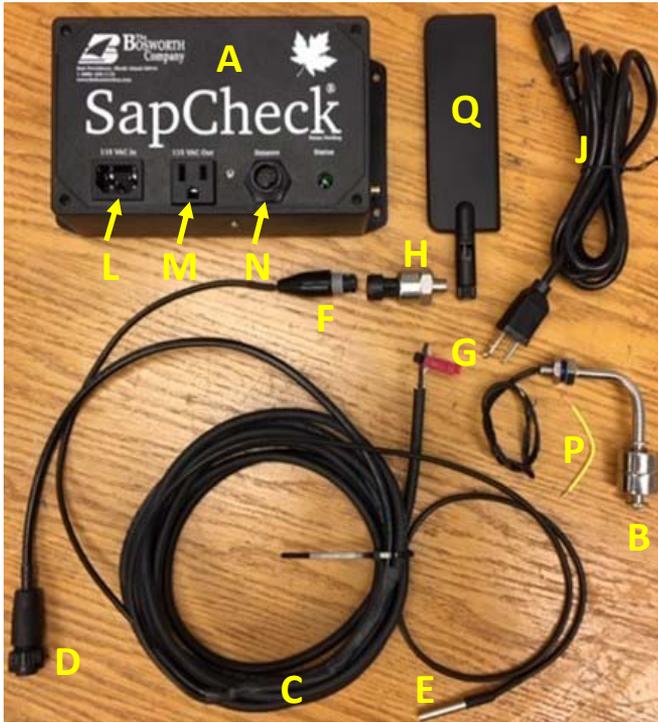


Figure 4

- ◆ SapCheck Controller (A)
- ◆ Tank float switch (B)
- ◆ 12' insulated float switch cable (C)
- ◆ Wire assembly consisting of Male Sensor Connector Plug (D) with temperature sensor (E) and male vacuum sensor connector (F) and 2 terminated Float Switch wires (G)
- ◆ Vacuum Sensor transducer with female connector (H)
- ◆ Controller Power Cord (J)
- ◆ "Power In" Receptacle on Controller (L)
- ◆ "Power Out" Receptacle on Controller (M)
- ◆ Multi-sensor connector (N)
- ◆ Float Switch By-pass wire (P)
- ◆ Antenna (Q)

INSTALLATION

TOOLS YOU WILL NEED

Drill bits	Other
9/32" - Pump enclosure hole for temperature sensor	1/8" NPT tap
21/64" - Starter hole for vacuum transducer (to be tapped 3/8" NPT)	Electrical tape
3/8" - Pump enclosure hole for float switch cables	Teflon tape
13/32" - Float switch hole in sap collection tank (Drill 2-34" above alert level.)	Adjustable wrench (for installing tank float switch and vacuum transducer)

BEFORE YOU BEGIN

The SapCheck Controller unit must be co-located near your pump. It should be installed in a dry, ventilated enclosure that protects it from the elements. These instructions assume that SapCheck will be installed in the same enclosure that contains your vacuum pump.

Your SapCheck unit has been pre-configured to send text messages to the cell phone number (a "Command Number") you provided. You can send text messages to your SapCheck unit at the SapCheck phone number listed with this installation note. We suggest you add this phone number to your "Contacts" on your cell phone, giving it the name "SapCheck" or, if you have more than one SapCheck unit, a name referencing the sugarbush location where the unit is deployed. That way, you will be receiving and sending text messages either from/to "SapCheck" or from/to the sugarbush location where SapCheck is operating.

INSTALLATION STEPS

1. Locate the SapCheck controller (**A**) within your pump enclosure. (Make sure that you have previously installed the antenna (**Q**) onto the controller. (See page 3 for details.)
2. Attach the Male Sensor Connection Plug (**D**) to the Female Connector (**N**) on the top of the SapCheck box.
3. Note: If you do not wish to install the Tank Float Switch provided, simply connect the two Float Switch (**G**) wires coming from the Male Sensor Connector Plug (**D**) to the Float Switch By-pass wire (**P**).
4. Note: The tank float switch (**B**) is to be installed in your sap collection tank. The maximum tank wall thickness that the float switch can accommodate is 3/8 in. The switching end of the float switch must be installed pointing down.

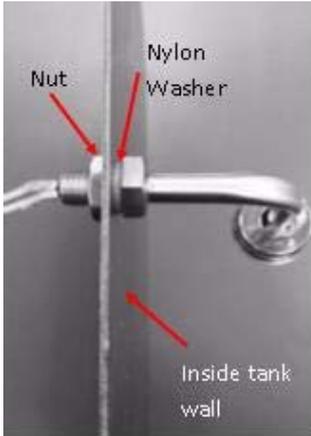
INSTALLATION STEPS (CONT'D)

Figure 5a View from above



Figure 5b View from inside tank

Figure 5a pictures tank wall from above, showing the installed float switch with exterior nut holding switch in place. The nylon washer fits between the inside nut (non-rotating) and inside tank wall to ensure secure fit with no leakage.

Figure 3b shows installed float switch, with bottom of switch roughly 3-1/2 in from top of tank. Center of hole drilled to accommodate float switch (13/32 in diameter) was located 5/8 in from top of tank.

5. Determine the desired sap level height in your collection tank at which you want the SapCheck unit to send you a Sap Alert Level message. Using the 13/32" drill bit, drill a hole 2-3/4" above this height in your tank to mount the float switch. Remove the nut from the Float Switch (G) and pass the float switch wires through this hole from inside the tank wall out. (Ensure that the nylon washer sits between the inside tank wall and the interior float switch nut.) Pass the nut over the wires on the outside and secure the nut onto the exposed threads of the tank float switch using an adjustable wrench.
6. Drill a 3/8" hole in the pump enclosure near where the SapCheck Controller is to be located. Pass the end of the 12' float switch cable (C) through this hole and connect the cable to the SapCheck Float Switch wires (G) using the red Posi-Tap connectors. (See Figure 6.) Wrap the connections with waterproof electrical tape. (Note: If your sap collection tank is further than 12 feet from the SapCheck Controller, you can splice additional wires onto the existing Float Switch wires without affecting the operation of the Float Switch.)



Figure 6a



Figure 6b



Figure 6c



Figure 6d

(6a) Remove red nut from one of the Posi-tab terminals on the 12' float switch cable and insert one of the bared end float switch wires through the red nut. (6b) Insert the bared end wire into the other end of the Posi-tab terminals. Screw the red nut from (6a) onto the Posi-tab terminal in (6b) into which the float switch wire has been inserted. When the red nut is completely screwed onto the Posi-tab terminal, pull on the float switch wire (6d) to test that a solid connection has been made. Repeat to connect the other float switch wire to the remaining float

INSTALLATION STEPS (CONT'D)

8. Drill a 9/32" hole in the pump enclosure box near where the SapCheck Controller is located and pass the temperature sensor (E) from inside the enclosure to the outside. (See Figure 7.) Ensure that the end of the temperature sensor probe is exposed to the outside temperature.



Figure 7a



Figure 7b



Figure 7c

(7a) shows temperature probe being inserted through 9/32" diameter hole in floor of pump enclosure box. (7b) shows temperature sensor installed through a hole in the floor of the pump enclosure box. (7c) shows the metal end of the temperature probe located outside and below the pump enclosure box. The metal end tip of temperature sensor must be exposed to the outside air to correctly register outside temperature. The probe tip should be located at least 12 inches away from the pump enclosure box so that it does not register heat being radiated in the area immediately near the box by the equipment operating within.

INSTALLATION STEPS (CONT'D)

9. For best results, SapCheck's vacuum sensor should be installed so that it avoids coming in contact with sap. We recommend lofting it approximately 6 inches above the mainline near the pump inlet. This can be accomplished by installing a T-fitting in the mainline near the pump that can accommodate a 6-inch length of tubing terminated with a plug. (See Figure 8.)

Tap a 1/8" NPT hole in the tubing plug. (First drill a 21/64" hole and then use a tapping tool to create a 1/8" NPT tap inside the hole.) Note: Locate this tapped hole so that it can connect to the SapCheck Controller using the approximately 30" long wire coming from the Controller and terminating in the male vacuum sensor connector (F). Using an adjustable wrench, install the vacuum sensor transducer (H) into the tapped hole, using Teflon tape for a leak-proof connection. Connect the male vacuum sensor plug (F) into the female receptacle on the vacuum sensor transducer (H). (See Figure 8.)

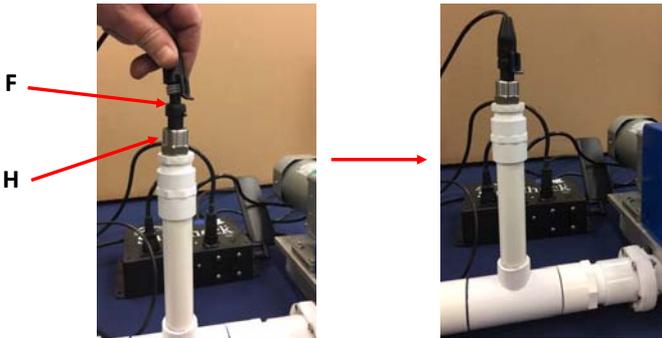


Figure 8

10. Connect your vacuum pump to 120 VAC Out power receptacle (M) on the SapCheck Controller. If your vacuum pump has an ON/OFF switch, set it to the ON position.
11. Connect the female end of the Controller power cord (J) into the male 120 VAC In power plug (L) on the Controller and plug the other end of this cord into 120 VAC power. The green light on the SapCheck Controller will illuminate. Within 2 minutes, you will receive a "Monitoring System is ON" text message on the cell phone set up as the Command Number for your device. *(Ensure that your cell phone is powered on and has reception.)*

SapCheck is now ready to receive and respond to text message commands from your cell phone to monitor and control your vacuum pump operation.

SAPCHECK OPERATION

When SapCheck receives a text message from a Command Number, it will always reply by texting back a confirming message. This indicates that SapCheck has received and processed the text message command that you sent.

MONITORING FUNCTIONS—ASKING SAPCHECK A QUESTION (?)

To ask SapCheck a question, you simply begin the text message with a question mark (?) or the word "get". SapCheck can provide you with temperature and vacuum information as collected from its temperature and vacuum sensors. Additionally, SapCheck will tell you whether or not the level of sap in your sap collection tank has reached the tank float switch. The "?" (get) commands allow you to inquire about the readings from these sensors:

- ◆ **?temp OR get temp** returns current temperature
- ◆ **?vac OR get vac** returns current vacuum
- ◆ **?tank OR get tank** returns a message indicating whether or not the sap has reached the sap alert level

(Note that the sap alert level corresponds to the height at which you have installed the float switch on your sap collection tank.)

Additionally, you can send the following text messages:

- ◆ **?status OR get status** returns a message indicating current temperature, vacuum, tank full status and pump operation state.

Note: This is the most efficient way to monitor conditions at the sugarbush as it returns all information in one text message, as opposed to multiple individual messages for each piece of information.

- ◆ **?settings OR get settings** returns a message indicating the values of all the control or alert settings that you have previously defined.
- ◆ **?version OR get version** returns the current version number of the SapCheck software installed in the Controller.

SAPCHECK OPERATION

- ◆ **?help** *OR* **help** returns a text message listing all the text message commands that SapCheck recognizes. The “?help” command is really the only SapCheck command you need to remember if you do not have access to your User's Guide.

SETTING A VACUUM ALERT

Commands that set various values for alert or temperature-based pump control are preceded by the equals sign, “=”, or you can substitute “set”.

To set the vacuum alert level, send the text message

=vac warning value *OR* **set warning value**

For example, to set the vacuum alert level to 10 in Hg, send the text message

=vac warning 10 *OR* **set warning 10**

If the vacuum measured by SapCheck's vacuum sensor falls below the previously specified alert level, SapCheck will send the following message to your cell phone:

Low Vacuum Warning <nn> in. Hg

The <nn> value is the current vacuum reading.

If you cannot remember what value you have specified for the vacuum alert, send the text message

?settings *OR* **get settings**

and it will return the values of all the settings you have specified, including the vacuum alert level.

SAP LEVEL ALERT

When the sap in your collection tank rises to the point where it causes the float switch to close, SapCheck will text the following alert to your cell phone:

Sap Alert Level

SapCheck User's Guide

TEMPERATURE AUTO CONTROL

SapCheck can automatically turn your vacuum pump on/off based on the temperature at your sugarbush. You can define one temperature at which the pump will turn on, and a second temperature at which the pump will turn off. For example, you might want to wait until the temperature warms up to 33°F before turning the pump on (to be sure that any ice inside the pump has melted) and to keep running until the temperature drops below, say, 30°F.

To set the temperature value at which the pump will turn on, send the text message

=temp on value OR set temp on value

To set the temperature value at which the pump will turn off, send the text message

=temp off value OR set temp off value

Finally, send the following text message to tell SapCheck to use these temperature settings to automatically turn the pump on and off.

auto

Figure 9 below shows a sample texting session implementing Temperature Auto Control.

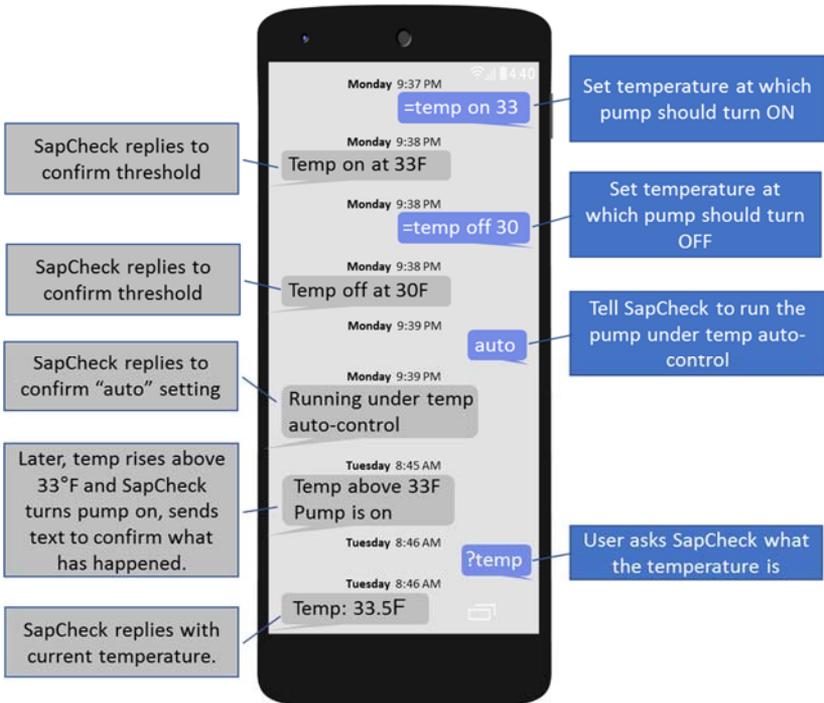


Figure 9

SAPCHECK OPERATION**REMOTELY STARTING / STOPPING VACUUM PUMP**

To force your pump to turn on, simply text the following message to SapCheck:

start

To force your pump to turn off, text the following message to SapCheck:

stop

If you have previously texted **auto** to SapCheck to turn on Temperature Auto-Control, texting either the **start** or **stop** commands will override the Temperature Auto-Control function.

To return the pump to Temperature Auto-Control, simply text the "auto" command again to Sapcheck.

COMMAND PHONE NUMBERS

SapCheck will only respond to text commands from cell phone numbers that have been registered with it using the **set user** command. To add a new Command Number for a user with cell phone xxx-yyy-zzzz, send the text message command below:

set user xxxyyyzzzz

To delete xxx-yyy-zzzz from the command number list, text:

set user xxxyyyzzzz del

Any active command number can issue a SapCheck command, and all active command numbers will receive SapCheck alerts. Only the command-issuing number will receive a response to a SapCheck query.

To make a command number inactive, text

set user xxxyyyzzzz act off

Inactive command numbers will not receive SapCheck alerts, and SapCheck will not process any command from an inactive number with the exception of the command to make the number active

set user xxxyyyzzzz act on

The "get user" text command returns a list of all Command Numbers and their status (active/inactive).

Note: Canadian users must add the prefix "+1" when specifying a phone # in a SapCheck text command; e.g.,

set user +1xxxxyyyzzzz

SAPCHECK OPERATION**SERVICE MODE**

For product support purposes, SapCheck can be put into "service mode" by texting the command

service control on

When in service mode, the unit will respond only to command texts from a special Bosworth Service Number. While in service mode, all command-confirming texts are sent only to this number. When this command is initiated, SapCheck texts the following message to the user:

SERVICE CONTROL ON

This message indicates that the unit is currently under "Service Control", and that no commands will be accepted from any user Command Numbers while in this mode.

When service mode is terminated, SapCheck resumes responding to texts from the user's Command Number. The user receives the following text to indicate that service mode has been terminated:

SERVICE CONTROL OFF

CALIBRATING SAPCHECK'S VACUUM SENSOR

The SapCheck vacuum sensor is factory-calibrated prior to product shipment. However, it is possible for sensor accuracy to drift over time. Additionally, you may choose to calibrate SapCheck's vacuum sensor to more closely match vacuum readings of a vacuum gauge installed on your sap line. For these reasons, SapCheck provides a set of commands that you can use to re-calibrate its vacuum sensor.

Re-calibrating the SapCheck vacuum sensor involves setting two different vacuum readings, one at zero vacuum (atmospheric pressure) and one at as high a vacuum as you can obtain on your system as read by your calibration gauge. Follow the steps below:

- 1) With your pump system running so that your calibrating gauge reads 0 in Hg vacuum, text the following command to SapCheck:

set calibrate lowvac 0.0

- 2) With your pump system running so that your calibrating gauge reads as high a vacuum reading as possible, text the following command to SapCheck

set calibrate hivac ###

where **###** is the vacuum reading on your calibrating gauge.

- 3) After setting the low and high vacuum points, text the following command to SapCheck

set calibrate

The Calibrate command causes SapCheck to install the new calibration settings and automatically reboot.

When SapCheck restarts, the new calibration settings will be used for reporting vacuum sensor readings.

SAPCHECK ACTIVATION; MONTHLY TEXT MESSAGE LIMITS

Your SapCheck Support Plan provides cellular network connectivity for your SapCheck unit. SapCheck units become active once a Support Plan is purchased. A SapCheck Support Plan provides up to 1500 messages per month and can be purchased to cover from 1 to 6 months' operation. Both messages "sent" and "received" by the SapCheck unit are counted toward the 1500 monthly message limit. Additional charges apply for messages above the 1500 monthly message limit. Contact The Bosworth Company for more details.

At any time, you can find out how many text messages you have used in a cycle by issuing the command

get usage

This text message returns

Current Cycle Start: <mm/dd/yy>	(start date of the current monthly cycle)
Monthly Text Allotment: <nnnn>	(monthly message limit as specified in the set monthly plan)
Usage This Cycle: <zzzz>	(number of messages used this cycle, including the current message)

LIST OF COMMANDS

Text Message Command	Meaning
auto	Returns the pump to operating under sensor control; sends confirming text
get help OR ?help	Generates 4 successive text messages listing all user text commands recognized by SapCheck
get settings OR ?settings	Generates text message containing current temperature and vacuum warning settings, as well status report interval.
get status OR ?status	Generates text message containing current operating state of pump (on/off), vacuum and temperature readings, whether or not tank has reached sap alert level in tank
get tank OR ?tank	Generates text message containing tank full status (full or not full)
get temp OR ?temp	Generates text message containing current temperature reading (°F) measured by sensor
get usage OR ?usage	Returns <u>current cycle start</u> date for the current monthly text cycle, the user's <u>monthly text allotment</u> (monthly text message limit) and <u>usage this cycle</u> (number of text messages used this cycle, including the command message and its reply.)
get user OR ?user	Returns the list of SapCheck command numbers and their active/inactive status
get vacuum OR ?vac	Generates text message containing current vacuum reading (in of Hg) measured by sensor
get version OR ?version	Reports software/firmware version # that the unit is running.
reboot	Turns SapCheck off and then back on. When the unit turns back on, it issues the "SapCheck is ON ..." message to the command number.

LIST OF COMMANDS (CON'TD)

Text Message Command	Meaning
service control on	Turns "Service Control" on. Unit will only respond to text commands from the "Service" phone #.
set calibrate lowvac <i>##.#</i>	Sets the low vacuum endpoint used for calibrating the SapCheck vacuum sensor. Usually, this is chosen when the system is running so that a second, calibrating gauge reads 0 in Hg. In that case, the value 0.0 is entered for <i>##.#</i>
set calibrate hivac <i>##.#</i>	Sets the high vacuum endpoint used for calibrating the SapCheck vacuum sensor. Usually, this is chosen when the system is running at or near the highest vacuum as indicated by a second, calibrating gauge. The value entered for <i>##.#</i> is the value (in units of in Hg) reported by the second, calibrating gauge.
set calibrate	Installs the "lowvac" and "hivac" points specified by the set calibrate lowvac and hivac commands and automatically reboots SapCheck. Vacuum sensor re-calibration will take effect when SapCheck restarts.
set report <i>value</i>	Sets the time interval in hours at which SapCheck will automatically send status message texts. Useful if you want to see status information on a regular basis without having to issue "?status" text messages for each report.
set temp off <i>value</i> <i>OR</i> =temp off <i>value</i>	Sets the "falling" temperature value when the pump will turn off under auto-temp control. If the temperature is already below this temperature, the pump will turn off if under auto-temp control.
set temp on <i>value</i> <i>OR</i> =temp on <i>value</i>	Sets the "rising" temperature value when the pump will turn on under auto-temp control. If the temperature is already above this temperature, the pump will turn on if under auto-temp control.

Text Message Command	Meaning
set user xxxxyyzzzz <i>Example:</i> set user 4011234567 Canadian: set user +1xxxxyyzzzz	Sets the user phone # (area code + number; no dashes!) which the unit will recognize as a "command-generating" number. <u>IMPORTANT!</u> <i>Be very careful using this command. If you do not enter the phone # correctly, you may enable command of your SapCheck unit by an unknown party!</i> <u>NOTE:</u> Canadian users must specify "+1" before the phone number.
set user xxxxyyzzzz del Canadian: set user +1xxxxyyzzzz del	Deletes phone # xxxxyyzzzz from the command number list. <u>NOTE:</u> Canadian users must specify "+1" before the phone number.
set user xxxxyyzzzz act on/off Canadian: set user +1xxxxyyzzzz act on/off	Sets the status of command number to either active ("on") or inactive ("off"). Inactive command numbers do not receive any alerts and cannot issue any text commands with the exception of the command to change their status to active. <u>NOTE:</u> Canadian users must specify "+1" before the phone number.
set vacuum warning value OR =vacuum warning value	Sets the (falling) vacuum value at which a warning text is sent to the user
get signal OR ?signal	Returns a % indicator of cell phone communication strength where the SapCheck Controller is located.
start	Starts the pump, regardless of sensor input; sends confirming text
stop	Stops the pump, regardless of sensor input; sends confirming text
update	Issued to upload new SapCheck software version from thumb drive. Thumb drive must be inserted into USB port when command is texted.

Note:

Commands are not case-sensitive, but **all characters in a command must be typed as shown, including spaces.**

The <value> entries should be replaced by a number. For example, sending the text message ...

=temp on 33

... will set the "temp on" value to 33°F.

The "get" and "set" versions of the commands are designed to be used with voice-recognition, if available, on your cell phone.

SUPPORT

Each SapCheck unit must have access to a cellular communications network to function. Cellular network connectivity is provided through a SapCheck Support Plan that is purchased from The Bosworth Company. SapCheck Support Plans provide for cellular network connectivity as well as access to software upgrades and new releases.

All Sapcheck units purchased directly from Bosworth are shipped with an active support plan. **In the case of a SapCheck unit purchased through a dealer, the user must contact The Bosworth Company to purchase a support plan.**

Support plans can be purchased either by going on the following Bosworth website page ...

www.thebosworthco.com/SapCheck/activate

or by calling The Bosworth Company at 1-888-438-1110. You must provide the your SapCheck ID # (printed on the bottom of the Controller box) to purchase a support plan.

Once a plan has been purchased, the telecommunications capability within SapCheck is activated and the unit is assigned a telephone number. The user can then send commands to SapCheck by texting messages to this SapCheck phone number.

SOFTWARE UPGRADES

Software upgrades are installed by connecting the USB port on the SapCheck Controller to a USB (thumb) drive onto which the latest version of the software has been downloaded.

Each SapCheck user has a user SapCheck account on The Bosworth Company website. The most current version of the SapCheck software is available on the user's SapCheck account and can be downloaded from his/her account onto a temporary directory on a computer.

The SapCheck software is stored in a file with a filename of sapcheck.bos. If there is already a previous version of sapcheck.bos on the thumb drive that you are going to use to update your SapCheck software, be sure to rename this file on the thumb drive to some other filename (e.g., sapcheck.bos_old) before moving or copying the latest version of the sapcheck software onto the thumb drive. If you do not do this, the copying/moving operation may result in renaming the newer sapcheck.bos file with a different name (e.g., sap-check.bos(1)), and, as a result, the updating procedure will not find this file to upload it on the SapCheck controller.

SOFTWARE UPGRADES (CONT'D)

Additionally, ensure that the thumb drive to which you are download the SapCheck software is formatted as NTFS. The software update process will not work if the thumb drive is formatted under the older FAT32 format. You can Google NTFS on the web for instructions about reformatting your thumb drive using NTFS.

Once the sapcheck.bos software has been downloaded onto a thumb drive, and while the SapCheck Controller is powered on, insert the USB drive into the USB port on the back side of the SapCheck Controller. From the command cell phone issue the text command **update**. If the software on the thumb drive is newer than the release that SapCheck is running, SapCheck will install the new software from the thumb drive. SapCheck will reboot to complete the software installation. This process will take approximately 2 minutes. When the reboot has finished, SapCheck will text the power-on message; namely, **SapCheck version X.YY.ZZ**. Once this has occurred, the update process has successful completed and the thumb drive can be removed.

TROUBLESHOOTING

The most likely cause of poor SapCheck functionality is poor or spotty cell phone communication at the sugarbush. The table below presents some additional troubleshooting suggestions to help diagnose and correct performance issues.

Problem	Things to check
SapCheck did not respond to my text command	<ul style="list-style-type: none"> The most likely cause of this is a temporary problem with the cellular network. The simplest solution is to simply re-issue the command. Best practice is to wait a minimum of 5 seconds before issuing a follow-on command.
SapCheck is not responding to any of my text commands	<p>When SapCheck recognizes a command, it replies with a confirming text. If you do not receive any confirming text, it may be due to any of the following causes:</p> <ul style="list-style-type: none"> you did not send a correctly formatted text to SapCheck. (Ensure that you are entering the command with all words spelled correctly and with any required spaces; also take care that you are not entering any spaces or punctuation that are not required.) you sent a correctly entered text command, but not from the "command phone #". SapCheck will only respond to commands from the phone # identified by the set user xxxyyyzzzz command.

TROUBLESHOOTING (CONT'D)

Problem	Things to check
SapCheck is not responding to any of my text commands	<ul style="list-style-type: none"> • cell phone communication has been interrupted or is not functioning with sufficient strength at the sugarbush • SapCheck is not powered on. • If, after 5 minutes, SapCheck is not responding, and you have confirmed that you have cell-phone connectivity at your sugarbush where SapCheck is deployed, then “power-cycle” SapCheck by unplugging it and then plugging it in again to power. This effectively “reboots” the SapCheck device and should clear up any communications problem.
Vacuum pump is not responding to temperature control	<p>Text auto command to ensure that SapCheck is operating the pump under auto-temp control.</p> <p>Text ?settings command to ensure the temperature and vacuum thresholds are correct.</p> <ul style="list-style-type: none"> • Temp on value should be higher than temp off value. • Check that pump is powered on and connected to SapCheck controller.
My temperature reading seems to be “frozen” at a certain value and is not accurate	<ul style="list-style-type: none"> • The most likely cause of a “frozen” temperature reading is that the sensor input cable was disconnected from the unit and then re-connected after the unit was powered up. To fix this, ensure that the sensor input cable is properly plugged into the Controller box and then power the box off and then back on. • If you are certain that the sensor cable is properly plugged into the box and you are not at your sugarbush, you can also “power-cycle” the unit by issuing the reboot command from your command phone #.

YOUR NOTES

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